International Journal of Agriculture, Environment and Bioresearch

Vol. 2, No. 05; 2017

ISSN: 2456-8643

UNDERSTANDING THE MIOMBO WOODLANDS DEFORESTATION: DRIVER-COMMODITIES-GENDER NEXUS IN THREE DISTRICTS, TANZANIA

Anthony Sangeda[1], David Maleko[1] and George Kajembe[2]

[1]Department of Animal, Aquaculture and Range Sciences, Sokoine University of Agriculture, P.O. Box 3004, Morogoro, Tanzania

[2]Department of Forest Resources Assessment and Management, Sokoine University of Agriculture, P.O. Box 3013, Morogoro, Tanzania

ABSTRACT

The underlying causes of land use change and degradation are defined by the needs of men and women. This article focuses on analyzing the elements that define who plays which role in land use and forest cover change; the net benefits that they derive from current land uses and who will participate and benefit from the change in land use policies and practices. A total of 178 households which were engaged with the two commodities namely simsim (*Sesamum indicum*) and charcoal were interviewed by using a structured questionnaire. All respondents agreed that unsustainable charcoal making contributes significantly to forest degradation. It was observed that most of trees which were felled to open new simsim farms were turned into charcoal. Simsim and charcoal production are practiced by rural poor communities with limited livelihood options. Both men and women involved in production value chain earned a profit. More youths are expected to be engaged in production due to high-profit margins of these two commodities.

Keywords: Drivers of deforestation, charcoal, simsim, land use cover change.

INTRODUCTION

Agriculture is the most significant driver of deforestation**,** while unsustainable charcoal production is the most important driver of forest degradation in large parts of Africa (Kissinger *et al*., 2012). The area of land covered by natural forests or by woodlands classified as forests in Sub- Saharan Africa declined by 9.5 % between 2000 and 2010 (WDI, 2016), of which an estimated 75 % was due to conversion to agriculture (Hosonuma et al., 2012). It is estimated that 61 % of the total land area in Tanzania is degraded (URT, 2016b). In many areas of the country, the agricultural expansion for crops and grazing plays a very significant role in ecological habitat fragmentation and loss of biodiversity (URT, 2015a). Virgin forest lands are more fertile and productive than old agricultural lands. New farms prepared through the burning of forests are thought to have fewer weeds for about the first two farming seasons. Also, new farms are less

Vol. 2, No. 05; 2017

ISSN: 2456-8643

infested by pests and diseases, well drained and require less tillage before planting (Kideghesho, 2015).

The current rate of deforestation is estimated at 0.4 million hectares (0.9 %) annually; should this continue, the country will lose most of its forests in the next 50 to 80 years (FCPF, 2014). The majority of smallholder farmers in Tanzania are women producing about 70 % of the country's food requirements (URT, 2015c). Clearing vegetation for agricultural expansion often goes hand-in-hand with firewood collection and charcoal production that is; the two drivers are not independent (Franks *et al*., 2017). Nevertheless, agricultural expansion is generally considered to be the main underlying driver of deforestation, and firewood collection and charcoal production are viewed as immediate/direct drivers (Kessy *et al.,* 2016; Kweka *et al.,* 2016; USAID-MoA, 2012). This is owing to the fact that about 96% of households in Tanzania rely on wood fuel for energy (URT, 2015b).

Global wood charcoal production has trebled over the last 50 years from 17.3 million tons in 1964 to 53.1 million tons in 2014 (FAO, 2016a). About 61% of the current global production occurs in Africa (FAO, 2016a), primarily to satisfy the demand for cooking fuel from urban and peri-urban households (Mwampamba et al., 2013; d'Agostino et al., 2015).There was a net forest loss of 7 million hectares per year in tropical countries in 2000–2010 and a net gain in agricultural land of 6 million hectares per year (FAO, 2016a). A growing population implies a growing demand for agricultural and forest products (Rademakers et al., 2010).Underlying factors affecting forest conversion include population growth and changing food consumption patterns; agricultural developments, such as changing markets, technological improvements and active policy interventions (FAO, 2016b). Charcoal and simsim are among commercialized commodities that drive deforestation and forest degradation in Tanzania. Out of 50 million people, an estimated 90% of the country's energy needs are satisfied through the use of wood fuels.

This research aimed at analyzing the elements that define who (in terms of gender) plays a role in land use and forest cover change; the net benefits that they derive from current land uses and who will participate and benefit from the change in land use policies and practice. Understanding this is important for a transformative plan that enhances sustainable and equitable land use options in Tanzania. The questions for this paper were how men and women respond to policies as drivers of change in land uses? What do men and women gain from the current land uses? Successful implementation of sustainable forestry and land use principles depend on how gender and environmental issues are addressed at strategic and implementation levels. The underlying causes of forest and land degradation are defined by the needs of men and women. These needs could be daily subsistence, food, energy, and other products. Search for income, employment

Vol. 2, No. 05; 2017

ISSN: 2456-8643

opportunities, generation of state revenue and other factors determine the extent of drivers and actors involved. The challenging question is how can these objectives be reconciled in order to achieve improved wellbeing of men and women who depend on natural resources? The objective of this paper is therefore on equity issues where the land use change drivers and their associated commodities are explained, value chain identified and therefore net gains established.

MATERIALS AND METHODS

The study areas

The study was conducted in Kilosa, Kisarawe and Kilwa Districts in Tanzania mainland (Figure 1). Kilosa was chosen based on its long-term practice in shifting cultivation for simsim farming and improved technology in charcoal making (Sustainable Charcoal Project-SCP by Tanzania Forest Conservation Group (TFCG). Kilwa district was chosen based on its long tradition of growing simsim and existence of charcoal production. In contrary to the past, currently simsim farmers in Kilwa use improved seeds and insecticides to improve productivity. Kisarawe district was chosen because it is the amongst major sources of charcoal for Dar- es- Salaam City, the main commercial city of Tanzania. In addition, Kisarawe is among the Tanzanian districts where simsim is still a new commercial crop and it is attracting most farmers including the youth and women. Project study villages included Nyali and Zombo in Kilosa district, Gwata and Vikumbulu in Kisarawe district and Migeregere and Nanjilingi in Kilwa district. The major criteria for selection of these six project villages were based on the prevalence of simsim and charcoal production.

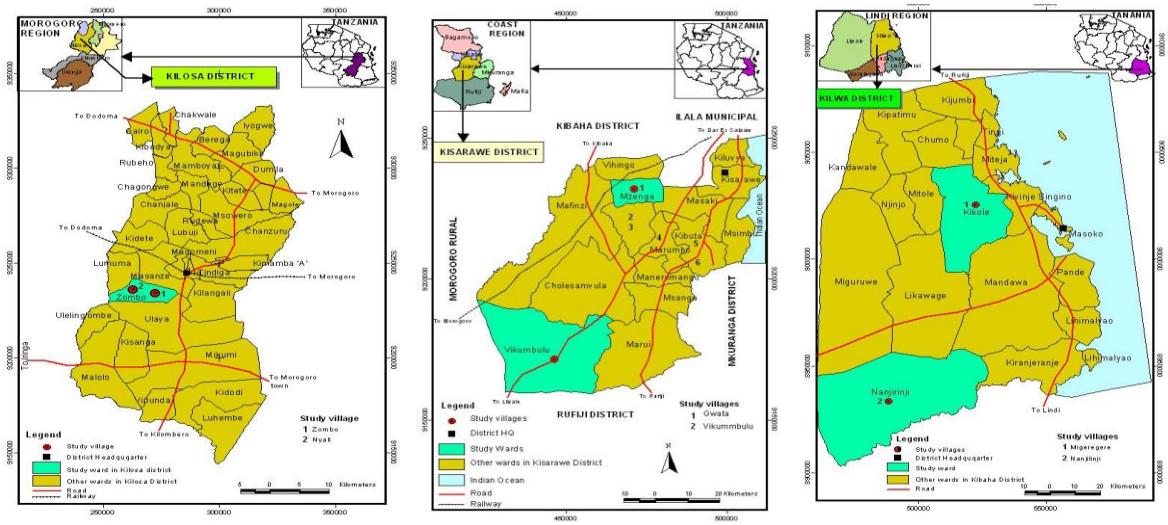

Figure 1: Maps showing the study villages and districts in Tanzania

Sampling procedures

Vol. 2, No. 05; 2017

ISSN: 2456-8643

The household surveys using a structured questionnaire and interviewing of key actors for the two commodities (charcoal and simsim) were preceded by a reconnaissance report (Sangeda *et al*. 2015). In which, three villages (Nyali, Gwata and Migeregere) out of the six (6) project villages were visited for project introduction and initial data collection through participatory rural appraisal techniques. The reconnaissance survey was followed by administering of the household questionnaire to a total of 178 households. Among them, 60% were males and 40% females. In addition, the survey conducted informal interviews using semi-structured questionnaires with various actors in the production and value chain of the two focus commodities for driving forest cover change. The actors and players included local traders, retailers, wholesalers, government officials (Central government –Tanzania Forest Service and Local government -Forest and agriculture departments) and interested parties such as the Tanzania Forest Conservation Group which is non-governmental organization. Nonetheless, researchers' field observation and collection of secondary data (grey literature) from relevant organizations and institutions were done.

Data analysis

The primary data collected through structured questionnaire were analyzed using SPSS IBM 20 computer program. Descriptive statistical analysis was generated with regard to socio-economic issues (education, income, marital status, occupation and land access/ownership). In addition, statistics on value chain (associated prices, costs and benefits from producer to consumer or exporter) were also calculated. Content analysis was employed to analyze the semi-structured questionnaires to allow drawing conclusion on major issues out of the informal discussions.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

Results showed that most respondents in the study villages were in the active age group of between 18 and 45 years (Table 1) with more male respondents (60%) than females (40%). This has been a common trend in Tanzania and other African countries where there are more male headed than female-headed households. According to the 2012 national population census, Tanzania has a population of 44.9 million people and males (48.7%) are less than females (51.3%) with an average sex ratio of 95 and annual growth rate of 2.7% (URT, 2013). At the current growth rate of 2.7 percent, the population of Tanzania is expected to double in the next 26 years. Most of our respondents were married and less educated (primary education), most of them ending at standard seven level. Almost all households in all study villages were practicing crop farming accompanied by charcoal making as a major source of household income. Approximately 46% of all households were poor with an annual income ranging Tsh 600,000 to

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Tsh 1,990,000 (Table 1) which is equivalent to US DOLLARS 316 to 1,047, meaning that they earn between less than one dollar to 3 dollars per day (at the time of the study 1 dollar ≈1,900 Tanzanian Shillings). Results also revealed that a number of households (24%) practicing simsim cultivation and charcoal production were not originating from study districts, they were immigrants from other districts of Tanzania. This percentage of immigrants is expected to increase over time because of the attractive prices and net profits of simsim and charcoal in the study areas.

Table 1: Socio-economic and demographic characteristics of the respondents in study areas (N = 178)

Variables	Kilwa District		Kisarawe District		Kilosa District		Overall mean
	Migeregere	Nanjilinji A	Vikumbulu	Gwata	Zombo	Nyali	
Sex	**Percentage (%) responses**						
Male	58.6	51.9	79.3	58.1	58.1	53.3	59.9
Female	41.4	48.1	20.7	41.9	41.9	46.7	40.1
Average age(yrs)	39	39	42	42	37	42	39.8
Marital status							
single	6.9	3.7	3.4	3.2	6.5	16.7	6.7
Married	65.5	88.9	93.1	87.1	77.4	66.7	79.8
Widowed	6.9	3.7	3.4	0.0	0.0	3.3	2.9
Divorced	20.7	0.0	0.0	3.2	6.5	3.3	5.6
Separated	0.0	3.7	0.0	3.2	9.7	10.0	4.4
Literacy							
None	6.9	18.5	0.0	3.2	0.0	3.3	5.3
Adult Education	0.0	0.0	13.8	12.9	3.2	3.3	5.5
Primary education 1	13.8	0.0	3.4	12.9	6.5	10.0	7.8
Primary education 2	79.3	77.8	82.8	64.5	90.3	80.0	79.1
Ordinary level	0.0	0.0	0.0	6.5	0.0	3.3	1.6
Post-secondary	0.0	3.7	0.0	0.0	0.0	0.0	0.6
Occupation							
Crop Cultivation	100.0	100.0	100.0	96.8	100.0	100.0	99.5

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Livestock keeping	13.8	3.6	24.1	25.8	38.7	53.3	26.6
Charcoal Making	65.5	14.3	86.2	51.6	77.4	100.0	65.8
Lumbering	0.0	0.0	0.0	6.5	0.0	0.0	1.1
Firewood	0.0	0.0	3.4	0.0	0.0	0.0	0.6
Petty business	0.0	0.0	0.0	25.8	0.0	0.0	4.3
Casual labour	10.3	3.6	0.0	0.0	0.0	0.0	2.3
Income (Tsh)							
Less than 50000	0.0	0.0	0.0	6.5	0.0	0.0	1.1
50000-199000	7.1	3.7	37.9	45.2	6.5	3.3	17.3
200000-599000	32.1	29.6	44.8	16.1	22.6	40.0	30.9
600000-1990000	53.6	66.7	13.8	22.6	64.5	56.7	46.3
<2000000	7.1	0.0	3.4	9.7	6.5	0.0	4.5
Residence Status							
Indigenous	64.3	74.1	89.7	61.3	87.1	80.0	76.1
Immigrant	35.7	25.9	10.3	38.7	12.9	20.0	23.9

Simsim production

It was noted that in Kilosa, simsim is sown in December to January and takes 4 to 5 months for the crop to mature. During the survey (March, 2015) simsim plants were flowering (Plate 1). Most of the farmers were not using certified simsim seeds such as Naliendele 92, Ziada 94 and Lindi 02 that have higher yield compared to traditional varieties. The major reason for farmers not to adopt improved simsim varieties was the fact that they need more water and they are expensive (the price ranges between Tsh 5000 and 6000 per kg. Whilst, the local variety a Kg costs between 2000 and 2500 Tsh and in addition most farmers store and use seeds from the previous harvest.

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Plate 1: Simsim (*Sesamum indicum*) farm in Kilosa district, Morogoro, Tanzania (Photo courtesy: D. Maleko, March 2015).

The main production input was pesticides to control insects that normally damage simsim flowers and fruits. A 250 mills bottle of Atkan – C (most commonly used pesticide) was reported to cost 5000 Tsh and it was further mentioned that it is enough for spraying only one acre. No farmer mentioned the use of fertilizers and the same was lamented by the agricultural officers. Shifting cultivation practices were reported to decline in both study villages due to strict bylaws and presence of village environmental groups. Most production activities for simsim are done by household members (Table 2). Masculine activities such as land clearing and pitting for sowing seeds is done by a male. Whilst, activities that are considered feminine such as fetching water for mixing pesticides and winnowing during threshing are done by females. However, making decisions of how to use the money after selling crop is highly driven my men (heads of households). This practice of heads of households to make a decision on the accrued money is also common in subsistence crops such as maize and beans. Most farmers are selling the produced simsim on the farm and some sold at home and the main buyers are local traders and some middleman/brokers (mostly men) from village centers or nearby towns. The local traders reported going around the farms to satisfy themselves with the quality of the products in which it was further reported that the dried simsim grains need to be free from chaff, sandy or dust. When local traders/middleman are contented with the quality of the product, they normally buy on behalf of the wholesalers who transport the product to Dar es Salaam and later to China and Japan.

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Table 2: Value chain analysis for simsim production in the study sites

Activity	Bush clearing	Collection and firing	Tilling	Sowing	Pesticides spraying	Weeding	Harvesting	Parking	Transportation and marketing
Gender	Men	Children, women and men	Children, women and men	Children, women and men	Men	Women, men	Children, women and men	Men	Men

In Kilosa, it was reported that for the last year the dominant price for simsim was 250,000 Tsh per full 100 Kg bag. The full 100 Kg bag was approximated to contain 120Kg of dried simsim grains and a price per kg for the last season was estimated to be 2,083 Tsh. However, in Kilwa and Kisarawe the middlemen were walking around with weigh scales and buying dried simsim at farmers' home or on-farm at a price ranging between 2,000-2,200 and 1750-2050 Tsh respectively (see Table 3). The main buyer was mentioned to be Mohamed Enterprises who bought a Kg at 3200 Tsh from wholesalers for 2014/2015. It was further reported that most of the simsim was exported to Asia (China and Japan) and Europe (France) by Mohamed Enterprises.

Most farmers are selling the produced simsim on the farm and some sold at home and the main buyers are local traders and some middleman/brokers (mostly men) from village centers or nearby towns. The local traders reported to go around the farms to satisfy themselves with the quality of the products in which it was further reported that the dried simsim grains need to be free from chaff, sandy or dust. When local traders/middleman is contented with the quality of the product, they normally buy on behalf of the wholesalers who transport the product to Dar es Salaam and later to China and Japan.

In Kilosa, it was reported that for the last year the dominant price for simsim was 250,000 Th per full 100 Kg bag. The full 100Kg bag was approximated to contain 120 Kg of dried simsim grains and a price per kg for the last season was estimated to be 2,083 Tsh both on the farm and at home. However, in Kilwa and Kisarawe the middlemen were walking around with weigh scales and buying dried simsim at farmers' home or on-farm at a price ranging between 2,000-2,200 and 1750-2050 Tsh respectively (Table 3). The main buyer was mentioned to be Mohamed Enterprises who bought a Kg at 3,200 TSh from wholesalers for the 2014/2015 season. It was further reported that most of the simsim was exported to Asia (China and Japan) and Europe (France) by Mohamed Enterprises.

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Table 3: Yields and associated costs and benefits per acre of produced simsim in the study sites for 2014-2015 (N=129). (1 US DOLLARS ≈ 1900 TSh)

District	Village	Average yield/acre (Kg)	Average price/Kg (TSh)	Average revenue/acre/ annum (TSh)	Average total costs/acre/ annum (TSh)	Profit margin (TSh)
Kilwa	Migeregere	154.36	2,160.71	331,320.83	225,684.62	105,636.22
	Nanjilinji A	157.70	2,085.19	330,032.10	225,095.65	104,936.45
Kilosa	Nyali	189.06	1,984.90	374,029.42	221,606.00	152,423.42
	Zombo	200.77	2,052.00	411,595.62	227,139.09	184,456.53
Kisarawe	Gwata	114.95	1,769.23	204,472.16	182,557.69	21,914.47
	Vikumbulu	121.33	2,011.11	244,118.52	184,000.00	60,118.52
Overall		**162.62**	**2,013.64**	**329,016.82**	**213,542.88**	**115,473.94**

Despite a number of costs variables that are involved in simsim production (e.g. inputs), simsim cultivation was still profitable. As described earlier, simsim is a traditional crop in East Africa but was not valuable in the past because it was cultivated for domestic consumption only. Currently, it is cultivated mainly for commercial purposes. The trend of exportation of simsim oil seed has been increasing due to the high demand for its products. In the coastal and southern districts like Kisarawe and Kilwa, simsim is replacing a long-term declining cash crop -cashew nuts. According to the Kilwa District Executive Director (DED), the price of cashew nuts was on average of 600 Tsh per kg while the price of simsim kept increasing from 2,000 to 2,500 Tsh per kg. DED argued further that the cost of pesticides for the cashew nuts is increasing while both its production and price are declining.

Despite the fact that simsim oilseeds fetch a good price, it also matures within four to five months. In this way, it attracts many youths who have higher discount rate. Nevertheless, females were getting more yields than men (Table 4). This is probably due to the fact that females pay more attention in tending the crop e.g. weeding and harvesting at a right stage. Whereby, in contrary men often tend to engage in other businesses such as charcoal making and pet business or just being lazy and not managing their crop fields properly.

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Table 4: Engendered simsim yields, production costs, revenue and profit margin

Group Statistics	Sex of respondent	N	Mean	Std. error of the mean
Yield per Acre simsim (Kg)	Male	87	**152.90**	10.56
	Female	64	**175.84**	12.05
Revenue per Acre simsim (TSh)	Male	87	**309160.65**	21941.48
	Female	64	**356008.81**	25119.00
Total costs per Acre simsim (TSh)	Male	77	**215889.16**	3705.30
	Female	52	**210068.58**	5984.90
Profit per acre simsim	Male	87	**93271.49**	-
	Female	64	**145940.23**	-

Charcoal production

In the past, in the study sites charcoal was being produced illegally in the village land forests and even some were being produced in abandoned farmlands (secondary forests). The activity was illegal due to the fact that most producers had no license for harvesting the charcoal. However, at Nyali village, charcoal production was taking place within the forest management units in village land forests that have been set aside purposely for charcoal production under the sustainable charcoal project. Charcoal producers are organized into village charcoal associations registered at the village office. Most production activities are done by men such as tree felling and log chopping and piling for making the charcoal kiln (Table 5).

Table 5: Value chain analysis for charcoal production in the study sites, Tanzania

Activity	Species identification and felling	Cross-cutting	Soiling work and firing	Packing	Loading and unloading	Transporting	Storage	Retailing
Gender	Men, Women	Men, women	Men	Men, women	Men	Men, women	Men, women	Women

In Kilwa, the female charcoal producers are employing men to undertake masculine related activities in the production process. However, in Nyali village where there was a sustainable charcoal project, females were equally involved in all the production processes as men. The charcoal production process is tedious and involves a number of cost centers where tree felling and collection is the most expensive activity. In Kilosa, the price of a charcoal in 100 Kg bag ranged from 8,000 – 10,000 Tsh and it was being sold at the production site. Most charcoal was sold to local traders (mainly males) who use bicycles or motorbikes to transport charcoal to Kilosa town (Plate 2), where they sell the charcoal to urban retailers (who are mainly females) or consumers at a price of 20,000 – 22,000 TSh per bag. Traders pay a fee of 2000 TSh per 100Kg

Vol. 2, No. 05; 2017

ISSN: 2456-8643

bag of charcoal at the village level. For the wholesalers who are transporting to metropolitan areas such as Morogoro municipality, in addition to the village fee, have to pay a fee of 14,400 Tshs at the Kilosa district council or Tanzania Forest Service (TFS) offices to get a permit to transport the charcoal. The price of charcoal in Dar es salaam was reported to be 40,000 – 45,000 Tsh for a 100 Kg bag of charcoal depending on demand (scarcity). Charcoal business was observed to be a profitable (Table 6) because of the high-profit margin.

Table 6: Profit margin for charcoal in 100 Kg bags in the 3 study districts, April 2015

District	Village	Price/ 100Kg bag (Tsh)	Production costs/100kg bag (Tsh)	Profit margin
Kilwa	Migeregere	12,100.00	6,488.89	5,611.11
	Nanjilinji A	16,615.38	6,300.00	10,315.38
Kilosa	Nyali	9,900.00	6,805.87	3,094.13
	Zombo	12,090.91	7,025.00	5,065.91
Kisarawe	Gwata	13,777.78	7,580.00	6,197.78
	Vikumbulu	13,400.00	4,749.42	8,650.58
Overall		**12,572.65**	**6,249.62**	**6,323.03**

Profit margin was also higher for the Nanjilingi, Kilwa district as compared to other study villages due to higher prices per bag. The reason for higher charcoal prices in Kilwa was mentioned to be high demand for charcoal in Zanzibar and other Indian islands where traders do ship bulk of the charcoal produced in Kilwa. Wholesalers have higher profit margin than the producers and local traders (Figure 3). Retailers are also making a good profit compared to producers. Figure 3, shows that males are benefiting more from the charcoal business as compared to women. This is due to the fact that men can do most of the masculine activities themselves such as tree felling, rolling of logs and kiln digging while females at times they have to hire males to perform some duties. Likewise, due to the availability of grants (soft loans) offered to females in Tanzania, women are tending to take over from men from charcoal making to business through hiring them to perform the masculine jobs.

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Table 7: Engendered producers' total revenue, costs and profit margin of charcoal in the study villages, Tanzania

Group Statistics	Sex of respondent	N	Mean	Std. Error Mean
Total revenue per 100 Kg charcoal bag (Tsh)	Male		10000.00	-
	Female		10000.00	-
Total costs per 100 Kg charcoal bag (Tsh)	Male	60	5960.8167	304.52094
	Female	39	6693.9231	468.96624
Profit margin per 100kg charcoal bag (Tsh)	Male		4039.1833	-
	Female		3306.0769	-

As table 6 shows, total production costs for a 100kg bag of charcoal is 5,960.82 and 6,693.92 Tsh for males and females respectively. The average price of charcoal at the production price was 10000 Tsh, hence making the profit margin for producers being 4,039.18 and 3,306.08 Tsh for male and female producers respectively (Figure 2). The profit margin for the wholesalers (both men and women) was estimated to be 7,400 Tsh based on reported prices and costs in which a 100kg bag of charcoal is sold 10,000 Tsh at the production site and 2,000Tshs should be paid to the government as a fee. Thereafter, a 16,600 Tshs/100 kg bag should be paid to the government as tax and transport cost to Dar es Salaam is 4,000/100 kg bag. A 100 Kg bag of charcoal is sold at a price of 40,000 - 45,000 Tsh in Dar salaam to either retailers or consumers. It low-income that retailers mostly female do sale a 100 Kg bag of charcoal at of price of 52,000 – 55,000 Tsh after packing in smaller bags or weigh by small containers. Local traders (mostly males) do buy one to two bags at a price of 10,000 Tshs of charcoal at the production sites that are often in remote areas, pay 2,000 Tsh/bag to the village government and transport to nearby urban centers by means of bicycle or motorcycle whereby the bag is sold at a price of 21,000 – 22,000 Tsh to consumers (Figure 2). Transport cost per 100 kg bag of charcoal was about 3,000 Tsh.

Effects of charcoal and simsim production to land use cover change

Respondents agreed that charcoal contributes significantly to forest degradation and cover loss due to the fact that trees of all diameter classes are harvested (Plate 2) during charcoal production. During the surveys, researchers observed that in sites where new simsim farms were opened, all cut trees were turned into charcoal and in most cases, some opened areas were not planted (Plates 2a and 2b). This was verified by village executive officers who are responsible for allocating village lands to their villagers as one was quoted in Gwata village saying "Many village lands are bare because they are harvested for charcoal making in the name of crop farming".

Vol. 2, No. 05; 2017

ISSN: 2456-8643

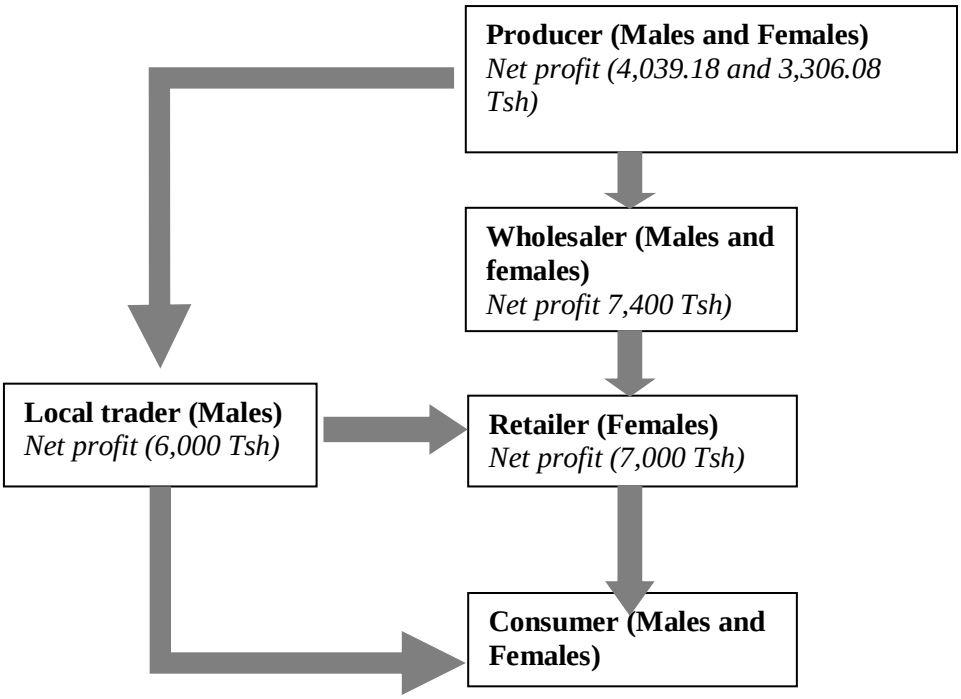

Figure 2: Charcoal value chain and net profits per 100 Kg bag for various actors

Plate 2a **Plate 2b**

Plates 2a and 2b: Charcoal kilns in new farms at Gwata and Zombo villages in Tanzania respectively

On the other hand, most farmers agreed that simsim production is driving deforestation and forest degradation due to the high rate of farm expansion (Figure 3). However, some respondents

Vol. 2, No. 05; 2017

ISSN: 2456-8643

also revealed that their village government has bylaws to regulate land use but due to poor governance and corruption there is no compliance with the bylaws.

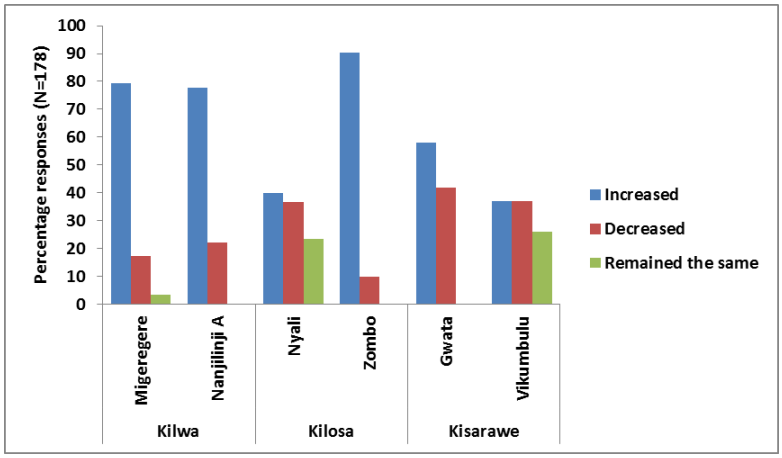

Figure 3: Perception of respondents in land cover changes in the study sites, Tanzania

Based on Figure 3, it can be deduced that land cover loss is happening in the study sites as a significant number of respondents do observe an increasing forest loss.

CONCLUSION

This study has found that, charcoal and simsim are major drivers of forest degradation and deforestation in the study areas. Simsim and charcoal production are mainly practiced by poor households with annual income ranging from Tsh 600,000 to Tsh 1,990,000 which is equivalent to US dollars 316 to 1,047. Thus, they earn between less than one (1) to three (3) US dollars per day. This confirmed that simsim cultivation and charcoal production in the study sites is predominantly practiced by low income rural communities with limited alternative livelihood options. It is further concluded that in simsim value chain, men dominated in selling products and involved in masculine activities such as land clearing and relatively dangerous activities such as pesticide spraying while females were involved in sowing, weeding and harvesting. Also, there was a general consensus that in the food crop fields all household members (male, female, old, youth and children) were involved in various stages from land clearing, tilling to harvesting. In general, all actors in the value chain do benefit from the current land uses (charcoal making and simsim production), however, wholesalers benefit more than producers and retailers. Men dominate in simsim value chain while women dominate in the charcoal value chain. More people including youth are expected to be engaged in charcoal and simsim production with time due to high-profit margins of these commodities. Specialization of labor by gender has been clearly observed in simsim than in charcoal production.

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Acknowledgements

Authors would like to acknowledge International Institute for Environment and Development (IIED-UK) for funding the study. Special thanks to Isilda Nhantumbo and Dawn Mc Innes for technical and logistical support. Authors also wish to thank technical and administrative officers in Kilosa, Kilwa and Kisarawe districts for their support to this study. Villagers (respondents) and village leaders were also very instrumental to the accomplishment of the study.

References

Abdallah, J. M., & Monela, G. C. 2007. Overview of Miombo woodlands in Tanzania. MITIMIOMBO–management of indigenous tree species for ecosystem restoration and wood production in semi-arid Miombo woodlands in eastern Africa. Working Papers of the Finnish Forest Research Institute, 50, 9-23

Andrea, S and Jennifer, M. 2010. Unlocking simsim farmers' potential for fair trade in southern Tanzania.pp 1-6

ESRF (The Economic and Social Research Foundation) 2013. Assessment of practices of agricultural production, marketing and domestic trade policies in Tanzania. Discussion paper no. 45

FAO. 2016. FAOSTAT.Food and Agriculture Organization of the United Nations.Rome: Available online at: http://faostat.fao.org/default.aspx

FAO. 2001. Production year book. Rome, Italy

FAO. 2016a. *State of the World's Forests 2016.Forests and agriculture: land-use challenges and opportunities.* Rome.

FCPF. 2014. Tanzania REDD readiness progress fact sheet.

Franks 2017. Reconciling forest conservation with food production in sub-Saharan Africa: case studies from Ethiopia, Ghana and Tanzania. IIED Research Report, London.

Grogan, K., Birch-Thomsen, T., & Lyimo, J. 2013. The transition of shifting cultivation and its impact on people's livelihoods in the Miombo woodlands of northern Zambia and south-western Tanzania. *Human Ecology*, 41(1), 77-92.

Vol. 2, No. 05; 2017

ISSN: 2456-8643

Hosonuma, N. Herold, M. De Sy, V. De Fries, R. Brockhaus, M. Verchot, L. Angelsen, A & Romijn, E. 2012. An assessment of deforestation and forest degradation drivers in developing countries, *Environment Research Letters* 7. http://stacks.iop.org/ERL/7/044009

Kambikambi, T.T., Mwala, M.S. & Mbewe, D. M. N. 1997. The relationship between yields and yield components of sesame. African Crop Science Conference Proceedings 3, 169 – 174.

Kessy, J. F. Nsokko, E. Kaswamila, A. & Kimaro F. 2016. Analysis of drivers and agents of deforestation and forest degradation in Masito forests, Kigoma, Tanzania. International Journal of Asian Social Science 6(2). 93–10 https://ideas.repec.org/a/asi/ijoass/2016p93-107.html

Kideghesho, J R 2015. Realities on deforestation in Tanzania: trends, drivers, implications and the way forward. In: Zlatic, M (ed.) Precious Forests — Precious Earth. Intech.

Kissinger, G., M. Herold, V. De Sy. 2012. Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policy makers. Lexeme Consulting, Vancouver Canada.

Kweka, D. Carmenta, R. Hyle, M. Mustalahti, I. Dokken, T and Brockhaus, M. 2015. The context of REDD+ in Tanzania: drivers, agents and institutions. CIFOR.www.cifor.org/library/5744/the-context-of-redd-in-tanzania-drivers-agents-andinstitutions/

Malimbwi, R.E and Zahabu, E. 2007. The analysis of sustainable charcoal production in Tanzania. FAO Forest Department

Rademaekers K., Eichler L., Berg J., Obersteiner M., Havlik P., 2010. Study on the evolution of some deforestation drivers and their potential impacts on the costs of an avoiding deforestation scheme. Prepared for the European Commission by EcoRI and IIASA. Rotterdam, Netherlands

Ram, R., Catlin, D., Romro, J. & Cowley, C. 1990. Sesame: new approaches for crop improvement. In: J. Janick and Simon, J.E. (eds). Advances in new crops. Timber Press. Portland. pp. 225-228.

Sangeda A.Z., Kajembe G.C., Mombo F., Ambonisye H., and Mahutanga G.2015. Understanding the driver-commodities-gender nexus in Tanzania. Field Reconnaissance and Characterization Report.

URT 2015a. National Biodiversity Strategy and Action Plan (NBSAP) 2015–2020. Vice President's Office, Division of Environment

Vol. 2, No. 05; 2017

ISSN: 2456-8643

URT 2015b. National Forest Resources Monitoring and Assessment (NAFORMA) of Tanzania. TFSA, Government of Finland and FAO.

URT 2015c. Tanzania Climate Smart Agriculture Programme, 2015–2025.

URT 2016. National Tree Planting and Management Strategy 2016–2021. Draft.

USAID-MANR 2012. Situation assessment on land dispute resolution in four regional states ofEthiopia.www.moa.gov.et/documents/93665/5999721/Situation+Assessement+on+Land +Dispute+Resolution+in+Four+Reg.pdf/e9943955-db36-4581-a701-f83fefc468b1

Weiss, E.A. 1983. Oilseed crops.Tropical Agriculture Series.Longman.London and New York.

World Development Indicators, WDI 2016. http://data.worldbank.org/products/wdi