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EFFECTS OF FOOD WASTE MANAGEMENT PRACTICES ON CREATION OF ELECTRICAL ENERGY IN NAIROBI CITY COUNTY

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Abstract: Energy recovered from waste can be used for generation of heat and power (electricity). The energy generation option selected depended on potential end users that utilized heat and power available. Despite the importance of renewable energy generation in promotion of country's economic development and environment conservation, most previous projects on creation of renewable electrical energy projects have failed. The main objective of the study was to determine the influence of food waste practice on creation of renewable electrical energy projects, the study also sought to understand which of the factors have the most impact. The factors identified were project expertise, stakeholder participation, government policies, resources and leadership styles. The study adopted descriptive research design of which target population was private investors in Nairobi Solid Waste Sector. The study applied purposive sampling technique to select a sample size of 100 respondents. Questionnaires were used as the main data collection instruments and a pilot study was conducted to pre-test questionnaires for reliability. Descriptive statistics and multiple regression analysis were used to analyze the gathered data and the results were presented on tables and charts. The study found out that project expertise, stakeholder's participation, government policies, resources and leadership styles all influence the creation of renewable electrical energy projects. The study drew conclusion that government policies is the independent variable that influences most the dependent variable creation of renewable electrical energy projects, followed by leadership styles, stakeholders' participation and lastly project expertise. The study recommends that in order to successfully support the creation of renewable electrical energy projects; firms implementing renewable electrical energy projects should acquire professionally trained experts and also train their staff on renewable energy generation best practices. The firms can also benchmark project expertise from renewable energy firms in developed nations. All stake holders involved in renewable energy projects should be full engaged in all matters concerning project implementation. It was also recommended that the government should provide guideline on how to manage creation of electrical energy projects. The project managers and project team leaders should employ democratic or participative leadership styles style in order to facilitate in coaching and development of project team members.

Introduction

Energy is essential, however, it is also one of the benefits taken into granted. Having dependent mainly on hydropower and thermal energy, Kenya has continuously reviewed its energy policy to ensure sustainable energy supply through adoption of renewable energy in the energy mix. The study paper examines and discusses how food waste management practices are an attractive option of both supplementing the inadequate power supply in the country and eliminating solid waste disposal problem.

Food waste is slowly gaining momentum as a critical issue, particularly in cities where its volume and impacts are more pronounced than in less densely populated areas. There is little dispute over the urgency of addressing food waste and its broader implications, despite the lack of government

participation in the study discussion. While scholarly sources identify food waste as a legitimate concern, the methods used and suggestions proposed when presenting vary based on whether food waste is being framed as an environmental, social, or economic issue. (Gunders, 2012).

In the present study, different landfill gas (LFG) energy recovery systems, including traditional and innovative technologies, are analyzed through a techno economic and an environmental comparison. (Bloom, 2010). Organic waste is produced wherever there is human habitation. The main forms of organic waste are household food waste, agricultural waste, human and animal waste. In industrialized countries the amount of organic waste produced is increasing dramatically each year.

In 2015, the quantity of household waste going to landfill in Sweden increased by 16 percent (5,400 tonnes) to 38,300 tonnes compared to 2014, or 4 kg/person (Lantz, 2014). Whereas, 25 percent of total Europe methane emissions is accounted for by waste material that were once living, such as food, plant debris, and some paper that become preserved in lifeless landfills (Gunders, 2012). As we move to the United States, landfills have become the most convenient places to dispose of biodegradable materials, despite its potential to naturally decompose. In both 2000 and 2008, just 2.5 percent of food waste was composted, suggesting that attitudes toward food waste have not improved despite an increase in awareness, policy changes, and the establishment of new facilities to process organic wastes (Bloom, 2010).

Diverting food waste from landfills not only conserves limited landfill space, but also helps to reduce greenhouse gas emissions. By putting food waste into a landfill, we are wasting a valuable resource. When properly processed, food scraps can generate renewable energy. According to a study done by EBMUD it has been proven that through different technologies that is. anaerobically digesting, 100 tons of food waste per day, five days a week, provides sufficient power for approximately 1,000 homes. The study means that if 50% of the food waste generated each year in the U.S. was anaerobically digested, enough electricity would be generated to power over 2.5 million homes for a year (Bloom, 2010).

A closer look at neighboring West African countries such as Nigeria, dictates that materials and resources must be used to their full potential, and the study has propagated a culture of reuse, repair and recycling. In these countries, there exists a whole sector of recyclers, scavengers and collectors, whose business is to salvage ‘waste’ material and reclaim it for further use (Ogwueleka, 2014). In Central Africa we see large quantities of waste creation, usually in the major cities, there are inadequate facilities for dealing with it, and much of this waste is either left to rot in the streets, or is collected and dumped on open land near the city limits. There are few environmental controls in these countries to prevent such practices (Trois, 2012).

Improper disposal of solid waste associated with high rates of generation in urban areas in Kenya is alarming (Njoroge, Kimani & Ndunge, 2014) .The relative lack of adequate management is associated with rapid urbanization and industrialization without commensurate solid waste disposal facilities. The study has resulted in solid waste being dumped in open spaces causing blockage of drainage channels, posing health hazards and damaging aesthetic values of the environment, yet relatively few mitigation measures are in place (Henry, Yongsheng & Jun, 2010).

According to a recent survey by UNEP, Nairobi with a population of 4.0 million generates 3,200 tons of waste daily. The solid waste generated constitutes of 23% paper, 10% textiles, 51.5% of food waste and the remaining 9% to the rest, making food waste the largest waste stream sent to landfills. Only 850 tons reach Dandora dumpsite with the rest remaining unaccounted for. This is relevant to the study

since it shows how waste management is a big issue and hence creating an opportunity for waste to energy management.

Statement of the problem

Access of electricity in Kenya is low despite the government's 2030 ambition target to increase electricity commodity from currently 15% to 22% (Henry, 2010). Inadequate power supply capacity due to increase in demand for electricity, which is growing faster than the ability to install additional generation plants. Kenya's energy mix is low, it comprises of mainly hydro and thermal, this has led to over dependence on hydro-power which exposes the country power rationing due to extreme weather condition. Renewable energy is another source that can certainly increase the country's energy mix; but most of projects implemented under sustainable energy are mostly solar and wind, waste to energy facility is fairly a new concept that is yet to be embraced in the country. (Kombo, 2010).

According Njoroge et al. (2010), a total of 2,679.89 tonnes per day of solid waste is generated in the Nairobi City County with an apparent specific gravity of 0.28. Taking the 2010 census figures there was a total population of 3.86 Million, hence the current amount of solid wastes generated per day per person is approximately 0.7 kg per person per day. The collection efficiency of 25% is used, arithmetically 65% of the solid wastes generated is uncollected, this is because the public sector (county government) is unable to deliver services effectively and this translates to 1,741.93 tonnes/day (Henry, 2010). This could be more due to increasing population in Nairobi City County due to several increasing industrial activities from many sectors. According to a study done by EBMUD it has been proven that through different technologies that is anaerobically digesting, 100 tons of food waste per day, five days a week, provides sufficient power for approximately 1,000 homes. The study means that if 50% of the food waste generated each year in the Nairobi City County was anaerobically digested, enough electricity would be generated to power over 25 million homes for a year (Bloom, 2010).

Despite the importance of renewable energy generation in promotion of country's economic development and environment conservation, most previous projects on creation of renewable electrical energy projects have failed (Njoroge et al, 2014), majorly because most previous studies on solid waste management have focused on different areas (Kombo, 2010). A study done by Rotich (2007), focuses on possible solutions that can be undertaken to improve municipal solid waste (MSW) services. Other studies done, include: (Paul, 2014) focus on Stakeholder's involvement in municipal solid waste management, the study examines effectiveness of decentralized approach in solving the SWM problems. Tilahun (2016) also focuses on Evolution of Solid Waste Management Policy Landscape in Kenya which is an analysis of evolvement of policy priorities and strategies. Therefore, there is a need to undertake the study in order to determine the influence of food waste practice on creation of renewable electrical energy projects.

The objective of the study were;

i. To determine influence of project expertise on creation of electrical energy projects
ii. To determine influence of Stakeholder participation on creation of electrical energy projects
iii. To evaluate influence of government policies on creation of electrical energy projects.
iv. To find out influence of resources on creation of electrical energy projects.
v. To evaluate leadership styles influence on creation of electrical energy projects

Theoretical Review

The theoretical framework is the structure that can hold or support a theory of a research study. It introduces and describes the theory that explains why the research problem under study exists. This

study was anchored on five theories, namely; transformational theory, resource mobilization theory, institutional theory and social cognitive theory.

Transformational Theory

According to Burns (2010) transformational theory of leadership is a process in which "leaders and followers help each other to advance to a higher level of morale and motivation". The study describes leadership styles as an approach that causes change in individuals and social systems. In its ideal form, it creates valuable and positive change in the followers with the end goal of developing followers into leaders. Transformational leadership styles enhances the motivation, morale and performance of followers through a variety of mechanisms. Different studies show that the project manager who exercises transformational leadership behaviour of inspirational motivation enjoys project success. The development of a shared vision is an integral component of the idealized, transformational leader's role (Jung & Avolio, 2000). It helps the team look towards the future while gaining group acceptance of ideas through the alignment of personal values and interests that serve the group's purposes. In short, the study shows that a project manager must be a strong transformational role model for the team and display a second, more tactical approach to adapting relationship actions towards the team to achieve task success. Project managers who employ transformational leadership and more specifically, idealized influence in conjunction with a relationship-oriented approach enjoy more project success (Slevin & Pinto, 2004). This theory supports the variable leadership styles by showing how critical it can be in waste to energy projects.

Resource Mobilization Theory

According to McCarthy and Zald (2010) resource mobilization theory is whereby all the actions taken by an organization to ensure that it has the resources it needs to properly implement its projects. The term "resource" covers not only financial resources, but also the human resources and goods and services made available to the organization. A resource-mobilization strategy requires broad outreach to potential donors and partners in order to diversify the sources of support and financing. First introduced by John McCarthy, resource mobilization theory states that the political concept in which a group acts, the resources available to the group, and how the group uses its resources all affect the success of the group. Resource mobilization involves securing new and additional resources for your project. Making better use of, and maximizing existing resources with the aim of continuous improvement hence sustainability (McCarthy and Zald, 2010). Resource mobilization theory argues that projects succeed through the effective mobilization of resources and the development of opportunities from needs. Projects can mobilize both material and non-material resources. Material resources include money, organizations, manpower, technology, means of communication, and mass media, while non-material resources include legitimacy, loyalty, social relationships, networks, personal connections, public attention, authority, moral commitment, and solidarity (Fuchs, 2010). Resource Mobilization is a fundamental component to project delivery and impact, it is central to the process, demonstrating that once the focus of work is set, resources are required to ensure successful implementation, delivery and impact of waste to energy projects.

Social Cognitive Theory

The social cognitive theory explains how people acquire and maintain certain behavioural patterns, while also providing the basis for intervention strategies (Bandura, 2012). Evaluating behavioural change depends on the factors environment, people and behaviour. Social cognitive theory provides a framework for designing, implementing and evaluating programs. The three factors environment, people and behaviour are constantly influencing each other. Behaviour is not simply the result of the

environment and the person, just as the environment is not simply the result of the person and behaviour (Glanz et al, 2012).

The concept of behaviour can be viewed in many ways. Behavioural capability means that if a person is to perform a behaviour he must know what the behaviour is and have the skills to perform it (Bandura, 2012). Exercise of personal agency through the self-efficacy mechanism). Bandura's Social Cognitive Theory proposes that people are driven not by inner forces, but by external factors. This study model suggests that human functioning can be explained by a triadic interaction of behavior, personal and environmental factors. The Social Cognitive theory supports the variable stakeholder Participation programs by emphasizes different aspects likely to trigger change that is. one can appeal to people's minds so as to influence their attitude about a certain behavior(in this study case, by showing risks associated with food waste hazards and emphasizing on the benefits of its eradication through creation of electrical energy).

Conceptual Framework

Conceptual framework is a pictorial or diagrammatic representative showing the relationship between the independent and dependent variable. In this study case project expertise, stakeholder's participation, government policy, resources and leadership styles the independent variables while the dependent variable is creation of renewable electrical energy/

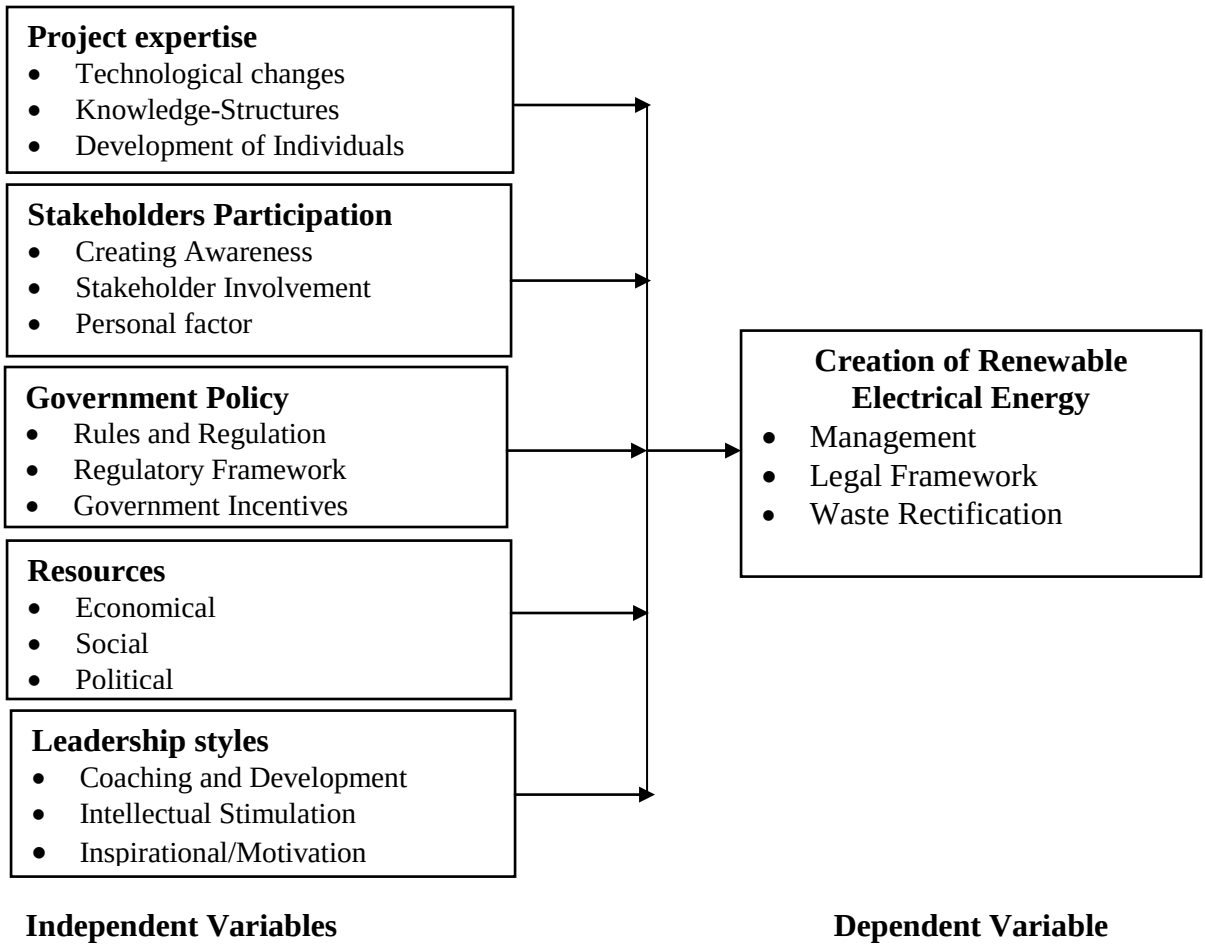

Figure 1: Conceptual Framework

Empirical Review

Empirical research is based on observed and measured phenomena and derives knowledge from actual experience rather than from theory or belief. Definition of the population, behavior, or phenomena being studied. It is an interdisciplinary field of research which includes the psychology, sociology, Philosophy, the contextual study of literature, and the history of reading literary texts.

Project expertise

For elimination of solid waste, waste to energy is an attractive option with energy recovery. In this study section, an overview for various technologies that can be used, Incineration is the process of control and complete combustion, for burning solid wastes. It leads to energy recovery and destruction of toxic wastes, for example, waste from hospitals. The temperature in the incinerators varies between 980 and 2000C. The heat generated from combustion is used to produce steam to drive a steam turbine to generate electricity. One of the most attractive features of the incineration process is that it can be used to reduce the original volume of combustible solid waste by 80–90% (Sharholy, Ahmad, Mahmood & Trivedi, 2008). Waste incinerators have existed since the 19th century with renewed interest across the United States, Europe and Asia since the 1970s. In the 1990s, major regulatory reform occurred across the world to reduce the environmental and health impacts of mass burn incinerators and waste to energy plants. As opposed to older plants, modern plants have been designed to produce energy as the primary objective, and dispose of waste as a secondary objective. For example, in Europe there are set energy recovery levels that must be reached if a plant is to be classed as a legitimate waste to energy resource recovery operation rather than a disposal operation.

Stakeholder Participation Programs

A study by DANIDA (2010) revealed that awareness is crucial, since it acts as a motivator, for segregation of waste to be done as part of daily routines. Creation of awareness is a requirement from the beginning of the project, in order for the stake holders to feel as part of the project and get the benefits of the project. To make the awareness program a success, centers are created for briefing and participatory meetings. Educational pamphlets are prepared and distributed during the talk. The pamphlets act as educational tools of how project implementation is done. During such awareness programs stakeholders are required to coordinate and monitor the overall implementation of the project. (DANIDA, 2010) In 2009, the Government of Denmark through the Danish International Development Assistance (DANIDA) agreed with the Government of Malaysia to establish a fund to support Local Authorities, who were committed to carry out such initiatives to increase public participation and awareness in solid waste management on the local level. The food waste segregation programme for public food courts in Subang Jaya is one of the initiatives taken by Subang Jaya Municipal Council (MPSJ) to increase public participation in sustainable solid waste management. Food waste is the largest component of our solid waste. Achieving high recycling rates for our waste therefore, cannot be done without involving food waste producers.

Government Policy

A study by Michaels (2007) found out that government policies can play a major role in creating incentives for waste-to-energy. In Sweden there have been a number of Government and EU policies designed to help move Sweden and Europe away from dependency on fossil fuels, and which have encouraged utilities to develop increased waste-to-energy capacity. The following list, while not all-inclusive, demonstrates policies that can be instrumental in helping to spur WTE development. Price on Carbon/Carbon Tax, Placing a price on greenhouse gas emissions, provided the price is high

enough, incentives emitters to reduce emissions. A price on carbon typically comes in the form of a cap and trade system, or a carbon tax. Swedish energy companies are currently under the influence of both a carbon tax and the European Union Emissions Trading Scheme (EU ETS). However, waste-to-energy is not included in the Emission Trading System and therefore does not require carbon credits. In Sweden the carbon content for household waste is assumed to be 12.6 percent by weight, which is far less than fossil fuel (Michaels, 2007).

Resources

Eurostat (2012) study noted that waste is not only an environmental problem, but also an economic loss. On average Europeans produce 481 kilograms of municipal waste per year. An increasing share of this study is recycled or composted, and less is sent to landfill. We can change the way we produce and consume so as to produce less and less waste, while using all waste as a resource. The amount of waste we generate is closely linked to our consumption and production patterns. The sheer number of products entering the market poses yet another challenge. Demographic changes, like an increase in the number of one-person households, also affect the amount of waste we generate (e.g. packaging goods in smaller units).The large spectrum of waste types and complex waste-treatment paths (including illegal ones) makes it difficult to get a complete overview of the waste generated and its whereabouts. There are data, albeit of varying quality, for all types of waste. McCarthy and Zald (2007) found out that resource mobilization theory stated that the political concept in which a group acts, the resources available to the group, and how the group uses its resources all affect the success of the group. Resource mobilization involves securing new and additional resources for your project. Making better use of, and maximizing existing resources with the aim of continuous improvement hence sustainability.

Leadership styles

James McGregor Burns writing in the study book 'Leadership styles' was the first to put forward the concept of "leadership styles". To Burns leadership styles "is a relationship of mutual stimulation and elevation that converts followers into leaders and may convert leaders into moral agents". Burns went on to also further define it by suggesting that: It occurs when one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality. Waste collection authority provides receptacles for the waste for households, collect the waste in its area and deliver it to the place of disposal. The collection authority is also responsible for the development of the recycling plan dealing with the kinds and quantity of recyclable waste. There is also a concept of 'duty care', which seeks to ensure safe storage, handling and transport of waste by authorized people and to authorized sites for commercial and industrial waste. The Environmental agency is required to prepare Waste disposal plans for the county or metropolitan area. This study plan include provisions as arrangements needed for the treatment and disposal of household, industrial and commercial waste (Williams, 2012).

Research Methodology

Descriptive research was used as the research design. The study focused on Nairobi Solid Waste Sector, since it is a commercial area with an increasing growing population. The study majorly comprised of private investors and the county officers at the solid waste department. The target population was 135.

Purposive sampling was used to achieve the objectives of the study, based on who can give the best information on the topic of research. Food Waste as a source of electrical energy is a fairly new

concept in Kenya and only a minority of industries have embraced the concept. The identified population was categorized into two (the Private Investors and senior council officers in the solid waste department), who are mainly involved in the waste generation sector, and total to about 135. The sample size was calculated based on Yamane's formula (Yamane, 1967).

$$n = \frac{N}{1 + Ne^2}$$

Where, n = the sample size; N = the size of population; e = the error of 5 percentage point. By using Yamane's formula of sample size with an error 5% and with a confidence coefficient of 95% (Yamane, 1967), the calculation from a population of 135 (population approximation) was a sample size selected of 100.

Questionnaires were the main data collection method and the tool used for the study. Open ended questions were used to allow the respondents to give their own opinions. Analysis of the data collected was done using descriptive statistics in the form of percentages and tables. This study is because descriptive statistics offers a systematic collection, analysis and interpretation of data in order to meet the required research objectives. Descriptive statistics was used to compute data frequency, percentage, percentage mean, and standard deviation and variance results aided by Statistical Packages for Social Science (SPSS Version 23). Further, inferential statistics were done using multiple regression model to establish the statistical significance relationships between the independent variables and the dependent variable. The findings were presented using tables and charts.

The following multiple regression model will be applied:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + ɛ.$

The independent variables included; (X_1) project expertise, (X_2) stakeholder's participation, (X_3) government policies, (X_4) resources, (X_5) leadership styles, and ɛ was the Constant. The dependent variables (Y) was the creation of renewable electrical energy projects. Other methods used to analyses the data included: correlation, ANOVA and Beta coefficients.

Data Findings, Analysis and Discussion

The researcher sample size of 100 respondents where 84% the respondents filled and returned questionnaires while 16% of the respondents did not respond. From the finding it can also be concluded that the response rate was good enough for the researcher to proceed on with the analysis. According to Mugenda and Mugenda (2003), a 50% response rate is adequate, 60% good and above 70% rated very well. This study is also in line with the assertion by (Bailey, 2007), that a response rate of 50% is adequate, while a response rate greater than 70% is very good.

Study Variables

The study sought to determine the influence of food waste practice on creation of renewable electrical energy projects. Specifically, the study analyzed data in this study section based on research variables which included; project expertise; stakeholder participation; resources; government policies and leadership styles; the dependent variable was creation of electrical energy projects.

Project expertise

The study sought to determine the influence of project expertise on creation of electrical energy projects. From the findings, a mean score of 4.2500 was obtained on technological changes of a waste to energy facility is critical to its successful set up; a mean score of 4.1429 was obtained development

of knowledge structures on waste to energy bring about more adoption of the theory and a mean score of 4.2500 was obtained on implementing of individual development on importance of waste to energy is critical to the success because it enhances project expertise. On average all the project expertise factors determining success of a waste to energy facility had a mean score of 4.2659; a standard deviation of 0.83675 and a variance of 0.708. These implies that majority of the respondents agreed that all the project expertise factors determined the success of a waste to energy facility. The findings concurs with Sharholy, Ahmad, Mahmood, and Trivedi (2008) where they found out that in many developing nations' project expertise problems arising as result of technological changes of a waste to energy facilities; lack of development of knowledge structures on waste to energy and lack of implementation of individual developments on importance of waste to energy hampers the success of the creation of electrical energy projects.

Table 1: Project expertise Factors

Project expertise	N	Mean	Std. Deviation	Variance
Technological changes	84	4.2500	.83414	.696
Knowledge development structures	84	4.1429	.94605	.895
Individual development	84	4.4048	.73006	.533
Average	**84**	**4.2659**	**0.83675**	**0.708**

Stakeholders Participation

The study sought to determine influence of Stakeholder participation on creation of electrical energy projects. From the findings, a mean score of 4.4405 was obtained on stakeholder involvement is very important in successful set up of waste to energy project; a mean score of 4.3690 was obtained on it is important to articulate the benefits of setting up a waste to energy facility to relevant stakeholders in order to gain support; a mean score of 4.4405 was obtained on getting buy in from all the actors in the waste value chain is important in waste to energy project success and finally a mean score of 4.4167 was obtained on community involvement is a critical factor to a successful set up of a waste to energy project. On average all the stakeholder involvement factors had a mean score of 4.4166; a standard deviation of 0.7444 and a variance of 0.5582. The findings are in agreement with Nelson and Smith (2011) where they found out that in India and Pakistan stakeholder involvement issues in electric energy projects such as the methods employed in articulating the benefits of electric energy projects to the community; acquiring the support from all the actors in the electric value chain and the level of community involvement affects creation of electrical energy projects.

Table 2: Stake Holders Factors

Stakeholder Participation	N	Mean	Std. Deviation	Variance
Stakeholder involvement	84	4.4405	0.78158	0.611
Waste to energy facility benefits	84	4.3690	0.81816	0.669
Buy in from all the actors	84	4.4405	0.64661	0.418
Community involvement	84	4.4167	0.73153	0.535
Average	**84**	4.416675	0.7444	0.5582

Government Policies

The objective was to evaluate influence of government policies on creation of electrical energy projects. The results show that a mean score of 4.5119 was obtained on Government can catalyze the success of waste to energy project by having incentives in order to attract investors; a mean score of 4.4524 was obtained on having policies that regulate the management of municipal solid waste is a

critical factor in successful set up of waste to energy project and a mean score of 4.5476 was obtained on in order to be a successful in setting up a waste to energy project, a clear regulatory framework to support such set up should be put in place. On average all the government policy factors had a mean score of 4.50396; a standard deviation of 0.79501 and a variance of 0.644. The findings corroborates findings by Michaels (2007) where he found out that government policies can play a major role in creating incentives for waste-to-energy and this study helps in creation of electrical energy projects.

Table 3: Government Policies Factors

Government Policies	N	Mean	Std. Deviation	Variance
Government Incentives	84	4.5119	.92481	.855
Management of policies	84	4.4524	.81262	.660
Regulatory framework	84	4.5476	.64760	.419
Average	**84**	4.50396	0.79501	0.644

Resources

The objective was to find out the influence of resources on creation of electrical energy projects. The results show that a mean score of 4.5714 was obtained on resources should be available for a waste to energy project needs to make economic sense. It should be able to pay for its cost and generate some surplus amount of money; a mean score of 4.6071 was obtained on the generation, collection and transportation of municipal solid waste should be taken into account when setting up a waste to energy project for it to be viable and lastly a mean score of 4.4405 was obtained on the source separation and recycling is important in determining the final waste composition that reaches the waste to energy project for it to be manageable. On average all the resources factors had a mean score of 4.5396; a standard deviation of 0.73153 and a variance of 0.535. These findings therefore indicates that the resources factors notably, resources availability; resources availability for a waste to energy project needs to make economic sense; resources for the generation, collection and transportation of municipal solid waste should be taken into account when setting up a waste to energy project for it to be viable and management resources for managing the source separation and recycling the final waste composition that reaches the waste to energy project. These findings echoes findings by Chappell (2010) that resources should be available for a waste to energy project needs to make economic sense and the project should have enough financial resources to be able to pay for its cost and generate some surplus amount of money.

Table 4: Resources Factors

Resources Factors	N	Mean	Std. Deviation	Variance
Project Feasibility	84	4.5714	.74907	.561
Set up Cost	84	4.6071	.71166	.506
Waste segregation	84	4.4405	.73388	.539
Average	**84**	4.5396	0.73153	0.535

Leadership styles

The objective was to evaluate leadership styles influence on creation of electrical energy projects. The results show that a mean score of 4.6190 was obtained on the statement that in order to be successful in setting up a waste to energy plant, coaching and development is extremely important; a mean score of 4.5714 was obtained on intellectual stimulation should be taken into account when setting up waste to energy project and a mean score of 4.5476 was obtained on a project that has motivation and inspiration support is more likely to be successful than one that lacks. On average all the leadership

styles factors had a mean score of 4.5793; a standard deviation of 0.7256 and a variance of 0.527. The findings are in line with Williams (2012) that leadership styles plays critical role for effective collection and disposal and the management of waste collection firms should take the responsibility of coaching and development and providing intellectual stimulation to all employees involved in handling and disposal of waste in all locations.

Table 5: Leadership styles

Leadership styles Factors	N	Mean	Std. Deviation	Variance
Coaching and Development	84	4.6190	.74291	.552
Intellectual stimulation	84	4.5714	.73281	.537
Motivation and Inspiration support	84	4.5476	.70120	.492
Average	**84**	4.5793	0.7256	0.527

Creation of Renewable Electrical Energy

The study aimed to establish the major issues that determine the creation of food waste management electrical energy projects. The results show that a mean score of 4.5714 was obtained on the statement that in order to be successful good management skills must be applied towards the waste to energy facility; a mean score of 4.5952 was obtained on government policies that support food waste management practices are likely to lead to project success unlike one that lacks and a mean score of 4.4881 was obtained on technology that makes economic sense should be implemented in food waste management to avoid project failure due to cost overruns. On average all the food waste management factors had a mean score of 4.5515; a standard deviation of 0.70205and a variance of 0.497. The findings are in agreement with Trois (2012) that waste management firms requires managers with good management skills; supportive government policies and application of current modern technology since waste management firms operate on harmful materials which may have a negative impact to the environment in case of disruption in waste handling and management.

Table 6: Creation of Renewable Electrical Energy Factors

Food Waste Management	N	Mean	Std. Deviation	Variance
Good management skills	84	4.5714	.69915	.489
Government policies	84	4.5952	.62323	.388
Technological Application	84	4.4881	.78378	.614
Average	**84**	4.5515	0.70205	0.497

Regression Analysis

The model used for the regression analysis was expressed in the general form as:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + ε.$

The regression model coefficient of determination ($R^{2)}$ is 0.698 and R is 0.836 at .05 significance level. This study is an indication that the four independent variables notably; project expertise, stakeholder's participation, government policies, resources and leadership styles influences the dependent variable which is creation of renewable electrical energy projects. The coefficient of determination (R^2, 0.698) indicates that 69.8% of the variation on creation of renewable electrical energy projects can be attributed to changes in project expertise, stakeholders' participation, government policies, resources and leadership styles influences. The remaining 30.2% of the variation on creation of renewable electrical energy projects is determined by other variables not included in the study model.

Table 7: Regression Model Summary

R	R Squared	Adjusted R Square	Std. Error of the Estimate
.836(a)	.698	.670	.27703

a Predictors: (Constant), X1, X2, X3, X4, X5

The study further used Analysis of Variance (ANOVA) in order to test the significance of the overall regression model. From the results, it can be concluded that all the independent variables significantly affect creation of renewable electrical energy projects, since, The F-calculated is 49.980 which is greater than the F-critical, which is 24.990 implies goodness of fit of the model.

Table 4.1 Analysis of Variance (ANOVA)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	9.589	5	1.918	24.990	.000(a)
Residual	4.144	54	.077		
Total	13.733	59			

a Predictors: (Constant), X1, X2, X3, X4, X5
b Dependent Variable: Y

The results, indicate that a unit of increase in project expertise will lead to a .042 increase in creation of renewable electrical energy. A unit of increase of stakeholders' participation will lead to a .139 increase in creation of renewable electrical energy projects. A unit of increase in Government policies will lead to a 0.453 significant increase in creation of renewable electrical energy projects. A unit increase of Resources coefficient will lead to a 0.155 increase in creation of renewable electrical energy

A unit increase of Leadership styles coefficient will lead to a significant .252 increase in creation of renewable electrical energy projects. This study clearly demonstrates that all the independent variables significantly positively influences creation of renewable electrical energy projects, but the significant influence of each independent variable is determined by the value of the beta coefficient of each independent variable.

The higher the coefficient of the independent variable, the higher the independent variable influences dependent variable. Based on the coefficient variables of all the independent variables in in table 4.17, government policies (X_3) is the independent variable that influences most the dependent variable (Y) creation of renewable electrical energy projects. This study is followed by leadership styles (X_5) with a coefficient of .252, Resources (X_4) with a coefficient of .155 then stakeholders' participation (X_2) with a coefficient of 0.139 and lastly project expertise (X_1) with the least coefficient of 0.042.

$Y=0.318 + 0.453X_3 + 0.242X_5 + 0.139X_1 + 0.55X_4 + 0.042X_1 + \acute{\varepsilon}$

Table 7: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.318	.406		.783	.030
Project expertise	.042	.089	.052	.476	.043
Stakeholders Participation	.139	.134	.137	1.043	.030
Government Policies	.453	.152	.445	2.990	.004
Resource	.155	.074	.074	.740	.046
Leadership styles	.252	.069	.337	3.635	.001

a Dependent Variable: Y

Conclusions

The study concludes that project expertise is one of the important factors to be considered in order to facilitate creation of electrical energy projects. Therefore without project expertise creation of electrical energy projects cannot be achieved. The study also concludes that stakeholder participation in the organization is an important factor which should be taken into consideration before commencing on creation of electrical energy projects.

The study further concludes that government policies does affect creation of electrical energy projects. Based on the finding it can be concluded that has a greater impact in creation of electrical energy projects. The study also concludes that available resources in the organization is an important factor which should be taken into consideration before commencing on creation of electrical energy projects.

Also, the study concludes that leadership styles style is one of the important factors to be considered in order to facilitate creation of electrical energy projects. Therefore without democratic leadership styles style creation of electrical energy projects cannot be achieved. Lastly, the study concludes that government policies influences the creation of renewable electrical energy projects most followed by leadership styles, stakeholders' participation and lastly project expertise.

Recommendations

As a measure of successfully support the creation of renewable electrical energy projects, the study gave the following recommendations:

Firms implementing renewable electrical energy projects should acquire professionally trained experts on generation of renewable energy from waste food products and also train their staff on renewable energy generation best practices. The firms can also source project expertise and benchmark from renewable energy firms from developed nations like Sweden where remarkable development in renewable energy generation have been made.

All stake holders involved in renewable energy projects should be full engaged in all matters concerning project implementation. The project implementers should also articulate the benefits of the projects to the investors and the community; firms engaged in renewable project implementation should get buy in from all the actors in the waste value chain and much emphasis should also be made in ensuring members of the community are involved.

Government policy is necessary for the organization to follow and discuss the important issues that need through understanding in regards to creation of electrical energy projects. It was also

recommended that the government should provide guideline on how to manage creation of electrical energy projects. It was recommended that creation of electrical energy projects by project managers should be applied with a wide consultation and informs employees at any moment they are changes in the government regulation.

The required project implementation resources should be made available in order to effectively facilitating financing and management of waste to energy project implementation activities. Cost based analysis on project viability should be undertaken before project implementation to ensure that the project is able to pay for its cost and generate some surplus amount of money.

Conventional sources of energy pose significant threats to the current and future global security, environmental quality, health and social wellbeing. Renewable energy sources mitigate the negative effects of fossil fuel use. The researcher recommends that governments should intervene in the energy sector and they should considered access to energy to be a public good.

The project managers and project team leaders should employ democratic or participative leadership styles style in order to facilitate in coaching and development of project team members; The project team members should also engage in intellectual stimulation of the junior project staff and provide various measures like rewards and better remuneration in order to inspire and motivate all project team members.

Suggestions for Further Study

The study focused on creation of electrical energy projects in Kenya may not have fully covered all areas that involve creation of electrical energy projects therefore additional studies are required for researcher to carry out further studies on the same topic. Extensive research in this study particular study may involve covering other areas which have not been fully covered. The aim of further study will be identify ways to enhance creation of electrical energy projects. The study can also be carried out by use of other variable for instance, infrastructure, level of technology and any other applicable variable on the same topic.

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