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Potential Evaluation of Environmental Impact Assessment on Land Reclamation Resilience in Bakoteh Dumpsite and Bafuloto Quarry in West Coast Region in the Gambia

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Abstract

This study is carried to assess and evaluate the Potential Environmental Impact Assessment of Land Reclamation and Resilience Mitigation in Bakoteh Dumpsite and Bafuloto Quarry in West Coast Region (WCR) in Gambia. The term reclamation and recovery are used interchangeably for land left for a longer period of time that could be for agricultural practices and development advancement purposes. Though, the left over land may have been affected by different activities of anthropogenic and natural phenomena which may results to climate change and global warming effects. Land reclamation sustainability strategic approaches in improving the land efficiency through physical master land plan and policies (PMLPP), adopted and practiced by the government in the country for buildings and roads construction. This is achieved through sustainable development goal (SDG), 9, 10, 11, 12, etc. This study adopts the use of qualitative research methods, a total of two hundred and seventy (270) persons were administered questionnaire for assessment, bothsex is above the ages of twenty (20),was selected during data collection. The analysis of data was done using simple percentage expression. Data analyses alsoshowed that the highest percentage rates was found in not accepted (NA) which recorded 62.96% from responses of on hundred and seventy persons in Bakoteh from the questionnaire number 9 which says" Are Bakoteh people compensated on their land reclaimed dividend benefits?, followed by the average percentage rate of 57.77% recorded against not accepted (NA) from the responses of one hundred and fifty-six people in Bakoteh as well, from the questionnaire number 10 which says" Do you think land reclaimed in Bakoteh dumpsite, possess sustainable development goal (SDGs 9)?. The lowest percentage rate was found in strongly accepted (SA) in questionnaire number 9 also, with4.07% from the responses of eleven people only. Chi-square was use statistically, to test for their level of significance, for the respondent

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responses in stations specification, and data characterization, At P>0.05, it showed level of insignificant.

Subject Area: Environmental Sciences

Keywords: Environmental Impact Assessment, Land Reclamation, Potential Resilience and Sustainable Development Goals (SDGs).

1.0 Introduction

Regarding to population growths and development advancement, Gambia population is becoming larger rapidly; developments have played an important environmental function significantly, which results to urbanization migration in the country. The rural-urban movement and urban-rural migration in different geographical location in the country, has led to socioeconomic urbanization [IPCC, 2014, Pareja and Stoa, 2004]. As such, land reclamation/recover is as well taking place in all parts of the country due to the rapid population increase. As a result of this, abandoned lands left for a longer period of time, had been recovered which led to the environmental impact assessment and evaluation of land reclamation and the potential resilience in the two study stations. The term land reclamation is used in environmental and geological ways, attributed to bringing back, or redeems land back from its abandoned geological site. Land is redeemed, reclaim and recover due to its strategic environmental impact assessment that meets up with sustainable development goals, depending on their impacts and role they play in that given geological environment.

Impacts could be either positive (good and beneficial in the future) or negative (bad in the future) that affects or influence an environment for its sustainability according to the rapid development rise is taking place to meet up with the modern sustainable development goal 9, 10, 11 and 12 in the two geographical locations in the Gambia; as such significant urbanization stretches indication in the near future, due to the sustainable physical master land plan policy (SPMLPP) in the country.

As a result of this sustainable physical master land plan policy (SPMLPP), land developers, development for building different structures becomes efficient and sustainable management usage, that will adopt and achieve by 4Rs strategies such as; Reclamation, Resilience, Recovery and Reuse, since land is a natural resources that are renewable, replaceable and replenish able according to work done by[Gozie, 2010].The two recovered land in this study area, Bafuloto&Bakoteh are now used for Agricultural and Environmental practices because they meet up to the fertility of the soil suitable for Agriculture and Environmental uses, since the top soil was used initially to sand filled roads, recent ongoing road construction in different parts of the country. Since the topsoil can't be used, initially by the farmers /gardeners because it wasn't fertile because all the nutrients availability for plant use has been leached out, this resulted what made the topsoil to be removed, information gotten from elderly people in the community revealed that agricultural practices wasn't effective until recently environmental experts came

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and advice for the topsoil profile should be excavated before excellent agricultural farming can be practiced.

However, farmers and dwellers in such geographical Environments are now depending on sub-soil agricultural practices for numerous operations according to the soil profile indication arrangement; this has attracted many people for their commercial farming in such a location. Environmental impact assessment is a systematic process of identifying, predicting, evaluating and mitigating biophysical, social, health and other important effects of a proposed development prior to major decision making and commitment being made, [Hesp, 1995]. Since Environmental impact assessment of a development has reached up to a standard, it results to sustainable development [WCED, 1987, OECD, 2000], a development that meet the needs of present generation without imposing or compromising the ability of future generation to meet with their required needs. The main value of sustainable development in any given area is its sustainability, integrity and utility.

1.1 Environmental Impacts of Land Reclamation in BakotehKombo Central, West Coast Region, Gambia.

At the surface of regional physical development, West Coast Region of the Gambia, represent an affluent site of modernity with large spread urbanization, canters for commerce, and nearly trillion in sovereign wealth. Gambia is in perpetual state of crises, as in decrease rainfall from global warming and climate change continues to raise the sea level every year. The small country in West Africa, that made up of numerous shrinking islands often lacks enough lands to support its growing population and economy. While some Environmental scientist engineer propose constructing infrastructure overhead bridge for easy road network to avoid excessive road traffic, infrastructure also on floating platform which confirmed sustainable development goals in the Gambia. Gambia government instead employs another capital intensive land information strategy, known as land reclamation. This method offer Gambia increased physical space to improve the sustainability of its urban landscapes. Reclamation of land however, interrupts and replaces the natural biodiversity of plants and animals in their diverse coastal ecosystem [Martin, 2016].Land reclamation process, simply means any practice that helps an organization to recover and achieve a portion of land areas for an important use. Land reclamation, involves the use of delimiting dykes, or barriers used to hold back water from a larger lake or ocean. Land reclamation involves packing the empty hole with infill. Modern reclamation engineers often utilize concrete and silt to stabilize the foundation, instead of relying on the pouring of sand onto the sea bottom and the infrequent placing of drains for pumping out surplus water as seen in [Enviromarc Services, 2020]**.** After the drained area is filled, governments repurpose the reclaimed land for port expansion, industrial and residential areas, airport runways, and agricultural zones. With regard to Singapore, villages utilized land reclamation during the mid-nineteenth century to strengthen coastlines and ultimately protect fishing communities from flooding; however, Singapore's government has prioritized the use of land reclamation for infrastructure projects, industry, public utilities like transport links, and military purposes since the nations sudden. As a result of its endless land reclamation; government only seeks to expand

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these reclamation projects through the next decade; by 2030, government officials' project size to increase by 100 square kilometers.

1.2 Benefits of Land Reclamation

The most important impact of Bakoteh's land reclamations is to improve the country's sustainability in urban spaces. According to [Gardener, 2016], sustainable cities needs to work "friendly" by the nature and virtue of establishing "green spaces" and "green infrastructure" that cleans the air, decrease artificial hotness from buildings, and improve the individual health. Coupled with millions of trees and shrubs that are planted within the communities, and the entire country at large, which aimed at restoration of mangroves natural resources that are renewable as initiated by large-scale Ecosystem-based Adaptation(EBA)project, sponsored by United Nations laid this emphasis on establishing spaces for nature for future (NFF), within Gambia rural and urban environments, demonstrates how land reclamation has now increased their biological diversity but ultimately created more liveable nature for future sustainability, according to [Justin, 2020], as shown below.

- It brings healthier and stronger environment in terms of forests, water sources, agricultural potential, recreational potential, aesthetic values, and clean living in urban areas.
- It improves human health
- It helps in maintenance of biodiversity in the ecosystem.
- It decrease resources use.
- It possesses fewer conflicts over natural resource use.
- It improves and increased community skills, knowledge and pride.

1.3 Consequences of Land Reclamation

Common concerns related with land reclamation is its longevity soil and sand infill materials that makes it sustainable and renewable natural resources in which other renewable natural resources can be derived from for their stability. For instance, these materials often complicates land consolidation; as soil and sand struggle with compaction, as show in an article published in Singapore, Singapore reserves most infill materials for urban environments in need of deep foundations and therefore, threatens port yards and storage areas that require less infill with potential collapse. Soil liquefaction similarly illustrates the instability of reclaimed land; in response to sudden changes in pressure. Sand can temporarily behave like a liquid and lose its ability to support larger structures. As a result, key pieces of Gambia's infrastructure like its roads, bridges, and airports are prone to collapsing if not constructed up to standard, according to [UNDP, 2020].

2.0 Materials and Methods

The materials and methods used in carrying out this research, is the qualitative research approach. It involves the use of stratified and structured questionnaire for a meaningful and a better understanding on The Environmental Impacts Assessment and Recovery Potential

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Resilience of Bakoteh Dumpsite and Bafuloto Quarry land in Kombo West Coast Region in the Gambia.

2.1 Description of Study Area

Bakoteh dumpsite is situated in Bakoteh, opposite SOS child's Fund and Amsterdam, West Coast Region (WCR), Gambia. Its geographical coordinates lies between Latitude 13° 27' 57" N, and Longitude 16° 42' 1"W. **Bakoteh**s' recent population is made up of 6 594 people. Bakoteh is one of the 17th cities in the Gambia and rated sixteenth by rank in The Gambia. The population data of Bakoteh was gotten from different sources in the public. **Bafuloto** quarry land recovery is also situated in Kombo Central, western part of the Gambia; its main geological coordinates are latitude 13° 19' 8" N and longitude 16° 37' 39" W. The climate of this place is mostly cloudy; with wind speed of about 17.50Kmph, an average temperature of 29^{0}C with a relative humidity of approximately 69%. Bafuloto have twelve (12) different communities; it is about 5.80km close to Brikama and 16.00km away from the capital city Banjul. It is a town that is very close to the Gambia airport, which makes many Cosmopolitan to live and colonize there due to their attractive weather and climatic condition as well as its boundary shared with the Gambia international airport fence.

2.2 Design of the Study

This study is designed based on the qualitative research method son the Environmental Impacts Assessment and Potential Resilience of Bakoteh Dumpsite Land Reclamation and Bafuloto Quarry land Recovery in Kombo West Coast Region in the Gambia. A narrative survey design was adopted with the use of questionnaire for the purpose of this study. With regards to work done by [Nachmais and Frankfort, 2008], narrative research method is designed to meet the guide of the researcher, the process of getting data, calculating, interpreting and observing the pattern of the research.

2.3 Study Population

The study population comprises of unisex that is both male and female of ages between 25 to 50years. A total of two hundred and seventy (270) clients were selected in both Bakoteh and Bafuloto community. Selected clients for each community is one hundred and thirty-five persons, both educated and uneducated people are staying in the study location which resulted to the sample size of this research.

2.4 Methods of Sampling

A systematic planned sampling method was used randomly in achieving sustainable renewable natural land resources for this study. Sampling sizes of two hundred and seventy (270) persons were estimated for the population in this study. Both male and female were interviewed in the study area.

2.5 Tools for Data Collection

The tool for data collection is questionnaire. It is divided into two parts, namely Part A and Part B. The part A is for personal information and the part B is for responses used in answering the

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questionnaire questions such as: Accepted (**A**), Strongly Accepted (**SA**) and Not Accepted (**NA**), according to the work done on waste by [Oyareme et al, 2021].

2.6 Analysis of Data

This research employs simple statistical measurement of central tendency, used to determine the people responses in the questionnaire. Statistical analyses were type and arranged on a Microsoft word with a narrative simple percentage correlation coefficient reliability index (SPCCRI), in order to determine, summarize and represent all calculated data and the results presented in the form of tables. The calculation used is shown below for further expression and understanding; Percentage correlation coefficient index (%) = Total number of outcome (**N**) Divided by the total Sample (**F**) multiply by 100, where F= frequency of the response, N= Number of response, and % = Percentage [Ogbeibu, 2014]

2.7 The Study Validity

The validity of the study in this research was acceptable due to its degree of measurement test. The questionnaires were structured by the researcher, and edited by co-author; the corrections made on questionnaires by the reviewer formed my final and valid draft of the questionnaire of this research.

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Table 1: Analysis of data on the Environmental Impacts Assessment and potential resilience of Bakotedumpsite land reclamation and Bafuloto quarry land recovery in Kombo West Coast Region in The Gambia.

Item /No	QUESTIONNAIRE VARIABLE STATEMENTS	RESPONDENTSRESPONSE		
		Accepted (A)	**Strongly Accepted (SA)**	**Not Accepted (NA)**
1	Do you think individual action can contribute to the improvement of land reclamation and recoveryin the quality of an environmental?	137 (50.74%)	60 (22.22%)	73 (27.03%)
2	Do you think re-use, recovery, and reclamation of land is a strategic management approach for sustainable landuse?	96 (35.55%)	88 (32.59%)	86 (31.85%)
3	Does the governing agency on land have the obligation right and policies for land reclamation and recovery at Bakoteh dumpsite and Bafuloto?	102 (37.77%)	146 (54.07%)	22 (8.14%)
4	Do landfills have any harmful effects on reclamation of land in Bakoteh community?	105 (38.88%)	98 (36.29%)	67 (24.81%)
5	Do you think dumpsite land reclamation is the best environmental solution in Bakoteh metropolis?	82 (30.37%)	53 (19.62%)	135 (50.00%)
6	Is reclamation and recoverythe most appropriate and efficient approach for land and waste disposal dumpsite in Bakotehand Bafulotoby the Gambiangovernment?	94 (34.81%)	66 (24.44%)	110 (40.74%)
7	Do you thinkBakotehland reclamation with regards to physical planning policies made by Gambia government, affects people in the area?	72 (26.66%)	155 (57.40%)	43 (15.93%)
8	How can government policy on land reclamation in Bakoteh change the ability of people's behavior into a sustainable land usage?	123 (45.55%)	107 (39.62%)	40 (14.81%)
9	Are Bakotehpeople compensated on their land reclaimed dividend benefits?	89 (32.96%)	11 (4.07%)	170 (62.96%)
10	Do you think land reclaimed in Bakoteh dumpsite, possess sustainable development goal (SDGs 9)?	67 (24.81%)	47 (17.40%)	156 (57.77%)
11	Are you aware that land recovery in Bafuloto can bring sustainable development in Gambia?	77 (28.51%)	132 (48.88%)	61 (22.59%)
12	Were they any health challenging issues associated with people in Bafuloto due to therecovered land?	79 (29.25%)	82 (30.37%)	109 (40.37%)
13	Are you aware that staying close to the quarryexposesoneself to respiratory problems and air pollution?	89 (32.96%)	97 (35.92%)	84 (31.11%)
14	Are you aware thatexcess carbon dioxide (smoke) release from thosemachinery used in quarry causes climate change and global warming?	101 (37.40%)	59 (21.85%)	110 (40.74%)
15	Are people affected in Bafuloto regarding tosustainable development goal 10?	65 (24.07%)	141 (52.22%)	64 (23.70%)
16	Is there any hazard associated with people living in this quarry recovered land in Bafuloto?	77 (28.51%)	93 (34.44%)	100 (37.03%)
17	Has anyone being hospitalized due to quarry land recovery in Bafuloto in Gambia?	29 (10.74%)	107 (39.62%)	134 (49.62%)
18	Does recovery land in Bafulotohave what it takes to meet up with sustainable development goal 11 before 2030?	115 (42.59%)	117 (43.33%)	38 (14.07%)
19	Are peopleaware of the protective mechanisms on land recovery and	75	141	54

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	strategic management measures?	(27.77%)	(52.22%)	(20.00%)
20	Is there any probability, severity and vulnerability of waste disposal and land reclamation and associated diseases on human health in the Gambia?	94 (34.81%)	80 (29.62%)	96 (35.55%)

3.0 Data Presentation, Analysis and Discussions

This research is conducted on The Environmental Impacts Assessment and potential resilience of Bakoteh dumpsite land reclamation and Bafuloto quarry land recovery in Kombo West Coast Region in The Gambia and its effective waste disposal management strategy. Data obtained in this research is tested and assessed from the questionnaires administered to the residents in thestudy area, using simple percentage correlation coefficient index. Those responds gotten in this research was quite okay and a total of two hundred and seventy (270) questionnaires was administered and were all filled and collected from different respondents in both Bakoteh and Bafuloto communities.

3.1 Discussion

Table 1 summarizes all the results from the analysis of data on the evaluation of Environmental Impacts Assessment and potential resilience of Bakoteh dumpsite land reclamation and Bafuloto quarry land recovery in Kombo West Coast Region in The Gambia. An average percentage rate of 50.74% was recorded against accepted (A) from a respondents total population of 137 people, strongly accepted (SA) had an average percentage rate of 22.22% from 60 people responses as the lowest percentage rate and not accepted (NA) had a percentage rate of 27.03% from a total number of 73 people from the questionnaire variable statement made on question number 1, as "Do you think individual action can contribute to the improvement of land reclamation and recovery in the quality of an environmental?. The highest percentage rate was found in accepted (A) shows that individual contribution can lead to the improvement and the quality of the reclaimed and recovered land in the study area and the Environment at large.

In questionnaire statement 2, made in table 1, which says "Do you think re-use, recovery, and reclamation of land is a strategic management approach for sustainable land use? From the data analysis of respondents responses, accepted (A) had an average percentage rate of 35.55% from population of 96 people, as the highest percentage rate, followed by strongly accepted (SA) which had a percentage rate of 32.59% from responses of 88 people and the lowest percentage rate was found in not accepted (NA), which had an average percentage rate of 31.85% from population of 86 people. This is due to the fact that re-use, recovery and reclamation are the most strategic approaches use in management of thingslike waste that are not useful at present but may be useful later due to its new recycle formation.

Questionnaire number 3 statement made reads "Does the governing agency on land have the obligation right and policies for land reclamation and recovery at Bakoteh dumpsite and Bafuloto? This is expressed from the analysis of data. Accepted (A) had an average percentage rate of 37.71% from the responses of 102 people, strongly accepted (SA) recorded the highest percentage rate of 54.07% from a total population of 146 people on item 3, and the lowest was found in not accepted (NA), which recorded an average percentage rate of 8.14% from a total

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population of just 22 people responses. This implies that government policies exist in departments of physical planning, park and wildlife and nature.

Item 4 questionnaire variable statement says" Do landfills have any harmful effects on reclamation of land in Bakoteh community? From the statement, analysis of data in table 1, showed accepted (A) having a percentage rate of 38.88% from respondents responses of 105 people, as the highest percentage rate, followed by strongly accepted (SA) which recorded an average percentage rate of 36.29% from a total population of 98 people and the lowest percentage rate was found in not accepted (NA) which had an average percentage rate of 24.81% from a population of 67 people. Associated waste materials disposed may contain heavy metals that may be as well buried in landfills if not proper treatment may contaminate the soil as well as the underground water which pose risk to human health, except the land is been remediated using the appropriate plant species for phytoremediation.

Questionnaire variable statement in item 5 reads" Do you think dumpsite land reclamation is the best environmental solution in Bakoteh metropolis? From the analysis of data in table 1, revealed that accepted (A) recorded an average rate percentage of 30.39% from 82 people, a total population of 53 people responses in strongly accepted (SA) had an average percentage rate of 19.62% as the lowest, while the highest percentage rate was found in not accepted (NA) which had 50% from a population of 135 people.

In table 1, item 6 questionnaire variable statement says "Is reclamation and recovery the most appropriate and efficient approach for land and waste disposal dumpsite in Bakoteh and Bafuloto by the Gambian government? Observation from data analyzed showed that the respondents responses of 94 people from the average percentage rate of 34.81% which was recorded against accepted (A), strongly accepted (SA) had 24.44% from a total population of 66 people as the lowest and the highest percentage rate was found in not accepted (NA), which had a percentage of 40.74% from 110 people.

The questionnaire variable statement in item 7 states" Do you think Bakoteh land reclamation with regards to physical planning policies made by the Gambia government, affects people in the study area? From the data analysis, it showed that accepted (A) recorded a percentage average rate of 26.66% from a population of 72 people response, strongly accepted (SA) had a percentage rate of 57.40% as the highest percentage rate from a total population of 155 people and the lowest percentage rate, was found in not accepted (NA) which recorded an average percentage rate of 15.93% from a total population of just only 43 people.

About 45.55% average percentage rate was recorded in accepted (A) from a population of 123 people, strongly accepted(SA) had a percentage rate of 39.62% from a total population of 107 people and finally the lowest was found in not accepted (NA), had an average percentage rate of 14.81% from a population of 40 people from item 8 questionnaire variable series statement made, which says" How can government policy on land reclamation in Bakoteh change the ability of people's behavior into a sustainable land usage[CEC, 2005].

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The questionnaire variable statement made on item 9 reads "Are Bakoteh people compensated on their land reclaimed dividend benefits? From the expression of data in the above table 1, a total population of 89 people responded accepted (A) which accounted for an average percentage rate of 32.96%, strongly accepted (SA) had the lowest percentage rate of 4.07% from respondents responses of just 11 people and the highest percentage rate was recorded in not accepted which had 62.96% from responses of 170 people. From the assessment response from the respondents, it showed that no dividend benefits were given to the dwellers as well as household living in that part of the country.

Item 10 questionnaire variable statements in table 1, reads "Do you think land reclaimed in Bakoteh dumpsite, possess sustainable development goal (SDGs 9)? From the statement, about 67 persons responds were accepted (A) which accounted for an average percentage rate of 24.81%, population of 47 people responses resulted in average percentage rate of 17.40% as the lowest in this questionnaire category, the highest percentage rate was found in not accepted (NA) which had 57.77%percentage rate from respondents responses of 156 people. Although most people in Bakoteh do not know the agenda of the government with regards to sustainable development goal 9. Sustainable development goal 9; seeks to build strong infrastructure that promotes sustainable buildings, industrialization and foster economies innovations. Economy with strong diversified industrial sector and resilient infrastructure perceived minor damage and experience faster recovery based on Gambia building conformity.

In item 11 questionnaire analysis showed, a total population of 77 people responds, found in accepted (A) based on the statement variable statement made, which accounted for an average percentage rate of 28.51%, strongly accepted (SA) had an average percentage rate of 48.88% from the respondent responses of 138 people, strongly accepted (SA) recorded the highest percentage rate in this column and the lowest percentage rate was found in not accepted (NA), which recorded average percentage rate of 22.59% from respondent population of 61 people responses. This goes in agreement with [Michalos, 1997], and on sustainable development in any given communities.

In item 12, responses from the respondents showed a significant increase population result of 79 people, which recorded an average percentage rate of 29.25% for accepted (A), strongly accepted (SA) had an average percentage rate of 30.37% and not accepted (NA) recorded the highest percentage rate here, having 40.39% as the percentage rate from a population of 109 people responses towards the questionnaire administered to them.

Item 13 questionnaire had similar responses as stated above in item 12 based on the questionnaire asked. A total population of 89 persons response, responded for an average percentage rate of 32.96% for accepted (A), strongly accepted (SA) recorded an average percentage rate of 35.92% as the highest from the population of 97 persons in this series and the lowest percentage rate was found in not accepted (NA), which had a percentage rate of 31.11% from a population of 84 people responses.

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Item 14 questionnaire statement read "Are you aware that excess carbon dioxide (smoke) release from that machinery used in quarry, causes climate change and global warming? This showed a significant difference across the table columns and theresponses of recipient. Accepted recorded average percentage rate of 37.40% from a given population of 101 people responds, 59 people responds was recorded against strongly accepted with a percentage rate of 21.85% and not accepted recorded the highest percentage rate of 40.74% from respondents responses of 110 people, this agreed with work done according to [IPCC, 2018, Tan et al, 2021] on climate change and global warming.

Questionnaire statement made on item 15, showed different coefficient of variation against the instrument used in collection data; from data analysis in table 1, a total population of 65 people responses recorded 24.07% on accepted (A), total population of 141 peoples responses resulted to an average percentage rate of 52.22% against strongly accepted (SA) as the highest percentage rate, and not accepted (NA) recorded an average percentage rate of 23.70% from respondents responses total population of 64 people as the lowest.

The next item is 16, from the analysis of data in table, in this item, series of percentage variation occurred across the column, in which accepted (A) had 28.51% from a population of 77 people, strongly accepted (SA) had 39.62% from 107 people, and not accepted (NA) recorded the highest percentage rate of 49.62% from a respondent population responses of 134 people.

In questionnaire number 17, in the table 1, it reads "Has anyone being hospitalized due to quarry land recovery in Bafuloto in Gambia? Analysis of data showed that accepted(A) recorded 10.74% from a total population of 29 persons, as the lowest percentage rate in this category, strongly accepted (SA) had 39.64% percentage rate from a total population of 107 persons and not accepted (NA) had 49.62% from respondent population responses of 134 people.

Item 18 questions read "Does land recovery in Bafuloto have what it takes to meet up with sustainable development goal 11 before 2030? From the analysis of data, in the above table 1, 115 people responds accounted for a percentage rate of 42.59% in accepted (A), strongly accepted (SA) had the highest percentage rate of 43.33% from a population of 117 people in this column and not accepted (NA) recorded the lowest percentage rate as 14.07% from a population of 38 people. This implies that accepted and strongly accepted go in agreement with sustainable development goals in achieving transportation and buildings in cities and communities, [UNDP, 2020, UN, 2014].

Questionnaire statement made on item 19 says "Are people aware of the protective mechanisms on land recovery and strategic management measures? Accepted (A) had an awareness percentage rate of 27.77% from the population of 75 people followed by strongly accepted (SA)with average percentage rate of 52.22% as the highest here, in this same category from a total population of 141 people and not accepted (NA) had 20% average percentage rate from respondent responses of 54 people and;

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Finally item 20 questionnaire reads “Is there any probability, severity and vulnerability of waste disposal and land reclamation associated diseases on human health in the Gambia? The analysis of data showed the severity, vulnerability and probability of the study area, with accepted (A) having a percentage rate of 34.81% from population of 94 people, strongly accepted (SA) had 29.62% from 80 people responses and not accepted (NA) recorded the highest in this column with average percentage rate of 35.55% from a population of 96 people.

4.0 Summary

Land reclamation/ recovery are summarily showing the creating of a new land from an abandoned geographical location. The simplest and commonest method of land reclamation involves sand filling the area with large amounts of heavy rocks, filling with clay and soil until the desired height is attained. Once the surface mining operations stopped, reclamation is carried out immediately to restore the environment, into a sustainable land use achievement (SLUA) adoption. This makes it less destructive effects caused by mining and ensures the ecosystem is returned to a sustainable state which different goals.

5.0 Recommendations/towards a sustainable management policy

i. Sustainable reclaimed land management requires suitable investigation, following the established standards from the Government interventions.
ii. Land reclaimed policy will be sustainable considering the challenges and contemporary Environmental issues faced by different communities that may be taken into consideration.
iii. Reclamation land process should be generalized from the aspect of educated and uneducated farmers in order not to be abused by the community leaders.
iv. Government should ensure that employment opportunities are provided in the study area, to stop internal displacement and give prospects to the victim land owners to get back their land through reclamation due to proper planning provides prevalent performance (5P) of any reclaimed and recovered land according to [Oyareme and Osaji, 2022].

6.0 Conclusion

The main conclusion drawn from this study is that land reclamation development may result to relevant impacts in the communities which are specifically benefited in terms of development. In the other aspects, economic, strategic, environmental and other social effects directly or indirectly related to reclamation projects are substantial. This indicates that a thorough identification and project assessment measurement effects is fundamental for clarifying the comparative advantages that reclamation offers with respect to alternative spatial-development plans. With respect to the Environment, comprehensive and consistent evaluation of the impacts on society can contribute to better consideration of reclamation as an urban and rural solution is an investment opportunity for both private and public on this study

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Authors Contributions
Authors made a significant, intellectual contributions and scientific arrangement in data collection and most especially in the field. The drafting and structuring of this article for peer reviewer attributes and efforts, that led to the submission to this journal presently give the trust and enthusiasm for final endorsement of this paper approval for publication and concern to be accounted to other area of this work.

Declaration of interests' statement by the author
The author declares that there is no conflict of interest.

References
Commission of the European Communities (2005): Sustainable development indicators to monitor the implementation of the EU sustainable development strategy. Communication from Commissioner

Almunia to members of the European Commission: Brussels 9/2/05.SEC (2005) 161 final: Retrieved January 23, 2007 from http://ec.europa.eu/sustainable/docs/sec2005_0161_en.pdf ***Accessed 26th May, 2023***

Enviromarc Services, Ltd. (2020, June 23). *5 monster (or best) land reclamation projects in Canada*. http://www.enviromarc.com/blog/5-monster-or-best-land-reclamation-projects-in-canada

Gardner, G. (2016): Toward a Vision of Sustainable Cities. In Can a City Be Sustainable? (pp. 45-64). Island Press.

Gozie, S., Ogbodo (2010): Handbook on National Environmental Standards and Regulations Enforcement Agency Act, Published by Law Research and Development, Ambik press Lagos, Nigeria. Pp. 1080-1086

Hesp, P. A. (1995): The environmental impact assessment process in Singapore with particular respect to coastal environments and the role of NGOs. *Journal of Coastal Conservation, 1*(2), 135-144.

IPCC, (2014): Synthesis Report Contribution of Working Group I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (Core Writing team IPCC, Geneva, Switzerland). Pp 151-153.

IPCC, (2018). Annex 1: glossary in Matthews, J.BR. (Ed.). In Global Warming of 15^0C. An IPCC Special Report on Impacts of Global Warming of 1.5.

Justin Bove, N.G. T. (2020). The importance of land reclamation in Hong Kong and its impacts. *Earth.org*. https://earth.org/land-reclamation-hong. ***Access on December 14th 2023.***

Martín-Antón (2016): Review of coastal land reclamation situation in the world. *Journal of Coastal Research, 1*(75), 667-671.

Michalos, A. (1997). Combining social, economic and environmental indicators to measure

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ISSN: 2456-3676

sustainable human well-being *Social Indicators Research,***41**: 1–4.

Nachmais, D. and Frankfort-Nachmais, C. (2008): Research method in social sciences. Retrieved from: *http://store.vitals.source.com/*

OECD (2000): Towards sustainable development: Indicators to measure progress. (Proceedings of An OECD Conference, Rome).

Ogbeibu, A .E, (2014). A practical Approached to Research and Data Handing, Published by Mindex Co Ltd, Benin-City, Edo State, Nigeria: Pp 143– 150.

Oyareme, V., Osaji, E.I.O., Barrow, A. and Bah, A. (2021): The Effects and Management of Municipal Solid Waste Generation and Disposal on Human Health in Serrekunda Market (Commercial Center), Kanifing Municipality, The Gambia. *Open Access Library Journal*, **8**: e7755 https://doi.org/10.4236/oalib.1107755.

Oyareme, V. and Osaji, E.I.O. (2022) Environmental Air Quality Parameters Monitory Information Assessments and Its Health Implications on Biotic Factors in Banjul Metropolis, the Gambia. *Open Access Library Journal*, **9**: e8428. https://doi.org/10.4236/oalib.1108428

Pareja-Eastaway, M., and Stoa, E. (2004): Dimensions of housing and urban sustainability. *Journal of Housing and the Built Environment*, **19**: 1–8.

Tan, X.C, Zhu, K.W, Sun, Y.L., Zhao, W. Y., Chen, F. (2021): Bibliometric research on the development of climate change in the BRI regions. *Journal of Advance Climate Change Resources;***12**(2): 254-262

UNDP (2020). Annual Report: Joint UNDP-DPPA Programme on Building National Capacities for Conflict Prevention and sustainable development goals.

UNDP (2020). Annual Report: Joint UNDP-DPPA Programme on Building National Capacities for Conflict Prevention and sustainable development goals.

United Nations, (2014): *World urbanization prospects*. New York: United Nations. [Crossref], [Google Scholar].

World Commission on Environment and Development (1987): Our common future. Oxford: Oxford University Press