



Implementing Urgent Adaptation Priorities Through Strengthened Decentralized and National Development Plans (ADAPT- PLAN)

A Final Report

For

A Baseline Study and Development of Monitoring,
Evaluation and Learning Systems for ADAPT Plan Project

Prepared For

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LIST OF ACRONYMS AND ABBREVIATIONS

FGD	Focus Group Discussions
GEF	Global Environment Facility
GVHs	Group Village Headmen
LDCF	Least Developed Countries Fund
MEL	Monitoring, Evaluation and Learning
NEP	National Environmental Policy
NGO	Non-Governmental Organizations
SDE	Sustainable Development Excellence
T/A	Traditional Authority
UNDP	United Nation Development Programme

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EXECUTIVE SUMMARY

The Department of Environmental Affairs engaged Sustainable Development Excellence (SDE) Consulting to conduct a baseline survey for the ADAPT-Plan Project. The main objective of the baseline survey is to establish the benchmarks of main indicators under the three main components, namely; **Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level; Mainstreaming of climate change adaptation in development plans at community and district levels and Diversified and strengthened livelihoods for vulnerable people in target areas.** Data, both qualitative and quantitative, were collected at household, district and national levels. Desk review of the relevant public policies and strategies was also conducted to enrich the approach to the design of baseline survey. The benchmarks for each indicator under respective components are outlined in the Results framework. Sustainable Development Excellence (SDE) Consulting was also tasked to develop the Monitoring, Evaluation and Learning Systems for ADAPT Plan Project. The MEL system has also been developed for the project.

CHAPTER I

BACKGROUND OF ADAPT-PLAN

I.1 Programme Description

The Government of Malawi, through the Ministry of Natural Resources Energy and Mining with support from Global Environment Facility (GEF)-Least Developed Countries Fund (LDCF) and United Nation Development Programme (UNDP) is implementing a project known as ADAPT PLAN. The project was developed after realization that significant political will and commitment shown to addressing climate change in Malawi, significant barriers and challenges exist in mainstreaming adaptation into development planning. These barriers include: weak institutional structures, technical capacity challenges and knowledge gaps.

Therefore, the project aims to integrate adaptation into development planning at national and local levels, beginning with 3 sectors (Agriculture, Water and Forestry) in the pilot districts of Nkhata Bay, Ntcheu and Zomba. Integration of climate change adaptation will be enabled by the establishment of adaptation indicators that will be used by the appropriate parties at local and national level to determine the level of finances to be allocated to planned activities, thereby incentivizing active incorporation of climate adaptation and enabling implementation of the national development strategy.

Therefore, the project needs to demonstrate success and impact through positive demonstration by the target sectors and districts to enable integration of adaptation into National planning. It is within this consideration that the project is inviting bids from competent Consultants to develop ADAPT PLAN project baseline, and Monitoring, Evaluation and Learning (MEL) system. The baseline study and the MEL system developed will be the basis for setting project indicators, data collection mechanisms at different levels (from community, district to national level) for project monitoring and impact measurement.

I.1.1 ADAPT-PLAN Project Design

To achieve the ADAPT-PLAN objectives, three districts were selected for piloting. It is being envisaged that activities with the highest impact and best practices during the inception phase would be implemented in all the three selected districts. These are Nkhata Bay in the north Ntcheu in the central and Zomba in the south. The three districts were selected considering the diverse agricultural and natural resources activities throughout the country. To effectively implement and monitor the activities of the project in the inception phase, a baseline study was conducted in the three districts by a team of consultants.

1.1.2 Rationale for the Base Line Survey

The key objective of the Base Line Survey is to establish a benchmark for monitoring the direction and progress of the projects in meeting objectives and to initiate the recognition of the impact of activities implemented. The baseline work will provide information that will assist in determining how the social and spatial distribution of human well-being has changed over the period of the programme. This exercise shall center on the livelihood, knowledge of climate change adaptation measures and mainstreaming of climate change.

CHAPTER 2

2 APPROACHES AND METHODOLOGY

A total of six traditional Authority sites were jointly identified by a team of the consultants and district government officials based on specific criteria. The criteria included the accessibility at the time of assessment, general vulnerability of the area to climate change impacts and also the potential for the areas to show impact within the envisaged project period.

The methodology was designed to achieve the following objectives;

- a) Establish measuring points to be used later for development of participatory monitoring and evaluation (PM &E)
- b) Determine constraints and gaps and a to develop framework within which ADAPT-plan project will operate.

2.1 Data collection logistics

Primary and Secondary data were collected from a broad spectrum of stakeholders, reports, from the community, project and national data.

2.2 Literature review and Desk Analysis

The team reviewed various relevant documents and reports related to the project to understand the design and relevance to Malawi Growth and Development Goals (MGDS). The team also reviewed policies of different implementing agencies. An analysis of interests of the various stakeholders was also carried out. The literature review helped the consultants in designing the approach of the study and development of the data collection tools. The reviewed documents include;

- Natural Environmental policy
- Natural climate change policy
- The natural agriculture policy
- The natural water policy
- National forestry policy
- The fisheries policy
- Reports from other projects

2.3 Sampling

It was determined that a sample of 200 respondents would be picked across the three pilot districts. Teams comprising five enumerators and three principal consultants were formed to collect data in each district. The teams also relied on the assistance of government officials ie district environmental and agriculture staff for guidance and information. The teams spent a total of 12 day collecting data. More time was spent in Nkhata Bay in the north compared to the districts in the other regions. Pre-testing and training of enumerators were done in Nkhata Bay hence the increase in the number of days.

2.4 Stakeholder identification

This was done to identify those stakeholders that need to participate directly in the project and those that shall be mere respondents of a questionnaire. This included sector ministries, and institutions, village committees that are in rural development specifically in afforestation agriculture, food security and natural resources management.

2.5 Stakeholder Consultations

The team conducted in-depth interviews with UNDP and other relevant stakeholders within government departments and ministries including the Environmental Affairs Department. In addition, the team interviewed District Executive Committee members (Sector Heads) in the three project districts. The interviews collected information on various aspects of the baseline in each district. The information enabled the baseline team to understand better the project context and gaps in climate related interventions, which could be entry points for the ADAPT-PLAN project. At community (beneficiary) level, a sample of Group Village Headmen (GVHs) was drawn from each T/A where Focus Group Discussions (FGD) were held with potential project beneficiaries. Within these GVHs, a sample of local leaders was also interviewed as key informants on various issues concerning climate change in general and in relation to project indicators. A total of 18 FGDs were conducted, three in each hotspot. Table I below shows a summary of stakeholders that were interviewed.

Table I:List of stakeholders/Key informants interviewed for the ADAPT-PLAN project

District level	Project / program (Community) level
<input type="checkbox"/> District Environmental Officer (District Project coordinators)	<input type="checkbox"/> Households
<input type="checkbox"/> District Forestry Officer	<input type="checkbox"/> Farmers clubs
<input type="checkbox"/> District Irrigation Officers	<input type="checkbox"/> Local leaders
<input type="checkbox"/> District Fisheries Officer	<input type="checkbox"/> Area Development Committee
<input type="checkbox"/> District Lands Officer	<input type="checkbox"/> Village Development Committee

2.6 Interviews with Stakeholders

The design and plan for data collection involved both structured and semi-structures interviews using questionnaires, checklist for focus group discussions and check list for key informants. Design of these instruments took into consideration existing national data collecting formats. Discussion on crop husbandly practices and livestock production systems, climate change and adaptation, land and environmental management and mainstreaming of climate change adaptation was done at the focus group meetings.

2.7 Data Analysis

Data were analysed using STATA for quantitative data, and summaries and other tools for the qualitative data to come up with meaningful interpretations. Before analysis data were checked for errors and other illogical responses and the data were then cleaned accordingly. The continuous quantitative data were assessed for normality in order to establish the kind of statistics to report. All the data were analysed by the consultants.

CHAPTER 3

3 SITUATION REVIEW

3.1 Policy Review

The Malawi government has a number of instruments put in place to achieve the country's sustainable economic growth and development plans. Among these are policies and strategies whose development is mainly aligned to the Malawi Growth and Development Strategy II and the Vision 2020. This section outlines and briefly highlights the major objectives of these policies and attempts to illustrate how issues of climate change are being tackled and addressed. The policies reviewed were as follows: National Environmental Policy, The National Climate Change Policy, The National Agriculture Policy, National Water Policy, National Forestry Policy and fisheries policy.

3.1.1 National Environmental Policy (2004)

The overall National Environmental Policy (NEP) goal is to promote sustainable social and economic development through the sound management of the environment and natural resources. The policy has specific goals which were framed to ensure Malawians benefit from the environment while maintaining responsible environmental stewardship. Central to the NEP is the engagement of communities in the management of the environment sustainably. In terms of implementation of policy, there are 16 key guiding principles which also focuses on people centred approaches, to a larger extent advocating for strong ownership of the policy by every Malawian regardless of age and vulnerability to environmental disasters;

1. Secure for all persons, now and in the future, an environment suitable for their health and well-being.
2. Promote sustainable utilization and management of the country's natural resources and encourage, where appropriate, long term self-sufficiency in food, fuel wood and other energy requirements.
3. Facilitate the restoration, maintenance and enhancement of the ecosystems and ecological processes essential for the functioning of the biosphere and prudent use of renewable resources.
4. Promote the ecosystems management approach so as to ensure that sectoral mandates and responsibilities are fully and effectively channelled towards sustainable environment and natural resources management.
5. Enhance public education and awareness of various environmental issues and public participation in addressing them.

6. Integrate sustainable environment and natural resources management into the decentralized governance systems and ensure that the institutional framework for the management of the environment and natural resources supports environmental governance in local government authorities.
7. Promote local community, Non-Governmental Organizations (NGO) and private sector participation in environment and natural resources management.
8. Promote the use and application of local knowledge and norms that facilitate sustainable environment and natural resources management.
9. Promote co-operation with other Governments and relevant regional and international organizations in the management and conservation of the environment.
10. Develop and regularly update environmental information systems to facilitate planning and decision-making at local, national and international levels.
11. Facilitate development and regular review of policies and legislation to promote sustainable management of the environment and natural resources.
12. Facilitate development of mechanisms for management of conflicts in the environment and natural resources sector.

3.1.2 The National Agricultural Policy (2016)

The policy reiterates the contribution of Agriculture to national economic development. The policy also highlights the fact that majority of Malawians rely on agriculture as a source of employment. Consequently, the policy also hints at the role of Agriculture in ensuring the national and household food security and nutrition. It has been highlighted in the policy that despite major investments in the Agricultural sector, very little has been achieved overall, largely because of erratic rainfall and thus the policy also has incorporated aspects of sustainable agriculture production and irrigation development. The policy has now explicitly shown the need to incorporate or mainstream climate change issues in agriculture, this has even been reflected in one of the policy statements; *“Promote investments in climate-smart agriculture and sustainable land and water management, including integrated soil fertility management and conservation and utilisation of Malawi’s rich agrobiodiversity.”* The policy has 8 priority areas as shown below:

- 1) Sustainable Agricultural Production and Productivity.
- 2) Sustainable Irrigation Development.
- 3) Mechanisation of Agriculture.
- 4) Agricultural Market Development, Agro-processing and Value Addition.
- 5) Food and Nutrition Security.
- 6) Agricultural Risk Management.
- 7) Empowerment of Youth, Women and Vulnerable Groups in Agriculture.

8) Institutional Development, Coordination and Capacity Strengthening.

The Government of Malawi has consequently, included an objective to improve agricultural productivity through sustainable land management. In order to operationalize the objective, the policy has also specified the strategy and key responsible departments among others is the Department of Environmental Affairs including the Ministry of Natural Resources, Energy and Mining.

3.1.3 National Climate Change Policy 2012

The National Climate Change Policy provides guidance and takes a leading leadership role on the following aspects i) National vision on Climate Change Management, ii) Policy Goals and Objectives for Climate Change Management in Malawi, iii) Principles, Strategies and Institutional Framework for effective management of critical Climate Change issues. 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 wellbeing and social equity, while pursuing economic development that significantly reduces environmental risks and ecological scarcities. The policy has three main objectives which are:

- To effectively manage the impacts of climate change through interventions that build and sustain the social and ecological resilience of Malawians
- To contribute towards the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human-induced interference with the climate system within a timeframe that enables social, economic and environmental development to proceed in a sustainable manner;
- To integrate cross-cutting issues including climate financing, capacity building, research and technology, population, gender, HIV and AIDS through an appropriate institutional framework.

The policy has 7 priority areas, each one of them has its own policy statements and strategies to be implement. The first priority area is adaptation, whose main focus is to reduce vulnerabilities and promote community and eco-system resilience to the impact of climate change. Thus the ADAPT-plan project responds very well to the national climate change policy goal.

3.1.4 National Forestry policy

The Forestry Policy is in the process of being updated, and the new version explicitly considers climate change, especially on REDD, in keeping with the mandate from the MGDSII. The results of this project will provide inputs as to how adaptation can explicitly be incorporated into policy implementation through the strategy working group strategy.

3.1.5 Fisheries policy

The National Fisheries policy is also aligned to the MGDS II, thus the policy recognizes the need for sustainable approaches to national development from the fisheries sector's perspective. The goal of the Policy is to promote sustainable fisheries and aquaculture development in order to contribute to economic growth in Malawi. The policy has 7 priority objectives, none of which mentions or highlights the need for climate change adaptation. However, the policy does mention climate change as an emerging issue under policy statement of the Research and information policy priority.

3.1.6 Water Policy 2005

The National Water Policy is an important tool that the Government of Malawi is using as an overall guide in the management and development of water resources. The policy highlights the imperativeness of protecting the environment in the course of using the national water resources. The policy thus promotes the use of mechanisms such as Integrated Water Resources Management (IWRM) principles and Community-based management of water resources. These mechanisms are meant to foster community ownership of the interventions promoting sustainable water resources utilization and also to enhance inclusiveness of all line sectors in sustainable water resources utilization. The main national water policy goal is *“sustainable management and utilization of water resources, in order to provide water of acceptable quality and of sufficient quantities, and ensure availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Malawian and for the enhancement of the country's natural ecosystems”*.

Some of the major policy components are Water Resources Management and Development (WRMD), Water Quality and Pollution Control (WQPC), Water Utilization, Disaster Management and Policy Monitoring and Evaluation. Each one of these components has its specific objectives and strategies for implementation. The water utilization component has much more sub-components including the Agriculture, Fisheries and Forestry among others. Thus the policy does mainstream sustainable water development at all levels up to community and household levels. The Policy, however, does not have succinct and clear clauses on climate change adaptation.

Chapter 4

4 Findings

4.1 Summary of the study sites

The study was conducted in selected sites in the three intervention sites as shown in Table 2 below. The study was commenced in Nkhata-bay and completed in Ntcheu.

Table 2: Summary of study sites

DISTRICT	TA covered	Statistics	
		N	%
Nkhata-bay	Kabunduli	14	16.5
	Malanda	25	29.4
	Timbiri	46	54.1
Ntcheu	Mpando	97	100
Zomba	Mwambo	70	68.6
	STA Ngwerero	32	31.4

4.2 Demographic Characteristics of the Project Sites

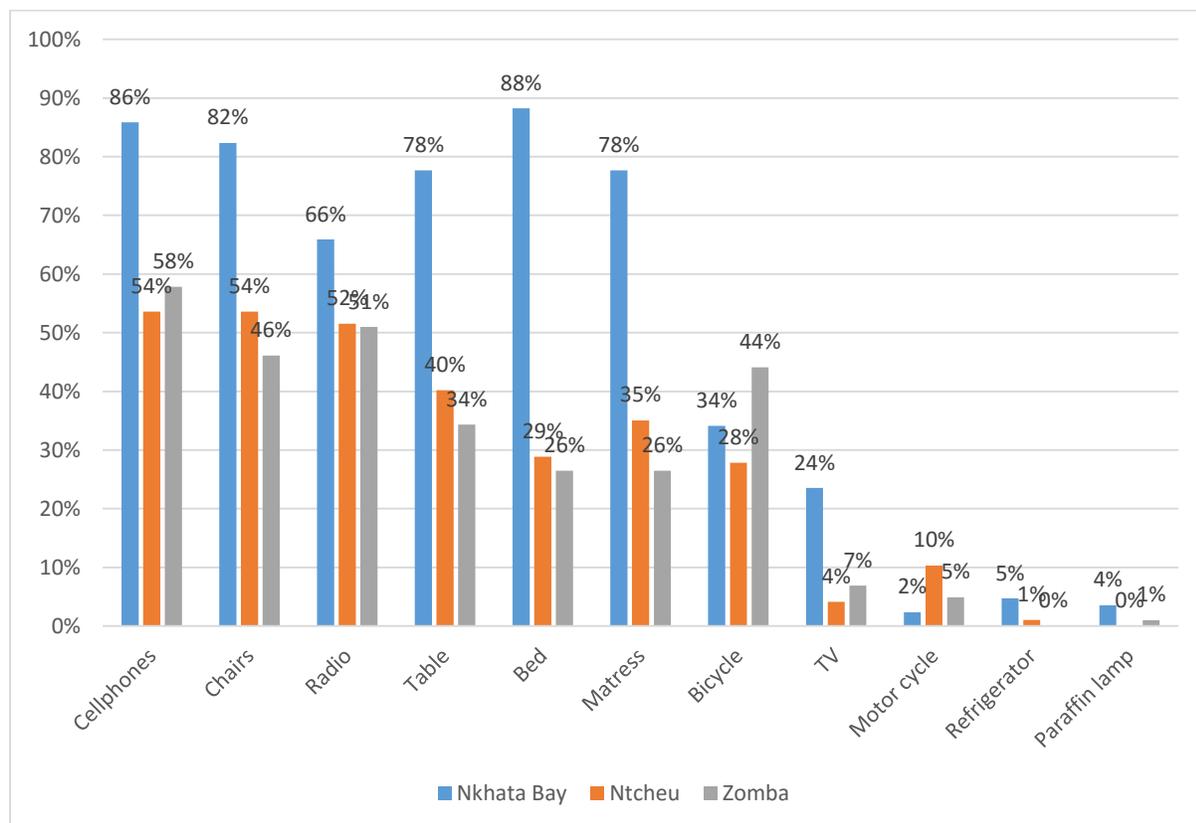
A number of demographic variables were collected in order to have a general picture of the communities in the project sites. The variables include the marital status, age of the household head, education level, the dwelling house which including the type of roof, wall and floor. The situation in all the three districts appears to be similar in many demographic variables except for the materials for construction of houses. Majority are farmers, with household heads within the active age ranges of 41 years. In Nkhata Bay and Zomba the mean number of years spent in school was slightly higher than Ntcheu though the difference was not significant. This has implications with respect to uptake of extension and development related messages, thus necessitating need for adult literacy in all the three districts. More houses in Nkhata Bay were reported to have iron sheets; Ntcheu and Zomba had more grass thatched houses. The majority of the houses are built using burnt bricks. This shows a gradual move away from old-fashioned mud type houses, however, the practice of burning bricks has serious implications on the environment. An increase in the number of households roofed with iron sheets would be a better indicator of improved welfare and can therefore be tracked by looking at proportion of households with houses that are roofed with iron sheets. Current situation is as shown in Table 3.

Table 3: Demographic characteristics

Parameter	Nkhata-bay	Ntcheu	Zomba
Marital Status of Household head			
Married	89.4	81.4	86.3
Single	3.5	0	0
Widow	3.5	7.2	6.7
Divorced	1.2	7.2	3.9
Separated	1.1	4.1	2.9
N	84	97	102
Age of household head (years)			
Mean \pm SD	40.9 \pm 13.6	41.58 \pm 13.1	41.18 \pm 13.3
Educational status of household head			
Mean \pm SD	5.2 \pm 3.8	4.5 \pm 3.8	5.3 \pm 3.8
House type by roof			
Grass thatched	24.7	61.9	65.7
Iron sheets	75.3	38.1	33.3
Tiles	0	0	1.0
N	85	97	102
House type by wall			
Burnt bricks	77.7	52.6	57.9
Mud wall	22.4	40.2	39.2
Cement bricks	0	4.1	
Poled			2.0
N	85	97	102
House type by floor			
Cement	60.0	21.7	15.7
Smearred	40.0	75.3	82.4
Sand or mud	0	3.1	2.0
N	85	97	102

In terms of household assets, it is apparent from the survey that respondents from Nkhata Bay owned most of the assets categories as shown in Figure 1. Asset ownership is a good proxy indicator of better social economic status; this therefore indicates that respondents in Nkhata Bay were better off economically.

Figure I: Household asset ownership



Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.

4.3 Climate Change and its impacts

The section presents result of the baseline on climate change awareness and addresses the objective of strengthening awareness and ownership of adaptation and climate risk reduction processes at local level with the following expected outcomes;

Outcome: Strengthened adaptive capacity to reduce risks to climate-induced economic losses

Outcome: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level

Outcome: Reduced vulnerability to climate change in development sectors

Outcome: Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas

Outcome: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas

- i. Percentage of population that is aware of the impacts of climate change
- ii. Percentage of population that has taken some action to mitigate against the impacts of climate change (climate proofing)
- iii. Percentage of population living in a community with an adaptation plan

4.4 Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level

4.4.1 The percentage of the population that is aware of climate change

Table 4 below presents detailed results on climate change awareness (whether the respondent has considerable knowledge on climate change or not). Overall the awareness on climate change is pretty high across the three intervention districts, with the overall proportion being about 87%, ranging from about 85% in Ntcheu to about 89% in Nkhata Bay. The trend was quite similar at TA level where the majority indicated to have been aware of climate change.

Table 4: Percentage of households aware of climate change at district level

Response	DISTRICT			
	Nkhata Bay	Ntcheu	Zomba	Total
Yes	76 (89.41)	82 (84.54)	90 (87.38)	248 (87.02)
No	9 (10.59)	15 (15.46)	13 (12.62)	37 (12.98)

4.4.1.1.1

4.4.1.1.2 4.5.1.2 Sources of climate change information

The study investigated further to know the sources of information with regards to climate change. Overall radio was reported to be the major source of information at both TA and district level. At district level the overall per cent of respondents indicating the radio as the main source of information was 82%, followed by village leaders and district officials respectively (Table 5). This means radios and village leaders may play crucial role in conveying information to the community.

Table 5: Source of information for climate change (Impact districts), at district levels

Response	District (n, %)			
	Nkhata Bay	Ntcheu	Zomba	Total
Radio	61 (81.33)	72 (87.8)	70 (78.65)	203 (82.5)
Village Leaders	17 (22.67)	23 (28.05)	34 (38.2)	74 (30.08)
Districts Official	20 (26.67)	5 (6.1)	19 (21.35)	44 (17.89)
NGOs	15 (20.00)	10 (12.2)	14 (15.73)	39 (15.85)

Village Development Committee	8 (10.67)	13 (15.85)	16 (17.98)	37 (15.04)
Friends or Relatives	19 (25.33)	8 (9.76)	6 (6.74)	33 (13.41)
Church or Mosque	15 (20.00)	6 (7.32)	7 (7.87)	28 (11.38)
School	9 (12.00)	2 (2.44)	4 (4.49)	15 (6.1)
Area Development Committee	5 (6.67)	2 (2.44)	7 (7.87)	14 (5.69)
Newspaper	2 (2.67)	5 (6.1)	2 (2.25)	9 (3.66)
Television	7 (9.33)	1 (1.22)	0	8 (3.25)

4.4.2 The Climate change in the community

The survey showed that in all the three district the households experienced climate in the past five years and this was reported more in Zomba at 98.89% followed by Nkhata Bay at 97.37% and 95.12% in Ntcheu (Table 6).

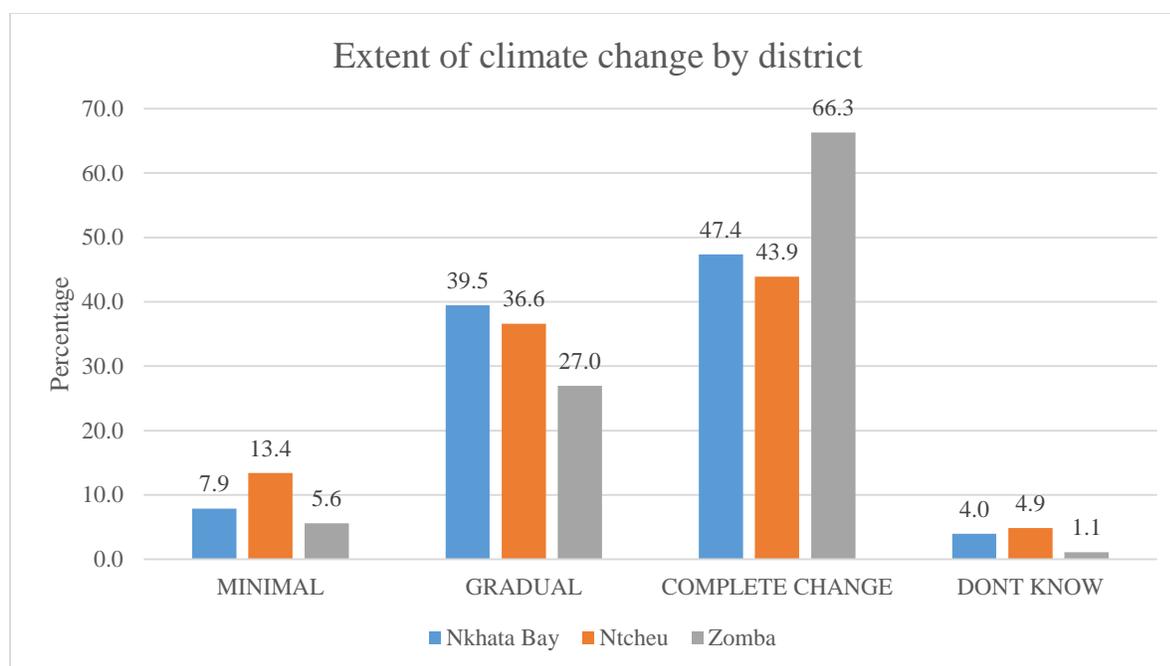
Table 6: Climate change in the community

Response	DISTRICT			
	Nkhata Bay	Ntcheu	Zomba	Total
Yes	74 (97.37)	78 (95.12)	88 (98.88)	240 (97.17)
No	2 (2.63)	4 (4.88)	1 (1.12)	7 (2.83)

4.4.3 Extent of climate change in the communities from the district

In all the districts the study revealed that households had experienced climate change over the past ten years with the majority indicating a complete change at 53.04%, those that had experienced a gradual change were at 34.01%, 8.91% reported to have experience a minimal change and 3.24 % did not about the change. The results have been summarized in the Figure 2 below.

Figure 2: Extent of climate change by district



4.4.4 How has the climate changed across the project districts?

The results on the extent of climate change revealed low rainfall, change in rainfall pattern, dry spells and poor distribution of rainfall as the major indicators of climate change, low rainfall was reported the highest in terms of overall indicators of climate change and this was at 74.58% followed by late start of rainfall at 72.92%.the trend was almost the same in all the three districts, dry spell and poor rainfall distribution featured high across the three districts, floods are experienced more in Zomba and Nkhata-bay (Table 1).

Table 7: Signs of climate change in communities

Response	Nkhata Bay	Ntcheu	Zomba
Low rainfall	86.49	58.97	78.41
Rainy season started very late	82.43	75.64	62.5
Dry spell	55.41	50	59.09
Poor rainfall distribution	44.59	44.87	47.73
High temperatures	35.14	25.64	37.5
Scorching sunshine	32.43	23.08	40.91
Heavy rains with floods	37.84	3.85	36.36
Increased cases of dry spell	24.32	24.36	21.59
Drought	32.43	10.26	18.18
Rains stopping very early	21.62	21.79	11.36

Erratic rains	25.68	2.56	11.36
Strong winds	14.86	1.28	13.64
Low temperature	9.46	3.85	0

4.4.5 Effects of climate change

With regards to the effect of climate change (Table 8), the overall effects were; crop failure and destruction reported at (90.83%) and (60.42%) respectively, pest and diseases at 27.08%, farm loss 26.67%, theft at 17.08%, loss of soil fertility at 14.17% increased price of food stuff at 12.5% and loss of infrastructure at 7.5%. During the focus Group discussions (FGDs), migration featured as the major effect and that it has fueled the spread of HIV as men left their homes migrate to other district or neighboring countries in search for jobs in the process they have ended up remarrying. As men are leaving the homes Women have ended up entertaining other men (prostitution) and is was reported more Zomba followed by Ntcheu.

Table 8: Effects of climate change

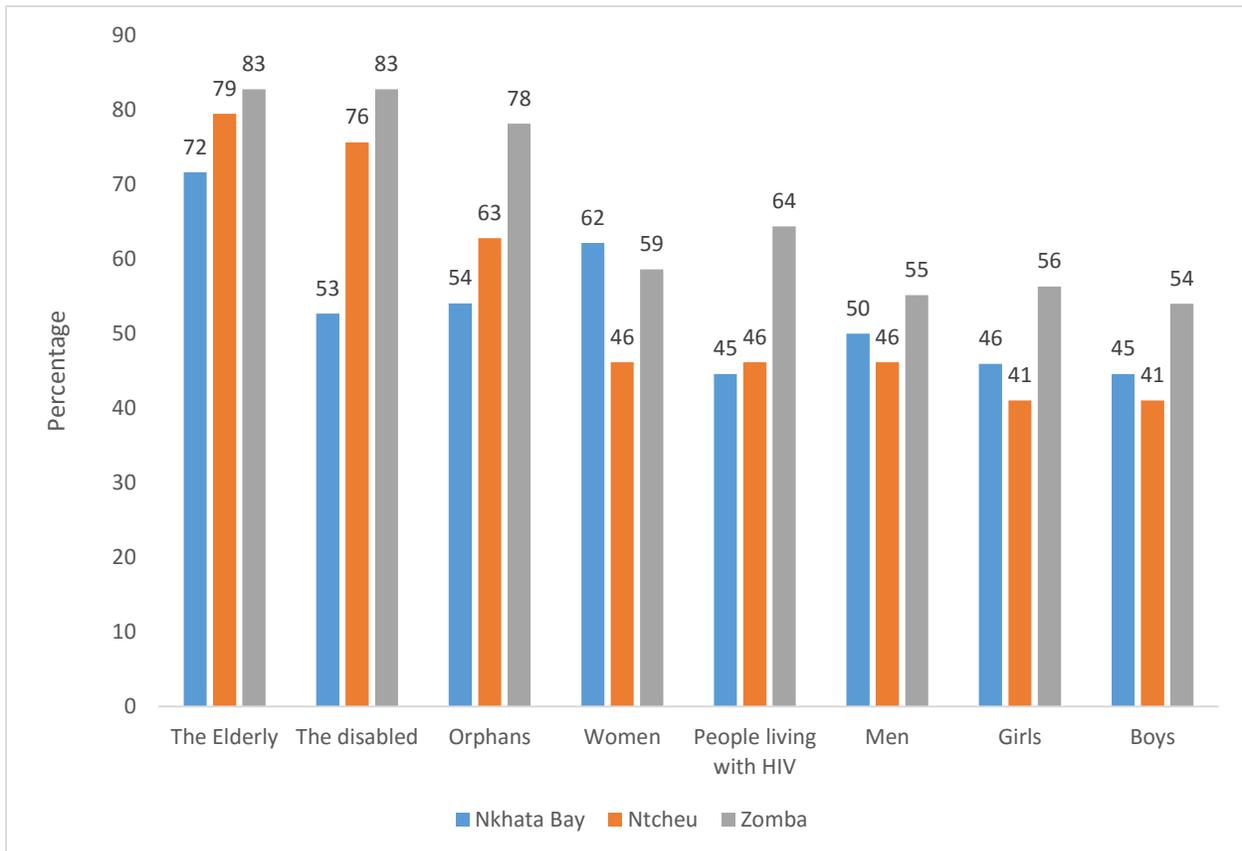
Effect of climate change	N	%
Reduced or crop failure	218	90.83
Crop destruction	145	60.42
Pests and diseases	65	27.08
Loss of farm inputs	64	26.67
Increased cases of theft	41	17.08
Loss of soil fertility	34	14.17
Increased prices of food stuff	30	12.5
Destruction or loss of infrastructure	18	7.5
Long distance or time to fetch water for domestic use	13	5.42
Low pasture production	11	4.58
Death of livestock	9	3.75
Increased cases of prostitution	9	3.75
Increased cases of malaria	7	2.92
Increased cases of cholera	4	1.67
School drop out or absenteeism	4	1.67
Long distance to fetch firewood	3	1.25
Long distance to graze livestock	2	0.83
Migration	1	0.42

4.4.6 Groups most vulnerable to climate change

The study also tried to establish the groups of people that are most affected (*Figure 3*) by the impacts of climate change. Overall the elderly featured as the most affected group at 78.24, the

disabled reported at 71.13%, orphans 65.69% while the women and people living with HIV reported 55.65% and 52.3% respectively. The outcome of the focus group discussion revealed the same trend but emphasized women and children as the most affected group see the figure below

Figure 3: Groups most vulnerable to climate change



4.4.7 Climate Change Adaptation

In all the three districts crop diversification, plant and conservation of natural resource and adoption of irrigation were found dominating at household level as mechanism of adapting to climate change (Table 9). Income diversification, practice of agro forestry, conservation agriculture, planting of early maturing crops were found to be practiced at household level though at moderate level. Manure making, planting of drought resistant variety, digging of deeper wells and livestock keeping were among the adaptation activities also practiced at household level, very few reported burning of charcoal -which implies that burning charcoal is in a way perceived as coping mechanism.

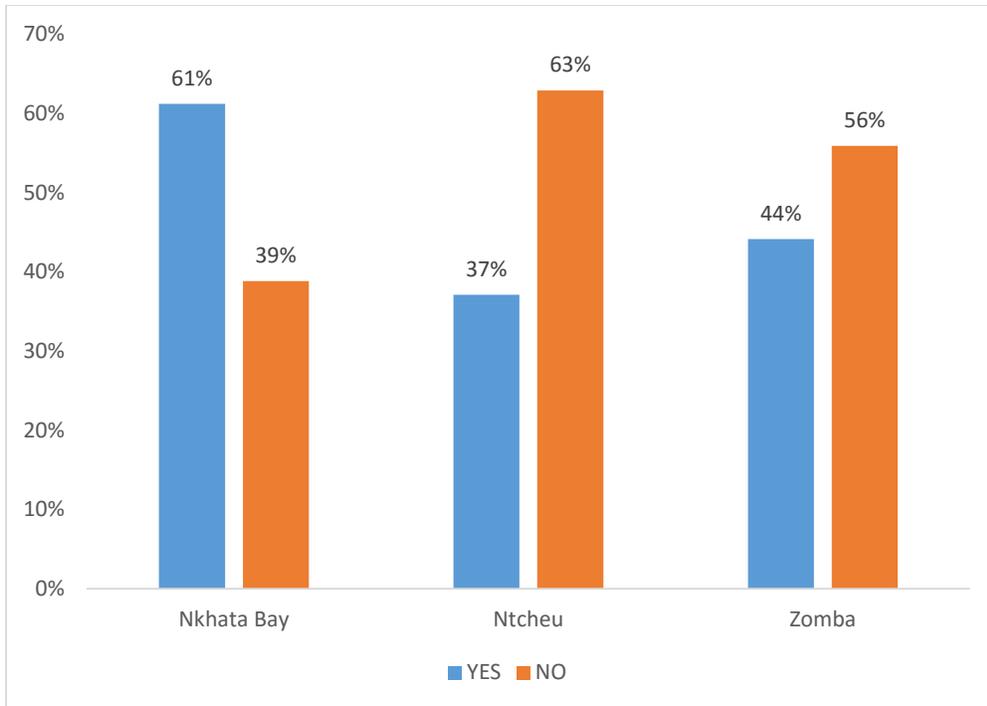
Table 9: Adaptation to climate change (by district)

Adaptation strategy	DISTRICT		
	Nkhata Bay	Ntcheu	Zomba
Crop diversification	74.32	87.18	86.36
Plant and conserve trees	37.84	44.87	72.73
Adoption of irrigation	48.65	46.15	42.05
Income diversification	45.95	32.05	27.27
Practice agro-forestry	29.73	14.1	32.95
Conservation agriculture adoption	21.62	15.38	35.23
Plant early maturing crops	29.73	8.97	23.86
Changing timing of farm	6.76	29.49	20.45
Use of manure	14.86	5.13	22.73
Grow drought resistant varieties	17.57	5.13	12.5
Construction of deeper wells	9.46	16.67	6.82
Livestock diversification	12.16	7.69	10.23
Avoid burning charcoal	10.81	1.28	3.41

4.4.8 Proportion of households receiving weather related information

Figure 4 shows that there were more households in Nkhata Bay who had received information related to weather compared to Ntcheu and Zomba. These findings have an important bearing on climate adaption efforts especially in these vulnerable communities, considering that lack of access to weather and climate information is one of the challenges affecting resilience to climate change.

Figure 4: Receipt of the weather information



4.4.9 Proportion of households practicing conservation agriculture

The proportion of households practicing conservation agriculture in the three districts is quite suboptimal (

Figure 5). These results would certainly justify the need to invest in advocacy and training of communities in conservation agriculture. Nkhata Bay district has much more households practicing conservation than both Ntcheu and Zomba, with Ntcheu having the least. Conservation agriculture promotion has been highlighted in the new National Agriculture Policy, what remains to be done is to ensure the implementation of the strategies aimed at promoting the practice. The major forms of conservation agriculture being followed in the three districts have been shown in *Figure 6*.

Figure 5: Practicing conservation agriculture at district level

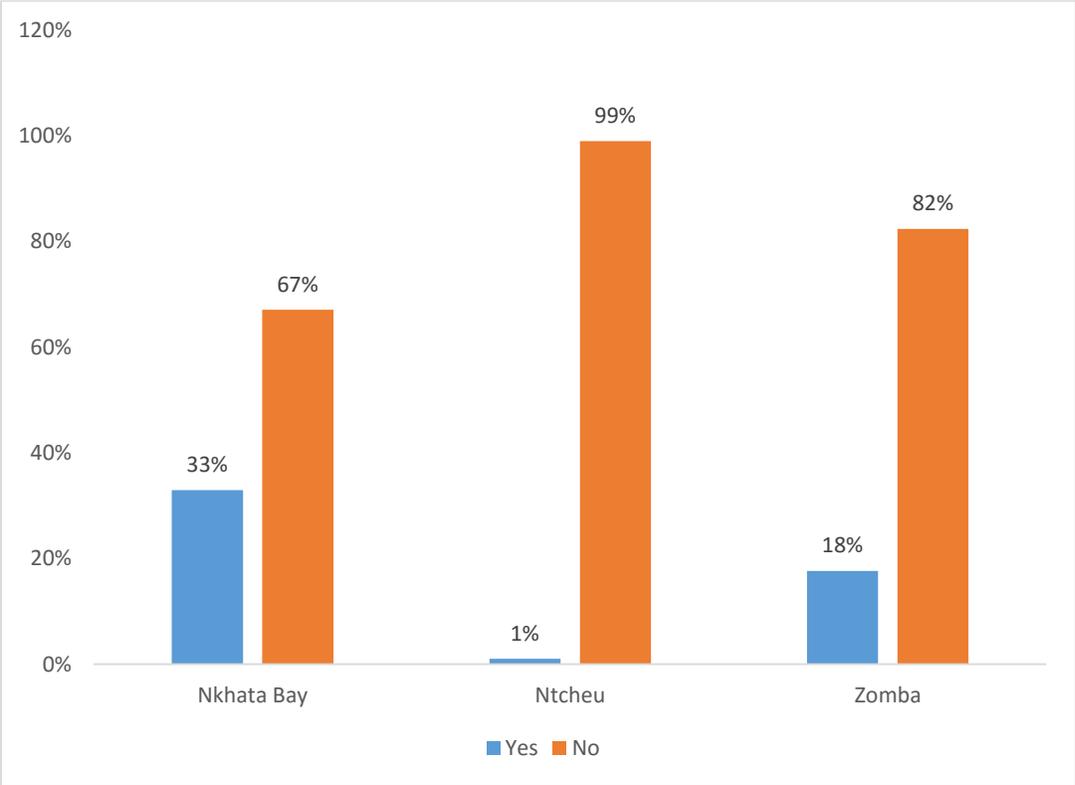
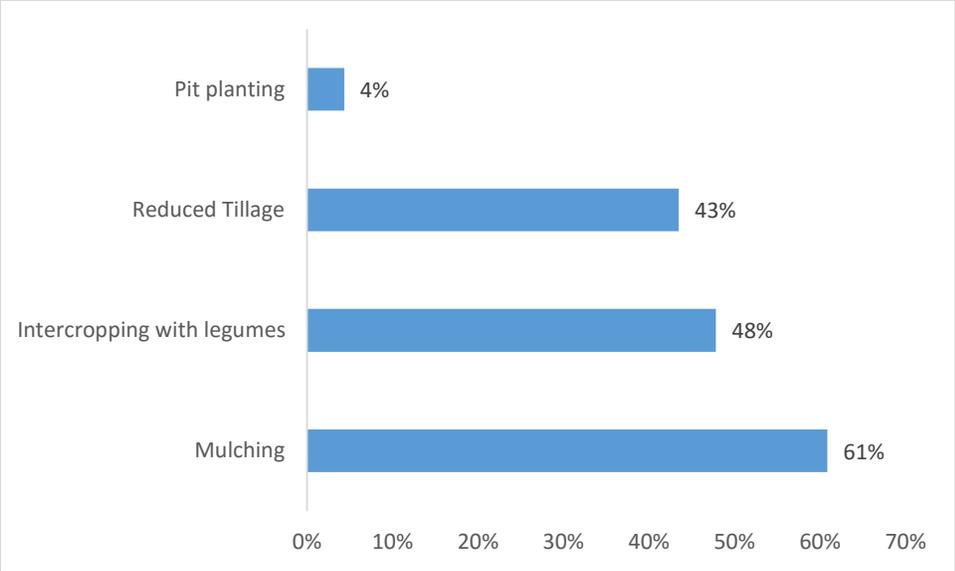


Figure 6: Components of Conservation Agriculture



The survey demonstrated that agro-forestry is also quite rare in the three districts. Figure 7 shows the proportions of the sampled households who practice agro-forestry. Despite all the benefits associated with practicing agro-forestry, including its potential to mitigate climate change, majority of Malawians don't seem to embrace the practice. The National Agriculture Policy also highlights this challenge and points out that the major reasons for poor adaption are: long waiting time to start enjoying the returns from investing in trees, limited capacity in agroforestry management, and the high labour demand associated with some agroforestry technologies more especially for women. The type of agro-forestry techniques and proportion of those practicing them is shown in *Table 10*.

Figure 7: Practicing agro-forestry at district level

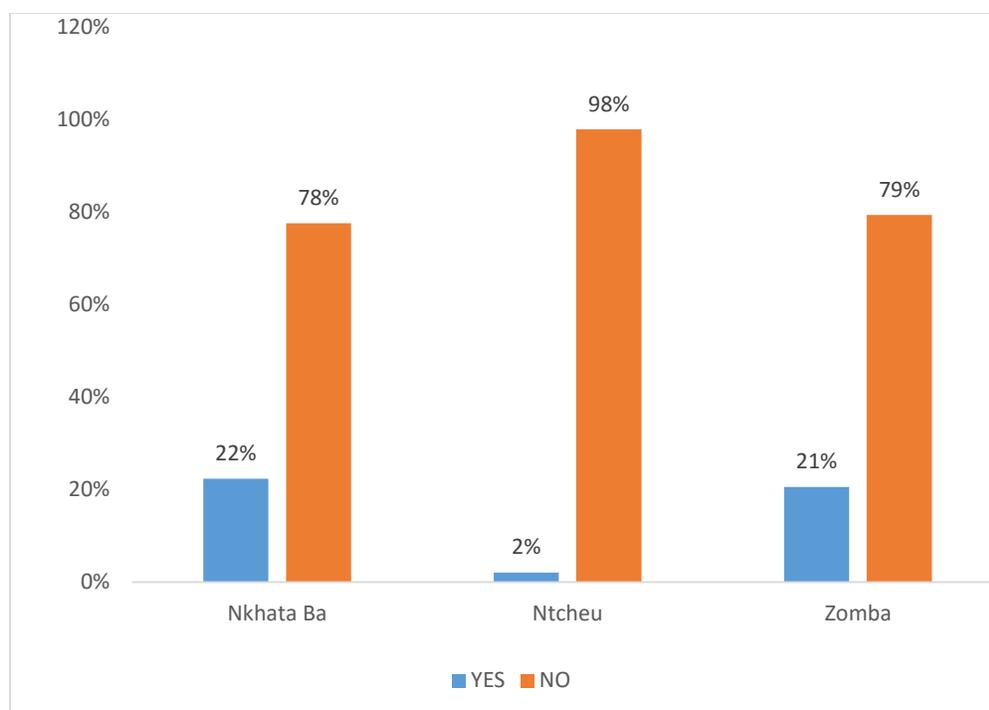


Table 10: Type of agro-forestry practices

Agroforestry types	Nkhata Bay	Ntcheu	Zomba
Tree rotational fallow with crops	2 (10.53)	0	0
Trees in mixture (inter cropping/ alley cropping) with crops	10 (52.63)	1 (50)	8 (38.1)
Trees grown as live fencing/wind breaks/ shelter belts	4 (21.05)	0%	12 (57.14)
Trees in crop field	9 (47.37)	1 (50)	1 (4.76)

4.5 Diversified and strengthened livelihoods for vulnerable people in target areas

4.5.1 Irrigation farming in smallholder sector.

The Government of Malawi has recognized the potential of irrigation in national development as well as improvement of livelihood of rural masses. Across the districts the percentage of those practice irrigation was about 53%, with Nkhata-bay and Ntcheu having the least and highest percentage of respondents practicing irrigation respectively (Table 11). The main reason for failing to practice irrigation was lack of irrigation land. In terms of the sources of water, rivers and wells

featured highly at about 76% and 40% respectively (Table 12). These findings could have implications in terms of sustainable irrigation techniques including promotion of rain water harvesting. This observation is back up by the finding that about 55% of the respondents across the three districts indicated that water was not sufficient for irrigation farming. Furthermore, majority of those who practice irrigation farming do not supplement their water sources, suggesting that more alternatives that are locally feasible should be suggested. In this way the communities who have the land that can be irrigated may optimize their livelihood from irrigation.

The main implement used to irrigate crops was the watering can, which was used by 62% of those practicing irrigation across the three districts. At district level, the watering-can was used by 81, 54 and 61 percent of respondents in Nkhata-bay, Ntcheu and Zomba respectively. There is a great potential for irrigation development in many parts of Malawi, as such documenting the amount of land under irrigation would provide a basis for deciding on the investment strategies by ADAPT-Plan project. From the household surveys, it was apparent that farmers do not really estimate the amount of their land under irrigation. However, the survey did find that the median land size under irrigation for Nkhata-bay, Ntcheu and Zomba were 2.5, 5 and 5 acres respectively.

Table 11: Proportion of respondents practicing irrigation farming

Response	Districts			
	Nkhata-bay	Ntcheu	Zomba	Total
Yes, n (%)	32 (38.10)	72 (74.23)	46 (45.54)	150 (53.19)
No, n (%)	52 (61.90)	25 (25.77)	55 (54.46)	132 (46.81)
Total, N	84	97	101	282

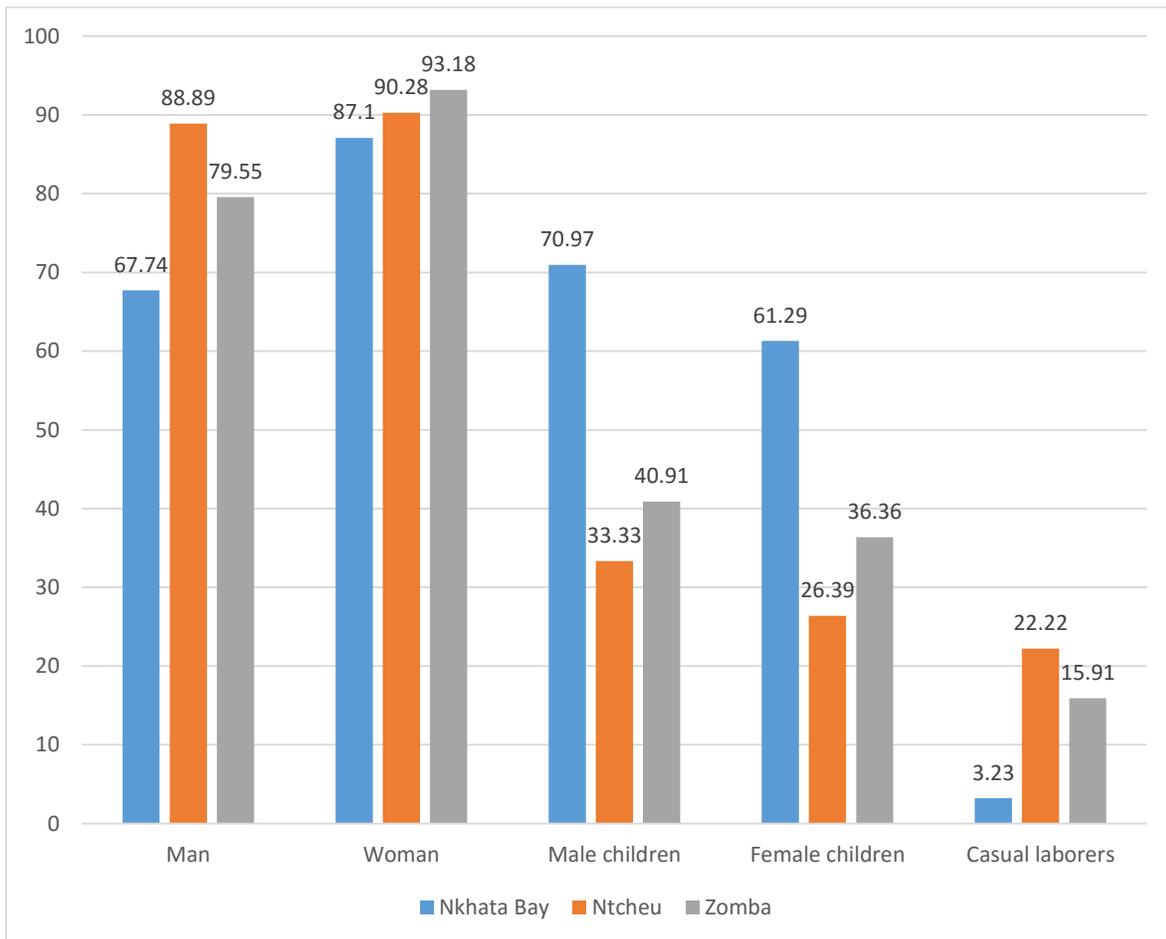
Table 12: Sources of water for irrigation farming

Source	DISTRICT			
	Nkhata Bay	Ntcheu	Zomba	Total
River, n (%)	23 (76.67)	52 (72.22)	38 (82.61)	113 (76.35)
Dam, n (%)	0	11 (15.28)	2 (4.35)	13 (8.78)
Well, n (%)	12 (40)	30 (41.67)	17 (36.96)	59 (39.86)

The median time spent on irrigation farming for Nkhata-bay, Ntcheu and Zomba were 3,3 and 2 hours respectively. Overall the median time spent on irrigation farming was 3 hours. In terms of the work distribution women formed the main groups doing irrigation at 90% across the three districts, followed by men at 81%. The distribution of responsibility in terms of gender and age across the three project districts is shown in Figure 8. It is well documented that women are

among the most vulnerable to climate change and also that they are the ones bearing most of the work at household level. These findings are significant in terms of designing irrigation methods which are gender sensitive in order to ensure that adaptation to climate change by women is enhanced through the ADAPT-Plan project.

Figure 8: Individuals involved in irrigation



The major crops under irrigation were maize in Nkhata-bay and Zomba and Irish potato in Ntcheu. The major limitations have been outlined in *Table 13*. The main limitations were lack of permanent resources and high cost of operation.

Table 13: Major crops under irrigation

Crop	District			Total
	Nkhata Bay	Ntcheu	Zomba	
Maize	29 (96.67)	20 (31.25)	28 (71.79)	77 (57.89)
Irish	0	57 (89.06)	0	57 (42.86)
Rice	3 (10)	1 (1.56)	13 (33.33)	17 (12.78)
Beans	1 (3.3)	6 (9.38)	2 (5.13)	9 (6.77)
Sweet Potatoes	4 (13.33)	1 (1.56)	2 (5.13)	7 (5.26)

4.5.2 Major limitations for practicing irrigation farming

In terms of livestock ownership, the major forms kept across the three districts were chickens and goats at 83% and 33% respectively. Small scale livestock production can play a critical role in climate change adaptation through various pathways. First as a source of income for household, which would contribute to sustainable food and livelihood to families in the impact areas. In turn communities are less likely to be engaged in unsustainable activities detrimental to the environment such as charcoal production and firewood selling. Livestock can also be incorporated into sustainable agriculture through manure production as well as integrated into aquaculture. The proportion of households keeping livestock can be tracked across the lifespan of the project and even beyond.

4.5.3 Proportion of households practicing aquaculture

Aquaculture was not common in the three intervention districts, the proportion of respondents who practice aquaculture was just 1%. All the three fish ponds mentioned by participants were traditional ponds. The national fisheries and aquaculture policy/act recognizes does highlight the potential of aquaculture towards climate adaptation at community and household levels. Number of modern fish ponds constructed

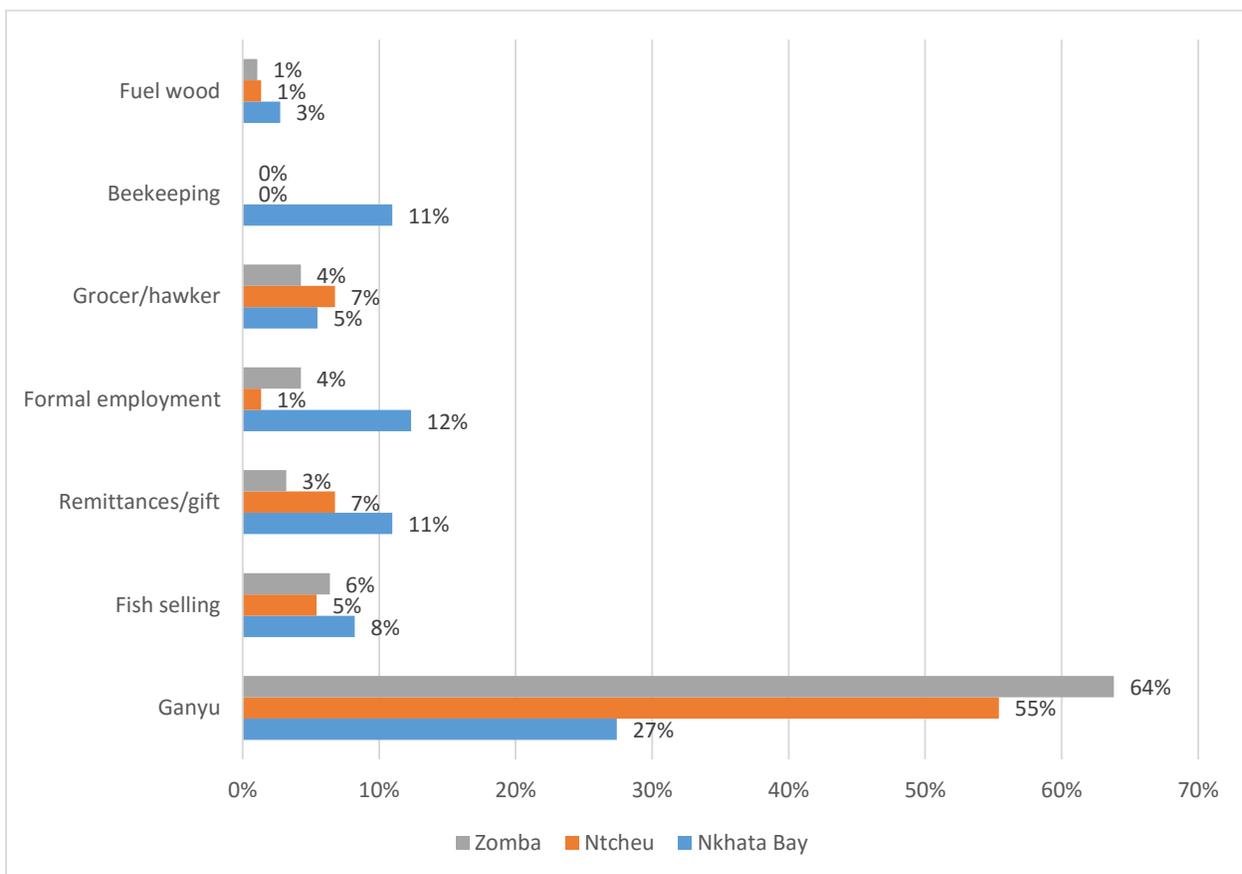
Among other things, ADAPT-Plan project will facilitate construction of fish ponds in some parts of the three project districts. ADAPT-plan will be able to tract the impact of the interventions by tracking the number of modern fish ponds constructed in the impact areas. The study has demonstrated that aquaculture is not fully exploited in the three project districts. Thus it will be imperative to invest in training and advocacy activities in order to maximize the potential of

aquaculture in building and sustaining community climate change sensitive livelihoods such as aquaculture.

4.5.4 Non-farm sources of income

Figure 9 shows that majority of the households engage in Ganyu (informal employment) as the main non-farm source of income. Zomba and Ntcheu have much bigger promotions compared to Nkhata Bay which may be an indication of availability of economic activities going on in the three districts. Though now commonly mentioned by most households, selling of firewood appears to be an issue in Nkhata Bay, consequently the ADAPT-PLAN project comes at the right time in all the three districts but more especially for Nkhata Bay with respect to conservation of trees and other such related forest products.

Figure 9: Non-farm sources of income



4.6 Mainstreaming of climate change adaptation in development plans at community and district levels

The survey had revealed that almost all line ministries are yet to incorporate climate change adaptation mainstreaming in their development plans, and consequently in their budget. This is

despite the fact that it is now widely agreed that there is need for respective sector to integrate climate related priorities in their planning and budgeting. These findings, form empirical evidence on the need to advocate for promotion of integrating climate change adaptation in the policy development of line ministries and sectors. Considering that governments usually operate based on sound evidence, consequently the ADAPT-PLAN baseline survey results will be of much help in contributing to mainstreaming climate change adaptation at all levels including the district assemblies. The survey results also provide anecdotal evidence that the lack of planning and budgeting for climate change adaptation may be due to poor understanding of climate change, its impact and vulnerability of the country and communities to climate change adverse impact. This is back by the responses obtained during Key informant interviews on the need for capacity building in the area of climate change adaptation. Most respondents indicated that they are new to the concepts of climate change and therefore it would not make much sense for them to even plan for it and let alone allocate budgetary resources. This is why the ADAPT-PLAN project is likely to go a long way in providing evidence for the need to take a very deliberate policy actions that significantly enhance mainstreaming climate change adaptation in national development policies. From the public policy review conducted, it is also apparent that most line ministries do not explicitly address issues of climate change adaptation.

4.7 SUMMARY OF STAKEHOLDER CONSULTATIONS

These study Stakeholder's consultations involved conduction of 2 public meetings where 23 people participated, six focused group discussions where 42 people participated and holding eight key informant interviews where 8 people participated giving a total participation of 63 stakeholders who have given input into this report. Overall, most stakeholders are aware of climate change and variability as has been indicated in their verbalization of elements of climate change, and their subsequent impacts and adaptation strategies that they have already initiated as presented in table I below. The ADAPT PLAN Project has well been received by Stakeholders. However, there are some concerns with regards to the articulation of sustainable climate change smart farming systems in the field by both the communities and service providers. Since these could form the basis of livelihoods support systems of these communities, we have made efforts to explicitly provide some of them below for considered in the implementation of the ADAPT PLAN Project in line with the terms of reference for this study.

Table 14: Community verbalization of elements of climate change and variability, their impacts and subsequent adaptation strategies

ITEM NUMBER	VERBALISED ELEMENT OF CLIMATE CHANGE AND VARIABILITY	EXPERIENCED CLIMATE CHANGE IMPACT	ADAPTATION STRATEGIES THAT ARE BEING IMPLEMENTED	CHALLENGES THAT ARE BEING EXPERIENCED IN THE IMPLEMENTATION OF ADAPTATION STRATEGIES
1	Early demise of rainfall season than has been the norm	Reduced crop production leading to household food insecurity and increased poverty levels	Planting of short cycle crops and early maturing varieties	In availability of suitable seed of the crop varieties and purchasing power, inadequate knowledge and skills in crop agronomy and limited coverage of extension messages
2	Erratic rainfall patterns, signifying poor rainfall season quality	Reduced productivity and increased household food insecurity	Enterprise diversification including none agricultural such as bee keeping, bakery, sewing, village banking	Limited knowledge and skills due of the communities and to inadequate extension coverage, limited initial capital and market availability
3	Low rainfall amount resulting into decreased mean annual rainfall	Reduced crop production drying-up of fish ponds, streams and rivers,	Making and application of compost manure, mulching of gardens, planning of contour vetiver hedgerows , and establishment of woodlots	Poor quality of materials used for making compost, limited material for mulching and inadequate tree seedlings and vetiver planting materials
4	Frequent prolonged dry spells	Reduced crop production resulting into households food insecurity	Staggering planting dates as risk evading strategy, making and application of compost manure, mulching of gardens,	None existence information system for localized rainy season forecast, and poor quality of materials for making compost
5	Delayed start of planting rains	Wide spread manifestation of crop diseases and reduced crop production resulting into disruption of livelihoods support systems	Application of chemicals to control the spread of crop diseases and planting of drought tolerant varieties such as cassava and sweet potatoes	Inadequate chemical sprayers, and purchasing power, inadequate knowledge and skills for the chemicals to be applied to their crops and limited extension coverage

6	Shortened length of growing periods as a result of late start of planting rains and early demise of rainy season	Reduced productivity and increased household food insecurity	Enterprise diversification including none agricultural such as bakery, bee keeping, and rearing of small ruminants	None existence of localized information system of season forecast, and inadequate knowledge and skills for enterprise combination and diversification
7	Frequent occurrence of short duration high intensity or heavy rain storms	Increased frequency of floods leading to destruction of livelihood support systems such as loss of livestock and life	Crop and livestock diversification and use of intercropping farming systems	Limited agricultural extension system
8	Increased frequency of diurnal temperatures	Occurrence of heat wave, increased soil evaporative losses resulting into streams and fish ponds drying-up thereby disrupting of livelihood support systems	Restocking of fish ponds,	Inadequate availability of suitable fingerings and knowledge and skills of fish ponds management
9	Increased frequency of strong winds especially during rainy reason	Destruction of property and crops especially iron sheets of dwelling houses and maize crops	Establishment of tree shelter belts around villages and gardens	Inadequate seedlings of suitable tree species, lack of roofing /building code and inadequate knowledge and skills amongst most of the land users
10	Increased frequency of strong South East Trade winds (Mwera)	Lake Malawi becoming rough leading to loss of life especially of fishermen	Listening to Radio forecast broadcast	Inadequate availability of radios and regional/area specific forecast of messages

5 Conclusions

The baseline study has demonstrated that awareness of climate change in the three districts is quite high. Communities are able to recognize that climate has changed based on locally defined indicators including erratic and poor rainfall patterns and drought among others. The study shown that communities from across the three districts do not have much options for sustainable and descent livelihood activities, the main form of non-agricultural source of income is informal employment (ganyu). In terms of mainstreaming of climate change adaptation, the study results demonstrate that line ministries at district level do not have plans and to that effect budget lines for climate change adaptation. The main reason for failure to mainstream climate change adaptation at district level was poor knowledge and understanding of climate change.

6 Recommendations

Based on the above conclusions the following recommendation are proposed:

Promote active community participation in climate change adaption related measures, among others encourage community-based planning and budgeting related to climate change adaption plans

Advocate for awareness mechanisms at district level on the need to plan and budget for climate change adaptation

Continue sensitization activities on climate change adaptation with various line ministries and relevant government departments

Annexes

ANNEX I: NATIONAL CONSULTATION CHECKLIST

Please tick under the appropriate response (Yes, No and Partial)							
Climate change integration into planning	Yes	No	Partial				
Does the institution have a climate change plan or strategy?							
Are there formal requirements (legally binding) for climate change adaption to be mainstreamed into the development planning?							
Does your institution have specific measures identified and funded to address climate change adaption?							
Are climate relevant initiatives screened for climate change adaption?							
Institutional coordination for mainstreaming							
Is there a taskforce or committee tasked with mainstreaming climate change planning and actions?							
Is the taskforce mandated enough to coordinate climate change adaption initiatives across different sectors?							
Is there a formal institutional mechanism for mainstreaming and coordination of climate change adaption?							
Does the institution have budget lines and respective funding for climate change adaption for sustainability?							
Does your institution have regular meetings/contacts with stakeholders including the district level authorities?							
Institutional knowledge and capacity							
Does planning involve individuals who are conversant with climate change?							

Does planning in the institution involve individuals with formal training in climate change related issues?								
Does planning in the institution involve individuals who have attended accredited courses on climate change related issues including mainstreaming?								
Are enough people with required training involved in planning processes?								
Climate change information								
Does planning consider observational data relating to climate change trends and variability?								
Does planning take account of climate change projections i.e is climate change information (forecasts, projections etc) readily accessible through information sharing platforms?								
Is there sufficient access to climate information generated by internationally institutions eg research and academic institutions?								
Is the use of scientific information from external sources complemented by domestic generated evidence including from indigenous sources?								
Does the capacity to interpret and use climate information (Including vulnerability assessment, risk frameworks) exist?								
Planning under uncertainty								
Does planning incorporate aspects of uncertainty defined as plausible ranges of key climatic parameters over relevant timescales, informed by climate project where feasible?								
Does planning make use of scenario planning exercises, preferably based on envelopes uncertainty								
Does planning explicitly address risks associated with “maladaptation”?								
Is planning guided by well-developed frameworks and methodologies that address uncertainty?								

Do mechanisms exist for ensuring that planning guidance is updated with new information on climate as it becomes available?								
Participation								
Are all relevant levels within the institution represented in planning processes?								
Are the those who may be vulnerable to climate change initiatives represented in the planning and decision making processes?								
Does the institution involve those who are likely to benefit from climate change initiatives?								
Are the vulnerable and most marginalized groups in the society represented in the planned phases of climate change initiatives?								
Is the participation of all the above groups sustained throughout the planning and implementation (throughout the initiatives life course)?								
Awareness among stakeholders								
Are the stakeholders aware of climate change and its potetial implications								
Are the stakeholders aware of the potential, available, or on-going climate change response options?								
Does relevant information reach key stakeholders?								
Do institutional mandates raise awareness of and disseminate information about climate change adaptation?								
Is adequate funding available for awareness raising among relevant stakeholders and the public at large?								

ANNEX II: HOUSEHOLD QUESTIONNAIRE