



No. 3/2013

ESRF POLICY BRIEF

ECONOMIC AND SOCIAL RESEARCH FOUNDATION

www.esrf.or.tz

Do we really know how climate change affects our livelihood? Evidences from village communities in rural Tanzania

By Apronius Mbilinyi

ABSTRACT

Evidence from rural communities show that they know the signs for climate changes and its effects, climate change has altered the gender role in families, intensified diversification of rural economic activities and both livestock keepers and farmers have design their own coping strategies.

Climate change is defined as a result of temperature variability due to emissions of greenhouse gases produced by human activities (Hope, 2009). According to Hope (2009:451), human activities such as burning of fossil fuels, industrial production, cutting down of rainforests change the atmosphere's composition by increasing the amount of greenhouse gases, which in turn, traps heat in the atmosphere and thereby facilitating climatic changes. The impact of climate change is two-fold, bio-physical and socio-economic. Whereby bio-physical impact include rising sea, lakes and river water levels, intense storms, extinction of species, worsening drought, crop failure. As well as changes in cloud cover and precipitation, melting of polar ice caps and glaciers, and reduced snow cover (Mendelsohn and Dinah, 2005; UNDP, 2004; UNFCCC, 2007).

Already climate change is threatening many lives and is expected to have more significant impact on the livelihoods of the rural poor in developing countries including Tanzania. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) predicts that climate change is likely to have a significant effect on agricultural production in many African countries; this also is witnessed in the visited areas and the stories by the villagers¹. The

effects of climate change and climate variability will continue to challenge vulnerable people especially in developing countries. Droughts and dry seasons will be more frequent, rain more inconsistent, and torrential downpours heavier, all these phenomena increase the risk of soil erosion and vegetation damage through runoff. Higher temperatures will also increase the evaporation of soil moisture. Climate change will aggravate water stress, which the continent has already experienced; more people will be at risk of water stress (Boko et al, 2007).

Africa is among the continent most vulnerable to climate change and climate variability. Tanzania and many African countries are dependent on sectors that are vulnerable to climate conditions, such as agriculture, fisheries, forestry, and tourism. Agriculture and natural resources provide the livelihood for about 80% of the population, and account for around 30% of GDP and 40% of export revenue in Sub-Saharan Africa (Toulmin and Huq 2006). In most Sub-Saharan Africa's agriculture employs 60% to 90% of the total labour forces (Thornton et al. 2006). Tanzania is not different from the rest of Sub-Saharan African countries; agriculture is the dominant sector accounting for about 76 % of employed persons (National Bureau of Statistics, 2013).

¹ Found in the study "impact of climate change to small scale farmers: voice of farmers in village communities in Tanzania (2012)

In addressing the challenges of global warming and climate change, the focus for a while has been on reducing green house emissions (Mubaya et al(2010)).

There has been little progress on reducing these emissions and the climate has continued to change affecting the agriculture sector negatively in many developing countries (ibid). Currently the focus is slowly shifting to adaptation measures to reduce vulnerability to climate change impacts (Guthiga and Newsham, 2011). In Tanzania where 76 % of the employed persons are in the agriculture sector, the continued impacts of climate change have and will continue to have devastating effects on the economy, food security and threaten the stability of the country, this is also shown by stories by rural communities in visited areas in Tanga, Iringa, Mbeya, Kagera, Mtwara and Shinyanga. This is because in Tanzania the form of agriculture practiced is mainly subsistence farming consisting of small scale farming communities with very minimal irrigation, mechanization and application of modern technologies. Like any other developing African countries, climate change in Tanzania is predicted to impact negatively on these farmers who in most cases have few or no safety nets, little coping strategies and resources to cope with the changes.

Role of indigenous knowledge and voices

As the climatic changes is likely to bring more effects in livelihood of the poor; it is crucial for Tanzania to invest in terms of financial resources and research on adaptation measures farmers could implement to cope with climatic changes especially in the agriculture sector. Guthiga and Newsham, (2011) argue that in recent years indigenous people have been recognized as powerful knowledge - holders on climate change and key actors for developing policy to cope with and adapt to its effects. Therefore using local persons knowledge is believed to lead to development of effective mitigation and adaptation strategies that are cost-effective, participatory and sustainable (ibid). Normally, adaptation measures need to be planned at the micro and macro levels. Studying this indigenous knowledge as argued by Newsham; ESRF conducted a research that managed to get the voices of small scale farmers who expressed their understanding on climate change, observations on how climate change has been taking place in the country, factors and its social economic impact experienced over time as well as their designed adaptation strategies. The

main focus of the study was to present the voices of small scale farmers in Tanzania on climate change issues; indicating what they perceive to be the impact of climate change on agricultural production, different challenges they face as climate varies and how they cope with these changes.

How do farmers recognize changes in climate?

During the focus group discussions farmers indicated that over time they have observed changes in rainfall seasons and patterns, higher temperatures in some areas than they were before and incidences of extreme catastrophic events such as floods and drought have increased. In some areas such as coast areas there are no more vuli (short rains) or mchoo (scattered showers) rains, and when they come, it is not at the usual time and trend. Some farmers said that they observed changes in the rainfall pattern noting that in "some areas rain was about 3 times a year but now only once or rarely twice a year and they are so unpredictable. They start late and ends before end of rainy season... in the 1950 and 1970s we could cultivate and harvest twice but now we only harvest once" (Muheza FGD, 2012). The interviews with farmers also indicated that many thought that lack of rain has been affecting their crops severely, while few thought that the impact was moderate or minimal. Farmers also indicated that in many years there were either no or very little rains for them to grow food crops.

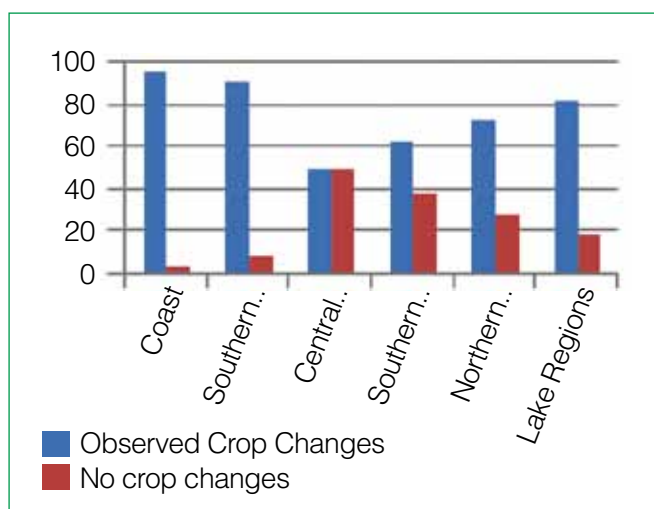
Interviewed villagers also said that with the changes in the pattern of rainfall in the past 10 years, they have designed various adaptation methods; among others include changing the planting season and even types of crops they plant. For example farmers indicated that unlike in the past where dates for planting crops such as maize or rice was well know to every farmer, now they just guess or indulge in trial and error exercise as the rains are not predictable. These changes also include delay or lack of vuli and Mchoo rains as a result when there is no vuli rains, they don't plant vulimaize or rice affecting food security in families.

Generally, farmers indicated that rains have become unpredictable in the recent years hence affecting their farming plans. Furthermore, interviews with farmers indicated that farmers feel that high temperatures do affect crops and livestock products negatively. Impact of climate

change to small scale farmers: voices of farmers in village communities in Tanzania (2012)

Farmers who also raise animals indicated that one consequence of these changes is reduction in areas for grazing, as pasture is less available and this has affected their incomes and amount of livestock products such as milk. One farmer at Bhaghai village in Lushoto said that “Mifugo imepungua kutokana na kupungua kwa malisho kulikosababishwa na ukame na mabadiliko ya hali ya hewa, baadhi ya miaka kame mifugo mingi imekufa kutokana na kukosa maji”, (“there is a reduced number of livestock due to reduced crop for feeding animals due to drought, a lot of livestock died due to lack of water”).

Another impact of climate change noted by farmers included reduction in soil fertility. Most farmers said that soil fertility has been declining over the years to even threaten food security in families. This has resulted in reduced crop production especially in high altitudes areas such as Lushoto district. Examples were given by farmers that, compare to the past maize harvest has drastically reduced and due to reduced soil fertility if they do not use fertilizer the harvest becomes so low. The figure below show villager’s perceptions on climatic related changes in maize production; almost all zone in Tanzania agree on negative climatic effects on maize crops which is a major staple food in the country; surprisingly the central zone seem to have a balanced perception on whether they did experience any changes.



Some farmers indicated the sequence of yield decline as they said for instance “in 2001 from 1 acre you could get 5 sacks of maize, in 2005 about 3 sacks and now even making one sack of maize can be a challenge”. There were more

examples given by farmers, for example one farmer indicated that “before from 1 acre you could get about 25 bags of rice, 10 bags of maize, 15 bags of groundnuts but now you only get 10 bags of rice, 3 bags of maize and 4 bags of groundnuts”(Afarmer in Mtwara region, 2012).

Changes in family gender roles

One of the socio economic impacts of climate change is related to changes in the gender roles in families. Apart of doing daily activities in the farms, traditionally women do other family activities such as fetching water and firewood, cooking etc. However due to changes in weather and other global changes some roles are now taken over by men. For instance in visited villages in Lushoto, Mtwara and Muheza, women said that due to drought they spend more hours searching for water and pasture at the expense of other economic activities and sometimes have to get up midnight to go to fetch water. According to them Men also participate in fetching water using bicycles, carts and other means hence climatic changes have altered the gender distribution of family roles. They also said that due to reduction of forests; fetching firewood has been difficult hence men also have to take bicycles or carts for fetching them. Fetching water and fire woods in the past were primary roles for women but with scarcity even men are involve in these activities.

Villagers Coping Strategies

In order to cope with the effects of climate change at household level, both pastoralists and farming communities diversify their economic activities by doing both agriculture and animal keeping; this confirms what the National Census that had earlier indicated that 3.7 million households in Tanzania are pastoralists and 7% are agro-pastoralist. Other coping mechanisms for farmers and pastoralists included; involvement in petty trade, shifting from one area to another; for instance pastoralists from drought prone areas usually move with their animals from one place to another in search of water and pastures. These movements in most cases are not planned or coordinated and sometimes results into conflicts between groups (Famers vs pastoralist, pastoralists’ vs government), a good example is the pastoral encroachments at Ihefu, Rukwa, and Mbalali, etc). Other measures include change of new breed of animals or crops that resist diseases and climate change impacts, construction of small dams for water storages etc.

The field visits indicated that coping strategies differed according to geographic areas and villagers diversified their economic activities changing their lifestyles or switched to other income generating activities; for instance young people and women start petty trade or establish motorcycles driving business-Bodaboda (Figure below), selling of oil and petrol, saloon, retail shops, small scale poultry keeping, vending food items across the roads as a new income generating activities.

In some areas people have been migrating seasonally or permanently from one area to another especially from rural areas to urban areas. There is a need to conduct a thorough research for this climate change related migration in the country. Such dynamics has resulted in some negative social and economic impacts. For instance the discussion with some villagers in Tanga, Mtwara, Kagera regions indicated that one of the effects of such climate change is rise in seasonal migrations that cause HIV/AIDs spread as partners engage in other sexual relationships with other partners when they are away from their families.

Study Findings

- Both farmers and livestock keeping communities know the causes and signs of climate change.
- Both crop farming and livestock keeping has been negatively affected by climate changes.
- Over time there has been an increase in the frequency of extreme events such as drought and flooding which reduced soil fertility and yields from crop production and livestock products.
- Climatic changes have resulted into socio economic challenges such as spread of

diseases such as malaria in areas where they did exist before, reduced income from land and changes in gender roles.

- Coping strategies vary by social groups, where both farmers and pastoralists' communities diversify their economic activities by doing both agriculture and animal keeping. Intercropping or switched to other income generating activities.

Policy messages

- While climate changes effects are globally known up to the grassroots level, the interventions, coping strategies and programs are not well coordinated as there is a need for coordinating institutions to be represented up to grass root level.
- Some human activities cause climate changes. There is need to actively involve all stakeholders including the private sector (not only Government institutions and CSOs) in national campaigns such as tree planting and reporting how many survived each year.
- A need to have a green revolution by establishing serious campaigns in environmental conservations. Serious National tree planting campaigns can be established; such efforts were conducted in China and India in 18th Century; Institutions such as schools, colleges, armies, prisons can take the lead when motivated. Such efforts will help to mitigate further global warming that cause climate change by absolving more CO₂ due increased economic activities.
- There is a need to conduct more studies to clearly understand what will be the future effects of the global changes in weather and how the country will be affected so that the country is not caught in surprise.



The Economic and Social Research Foundation (ESRF)

51 Uporoto Street, Ursino Estate.
 P.O Box 31226, Dar es Salaam, Tanzania
 Tel: +255 22 2760260/2760758/2760751-52
 Fax: + 255 22 2760062 • E-mail: esrf@esrf.or.tz
 Website: <http://www.esrf.or.tz>