

Case Study 3. The use of Wood Based Bio-energy by Women in Maasai Communities in Kilindi - by Amon Richard and Loyce Lema, *Envirocare – Tanzania*



Maasai woman with firewoods. Photo courtesy: Envirocare.

This case study considers a Maasai community in Kilindi District-Tanga Region in Tanzania. The District has no coastline and its altitude ranges from about 300m to 1,700m above sea level. The altitudinal gradient rises from the South to the North, West and Southwest and most of the district area is covered by hills and mountains. Some of these mountains, for example the Nguu Mountains, are part of the beautiful 'Eastern Arc' of Mountains in Tanzania, which are renowned for their biodiversity and richness in endemic species.¹ The average annual rainfall is 800-1000mm.² Other surrounding ecosystems include Kilindi Forest Reserve which is located at 5° 34' 60" South and 37° 34' 60" East. According to Tanzania's National Human and Settlement Census 2012³, the district has a population of 236,833 inhabitants. The availability of untapped natural resources in the district attracts immigrants from other parts of the region and from other parts of the country. This case study describes rural communities which involve Maasai and Nguu tribes, who are pastoralists and small holder farmers.

In Tanzania 88.6% of the total energy consumption is estimated to be biomass (firewood and charcoal). The remainder comes from petroleum (9.2%) and electricity from hydropower (1.8%).

Domestic households are major consumers of fuel wood, and charcoal is the largest source of household energy in urban areas.⁴ In rural areas fuel wood constitutes 96.6% and 4.2% of cooking and lighting fuel respectively.⁵

Biomass energy provides the major energy source for a wide range of rural and urban activities, including commercial, institutional and industrial uses; it is estimated that this non-household demand is equivalent to approximately 15% of urban household consumption, amounting to 300,000 tonnes of charcoal in 2012. Commercial biomass energy is also a major source of rural and urban livelihoods. Charcoal and commercial fuel wood (firewood) generated approximately TZS 1.6 trillion (US\$1 billion) in revenues for hundreds of thousands of rural and urban producers, transporters and wood energy sellers in 2012. In fact commercial biomass energy is the largest source of cash income in rural Tanzania.

¹ <http://www.easternarc.or.tz/nguu>

² Kilindi District Council Report, 2012

³ www.nbs.go.tz/censusgeneralreport-29March2013_combined_financialforprinting.pdf

⁴ Scaling-up Renewable Energy Programme (SREP), Investment Plan for Tanzania, 21 April 2013, <http://www.ewura.go.tz/newsite/attachments/article/95/SREP%20Tanzania%20IP%20April%2022%20Final%20Final%20Final%20Draft.pdf>

⁵ www.fao.org/docrep/012/i1321e/i1321e09.pdf

Initial results from the National Forestry Resources Management Monitoring and Assessment Report (NAFORMA)⁶ show that rural household demand (some 47 tonnes in 2012) was roughly equal to national annual forestry yield outside protected areas. However, demand for charcoal, without supply- and demand-side interventions, is expected to double by 2030, from approximately 2.3 million tonnes of charcoal in 2012.

The Tanzanian National Energy Policy (2003)⁷ states that, “*the energy balance is dominated by biomass-based fuels particularly fuel-wood (charcoal and firewood), which are the main source of energy to both urban and rural areas. Biomass-based fuel accounts for more than 90% of primary energy supply.*” Its main objective is to address national energy needs. The policy includes an objective of reducing forest depletion and references climate change.⁸

The National Environmental Policy of 1997⁹ defines the environmental framework for various sectors, including energy. Among its objectives are the equitable use of resources to meet the basic needs of present and future generations, without risking health and safety.

Specifically with respect to wood-based energy, there are various policies and strategies that call for sustainable wood-based energy use in both rural and urban areas. For example the National Energy Policy 2003 includes a focus on the development and utilisation of indigenous and renewable energy sources and technologies and increasing energy efficiency and conservation in all sectors. The main elements of the policy are the development of domestic energy sources, economic energy pricing, encouragement of private sector participation in the energy market, and enhancement of energy efficiency and energy reliability. The Charcoal Regulations 2006¹⁰ also state the importance of investing in sustainable charcoal production that will enhance environmental conservation.

Tanzania’s Biomass Energy Strategy identifies ways of ensuring a more sustainable supply of biomass energy; raising the efficiency with which biomass energy is produced and utilised; promoting access to alternative energy sources where appropriate and affordable; and ensuring an enabling institutional environment for implementation.¹¹

Current situation regarding bio-energy in Kilindi

In Kilindi district, firewood is the main source of energy for rural households, and many communities including the Maasai rely solely on firewood for cooking and other household tasks. It is generally the preferred fuel for cooking different type of foods, making local beverage varieties, and heating water.

Envirocare poverty mapping report in Kilindi¹² signifies annual per person consumption of fuel wood is about 1.1m³. The 180 households in the six villages visited (Jungu,

⁶ <http://www.mnrt.go.tz/resources/view/national-forestry-resources-monitoring-and-assessment-of-tanzania-nafo>, 2013

⁷ United Republic of Tanzania (2003) Tanzania, National Energy Policy, Government Publishers, Dar es Salaam.

⁸ <http://www.reegle.info/policy-and-regulatory-overviews/TZ>

⁹ <http://www.tzonline.org/pdf/nationalenvironmentalpolicy.pdf>

¹⁰ www.fao.org/docrep/012/i1321e/i1321e10.pdf

¹¹ The Biomass Energy Strategy Tanzania 2014, <http://www.euei-pdf.org/country-studies/biomass-energy-strategy-best-tanzania>

¹² In Press. 2014. Envirocare Report On Mapping Poverty, Vulnerability and Resource Rights in Tanzania.

Loriparaku, Balang'a, Kibirashi, Mafisa and Gombero) produce and use at least five kilograms of stacked wood in a conventional manner every day. This makes a total of approximately 328.5 tons of stacked wood/firewood consumption per annum. For modern house construction, it was estimated that brick burning (50,000 bricks) requires about 20 tons of firewood.

Key environmental, socio-cultural, health and gender impacts

Environmental

Deforestation: In the case of Kilindi district, fuel wood is used as domestic fuel especially by the Maasai communities, and the community forests and woodlands including Kilindi Forest Reserve are some of the main places where these fuel woods are collected.

Also, the nomadic nature of grazing is associated with shifting cultivation, which does have an impact on forest clearing. As the result of over-utilization of forest resources for firewood, house construction, etc., there has been a 30%+ increase in the rate of deforestation since the 1990's.

Greenhouse gas emissions: Due to excessive combustion of fuel wood and other biomass fuels, CO₂ emissions have increased. Increasing CO₂ in the atmosphere is leading to increasing temperatures (global warming) and humidity. Amongst visited villages, most of the community members claimed to feel changes in annual temperature and rainfall patterns.

Loss of Biodiversity and Erosion: Unsustainable firewood harvesting has significantly contributed to loss of biodiversity (loss of access to fresh water and endemic species) and erosion due to loss of forest cover within the Kilindi Forest Reserve.

Socio-cultural

The gradual destruction of the local forests in Kilindi has impacted most of the inhabitants as biodiversity significant for local food and medicines production, such as nuts, fruits, berries, tubers, leaves, honey, and mushrooms, has declined. For many forest communities in Tanzania, including the Maasai communities, their culture and identity are intricately linked with the forest ecosystem, and loss of this environment profoundly and perhaps irreversibly transforms these cultures.

Health & Gender

In Kilindi district, most of the Maasai community houses are locally constructed in such a way that they do not allow any ventilation. The Maasai women tend to cook inside these houses, even though they have no windows and there is insufficient air circulation. This eventually leads to several health problems mostly for the women and children, who are most exposed. A good example includes eye diseases, respiratory disorders (TB, pneumonia and even lung cancer amongst older Maasai—about 35% of the visited households in Kilindi are suffering from several respiratory disorders). Red eyes can also lead to discrimination against them, as women with red eyes are thought to be wicked people and practicing witchcraft in the communities. In addition, girls are exposed to a risk of dying from house fires or from problems caused by indoor air pollution. For instance, in 2010 more than 10 Maasai girls are reported to have died following indoor air pollution.



Left: Maasai woman cooking outdoors; Right: Typical Maasai houses and villaaes

Burns: The use of firewood among the Maasai women and children has led to several injuries especially burns, mostly amongst young girls. This happens when young girls are left cooking food for their brothers during the day when their mothers have to walk a long way in search of more firewood and water.

In Kilindi District the Maasai women and girls work long hours every day. This is because they have responsibilities for taking good care of their families which include walking over 20 km searching for firewood (which can take five hours), and fetching water and food. When searching for firewood, food and water, Maasai women and girls are exposed to the danger of being attacked by wild animals or being raped.

Conclusion

In Tanzania fuel wood is used for everything, including by industry and institutions, but it is urban centres that are using most of the charcoal while leaving rural communities in need of this primary source of energy for their livelihoods. Thus, in order for the Maasai to find fuelwood, women have to walk further distances enduring serious risks and devoting valuable time to this instead of education. Furthermore, it is women and girls who are bearing the impacts of cooking with firewood while lacking a safe source of energy; health impacts mainly consist of respiratory diseases but there are others that could also generate impacts on women's livelihoods.

The Rural Energy Act 2005 established the Rural Energy Board, Fund and Agency, which is responsible for promoting improved access to modern energy services in the rural areas of mainland Tanzania and through the Rural Energy Fund, to provide grants to institutions that are ready to promote the use of energy sustainably. According to estimates made by the Renewable Energy Agency (REA), Tanzania generates about 15 million tons per year of agricultural, livestock and forestry residues, including sugar biogas, some of which may be available for use in power generation. But rural communities like the Maasai in Kilindi, are in urgent need of such modern energy availability in order to reduce pressure from the over utilizations of wood-based energy, as well as to improve women's and girl's livelihoods.

The reports 'Scaling up Renewable Energy Programme, Investment Plan for Tanzania' and the Biomass Energy Strategy are very detailed and focus on both the demand for and supply of energy. However, while the former considers plantations as a source of wood-based energy, the latter document prioritizes participatory forest management, community-based forest management, joint forestry management and 'overall sustainable wood energy production' promoting reduced reliance on wood-fuel and deforestation. Also there

is a significant focus on the use of crop waste, and organizing and licensing charcoal production to get efficiency up by 50%.