

Analysis of the Immediate and Long-Term Impacts of Transferring of Men's Labour Force from Agriculture to Artisanal Small-Scale Gold Mining in Tanzania

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Abstract

In Tanzania, agriculture has been earmarked as a priority area to stimulate economic development. However, challenges facing the country's agriculture motivate an increasing number of men to transfer of labour into artisanal small-scale gold mining leaving women behind to sustain the livelihoods of their household. In literature on Tanzanian economic development, there is a gap on the actual impact on household welfare prompted by men laborers switching to artisanal small-scale gold mining. This paper therefore, investigated different factors that explain the phenomena with the special focus on artisanal small-scale gold mining areas of Nyarugusu village, Geita Region, Tanzania. Data was collected from 200 women who had taken up household headship after their men migrated in search of gold. From this sample, data was collected regarding their demographic factors; education history, attitudes and perceptions about economic benefits and negative impacts of artisanal small-scale gold mining using a combination of tools and methods, which included; semi-structured questionnaire, focus group discussions and in-depth one-to-one interviews. The data was analyzed both descriptively and statistically using Statistical Package for Social Scientists (SPSS version 16.1) to establish the effects of transferring men's labour force from agriculture to artisanal small-scale gold mining on agriculture. Results revealed a number of immediate and long-term impacts on agriculture caused by the transferring of men's labour force from agriculture to artisanal small-scale gold mining. This included; immediate and long term impacts on agriculture as well as the change that happened in agriculture in comparison when men were helping in agricultural activities to when it was only women working on agriculture. The major recommendation was that, Tanzanian government should consider to put in place community empowerment programs such as: cooperatives and involve all other stakeholders to invest in tailor-made 'hands-on' awareness programs for such disadvantaged communities, to improve their personal skills so as to benefit both in mining and other entrepreneurial endeavors hence reduce the transferring of men's labour force from agriculture to artisanal small-scale gold mining.

Keywords: left behind women, agriculture, artisanal small-scale gold mining, livelihood impacts, Tanzania

1.0 . Introduction

Agriculture is the main source of income for rural livelihoods, and central to economic development in East Africa, Tanzania is of no exception (World Bank report, 2008). In Tanzania, Agriculture is one of the vital economic instrument accommodating approximately 74% of the country's population and contributing for about 25% of the Gross Domestic Product (GDP)(URT,2014). Agriculture, also provides livelihoods for the majority of the rural population, about 60% of the rural households earn income from livestock husbandry, while 97% cultivate crops and around 20 % are employed as agricultural wage labourers.. (John C. P, et al 2017) ; (Katia et al, 2012).

Apart from agriculture, Tanzania has abundant deposits of minerals including; gold, diamonds and a variety of colored gemstones like tanzanite, ruby, garnets, pearls (Pedersen, et al 2016). Just like agriculture, Artisanal small-scale gold mining can potentially contribute to development by; providing employment, increasing local purchasing power, stimulating local economic growth and slowing urban migration (Banchirigah, 2010). In the past three decades, the artisanal and small-scale gold mining sector, has been increasingly important for poverty alleviation in Africa (Fisher et al, 2009). In recent years; there has been an increasing number of men from mining communities in Tanzania leaving subsistence agriculture and joining artisanal small-scale gold mining to supplement income (Dora H.O.et al 2017).Over a million people are involved in artisanal and small-scale mining in Tanzania(World Bank, 2016). Studies have shown that Artisanal small-scale gold mining is preferred to agriculture among some rural communities due to its quick returns and less investment in terms of tools (Hilson G., 2016).

Inseparable linkages between agriculture and artisanal small-scale gold mining have also been reported in many gold mining parts in Ghana (Hilson, G., Garforth, C.J., 2013). Numerous Studies have captured the synergies between artisanal small scale gold mining and farming in sub-Saharan Africa. Studies in Mozambique revealed that profits from Artisanal small-scale gold mining at Chazuka have enabled individuals to buy fertilisers and other crucial farm inputs (Dondeyne and Ndunguru, 2014). Research in Mali (Komana West) and

Ghana (East Akim) confirms that some families ‘branch out’ into ASM in the dry season, especially in the former, a distinctively Sahelian country, where less than two percent of land is cultivatable and dry seasons are prolonged (Hilson G. Garthon C.J, 2012). Cartier, (2011) further indicates that at present, the vast majority of small-scale agriculture in Sierra Leone is not profitable thus Farmers overcome food insecurity and generate income by diversifying and complementing their activities resulting to a numerous number of subsistence farmers moving into seasonal gold mining to complement their income.

However, Tanzania seems to have a unique dimension as agriculture is seemingly creeping due to the excessive immigration of men following the gold rush. Apparently, due to the increased competitiveness, artisanal small-scale gold mining sector tends to be associated with feverish ‘rushes’ that lead to the establishment of semi-permanent and permanent camps where men migrate as far as hundreds of kilometers away to newly discovered gold mines for periods longer than one year. Given that agriculture is mainly manual, cropping in relatively large areas requires a substantial supply manual labour. Thus, the reallocation of men’s labour force to other activities such as ASM leaves women overburdened with responsibilities which were originally men’s. The created vacuum is usually expected to be covered by the remittances from mining activities to hire extra labour and provide other essentials supplies for the families in the absence of the men. The allure of mining compared to other livelihoods is strongly related to belief in its greater potential for substantial returns. Logical thinking would be that gold mining is more profitable to whoever is involved, yet as many scholars have argued out, miners and their families often end up in an economic “poverty trap” contrary to their original goal of eradicating poverty (Hilson G. Garthon C.J, 2012).

Traditionally men are expected to be leaders in the manual agricultural labour such as land clearing, cash crop farming, planting, while women carry on responsibilities like food crop farming and doing house chores such as cooking collecting firewood gathering, cleaning and catering for the children (SOFA, 2011). Yet, women particularly those of rural areas in Tanzania comprise about 98 % of the total workforce in agriculture (Agriculture Food and Cooperatives, (2012) report). The reason for the increased women involvement is attributed to men switching their labour to quick and more liquid economic activities such as fishing, mining and petty retail trade. Deterioration in the economic position of small-scale farmers has directly led to the increased significance of artisanal mining activity across Africa. For example, where the price of fertilizers is no longer subsidized, small farmers cannot afford to buy fertilizer, so their income from farming is insufficient to support their families. As a consequence, farmers turn to artisanal mining for cash income. Artisanal mining and agriculture often involve the same people in the same communities (Brazilian et al 2013).

The impact of artisanal small-scale gold mining to agricultural sustainability is of particular importance. This is because it affects both food security and the sensitive ecosystems. Most commonly, artisanal small-scale gold mining practice is characterized by deforestation and modifications of hydrologic systems such as constructing water reservoirs or through silt accumulation in rivers (Akagi and Naganuma 2000). Besides, with surface mining, large areas of land need to be clear which has a large-scale impact on the environment. When uncontrolled destruction of the natural resources and ecosystems is unchecked, this negates the economic and sustainability benefit from artisanal small-scale gold mining. At present, there is limited research on the immediate and long-term impacts of switching labour from agricultural production to artisanal small-scale gold mining operations. To address the gap, this study has investigated effects of transferring men’s labour force from farm to artisanal small-scale gold mining on agriculture, and on the left behind families.

2.0 Materials and Methods

2.1 Study area

To establish effects caused by the transferring of men’s labour force from farm to artisanal small-scale gold mining on agriculture, an investigation on different factors that lead to the switch in labour and perceived benefits visavae consequences was conducted with a special focus on artisanal mining areas of Nyarugusu village, in Geita region, Tanzania. Nyarugusu is a typical artisanal small-scale gold mining settlement village that had gold mining activities since colonial period to present (Breyceson 2014/008). Alongside with mining, Nyarugusu village also depends on agriculture for the sustenance of livelihoods. In recent years, Nyarugusu witnessed some big shifts from agriculture to artisanal small-scale gold mining as a result of climate change, which negatively affected agriculture. Unfortunately, gold availability in the region has become a challenge due to overexploitation and also large numbers of mining dependents. In the past decade, artisanal small-scale gold mining in the area was a quick escape way from poverty but in recent years, it has become more and more difficult to get a lump sum of gold without machinery for deeper extraction. Given this scenario, artisanal miners with rudimental tools have automatically been forced to spread out in search of virgin mining sites to increase survival in the mining business and to sustain their livelihoods. In the event of migration, the women and children are left behind as the men scout out distant mining places.

2.2. Data collection and analysis

The study adopted a multi-method approach that involved a secondary and primary research data collection. Secondary data were obtained from the local offices and private institutions for the purpose of triangulating information obtained from primary data. The process of primary data collection involved, a purposive sample of 200 left behind women who were once living with their husbands and then left behind to take care of households by themselves. From the selected respondents, information on their demographic factors, education history, and current activities was collected using a semi-structured questionnaire and where appropriate focus group discussions and in-depth one-to-one interviews were used to triangulate the information obtained. A purposive sampling was also used to select officials from the local government and community members who were indigenous to Nyarugusu for In-depth interviews and focus group discussion in order to obtain in-depth information about the study. The data obtained was then analyzed both descriptively and statistically using Statistical Package for Social Scientists (SPSS version 21) to determine factors associated with the impacts caused by transferring of men's labour force from farm to artisanal small-scale gold mining on agriculture.

3.0. Results and Discussion

The study highlighted a number of immediate and long-term impacts as well as changes that took place in agriculture after the transfer of men's labour force from agriculture to artisanal small-scale gold mining. Respondents mentioned different impacts and changes that took place in agriculture with a special focus on the history of how agriculture was before men left and how is it now that only women were left behind to sustain livelihood with agriculture being the main livelihood asset. To further understand the population to which this research focused on, the author went further to obtain detailed information on the demographic characteristics of the left behind women as its indicated in table 1

Table 1: Demographic Characteristics the population evaluated

Variables	Frequency	%
Age		
20-35	130	65
36-45	64	32.0
>46	6	3.0
Total	200	100.0
Education (number of school years)*		
Never attended school	24	12.0
7 years	25	12.5
10 years	95	47.5
12 years	12	6.0
14 years	44	22.0
Total	200	100.0
Occupation		
Farming	40	20.0
Business	96	48.0
Hired employee	52	26.0
Housewives	12	6.0
Total	200	100.0
Household size		
2-5 people	24	12.0
5-10 people	160	80.0
>10 people	16	8.0
Total	200	100.0
Religion		
Muslim	50	25.0
Christian	150	75.0
Total	200	100.0

Source: Field data 2016 and 2017

3.1 Gender & Age

This study focused on the left behind women in Nyarugusu village in Tanzania, in which findings established a number of theoretical saturation to reach about 200(100)of the left behind women. Thus, about 200 left behind women were interviewed for the purpose of getting in-depth information on the topic at hand. Findings showed different age groups among respondents. However, despite the difference found in the respondents' age groups, the majority of the left behind women were still young with enough energy to sustain their livelihoods using

different coping mechanism available in the study area such as agriculture, starting a business, remarry, getting help from friends and family, getting employment among others. It was further indicated that of the 200 respondents 58(29.0) %were women of age between 26-30years, about 40(20.0) % were of the age of between 21-25 years and 36-40, and 32(16.0)% of the of age between 36-40 years The women of age between 41-45 years were 24(12.0) % while it was only 6(3.0)percent of women who were aged between 46-50 years.

3.2 Education and Occupation

Findings highlighted a link between the education level of the respondents and the kind of occupation selected for livelihoods sustenance. In this case, a significant number of the left behind women had acquired different levels of basic education, the opted occupation was that which did not demand any professional skills such as hired employee in farms and the like, business, farming and other kinds of jobs inclined manual labour... The absence of men to help in agricultural activities left women in a dilemma on how to sustain livelihoods of their household by themselves, But after a period of struggle, women started to cope and discovered different capabilities that they never knew they had when their men were providing for the household. It was further noted that about 40(20.0)% of the left behind women remained as farmers, while 96(48.0)% decided to be businesswomen. This research noted different business conducted by the left behind women including clothes and shoe shops, restaurants, and foodstuff (rice, maize, beans, banana among other) stores. About 52(26.0)% of the left behind women quitted farming and got employed in different local offices within the study area while about 12(6.0)% of the respondents decided to remarry so that they can have a husband to sustain their livelihoods.

3.4 Household size & Religion

Different in household size was noted to have a different level of impact and changes in the process of sustaining livelihoods. Findings revealed that that size of the household can determine strategies and the level of vulnerability facing a particular household. Households with a small number of people were faced with fewer challenges in sustaining the livelihoods of their households because they had to provide basic needs with such food, clothing, shelter and the like to a fewer number of people compared to the household with a big number of people. Of the 200 left behind women about 87(44.5)% came from the household of seven people, 59(29.0)% came from a household of eight people, 24(12.0)% were from a household of five people and about 16(8.0)% of respondents were from a household of eleven people. While It was only 12(6.0)% of the left behind women who came from a household of ten people thus adopted different livelihood mechanism accordingly.

Religion was also one of the demographic characteristic used to further understand respondents in question. Results indicated that of the 200(100)% respondents, about 50 (25.0) % were Muslims while 150(75.0) % were Christians. The study further identified the use of religious festivals in the process of sustaining livelihoods. Findings revealed religious festivals to be one of the peak seasons for different kinds of businesses such as cloth business, shoes, food, transport thus become one of the earning periods for the behind women particularly those running different businesses in the area.

Table 2: Immediate and long term impacts on agriculture

Immediate impacts		
Indicators	Frequency	%
Shortage of labour	58	29.0
Mismanagement of farm land	14	7.0
Change in the use of agricultural yield	15	7.5
Decline of agricultural yield	45	22.5
Lack of time to work on farm	34	17.0
Increase dependency on agricultural yield	34	17.0
Total	200	100.0
Long term impacts		
Indicators	Frequency	%
Diversification of food crops	44	22.0
Decline of agricultural land fertility	48	24.0
Introduction of non-farming income generating activities.	108	54.0
Total	200	100.0

Source: field data 2016 and 2017

3.5 Shortage of labour force

Of the 200 left behind women about 58(29.0)% revealed the challenge of shortage of labour in agricultural activities as one of the immediate problems that arose as soon as they were left alone to work in farming

activities. Artisanal mining and subsistence agriculture are closely linked because they are both characterized by an enormous demand in the labour force, they both involve men in their economic peak ages, the similarity between the two, has to result to tradeoffs between agriculture and artisanal small-scale gold mining (Bryceson et al. 2012), (Hilson, 2013). In recent years there has been an increased transfer of energetic men from working in agriculture to artisanal small-scale gold mining hence leave the women left behind overwhelmed with a range of responsibilities including those which were traditionally shouldered by their men (FAO, 1990). The impacts of mining operations are not gender neutral. Women can encounter the negative side of the artisanal small-scale gold mining in a more practical way compared to men. As men get employment in mines, there is a withdrawal of male labour from traditional subsistence activities such as agriculture. This can result in increased work burden for women who become solely responsible for subsistence activities and providing for families (OXFAM Australia, 2009). Emotionally speaking while fighting her tears from revealing the true sadness she feel when asked to explain on how she ended up taking care of the household of more than six people for more than nine years alone one of the left behind women had this to say;

"Over the years my husband and I had witnessed people coming back to the village rich and do away with poverty. After discussing with my husband we decided that we should also try artisanal small-scale gold mining, but it has been more than nine years now since my husband left for artisanal small-scale gold mining. I have been alone ever since I used to receive remittances from 50 dollars or less from time to time to support the livelihood of the household and agricultural activities in the early years of his joining mining. So we decided that he should continue to work in artisanal small-scale gold mining hoping that he will get a lump sum of gold in one or two years to come. I have been more than nine years now ever since he left for mining. He stopped sending remittances seven years ago. I don't even know where he is given that they are never in one permanent place. I don't know how to reach him anymore. I have no one to help with the shortage of labour in agricultural activities because my children are still young to work on farm and I don't have money to hire people to help me with farming instead I have to farm a small portion of land for our subsistence and use the rest of my time to look for cash income".

A study on rural livelihoods and poverty in Mkinga District in Tanga region in Tanzania further elaborates that, it is a traditional practice in Tanzania that households are predominantly led by men Xiaoyun, (2016). However, Artisanal gold mining is associated with high mobility where gold miners move from one place to another during the gold rush. This is the situation in Nyarugusu Village in which artisanal small-scale gold miners mostly men move to remote places such as forests, mountains, and to other remote regions like Shinyanga region in search of gold leaving their family behind (Olivieira, M. Heemskerk & M., 2003). Henceforth, women who are left behind are propelled to be the households' breadwinners as they wait for their husbands' luck to obtain gold big enough to pull them out of poverty (Dora et al, 2017).

Moreover, A study in rural China further emphasizes that there has been an increasing number of men migrating from their families in rural areas to look for an alternative to other economic generating activities besides agriculture. The left behind women, therefore, work to fill the gap left by their men while at the same time assumes their traditional workload, that is, raising the children, providing care for the old people, and at the same time raising livestock to subsidize the family expenses. A survey in a south-western province showed that in a busy season, the left behind women work for more than 11 hours per day, among them, about 20% women had to work for more than 12 hours a day. Evening the free season, 58% women had to work for more than 8 hours per day, 20% women more than 10 hours. Almost 80% women reported there was no leisure time for them (Zho, 2007) and (Zhou F., 2007)

Mismanagement of agricultural farmland

Maintaining soil fertility in the agricultural land needs money but because of the many family obligations shouldered by the left behind women, buying fertilizers becomes difficult. At the same time, agriculture becomes the immediate asset they are left with to sustain their livelihoods. Consequently, the continuous farming without putting in fertilizers results to soil depletion thus decline of its fertility. Of the 200 respondents, 14(7.0)% mentioned that they face problem in managing agricultural farmland because they lack money for fertilizers hence the decline in agricultural yield Batiaono, A., al al (1998); Nandwa, S.M. , (2003) also revealed that depletion of soil fertility is one of the major cause of diminishing productivity in subsistence agriculture. A similar observation was made by (Foel E, et al, (2002) in a study on evaluation of environmental degradation in northern Ethiopia. The study revealed that increase in demand for agricultural land inevitably results to loss of vegetation thus trigger series of changes most of which have major negatives impacts on the sustainability of the entire ecosystem leading to agricultural low yield and high rate of crop failure. On the other hand, several left behind women admitted failing in maintaining their agricultural land because of the big size of acreage left for them to manage. One of the respondents went further to explain that, she was left with about 10 acres to farm by herself and on top of that she was expected to attend to household chores and other responsibilities. As a result, she had to sell about 8 acres retaining only 2 acres for her household food consumption. The money she obtained

from selling the 8 acres of her farmland was used to establish a small restaurant business for income. The deteriorating in the economic position of small-scale farmers, directly lead to the increased significance of artisanal small-scale mining activities across Africa. For instance, where the price of fertilizers is no longer subsidized, small farmers cannot afford to buy fertilizer, so their income from farming is insufficient to support their families (Hilson, 2013).

The decline in agricultural yield

Lack of money for agricultural inputs such as good seeds, insecticides, pesticides, fertilizers and the shortage of time to work in farming among other reasons were mentioned to create a problem in obtaining enough yield for a significant number of left-behind women in Nyarugusu village. Of the 200 respondents 45(22.5)% revealed to immediately face the decline of agricultural yield hence lack enough food for household consumption. This was also attributed to lack of qualification to access financial help from financial institutions which demand asset entitlement. (J.W.Waceke and J.W.Kimenju, 2007) revealed that low yield and high rate of crop failure is due to poor farm management and agriculture practices such as continues cropping and lack of adequate and appropriate external Waceke further suggested that lack of secure land tenure poses a constraints to sustainable subsistence agriculture development because, despite the significant roles women perform in agriculture, they still have a limited access to financial help from financial institutions thus fail to support agriculture. One cause of poverty is the lack of access to credit, especially among rural households (Coleman, B.E. and Wynne-Williams, J., 2006). Evidence shows that financial help can promote the range of individual's households and firms that can become a foothold in the modern economy (Basu, 2006). Rural finance is the provision of financial services in rural areas that support a wide range of economic activities and households of various income levels. The wide-range and an increasing male migration from agriculture to other economic activities perpetual low yield and high frequency of crop failure are challenges that face every subsistence farmers around the world (Richer, 2011).

Introduction of non-farming income generating activities

Findings established that of the 200 left behind women about 108(54.0) % found an alternative in non-farming economic generating activities. This was evident as one of the left behind woman further explained that, since she could not maintain the land of 10 acres by herself she had to sell the land and establish a motor bicycle(commonly known as boda-boda) business in which she had guarantee of about 10,000 Tanzanian shillings a day, which is equivalent to 4 USD. With 4 USD, one is guaranteed of three meals per day for her household. This was also the case with another respondent, who had channelled her attention from farming to off-farming economic generating activities to a restaurant business in which was able to make at least 3 - 5 USD a day. This study also discovered that a number of the left behind women working on the nearby small-scale gold mining for day to day cash income and focus on agriculture during the rainy season, explaining on the situation one of the left behind women said:

"The presence of deposits left from the previous small-scale gold mining activities in the study area, has enabled us to have an easy way to obtain cash income for our households, we can now get employed to wash gold deposits from local investors and generate at least 4 USD per day, at times less or higher depends on how hard one works, thus sustain livelihoods of our households".

The marginalization of agriculture has forced some rural women to enter into artisanal small-scale gold mining here they are usually engaged in gold mining activities with low returns. The role of small-scale mining as the backbone of some local economies is seen to facilitate the development of complementary, sustainable, revenue-generating activities, which may serve as a source of finance for local investors to run their small businesses (Hentschel, Hruschka, &Priester, 2015). Evidence suggests that artisanal small-scale gold mining to be the source of income is being used to for basic needs such as food, children's education, healthcare, clothing, and shelter (Chupezi, Ingram, &Schure, 2009.)A study in Maasai households in East Africa identified that non-farm diversification is of tremendous importance for many Maasai households. Non-farm income accounts for 8% of overall income in Mara, 20% in Amboseli, 30% of income across all income categories in Tarangire, 34% in Longido, and 43% of overall household income in Kitengela (Katherine Homewood, 2009.)A growing body of evidence shows that agriculture is no more sufficient to ensure sustainable rural development in Bosnia and Herzegovina (BiH) therefore rural livelihoods diversification is crucial (Sinisa Berjan, 2014). Evidence from many European countries shows that non-agricultural economy influences greatly rural areas economic growth thus improving rural population working and living conditions. (Marina M. Miljkovic, 2010)

On the other hand, the prolonged absence of men from family setting has brought in social activities which can somewhat influence the spread of HIV/AIDS (J.W.Waceke and J.W.Kimenju, 2007). This is a case in the study area whereas, when a male spouse decides to return to his original home can expose a left behind woman to HIV AIDS. Studies have clearly revealed that mining communities often encounter challenges which negatively affects livelihoods and create vulnerability, especially those who are unable to cope or adapt to the

changes brought in by mining.(Carney, 1998). Displacement and the shift from a traditional subsistence economy to a cash-based economy can lead to the loss of traditional values and way of life. This can diminish women's traditional status in society, particularly where newly-created gender roles emphasize women's work in the domestic sphere, i.e. their reproductive work, and undermine their productive and leadership roles. Due to the decline of traditional mechanisms of social control and the influx of a transient male workforce, social and health problems can become more prevalent in communities. These problems can include increased alcohol use, domestic violence, sexual violence, sexually transmitted infections and HIV and AIDS, and prostitution (OXFAM Australia, 2009). Several studies in rural China have also indicated that women left behind in China are increasingly affected by various social, economic, and demographic changes that directly or indirectly influence their health negatively. Many surveys on Chinese women left behind reported that majority of this population has been suffering physical health problems, including reproductive tract infection, maternity disease, occupational diseases, as well as high-risk of STIs or HIV/AIDS (Zhou F. , 2007), (F., 2007),(Hong, 2009) and (Zhu, 2007,).

Change in the use agricultural yield & Increase dependency in agricultural yield

Of the 200 women left behind 15(7.5)% revealed that the absence of men to provide cash income for their household had stimulated an increase on the dependency in the use of agricultural yield which suddenly became the only means of cash income as well as food consumption for the household. One of the left behind woman shared her story that she was left behind hoping that she will be receiving remittance from time to time. But the unpredictability nature of small-scale artisanal gold has made her the main breadwinner of her household since the money that her husband makes is only enough for his upkeep at his place of work. Consequently in making sure children are not suffering she had to work hard on the farm with the help of her four children who are in their twenties to produce enough yield for household food and for the cash income. Concurrently, the absence of men to provide cash income for the household has created an increase of the dependency on agricultural yield. Of the 200 respondents, 34(17.0)% revealed that they immediately faced a challenge of lack of other sources of cash income resulted to selling some of the yields for household cash income. The increasing reliance on only agricultural yield stumbled upon an obstacle of the decrease in agricultural output due to the excessive use of the farmland with lack of agricultural input.

Diversification of food crops & Shift from cash to food crops

Results point out that increased dependency on agricultural yield created a diversification in crops. The study revealed that about 44(22.0) % of the 200 respondents had adopted a variety of crops because of an increase of demand in agricultural yield which had influenced women to farm in accordance to household and market demands. A similar mechanism was identified in rural China among the left behind women that, in the same situation, women in rural China would normally apply strategies such as reducing land acreage and remain with the land which would provide household food. They would grow the single-season food crop instead of the multi-season or switch the agricultural products from food crop with the characteristic of low-gain and large-acreage to a commercial product with high-profit (Wu, 2009) and (Lin, Z.B., Qiu, G.J., 2001). On the other hand, overwhelmed with enormous responsibilities while faced with lack of income to invest in cash crops farming motivated a considerable number of the left behind women to use their agricultural land as a starting point towards sustaining the livelihoods of their households. This study identified that lack of agricultural input led to a switch from farming cash crops and food crops to food crops only. This was affirmed by 48(24.0)% of the 200 left behind women who revealed that they used to farm food and cash crops when their husbands were there to help but as soon they left them to work in farming activities all alone, they opted to farm only food crops because farming both cash crops and food crops was expensive for them.

Lack of time to work on a farm

Results indicate that transferring men's labour force from agriculture to artisanal small-scale gold mining created a gap in farming activities given that subsistence farming requires a substantial supply of manual labour. Lack of involvement of men in farming activities automatically required women left behind to work overtime hoping to cover the gap left by men in the farming process to no avail. Of the 200 respondents, 34(17.0) % respondents revealed that they lack time to attend to their traditionally given responsibilities such as household chores and attending to farming activities. During an interview one of the left behind woman had this to say;

" I used to spend about half a day in farming when my husband was here to assist with some of the household obligations such as providing cash income for the household and helping in farming activities. But now that I am alone I cannot dedicate the same amount of time as I previously did. I have to work on the farm for fewer hours because I also have to work for cash income generating activities to be able to sustain the livelihood of my family".

The absence of men created a problem of lack of time to attend to farm work because of the increased

burden that they are left with it fill such as taking over men's responsibility from household to farming while attending to their traditional given responsibility. Hudu Zakaria, (2015) established that, Apart from traditionally being obligated to taking care of household chores, rural women work in non-agricultural self-employment activities than men in rural areas. The challenge of overburdening of responsibility among the left behind women was again mentioned to have a negative impact on the left behind women as Zhou H. , (2007) and Zhou, Q.X.,Zeng,Z.,Nie,Z.M.,(2007) who identified that extreme workload generated a lot of physical problems for the left bend women in rural China mentioning a study done in eastern northwestern areas which indicated about 60% the left behind to have suffered the occupational diseases caused by heavy farming thus negatively affect agriculture. To further generate an in-depth information on the change that took place in agriculture, this study focused on the comparison on when men were helping in the farming process and when it was only women left behind to w work on agriculture as detailed in table 3.

Table3: The Change in agriculture in comparison to then and now

Indicators		Frequency	%
Change in Purpose of agriculture (the use of agriculture)			
Then	Now		
Food consumption and cash income	Food consumption only	50	25.0
Food consumption only	Food consumption only	56	28.0
Food consumption and cash income	Food consumption and household income	46	23.0
Food consumption only	Cash income and food consumption	48	24.0
Total		200	100.0
Change on acreage under cultivation			
Then	Now		
5 acres	0 acre	20	10.0
3.5acres	2 acres	58	29.0
6.5 - 10 acres	3 acres	48	24.0
10.5-15 acres	5 acres	19	9.5
5 acres	12 acres	36	18.0
4 acres	1 acres	19	9.5
Total		200	100.0
Change on agricultural yield			
Then	Now		
7 Sacs	Off- farm activities	53	26.5
5 Sacs	2 Sacs	104	52.0
5.5-10 Sacs	2.6 Sacs	11	5.5
2 sacs	7 Sacs	32	16.0
Total		200	100.0
Change on Time (days) spent in farming activities			
Then	Now		
1-5 days per 1acre	Off -farm activities	53	26.5
4 days per acre	14 days per acre	104	52.0
3 days per 2-5 acres	30 days per 2-5 acres	11	5.5
1 day per acre	15 days per acre	32	16.0
Total		200	100.0

source :Field data 2016 and 2017

Change in the purpose of agriculture

Findings indicated that of the 200 respondents about 50(25.0)% revealed that agriculture used to be for the purpose household consumption and for generating household cash income. About 56(28.0)% said the purpose of agriculture had not changed in comparison from then to present, elaborating about the situation one of the left behind women said:

"Our household of eight people has always depended on our four acreages for food consumption. When my husband decided to leave farming for artisanal small-scale gold mining, I thought he was going to send remittance for cash income but on the contrary, I never received any remittance from him because he only gets the money for his upkeep where he works. In sustaining the livelihoods of the household by myself, I had to use my children to help with agricultural activities and spent the rest of my time to work in other people's farms for cash income so agriculture has remained for food consumption just like when my husband was around".

While 48(24.0) % of the 1 responds further explained that, the transferring of men`s labour force from farm to artisanal small-scale gold mining created a gap in family income instead of solving the problem, lack of remittance from their husbands forced the left behind women to use the agricultural yield for cash income and

food consumption instead of just food consumption as it was originally. About 46(23.0)% further added that agriculture used to be for food purpose previously and at present, the situation has not changed. However, the only change noted was in the amount of the produce from agriculture.

Change on acreage under cultivation

Of the 200 hundred respondents about 20(10.0)% identified that they used to farm under 5 acres then, but the absence of men's support in agricultural activities motivated them to shift to non-agricultural income-generating activities. Whereas 58(29.0)% respondents explained that, they continued to farm on smaller acreage compared to when their husbands were present to help. Elaborating about the situation, the left behind women said that, they used to farm in 3.5 acres but now she is working on 1 just 2 acres because they lack time to work on a farm and at the same time attending to household chores. Similar situation was found to 19(9.5)% of the left behind women who admitted that their number of acreages has reduced from 10.5-15 to 5 acres now whereas about 19(9.5)% had a popular opinion of the declining in the acreage under cultivation from 4 when men were helping in agriculture to only 1 acre. Wu, (2009) and Lin, Z.B., Qiu, G.J., (2001), indicated that the situation of leaving the land uncultivated was identified as a new problem in current Chinese rural areas. Some researchers have already shown a great anxiety about that the feminization of agriculture would negatively affect the food supplies in the national side in the long term. The opposite situation was found to 36(18.0)% of the respondents, who explained that absence of men gave them the power to be able to manage agriculture efficiently where she increased the land under acreage from 5 to 12.

Change in agricultural yield

The change in agricultural yield was also noted to be one of the changes that occurred in agriculture. About 53(26.5)% of women explained that when their husband was helping in agricultural they used to obtain about 7 sacks per one season but lack of support from their partners motivated them to switch to off-farming economic generating activities the research pointed out about 104(52.0) % of respondents faced a problem of the decline of agricultural yield from 5 sacks to 2 sacks. The decline of agricultural yield was again noted in about 11(5.5)% of respondents who said that previously they used to obtain about 5.5-10 sacks but now they are getting about 2.6 sacks of agricultural yield. About 32(16.0) % women faced a different situation in which they learned how to go about sustaining agriculture on their own with the help of friends and family and instead of facing the decline in agricultural yield, their agricultural produce went up from 2 sacks to 7 sacks.

Change on Time (days) spent in farming activities

Subsistence farming is characterized by manual labour but the absence of men's labour force automatically caused women who were left behind to work on the farms by themselves. To this effect, they are forced to invest more time in farming compared to previously so as to cater for the gap left by their husband. The study on gender perspective highlight that subsistence agriculture is characterized by high labour intensity and occasional hiring of wage labors to which women contribute to about 60-80%. However, despite their high contribution the absence of men automatically force women to work double in the trying to fill the gap left thus spend even more time in farming than before IFAD (2000). This study noted about 53(26.5) % of respondents stopped farming and sort for an alternative means because they were not able to handle farming and at the same time work for cash income. Findings revealed a substantial number of about 104 (52.0)% of respondents stated that, previously they used to spend about 4days in farming an acre but in absence of their husband they spend one to two weeks. A similar situation was discovered to about 11(6.5)% of the left behind women who revealed that previously they use to spend about 3 days per 2 to 5 acres which changed to 30 days per the same acres. 32(16.0) % of the left behind women explained to have spent the same number of days that is one day per one acre.

3.0. Conclusion and Suggestions

Tanzania's government should consider to put in place community empowerment programs such as cooperatives and involve all other stakeholders to invest in tailor-made 'hands-on' awareness program for such disadvantaged women to improve their personal skills so as to benefit both in mining and other entrepreneurial endeavors hence reduce vulnerability among left behind women.

The government needs to foster the potential for non-farm employment, both through encouraging rural industries and also through supporting better education and skills provision for the rural populations. Development practitioners and Tanzanian government should introduce different approaches when designing development programs because different regions have different unique features hence the same problem may need a different approach.

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