

Perceptions on Early and Expected Effects of Natural Gas Investments on the Coastal Communities of Mtwara and Lindi Regions in Tanzania

*Opportuna Kweka**

Abstract

This paper examines the early and expected effects of a natural gas investment in the regions of Mtwara and Lindi in Tanzania. Using information from the survey and focus groups, the paper examines the perceptions of the communities and finds mixed social and economic effects. In general, the initial investment in Songosongo pipeline shows some positive outcomes as compared the new investment in the Mtwara-Dar es Salaam pipeline. More of the positive effects are on social services such as the provision of water and health services. Some of the positive outcomes on casual employment were reported in the initial stages of investments in Mtwara. Whereas quantitative data shows that the effects are generally positive, qualitative results show some communities have grievances due to the fact that their earlier expectectation have not been met. In Songosongo, the results show some pecuniary benefits, yet communities reported some environmental pollution, with flourishing seaweeds and dying fish and social problems, such as prostitution due to population increase. In Mtwara, the communities still have high expectations. These preliminary findings call for a follow-up study since the effects are likely to change with time, which justifies the need for a large-scale study in these regions.

Keywords: impact on oil and gas, local communities, investment, southern Tanzania, local content

1. Introduction

The discoveries of natural gas in Tanzania have been identified by many authors as blessings, which accrue to countries rich in oil and gas resources. The abundance of oil and gas creates hopes and high expectations that the expected revenue will lead to the development of communities and benefit the country as a whole, but in most cases, the outcomes have been different. Hopes and expectations turn into misery, due to experiencing negative effects (Darkwah, 2010). The nature of direct and indirect effects of oil and gas activities depend on the stage of the oil and gas development but are similar in their disruptive nature (Clers, 2007). Some effects on communities that have been documented in the literature include conflicts, forced resettlement, loss of means of livelihood, and risks to the health of the people.

According to Darkwah, (2010), oil and gas-producing communities experience health risks. For example, communities living near the Niger delta are affected by several diseases originating from oil and gas activities. The common diseases in oil and gas producing areas include respiratory diseases, skin rashes, coughing up blood, tumours, gastrointestinal problems, red eyes, ear pain which sometimes leads to deafness, different kinds of cancers and malnourishment (Darkwah, 2010; Omorede,

* Department of Geography, University of Dar es Salaam es Salaam, Tanzania: Kweka@udsm.ac.tz

2014). Moreover, most oil and gas producing areas lack quality healthcare services despite the health risks they face and where the health centres are available they face inadequate medical personnel and medical facilities (Babatunde, 2010).

Forced resettlement is often associated with the extractive industry, oil and gas being one of them (Darkwah, 2010). People's land and fishing areas are taken for oil and gas exploitation and exploration activities, which force people to be resettled in other places or areas. Oil and gas-producing communities also experience social conflict between communities and oil and gas companies or governments (Celestine, 2003). The conflict arises when laws and regulations are created or modified to regulate the community's access to communal or open-access resources, which are the primary source of community livelihoods while allowing oil and gas companies to have unrestricted or unchallenged access (Celestine, 2003). Sometimes social conflicts occur as a result of a violation of the rights of the community. The community demand improved social services and infrastructure from oil and gas companies or the state. Tanzania also experienced social conflict from communities of Mtwara following the construction of a pipeline to transfer natural gas from Mtwara. The community of Mtwara opposed the transfer of natural gas under the premise that the transfer of natural gas would not benefit the region (Ndimbwa, 2014). The social conflict in Mtwara has been reported to cause several problems, such as death, destruction of properties and suffering (Ndimbwa, 2014).

Coastal areas are rich in natural resources, which include fish, mangroves, coral reefs, biodiversity, and oil and gas, among others (Mangora & Shalli, 2006; Sesabo & Tol, 2007). These resources have been useful for the overall development of the communities and contribute to the economic growth of the nation. However, they also impinge negative effects on coastal communities, society and the environment. Globally, the exploration and exploitation of oil and gas are concentrated in coastal areas (Crossland et al., 2005). The coastal area has become a major focus for oil and gas exploration and overutilization worldwide (Crossland et al., 2005). The activities of oil and gas have increased considerably and are expanding to include shallow coastal and deep slope water (Lockwood et al. 2006).

Oil and gas activities are several, which include drilling and production activities, among others (Lockwood et al., 2006). In Tanzania, most studies on oil and gas exploration have been on the geological and engineering of oil and gas. These exploration and extraction activities are impinging positive or negative effects on the environment, communities, fisheries and livelihoods, which need to be researched and analysed. In addition, because the gas sector in Tanzania is new, the country needs to learn from experience how to regulate the effects of gas exploration and production. Thus, this paper will contribute to the literature on oil and gas in Tanzania by enhancing the understanding of the underlying social and economic effects.

Mtwara and Lindi are regions with gas deposits where the mid-stream activities started in 2005 at the Songosongo Island in the Lindi region and 2007 at Mnazi Bay in the Mtwara region. While local communities in Lindi and Dar es Salaam

have benefited from electricity, the effects of the industry on local communities, coastal resources and fisheries specifically are not well documented. In 2013, the people of Mtwara opposed the construction of pipes to transport gas to Dar es Salaam as they wanted the government to build industries instead in Mtwara, which would create employment for people in the region. In 2015, the government established some policies and laws and several institutions are involved in managing coastal resources. Oil and gas investments in the country are new and warrant studies to understand their operations and effects on the communities.

The largest natural gas investment in Tanzania at the moment is the Mtwara Dar es Salaam gas pipeline, which passes through four coastal regions. There are also two other plants, an old one run by Songas and Pan African Energy for the Songosongo natural gas since 2004 and a newer one by the Tanzania Petroleum Development Corporation (TPDC). The two pipelines, one for Songas and one for TPDC all from Songosongo are connecting with the Mtwara pipeline at Somanga Fungu and head towards Dar es Salaam. There is a plan to have an liquidified natural gas, LNG plant in Lindi. At the moment the contracts have been signed. There is also the oil pipeline from Hoima (Uganda) to Tanga (Tanzania) currently being constructed by a French company, Total.

2. Methodology

This paper investigated the early and expected effects of oil and gas projects on the coastal communities. The study assessed the social and economic effects of gas production on communities in the Lindi and Mtwara regions by interviewing the communities about their expectations and implementation of the projects. A survey was conducted with a total of 199 individuals aged 18 and above using a questionnaire. The unit of analysis was individual interviewees selected from a household living in the villages where the gas pipes have passed. The selection of the villages was based on information from previous research and the interviews with officials of the government and oil and gas companies, whereby the interviewees were randomly selected to get at least 30 interviewees from each village. The selection also considered the time and accessibility of the study areas and ensured coverage of the different sub-villages and inclusion of women and youths.

Kilwa district in the Lindi region was selected because this is where gas activities have been ongoing since 2004; while gas activities in Mtwara started later. The villages in the surveys (with the number of interviewees put in brackets) included Msimbati (40), Madimba (32), Hiari (34) in Mtwara. In Kilwa, they included Kilwa Masoko (35), Somanga (37) and Songosongo (32). Msimbati was included because this is where the gas is extracted at Mnazi Bay by Maurel and Prom Company (the initial investor was Artumas). The gas was discovered in 1982 by Agip; later in 2005, a small pipeline from Mnazi Bay in Msimbati to Mtwara (Urban) was built to supply gas to Mtwara (Urban). In 2013, a pipeline to Dar es Salaam was built, and also a processing plant at Madimba. The pipe passes through Hiari and other villages. At Hiari, the Dangote Cement Factory has started the processing of gas into electricity for use in the factory, and the surplus

is sold to the Tanzania Electricity Supply Company (TANESCO). In Kilwa Masoko two sub-villages of Miembe Miwili and Mnazi Mmoja were included because this is where there was a plan to have a fertilizer industry associated with the natural gas processing byproducts.

The study analysed the effects of undertaking gas activities in the areas where gas extraction had been ongoing for some time, for example in Songosongo, and the expected effects on people residing along the new pipeline from Mtwara to Dar es Salaam. SPSS programme was used to obtain frequency distributions of the analysed variables, which are summarized in several tables below. The quantitative analysis involved only the broad categories of economic and social-political effects. Hence, the study deepened the analysis by complementing it with some information from focus group discussions in order to unpack the details of the social, economic and political effects mentioned in the quantitative analysis. Early gas projects in the regions involved extraction and processing activities. The Mourel and Prom Company invested in Msimbati and the Pan African and Songas Company in Songosongo and Somanga. The National (Tanzania) oil Company which was the former Petroleum Development Corporation (TPDC) has invested in gas processing and transportation and pipelines in Madimba and Songosongo. Other related investment included in the study are the Dangote processing gas plant in Hiari and the Fertilizer plant in Kilwa Masoko at Njia Nne and Miembe Miwili.

Table 1 shows the demographic characteristics of the respondents. A total of 199 people were interviewed; 51.8% were males and 48.2% were females.

Table 1: Demographic Characteristics of the Respondents in Numbers and Percentages

a) Gender	Number	%	b) Migration	Number	%
Male	103	51.8	No	61	30.7
Female	96	48.2	Yes	138	69.3
Total	199	100	Total	199	100
c) Age	Frequency	%	d) M/Status	Frequency	%
Youth	69	34.7	Single	29	14.6
Adult	82	41.2	Married	158	79.4
Aged	48	24.1	Others	12	6
Total	199	100	Total	199	100
e) Education	Frequency	%	f) Occupation	Frequency	%
No	42	21.6	Farming	59	29.6
Primary	136	68.3	Fishing	12	6.0
Secondary	20	10.1	Business	48	24.1
Total	199	100	Employed	17	8.5
g) Children	Total	%	Mixed	63	31.7
No	18	9.0	Total	199	100
1-2	60	30.2			
3-6	96	48.2			
7 +	25	12.6			
Total	199	100			

Source: Researcher's Computations from the Survey, 2016

Of these, 30.7% were born in the villages and 69.3% came from nearby villages. A total of 41.7% were aged between 36 and 50 (adults), 34.7% were aged between 18 and 35, and 24.1% were aged 50 and over. A total of 79.4% of the respondents were married, 14.6% were single and 6% were either widowed, divorced or separated; 48.2% had 3 to 6 children, 30.2% had 1 or 2 children; 12% had 7 or more children, and 9% had no children. The education level of the respondents was mostly primary (68.3%); only 10.1% attained secondary level education and 21.1% did not go to school at all. The main livelihood activities were as follows: mixed (31.7%), farming only (29.6%), business only (24.1%), employed (8.5%) and fishing (6.0%).

3. Findings

3.1 Perceived Changes as a Result of Natural Gas Investments on Livelihood

The perceived changes by the respondents in the social and economic conditions and the reasons for the changes are summarized in Table 2. A total of 77.4% said their lives changed, whereas 22.6% said they did not perceive any changes in their lives (Table 2 (part (a))). The respondents were asked about the reasons for the changes (Table 2 (part (b))), whereby 13.6% mentioned gas, 40.2% said it was due to multiple factors, including gas; 18.6% said they did not know, whereas 21.1% mentioned other factors apart from gas, such as climate change and changes in the political economy of the country due to a new political regime (Fifth-phase Government) and 6.5% said it was not applicable.

Respondents were also asked if the perceived changes were positive or negative (Table 2 part (c)), whereby 71% said the perceived changes were positive, 23% they were negative and 6.0% said they experienced both positive and negative changes. The mentioned changes were further categorized as social, economic, multiple, environmental or others (Table 2 part (d)).

Table 2: Perceived Changes in the Social and Economic Conditions and Reasons for Changes

a) Changes	Number	%	b) Reasons	Number	%
Yes	154	77.4	Gas	27	13.6
No	45	22.6	Other	42	21.1
Total	199	100	Multiple	80	40.2
c) Nature of change	Frequency	%	Do not know	37	18.6
Positive	141	70.9	NA	13	6.5
Negative	46	23.1	Total	199	100
Both	12	6.0			
Total	199	100			
d) positive effects	Number	%	e) negative effects	Number	%
Economic	13	6.5	Economic	20	10.1
Social	46	23.1	Social	12	6.0
Other	16	8.0	Environmental	16	8.0
Multiple	80	40.2	Other	74	37.2
NA	14	7.0	NA	37	18.6
Do not know	30	15.1	Do not know	40	20.1
Total	199	100	Total	199	100

Among these categories, positive changes (Table 2 part (d)) were said to be economic (6.5%), social (23.1%), others (8.0%), multiple (combining social, economic, and political) (40.2%), other positive effects (8.0%); the rest responded that they did not know or the question was not applicable. The respondents listed negative economic (10.1%), social (6.0%), Environmental (8.0%), and other (37.2%) and the rest responded that the question was not applicable or they did not know. In comparison, respondents who listed positive social changes were 23.1% and those who listed negative social changes were 6.0%. As for economic changes, 6.5% of the respondents experienced positive changes, whereas 10.1% said they experienced negative economic changes. About 40.2% of the respondents said they experienced multiple positive changes; where on the negative side, 37.2% experienced other negative changes apart from economic, social and environmental.

Table 3 presents respondents' understanding of the effects on various occupational groups. These groups include farmers, fishers, business owners, the employees, contract labour and several combinations of these groups. Table 3 (part (a)), 35.7% of the respondents indicated that gas had effects on multiple economic groups, 17.1% mentioned that farmers were the most affected, 5.5% said the fishers were the most affected and 7.5% said both farmers and fishers were affected. For the remaining groups, 7.0% of respondents mentioned contract labour as the most affected, business (5.5%), employees (11%) and 12.1% said they did not know. Table 3 part (b) examines how the groups were affected (i.e., either positively or negatively), whereby 58.8% perceived the effects on economic groups to have been mixed (i.e., both positive and negative), 28.6% mainly negative, and 8.5% mainly positive, whereas 4.0 thought that there were no effects on the economic groups. Table 3 part (c) indicates that 39.2% of the respondents indicated that the effects on the groups were economic-related, 28.6% thought they were both negative and positive, 9.5% perceived them to be social, and 22.6% mentioned that they did not know how the economic groups were affected.

Table 3: Respondents' Perception of Mostly Affected Occupational Group by Gas Activities

a) Economic group	Number	%	b) How affected	Number	%			
1. Farmers	34	17.1	Negative	57	28.6			
2. Fishers	11	5.5	Positive	17	8.5			
3. Business	9	4.5	Both	79	58.8			
4. Employees	11	5.5	None	8	4.0			
5. Contract	14	7.0	Total	199	100			
6. Farmers & Fishers	15	7.5	c) Effects on Group	Number	Total			
7. Farmers & Business	10	5.0				Economic	78	39.2
8. Multiple	71	35.7				Social	19	9.5

Table 4 shows respondent's perception of the effects on various sectors in the economy. While 43.7% said they experienced both economic and social effects, 21% said that theirs was only economic, 18% said it was social, while 17% mentioned other effects. On whether these effects were negative or positive (Table 4b), for 37.7% it was positive

(either economic or social), for 36.7% it was positive (both economic and social), for 4.0% it was negative, and 23.6% said they did not know. The respondents identified the causes of the effects as being multiple factors (34.7%), social-related factors (29.6%), economic-related factors (16%), while 19.6% of the respondents said they did not know.

Table 4: Perceived Effects of Gas on the Various Sectors of the Economy

a)Sector most affected	Number	%	b)How Affected	Number	%
Economic	42	21.1	Positive	73	36.7
Social	36	18.1	Negative	8	4.0
Both Economic and Social	87	43.7	Both	71	35.7
Others	34	17.0	Others	53	23.6
Total	199	100	Total	199	100
c) Nature of the Effect	Number	%			
Economic	32	16			
Social	59	29.6			
Multiple	69	34.7			
Others	39	19.6			
Total	199	100			

The effects of gas investment on different groups of the population are summarized in Table 5, whereby 49.7% of the respondents perceived the effects to be on multiple groups, and 10.6% perceive to be on youth, 3.5% on men, 2.0% on women, and 3.0 on girls only. Table 5b shows that perceive effects on groups, where 27.6% mentioned positive effects; 7.5% mentioned negative effects; and 31.2% mentioned both positive and negative effects, while 15.6% did not know. On the nature of the effect (Table 5c), for 39.7% it was economic, 17.1% it was mixed, and 23.1% did not know.

Table 5: Perceived Effect of Gas Investments on the Population Groups

a)Population group	Number	%	b)How affected	Number	%
Men	7	3.5	Positive	55	27.6
Women	4	2.0	Negative	15	7.5
Youth	21	10.6	Both	62	31.2
Elders	6	3.0	Others	67	15.6
Girls	6	3.0	Total	199	100
Multiple	99	49.7			
Do not know	56	28.1			
Total	199	100			
c)Nature of the effects	Number	%			
Economic	79	39.7			
Social	14	7.0			
Multiple	34	17.1			
Others /political	8	4.0			
NA	9	4.5			
None	9	4.5			
Do not know	49	23.1			
Total	199	100			

The responses to the perceived effects of gas by geographic areas are presented in Table 6. As summarized in Table 6 (part (a)), 49.2% said the effects are in both the rural and urban areas, 17.1% mentioned only the urban areas, 16.6% said only the

rural areas and 17.1% said they did not know. Those who said the areas were affected positively are 42.7%, both in negative and positive ways (35.2%), only negatively (6.5%) and those who said they did not know (15.5%) (Table 6 part (b)). The respondents accounted for the effects of economic factors (36.7%), social factors (19.6%), multiple factors (20.6%), other factors (5.5%) and those who said they did not know what the causes were (10.5%) (Table 6 part (c)).

Table 6: Distribution of Perceived Effect by Urban and Rural areas

a) Areas	Number	%	b) How affected	Number	%
Urban	34	17.1	Positive	85	42.7
Rural	33	16.6	Negative	13	6.5
Both	98	49.2	Both	70	35.2
Do not	34	17.1	Do not know	31	15.5
Total	199	100	Total	199	100
c) Nature of the effects	Number	%			
Economic	73	36.7			
Social	39	19.6			
Multiple	41	20.6			
Other	11	5.5			
NA/none	11	5.5			
Do not	24	10.5			
Total	199	100			

3.2 Respondents' Participation in the Process of Investments in Gas

Table 7 presents a summary of responses to questions on land issues. The respondents were first asked if they are among those who offered land for investments in gas and related activities (Table 7 (a)), with 36.6% saying “Yes” and 63.4% replying “No” or NA.

Table 7: Respondents Who Have Given Land and Perception on Compensation

a) Given land	Number	%	b) Compensation	Number	%
Yes	73	36.6	Adequate	9	4.5
NA/no	126	63.4	Not adequate enough	64	32.1
Total	199	100	Not compensated	4	2.0
			NA	122	61.4
			Total	199	100
c) Foregone economic activity on land?	Number	%	d) Compensation was received?	Number	%
Yes	48	24.1	Adequate	5	2.5
No	151	75.9	Somehow adequate	14	7.0
Total	199	100	Not compensated	3	1.5
			Not adequate	26	13.1
			NA	151	75.9
			Total	199	100
e) Working in Gas	Number	%			
Yes	31	15.6			
No	168	84.4			
Total	199	100			
f) Job type in the gas company	Number	%			
Skilled permanent	13	6.5			
Unskilled contract	23	11.6			
NA and no	163	81.9			
Total	199	100			

Those who offered land were asked if they were compensated (Table 7 part (b)), whereby 32.1% said they were not adequately compensated, 4.5% said compensation was adequate and only 2% said they were not compensated. Furthermore, the respondents were asked if there were foregone economic activity on the land, which means the land was used as a source of livelihood to grow food for subsistence and cash crops, such as cashew and coconut, to which 24.1% replied yes (Table 7 part (c)). Furthermore, the respondents were asked if they had been offered employment in the gas companies (Table 7 part (e)), to which 15.6% replied “yes”. For those who answered the question about the type of job offered (Table 7 part (f)), 6.5% mentioned skilled employment and 11.6% unskilled contract.

3.3 Information on Natural Gas Activities in Respondents' Areas

Respondents were also asked if they receive information on natural gas in their areas (Table 8 part (a)), where they have heard the information from (Table 8 part (b)), and if they needed more information (Table 8 part (c)). Of all the respondents, 40.7% said they do not get any information, 40.7% said they do not receive information regularly, 6.5% said they received information often and 12% do not need the information. On the source of information (Table 8 part (b)), 27.1% mentioned meetings, 5% companies, 21.6% from other sources, 8% from multiple sources and 38.2% did not mention any source. In response to the question as to whether they needed more information and of what kind (Table 8 part (d)), 42.2% mentioned information related to economic benefits of gas, 13.1% said politically-related information and 10% mentioned socially related information, 12.6% mentioned a combination of different types of information, and 2% mentioned other types of information, such as environmental, 9% said they did not know and 16.15% said they did not need any more information.

Table 8: Respondents and Information on Gas

a) How often	Number	%	b)Where from	Number	%
Not	81	40.7	Meeting	54	27.1
Less often	81	40.7	Company	10	5
Often	13	6.5	Others	43	21.6
NA	24	12	Multiple	16	8
Total	199	100	No	76	38.2
			Total	199	100
c) More info needed?	Number	%			
Economic	84	42.2			
Social	10	5.0			
Political	26	13.1			
Multiple	25	12.6			
Do not know	18	9.0			
Others	4	2.0			
No	32	16.1			
Total	199	100			

3.4 Local Content

Table 9 summarizes the responses to the question as to how they would want to be involved in the gas economy. The respondents mentioned being involved economically (participating in production ventures) (55.8), socially (5.5%), politically

(13.1%), multiple ways (6.0%), and 19.6% said they do not know (Table 9 part (a)). Respondents were also asked about the needed preparations to participate meaningfully in the gas economy, 18.6% mentioned economic preparations, e.g., training in VETA colleges, 3.5% mentioned social preparations, 4.0% said political preparations, for example, being availed more information, whereas 72.8% answered that the question was not applicable, i.e, they did not need any preparations.

Table 9: How Would You Like to Be Involved in the Gas Economy?

a)How involved?	Number	%	b) Needed preparations	Number	%
Economic	111	55.8	Economic	37	18.6
Social	11	5.5	Social	7	3.5
Political	26	13.1	Political	8	4.0
Multiple	12	6.0	Multiple	2	1.0
NA	39	19.6	NA	145	72.8
Total	199	100	Total	199	100

3.5 Respondents' Advice to the Government

Respondents were asked for their advice to the government on how the government can engage the communities in the areas where the gas is extracted to ensure their participation and benefits. In their 27.1% gave economic-related advice, 19.1% gave social-related advice, 6.0% gave political-related advice, 34.7% gave advice entailing a combination of social, economic political issues, 3.5% gave other advice and 5.9% did not have any advice to give. When asked about the nature of more information needed, 7.5% of the respondents mention economic, 6.0% social, 3.5% political, 9.5% mentioned a combination of economic, social and political, and 3.5% mentioned other factors.

Table 10: Respondents' Advice to the Government on their Engagement

a)Advice on their engagement	Number	%	b) More information	Number	%
Economic	54	27.1	Economic	15	7.5
Social	38	19.1	Social	12	6.0
Political	12	6.0	Political	7	3.5
Multiple	69	34.7	Multiple	19	9.5
Others	7	3.5	Others	7	3.5
Not	9.5	5.9	Not	139	69.8
Total	199	100	Total	199	100

3.6 Discussion of Focus Groups

The information from the survey formed the basis for the qualitative part of the study, which involved group discussions. From the quantitative information (survey) it was indicated that in terms of numbers, not many people seem to be negatively affected. However, the qualitative analysis revealed that there are more negative perceptions of the gas investments, mainly from unfulfilled expectations and promises of some of the leaders. The main positive and negative social and economic perceptions discussed involved the following issues.

3.6.1 Land

One of the effects on the local communities was on land. Some of those who have given their land for pipeline or plant construction have experienced positive effects, whereas others have experienced negative effects. Positive effects included building new houses and buying farms. Negative effects were mentioned by those who have traded off their farms for compensation. These people were not able to use the money for other livelihood activities nor were they able to get any form of employment from the investing companies. It was also reported that only those who own large pieces of land benefitted. Those owning family farms or small farms did not benefit much. Poverty is likely to have increased among those who traded off their land. Some of the improvements mentioned were due to increase price of the cashew nuts crop. Further research is needed on those who traded off their land, especially by quantifying the direct effects they have had, in addition to other factors.

3.6.2 Employment

One of the main expectations of the communities is employment. However, they were disappointed that very few were able to secure employment and are paid very lowly for marginal jobs, such as cleaning and cooking and the skilled ones are on a labour contract. The other problem associated with employment is the rise of xenophobia against in-migrants from other regions who can secure jobs in the areas. The villagers complain that leaders and investors had promised that they will be prioritized. Instead, they see people from other parts of the country are preferred, even for the jobs that they could do. Thus, there is a need to establish in the local content how communities living adjacent to the investments are benefiting, and to avoid cheap labour. In Songosongo, the situation is better as some permanent jobs have been secured.

3.6.3 Infrastructural Development

The rural communities where gas is extracted have access to electricity. However, unlike in Songosongo where access to electricity is free, those in Madimba and Msimbati complained that they have to pay for electricity, which is not according to the given promises, even though the connection to electricity supply is free. They also show high expectations to have access to gas for cooking because electricity is said to benefit mostly fish traders. However, the power supply is not stable; sometimes, it causes fish traders to sell the fish at reduced prices. The villagers also complained about the heavy trucks, which are destroying the road. They acknowledge that in general the roads have been improved, but not to the tarmac level from Msimbati through Madimba to Mtwara town, as promised.

3.6.4 Social Services Provision

In terms of social services, health and education provision have been enhanced. For example, a maternity ward has been built in Msimbati and supplied with wheelchairs; new classrooms for primary and secondary schools have been built, and more social services are expected, such as dormitories and more health facilities.

3.6.5 Effect on Economic Groups

The discussion pointed to more benefits for fishers, because of the supply of electricity, especially for those who use freezers to store their fish and sell in large quantities, though production has fallen. The discussions pointed also out the effects of pollution, which has affected fish production and increased the risk of food insecurity. Fishermen do not have big boats to fish in the deep sea. In addition, food prices have risen. Farmers benefit less because they depend on crops. There have been business expansion, increase business opportunities and employment in business for those who have products to sell, but these are few. Some pointed out that the increased population in the areas has promoted the thriving of businesses due to the high incomes from those employed and the creation of larger markets.

3.6.6 Effects on Social Groups

The elderly received land compensation. However, they lost the valuable resource that was giving them support, and they do not expect to be employed, as the youth do. Another unintended consequence is that the gas investments have awakened the youth politically and they expect more employment. In addition, many social groups have expectations that their lives will change through the opening and owning of businesses. Furthermore, people complained about the dearth of industries in the rural areas and the lack of transparency in the employment sector. Employment to the youth has been commended in Msimbati; however, many youths have low education (i.e., primary level education) and do not have any skills. Thus, they have not benefited from the opportunity. People suggested that there is a need for the youth to be trained to engage fruitfully in the gas economy. Most women in the rural areas explained that they expect to be employed in the sector to cook and clean. However, older women have limited access to jobs in comparison to young women, who can cook and clean. Whereas the rural women expect to be employed in cooking, only women in urban areas get the tenders to supply the food. The rural women need to be given support to be able to supply food in these companies.

There are growing feelings of xenophobia among the Tanzanians from other regions who are assigned jobs in the region. Additionally, the local people associate the increase in HIV with workers from other parts of the country due to a clash of cultures. Generally, people see that there are no strategies formulated to assist various groups. Although social services have improved, the communities do not perceive to have had better lives. They concede that some individuals might have benefited, but not the communities in general.

3.6.7 Environmental Effects on Health

Some members in the groups pointed out health concerns due to heat and high temperatures. However, support in terms of health has been part of Corporate Social Responsibility. There is pollution and no compensation for pollution. Fear of environmental disaster has been reported in Msimbati where some of the wells have sunk. Pollution from blasting furnaces and increase in temperature and chest problems have been reported. In Songosongo, it is alleged that increased incidences of vomiting may be due to pollution. In addition, there has been a reduction in fish and seaweed production, which the local people have associated with the pollution from gas processing and production.

3.6.8 Political Issues

People pointed out a need for openness and transparency on oil and gas issues and the benefits and opportunities and health and environmental effects associated with gas production. Communities indicated that they need to know more about employment, the companies, training opportunities, and involvement in the decision-making process, especially on the revenue to support the district and village budgets. The community urged to be educated more on plans and processes and for transparency in the revenue received from the government.

3.6.9 Various Effects in the Rural and Urban Areas

The urban areas are said to benefit more than the rural areas as they provide different services to the investors, such as hotel services, electricity and employees. Urban areas benefit more from employment opportunities having more qualified people for jobs, such as driving and machine repairs, even though the gas is produced in the rural areas. The rural dwellers are the ones who have traded off the land and forgone the production of crops; however, they only get employment during the construction phases. In addition, it is the rural environment that is destructed, which is accompanied by livelihood changes, with positive changes for their livelihood being limited. Efforts needs to be done to see how the rural can also be compensated for the lost they have incurred.

4. Conclusions

This study has served to indicate a need for a broader study for analysing poverty to gauge the extent to which the changes in poverty are attributed to the oil and gas investment, particularly for those who have traded off the land. The poverty analysis should assess the employment effects of those who have traded off the land on individuals' and communities' livelihoods. Access to electricity is one positive effect; however, the analysis could examine how it could be extended for home use, such as for cooking.

Social services such as education and health are provided under the umbrella of corporate social responsibility, which is not binding to the investors, and neither is the government held accountable for its obligations. Corporate social responsibility should be specified and made mandatory because its motivation rests with compensating for the environmental, health and other effects of gas extraction activities on the communities and peoples' livelihoods in these communities. Hence there is a need to establish a framework that entails the correct compensation and mitigation that is based on the assessment of the environmental effects and not the self-evaluated corporate social responsibility. In addition, fishers need support gear to be able to fish in the deep-sea and farming need to be linked to the gas sector.

The effects on the communities where gas investments are ongoing have high expectations. These expectations should be managed to match with the realities of the likely benefits. In addition, because different groups are affected differently, strategies should be formulated to distribute the benefits based on equity to various groups. The major negative effects of oil and gas are on health and the environment. A clear understanding of these effects calls for further study.

Acknowledgement

The author acknowledges the support received from the European Union under a Projects on Capacity Building, in Higher Education Institution in Tanzania in the Development of Oil and Gas Sector, project done with Aberdeen University. The ideas contained in this paper are solely those of the author.

References

- Babatunde, A. (2010). The Effect of oil exploitation on the Socio-economic life of the Ilaje-Ugbo people of Ondo State, Nigeria. *Journal of Sustainable Development in Africa*, 12(5): 61–84.
- Celestine, A. (2003). Hydrocarbon Exploitation, environmental degradation and Poverty: The Niger Delta Experience diffuse pollution conference. In *Diffuse Pollution Conference* (pp. 32–37). Dublin.
- Clers, S. (2007). Mitigating the effects of oil exploration and production on coastal and wetlands livelihoods in West / Central Africa. *DFID Sustainable Fisheries Livelihoods Programme*, (May), 58.
- Crossland, C. J., Kremer, H. H., Lindeboom, H. J., Crossland, J. I. M. & Le Tissier, M. D. (2005). *Coastal fluxes in the Anthropocene: The land-ocean interaction in the coastal zone project of the International Geosphere-Biosphere Programme*. Germany: Springer-Verlag.
- Darkwah, A. K. (2010). The effects of oil and gas discovery and exploration on communities with emphasis on women. *Journal of Sociology*, 1–16.
- Lockwood, M., Worboys, G. L. & Kothari, A. (2006). *Managing protected areas: A global guide*. London: Earthscan.
- Mangora, M. M. & Shalli, M. S. (2006). Socio-economic profiles of communities adjacent to Tanga marine reserve systems, Tanzania: Key Ingredients to general management planning. *Journal of Social Science*, 4(2): 141–149. Uganda's Albertine Region. Aalborg University.
- Ndimbwa, M. R. (2014). *Natural gas conflict in Tanzania and the effects to the population in Mtwara municipality*. Norwegian University of Life Sciences.
- Omoredede, C. K. (2014). Assessment of the effect of oil and gas resource exploration on the environment of selected communities in Delta State, Nigeria. *International Journal of Management Economics and Social Sciences*, 3(2): 79–99.
- Sesabo, J. K. & Tol, R. S. J. (2007). Technical efficiency of small-scale fishing households in Tanzanian coastal villages: An empirical analysis, (June 2015): 37–41. <http://doi.org/10.2989/AJAS.2007.32.1.8.145>.