



Save the Children



Arid Support Programme Resilience Measurement Report

Acknowledgements

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Table of Contents

ACKNOWLEDGEMENTS	1
TABLE OF CONTENTS	2
LIST OF TABLES AND FIGURES	3
EXECUTIVE SUMMARY	4
OBJECTIVES OF THE STUDY.....	4
METHODOLOGY.....	4
KEY FINDINGS AND CONCLUSIONS.....	5
THE ARID LANDS SUPPORT PROGRAMME.....	6
ASSESSMENT OBJECTIVES	6
THE INQUIRY PROCESS: -METHODOLOGY	7
THE ANALYSIS DESIGN.....	7
<i>What is HEA?</i>	7
<i>Baseline Analysis</i>	7
<i>Outcome Analysis</i>	8
<i>Using HEA to Measure Resilience</i>	9
IMPLEMENTATION STRATEGY	10
EVALUATION FINDINGS	11
MODERATE DROUGHT PROBLEM SPECIFICATIONS	11
<i>Defining a moderate drought</i>	11
MODERATE DROUGHT OUTCOMES AT BASELINE.....	13
<i>Resilience scores for a moderate drought at baseline</i>	14
CONCLUSION AND RECOMMENDATIONS	19
ANNEXES	21

List of tables and figures

Figure 1: An Example of Outcome Analysis.....	8
Figure 2: The Resilience Score based upon HEA	10
Figure 3: Parameters used to pick a moderate drought year	11
Figure 4: Effect of the Moderate Drought Scenario on Total Income by Wealth Group	13
Figure 5: Modelling of time taken to build resilience	17
Table 1: Resilience Definitions.....	9
Table 2: Case study sample size	10
Table 3: Key Parameters for the PUG, NEP and NEA Livelihood zones.....	11
Table 4: Problem Specification for a Moderate Drought	12
Table 5: Resilience score Moderate Shock at Baseline	14
Table 6: Intervention net income following moderate drought	16
Table 7: Average Resilience Scores of different interventions for project	16
Table 8: Overall Resilience Scores comparisons.....	17
Table 9: Intervention Mapping.....	21

EXECUTIVE SUMMARY

Objectives of the Study

Save the Children Kenya has completed implementation of a three year Arid Lands Support Programme (ASP) aimed at resilience building in the north-eastern county of Mandera. The project was implemented from May 2013 to March 2016 through three actions; (I.) **improving livestock productivity through access to production system inputs and community assets** by improving pasture availability during times of stress, supplementing the incomes of vulnerable households, improving animal health, improving access to water for animals, supporting inclusive access to livestock market information; (II.) **providing women and youth with skills and asset building inputs enabling them to sustainably diversify their sources of income** by identifying and supporting existing or new income generating activities, improving the economic inclusion of youth, increasing the number of vulnerable households involved in crop or fodder production, and enhancing the sustainability/viability of existing dryland irrigation schemes; and (III.) **strengthening county government systems for community development and supporting community-led initiatives** by enhancing “early warning and early action” to avert livelihoods loss and support transformational development, strengthening community engagement in county planning and resource allocation, enhancing social audit and public monitoring.

The project was implemented in response to the vulnerability of rural and peri-urban communities in Mandera due to increased frequency of drought and livestock diseases outbreaks. The project was aimed at building vulnerable households’ resilience and adaptive capacities as well as that of communities and government systems in the face of shocks or stresses related to drought. The project was implemented in Bambo, Banisa, Burduras, Chachabole, Fincharo, Gither, Hardimtu, Mandera South, Mandera West, Quramadhoo, S.Fatuma, Sake, Shimbir and Warankara villages. A total of 52,000 people were reached directly and 150,000 indirectly, according to project monitoring data.

Save the Children’s purpose was to demonstrate the impact of the project by measuring resilience for sampled ASP beneficiary households using the [Household Economy Approach \(HEA\)](#). This report provides end-line resilience measurement outcomes in addition to the previous work on pre-implementation and mid-term measurements. The report is aimed at providing judgement as to the overall performance of the project in building household resilience as well as recommendations for application in similar projects through replication and/or scaling-up.

Methodology

Household Economy Analysis (HEA) was used to measure resilience using the available HEA baselines that provide a quantified summary of livelihood options disaggregated by livelihood zone and by wealth group. The baselines provide a starting point to examine resilience by analysing whether households have enough income following a locally relevant shock (**moderate drought**) to a) cover their immediate essential food and non-food needs and b) recover quickly so that they can maximise income in the next non-hazard year. The results were used to develop HEA resilience scores as a measure of resilience. The analysis incorporates interventions, looking at their effectiveness at increasing household resilience to moderate drought conditions, such as those experienced from **October to September** of 2003/4, 2008/9 and 2013/14, when Mandera received 24-35 percent below normal and poorly distributed rainfall in both long and short rain seasons - see **Figure 3**. The end-line evaluation provides the final picture in the resilience measurement study, outlining the results of the resilience scores over, **I. Baseline (pre-project)**, **II. Mid-Term (Year 1 and 2)**, and **III. End-line (Year 3)** periods for households from different wealth groups using the economically measurable interventions.

Key Findings and Conclusions

Mandera falls under the arid climate characterised by low rainfall, high temperatures and poor soils. This underlying environment is exacerbated by the frequent droughts driven by failure of one or both rainy seasons which have severe impacts on pastoral and agro-pastoral economies. Given this context the work by Save the Children has proven that no single intervention will be able to build sufficient resources to make households resilient to moderate drought.

Intervention packages: The nature of support provided to communities and households should be an integrated package that addresses water conservation, non- agriculture income generation and a savings and investment culture. Social insurance based strategies are likely to enhance resilience of households given susceptibility to shocks.

Resilience impact: Resilience scores have increased slightly, due to the challenge of late start of programmes coupled with low input provision for households. This evaluation has however proved that there is positive impact that the interventions bring and this could be enhanced by either longer multi-year programming or substantial investment in shorter periods. The poor and very poor household still fail to reach the desirable resilience score of 1 in the absence of humanitarian support, indicating a need for further investment.

Targeting: The analysis has demonstrated that the middle and better off households in pastoral and agro-pastoral zones are resilient to moderate drought – one in five year event. This suggest the need for appropriate targeting of interventions. The major difference between richer and poorer households is the difference in asset wealth particularly livestock ownership where richer households are able to sale more animals to cover needs. This suggest that poverty reduction should be a key long-term strategy to build resilience.

The work that Save the Children has done in the last three years requires continuation particularly for poor and very poor households who persistently survive on humanitarian and safety net support even in non- drought years. It is there important that instead of exiting there is need for further investment given the likelihood of another moderate drought shock in the next 4 years.

BACKGROUND

The Arid Lands Support Programme

Save the Children has been operational in Kenya since the 1950s, providing support to children through developmental and humanitarian relief programmes delivered both directly and through partners. Save the Children's current programming in child poverty (livelihoods, social protection and vocational skills) includes the just ended three year DFID/UKAID-funded project across fourteen sites in Mandera County. The project aimed to build the resilience and adaptive capacities of vulnerable households, communities and government systems in the face of shocks or stresses – particularly recurring droughts in Arid and Semi-Arid Lands (ASALs). Droughts have increased the vulnerability of households as livestock herd sizes decline, while also making crop production is less viable and limiting the diversity of income sources .

Save the Children's Arid Lands Support Programme (ASP) saw the implementation of number of initiatives addressing livestock and crop productivity, diversified income generation, institutional and community participation and capacity in development planning and implementation.

The overall goal was to build the resilience, recovery and adaptive capacities of vulnerable households, communities and government systems during and after drought conditions through sustainable improvement in the food and nutritional status of at risk children and households. To achieve this, the programme implemented activities focused on the three outcomes below:



- i) 800 households have improved livestock productivity through access to production system inputs and community assets;
- ii) 400 Women and 400 youth from targeted households have received skill and asset building inputs enabling them to sustainably diversify their sources of income;
- iii) County government systems for community development are strengthened and community-led initiatives supported.

The outcome objective is that households have enhanced income, assets and skills to sustainably reduce their vulnerability and live in more resilient communities. Save the Children instituted the Resilience measurement analysis/study to be able to objectively measure impact of the project on household resilience to drought.

Assessment Objectives

This report presents the results of the resilience measurement aimed at building evidence on the involvement of resilience capacity of beneficiary households by examining the contribution of different interventions to enhancing resilience.

The primary objectives of the analysis are to provide the following:

-  Undertake end-line resilience measurement to provide a complete progression of impact on resilience from; **baseline** (*pre-project*), **mid-term** (*project year 1 and 2*) and **end-line** (*project year 3*) periods of project.
-  Provide judgement on project achievement of targeted outcomes and recommendations.

This end-line analysis provides a basis for guiding decision makers on the effectiveness of interventions in building household resilience.

THE INQUIRY PROCESS: -METHODOLOGY

The Analysis design

[Household Economy Approach](#) was used in this analysis as it offers a good starting point for measuring resilience because HEA baselines provide a quantified summary of livelihood options disaggregated by livelihood zone and by level of household wealth. Baselines were used to examine resilience by analysing whether households have enough income following a locally relevant shock (moderate drought) to a) cover their immediate essential food and non-food needs and b) recover quickly so that they can maximise income in the next non-hazard year. The results were used to develop resilience scores (as a measure of resilience). This enables us to understand whether project interventions increase household resilience.

What is HEA?

Household Economy Analysis is a method for assessing the impact of changes due to hazards or positive events on household livelihoods. It allows for an understanding and appreciation of elements which are crucial for a properly rounded view of food security but which are mostly invisible in official statistics. The HEA analytical approach has two main components:

- 1) **Baseline analysis** – the analysis of how people get by year to year and the connections with other people and places that enable them to do so, and
- 2) **Outcome analysis** - the investigation of how that baseline access to food and income might change as a result of a specific hazard such as drought or as the result of a positive change, such as a program input or beneficial price policy.

Baseline Analysis

The HEA baseline is a quantified summary of annual food, cash and expenditure for typical households from different wealth groups living within a specified area or livelihood zone. There are three steps to preparing an HEA baseline:

- 1) **The Livelihood Zone Map**: A livelihood zone is an area within which people share broadly the same means of production (the same crops, the same types of livestock) and broadly the same patterns of access to markets. The analysis was done in Garissa and Mandera Peri-Urban (GUP), North Eastern Pastoral (NEP) and North Eastern Agro-pastoral (NEA) livelihood zones for Mandera
- 2) **The Wealth Breakdown**: This is a division of the livelihood zone population into wealth groups using ownership of and access to productive assets (land, livestock, household labour, etc.). The rationale for this second step is that wealth is a major factor determining the ability of a household to exploit the available options within each livelihood zone. In the GUP, NEP and NEA livelihood zones, four wealth groups were identified and used in this analysis - "Very poor", "Poor", "Middle" and "Better-off". Here wealth is defined locally and used in relative terms.
- 3) **Food, Income and Expenditure Analysis**: This is a detailed analysis of sources and amounts of food, income and expenditure, for a defined or *reference year*. Knowing where households obtain their food and income, and what they need to spend money on, plus a quantification of these, provides the starting point for understanding how they will be affected by a shock (or a positive change).

The baseline analysis relates to a specific *reference year* – a 12-month period starting with one harvest/main milking month. The reference year for GUP is October 2006 to September 2007, and for

NEP and NEA is October 2011 to September 2012. The reference years start with the short rains season which brings increased livestock production for pastoral-dependent economies. Generally, the reference years were judged to be average, providing a good starting point for understanding changes in livelihoods from one year to the next (e.g. changes in livestock and crop production, intervention impact and market prices). These baselines can be used repeatedly over a number of years (generally between 5 and 10 years), until significant changes in the underlying economy render them invalid.

Outcome Analysis

Outcome analysis consists of three steps designed to produce a rational and defensible statement about the predicted effects of a hazard (e.g. moderate drought) or positive change (intervention actions) on household livelihood strategies (i.e. their ability to obtain food and cash income, and to acquire the non-food items they need to live). These steps are:

- 1) Problem specification: the translation of a shock such as drought into economic consequences at household level (such as a percentage fall in crop production or increase in food prices compared with the baseline),
- 2) Coping analysis: the assessment of the capacity of households in different wealth groups to cope themselves with the hazard, and
- 3) Projected outcome: access to food and income at household level is predicted for a defined future period and compared to two critical thresholds – the *survival* and *livelihood protection thresholds* - to determine whether there is a gap or deficit.

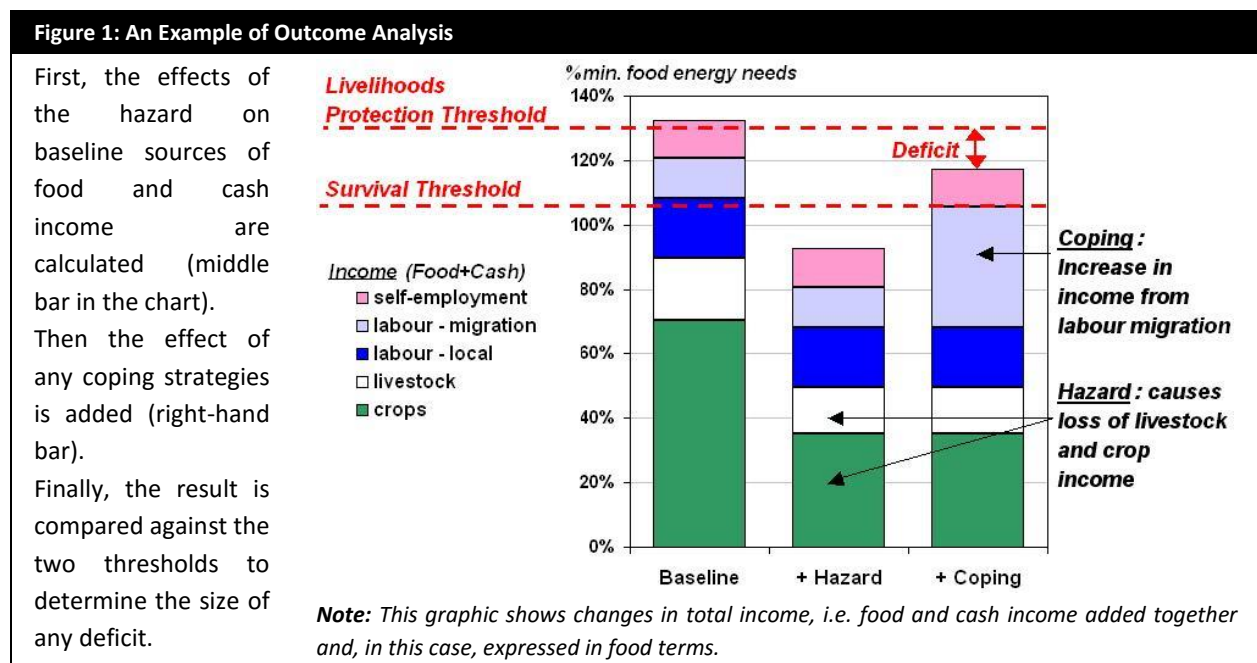


Figure 1: shows total income expressed in food terms (i.e. cash income has been converted into the amount of staple food that can be purchased with the corresponding cash). It is also possible to express total income in cash terms, in which case food that is directly consumed has to be converted into its cash value.

The survival threshold provides a measure of a household's ability to cover the bare minimum requirements for survival – to obtain and prepare basic food and, if necessary, purchase water. The livelihoods protection threshold provides a broader measure of a household's ability to sustain local patterns of livelihood, including covering the costs of productive inputs (seeds, livestock drugs, etc.) and basic expenditure on health and education.

A key feature of outcome analysis is that it provides an estimate of what the deficit might be given certain conditions rather than an analysis of behaviour. This is especially important in relation to coping, and which coping strategies get included in the analysis. The most damaging negative strategies (**high cost**) are always excluded from the analysis (e.g. excessive sale of livestock, mortgaging or sale of land). Including such strategies would have the effect of reducing the calculated deficit, effectively delaying any intervention until after that strategy has been fully utilised. Since we want to intervene before that stage is reached, we need to know what the deficit will be if these strategies are not used, i.e. if they are excluded from the analysis.

[Using HEA to Measure Resilience](#)

There are a number of definitions used for resilience and some examples are given in **Table 1**. Although variations are observed there exist a common theme in most definitions; that is, the **ability to withstand and recover from a shock in the short term**. There is also the element of adaptation in the longer term, and the idea of resilience at different levels, from individual to national. HEA lends itself most readily to an analysis at the household level, and in the short term (i.e. the shock year itself and recovery in subsequent years) and applies most easily the FAO definition of resilience. The idea is to run an HEA outcome analysis, but in such a way that we determine whether or not households can;

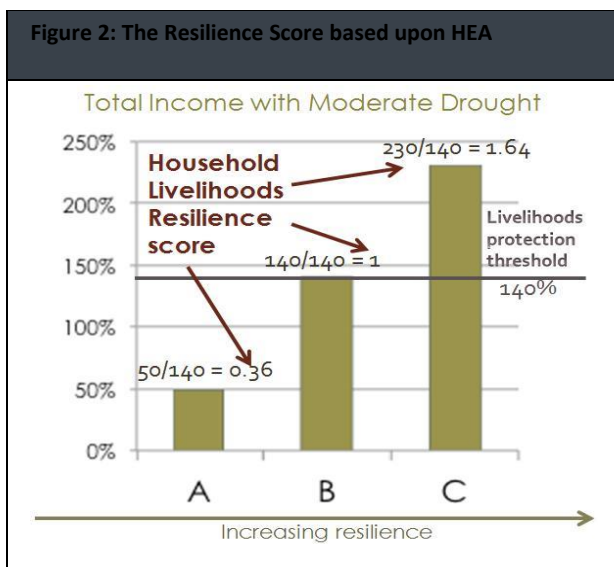
Table 1: Resilience Definitions
FAO: The ability of a household to keep within a certain level of well-being (i.e. being food secure) by withstanding shocks and stresses
EU: The ability of an individual, a household, a community, a country or a region to withstand, adapt, and quickly recover from stresses and shocks such as drought, violence, conflict or natural disaster
USAID: The ability of people, households, communities, countries, and systems to mitigate, adapt to and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth
OECD: Enhancing the capacity of individuals, communities and states to absorb, adapt and transform to the shocks and risks that they should normally be expected to deal with.

- **meet the costs of the livelihoods protection threshold (minimum level of well-being)** – that includes expenditure on productive inputs. If these expenditures can be maintained in the shock year, then production will be maximised, and recovery will be faster. This also includes additional costs associated with households maintaining production levels of interventions – **maintenance costs**.
- **.... after a typical locally-relevant hazard....** defined hazard that is to be withstood by households. This should be of a type and magnitude that is typical for the livelihood zone being analysed - in this case moderate drought.
- **.... without using damaging coping strategies** - To measure resilience, in addition to the highest cost coping strategies, medium cost strategies (e.g. *increased borrowing/credit and increased local or migrant labour*) that might slow recovery are also excluded, if these are likely to compete with time spent on own production.

Note: A key difference between this and other approaches to measuring resilience is that only one year is analysed (the consumption year that includes the shock), rather than a series of years including and after the shock. The rationale for this is that the HEA analysis answers the following question: can households generate enough income in the shock-affected year to cover their minimum food and non-food needs without having to use coping strategies that will slow recovery? If they can, then it follows that their income should recover quickly after the shock, and there should be no need to continue the measurements into subsequent years.

The outcome analysis enables the resilience score calculation, which is equal to the ratio of total income after a typical locally relevant shock to the livelihoods protection threshold.

Household Livelihoods Resilience Score = (Based upon total income after a shock)	$\frac{\text{Total Income after Shock}}{\text{Livelihoods Protection Threshold}}$	Equation 1
This is illustrated in Figure 2 below		



For the ASP programme, we are interested in measuring the effect of the project on resilience. We will do this by assessing whether or not the project has the effect of increasing the resilience score to above 1 (a resilience score of 1 indicates that a household is just able to reach the livelihoods protection threshold following a locally relevant shock - moderate drought for our analysis).

To evaluate the ASP programme, the measurement and comparisons of resilience scores for participating households has been done at three points - (i) baseline (ii) mid-term evaluation and (iii) end-line evaluation to understand the context of project impact.

Implementation Strategy

The analysis was done in three livelihood zones in Mandera County where Save the Children is operational: the Garissa and Mandera Peri-Urban, North Eastern Pastoral and North Eastern Agro-pastoral livelihood zones. The zones were purposively selected as they cover a large part of the ASP programme area. The collection of data was done through a total of 300 household interviews with 50 each for better off and very poor wealth groups and 100 each for middle and poor wealth groups - See **Table 2**. These households benefitted from at least one type of intervention.

Table 2: Case study sample size					
	Better Off	Middle	Poor	Very Poor	Grand Total
Households in Study	50	100	100	50	300
Pastoral Field Schools	28	46	33	10	117
Dry Land Farming	26	49	39	14	128
Livestock production	32	56	38	15	141
Cash for work	45	78	53	27	203
Village Savings and Lending	26	48	41	10	125
TVET and Business development	5	19	35	17	76

The analysis of resilience involved running HEA outcome analyses to see whether the different wealth groups could meet the costs of the livelihoods protection threshold after a typical locally-relevant moderate shock (drought) without using damaging coping strategies.

The steps in the analysis were as follows:

- i) Develop problem specifications for a range of locally relevant shocks; ii) Decide which coping strategies to include/exclude from the analysis; iii) Run the outcome analyses; iv) Use the results to calculate resilience scores corresponding to the range of shocks; and v) Incorporate project data on income and maintenance cost to see their impact on resilience scores.

Evaluation Findings

Moderate drought problem specifications

The first step in problem specification is to identify the most important sources of food, cash income and expenditure in the reference year. These are known as *key parameters*, and it is changes in these that will have the greatest effect on total income from one year to the next. There are two types of key parameter, those that relate to quantity and those that relate to price. The key parameters for the zones in Mandera are listed in **Table 3**. The problem specification was based on moderate drought defined through analysis of time series data for rainfall and vegetation cover as these were the available data series.

Defining a moderate drought

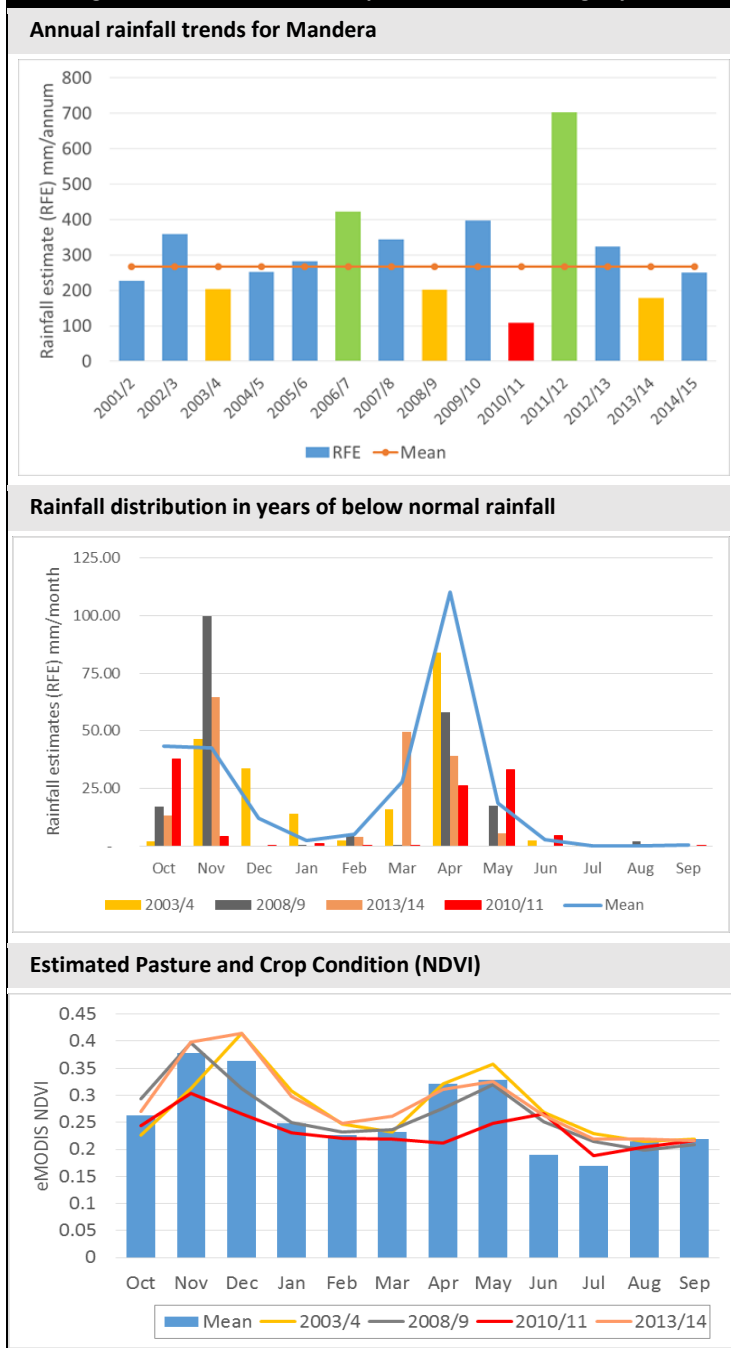
There are two rainfall seasons in Mandera the short rain season which starts in October and the long rain season which starts in March both of which are important for livestock and crop production. Rainfall estimates from satellite remote sensing data were obtained for the last 14 years for Mandera County ([Source: USGS website](#)). This data was used to identify years where rainfall was below average cumulatively and in distribution. The same process was done for vegetation cover using Normalized Difference Vegetation Index (NDVI) to estimate vegetation cover and therefore pasture and crop conditions in these years. This analysis resulted in the identification of a five-year cycle (2003/4, 2008/9 and 2013/14) where rainfall was significantly below average (-24 to 35 percent). This means that in one in every five years rainfall fails either in one or both seasons (*see Figure 3*). A rare 1 in 12 year severe drought was also observed for the 2010/11 season.

The combined analysis resulted in the selection of the years **October to**

Table 3: Key Parameters for the PUG, NEP and NEA Livelihood zones

Key Parameter for Quantity:	Key Parameter for Price:
Crops: sorghum -deyr, Livestock: Camel sales, goat sales Other: gifts and social support, firewood/charcoal, petty trade, self-employment (bush products, handicrafts), food aid, cash transfers.	Sales prices: camels, goats, firewood/charcoal, self-employment (bush products, handicrafts) Purchase prices: maize, pulses, Fertilisers, livestock drugs

Figure 3: Parameters used to pick a moderate drought year



September of 2003/04, 2008/09 and 2013/14 as the years which represent conditions of moderate drought with a one in five year frequency. The next stage was to use average data from the identified years to develop problem specifications for key parameters (**Table 4 below**) that can be considered representative of the problems and outcomes likely to be faced by households living in a moderate drought year - defined as the type and level of shock that is likely to occur once every five years. The procedure was as follows:

- Compare livestock and crop production trends
- Compare market price trends – adjusted for inflation
- Use these data to develop problem specifications for the outcome analysis by comparing to reference year values.

Table 4: Problem Specification for a Moderate Drought	
Problem Specification for Quantity:	Problem Specification for price:
Crops	Sales prices:
maize - deyr 56%	camels' milk - deyr 120%
sorghum - deyr 60%	camels' milk - gu 120%
maize - gu 65%	shoats' milk - deyr 120%
sorghum - gu 75%	shoats' milk - gu 120%
Livestock	camels - local 80%
camels' milk - deyr 50%	cattle sales 80%
camels' milk - gu 50%	goats 70%
shoats' milk - deyr 55%	labour - casual 80%
shoats' milk - gu 55%	firewood/charcoal self-emp (bush products, h/crafts) 100%
camel sales - local 80%	Staple Food
cattle sales 80%	maize 125%
goat sales 60%	pulses 185%
Other	Other Purchase
gifts/social support 90%	fertilizer 129%
food aid 0%	livestock drugs 150%
labour - casual 80%	
100	
firewood/charcoal %	
cash transfer 0%	
142	
petty trade %	
self-emp (bush products, h/crafts) 100	
%	
Assumptions when estimating problems specification:	
1) Production quantity data was based on comparing average production data for 2003/04, 2008/09 and 2013/14 years with reference year as representing moderate drought assuming similar production changes are anticipated in such years	
2) Natural resource exploitation- set to 100% as there was no information on how these would respond in drought year	
3) Labour casual labour reduced as better-off cannot afford to pay for as much labour in a bad year.	
4) Food assistance and cash transfers switched to zero	
5) Indicate a key parameter	

The problem specifications estimates developed were then used to run outcome analysis for PUG, NEP and NEA livelihood zones.

The moderate drought problem specification is summarised in **Table 4**. In general all production related strategies are worse than in the respective reference years, with prices of livestock deteriorating due to general decline in body condition. **Petty trade** been estimated to increase in quantity as access to markets has improved.

Food aid and cash transfers are set to zero since the objective of the analysis is to measure the ability of households to cope with or recover from drought without emergency food/cash assistance.

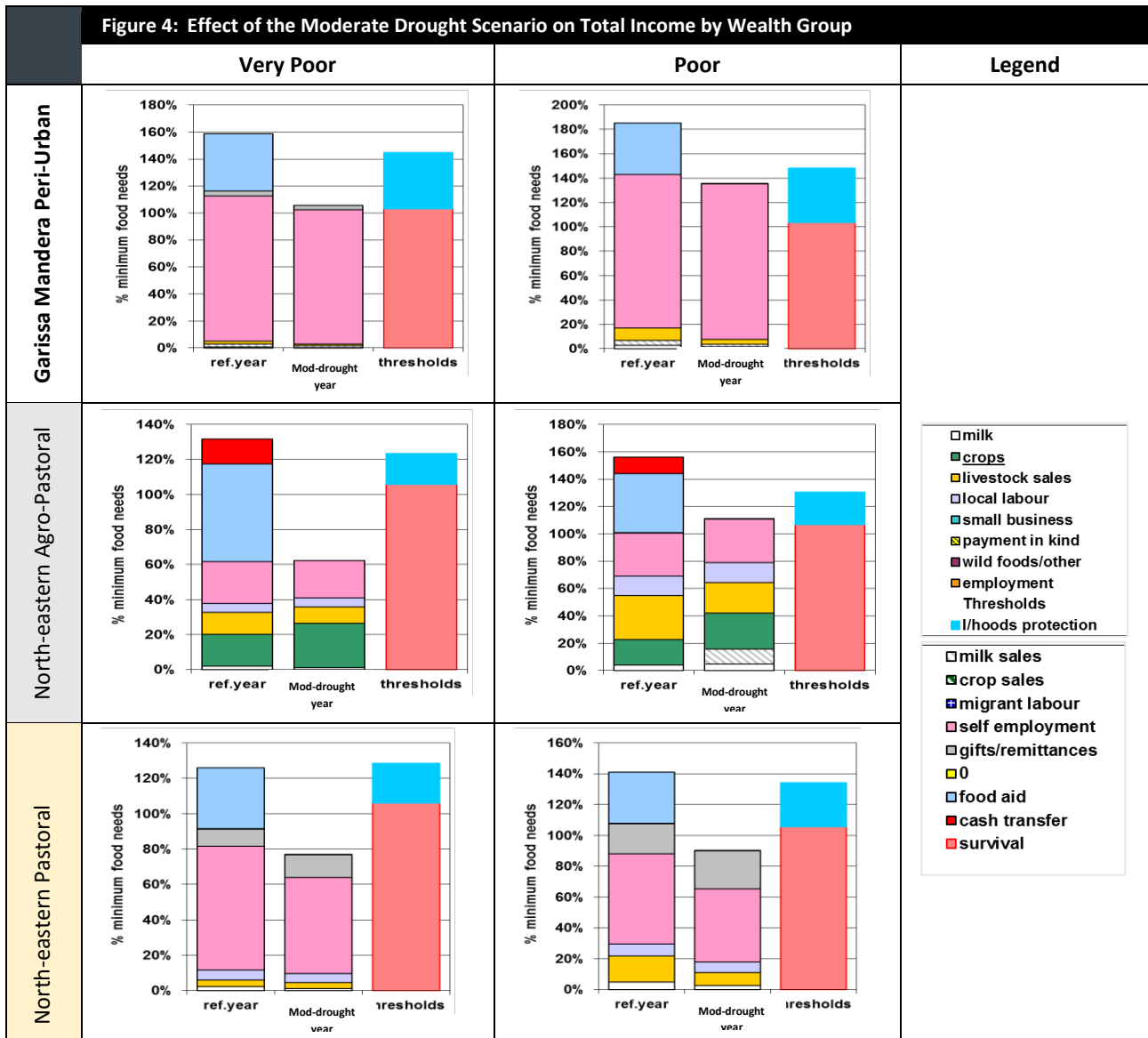
Coping strategies analysis for PUG, NEP and NEA

The objective of resilience analysis is to determine whether the different wealth groups can meet the costs of the livelihoods protection threshold after a typical locally relevant hazard, **without using damaging coping strategies**. High-cost coping strategies are always excluded from outcome analysis. For the analysis of resilience, some moderate cost coping strategies are also excluded to avoid negative effects on recovery. This review resulted in the following coping settings in the analysis:

Increased credit taking: no increase; **Self-employment** (e.g. sell of firewood): no increase; and **Increase in casual labour:** a maximum 10% increase in a bad year presumed not to have an effect on time spent own production.

Moderate drought outcomes at baseline

The effect of the moderate drought scenario on total income¹ before intervention is shown in **Figure 4**. The outcome analysis shows that poor and very poor households across all livelihood zones and middle and better off households in PUG would be unable to meet their livelihood protection/minimum well-being in the absence of safety nets and humanitarian food assistance. This is because the analysis of resilience relates to the ability of households to withstand and recover from a shock without external assistance – thus in this analysis food assistance and cash transfers were excluded. The deficits are shown in relation to the livelihoods protection threshold – which is the threshold against which we are measuring the ability of households to maintain, recover or bounce back in the event of a moderate drought. The moderate drought production for the NEA zone is better than the reference year which was a bad year with a lot of food assistance.



The significant point to note is that any resilience building measures have to build household incomes to cover the baseline contribution of food assistance and cash transfers and further increase incomes to guarantee resilience of households during moderate drought conditions, without the need for assistance.

¹ Total income is the sum of income from food plus income from cash. Here it is expressed in food terms - as a percentage of minimum food needs (2100 kcals per person per day).

Resilience scores for a moderate drought at baseline

The results of the resilience score calculations, based upon the moderate drought scenario, reflect the ability of typical households in each wealth group to withstand and recover from a moderate drought.

The results in **Table 5** indicate that middle and better-off households in NEP and NEA livelihood zones are resilient to moderate drought conditions. This means they will generally be able to meet their respective livelihood protection thresholds during moderate droughts, although their total incomes would decrease.

On the other hand, very poor and poor households in all zones will not be able to meet their livelihood protection needs in the absence of assistance during a moderate drought year. Similarly middle and better off households in PUG livelihood zone will not be able to meet their needs – this is mainly because low livestock numbers limit coping through sales and high food prices are likely following a moderate drought.

Very poor and poor households in all three livelihood zones and the middle and better off households in PUG have income that is less than their livelihoods protection threshold under the moderate drought scenario. Their resilience scores before intervention impact is considered range from 0.50 to 0.73 for the very poor; 0.67 to 0.91 for the poor; and 0.81 to 0.92 for the better off and middle households in PUG.

These results suggest potential for targeting and packaging of resilience programmes targeted at different households. The analysis suggests that middle and better off households in NEP and NEA would be able to cope with a moderate drought and hence would not require resilience building inputs as compared to the very poor and poor and peri-urban middle and better off who have limited coping options and low livestock ownership and clearly require resilience building initiatives. The middle and better off already have capacity to meet their minimum needs after a moderate drought, and monitoring of their respective livelihood assets against deterioration is important.

Impact of interventions on resilience scores ~ End-Line Evaluation

Information was gathered on the income generated by each intervention or a combination of interventions (project income) during moderate drought conditions. It was important to investigate how the interventions are affected during a shock occurrence in order to understand how interventions will enhance household resilience, defined as a household's ability to meet their livelihood needs following a moderate drought.

Table 5: Resilience score Moderate Shock at Baseline					
Garissa and Mandera Peri-Urban					
Wealth Group	VP	P	M	BO	
Total income after shock	106%	136%	138%	123%	
Livelihoods protection threshold	145%	148%	150%	153%	
Deficit	-39%	-12%	-12%	-30%	
Resilience score	0.73	0.91	0.92	0.81	
North-eastern Pastoral Livelihood Zone					
Total income after shock	77%	90%	142%	258%	
Livelihoods protection threshold	128%	134%	141%	152%	
Deficit	-52%	-44%	-	-	
Resilience score	0.60	0.67	1.01	1.70	
North-eastern Agro-pastoral Livelihood Zone					
Total income after shock	62%	109%	155%	298%	
Livelihoods protection threshold	123%	130%	137%	157%	
Deficit	-61%	-21%	-	-	
Resilience score	0.50	0.84	1.13	1.90	

Reminder: Where total income is below the livelihoods protection threshold (resilience score less than 1), households are unable to meet their needs following the moderate drought without turning to damaging coping strategies that are likely to slow recovery. Where it is above (equal and more than 1), households are able to meet their needs following a moderate drought.

Interventions also come with a cost to households. This cost was calculated based on the expenditure needs to maintain the intervention (e.g. purchase of drugs to maintain higher livestock herd sizes). The opportunity costs associated with participating in the project were also considered (i.e. reducing existing strategies in favour of other interventions- for example, a reduced number of labour days for casual employment because more time is being spent on own production). These costs were calculated in relation to income generated by each intervention to find out the net income generated for households. It is worth noting that the primary delivery modality used in the project was through organised groups, which reduced individual household opportunity costs.

Save the Children's interventions addressed four major areas: crop production, livestock production, income generation and disaster risk reduction capacity – See *detailed intervention mapping in Table 9*. The implementation strategy was mostly through organised groups; pastoral/farmer field schools, women groups and village savings and loans associations (VSLA) groups – with an average of 35 (ranging 30-40) households per group². Individual household targeting was also used, particularly for dryland farming. The following summaries give a description of the projects used in this analysis:

Fodder Production: - Through pastoral field schools, households were provided with training and seed for growing fodder using rain and or irrigation. Income benefit was through savings in purchase of feed and sales of fodder to other households.

Cereal Production: - Farmer groups and individuals were provided with training and seeds for the production of cereals for home consumption and sale.

Vegetable Production: - Farmer groups and individuals were provided with training and a variety of vegetable seeds to produce for home consumption and sale.

Beekeeping: - As part of the dryland farming, pastoral schools were provided with beehives and harvesting equipment coupled with training for the production of honey for sale. In addition to honey, sale of bee wax also emerged as additional income.

Livestock production: - In addition to fodder production, pastoralists were provided with animal drug vouchers for protecting animals against diseases in order to maintain and increase herd size. Income was generated through sale of livestock, milk and hides.

Village Savings and Loans Associations: Provision of training in saving and loaning to household groups. This created a platform of using savings to invest in income generating ventures, to diversify income portfolios.

Cash for Work: - Households were provided with a transfer of cash as they worked on various productive assets like water pans and tanks for harvest and storage of water. Some households were able to use the money in income generating ventures, providing additional incomes to households.

Technical vocational training and business/trade: - In addition to training, households were provided with start-up capital to invest in their business or to start a new business. This activity was primarily targeted at youths and women to provide skills and enhance the number of members contributing to household income. This was aimed at bringing diversity in sources and contributors to household income.

² Resilience Measurement Mid-Term Evaluation 2015

	Baseline	Mid-Term	End-Line	Average
Fodder rain fed	0.0%	0.2%	2.5%	1.35%
Fodder with irrigation	0.0%	1.4%	3.8%	2.60%
Cereal production (individual HH)	0.0%	1.5%	5.6%	3.55%
Cereal production (group)	0.0%	0.2%	2.3%	1.25%
Vegetable production (individual HH)	0.0%	1.1%	2.9%	2.00%
Vegetable production (Group)	0.0%	1.5%	3.4%	2.45%
Beekeeping	0.0%	0.5%	3.1%	1.80%
Livestock production	0.0%	9.8%	33.2%	21.50%
Villages Savings and Lending	0.0%	0.7%	15.4%	8.05%
Cash For work	0.0%	3.2%	10.6%	6.90%
Business/trade	0.0%	23.3%	30.0%	26.65%

The final evaluation analysis built on the baseline and mid-term measurement completed in 2015. The project impact data on income and related costs was obtained by the programme staff from 300 beneficiary households. This end-line evaluation provides a comparison of how resilience scores have evolved from baseline, through mid-term and end-line periods.

Households were asked how much income they obtained and what expenses and opportunity costs they incurred from the interventions they participated in at household level. This information was triangulated with reported incomes at group level.

Table 6 indicates the net average income (expressed as percentage of minimum food

needs) for different interventions. It's important to note that the delay in implementation in year 1 resulted in most incomes only generated in year 2, with some for technical vocational education and training only implemented at start of year 3. This delay impacted on the low intervention incomes observed during the mid-term evaluation. A majority of interventions generate less than 5% (Ksh 6,500), although this is an improvement from the mid-term when they generated less than 3% (Ksh 3,500) per annum. With the exception of livestock production, non-agricultural interventions tended to generate more income during drought conditions. Cash for work, village savings and lending, business/trade and livestock production have the greatest income generated (between 10% (Ksh 13,000) and 33% (Ksh 42,500)). Livestock production has increased due to increase in survival rate of animals allowing for sale of more livestock, production of more milk and the increase in prices. In conclusion, the non-agricultural

	Garissa and Mandera Peri-Urban				North-eastern Pastoral				North-eastern Agro-Pastoral			
	VP	P	M	BO	VP	P	M	BO	VP	P	M	BO
Baseline Resilience scores	0.73	0.91	0.92	0.81	0.60	0.67	1.01	1.70	0.50	0.84	1.13	1.90
Fodder production (rain fed)					0.62	0.69	1.02	1.70	0.53	0.86	1.14	1.90
Fodder production (irrigated)					0.61	0.68	1.01	1.70	0.51	0.85	1.13	1.90
Cereal production (individual HH)					0.61	0.69	1.02	1.70	0.52	0.85	1.13	1.90
Cereal production (group)					0.61	0.68	1.02	1.70	0.52	0.85	1.13	1.90
Vegetable production (individual HH)					0.61	0.68	1.02	1.70	0.52	0.85	1.13	1.90
Vegetable production (group)					0.61	0.69	1.02	1.70	0.53	0.85	1.14	1.90
Beekeeping					0.61	0.68	1.02	1.70	0.52	0.85	1.13	1.90
Livestock production					0.73	0.79	1.09	1.75	0.66	0.96	1.21	1.95
Village savings and lending					0.66	0.72	1.04	1.71	0.58	0.89	1.15	1.90
Cash for work					0.65	0.72	1.04	1.70	0.57	0.88	1.15	1.90
Business/Trade	1.01	1.10	1.15	1.13	0.76	0.81	1.12	1.77	0.69	0.99	1.24	1.98

interventions and livestock-related interventions were more effective in building resilience as they generated significant incomes during moderate drought conditions.

An analysis of the impact of intervention incomes on the resilience scores indicates a slight increase in the average scores for households in the project. The results in **Table 7 above** indicate that the interventions have a positive contribution to resilience of households, but the incomes generated are not enough to make poor and very poor households resilient or to cover the gaps coming from the impact of the moderate drought. The interventions increased the resilience scores by between 34 to 55 percent in PUG; 1 to 15 percent in NEP; and 2 to 18 percent in NEA livelihood zones compared to the respective baseline period. In all these interventions, Technical Vocational Education and training (TVET) and associated business/ trade activities implemented in peri-urban areas were able to generate enough income for households to meet their needs during a moderate drought – and therefore build resilience of households. The limited impact of similar actions in rural areas can be attributed to market access where demand of skills and traded commodities from the trainings is lower compared to peri-urban areas.

Trends in overall resilience scores over life of programme

Table 8, show the trends in average resilience scores for different wealth groups at different stages of the programme for all interventions in the programme. There is a general increasing trend in the scores of all wealth groups in the two livelihood zones from baseline to year three, with overall resilience scores higher than the reference year. This general trend indicates that the interventions have an incremental benefit on household resilience, however the rate of increase is small as the intervention strategy - group implementation, level of input support and income generated - did not contribute enough income in the implementation period of three years. Furthermore, as observed during the mid-term, there was no deliberate combination of intervention for households which could have complemented impact realised. While income does not necessarily increase on a linear scale as shown in **Figure 5**, the design of resilience models require an estimation of time it will take to reach the score of 1. Assuming a period of 4 years between moderate droughts and possibility of income and savings increasing following the three point observation trends **Figure 5** suggests that and very poor households would have required more than 3 years to reach the resilience score of 1. This analysis is particularly

Table 8: Overall Resilience Scores comparisons				
Garissa and Mandera Peri-Urban				
	VP	P	M	BO
Baseline (Pre-Implementation)	0.73	0.91	0.92	0.81
Mid-Term (Year 1-2)	1.09	1.14	1.21	1.23
End-Term (Year 3)	1.22	1.25	1.32	1.36
Overall Y1-Y3	1.01	1.10	1.15	1.13
North-eastern Pastoral Zone				
Baseline (Pre-Implementation)	0.60	0.67	1.01	1.70
Mid-Term (Year 1-2)	0.63	0.70	1.03	1.71
End-Term (Year 3)	0.68	0.74	1.06	1.72
Overall Y1-Y3	0.63	0.70	1.03	1.71
North-eastern Agro-Pastoral Zone				
Baseline (Pre-Implementation)	0.51	0.84	1.13	1.90
Mid-Term (Year 1-2)	0.54	0.87	1.14	1.91
End-Term (Year 3)	0.59	0.91	1.17	1.92
Overall Y1-Y3	0.55	0.87	1.15	1.91

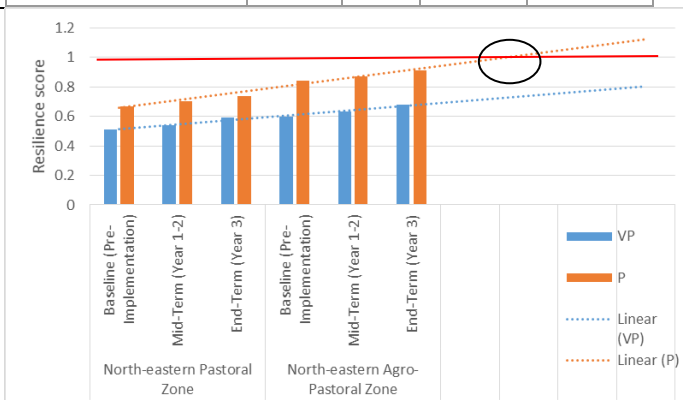


Figure 5: Modelling of time taken to build resilience

essential as it will allow project design to consider the level of investment, asset building, income and savings levels to be achieved in non-shock years to build resilience capacity of different households. In

this analysis it is clear that more time and investment was and is still required for poor and very poor to meet the desired resilience score.

The gradual increase in resilience scores suggests the need for either a longer multi-year programming or substantial investments for a shorter period with clear targets/milestones for each year to ensure sustained resilience building and strengthening. This will ensure that households can meet their livelihood protection threshold during moderate drought years with a resilience score of 1 or more through savings and investments made in non- drought years.

The forecasting of resilience scores for very poor households suggests the need for focussed resilience building safety nets and or increased input investment to increase their asset base, income generation and savings during non-drought years to speed up the time required to reach a resilience score of 1 or more.

The above outcomes demonstrate the need for considered targeting for resilience programmes; appropriate design of intervention packages and timing; and adequate level of inputs given project periods. A pre implementation evaluation done at design stage would have helped address some of the limitations in achieving resilience scores of 1 for the poor and very poor.

Conclusion and Recommendations

Context: The resilience building initiatives by Save the Children were implemented in fourteen villages in semi-arid areas of Mandera. The areas are characterised by low and poorly distributed rainfall which does not adequately support optimal crop agriculture, pasture and water availability for livestock, which are the mainstay of livelihoods for the population. The analysis of rainfall and pasture conditions indicates a high frequency of below normal rainfall, but in most years it's evenly distributed. However, a once in five years occurrence of below normal and poorly distributed rainfall for one or both seasons has been observed and in this case **October to September for 2003/4, 2008/9 and 2013/14** was observed as representing conditions of moderate drought in the context of Mandera. And a 1 in 12 year's severe drought as observed in the October 2010/11 is a rare occurrence – **See Figure 3.**

The context of Mandera requires an integrated approach of resilience building initiatives for crop- and livestock-based livelihood strategies. This support should be provided as a package to a households the community including: water harvesting, moisture retention and micro irrigation technologies where possible. Sustained support during non-drought years should focus on building savings – normally in the form of livestock and other forms that can be liquidated during moderate drought periods without depleting the capacity to recover.

Resilience to Moderate drought: The end-line evaluation, like the mid-term, has confirmed that while the interventions have generally had a positive impact on the resilience scores of households, the impact is small for most crop or fodder production interventions. The most effective interventions, with exception of livestock support, are non-agriculture related. At end-line the very poor and poor wealth groups in NEP and NEA livelihood zones remain well below the resilience score of 1 and require a longer time to achieve this score. The middle and better off in PUG who had a score lower than 1 were able, together with the poor and very poor in this livelihood zone, to generate enough income to cover their needs in moderate drought scenario – meaning the business development and TVET related entrepreneurial activities can make households in this zone resilient. The middle and better off wealth groups in NEA and NEP livelihood zones remained above the resilience score of 1 as at mid-term and from baseline.

Recommendation: The very poor and poor households still require additional support to achieve the desired resilience scores. This support should focus on 1) enhancing non- agricultural income generation activities such as trade/businesses, vocational skills application and VSLA, 2) enhancing sustainable increase in livestock (a key asset in this area), and 3) other forms of savings that will increase the coping capacity of households. However, a strong market-oriented support should be integral to avoid over production/supply that could hinder feasibility of initiatives.

In addition, the support given through groups is small given their size, which results in a small income benefit to each household. This is particularly true for fodder, bee keeping, cereal and vegetable production³. There is a need to reduce the size of groups and/or increase the level of input support provided.

³ In the intervention data provided some groups received small quantities of inputs. In some cases this was less than that given to individual households (e.g. cereal production and vegetable production).

The implementation of resilience projects should be preceded by a modelling of most appropriate interventions to help determine the level of input required to achieve resilience milestones. This should focus on appropriate targeting, intervention design and realistic timeframes.

Project Exit/Scale-Up/Replication? With all the outcomes and conclusions made during this analysis, there are critical questions that require clear response: Has the project helped build resilience? Is the project ready to exit or scale-up and/or be replicated? The following bullet points try to provide insight to these pertinent questions:

- ✚ It is clear that the interventions have produced slight increases in resilience scores. These increases are only slight because of limitations of input support provided through groups, late start of interventions and susceptibility to drought for most production related actions. Consequently, the poor and very poor are still unable to meet their needs following a moderate drought, both before and after intervention. These observations suggest that more has to be done for the poorer households to improve their resilience capacities, albeit while addressing some of the factors that have reduced effectiveness.
- ✚ While the project might have closed its last year of support, this analysis indicates a need for a follow up project with well-designed intervention packages suitable for the different wealth groups and livelihood zones. Based on the adjustments and application of lessons learnt, the interventions have potential to be scaled up and replicated in a similar context.
- ✚ The results suggest that the need of a follow up programme to maintain or strengthen the capacities of households to make certain level of savings and investments in non-drought years that will be a source of coping during the once in five years moderate drought event.

ANNEXES

Table 9: Intervention Mapping

ASP							
Crop Production			Production	Income Generation			
PFS	Dryland Farming	CCDRR	Veterinary services	Cash for Work	VSLA	Business	TVET
Fodder Production							
Vegetable Production	Vegetable Production	Vegetable Production					
Cereal Production	Cereal Production						
Beekkeeping	vegetable Production+cereal						
Fodder Production+beeking							
fodder Production +veg+beeking			Drug Vouchers				
fodder+cereal+beeking							
fodder Production +veg+beeking+cereal					Cash distribution		
Fodder					earthpan	VSLA	
					rangelnd		
							Business Capital