

CLIMATE CHANGE AND LIVELIHOOD SECURITY: SOME CHALLENGES AND OPTIONS

TPL. KALU, OLA IDIMA

maryk2195@gmail.com

ODUKO, JANET .E.

deborahifunanya@gmail.com

OPARA, VICTORIA C.

adzee044@gmail.com

TPL. JULIET CHIKA CHINEMELU

and

NWOKOLO COLLINS NNAMDI

kollinzpumping@gmail.com

Department of Urban and Regional Planning,

Akanu Ibiam Federal Polytechnic, Unwana, Afikpo North L. G. A. Ebonyi State.

ABSTRACT

The environment plays a very important role in providing life sustaining properties to human, animal and plant lives. Man's activities such as agriculture, resource explorations, technological improvement and advancement etc. have accelerated continuous and rapid degradation of the environment causing environmental changes such as climate change, pollution, deforestation etc. The United Nation Framework Convention on Climate Change,(UNFCCC,2005) define climate change as 'A change of climate, which is attributed directly or indirectly to human activity, that alters the composition of the global atmosphere, and in addition to natural climate variability, observed over comparable period of time.' The impact is both short term (frequent and more intense extreme weather conditions) and long term (changing temperatures and precipitation). This is a descriptive research and some findings shows that climate change has effects on food supply and food security and agricultural income. The sustainable livelihood assets (human, social, natural, physical and economic assets) of families are threatened by the effect of climate change. This paper seeks to highlight the impact of climate change on livelihoods of vulnerable communities in Nigeria and also suggest opportunities for mitigating and adapting to climate changes.

Keywords: Climate change, human, livelihood, environment and security

INTRODUCTION

Climate change is one of the environmental problems experienced by mankind. The implication of climate change cuts across various sectors, ranging from agriculture to health. Nigeria is Africa's largest economy, most populous country, and home to a wealth of natural resources, large land mass, solid minerals, oil and natural gas. Its multiple ecological zones have given rise to a wide range of livelihoods, agricultural practices, and commodities, all of which are affected by climate change.

The agricultural sector is sensitive to climatic conditions, and it has become one of the most susceptible sectors affected by the menaces and effects of global climate change. According to Ochieng et al. (2016), climate change has menacingly affected global agriculture in the 21st century. Moreover, its effects on agricultural production and livelihood according to FAO (2016) and Obasi and Uwanekwu, (2015) are expected to intensify over time, and to vary across countries and region.

Nhemachena and Hassan (2007), reveals that agriculture provides livelihood directly or indirectly especially for the people especially in the rural communities in Nigeria because it functions as a source of living for most of its inhabitants. FAO. (2003), noted that agricultural production remains a key source of income for many in the rural communities of developing countries including Africa and especially Nigeria.

This paper explores some of the programmes, policies and activities adopted by the Nigerian government in tackling climate change issues as it relates to livelihood security and some adaptation options.

Methodology

This is descriptive research and the data for this study was based on secondary data which are reviewed literatures and other relevant documents related to climate change and its impact on livelihood of vulnerable communities in Nigeria. Also, it includes national policies and strategies; climate change convention related documents, journal articles and published reports.

Definition and Concepts

Climate change

“Warming of the climate system is unequivocal as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising average sea level.”IPCC,(2007).

The United Nation Framework Convention on Climate Change,(UNFCCC, 2005) define climate change as ‘A change of climate, which is attributed directly or indirectly to human activity, that alters the composition of the global atmosphere, and in addition to natural climate variability, observed over comparable period of time.’ While the Intergovernmental Panel on Climate Change,(IPCC, 2007) defined it as ‘Any change in climate over time whether due to natural variability or as a result of human activity.’ The most general concept of climate change therefore, is a ‘change in the statistical properties of the climate system when considered over a long period of time, regardless of the cause’. Accordingly, fluctuations over periods shorter than a few decades do not represent climate change. The term is, sometimes, used to refer specifically to climate change caused by human activity, as opposed to changes in climate that may have resulted as part of the earth's natural processes.

It may be a change in the average weather conditions or a change in the distribution of weather events with respect to an average, for example, greater or fewer extreme weather events. Climate change may be limited to a specific region, or may occur across the globe.

Causes of Climate Change

According to Inter governmental Panel on Climate Change (IPCC, 2007), the causes of climate change can be linked basically to factors such as:

1. Industrial revolution: The activities of automobiles and other industries have led to emission of several gases like carbon dioxide into the atmosphere which over time affects the composition of greenhouse gases leading to altered climate.
2. Burning of fossil fuels by oil producing companies and refineries which emit greenhouse gases into the atmosphere.
3. Land use change such as deforestation and desertification which leads to climate change.

4. Agricultural activities such as bush burning, fertilizer application, fermentation among others, all of which are anthropological influencers of climate change.

Concept of Livelihood

The livelihood concepts have become noticeable as a means of mastering the factors that influence people's lives and well-being, especially in the developing countries. Livelihood involves the assets of an individual and the activities he/she engages in for sustenance and living. Accordingly, Vincent (2001), argues that livelihood concepts represent the upshot of how and why individuals organize to effectually change the environment in order to meet their needs via technology, physical work, capability, knowledge, and socializations.

Equally, livelihood has been described as a means of supporting oneself. There are various definitions of livelihood put forward by several authors. An instance is Chambers and Conway (1992), claim that livelihood constitutes the ability and belongings (supplies, capital, claims, and access) including the activities necessary for survival. However, this definition has been widely accepted by various authors like Carswell (1997), Carney (1998), Hussein and Nelson (1998), Scoones (1998), Drinkwater and Rusinow (1999), Ellis (2000), Swift and Hamilton (2001). As postulated by World Water Assessment Programme (WWAP, 2006).

Livelihood denotes the different ways in which households secure and acquire the basic requirements of life, both in good and bad years. According to Carney (1998, p.4) "a livelihood is defined as comprising ' the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood therefore comprises of resources that can be material which are tangible as well as social which are intangible. Rakodi (2002) clearly articulates that the livelihood model categorizes five main assets as human, social, natural, physical and financial capitals that are cardinal in determining the status and survival strategies of the households.

Human capital is seen in terms of the quality and not just the quantity of household members. This means that education level, members that are active and can do work as well as knowledge and skill are very important for household members to be able to contribute more. Social capital

refers to the social connections that provide mutual support which is important for survival. Poor people depend on relatives and friends for support. Social capital is also related to political capital which is very important for access to other key assets as it gives a way to connect to other institutions in the communities. On the other hand Physical capital refers to basic infrastructure which helps people support themselves. It also includes livestock, equipment, vehicles, houses etc. Financial resources on the other hand can be referred to as earnings, savings and other financial gains such as jewelries, insurance, credits etc that help people in their survival strategies. And finally natural capital refers to resources from the environment like water, access to land, wild products, biodiversity, forest. The livelihood approach assists in understanding challenging issues of poverty and how poor people use what they have to cope, improve or maintain their livelihoods.

Acharya (2006), asserts that households attain livelihood through four major ways, and they are:

Production-based livelihood

A large fraction of households obtains livelihoods through production of something. The availability or accesses to inputs as well as improved methods of production by this group of households determine how they make a living. Examples include agriculture, mining, craft making, etc.

Labour-based livelihood

Majority of the households who are not production based acquire livelihood through selling their labour. Their livelihoods are dependent on the demand for labour, wage rates and prices of food; these three are vital elements for survival.

Exchange-or market-based livelihood

Households that produce surplus agricultural food products and non-farm goods make a living from the excess produce they sell at the market. As a result, their livelihood is directly affected by the system of marketing that they adopt for the sale of their products, as well as influenced by the relative price of what they sell and buy.

Transfer-based livelihoods

In this context households who have no income-earning assets or individuals who lack the ability to work depend on the government for social grants or other social organization for their livelihoods. This group of households obtained their livelihood through a transfer of government's allowances and programmes which are relevant to their survival.

Evidences of Climate Change in Nigeria

Nigeria, with a vast land space of 923,768 sq km, spanning across different climatic regions is understood to be highly vulnerable to climate change. There is no gain saying the fact that the country is susceptible with extinction by a myriad of environmental problems, especially those triggered by climate change. Without a doubt, each of the 36 States and the Federal Capital is beset by one climate change problem or the other (see appendix 1). There is desert encroachment and extreme droughts in the northern states as well as serious problems of flooding and erosion in the southern states which are mingling to threaten Nigeria with shrinkage and collapse.

Increasing climate uncertainties, sheet erosion, gully erosion, periodic flooding, biodiversity depletion, agricultural land degradation and general decline in yields of agricultural produce are now common norms in the country. Areas that are mostly affected by flood are flood plain areas, Niger Delta States, low plains of South-East and South-South regions and urban areas with high vulnerability to flooding. Other causes of flood are poor drainage facility, blocked drainages and soil moisture saturation due to several hours of heavy rainfall. These result to submergence of houses, collapse of infrastructure, transport congestion, displacement of humans, plants and animals, loss of lives and property and also agricultural lands.

According to Daily Post newspaper of 14th October, 2022, between 2011 and 2022, Nigeria experienced 103 flood incidents across the 36 states and FCT with 9,501,777 persons affected, 1,187 lives lost and properties worth \$904,500 damaged.

All of these above are both direct and indirect consequences of climate change and affects the entire 179m population whose major occupation is agriculture, which, before the discovery of

oil, accounts for about 80% of the country's GDP and currently accounts for 90% of the non oil export earnings.

Government of Nigeria Climate Priorities

In 2013, the Government of Nigeria (GON) approved the National Policy on Climate Change which aims to achieve a low-carbon, high growth economic development pathway and to build a climate-resilient society. Nigeria is a party to the UN Framework Convention on Climate Change and ratified the Kyoto Protocol in 2004. In 2015, President Buhari committed to the Paris Agreement and presented Nigeria's Nationally Determined Contribution (NDC) with a pledge to reduce GHG emissions by 45 percent conditionally by 2030. In 2012, Nigeria became a voluntary member of the UN Environment's Climate and Clean Air Coalition to reduce short-lived climate pollutants across ten high-impact sectors. The Government of Nigeria is endeavoring to increase on-grid reliability and renewable in its energy supply. However, it faces challenges implementing climate priorities related to gas flaring, gas-to-power generation, transportation, climate-smart agriculture, and reforestation.

Relationship and Impact of Climate Change on Livelihood

"Over the last two decades, 76% of all disaster events were hydrological, meteorological or climatologically in nature. These accounted for 45% of the death and 79% of the economic losses caused by natural hazards" IDSR, (2008).

The consequences of Climate Change are frightening and life threatening. All countries are affected in varying degrees. The African continent and Nigeria in particular is more vulnerable to the impacts of climate change, a vulnerability that is compounded by the continent's massive infrastructure deficit, endemic poverty and disease burden.

Impact of climate change on social capital livelihood

Oduniyi (2014), revealed that climate change affects individuals and groups differently, for example, some group of people such as the elders, children, low-income population are more sensitive to climate change impact compare to others. Climate change effect like flooding,

prolonged rain or heat waves can isolate people from social functions such as going to school, health facilities, social gatherings etc.

In consequence, the dire effect of climate change on social capital livelihood reflects on food insecurity, network with other colleagues, friends and relatives, price rise, threatens social harmony among people, insecurity, social ties and network broken increased forced migration amongst others.

There is the problem of livestock grazing due to rainfall variability in the northern part of the country. This has led to frequent push-down-south of the livestock to feed them on farmlands, consequently resulting to loss of soil fertility and prevailing social problems (herdsmen and fanners clashes) as well as loss of lives and properties in some states like Benue, Plateau, Taraba, Enugu and Nasarawa. This was not so in some decades ago as pasture was adequately available in both regions.

Impact of climate change on financial capital livelihood

Climate change is expected to affect the Nigeria's economy due to loss and damage (to infrastructure, farmland, real estate, businesses, humans etc.) from extreme weather events that have been on a steady increase over the last decade.

Businesses worth billions of dollars has been submerged in water, farmlands of both subsistent and mechanized farmers destroyed as a result of flooding alone this year 2022 in Niger Delta States, low plains of South-East and South-South regions and some parts of North-East regions of Nigeria. The impact of climate change on financial capital livelihood is underscored in the decrease in income, grant, credit, etc., with poverty as the resultant effect. Irrefutably, poverty continues to be a major problem in many parts of the world, and it cannot be ignored. As stated by Enete and Amusa (2010), the ratio of Africans living in penury is far greater than any other region of the world. Otive, (2006) noted that throughout the whole region, rural poverty still accounts for 90 percent of total poverty and about 80 percent of the poor still rely on agriculture or farm labour for their livelihood.

Impact of climate change on human capital livelihood

Human capital is a pool of quality, which includes experience, skills, training, wisdom, talents an individual possessed. As postulated by Sheraly (2015), human capital denotes the accumulation of personal attributes, knowledge such as creativity embodied in an individual so as to generate economic value. Examples of human capital livelihood include employment, education, personal skill development and training which can enhance one's life in his/her area of endeavor.

According to IPCC (2014), the impact of climate change on human asset has led to food insecurity, under nourishment, increased risk of vector or water borne diseases, sanitation, mental and psychological problems and chronic hunger due to failed crops or high food price and the urban poor are the most affected. Also, human educations, health, access to services are compromised.

Women are more vulnerable than men. Unavailability of water supply has exacerbated hygiene among adolescent girl and changed their routine as they have to manage the household. Also according to FIAN (2013), it has led to increase in some diseases such as typhoid, fever, diarrhea, skin diseases, etc.

Impact of climate change on natural capital livelihood

Natural resources are the free gift from nature which can be used for economic gain to support livelihood, some of which are land or soil, forest, air, water, amongst others. There is a growing recognition that natural capital livelihood and climate change impacts are closely interconnected. For example, the impact of climate change in a form of flood affects the water quality for human consumption and industrial and agricultural use, in fish production and prevalence of pest and diseases in crop production. Climate change and variability threaten the natural resources used by the farmers in the production of food and fibers especially in Africa where resources are limited to support farming activities and production. In northern Nigeria today, drought in April and May, which is accepted as normal, prevents timely land preparation and tillage. It is reported that the physical and chemical properties of soil have been changed due to prolonged drought. The effect is the destruction of all crops and harvests become very poor. This trend is further compounded by the fact that most of the large-scale irrigation projects are moribund. Climate

change also directly or indirectly affects the growth and productivity of forest leading to defoliation and lack of forest resources, thwarting the livelihood of forest based population.

Impact of climate change on physical capital livelihood

The physical assets like buildings, roads, communication towers, water tanks, educational facilities, health facilities, etc are prone to suffer from climate changed induced disaster such as flooding. It not only destroys physical assets but disrupts further services from them. Damage to transportation route can halt the supply of food, petroleum, etc leading to adverse human, material, economic and environmental effects. A typical example is what we are facing presently in the south-south and south- east regions of Nigeria due to flooding.

Nigeria's Adaptation priorities in the climate change policies

Nigeria has developed several policy instruments on climate change and adaptation in particular. These are The National Adaptation Strategy and Action Plan on Climate Change for Nigeria (NASPA-CCN) developed in 2011, the National Adaptation Plan Framework (NAP) developed in 2020 and the Nigeria Climate Change and Response Strategy (NCCPRS) was developed in 2012 and recently reviewed in 2021.

The NASPA-CCN document contains an analysis of the current and future scenarios of climate change in the country, as well as a wide range of strategies to address specific adaptation challenges in the different sectors of the country's economy, including agriculture (crops and livestock), freshwater resources, water resources and fisheries, coastal ecosystems, forests, and biodiversity.

The NAP Framework aims to manage Nigeria's medium-and long-term adaptation needs in a coherent and coordinated manner. Its purpose is to guide the Government and lawmakers in developing, coordinating, and implementing the various policies, plans, strategies, and legislation to enable Nigeria to address its adaptation needs.

The NCCPRS policy outlines the need for promotion of low carbon and sustainable economy, enhancing national capacity to adapt to climate change, raise climate change related science,

technology, and research and development (R&D) to a new level that will enable the country to better participate in international scientific and technological cooperation on climate change. The policy also emphasized the need for strengthening of public institutions and functional framework for climate change governance. Increased public awareness and involvement of the private sector are also necessary for achieving the policy's objectives.

Adaptation Strategies for Livelihoods

- Develop a replicable approach/model that uses intermediate NGOs, community members and radio to diffuse climate change adaptation approaches and information and to gather feedback on adaptation actions focused on livelihoods.
- Build a network of intermediate NGOs capable of working on climate change and livelihoods issues, where these NGOs support a number of communities in high-risk states.
- Animate communities with appropriate engagement methods, in order to elicit and document valid climate change and livelihood related needs/vulnerabilities.
- Use or reinforce available (endogenous) community resources to reduce vulnerability and build livelihood-linked capacity to adapt to climate change.
- Encourage community participation and active roles by both genders in all livelihood development initiatives.

Averting the challenges of climate change:

Conclusion

Climate change poses a serious threat to livelihood sustainability and poverty alleviation in the poorest and most vulnerable regions in Nigeria as impacts result in increased high level of poverty, low level of human and physical capital development, crime, displacements, inequitable land distribution and poor infrastructure development, drying of streams, flooding occasion, damaging of roads and general damage to the ecosystem. The effects of climate change on agricultural productivity are numerous, including decrease in potential crop yields, shortening of crop growing period, decrease in water availability for irrigation and poor verbalization.

Recommendations

Nigeria as a nation, like other global communities, must keep focus on the goal of assuring livelihood security for all. This can be achieved through actions aimed at mitigating the impacts

of climate change on the populace. From what is still happening, it seems that the existing policies and sectorial plans are inadequate to combat this menace. The following are some recommendations that would go a long way in improving the food security situation in the country while at the same time safeguarding the environment and livelihoods.

- I. Remediation, protective and management measures of affected and vulnerable regions must commence without further delay. This will enhance food security, guarantee livelihoods and contribute to poverty eradication.
- II. Aggressive attitudinal reorientation campaigns for the public to accept the realities of climate change and its implication on food security, biodiversity, the natural resources and survival of the human race generally. This need goal setting, commitment, and unrelenting hard-work by all.
- III. Government need to design and implement effective plans and strategies based on national and local climate policy adapting to climate change impacts to achieve economic and social prosperity.
- IV. Improved agricultural practices and improved agricultural infrastructure.
- V. Strengthen research and development for new technologies

APPENDIX 1

Major climate change challenges in Nigeria

	CHALLENGES		AREAS MOST AFFECTED
S/N	NATURAL	ANTHROPOGENIC	
1	Drought and Desertification	Drought and Desertification	Northern States like; Sokoto ,Zamfara, Kastina, Jigawa, Kaduna, Borno, Bauchi, Yobe, Gombe, etc.
2	Flooding-	Flooding	Benue, Kogi, Delta, Anambra, Imo. Bayelsa, Lagos, Ibadan, Abia, Taraba.
3.	Erosion	Erosion	Enugu, Anambara, Imo, Abia, Ebonyi, Ondo. Ekiti, Akwa-ibom, Cross Rivers States.
4.	Coastal Erosion and Flooding		Lagos, Ondo, Delta, Rivers, Akwa ibom, Cross Rivers, Bayelsa States

REFERENCES

- Acharya, S.S. (2006). Sustainable Agriculture and Rural Livelihoods. *Agricultural Economics Research Review*. Vol. 19 July-December 2006 pp 205-217.
- Akinnagbe, O.M., Attamah, C.O. and Igbokwe, E.M. (2015). Sources of Information on Climate Change among Crop Farmers in Enugu North Agricultural Zone, Nigeria. *International Journal of Research in Agriculture and Forestry*, Volume 2, Issue 11, November 2015, PP. 27-33 ISSN 2394-5907 (Print) & ISSN 2394-5915
- Carney, D. (1998). Implementing the sustainable rural livelihoods approach in. In D. Carney, *Sustainable Rural Livelihoods: What contribution can we make?* London: DFID, viewed 06 June 2012, from <http://eprints.ru.ac.za/1632/2/Davenport-MSc-TR09-69.pdf>.
- Carswell, G. (1997). Agricultural intensification and rural sustainable livelihoods: A “think Piece”. IDS working paper 64. University of Sussex.
- Chambers, R. and Conway, G. (1992). Sustainable rural livelihoods: Practical concepts for the 21st century. IDS Discussion Paper 296. Institute of Development Studies, University of Sussex, Brighton. 28pp.
- Drinkwater, M. and Rusinow, T. (1999). Application of CARE’s livelihood approach. Paper presented at the National Resource Advisors’ conference (NRAC) 1999. <http://www.livelihoods.org/info/nrac/care.pdf>.
- Ellis, F. (1996). Rural livelihood diversity in developing countries: evidence and policy implications, (40). Retrieved from <http://ww.smallstock.info/reference/ODI/odinrp40.pdf>.
- Enete, A.A. and Taofeeq, A.A. (2010). Challenges of Agricultural Adaptation to Climate Change in Nigeria: a Synthesis from the Literature. *Field Actions Science Reports*[Online], Vol. 4 2010, Online since 20 December 2010, connection on 22 August 2017. URL: <http://factsreports.revues.org/678>.
- FAO. (2003). Responding to Agricultural and Food Insecurity Challenges Mobilizing Africa to Implement Nepad Programmes, Conference of Ministers of Agriculture of the African Union, Maputo, Mozambique, July 2003.
- Food and Agriculture Organization of the United Nations Rome (2016). The state of food and agriculture. Climate change, agriculture and food security. Pg. 4.
- Hussein, K. and Nelson, J. (1998). Sustainable livelihoods and livelihood diversification. IDS working paper 69. University of Sussex: IDS, viewed 05 June 2012, from http://libserv5.tut.ac.za:7780/pls/eres/wpg_docload.download_filefilename=F1559246066/MohamedSS.pdf.

- IPCC (Inter governmental Panel for Climate Change) (2001). Impacts, Adaptation and Vulnerability. IPCC working group II, Third assessment report. [McCarthy, J.J., Canziani, O.F., Leary, N.A., Dokken, D.J. and White K.S. (Eds.)]. Cambridge University Press.
- IPCC. (2007). Climate Change 2007: Impacts, Adaptation and Vulnerability. In: Parry ML, Canziani OF, Palutikof JP, van der Linder PJ, Hanson CE (eds.), Contribution of Working Group II to the IPCC fourth assessment report. Cambridge University Press, Cambridge.
- Nhemachena, C. and Hassan, R. (2007). Micro-level analysis of farmers' adaptation to climate change in Southern Africa. IFPRI Discussion Paper No. 00714. International Food Policy Research Institute, Washington, D.C.
- Nhemachena, C. (2008). Agriculture and future climate dynamics in Africa: Impacts and adaptation options. PhD Thesis. Department of Agricultural Economics, Extension and Rural Development, University of Pretoria.
- Obasi, I.O. and Uwanekwu, G.A. (2015). Livestock Policies and its Impact on India and Bihar, State. *Journal of Agricultural Economics and Rural Development*,2(1): 022-025.
- Ochieng, J., krimi, L. and Mathenge, M. (2016).Effect of climate variability and change on agricultural production: The case of small scale farmers in Kenya.Tegemeo Institute of Agricultural Policy and Development. <https://doi.org/10.1016/j.njas.2016.03.005>.
- Oduniyi, O. S. (2014). Climate change awareness: a case study of small scale maize farmers in Mpumalanga province, South Africa. A dissertation submitted at the Department of Agriculture and Animal health, University of South Africa.
- Rakodi, C., 2002. A livelihoods approach: conceptual issues and definitions. *Urban Livelihoods: A People-Centred Approach to Reducing Poverty*, pp. 3-22.
- Scoones, I. (1998). Sustainable rural livelihoods: a framework for analysis. IDS working paper 72. Sussex: Institute of Development Studies, University of Sussex, viewed 05 June 2012, from http://libserv5.tut.ac.za:7780/pls/eres/wpg_docload.download_file?p_filename=F1559246066/M_ohamedSS.pdf.
- Swift, J. and Hamilton, K. (2001). Household Food and Livelihood Security in Devereux .S. and Maxwell. S. (2001), *Food Security in Sub-Saharan Africa*, London, Intermediate Technology Development Group, Britain 2001, p. 70.
- United Nations Framework Convention on Climate Change(2005). Article –1 (Definition). Full Text of the Convention.

United States Department of Agriculture Economic Research Service, (2013). Overview of Food Security in the US. Economic Research Report No. (ERR-155).

Vincent, L. (2001). Water and rural livelihoods. In: Meinzen-Dick, R.S. and Rosegrant M.W. (eds.). Overcoming water scarcity and quality constraints. International Food and Policy Research Institute, Focus 9 Brief 5, viewed 17 October 2011, from <http://www.ifpri.org/2020/focus/focus09.asp>

WWAP (World Water Assessment Programme) (2006). Water, agriculture and rural livelihoods. Interventions for Improving Livelihoods in sub-Saharan Africa. pg 7.