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Assessment of the Environmental Sector and Climate Change in Malawi: Relationships between Environmental Policy, Scientific Literature, and Development Projects

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ABSTRACT
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As funding increases for climate change related issues in Sub-Saharan Africa there should also be an increase in research to understand how scientific literature in the environmental sector can assist in developing policy and implementing development projects. Using secondary research, this paper centers on Malawi to develop an understanding of what is occurring in Sub-Saharan Africa as a whole in regards to climate change and environmental policy, science and development projects. It sought to determine if scientific thematic areas of research and recommended courses of action were being incorporated into actual government policies and on the ground development projects. This study employed a literature and document review approach. Findings showed that minimal overlap among all three sectors of science, policy, and practice was occurring. The discussion of these results then compares communication and framing of environmental issues in these three sectors, and concludes with final recommendations that sustainable development projects are designed and implemented to include a wide variety of stakeholders.

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DEDICATION

This paper is dedicated to my family, friends, and colleagues who supported my efforts in writing this paper and pursing my Master's degree.

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I would like to thank the community of Mimosa in Mulanje, Malawi for welcoming me with open arms, especially Andrew Mario my friend, community activist, and mentor. Andrew, along with many others, inspired my interest in the field of International Development. I would also like to thank Clark University for providing a community, as well as a space to learn and grow. Lastly, I would like to thank Gregory Trencher for his patience and guidance while writing this research paper.

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1. Introduction

Beginning in the 1940's, roughly US$1 trillion of donor aid reached Africa from rich developed countries (Moyo, 2009). Displaying the large amount of donor funds entering into Africa, not stopping any time soon. ClimDev-Africa, a program that was created to establish a solid foundation for Africa's response to climate change, emphasized that US $100 billion should be provided for financing climate change from developed nations (ClimDev-Africa, 2016). Demonstrating that there will be an increase in aid in Africa with a focus on climate change and environmental aspects. In theory an increase in funding would mean that there would be an increase in the number of policies, development projects along with scientific literature to assist in the development of projects and policy implementation. It is unclear whether this engagement between spheres is occurring. Often times silos of knowledge are produced that fall short of making systems and communities more prosperous (Vogel et al., 2007; Young et al., 2004). Also a lack of communication exists among all of the project developers, policy creators, and academics who create these projects, policy, and scientific literature (Vogel et al., 2007). Though it is unclear how much communication is lacking. An assumption is made that development projects should be developed with input from the environmental policy documents and scientific literature findings in mind at different times but that often is not the case (Vogel et al., 2007; Young et al., 2004). The solution seems simple, bridge the gap between the different spheres. Yet it is not that simple because the process is not liner, it is more of a dynamic web (Vogel et al., 2007; Court et al., 2005; Young, 2005). This

dynamic web is referring to complicated nature of the process of development project implementation that incorporates the scientific literature and policies, and local stakeholders.

In order to better understand the specifics of a certain area in Sub-Saharan Africa(SSA), Malawi was targeted as the focus for this paper. This paper will focus on the environmental sector, for the purpose of this paper the environment sector is considered as all sub-sectors that involve natural resources such as forestry, land use, agriculture, climate change, and energy.

This paper specifically sets out to answer to following questions:

1. What are the key areas addressed and recommendations in the environmental related scientific literature for Malawi?
2. What are the priority areas and recommendations being made in the national environmental policy and strategic government documents of Malawi?
3. What are the key areas in the environmental sector that are being addressed and implemented in current development projects?

Answering these research questions will give a better understanding of what is occurring in Malawi in terms of research, policy, and practice. These answers can then assist in a broader understanding of what is happening in SSA as a region. Having a better understanding of the way development projects, environmental policy, and scientific literature interact and relate with one another can assist in

creating a more effective and efficient way to implement sustainable development projects. Which will be discussed in recommendation portion of the paper.

2. Background

2.1 Context of Study

The Conference of the Parties 21 (COP21) just finished and many developing countries including African nations have submitted Intended Nationally Determined Contributions (INDC). These INDC's are heavily reliant on financing from developed nations to meet the targeted goal of 2 degrees Celsius with the aspirational goal of 1.5 degrees Celsius. The pressure to increase funding amounts will correspond to the increase in pressure to meet these climate change goals. In 2015, the World bank funded 103 projects in Africa amounting to US $11.6 billion (The World Bank, 2015). Similarly DFID (Department for International Development-UK) for the 2015-2016 FY has pledged US $287 million to Africa for 220 projects (DFID, 2015). Lastly, USAID(United States Agency for International Development) does not have figures for Africa specifically, but has a budget for 2015-2016 FY of US $50.3 billion in total financing (Kerry, 2015). This amount of money going towards development projects in Africa is just one of the many reasons to examine what is occurring between policy, development projects, and scientific literature.

In the field of international development Young & Court write that researchers, practitioners, and policy makers live in parallel universes. Parallel universe is analogy to the minimal communication between the different aspects of international development (Young & Court, 2006). Often times researchers are not understanding why there is opposition to policy change when well-defined and resounding proof of a policy is presented (Young & Court, 2006). Aggravation is

common among policy makers concerning access, understanding, and time frames of valuable research (Young & Court, 2006). Practitioners/Development Project Planners often just do what they need to to get a project completed with the information they have available at the the time due to time constraints concerning projects (Young & Court, 2006). All of these issues lead to believe that a model of better communication and transparency would be helpful to all involved. As well as a network of data that could be of use to all parties involved in order to create a better outcome for all involved. This would be of particular interest for practitioners, policy makers, and academics in the field of international development.

Another assumption involving international development are the linear interactions between policy, development projects, and scientific literature (Young & Court, 2006). This assumption is often not the reality of what is occurring (Young & Court, 2006). The reality involves many multi-way processes that are formed by interactions and a way of understanding of knowledge (Young & Court, 2006). These multi-way process consist of the way actors in this process interact with other actors and spheres. For instance, practitioners may interact with the scientific literature throughout project development, but not interact with policy documents until the very end. These interactions create a particular understanding of the knowledge that is being produced. The same multi-way process can occur for all practitioners, policy makers, and academics. Policy processes alone are complex, non-linear, and chaotic (Naess et al., 2011). Adding research and

development projects just adds more layers and complexity that interact in many different ways and that will be explored throughout the paper.

2.2 Background of Malawi

Malawi is a landlocked country in southeastern Africa, bordered by Tanzania, Mozambique, and Zambia. The population of Malawi is 16.7 million people (The World Bank, 2014). Like many African nations Malawi was colonized by the British in 1883. Malawi then gained independence from Britain in 1964(Government of Malawi, 2015).

From 1964-1994 Dr. Hastings Kamuzu Banda was president and in 1970 he was named president for life. Kamuzu was a dictator that forced homes to grow maize on all fields and many things such as movies, mail, and music were highly censored. Kamuzu did improve the transportation and communication systems, and the estate sector, but the smallholder farmers were not successful (Kadzamira, 2014). In 1993, with pressure from the public a vote was held and a multi-party democracy was voted into place. In the 1994 democratic election Bakili Muluzi was elected, he was a member of the minority group of Muslims in the Yao tribe. He was re-elected in 1999, many Christians from the north were upset and so conflicts begun between the Christians and the Muslims countless properties and mosques were destroyed (Kadzamira, 2014). Muluzi was also accused and criticized for selling off maize surpluses to other countries and keeping the millions for himself in overseas accounts along with his accused embezzled donor funding (Kadzamira, 2014).

Muluzi held office until 2004 when Bingu wa Mutharika was elected. Bingu achieved high rates of agricultural production and food security during his first term due to the large amount of funding he allocated to farm subsides. The economy seemed to turning a corner (Kadzamira, 2014). Bingu was then re-elected in 2009 and soon was accused of being arrogant and autocratic. Bingu tried to isolate his vice president Joyce Banda by expelling her from the party because she would not support his brother as the next presidential nomination. Nevertheless, she remained vice president because no impeachment was ever made (Kadzamira, 2014). In 2011 there was discontent due to the countries political and economic situation. During this time long queues for fuel existed if it was even available and prices of basic goods saw increases. Protests started soon due to surmounting financial pressure (Kadzamira, 2014). The army dealt with the protest harshly and 19 demonstrators were killed. Which lead to international donors growing dissatisfaction with humanitarian issues and the economic situation (Kadzamira, 2014). Many donors withheld funding and Malawi lost millions of dollars in a much needed aid at critical time when all else in the country was at a breaking point. Paralleling all of the above mentioned issues, Bingu suffered a heart attack, eventually it was released to the public that he had died on April 7th, 2012 (Kadzamira, 2014).

Vice President Joyce Banda, had a constitutional right to be president however because of the preceding events many supporters of Bingu did not want her to become president (Kadzamira, 2014). Banda was appointed president and soon moved to adjust the polices of Bingu's administration. These policies included

restoring diplomatic relations with donors, repairing the economy, and eliminating government corruption (Kadzamira, 2014). In Malawi she is known for devaluing the currency which was backed by the International Monetary Fund (IMF) donors. While many Malawians criticized her due to the hike in inflation rates and increased prices of goods. Eventually the currency started to stabilize and economic growth doubled in her first 2 years in office (Kadzamira, 2014). The economic growth was overshadowed by a government corruption scandal. This scandal became apparent when the Ministry of Finance ,who was investigating government corruption was the target of an assassination attempt (Kadzamira, 2014). The investigation exposed the "cash-gate" scandal. Which involved high level government officials being involved in corruption and fraud including some of Banda's cabinet ministers. An independent audit states that more than $30 million had been stolen in a 6-month period. However, future reports stated it closer to somewhere between $100 million and $250 million (Mutharika, 2015). The 'cash-gate' scandal is said to have reduced the amount bi-lateral aid. The term bi-lateral aid is government to government transfer of funds, aid being provided to the Malawi government directly. Many of the Malawi government projects are funded by this bi-lateral aid. This made going through the government an even bigger point of concern due the increased amount of corruption occurring in the government. Banda's perceived involvement in the "cash-gate" scandal made her re-election in 2014 a long shot and Peter Mutharika, brother of Bingu wa Mutharika, was elected under suspected voting irregularities (Kadzamira, 2014).

All of these political changes and aspects play a role in development projects, policy, and scientific literature. In particular, these political issues have affected donor funded projects due to the various times that donor aid has been withheld and then redistributed under different conditions, making it very difficult to plan ahead with any certainty. According to current president Peter Mutharika on BBC's Hardtalk with Zeinab Badawi in December 2015, he is facing three difficulties; "cash-gate", donors pulling out, and last year's floods that were the worst in Malawi history. It is also stated that the 40% of donor aid that goes into government spending is now bi-passing the government and going directly to NGO's (Non-Governmental Organizations) and those in need, rather then been funneled through a corrupt government. Mutharika believes this to be undermining the government and a violation of sovereign rights. While this is interesting as well as pertaining to the future of Malawi in terms of development funding it is not the focus of what will be examined in this paper. However, this displays the complex nature of development projects, policy, and scientific literature which is important to note for the context of this paper.

3. Methods

3.1 Justification of case

Malawi was chosen as the case for this study due to a certain level of understanding of the country and the region by the author. In order to better understand SSA as a whole it is helpful to take a microscope to one area and then zoom out and apply it to the region, knowing that not all will apply but some key themes could develop. From this perspective, Malawi was chosen as a way to understand some similar trends that are occurring in SSA. Throughout the paper there is also a focus on forestry and land-use sector. The reasoning behind this is a need to focus on a specific grouping with in the environmental sector to better understand the exact key areas, recommendations, and gaps. Forestry and land use sector were used specifically due it being close to the median of the sectors of articles. However, "environmental projects" sector was also equally close to the median of 15.5, but not being specific sector and rather an overview, a deeper exploration might not be as meaningful. The "agriculture" and "climate change" sectors could have also been possible areas of focus due to the large number of articles. However, the agriculture sector had many articles by the same few authors, thus not being an overview of the scientific literature but rather a focus on what specific authors are saying. The "climate change" sector had a wide variety of topics making it difficult to find themes and commonalities, hence not being used as a point of focus. Using the "forestry" sector throughout the paper has allowed for continuity and ease of comparison among spheres.

3.2 Analytical framework

In order to make sense of the complex interactions and relationships of policy, development projects and scientific literature on environmental issues, an analytical framework was developed, seen in Diagram 1. This approach has enabled the author to compare the environmental sector and courses of action emphasized in three spheres, government policy, development projects, and scientific literature. The purpose of this is to create a systematic way to understand how these three spheres interact with one another in Malawi. Understanding the way these spheres interact with one another can assist in creating a more effective and efficient way to implement sustainable development projects in Malawi and in SSA. The findings for each of these spheres are reported separately (sections 4.1, 4.2, 4.3 respectively). Finally, in the Discussion section the findings from each of the three spheres are contrasted to identify overlaps or gaps in terms of topics being focused on in these spheres. Overlaps mean that topics are focused on in all of three of spheres. While gaps are referring to topics that may only be discussed in one or two of the spheres, not all three, and not the focus. The inference made is that overlap between spheres demonstrates an increase in interaction and shaping other spheres with knowledge. While gaps display a lack of interactions and shaping other spheres with knowledge. This systematic approach allowed for a complex concept to be easily understood.

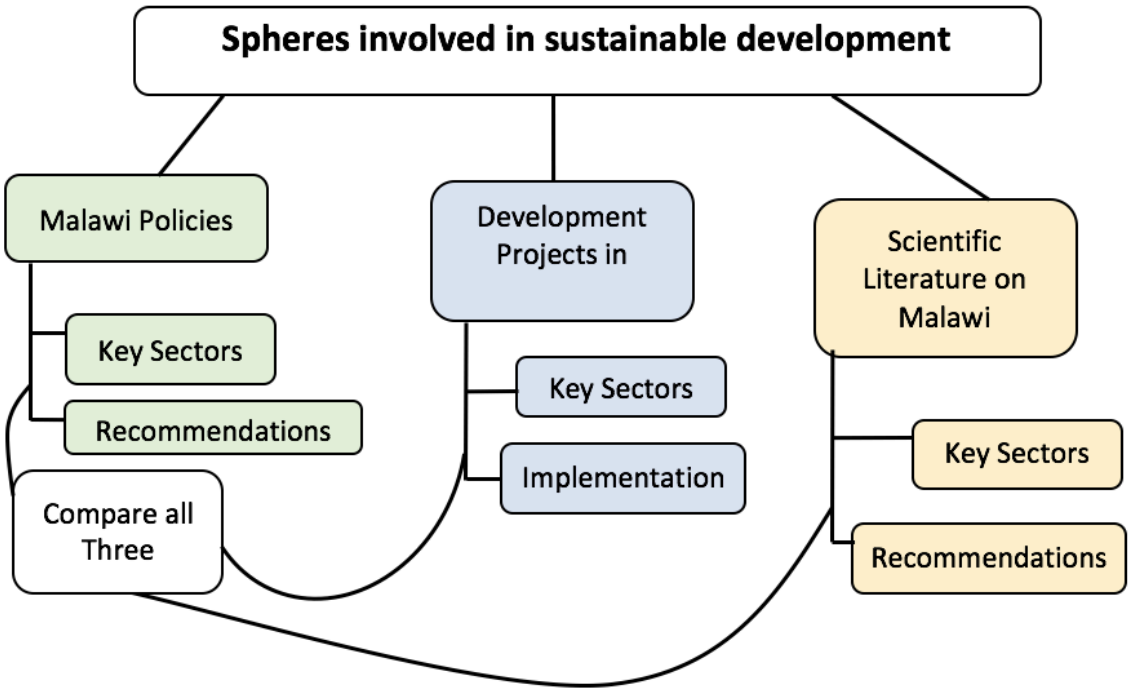

Figure 1: Analytical Framework

3.3 Data sources

Secondary data was obtained as follows. For the study of the scientific literature, 87 scientific journal articles were found in various online databases such as: Springer, ScienceDirect, Proquest, Project Muse, Gale, Cambridge and Wiley using key words. A few of the key words were Malawi, Environment, Forestry, Agriculture, Energy, and Climate Change. Journal articles collected were from 2005-present, this was done to account for the lag time in publishing peer reviewed journal articles. This time frame was chosen due to making sure the events occurring are current but also allowing for enough time for items to be published or disclosed to the public.

To find Malawi national government policy online searches on various government websites were done along with various searches on environmental topics. The analysis of national government policy documents consisted of four in total that are related to the environmental sector and released by the Government of Malawi (GOM). Four Policy documents were reviewed, there was no systematic way to find policy documents. Government of Malawi websites were searched as well various other search engines to find four policy documents that met the timeline of 2010-present which also related to the environmental sector and/or climate change. These four documents were written by the Malawi National government with the aid from outside organizations.

These documents will be reviewed in the following paragraph. The first and most recent report is the Intended Nationally Determined Contributions (INDC) which was created prior to the COP21. All INDC were submitted to the United Nations Framework Convention on Climate Change(UNFCCC) website and Malawi submitted theirs on October 8th 2015. The next policy report is the Environmental and Natural Resource Management(ENRM) Support to Malawi which was approved in February of 2013 by the Government of Malawi (GoM) under the Ministry of Environment and Climate Change Management, this plan is to cover from 2013 to 2016. The third policy is the National Climate Change Policy, this report was released by the Ministry of Environment and Climate Change Management in the Environmental Affairs Department. The Climate Change Policy document was to bring the country into 2020 and was in response to the last report looked at here, the Malawi State of Environment and Outlook Report

from 2010. The Malawi State of Environment and Outlook Report from 2010 was released by the Ministry of Natural Resources, Energy, and Environment in the aim to try provide knowledge, create a baseline, and to inform policy makers.

For the analysis of development projects first key donor agencies in Malawi were established. Donor agencies funding environmental sector related issues were then shortlisted. This shortlist of donor agencies was then researched on projects occurring in Malawi concerning the environment. The shortlist revealed three main players; The UK Department for International Development(DFID), the United States Agency for International Development(USAID), and The World Bank. These three donor organizations were chosen due to having projects focused on environmental aspects as well as being large donors to Malawi projects. The European Union is also a large donor to Malawi but their focus is more on the improvement of the macroeconomic environment (35-40% of total funding) and about 25-30% of funding on agriculture with a focus on the economics of agriculture rather than techniques in the field. So while this is interesting it did not completely pertain to the study at hand. Also Norway is a large donor to Malawi but it's focus is on health and education, while those are important, they once again not the focus of the study.

The information was obtained from the online websites of the organization and/or reports produced about the specific projects being assessed. The specific projects were then broken down into four categories; forestry/land use, agriculture, energy, and climate change. In order to find projects in Malawi the websites of the selected three organizations were used to find the most up to date

information, though finding accessible information on current projects was a challenge. The time frame that will be explored will be from 2010-present, mostly focusing on development projects having started before 2014. With all that in mind an establishment of the key donor organizations was made and then projects were reviewed. Table 3 in the Appendix has all the development projects that were reviewed for this analysis.

3.4 Organization of data

In order to interpret the data it was broken down further for ease of interpreting and understanding. 87 journal articles were found to be suitable for the study were organized by the key words used in the search for the articles mentioned above. These key words were adopted as sectors for evaluation. However, it may seem redundant to have "environmental projects" and "environment" as a sector for evaluation because of the overarching nature of the categories. For this study it was important to keep them as a separate sector of evaluation in order to see some of the general trends that came out of the journal article search as well as sector specific. The scientific journal articles were analyzed by reading the abstracts, introductions, recommendations, and conclusions. Notes were recorded on each of the articles to in order to examine the correlation between both the policy documents and development projects.

All four of the above mentioned policy documents were read and dissected. During this dissection process key players, a vison, priority areas, and concreate actions of each policy document was discovered. These discoveries were then put

in to a table by policy document which is in the appendix in Table 1 that allowed for ease of comparison to the scientific literature.

The environmental development projects for the three development agencies were broken down into four categories. Those categories are: Forestry and Land-use Projects, Agriculture projects, Energy projects, and lastly Resilience and Climate Change projects. This allowed for grouping of the projects but still allowed each project to be examined individually. Each projects implementing organization, amount funded, key players, goal of the project, actions of the project, and duration of project was examined. This information was then entered into a table format in order to better understand the data that was being collected. These tables were developed to help maintain order and ease understanding of the information. All of the tables mentioned above can be found in the appendix.

3.5 Challenges to collecting data

Several factors posed challenges to data collection this section will address those based on each sphere. The scientific literature had a few factors that posed as challenges. The first was minimal amount of literature from 2010 to present focusing on Malawi and the environment specifically. The second was the fact of human error, a systematic method was used to determine relevance but some human error could have occurred.

The development projects also had some challenges in obtaining accurate data. In order to determine what kind of aid projects were being funded and implemented in Malawi, first it was needed to know who the major organizations

that funded projects in Malawi. Two factors made this difficult, first the devaluation of the currency and second the "cash-gate" scandal both of which were discussed previously. Both of these factors resulted in donor budget support suspension during the examination period for this study, which in turn lowered other donor's confidence. At the same time a decrease by 20-25% in the exchange rate for outside currency was occurring. All of these factors posed issues to obtain accurate data on donor financing during the time period of this study.

Several factors posed challenges to data collection and organization concerning the policy documents. First was the timeframe, in order to compare all three documents from scientific institutions, donor agencies, and the government the time period needed to be the same. Due to this only four policy documents released by the Malawi national government were found. The time frame examined for this paper is from 2010 to the present. The second factor was finding environmental reports or aspects of reports that concern the environment. Many government policy documents were found but finding ones that related to the environment was the difficult portion.

4. Findings

4.1 Scientific Literature

This section will answer the first research question, what are the key areas addressed and recommendations being made in the environment related scientific literature for Malawi?

Table 1

Scientific Journal articles segregated by sectors for evaluation

Sectors for Evaluation	Total Articles
Environmental Projects	15
Environment	12
Forestry	16
Agriculture	17
Energy	10
Climate Change	17
Total Articles	87

The 87 journal articles were broken down by sectors for evaluation, as previously mentioned the sectors originated from search words used to find the journal articles and sectors of development projects. These sectors are displayed in Table 1 with the total articles found for each. “Environmental projects” and “environment” may seem redundant seeing that all of the sectors are environment related. However, the two categories give a broad overview of environmental topics that would be addressed if searched just by environmental projects or environment. This is important to provide understanding of what is being said about the environment as whole rather than sector by sector. As seen in Table 1

agriculture and climate change had the most followed by forestry. The key findings and recommendations made for each sector in Table 1 will be examined below.

The "environmental projects" category in Table 1 consists of a broad array of themes, the most common theme was sustainable forest management with five of the fifteen articles represented here (Kadyampakeni et al., 2015; Nyoka et al., 2011; Senganimalunje et al., 2015; Sanchez, 2011; Zulu, 2012) Also conservation agriculture was a common theme with two articles of the fifteen represented (Tesfaye et al., 2015; Kamanga et al., 2010). Other topics included: water quality, energy, nutrition based agriculture, fisheries management, pollen history, soil management, environmental impact assessment, and land resettlement (Grimason et al., 2013; Adkins et al., 2010; Kerr et al. 2011; Van Zwieten et al., 2011; Beuning et al., 2011; Mohamoud, 2013; Kosamu, 2011; Muller et al., 2014). The recommendations concerning sustainable forest management are community empowerment, service providers providing organizational and finical management, increased transparency, not one-size-fits-all Community Based Natural Resource Management(CBNRM), and promotion of of non-extractive livelihoods (Kadyampakeni et al., 2015; Nyoka et al., 2011; Senganimalunje et al., 2015; Sanchez, 2011; Zulu, 2012). The recommendations on the topic conservation agriculture stated in the articles were the improvement of spatial databases, investing in alternative feed sources, use of nitrogen fertilizer, intercropping, and training extension works as well as smallholder farmers (Tesfaye et al., 2015; Kamanga et al., 2010).

The “environmental” sector in Table 1 focus area was agriculture with specifics on agriculture soil management and fertilizer subsides (Mloza-Banda et al., 2016; Blythe, 2013; Dryer et al.,2012; Holden et al., 2015; Joy et al., 2015; TerAvest et al., 2015; Thierfelder et al., 2015). Other topics but not the focus of the articles included hydroelectric power, adaptation, energy balance of lake Malawi, and economic costs of extreme whether (Kaunda et al., 2013; Pangapanga et al., 2012, Lyons et al., 2011; Pauw et al.,2011). The recommendations for agriculture soil management are using conservation agriculture in response to climate variability and development of crop management strategies specific to conservation agriculture (Mloza-Banda et al., 2016; Blythe, 2013; Dryer et al.,2012; Holden et al., 2015; Joy et al., 2015; TerAvest et al., 2015; Thierfelder et al., 2015). The recommendations for fertilizer subsides are: targeting vouchers more effectively to the resource poor, a more comprehensive study on fertilizer subsidy program, supply of seed to local market, and seed accessible to farmers with limited cash (Mloza-Banda et al., 2016; Blythe, 2013; Dryer et al.,2012; Holden et al., 2015; Joy et al., 2015; TerAvest et al., 2015; Thierfelder et al., 2015).

The “forestry” sector focuses on deforestation four of the sixteen articles, (Bandyopadhyay et al., 2011; Chibwana et al., 2013; Kamala et al., 2014; Wiyo et al., 2015) and forest management/forest conservation five of the sixteen articles (Fisher et al., 2010; Senganimalunje et al., 2015; Zulu, 2013; Zulu 2012, Zulu,2010). In the forestry sector the recommendations varied quiet widely, though the most common thread in terms of recommendations was co-management or partnerships for forest management. Another common

recommendation was community or local involvement in forest management. Some topics in the articles were: agriculture subsides effects on forest conservation, forest biomass, baobab fruits and tree diversity, customary land rights, agroforestry, and charcoal. Forestry and land-use sector is examined more closely due to it being close to the median of all the articles, as mentioned in the methods section. Focusing on the forestry sector throughout the findings portion will provide for an in-depth examination of all of the spheres, scientific literature, policy and development.

The "agriculture" sector in Table 1 focused mostly on conservation agriculture and sustainable agriculture (Molza-Banda et al., 2016; Munthali et al., 2013; Ngwira et al., 2014a; Ngwira et al., 2014b; Ngwira et al., 2011; Ngwira et al., 2013; TerAvest et al 2015; Tesfaye et al., 2015; Thierfelder et al., 2015; Thierfelder et al., 2013). However, in this search several articles were written by the same author, this would assume that they are discussing similar topics and recommendations, a concern for evaluation. The dominant recommendation in the agriculture search was government or policy support to access critical inputs such as fertilizer, herbicides, and seeds. The underlying recommendation is to increase agriculture yields while continuing sustainable farming practices.

In the "energy" sector in Table 1 the primary focus in four of the ten articles was biomass usage (Gamula et al., 2013a; Gamula et al., 2014b; Zalengera et al., 2014; Zulu 2010). Some of the other areas were LED lighting, geothermal electricity generation, electric consumption relation to GDP, hydroelectric, and solar, though not focused on. The recommendations made for biomass usage were

as follows: new energy development strategies, prioritization of the energy sector in policies, allocation of more funds, incentives to the private sector to enlist in renewable energy, modernization of biomass, Community Based Forest Management(CBFM) expansion, and increase usage of energy conserving stoves (Gamula et al., 2013a; Gamula et al., 2014b; Zalengera et al., 2014; Zulu 2010).

In the "climate change" sector displayed in Table 1, emphasis was placed on adaptation to climate change represented by four articles of the seventeen (Arbdt et al., 2014; Brown, 2011; Jørstad et al., 2015; Chidanti-Malunga, 2011). The two most common themes in terms of recommendations are the implementation of a mainstream adaptation policy and the integration of indigenous or local knowledge into climate change polices (Arbdt et al., 2014; Brown, 2011; Jørstad et al., 2015; Chidanti-Malunga, 2011). Other article topics varied widely from infrastructure to hydropower to urbanization. Therefore, no common themes or recommendations could be established with any commonality on these other topics.

4.2 Policy Documents

In this section the following questioned will be answered: What are the priority areas and recommendations being made in the environmental national policy and strategic government documents of Malawi? The Intended Nationally Determined Contributions (INDC) which was created before the COP21 to openly outline what post-2020 climate actions they propose to take under the new

international agreement. The Environmental and Natural Resource Management(ENRM) Support to Malawi highlights current and emerging ENRM issues reflected in other policy documents. The National Climate Change Policy which will contribute to the attainment of sustainable development in Malawi. The Climate Change Policy intended to create an environment for the development of a nation-wide and coordinated approach which meets the needs of all sectors while continuing sustainable development. The Malawi State of Environment and Outlook Report aims to provide knowledge, create a baseline, and to inform policy makers in the environmental sector.

In the Appendix, Table 1 conveys who are the key players for each report, the vision of the report, priority areas, and concreate actions that are intended to occur. This table was used to clearly understand what the priority areas and recommendations that are being made. The United Nations Development Program(UNDP) was involved in the production of three of the policy documents. All documents mentioned or alluded to an increase in outside financing. Increases in outside funding is expected from a developing country that is considered low income (The World Bank, 2015). Agriculture was a focus in all four of the documents examined and agriculture yield was mentioned in three of them. This is not all that surprising because the agriculture sector is the leading contributor to the Malawian economy, contributing to 80% of foreign exchange earnings and employing 80% of the countries total workforce (Mwase, et al., 2014). Forestry was emphasized in all four of the documents that were reviewed. Deforestation is increasing due to an increase in population as well as the dependence on biomass

as an energy source for much of the country (Wiyo et al., 2015). Adaptation and Mitigation in terms of climate change was stated in two of the documents as sub-headings with a variety of sectors and polices listed under them. The International Panel on Climate Change identified in the 2007 report that Africa is at a high risk of climate change affecting basic needs such as: water, agriculture production, nutrition, and soil profiles. Two of the documents give attention to an increase in data and research to better improve policy development as well as implementation. The forestry sector will again be a point of focus due to previously stated reasons and for continuity of comparison between spheres.

The INDC from Malawi contains many important references and strategies for forestry in relation to climate change. These are made from both an adaptation and mitigation perspective. To begin with the mitigation portion on forestry is combined with land-use as a sector and five key concreate actions are mentioned in the INDC (Government of Malawi, 2015). Afforestation, reforestation and forest conservation and protection of catchment areas is one concreate action to be taken (Government of Malawi, 2015). Another concreate action is to upscale afforestation, reforestation and forest conservation and protection of catchment areas. Implementation of payment for ecosystem service for hydroelectric dams is another concreate action (Government of Malawi, 2015). Promotion of non-extractive livelihoods from forests is the fourth concreate action (Government of Malawi, 2015). The last concreate action is promotion of sustainable production of fuel wood by establishing woodlot plantations and forest management (Government of Malawi, 2015). These last two are the two actions that do not

require any outside funding to complete, the first three are all dependent on outside funding. These are the key actions to mitigate climate change. Though a brief portion on forestry and other land-use in relation to mitigation discussed two other mitigation actions (Government of Malawi, 2015). These actions are in agreement with the newly approved government of Malawi REDD+ Program Action Plan (Government of Malawi, 2015). The actions mentioned are protection and conservation, of existing forests and afforestation which includes tree planting in addition to natural and assisted regeneration. In this section it is discussed that a majority of these actions are conditional upon external support finically as well as technical aspects. A point of interest was the implementation of payment for ecosystem service for hydroelectric dams, this is not a common payment for ecosystem service but with the hope of energy reliance it may be an option (Government of Malawi, 2015). The idea is that people who were displaced or lost use of a particular ecosystem due to the hydroelectric dam would be compensated. However, there is much debate on the adequacy of payment received. The main points to take away from this are that afforestation, protection and conservation in existing forests is of high importance along with external funding to be able to complete these actions (Government of Malawi, 2015). This portion focused on mitigation in terms of forestry in the INDC, the following will address what is in the INDC related to adaptation measures in the forestry sector.

On to the adaptation segment, in which forestry was also was reviewed. The adaptation measure has two key actions, support research in drought tolerant and fast growing tree species and expand afforestation and forest regeneration

programs. Overtime communities may adapt by planting tree species that are drought tolerant and fast growing such as bamboo is an adaptation strategy developed by the Government of Malawi (Government of Malawi, 2015). Another adaptation strategy proposes that forest regeneration could stimulate bee-keeping and indigenous mushroom harvesting which reduce the amount of forest extractive activities (Government of Malawi, 2015). Minimal points were made in terms of actual actions to be taken concerning adaptation and forestry.

The Environmental and Natural Resource Management (ENRM) Support to Malawi policy recommendations document has forestry listed under the section of other environmental policies. This portion focuses on The Malawi Growth and Development Strategy (MGDS) that identifies the significance of the forestry sector to national development (Government of Malawi, 2013). The MGDS has an impressive goal of planting 200,000 hectares of forest to reverse the negative impacts of deforestation, though this is far from being reached (Government of Malawi, 2013). Another strategy of the MDGS is encouragement to plant indigenous tree species such as mahogany as well as participatory community-based forestry efforts (Government of Malawi, 2013). It is also stated that a low national priority has been given to the forestry sector, this is shown through the fact that the forestry ministry was moved to six different ministries in the span of 13 years (Government of Malawi, 2013). Another point discussed in the MGDS section states that between 2008-09 the forestry department received about one fifth of a proposed budget that was required to carry out activities (Government of Malawi, 2013). The mention of planting indigenous tree species mahogany in the

ENRM is somewhat different than planting drought tolerant and fast growing species such as bamboo as mentioned in the INDC. This is one concern, that each new policy is advising for people to plant different species of trees or plants, depending on what the current mainstream thought is, this could be problematic in the implementation stages.

The Malawi National Climate Change Policy under adaptation discusses the promotion of payment for ecosystems services through programs such as REDD+, biodiversity offset, and CDM (Government of Malawi, 2012). The mitigation policy priority area was forestry, as a way to stabilize green-house gas concentrations in the atmosphere (Government of Malawi, 2012). This will be achieved through the control of deforestation via afforestation, stronger legislation for sustainable extraction, marketing and export of timber, and the reduction of dependence on fuel wood by promotion alternatives which would then move the majority of Malawians up the energy ladder (Government of Malawi, 2012). Afforestation was the focus once again, it was in both the adaption and mitigation portions of the INDC but was not discussed in the brief portion on forestry in the ENRM support to Malawi. REDD+ was focused on in the INDC including a detailed action plan. However, some new concepts came up in the Malawi National Climate Change Policy such as Clean Development Mechanisms(CDM). The CDM is a project-based method that credits emissions reductions from green-house gases reduction projects in developing countries (Carbon Market Watch , 2015). However, many are skeptical of the effectiveness of the CDM due to the lack of climate benefits, sustainably benefits, and scale playing such a large role. The Malawi National

Climate Change Policy document was brief, with the focus on more broad issues surrounding climate change.

The Malawi State of Environment and Outlook Report was extensive in coverage, the focus here is Forests and Woodlands in Chapter 8. Forest and woodlands cover the following topics: classification for forest resources, current status of forest resources, economic importance of forests and woodlands, threats to forestry resources, impacts of deforestation and forest degradation, and strategies for sustainable management of forests (Government of Malawi, 2010). The recommendations included are: improving forestry data collection, improving forest governance, control plantation fires, develop an adaptation strategy for climate change-related threats to forestry, and initiate payment for ecosystem services program (Government of Malawi, 2010). While this document was a report rather than a policy document it had some valid recommendations for 2010. Though it appears that some of the same issues and recommendations are being made in 2015 in the INDC.

Looking at the over arching key areas and recommendations for all of the policy documents in terms of forestry will allow for a snapshot of what the policy documents have in common. Payment for ecosystem services were a recommendation in the INDC, the ENRM support of Malawi, and the Malawi State of Environment and Outlook Report. All four of the policy documents discuss adaptation measures in relation to the forestry sector. The INDC and the Malawi National Climate Change Policy both recommend afforestation to mitigate forest related issues, afforestation differs from reforestation in that afforestation focuses

on planting forest in areas that have not previously had forests on the land. In one way or another forest governance was focused on in all of the policy documents. The INDC recommends the protection of conservation areas. The ENRM support of Malawi recognizes the lack of funding for the Forestry department which is the focus of forest governance. The Malawi National Climate Change Policy focuses on stronger legislation for sustainable extractions of forest goods. Lastly the Malawi State of the Environment and Outlook report directly states improving forest governance as a recommendation.

4.3 Development Project

This section will address the following, what are the key areas in the environmental sector that are being addressed and implemented in current development projects? In Table 2 below an overview of the development projects organized by aid organization and then divided by sector, the sectors that were delineated are Forestry and Land Use, Agriculture, Energy, and Resilience and Climate Change. Table 3 in the Appendix breaks down each of the projects by name, organization funding the project, amount of funding, goal of the project, activities of the project, and the source where the information was acquired.

The forestry sector will again be a point of focus due to previously mentioned reasons and for continuity of comparison between spheres. There are a total of 6 development projects reviewed under the sector of forestry and land use,

3 were funded by United States Agency for International Development (USAID) and 3 were funded by The World Bank as displayed in Table 2.

Table 2:
Environmental Project types

Aid Organizations	Project Sectors			
	Forestry& Land-Use	Agriculture	Energy	Resilience & Climate Change
DFID	0	4	1	2
USAID	3	2	0	0
World Bank	3	4	1	0

The first three that will be examined are funded by USAID, Kulera Biodiversity Project, which took place in Northern Malawi. Kulera Biodiversity Project was implemented by Total Land Care, a Malawian Nongovernmental Organization (NGO) that focuses on small holder farmers and sound management of natural resources. The goal of the project was to improve biodiversity through improved governance of protected areas, improved livelihoods, and increased rural incomes. The project was completed in 2012, therefore the actual data of the completed project was available (ECODIT, 2013). The objective affecting the most people, some 45,000 people, was the training in natural resources management (ECODIT, 2013). This training focused specifically on tree nursery management, tree planting, tree regeneration management, and agroforestry (ECODIT, 2013). Some other activities include improved access to livestock, sustainable agriculture practices, estimates of carbon stocks, beekeeping courses, and village savings and loans programs implemented(ECODIT,2013).

Mountain Biodiversity Increases Livelihood Security (MOBILISE) was a project similar to Kulera and was reviewed under the same evaluation document, Malawi Biodiversity Projects Evaluation. The main difference was the region that each project took place, Kulera as mentioned occurred in the Northern region of Malawi and the MOBILISE project took place in the communities' surround Mt. Mulanje in the Southern region of Malawi. The goal of the MOBILISE project was to improve the ecological status of Mt. Mulanje and community livelihood base by introducing more intensive and diversified natural resource utilization opportunities to neighboring communities and also increase local involvement in mountain management activities(ECODIT). Some of the key actions are similar to Kulera but on a smaller scale. For example, 9,500 people received training in natural resources management, specifically agriculture, beekeeping, fish farming, and land resources management skills (ECODIT,2013). Also 1.2 million tea seedlings and 33,000 macadamia tree seedlings distributed (ECODIT,2013). Fish ponds, co-management agreements, and fuel efficient stoves were also implemented. The last USAID project is the Community Partnerships for Sustainable Resource Management (COMPASS II) project, this is the second installment of the project. Also this project ends before 2010 when the timeline for this research was to be done, it was important project due to it being the second installment. This project was completed in 2009, therefore actual data on what was completed was available(USAID, 2009). The goal of the project was sustainable economic growth through the implementation of the following: increasing the decentralization of natural resource management, enhance rural

communities' capacity to sustainability manage their natural resources, and increase sales of natural resources-base products(NRBP) (USAID, 2009). The project focused on site-based market driven value chain support for Community Based Natural Resource Management (CBNRM) and NRBP as well as the support of REDD, Drip Irrigation, and Horticulture Production (USAID, 2009).

Three projects from the World Bank were found that fit the timeline and had enough data available to report on in the sector of forestry and land-use. The first being the Shire River Basin Management Program, the goal of the project was to generate sustainable social, economic, and environmental benefits by effectively and collaboratively planning, developing, and managing the Shire River Basin's natural resources (The World Bank, 2015). This project is the first phase of several to undertake to most urgent water related infrastructure investments while protecting natural forests wetlands and biodiversity, which is why it was included in the forestry and land-use sector(The World Bank, 2015). The project experienced some delays due to the widespread floods in January of 2015, but have since resumed work on the project. The second World Bank project related to forestry and land-use was titled Effective Management of the Nkhotakota Wildlife Reserve. The goal of the project was to ensure effective management of the Nkhotakota Wildlife Reserve through a sustainable management model focusing the Bua watershed (The World Bank, 2014). The expected outcomes were to improve management of systems in the reserve, recovery of degraded biodiversity and increase revenue generation. The completed report was not available seeing that the project was just completed in 2015, so the quarterly report had to be used

to acquire the data. At the quarterly report procurement of a tractor, five motorcycles, fuel provisions, rations for field staff, and metrological equipment had been completed (The World Bank, 2014). As well as the training of resource staff and prosecutors. At this point six scout houses had also been completed. This project seems to focus mostly on the procurement of items that are supposed to assist in the management of Nkhotakota Wildlife Reserve. The last World Bank project is the Community Based Rural Land Development Project, the goal of this project is to increase agriculture productivity and incomes via decentralization, voluntary community-based land reforms. At first glance this may seem to be more of an agriculture sector project, it is actually focusing on land reforms to increase agriculture productivity therefore being placed in the forestry and land-use sector. The main focus was to get land poor households that owned 1 hectare or less of land legal rights to more land, this was done by strengthen the land administration institutions in the project areas, capacity building and monitoring and evaluating. At the end of the project some 30,000 incomes increase and 1,800 family's maize production increased. The World Bank projects seem to be focused on tangible items such as infrastructure, goods, and land with training as an add-in.

This portion will give a brief overview of what the projects overall objective or accomplishments were and whether they have been met. Two of the USAID projects were supposed to be focused on biodiversity Kulera and MOBILISE but focused more on training of CBNRM, tree nurseries, NRBP, and beekeeping. These may fall indirectly into biodiversity but the direct link to biodiversity is hard to find without more time after the project has been completed. The COMPASS II project

also focused on CMNRM and the support of NRBP. As previously stated the World Bank projects are more focused on tangible items such as infrastructure, goods, and land with capacity building as a support technique to the tangible items. Also the Effective Management of the Nkhotakota Wildlife Reserve project appears focus on forestry management in providing finical assistance via products, of the 7 activities only 2 of them involved training of any sort. The Shire River Basin Management Program discusses protecting natural forests, wetlands, and biodiversity but in this early stage of the project it is difficult to see how that will actually be implemented. Finally, the Community Based Rural Land Development project was directly related to land policies developed by the GoM which had inconsistencies and very little teeth for enforcing land laws.

5. Discussion

5.1 Scientific Literature Relevance to Policy

Now that the scientific literature, policy documents and development projects have been reviewed independently, the overlap and gaps between each section will be examined. First the scientific literatures relevance to the policy documents will be reviewed. The scientific literature was then reviewed by sector with a relevance rating to the policy documents that had been reviewed.

Table 3:
Scientific Literature Relevance to Policy Documents

Sectors	Relevance Rating				
	0-Not Relevant at all	1-Weakly Relevant	2-Mostly Relevant	3-Completely Relevant	Total
Environmental Policy	1	7	4	3	15
Environment	2	3	4	3	12
Forestry	4	5	3	4	16
Agriculture	2	5	10	0	17
Energy	4	4	1	1	10
Climate Change	4	7	5	1	17
Total	17	31	27	12	87
% of Total	19.5%	35.6%	31%	13.9%	100%

Table 3 displays that weakly relevant was the highest occurrence at 35.6% of the total articles followed by mostly relevant at 31% in terms of total number of articles. With fewer completely relevant 13.9% and not relevant at all at 19.5%. Forestry had the highest number of completely relevant number of articles found relating to any of the environmental categories previously mentioned. Agriculture

had the highest combined mostly relevant and completely relevant relationship to policy documents reviewed, but with all falling the mostly relevant category.

The thematic overlap between scientific research topics and national government environmental policy is overall weak. This suggests that the policy relevance of the scientific research on environmental issues in Malawi is not high there are not many completely relevant articles, only 13.9%. This also indicates that neither policy nor academia are influencing one another. To clarify academia is not influencing policy and policy is not influencing academia in the case of Malawi in the environmental sector. However, a combined percent of 66.9 of weakly relevant to mostly relevant displays that some overlap does exist. Though without recommendations and specifics issues being more aligned it can not be stated for certain that research is indeed informing policy measures or policy is informing research.

5.2 Scientific Literature Relevance to Development Projects

The same process of relevancy was completed for the development projects as for the policy documents in relation to the scientific literature. Though even less articles were completely relevant to the journal articles only 3.5% as Table 4 displays, and only 11.5% mostly relevant. The thematic overlap between scientific research topics and development projects is overall weak. This suggests that the development relevance of the scientific research on environmental issues in Malawi is not high there are not many completely relevant articles, only 3.5%. This

also indicates that neither development nor academia are influencing one another. To clarify academia is not influencing development projects and development projects are not influencing academia in the case of Malawi in the environmental sector. The highest number of articles fell into the weakly relevant category displaying that only 1-2 of the development projects had the same topic and recommendations or 2-4 projects discussing the same topic. Also 35.6% of the article topics were not discussed in any of the development project Using the forestry and land-use sector as case study within Malawi as a case study it was displayed that the development projects on the ground do not coincide with what the scientific literature or policy documents, however there is some overlap.

Table 4:
Scientific Literature Relevance to Development Projects

Sectors	Relevance Rating				
	0-Not Relevant at all	1-Weakly Relevant	2-Mostly Relevant	3-Completely Relevant	Total
Environmental Policy	2	12	1	0	15
Environment	5	3	2	2	12
Forestry	3	9	4	0	16
Agriculture	5	8	3	1	17
Energy	7	3	0	0	10
Climate Change	9	8	0	0	17
Total	31	43	10	3	87
% of Total	35.6%	49.4%	11.5%	3.5%	100%

Forest Management which includes CBNRM, forest governance, and co-management were discussed in the scientific literature, policy documents, and development projects. However, forest management is where the overlap between all three areas stops. Deforestation is the focus of the scientific literature and

afforestation is scattered in the policy documents but afforestation is not any of the projects primary goals. Though seedlings were given out, or tree nurseries were started in a few of the development projects the direct issue of afforestation was not there. Payment for ecosystem services was in many of the policy documents but only mentioned briefly in both the scientific literature and development projects. Climate Change adaptation in terms of forestry was a focus in the policy documents but was not specifically brought up in either the scientific literature or the development projects, though many of the concerns in both could be considered adaptation measures. Similar results can be seen for the other sectors but using forestry and land-use as a focused has allowed for a more specific and narrowed examination of the overlap and gaps.

Lastly when both the policy and development projects percentages of relevance to the scientific literature was averaged, it became clear that no significant overlap was occurring. Table 5 below displays the averaged percentages, with only smallest percentage 8.7% representing completely relevant and 42.5% weakly relevant there is a clear disconnect between scientific literature, policy documents, and development projects. This research reinforced an assumption that was made that each of these spheres are working independently of one another, as in silos as mentioned in the introduction.

Table 5

Averaged Percentages: Policy and Development

Relevance Rating	Percentage
0-Not Relevant at all	27.6%
1-Weakly Relevant	42.5%
2-Mostly Relevant	21.2%
3-Completely Relevant	8.7%

While these findings were focused on the environmental sector in Malawi, similar disconnects between academia, policy, and practitioners can be seen across the region. (Vogel et al., 2007; Court et al., 2005; Young, 2005; Naess et al., 2011, Dehkordy et al., 2013, Mwase et al., 2014; ODI, 2004; Darkoh, 2009). These disconnects can not only transcend regions but also sectors. Similar disconnects can be seen when dealing with the HIV/Aids epidemic, issues surrounding adaptation, reduction of poverty, and primary education just to name a few (Court et al.,2005; Young, 2005). The first step to better understanding the implications of these disconnects between spheres, is to accept that this is not a liner process. Academics, policy developers, and practitioners desire linear processes with clear answers to concerns. However, the bridging of research, policy, and practice is much more complicated, it is similar to a chaotic web, as previously mentioned (Vogel et al., 2007; Court et al., 2005; Young, 2005). This chaotic web is anything but linear, it dynamic, based on spatial and temporal information. Acknowledging this a enormous first step to better understanding and improving research-guided policy and practice, that will be discussed in the recommendations portion of this paper.

6. Recommendations

In this portion of the paper recommendations will be made on how academics, policy makers, and practitioners could improve relationships, interactions and communications between the spheres.

For evidence-based policy to be effective the peripheral situation has to be just right and three items are necessary, evidence that is credible and well communicated, political circumstances that allows policy-makers to be responsive to new discoveries, and well formed connections are created by researchers and policy makers (Court et al.,2005). Input from research or science does not just need to occur at the bringing of the process of developing a policy and project but can and should be brought in at a variety of points along the way in the process (Vogel et al., 2007). This would allow for a more integrated way of incorporating research into policy and practice.

Creating credible evidence is one of the solutions to having effective evidence-based policy, while this may not seem like a concern with peer reviewed journal articles that most academics have their finger tips but this is an issue for the developing world (Court et al., 2005; Young, 2005). Higher education with a focus building a capacity for research should be a goal for developing countries. Who knows a regions specific political, historical, and issues better then someone living in and experiencing it? Developing in-country national's skills to produce creditable research could be an amazing feat all on its own but to influence policy and development projects would be quite amazing as well. Achieving this through academia is one way to achieve this another option is think tanks. Think tanks

have an advantage to give information to policy makers in the proper format and at the exact time that it is needed, rather then trying to feed the journal cycle and needs like much of the academic work does (Young, 2005). However, if the Think Tanks do not have the proper organizational capacity it may be difficult to persist and prosper in very competitive arena.

Political circumstances that allow for policy makers to be responsive to new scientific insights and understanding is a whole other issue about politics. While this is very important aspect of policy, no recommendations can be made on this issue from the findings in this paper.

One key aspect to this integrated approach at improved evidence-based policy is better communication between all of the players mentioned. One way that could occur is to create some kind of interactive and integrated database that allows for all involved in a certain topic, region, project, etc. to have access to the same information. While this may not be as simple as just creating a database, there are a lot of other issues that come with this. Such as: Who will manage this database, how will it work with copyright laws in terms of published journals, who would have access and would this limit access to some? While this could possibility alleviate some of the current issues with time lag on journal publications influencing policy and development projects but not without some concern and issues as well. No recommendation mentioned here will be a simple solution due to the dynamic web that is being analyzed.

One aspect of this could be to develop national, regional, and global networks (Young, 2005). One example of this that comes from Malawi is the

pressure that donors applied via the Southern African networks to promote national civil societies participation in the Malawi Poverty Reduction Strategy Papers (Young, 2005). Though not all examples were as effective as the one mentioned above there is a role for networks to play in developing research-based policy to implement sustainable development projects.

A few recommendations have been discussed above and while no one is the single solution all of them could assist in improve the current dynamic web that involves research, policy and practice. More research in SSA on this issue is need along with more place-based research on specific outcomes of the aforementioned recommendations is needed.

7. Conclusion

An examination of Malawi's scientific literature, policy documents and development projects in the environment sector has assisted in a better understanding of some of the concerns that will be amplified with the increase of climate change funding. Analysis of the key areas and recommendations of the scientific research, policy, and development projects allowed for the comparison of all three. The comparison of the scientific literature to policy documents as well as the comparison of the scientific literature to development projects has proven that Malawi along with the rest of SSA is lacking an effective way for the three spheres to interact to produce the best possible solutions. This could become problematic in the years to come with increased funding and donor projects in the works on climate change related issues. However, some steps can be taken to assist in "bridging the gap" or making the system more effective. These steps include the creation of credible evidence in the region by people experiencing the issues, improved communication, and well formed connections between all involved in the process. This paper contributed to a better understanding of the way development projects, environmental policy, and scientific literature interact and relate with one another in the context of Malawi which could assist in creating a more effective and efficient way to progress development projects in all of SSA.

Solutions to improve linkages between the spheres are not only limited to the aforementioned solutions but could expand based on increased research in a variety of locations. Stakeholders from a variety of backgrounds should work on trying to strengthen links and cooperation to create research that should inform

policy and practice. This complicated web may be difficult to fully understand to increased research on the topic could assist in developing new techniques for cooperation. This will continue to be an ongoing issue, understanding the complexities of these relationships could improve sustainable development projects.

Acronyms

SSA	Sub-Saharan Africa
COP21	Conference of the Parties 21
DFID	Department for International Development
USAID	United States Agency for International Development
IMF	International Monetary Fund
NGO	Non-Governmental Organization
INDC	Intended Nationally Determined Contributions
UNFCCC	United Nations Framework Convention on Climate Change
ENRM	Environmental and Natural Resource Management
GoM	Government of Malawi
UNDP	United Nations Development Program
IPCC	International Panel on Climate Change
REDD+	Reduction of Emissions for Deforestation and Degradation
MGDS	Malawi Growth and Development Strategies
CDM	Clean Development Mechanism
MOBILISE	Mountain Biodiversity Increases Livelihood Security
COMPASS	Community Partnerships for Sustainable Resource Management
NRBP	Natural Resources-Based Products
CBNRM	Community Based Natural Resource Management
UNDP	United Nations Development Program

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Appendix

Table 1: Malawi Policies 2010-2015

Malawi's Intended Nationally Determined Contribution 2015

Key Players	Vision	Priority Areas	Key Concrete Actions
-United Nations Development Program(UNDP) -United Nations Framework Convention on Climate Change(UNFCCC) -Malawi Government -Malawi Ministry of Finance, Economic Planning and Development in collaboration with sector ministries.	-The overall goal of the Policy is to promote climate change adaptation and mitigation for sustainable livelihoods through measures that increase levels of knowledge and understanding and improve human well-being and social equity, while pursuing economic development that significantly reduces environmental risks and ecological scarcities. -In addition, Malawi has sector-specific policies which have mainstreamed adaptation and mitigation activities, as well as implementation frameworks that foster development and transfer of technology and capacity building.	**Mitigation Contributions by Sector:** -Energy -Industrial Process and Other Product Units -Agriculture -Forestry and other land-use -Waste **Adaptation Measures by Sector:** -Agriculture -Water -Human Health -Wildlife -Energy -Forestry -Fisheries -Gender -Infra structure	**Mitigation Contributions by Sector:** Energy -Produce 2000 solar water heaters -Produce 18 million liters of ethanol/year -Install 20,000 solar PV systems -Produce 2 million liters of bio-diesel/year -Increase members using mass transport by 1% -Increase hydro electric power by 800MW Industry -Support research and use of alternative cement materials -Develop national standards for alternative building materials -Support industries engaged in carbon capture and storage -Increase use of soil-cement stabilized block and rice husk ash blended cement to around 10% of current cement production Agriculture-Support development of market based polices and legal instruments to shift decisions from financial to environmental decisions -Develop appropriate extension and training materials for climate resilient agronomic practices -Build capacity to implement and monitor the agriculture NAMA. Forestry and land-use-Afforestation, reforestation and forest conservation and protection of catchments -Upscale afforestation, reforestation and forest conservation and protection of catchments -Implementation of payment for ecosystem service for hydroelectric dams -Promotion of non-extractive livelihoods from forest -Promote sustainable production of fuel wood by establishing woodlots plantations and forest manageme Waste-Construct controlled landfill for biogas recovery to generate up to 240 GWh of primary energy (95 GWh of electricity) per year -Promote solid and water waste reduction practices at household, institutional and industry level to redu waste generation -Process municipal solid wastes into fertilizers **Adaptation Measures by Sector** Agriculture-Increase irrigation at smallholder level -Develop financial mechanisms to support crop insurance targeting smallholder farmers

			Water-Implement integrated catchment conservation and management program -Develop and enhance climate information and early warning systems Human Health -Build capacity to diagnose, prevent and control climate-sensitive diseases such as malaria diarrheal diseases and malnutrition -Construct more health centers in order to improve access to health facilities within a walking distance of km Energy -Promote use of biomass briquettes as substitute for firewood and charcoal -Promote solar PV and use of energy efficient bulbs Forestry -Support research in drought tolerant and fast growing tree species -Expand afforestation and forest regeneration program Wildlife-Provide watering points at strategic locations of national park/ game reserve -Support capacity building in wildlife institution to lead in adaptation initiatives e.g. translocation and cull Fisheries -Capacity building in aquaculture and cage culture fish farming practices -Adopt eco-system services approach in the management of fisheries resources Gender-Promote gender mainstreaming in policies, program and projects -Support capacity building program for vulnerable groups Infrastructure-Construct infrastructure for flood control, transport, etc -Develop and implement climate related building codes/standards Industry-Promote research in industrial technologies

Environment and Natural Resources Management Support to Malawi 2013-2016

Key Players	Vision	Priority Areas	Concreate Actions
-Malawi Ministry of Environment and Climate Change Management (MoECCM)	**Output 1:** Environment and natural resources management (ERNM) mainstreamed in policies, development plans and programs at national level and implemented in 15 disaster prone districts.	Harmonization of the following areas: -Natural Resource Management -Water Resource Management	**Top Activities for Output 1:** -Review ENRM, lands and other legislation. -Integrate pro-poor sustainable ENRM into budgetary and donor allocations. -Harmonize sectorial legislation and policies to include poverty-environment linkages. -Develop alternative accounting methods for specific sectors that take into account ENRM-Poverty links a parameters. -Research on payment for ecosystems Services(PES) and other innovative ENRM financing options. **Top Activities for Output 2:**

-Malawi Ministry of Finance(MoF) -United Nations Development Program(UNDP)	**Output 2:** Data and knowledge of the impact of environment and natural resource degradation collected and made accessible to decision makers in government, private sector, and civil society. **Output 3:** Coordination mechanisms and implementation arrangements for Environment and Natural Resources established and used at national level and in disaster prone districts.	-Other Environmental Polices -Agriculture -Forestry -Fisheries -Mining /Extractive Industries	-Implement priority actions under the NE&CC Communication Strategy -Review & Update present data collection systems on ENR including poverty linkages. -Support functioning of national special data center. -Establish and Maintain national linked ENR databases. -Update ENRM and CC website. **Top Activities for Output 3:** -Support for establishment of Environmental Protection Agency. -Development of Strategic Environmental Assessments for sectors and districts. -Support and Training to National Council for Environment on Poverty. -Undertake feasibility study into setting up trust fund for ENR projects. -Support for implementation of ENR projects under trust fund.

National Climate Change Policy 2012

Key Players	Vision	Priority Areas	Concreate Actions
Ministry of Environment and Climate Change Management (MoECCM)	-Contribute to the attainment of sustainable development in line with Malawi's National goals, as outlined in Malawi's Growth and Development Strategy II and Vision 2020. -Achieved through better adaptation to, and mitigation against, climate change, with a focus on	-Adaptation -Mitigation -Capacity Building, Education, and Awareness -Financing Mechanisms -Institutional Coordination -Population -Research,	<u>Adaptation</u> -Promotion of practices and livelihoods that support and maintain sound environmental integrity - Developing Capacity building and training programs to enhance knowledge and skills in adaptation and mitigation - Integrate relevant and validated indigenous knowledge and practices in adaptation and disaster respons programs - Promote sustainable agricultural intensification practices that increase productivity while maintaining environmental integrity and ecosystem services - Promotion of payment for ecosystems services through programs such as REDD+, biodiversity offset anc Clean development mechanism Ensuring the participation of all stakeholders including vulnerable groups, in adaptation processes at all

	resilience building for Malawi's citizens. -guide actions that reduce community and ecosystem vulnerability through adaptation and mitigation -Intended to guide harmonized approaches by different sectors and institutions towards building community and ecosystem resilience to climate change. -promote climate change adaptation and mitigation for sustainable livelihoods through measures that increase levels of knowledge and understanding and improve human well-being and social equity, while pursuing economic development that significantly reduces environmental risks and ecological scarcities. **Outcomes:** **1.** Reduced vulnerability to climate change impacts in Malawi **2.** Controlled net greenhouse gas emissions from Malawi **3.** Increased awareness of	Technology, Systematic Observation -Cross-Cutting Issues and Disadvantaged Groups	levels <u>Mitigation</u> - Control of deforestation through various means including: afforestation stronger legislation for sustainable extraction, marketing and export of timber and reducing dependence fuel wood by promoting alternatives that would substantially shift the majority of Malawians up the ener ladder -Promotion of commercialization and use of renewable, energy efficient and low carbon technologies including: reducing duty on the import of renewable, low carbon and related technologies that are not manufactured in Malawi and promoting the local manufacture, establishment of and access to renewable energy technologies - Improving land use and agricultural practices for sustainable intensification of crop and livestock production, including: conservation agriculture, improved management of manure and fertilizers, improv soil and water management practices, integrating crop and livestock production in agriculture production systems to enhance resilience to climate change, development of human settlement policy to optimize a land use and building resilience to climate related disaster risks. <u>Capacity Building, Education and Awareness</u> - Increasing the availability and access of relevant high quality, complete and regularly updated data - Improving individual and institutional capacity for analysis of data, hazard mapping, modelling and the u of scenario based tools for long term planning - Access to, and development of, user friendly toolkits/manuals and other practical knowledge sharing methods for climate change advocacy - Supporting inclusion of climate change into the educational curriculum at primary school, secondary schools and higher education including technical and vocational training institutions <u>Financing Mechanisms</u> - Legislation is passed to ensure that levies are made on externalities that contribute to climate change. -Proactively supporting government, non-governmental and private sector institutions seeking multilater and bilateral resources and financing for enhanced climate change adaptation and mitigation -Increasing knowledge and skills to develop proposals and negotiate access to climate change finance -Incentivizing private sector investment in climate change adaptation and mitigation approaches, that wil promote innovation and create more employment. <u>Institutional Coordination</u> -Analysis and monitoring of legislation relating to climate change issues to resolve and prevent, or minimi contradictions and conflicts -Introduction of appropriate institutional arrangements for policy implementation

	climate change impacts, adaptation and mitigation measures **4.**Improved social and ecological resilience **5.** Improved policy coordination and harmonization for climate change **6.** Increased funding in the national budget for climate change adaptation and mitigation **7.**Improved integration of cross cutting issues across policies, strategies and activities		Population - Increasing awareness and education on linkages between population, sexual and reproductive health, gender and climate change; -Investing in health programs that adequately and efficiently meets the needs for family planning -Support empowerment of women through access to education, health facilities, micro finance and reproductive health services Research, Technology, Systematic Observation -Encouraging and supporting research on climate change to help Malawi make informed and evidence ba decisions to improve its adaptation and mitigation strategies -Supporting technology transfer and innovation to enhance low carbon growth in both public and private sector -Supporting the rehabilitation, maintenance and upgrade of existing weather and environmental monitor stations and to introduce new stations to provide reliable data for better understanding of climate chang and guide appropriate action against its impacts -Supporting the documentation and validation of indigenous knowledge, through community engagemen so that it will be fully integrated within the overall knowledge base that informs policy and action

Malawi State of the Environment and Outlook Report 2010			
Key Players	**Vision**	**Priority Areas**	**Concreate Actions**
-UNDP (United Nations Development Program) -UNEP (United Nations Environmental Program - LEAD SEA (Leadership for the Environment and Development-Southern and Eastern Africa) -CEDRESSA (Center for Sustainable Rural Development and Alimentary Sovereignty)	-Aims to integrate with the Malawi development framework form the beginning, and thus its main focus is on the Malawi Growth and Development Strategy(MDGS) and its key thematic areas.	-Agriculture & Food Security -Irrigation & Water Development -Transport infrastructure -Energy generation & supply -Integrated rural development -Prevention and management of nutritional disorders -HIV & AIDS -Climate Change -Environment & Natural Resources -Nsanje World Inland port	**National Policy Frameworks for Land & Agriculture:** -The Malawi Growth and Development Strategy(MGDS) is a shift from social consumption to sustainable economic growth and infrastructure development and places emphasis on nine key priority areas of management. -National Agriculture Policy Framework(NAPF) and Strategy's purpose is to increase agricultural productiv so as to ensure food security and sustainable agriculture growth and development. -The Greenbelt Initiative aimed at using available water resources to increase production, productivity, income and food security at both household and national levels. -The Agriculture Sector Wide Approach (ASWAp) offers strategies for supporting the priority activities in t agriculture sector in order to increase agricultural productivity. -National Environmental Policy 2004 seeks to promote environmentally sustainable crop and livestock production through ecologically appropriate production and management systems, and appropriate legal and institutional framework for sustainable environmental management. -National Land Policy provides a framework that will ensure tenure security and equitable access to land. *These concreate actions represent only one chapter's recommendations and strategies due to the repor being 300 pages long.

Aid Organizations	Table 2: Environmental Project types			
	Forestry/Land	Agriculture	Energy	Resilience/Climate Change
DFID	0	4	1	2
USAID	3	2	0	0
World Bank	3	4	1	0

Table 3: Environmental Development Projects

Forestry and Land Projects

Project Name	Organization	Amount of Funding	Goal of Project	Activities of Project	Years	Source
Kulera Biodiversity Project	USAID Implemented by Total Land Care	$7M	To Improve biodiversity through improved governance of protected areas, improved livelihoods, and increased rural incomes.	-44,419 people (28,864 men and 15,555 women) have received training in natural resources management and/or biodiversity conservation. Specifically, the trainings dealt with nursery management, tree planting, tree regeneration management, and agroforestry. -5,381 hectares are under sustainable agriculture practices, including under crop diversification, conservation agriculture, soil and water conservation, and soil fertility improvement. -8.3 million trees have been planted. -1,289 households have access, or improved access, to small livestock (e.g., goats, chickens) for nutrition and income, including the “pass on” of livestock from the original beneficiaries. -257 communities or groups have established Village Savings and Loans programs. -785 hectares of natural woodlands on customary village lands are under community management. -2,402,024 coffee seedlings have been produced for planting by smallholders. -5 courses (180 participants) have been offered in beekeeping for coffee growers. -82,000 macadamia trees have been planted in Ntchisi and Ntchenachen. -A preliminary estimate of current carbon stocks in	2009-2012	TotalLandCare.org

				project area based on initial inventory plots was completed. -A preliminary estimate of annual carbon stock changes in project area under baseline scenario was completed.		
MOBI+LISE	USAID Implemented by Mulnaje Mountain Conservation Trust	$3M	Improve the ecological status of Mt. Mulanje and community livelihood base by introducing more intensive and diversified natural resource utilization opportunities to neighboring communities and also increase local involvement in mountain management activities.	-9,567 people (4,223 men and 5,344 women) have received training in natural resources management and/or biodiversity conservation. Specifically, the trainings dealt with natural resources management, agriculture, beekeeping, fish farming, and land resources management skills. -1.2 million tea seedlings distributed to farmers. -33,076 macadamia tree seedlings distributed to farmers. -129 fish ponds were constructed. -13 forest co-management agreements and plans developed with communities; 5 submitted to Forestry Department and awaiting approval; 8 under review by Regional Forest Office prior to submission to FD. −4,641 people are using fuel-efficient stoves.	2010-2015	Devex.com
COMPASS II	USAID	$12.56M	To contribute toward USAID/Malawi's strategic objective of Sustainable Economic Growth through implementation of activities driven by the following three objectives: Increase the decentralization of natural resource management, enhance rural communities' capacity to sustainably manage their natural resources, and Increase sales of natural resources-based products (NRBP). Project focusing in the following districts: 1. **Nyika National Park** in Rumphi, Karonga and Chitipa Districts	-A site-based, market-driven value chain approach was created to speed up the CBRNM (Community Based Natural Resource Management) process and identify promising opportunities to generate income as well as spur sustainable resource use. -Created NRBP value chains for that worked with the strengths of rural small holders for the following NRBP: forest honey, aquaculture, mushrooms, baobab, dried fruit, and coffee. -Supported REDD (Reducing Emissions from Deforestation and Degradation), Drip Irrigation, and Horticulture Production.	2004-2009	Compass Report II

			2. **Nkhotakota Game Reserve** in Nkhotakota District 3. **Kasungu National Park** in Kasungu District 4. **Mkuwazi Forest Reserve** in Nkhata Bay District 5. **Kandoli Mountain** in Nkhata Bay District 6. **Lake Malawi, Lake Chilingali and Bua River**, all in Nkhotakota District 7. **Lake Chilwa and Chuita** in Phalombe, Zomba and Machinga Districts 8. **Mulanje Mountain** in Mulanje District.	-Worked with 2,000 villages in 8 districts which included working with government officials as well as 77 private sector and NGO partners.		
Shire River Basin Management Program	World Bank	$145.60 Million	To generate sustainable social, economic and environmental benefits by effectively and collaboratively planning, developing and managing the Shire River Basin's natural resources.	-Establishing of the Shire River Basin Agency and National Water Resources Authority as well as hiring of a director and technical staff -Procuring of critical equipment -Sustainable financing	2012-2018	Wds.worldbank.or
Effective Management of the Nkhotakota Wildlife Reserve	World Bank	$3,141,935	To ensure effective management of the Nkhotakota Wildlife Reserve through a sustainable management model focusing on its Bua watershed area The expected outcomes include improvement in management systems of the reserve, recovery of degraded biodiversity and increased revenue generation.	-Procurement of a tractor and five motorcycles. -Training of resource protection staff -Maintenance of road network in the reserve. -Procurement and provision of patrol rations to field staff. -Provision resources(fuel) for law enforcement support. -construction of six scout houses at Bua Scout Camp. -Procurement of metrological equipment. -Conduct prosecutor/judicial training.	2012-2015	Wds.worldbank.or
Community Based Rural Land Development	World Bank	$22.79 Million	To increase the agricultural productivity and incomes of about 15,000 poor rural families through the implementation of a decentralized, voluntary community-based land reform program on eligible land in the Project districts.	-Increased incomes for 30,500 Malawians -Increase in agriculture productivity 1,800 family's maize productivity and 800 family's tobacco productivity.	2007-2011	Wds.worldbank.or

Agriculture Projects

Project Name	Organization	Amount of Funding	Goal of Project	Activities of Project	Years	Sou
Malawi Agriculture Program	DFID	$56.49 M	To achieve a sustainable increase in agriculture productivity and production while focusing on Maize, legumes, and dairy. The goal of the project will compliment other programs addressing some of the broader constraints to agriculture growth with a focus on the Government Farm Input Subsidy Program(FISP), conservation agriculture, livestock development	-Increased uptake of new technologies for farming. -Increased use and adoption of quality seeds. -Proportion of smallholder maize cultivated area allocated to high yielding maize varieties (hybrid+ OPV) 16% above baseline. -Increase in improved maize and legume seed distributed by the private sector (subsidy and commercial) 4% above baseline. -Increase the number of households per year of program provided with improved seeds through the Farm Input Subsidy Program focusing on women headed households. -Increased maize production -Increase in average maize yields per hectare 4.5% higher than baseline -Increase in Total Legume (restricted to common beans, soya beans, pigeon peas, and groundnuts) Production 26% higher than baseline -Increase in domestic smallholder milk production per year -Average yield increases for additional land under conservation agriculture supported by this program, compared to prior to the program.	2011-2015	devt ker.(gov.
Maize Market Interventions	DFID	$2.5 M	To increase agricultural production and the development of Malawi's fertilizer, seed and maize markets. This project is considering the SOAS evaluation of the Farm Input Subsidy Program (FISP) and taking into account specific program designs and implementation issues.	*Advise on developing and implementing the FUM (Farmers Union of Malawi) & FISP(Farming Input Subsidy Program) monitoring systems:* questionnaire design for the rapid monitoring of coupon systems, input supplies/redemption is one example of this. -*Data system development*: data entry programs and procedures need to be developed for district monitors to enter weekly data and dispatch it to FUM in order to analyze. -*Training*: Provide support for training of FUM district monitors in data collection	2007-2011	devt ker.(gov.

				-*Initial field supervision support*: In the initial stages of data collection support for FUM field supervision of district monitors' data collection and reporting -*Initial data analysis support*: In the initial stages of data analysis will provide support for FUM collation, analysis and reporting of district monitors' data. -*Commissioning support*: Provide support to FUM in the writing of Terms of Reference and invitations to bid, and review and evaluation of submitted bids		
Input and Maize Markets interventions	DFID	$28M	To increase agricultural production and the development of Malawi's fertilizer, seed and maize markets	-5% of total budget was spent on agricultural policy and administrative management -45% of total budget was spent on agricultural development -50% of total budget was spent on food aid/food security programs. *little to no information was found on the specifics of the actual project.	2007-2011	devt ker. gov.
Fertilizer Procurement for the 2011/12 Farm Input Subsidy Program	DFID	$1.7 M	To increase food security, reduce hunger and malnutrition and accelerate agricultural output growth in Malawi by providing 300,000 households with 15,000 tons of affordable NPK (Nitrogen, Phosphorus and Potassium) fertilizer and providing 200,000 households with 10,000 tons Urea, jointly with Norway. An increase in the amount of funding for the 2011-2012 year in the FISP due to a request from the Malawi Government.	-300,000 households receive 15,000 tons of affordable NPK fertilizer and, jointly with Norway, provide another 200,000 households with 10,000 tons Urea. -Increasing the staple crop, maize, by 750,000 tones a year due to the Farm Input Subsidy Program (increasing national production by about a about a third); -Timely delivery of fertilizer before end of November for effective use by targeted smallholder farmers; -Increasing maize yields by 25% from a baseline of 2 tones per hectare from the support to FISP; -1.4 million households (of which 945,000 households supported by DFID)) receive affordable high quality maize and legume seeds.	2011-2012	devt ker. gov.
Feed the Future	USAID	$30 M	To sustainably reduce rural poverty and improve nutrition through the integration of agriculture and nutrition interventions.	-79,000 farmers have been trained in intercropping, the acceptance rate has been low. -Insect and disease management is a part of the package of technologies and practices that INVC(Integrating Nutrition in Value Chains) offers farmers, but only nine out of 25 focus groups interviewed received training -At present, it is not possible to determine the increase in productivity	2012-2016	USA Feed the futu final repo

				due to promoted agricultural production technologies and practices. The lack of reliable measurements of productivity has been compounded by floods and droughts, pests and diseases, or delayed planting. -Adoption of collective marketing—mostly association-led selling and, to a lesser extent, hedging—is taking place. -The Community Care Group Model did improve nutritional status in children at scale and at low cost, and it shows sufficient promise to merit further application.		
Malawi Dairy Development Alliance	USAID	$17.9M	Support 23 milk bulking groups (MBGs), through which farmers accessed credit, inputs and markets across the dairy value chain. This initiative helped to develop domestic economies of scale in milk production, collection and processing	-Increased number of improved dairy animals available to smallholder farmers by improving Artificial Insemination services available to farmers and increasing the quantity of cows placed with farmers -Increased access to inputs & services by small scale farmers and milk bulking groups (MBGs)by improved technical capacity of production service providers and strengthening financial services available. -Increased profitable production and sale of milk by small scale farmers & MBGs" by improving business capacity of farmers, increasing mild production, and improved market access.	2007-2012	Lanc kes. & Mal Dair Allia Fina Rep
Second Additional Financing to the Malawi Agriculture Sector Wide Approach	World Bank	$100 M	To improve the effectiveness of investments aimed at food security and sustainable agricultural growth, and to strengthen the natural resource base in agricultural lands, through a doubling of the area under sustainable land management as a basis for securing ecosystem services and sustainable agricultural productivity.	-Strengthening of Ministry of Agriculture and Food Security(MoAFS)administrative systems, particularly at the district level with a stronger focus on monitoring and evaluation systems; and strengthening MoAFS's capacity to implement the Agriculture Sector Wide Approach (ASWAp) -Enhancing Farm Input Subsidy Program (FISP) organization and implementation, monitoring and evaluation, with a stronger focus on maize and legumes seeds availability -Increasing the nationwide coverage of research and extension activities to reach out to more farmers and to increase FISP payoffs and sustainable impact on smallholders -Improving the efficiency of agricultural research and extension services	2014-2016	Wds rldb org

				while promoting a more pluralistic approach to delivering these services.		
Additional Financing to the Malawi Ag Development Program Support Project	World Bank	$30M	To improve the effectiveness of investments aimed at food security and sustainable agricultural growth, and strengthen the natural resource base in agricultural lands, through a doubling of the area under sustainable land management as a basis for securing ecosystem services and sustainable agricultural productivity.	-Increased maize production -Increased smaller holder agriculture in GDP -Reduction of buying and selling of coupons for agricultural inputs -Increase in cultivated areas at the expense of drought resistant crops such as millet, cassava and sorghum	2012-2016	Wds rldb org
Agriculture Development Program Support Project	World Bank	$32M	To improve the effectiveness of investments aimed at food security and sustainable agricultural growth.	-Increased national maize yields -Increased percentage of food secure rural households -Increased levels of organic matter in conservation farming application areas -Increased the number of staff trained in land administration and management services -Increase in average level of nitrogen use efficiency -Increased number of smallholder farmers using conservation farming -Increased availability of high quality legume seeds	2008-2016	Wds rldb org
Malawi Floods Emergency Recovery	World Bank	$80M	To sustainably restore agricultural livelihoods, reconstruct critical public infrastructure to improved standards in the flood-affected districts, and improve the Government of Malawi's disaster response and recovery capacities	-180,000 households with sustainability restored agriculture livelihoods -82 schools with services fully restored -2 health facilities reconstructed with services fully restored -90 kilometers of roads reconstructed to improved standards -50,000 tons of maize purchased with vouchers.	2015-2019	Wds rldb org

Energy Projects

Project Name	Organization	Amount of Funding	Goal of Project	Activities of Project	Years	Sou
Malawi Energy Efficient Lighting Project	DFID	$4.9 M	To see a 20% reduction in the current peak demand for electricity through the increased use of energy saving lighting and other energy saving measures	20% of the budget was categorized to be spent on environmental policy and administrative management while the 80% was categorized as being spent on energy policy and administrative management. No other information was given.	2010-2014	devt ker. gov.
Energy & Extractives Global Practice-Malawi	World Bank	$13.4 M only 18% of total project amount as of Nov 2015	To increase the reliability and quality of electricity supply in the major load centers with the following components: Electricity network strengthening & expansion; Generation & transmission feasibility studies; Demand side management & energy efficiency measures; Capacity building & technical assistance.	Two of the three key infrastructure contracts at ESCOM (Electricity Supply Corporation of Malawi) have been awarded and commitments under the project have risen to 73% compared to 28% in March 2015. The project may be restructured and/or extended so that the project can achieve the objectives.	2012-2016	Wds rldb org

Resilience/Climate Change Projects

Project Name	Organization	Amount of Funding	Goal of Project	Activities of Project	Years	Sou
Climate Change Program	DFID	$0.5M	To improve Malawi governments capacity to respond to climate change by providing technical assistance.	This will enable the government to climate-proof the policies, strategies and plans of the sectors of the economy. This will benefit 13 million Malawians. No other information was provided	2009-2013	devt ker. gov.

Enhancing Community Resilience Program	DFID	$26M	-To achieve sustainable disaster-resilient communities through community-based best practices, public awareness and policy change. -Increased Capacity of local authorities, communities and individuals to address the impacts of climate change. -Increased capacity of communities and individuals to adapt their livelihoods practices better to the impacts of climate change and variability -Strengthen information sharing by various stakeholders on Disaster Risk Management(DRM) and climate change adaptation. -Strengthen Early Warning Systems(EWS) for climate related slow onset disasters -Strengthen disaster risk reduction and climate change policy and programs.	-Education and Adoption of conservation agriculture -Introduction of high turnover livestock such as pigs and chickens -introduction of giant bamboo and direct planning of trees to enhance afforestation -introduction of energy efficient cook-stoves -increase number of woodlots -increase in solar lights	2010-2016	devt ker. gov.

Table 3