

Factors that influencing on charcoal production in lower Shabelle region of Somalia.

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Abstract

This study critically examines factors that influencing charcoal production in lower shabelle region and examines as its basic problem the lack of interesting and conserving of woodland and rangland of lower shabelle region which my bring Somali environmental degradation without community participation and social wakefulness which towered environmental unsafely.

Thus: current study was investigating environmental development and had the following objectives: To establish the influence factors on charcoal production in lower shabelle region. To assess the level of impacts of charcoal burning on local society in lower shabelle. To suggest possible and sustainable solutions to gain rural and agro- pastoralist development in lower shabelle region.

It had target population of 100 from some selected charcoal producers, charcoal retailers and household, in lower shabelle region with a sample size consisted of 80 participants.

The study concluded that majority of the participants raised that community plays an important role that influencing charcoal production in lower shabelle region and unless that it would not be successful.

The study recommends that Public awareness raising and mobilization programmes therefore play an essential part in reducing all hazardous environmental degradations and it is important to increase other alternatives of energy supply instead of charcoal, as well as to reduce any negative impact on environmental improvement.

The research ultimately concluded that there is prominent relationship between influencing factors of charcoal production and environmental development.

Keywords: - charcoal and production

Introduction

Somalia has limited forest of about 10.5% of the area of the country, because most of the tropical forest along Shabelle and Jubba rivers and the inter-riverine areas have been cleared for agricultural use (world bank, 2012). In addition, after the civil war, the production of charcoal (A porous black solid, consisting of an amorphous form of carbon, obtained as a residue when wood, bone or other organic matter is heated in the absence of air, and used as cooking, heating e.t.c) for local cooking use and mostly for export to Saudi Arabia (SA), United Arab Emirates (UAE) and Yemen, Solely for tobacco Smoking using _ SHISHA 'had a negative deforestation impact (Hamza, Burim 2012). The recent Tropical Cyclones as recent Chapola and Megh Cyclones that threatened Somalia are amongst the most powerful and destructive meteorological systems on earth that Somalia should be aware of (by Federal Government of Somalia, November, 2015).

In Somalia, deforestation and land degradation is rapidly increasing, particularly in lower Shabelle region. There is much loss of forest and vegetation, according to some statistics that has been done by United Nations from 1990---2000, Somalia has lost an average of 76.700 Hectares of forests per year, the annual deforestation rate was 0.93% and in (Global Forest Resources Assessment, 2000---2005) the rate of forest change increased by 10.4% per year.

However, the unscrupulous plunder of forest and range resources for charcoal production has been witnessed during the last two decades. Illegal imports of huge quantities of Somali charcoal by neighbouring countries of the region, absence of alternative sources of energy and limited livelihoods options for a large -warring & marginalized population has led to unsustainable production, trade and use of charcoal. In recent years, charcoal became the most sought after commodity to fuel the war economy with militia groups generating revenue in excess of \$15 million per annum from illegal exports. As such, a multitude of complex issues surround the production of charcoal in Somalia leading to triple threats - in the forms of irreversible environmental degradation, perpetual conflicts and dependence on short-term income from an unsustainable livelihood option. Realisation of these multifaced issues resulted in imposition of a ban on the export of Charcoal from Somalia by the UN Security Council in February 2012.

Charcoal is not national problem but it is global issue. There is a significance renewable energy potential, charcoal still remains the dominant source of cooking and heating energy for 80% of households in subsarahan Africa (SSA), (Arnold et; al 2006; Zulu and Recharadson, 2013).

Due to its low cost compared to other fuels like kerosene and liquefied petroleum gas (LPG), the demand for charcoal is expected to continue rising dramatically in the coming decades, despite

best efforts by modern energy advocates. Charcoal use in SSA is predicted to double by 2030, with over 700 million Africans relying on it as a durable, preferred, and cheap source of energy (Shengoma, E and R. Kappell 2006).

The use of United Nations charcoal consumption levels as a proxy for production is also examined. In Somalia, charcoal making, provides a considerable amount of employment in rural areas; it also allows for a quick return on investment. However, the inefficiencies inherent to production and use of charcoal cause heavy strain on local wood resources, resulting in severe and defective environmental consequences, (Deqa A. Farah et al 2010).

The Lower Shabelle region is most center of these devastations, that is why the study focuses on this region. Charcoal is one of the most important substances ever discovered. It's a killer. It's a saviour. It's also a trickster. It's one of the most important substances ever discovered. It's charcoal. It's black gold.

The general objective is to establish factors influence charcoal production and to mitigate or reduce the charcoal production level to obtain a balanced ecosystem and environmental conservation in general, and also to reduce the poverty, conflict, displacement, humanitarian crises and promote energy security, climatic condition, social equity, peace and development in Lower Shabelle Region. While the specific objectives of this study was :

1. To establish the influence factors on charcoal production in lower Shabelle region.
2. To assess the level of impacts of charcoal burning on local society in lower shabelle.
3. To suggest possible and sustainable solutions to gain rural and agro-pastoralist development in lower Shabelle region.

Therefore in this article as an author there is an expectation to clarify the importance of charcoal production and how it affects the environment directly and the society indirectly.

Methodology

The study was used cross sectional design to investigate population by selecting samples to analyze and discover occurrence of the data collected in the questionnaire. This design was selected a very effective, less costly and easily accessible for collecting information from the target population. It is used to determine factors that influencing charcoal production in Lower Shabelle Region of Somalia.

The sample size of the study was consist of 80 to determine the best sample size for the population; it will also collect data from 80 respondents. A justification of sample size, because this study was used Slovenes formula which is $n = N / (1 + (N * e^2))$, where n= sample size, N= population size, and e = margin of error of 5% $N = 100 / (1 + (100 * 0.0025)) = 80$ subjects

NO	ORGANIZATION NAME	POPULATION	SAMPLE SIZE
1	Charcoal Producers	30	25
2	Charcoal Retailers	30	25
3	Household	40	30
4	Total	100	80

Since the sample size is fairly large and there is limited time, the study was used questionnaire that is suitable instrument to obtain information needed and easily described in writing and considered ideal for collecting such data, for collecting a lot of information over a short period of time. The researcher was used an open ended questionnaire/ Quantitative.

How long were you producing charcoal

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Last 5 years	6	23.1	24.0	24.0
Last 10 Years	6	23.1	24.0	48.0
More than 10 years	13	50.0	52.0	100.0
Total	25	96.2	100.0	
Missing System	1	3.8		
Total	26	100.0		

Table 4.1 indicate that 23.1 % of the respondents last five years, how long were you producing charcoal, while 23.1 % of the respondents were last ten years, while 50.0 % of the respondents were more than ten years.

What method do you use for producing charcoal?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mound Method	4	15.4	16.0	16.0
	Pit Method	9	34.6	36.0	52.0
	Klin Method	12	46.2	48.0	100.0
	Total	25	96.2	100.0	
Missing	System	1	3.8		
Total		26	100.0		

Table 4.3 indicate that 15.4 % of the respondents Mound method, What method do you use for producing charcoal, while 34.6 % of the respondents were Pit method, while 46.2 % of the respondents were Klin method.

How many charcoal bags do you produce in a month?

How many charcoal bags do you produce in a month?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	41-60	14	53.8	56.0	56.0
	60-100	8	30.8	32.0	88.0
	More Than 101	3	11.5	12.0	100.0
	Total	25	96.2	100.0	
Missing	System	1	3.8		
Total		26	100.0		

Table 4.4 indicate that 53.8 % of the respondents Forty-one until sixty, How many charcoal bags do you produce in a month, while 30.8 % of the respondents were Sixty until hundred, while 11.5 % of the respondents were More than hundred one.

Does charcoal production cause conflict in the community?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	1	3.8	4.0	4.0
	Only occasionally	3	11.5	12.0	16.0
	Sometimes	12	46.2	48.0	64.0
	Often	6	23.1	24.0	88.0
	Very frequently	3	11.5	12.0	100.0
	Total	25	96.2	100.0	
Missing	System	1	3.8		
Total		26	100.0		

Table 4.11 indicate that 3.8 % of the respondents were Never, Does charcoal production cause conflict in the community, while 11.5 % of the respondents were Only occasionally, while 46.2% of respondents were Sometimes, while 23.1% of respondents were Often, while 11.5% of respondents were Very frequently.

How long were you selling charcoal

How long were you selling charcoal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Two years	2	7.7	8.0	8.0
	Five years	6	23.1	24.0	32.0
	Ten years	7	26.9	28.0	60.0
	More than ten years	10	38.5	40.0	100.0
	Total	25	96.2	100.0	
Missing	System	1	3.8		
Total		26	100.0		

Table 4.2.1 indicate that 7.7 % of the respondents were Two years, How long were you selling charcoal, while 23.1% of the respondents were Five years, while 26.9% of respondents were Ten years, while 38.5% of respondents were More than ten years.

Why did you join the charcoal business

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To find my daily basic need	14	53.8	56.0	56.0
	I can manage because it is not perishable and can sell long time	2	7.7	8.0	64.0
	To get money from it	9	34.6	36.0	100.0
	Total	25	96.2	100.0	
Missing	System	1	3.8		
Total		26	100.0		

Table 4.2.2 indicate that 53.8 % of the respondents were To find my daily basic need,Why did you join the charcoal business, while 7.7% of the respondents were I can manage because it is not perishable and can sell long time, while 34.6% of respondents were To get money from it.

How much do you pay per standard bag of charcoal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Eight dollars	6	23.1	24.0	24.0
	Eleven dollars	15	57.7	60.0	84.0
	Fourteen dollars	2	7.7	8.0	92.0
	Fifteen dollars	2	7.7	8.0	100.0
	Total	25	96.2	100.0	
Missing	System	1	3.8		
Total		26	100.0		

Table 4.2.7 indicate that 23.1 % of the respondents were Eight dollars,How much do you pay per standard bag of charcoal,while57.7% of the respondents were Eleven dollars, while 7.7% of respondents were Fourteen dollars, while 7.7% of the respondents were Fifteen dollars.

Which type of trees you prefer most for charcoal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Acacisbussei	9	34.6	36.0	36.0
	Acacia reficiens	3	11.5	12.0	48.0
	Galool	13	50.0	52.0	100.0
	Total	25	96.2	100.0	
Missing	System	1	3.8		
Total		26	100.0		

Table 4.2.9 indicate that 34.6 % of the respondents were Acacia bussei, Which type of trees you prefer most for charcoal, while 11.5% of the respondents were Acacia reficiens, while 50.0% of the respondents were Galool.

Are you aware of any environmental problems caused by the use of charcoal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	23.1	24.0	24.0
	No	19	73.1	76.0	100.0
	Total	25	96.2	100.0	
Missing	System	1	3.8		
Total		26	100.0		

Table 4.2.11 indicate that 23.1 % of the respondents were said Yes, Are you aware of any environmental problems caused by the use of charcoal, while 73.1% of the respondents were said No.

Literature Review

CHARCOAL EXPORT FROM SOMALIA

Charcoal production in Somalia has been in existence for centuries, and it has been a widely accepted practice to export charcoal from Somalia to countries of Arabian Peninsula. Between 1991 and 2000, around 90 000 tons of total charcoal production was exported to the Gulf Countries per annum, which increased to 250 000 tons in 2011 (by Somali government).

Somalia has limited forest of about 10.5 percent of the area of the country, because most of the tropical forest along the Shabelle and Jubba Rivers and the inter-riverine areas, have been cleared for agricultural use (World Bank, 2012). In addition, after the civil war, the production of charcoal for local cooking use and mostly for export to Saudi Arabia and the United Arab Emirate (UAE) solely for tobacco smoking using -Shisha had a negative deforestation impact. There is also some charcoal export to Yemen and India. Aerial survey reveals drastic clearing of forest throughout the Southern Somalia (UNDP and World Bank, 2007). Therefore, the

production and export of charcoal resulted in a colossal deforestation that resulted in desertification (Hamza, Buri M., 2012).

Unfortunately exports fell again in 2011 due to drought, putting Somali pastoralists under renewed livelihood stress. Until recently the illegal groups group had been safeguarding a well-established supply and demand chain of charcoal trade from Somalia to Gulf Countries in return of -rent from those using the ports controlled by the group(by Somalia government).

UNEP (2005) estimated that 4.4 million trees are logged annually to produce the 250,000 tons of charcoal that is exported every year from Somalia to Saudi Arabia, Yemen and the United Arab Emirates.

While part of the charcoal exported from Somalia may originate from neighboring countries like Ethiopia, the bulk of the exported charcoal is produced in Somalia itself (Belward et al., 2011). Even if national production estimates may be inaccurate (Mwampamba et al., 2013), the FAO database indicates a significant increase in production levels, i.e. from about 180,000 tons in 1961 to 420,000 tons in 1991, to almost 1.2 million tons in 2012 (FAO, 2014).

THE EFFECT OF AMISOM AND NEIGHBOUR COUNTRIES ON CHARCOAL EXPORT.

Charcoal had been termed as -black gold by the illegal groups group representing revenues in excess of USD 15 million a year. Somali owned and operated companies, engaged and protected by illegal groups, interfaced with the authorities and markets in the Gulf Countries. The owners of these companies are described as ideological affiliates of illegal groups, who prefer to collaborate with partners who share their ideological orientation. There are also unfounded reports that charcoal from other neighbouring countries were routed to illegal groups controlled ports and labelled as Somali charcoal. The charcoal trade is also closely linked with the importation of sugar and other commodities to illegal groups controlled areas. Many vessels offload commodities at Kismayo before loading vessel with charcoal for their return journey (by Somalia government).

The recent advances of the African Union Mission in Somalia (AMISOM), Kenyan, Ethiopian and Somali forces and recovery of areas from the illegal groups has changed the trade dynamics around charcoal. Backed by the UN Security Council ban, there are already media reports that millions of tons of charcoal cargo is lying at the ports or jetties. The port town of

Kismayo is reported to have stacked up approximately 4 million charcoal bags (approximately 100 000 tons).

The newly sworn in President is under immense pressure to side with the businesses behind the charcoal trade, lift the ban on charcoal exports [set by the UN Security Council] and clear the stacked up quantities. This move has been resisted so far and perhaps is an evidence of the fact that the new government in Mogadishu sees it as a window of opportunity to end to the illegal charcoal exports to other countries. For the international community, it is important to support the efforts of the new government through capacity building for enforcement, regional cooperation and securing support from Gulf Countries Council (GCC) to establish alternate businesses to absorb the CVCBs who have been exploited in their efforts to keep up with market demands.

LOCAL HOUSEHOLD ENERGY REQUIREMENTS AND LOW SOCIO- ECONOMIC PROBLEMS

PROSCAL is in response to the strong commitment of the Federal Government of Somalia to address the issues of charcoal with the objectives of stopping the environmental degradation and cutting down the revenues generated by the extremists from trade in charcoal. The TFG, the predecessor to the current government, wrote to the UN Security Council in 2011 seeking support of the international community to help Somalia in banning trade of charcoal from its soils. UN Security Council passed resolution 2036 (2012) that requires the international community to ban trade in charcoal from Somalia except local demand (by somalia government).

In developing countries woodfuel accounts for 67 to 80% of the total energy used (FAO, 2010) and is the main source of household energy (Zulu and Richardson, 2013). The woodfuel related market is an important source of income for many people (Clancy, 2008). Evidence exists that at the local level it can have significant impacts on forest degradation (FAO, 2010; Kanninen et al., 2007). Woodfuel refers to any energy source that is derived from woody biomass. These include fuelwood, charcoal, wood pellets, biogas, cellulosic ethanol, and other forms of bioenergy.

Charcoal is the dominant form of woodfuel used by urban households in Africa and other developing countries (Akpalu et al, 2011). Charcoal is a woodfuel made by burning wood in a low-oxygen environment. Compared to wood, it weighs about five times less and produces more heat per kilogram (Boucher et al., 2011) making it a more efficient form of transporting woodfuel (Akpalu et al, 2011).

Deforestation has become visible in almost every populated region where charcoal is used as the main source of energy. A survey undertaken on the use of charcoal was carried out by a local women's non-governmental organization, Nagaad. It revealed that 98% of the housewives used charcoal as their main source of energy (World Health Organization 2011).

According to FAO statistics, Africa produces 60% of the global charcoal production (FAO, 2014). However, these charcoal production estimates are often inaccurate when disaggregated at the national level. For many African countries, detailed information is lacking partly due to the informality and clandestine nature of production sector and the scattered production by rural population (Mwampamba et al, 2013).

The datedness of some of the estimates that are used as input in combination with the difficulty of data collection, makes that national charcoal production data are often at best -guesstimates with limited accuracy (Mwampamba et al., 2013).

Low process efficiencies, combined with unregulated actions of many producers, cause large volumes of wood to be harvested from nearby forests (De Miranda R.C. et al; 2010).

Additional findings suggest that this transition to cleaner cooking fuels and facilities will not occur until annual income is \$18,250 (Rosling, Hans.(2013).

In developing countries wood fuels account for between 50 and 90 percent of the energy used (FAO, 2010). The wood fuel related market is an important source of income for a significant number of people (Clancy, 2008).

Despite the fact that empirical evidence is lacking to support wood fuel collection as a key driver of deforestation on a global scale (Cooke et al., 2008), evidence exists that at the local level it can have significant impacts on forest degradation (FAO, 2010; Kanninen et al., 2007).

HOW TO PREPARE CHARCOAL IN SOMALIA

First of all, some woods are cut and chopped and then they are collected to a place, a donkey cart will take to the suitable place where it should be burned, the charge of woods are stacked in an excavate and covered with a large iron sheets, a burning fire furnace is poured over leaving air pits, it will be covered with an excavated earth to seal up the chamber allowing a few small openings for escape of smoke and entry of air. The air pits are then smoked with grass and waited from seven to ten days, when the grass and woods are seen to be burning; it shows that the woods are dried and carbonization point reached. The charcoal is ready.

After that the iron metals are removed, and plugged into sacks, lorry or tracks as shown in this photo.



CONCLUSIONS

This study was intended to examine the factors that influence of charcoal production in lower shabelle region. The study has showed that influencing factors has a positive effect on the environmental development. First objective of this study was to establish the influencing factors of charcoal production in lower shabelle region.

The study found that majority of the respondent assigned producing charcoal in more than ten years, which indicates that public influence factors has positive effect on environmental development and it also leads to achieve sustainable development goals(SDGs). The second objective of this study was to assess the level of impacts of charcoal burning on local society in lower shabelle.

The study discovered that most of the respondent assigned Selling charcoal more than ten years in terms of retailers, which shows that private influencing factors has positive effect on environmental development, the positive effect also include income, domestic saving, and job creation. And the conclusion there is positive relationship between influencing factors and environmental development.

RECOMMENDATIONS

Based on the results we found the research suggests the following points:

- Various efforts need to be organized in order to mobilize the public and other stakeholders { *Government agencies, business associations, retailers, research institutions, non- governmental organizations (NGOs), youth associations, women associations, religious institutions, donors and the media* } against degradation of vegetation and rangeland in order to minimize the excessive of land clearance.
- May in fact suggest the absence of a deficit situation, at least for most rural household needs. There is a need for further studies to determine the true fuel-wood situation.
- To prepare millions of improved cooking stoves in order to minimize using of charcoal bags per month by households.
- Besides these, it is important to remove any negative impact of the wide variety of actions, projects and activities undertaken to improve the wood energy situation in developing countries has been insufficient for the magnitude and the importance of the problems to be solved.
- Community awareness is very important point to protect environmental degradation and reduction of rangeland.
- Using alternative energy supply instead of charcoal such as bio-gas.
- To make further studies in this field.

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