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The role of community-based natural resource management in climate change adaptation in Ethiopia

Hannah Reid, Lucy Faulkner and Axel Weiser

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The role of community-based natural resource management in climate change adaptation in Ethiopia

Assessing participatory initiatives with pastoral communities

Hannah Reid, Lucy Faulkner and Axel Weiser

IIED Climate Change Working Paper No. 6, July 2013

This paper describes the methodology developed to assess what role selected community-based/participatory natural resource management initiatives undertaken by Save the Children with pastoral communities in the lowlands of Borana and Guji zones in Ethiopia have in contributing to climate change adaptation. It also outlines the results and recommendations generated from applying this bespoke methodology at the study sites. Similar sites that also suffered from drought and had the same history of development and humanitarian interventions, but not with Save the Children, were also visited for comparative purposes.

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Executive summary

Many pastoralist communities in East Africa experience persistent poverty, social and political marginalisation, land degradation and conflict (although experiences vary widely both within and between pastoral groups and pastoral areas). These are due to failures of policy and governance rather than the pastoral system itself. Pastoralism is often (wrongly) viewed as economically inefficient and environmentally destructive despite evidence that it often brings economic and environmental benefits beyond those achieved by alternative land-uses such as ranching. In addition, pastoralist livelihood systems are often more resilient to changing climatic conditions because over the years pastoralists have developed strategies to cope with difficult conditions. In many instances, pastoralists are able to positively exploit greater climate variability to increase their resilience and generate higher returns than would be the case if the environment/climate were more stable or predictable.

Climate change is predicted to have severe impacts in East Africa. Whilst some of these impacts will be positive, most are likely to be negative. The natural environments on which many of the poorest rely are expected to experience significant changes. Sound risk management to increase livelihood resilience and maintain ecosystem services can be an important component of a cost effective approach to help people adapt to climate change, especially the most vulnerable groups, which include women and children.

Whilst most development interventions are not designed with climate change adaptation as a key objective, it is likely that they influence community capacity to adapt to changing shocks and trends – whether as a result of climate change or other pressures associated with development. There is a growing appreciation that newer fields of study such as community-based adaptation have much in common with older disciplines such as community-based/participatory natural resource management (CB/PNRM) and can both learn and adopt many principles from this older field of study. Research that assesses the role of CB/PNRM interventions in adaptation, however, is in short supply.

A methodology was developed to assess what role selected CB/PNRM initiatives undertaken by Save the Children with pastoral communities in the lowlands of Borana and Guji zones in Ethiopia have in contributing to climate change adaptation. The results and recommendations generated from applying this bespoke methodology at the study sites are described in this paper. Similar sites that suffered from drought and had the same history of development and humanitarian interventions, but had no Save the Children interventions, were also visited for comparative purposes.

The framework used to assess adaptation benefits at the research sites is based on a monitoring and evaluation for community-based adaptation (M&E for CBA) framework developed by the Action Research on Community Adaptation in Bangladesh (ARCAB) action research programme. ARCAB's goal is 'transformed resilience', which means achieving resilience at scale, resulting in the successful longer term adaptation of the climate vulnerable poor to climate change impacts through sustainable adaptation strategies. The ARCAB framework has been developed in line with current international thinking on the M&E of adaptation. It focuses on three domains: knowledge, capacity and practice, which need to be affected in order to realise the goal of 'transformed resilience.' It provides guidance on identifying 'upstream' indicators that provide evidence of mainstreaming and capacity building of relevant local institutions and service providers that are identified as important by vulnerable communities in providing climate risk management and adaptation services, and 'downstream' indicators that focus on adaptive capacity at household and community level, based on the understanding that good development coupled with access to and ability to use information related to climate risks are pre-requisites for adaptation.

A set of context-specific indicators was developed using this framework. Indicator choice was guided by strong collaboration with Save the Children staff with good local knowledge, and also an extensive review of literature and external expert advice on the specifics of

adaptation in the context of dryland pastoralist systems. Fieldwork was then designed and conducted to capture all required information for the evaluation. Methods included focus group discussions, key informant interviews, participant observation and field notes.

To aid analysis of the results emerging from field and desk-based research on how effective Save the Children's CB/PNRM intervention is in building resilience to climate change risk, and delivering adaptation benefits for pastoralists and agro-pastoralists, a CB/PNRM Resilience Scale was developed to provide a framework for results analysis. This scale moves horizontally from development, to adaptation to climate variability including disaster risk reduction (ACV/DRR), to adaptation to climate change (ACC). Vertically, the scale moves from conventional approaches to development, ACV/DRR and ACC, to those that are 'transformative'.

Results show that much has been done at the Save the Children sites towards moving from conventional approaches to development (and adaptation to climate variability including disaster risk reduction) to 'transformative development' approaches that empower local people and support bottom-up, participatory, flexible decision-making and planning processes within a strong institutional context. Much has also been done towards moving from standard development approaches towards those that support ACV/DRR. Although project activities were initiated in line with the USAID-funded Pastoralist Livelihood Initiative II strategy and thus without improving climate change resilience as a key goal, evidence shows that many of the development-oriented processes implemented have made important contributions towards this outcome. In an adaptation to climate change context, this is significant as it means that Save the Children has, to a certain extent, moved beyond conventional development and ACV/DRR methods that largely lack the ability to foster sustainable resilience-building in an uncertain and changing environment. Particular strengths include: project participants shifting from seasonal planning to a more forward-thinking long-term vision, with the perception that they are better able to cope with and adapt to future drought conditions; responsiveness to the needs of the climate vulnerable poor through an inclusive community approach that respects pastoralist traditions, including benefit sharing mechanisms that reduce livelihood vulnerability and improve coping capacity; district government engagement that supports the revitalization and potential sustainability of upgraded traditional pastoralist rangeland management systems; a reduction in 'development deficits' through appropriate seasonal mobility and better access to nutritious pasture, water sources, salt licks and forest areas, thus facilitating improvements in wealth, livestock health and food security; improved community cohesion through the application of bottom-up participatory approaches leading to a shift in mindset from 'individualism' to 'communal' rangeland and natural resources use, and wider stakeholder solidity across a broader institutional landscape; utilization of participatory resource mapping and community action plans to support collective problem solving and consensus building, including a possible reduction in conflict situations and improvements in perceived system flexibility; community openness to test indigenous knowledge systems with external relevant information-bases supporting learning-by-doing approaches; two-way knowledge exchange on NRM processes, from local government to community, and community to local government, facilitating improved practices in a climate variability context; good community ability to debate and adjust available weather and seasonal forecast information in response to community needs; and, increased female inclusiveness in decision-making processes across scales, including the empowerment of women with perceived improvements in the ownership of and right to rangeland and natural resources, coupled with a shift in male mindset on the cultural role and value of women.

In other areas, however, analysis of results revealed that the intervention fell primarily in the realms of conventional development and disaster risk reduction (DRR), for example regarding access to and integration of weather and seasonal forecasts in planning and decision-making processes at community and local institutional levels. Merging local knowledge with

meaningful scientific information on potential longer term climate change impacts is required when considering transformative adaptation to climate change. This is more likely to provide new insights into potential future risks, forcing project participants to look beyond past experience and to consider the limitations of past adaptive solutions, as well as improve awareness of potentially maladaptive practices.

In stark comparison, the site visited without Save the Children interventions showed that existing pastoralist livelihood systems were no longer producing effective results in light of local changing circumstances, with respondents unable to adapt with change. Evidence showed that respondents were not bouncing back to previous productivity levels before changing drought conditions, with productivity levels appearing to be in slow decline over time. Coping strategies undertaken were not forming the basis of successful long-term adaptive strategies needed to address current and future climate change risk. Key differences between this and the Save the Children intervention site relate to: weak evidence relating to female inclusiveness in NRM processes and women's roles as strategic agents of community adaptation; the weak ability of existing livelihood and rangeland management practices to cope with and adapt to changing circumstances; perceptions of the surrounding natural environment as simply a provider of natural resources rather than a holistic ecosystem with associated services; poor access to new and improved livelihood and rangeland management practices that could support the ability to cope with and adapt to drought conditions; and an absence of weather and climate information integration into community planning and decision making.

The Save the Children's CB/PNRM intervention has clearly contributed towards reducing livelihood vulnerability and increasing resilience for its project participants by leaving behind a legacy of empowered people more able to cope with and adapt to current climate variability risk through strong development-based outcomes of 'good' development and improved institutional governance. This suggests that the potential role that development actors, such as Save the Children, can play in the context of building adaptive capacity merits further attention amongst governments and policymakers. Likewise the role that sustainable natural resource management can play as an adaptation strategy, particularly for poor and vulnerable groups, merits further attention when compared to alternative infrastructure or technological adaptation solutions.

1. Introduction

This paper describes the methodology developed by the International Institute for Environment and Development (IIED) to assess what role selected community-based/participatory natural resource management (CB/PNRM) initiatives undertaken by Save the Children with pastoral communities in the lowland Borana and Guji zones in Ethiopia have in contributing to climate change adaptation. It also describes the results and recommendations generated from IIED researchers applying this bespoke methodology at the study sites. These Save the Children CB/PNRM initiatives are part of Phase II of the Pastoral Livelihoods Initiative (see Box 1) and the sites visited experienced droughts in 2010/11. Similar sites in Horbtor Kebele, Yabello District, that also suffered from drought and had the same history of development and humanitarian interventions, but had no Save the Children interventions, were also visited. Quantitative and qualitative measurements were taken at both sites to enable a comparative assessment of adaptation and related outcomes thus strengthening scientific evidence regarding the role that these upgraded Save the Children CB/PNRM initiatives might play in supporting adaptation.

Women focus group discussion, Horbtor Kebele, Labello District, Oromia Regional State, Ethiopia (30 November 2012)
Photo credit: Lucy Faulkner

Men focus group discussion, Horbtor Kebele, Labello District, Oromia Regional State, Ethiopia (30 November 2012)
Photo credit: Lucy Faulkner

2. Background

Climate change is predicted to have severe impacts in East Africa. Whilst some of these impacts will be positive, for example bringing more rainfall to certain dry areas, most are likely to be negative. The natural environments on which many of the poorest rely is expected to experience significant changes. Sound risk management to increase livelihood resilience and maintain ecosystem services can be an important component of a cost effective approach to help people adapt to climate change, especially the most vulnerable groups, which include women and children (Ambani and Nicholles 2012).

Many pastoralist communities in East Africa experience persistent poverty, social and political marginalisation, land degradation and conflict (although experiences vary widely both within and between pastoral groups and pastoral areas). These are due to failures of policy and governance rather than the pastoral system itself. Pastoralism is often (wrongly) viewed as economically inefficient and environmentally destructive despite evidence that it often brings economic and environmental benefits beyond those achieved by alternative land-uses such as ranching. In addition, the pastoralist way of life is often more resilient to changing climatic conditions because over the years pastoralists have developed strategies to cope with difficult conditions (Riché *et al*. 2009). In many instances, pastoralists are able to positively exploit greater climate variability to increase their resilience and generate higher returns than would be the case if the environment/climate were more stable or predictable (Krätli and Schareika 2010; Hesse 2010). This is because pastoral systems often have institutions and strategies that can harness the ephemeral, variable and unpredictable distribution of resources (particularly high nutritious pastures) to their advantage. This in turn contributes to greater accumulation of assets, better diets and more income – in other words a more resilient community. Well-functioning pastoral systems can also often cope better with periodic extreme events such as drought when compared with institutions and strategies better suited to managing more stable resources. This is because they reduce the loss of assets and have a greater capacity to 'bounce back' and resume high productivity once the extreme event is over (Ced Hesse pers. comm. Nov. 2012).

Whilst most development interventions are not designed with climate change adaptation as a key objective, it is likely that they influence community capacity to adapt to changing shocks and trends – whether as a result of climate change or other pressures associated with development (Jones *et al*. 2010). Ambani and Nicholles (2012) refer to the potential for "double dividends" resulting from adaptation and development interventions due to the strong synergies between the two. There is also a growing appreciation that newer fields of study, such as community-based adaptation, have much in common with older disciplines such as CB/PNRM and can both learn and adopt many principles from this older field of study (Chishakwe *et al*. 2012; Munroe *et al*. 2011). Research that assesses the role of CB/PNRM interventions in adaptation, however, are in short supply, and evidence of these "double dividends" is mostly anecdotal. This study aims, in part, to help fill this information gap by conducting a more rigorous assessment of the contribution that selected Save the Children CB/PNRM activities have in contributing to adaptation.

3. Study sites

Save the Children project sites visited for this study were located in the lowland Borana (sometimes written Borena) and Guji Zones, Oromia (sometimes written Oromiya) Regional State in Ethiopia with a focus on the three neighbouring *woredas* (districts) of Liben, Gorodola and Arero. Similar sites in Horbtor, Yabello (sometimes called Labelo) District, with no Save the Children interventions, were also visited for comparative purposes. Figure 2 shows the location of these *woredas* in the Borana Zone).

The Borana Zone, Ethiopia

The Borana administrative zone is a lowland area situated in the south of Oromia Regional State in Ethiopia (see Figure 1). The zone is divided into ten *woredas*, which are predominantly arid and semi-arid rangelands dominated by tropical savannah vegetation with open grassland and perennial woody vegetation. Pastoralism is the predominant livelihood activity and most people in the Borana zone are pastoralists or agro-pastoralists, with livestock holdings determining levels of household wealth. The main livestock kept in the area are cattle, sheep, goats and camels. The main agricultural crops are maize, teff, sorghum and haricot beans (Riché *et al*. 2009).

The average annual rainfall in Borana ranges between 350 and 900 mm, with considerable spatial and temporal variability in quantities and distribution. Rainfall usually occurs in a long rainy season from March to May, and a shorter rainy season from September to November. The average annual temperature ranges between 19 and 26°C. Rainfall variability results in great variation regarding where the best forage is found (Riché *et al*. 2009). To cope with this, most communities practice mobile livestock management, where animals are usually only kept at the homestead (*wara*) on a seasonal basis to provide milk for children and older household members who do not migrate with the herd.

The study sites are currently located in medium and high drought probability zones (NAPA 2007), and Riché *et al*. (2009) identify drought as the "main climate-related hazard affecting pastoral and agro-pastoral communities in Borana". Drought and extreme heat events are negatively affecting the availability, productivity and quality of pastures and farmland, which leads to livestock emaciation and death, reduced disease resistance and livestock productivity (in terms of milk and meat), more livestock being sold on the market, and lower livestock prices thus reducing household income. Not everyone is affected in the same way, but reduced food availability (mainly meat and milk) has particularly affected the health of children under five years, pregnant women and old people. Riché *et al*. (2009) argue that "The magnitude and rate of current climate change, combined with additional environmental, social and political issues, are making many traditional coping strategies ineffective and/or unsustainable" in the Borana zone. Weiser (2012) also describes how pastoralist communities in the study sites have been in a state of crisis, because their present coping capacities have not been sufficient to cope with widespread, severe and recurrent droughts, such as those experienced in 2008 and 2010/11.

Figure 1. Oromia Regional State, Ethiopia

Figure 2. Oromia Regional State showing the Borana Region in the south and the study sites in this region

Development interventions at the study sites

Although Phase II of the Pastoral Livelihoods Initiative began in 2009 (see Box 1), Save the Children started to implement upgraded CB/PNRM work under this initiative in 2012 (see Box 2). These activities are the focus of this study. Prior to 2009, Save the Children was engaged in the same CB/PNRM project sites where this study was conducted through Phase I of the Pastoral Livelihoods Initiative, which was in operation from 2004 to 2008, as well as through short-term drought response activities. Additionally, Save the Children has run more 'conventional' activities in these project areas, including supporting child education in 2006, and a health-focused initiative that helped children receive appropriate hospital treatment in 2012.

Increasing drought frequency and changes in rainfall experienced in the project sites where Save the Children's upgraded CB/PNRM activities have taken place, as described in the section on expected climate change impacts below, form only part of the vulnerability landscape for pastoralist and agro-pastoralist groups. Rainfall fluctuations alone may not explain increasing drought vulnerability as highlighted by McDowell (2011), who states "we simply cannot blame the current [drought] crisis on the rain." Underlying these climatic risk factors are changes in non-climate contextual trends relating to changes in livelihoods and resource needs that have contributed to reducing pastoralist resilience over time. These trends include a reduction in natural resource and rangeland availability, especially to key dry season grazing areas due to commercial farming, and increasing population pressures resulting in a constant flow of people moving from highland areas to lowlands in search of productive natural resource

Box 1: The Pastoral Livelihoods Initiative (Stockton *et al.* 2012)

Phase II of the Pastoral Livelihoods Initiative is a four-year project, begun in May 2009, and implemented in partnership with CARE, Mercy Corps and International Rescue Committee. Its objective is to improve and strengthen the lives and livelihoods of approximately 205,000 pastoralists and ex-pastoralists living in 15 *woredas* in lowlands areas of Ethiopia's Oromia, Somali, and Afar Regional States. This US$16 million project is currently being led by a consortium headed by Save the Children. Interventions include:

1. Improving community-based natural resource management,
2. Improving the ability of pastoralists to gain more economic value from their livestock,
3. Diversifying their ability to generate income,
4. Improving the effectiveness of early warning systems,
5. Implementing selected interventions relating to maternal and child health and HIV/AIDS, and
6. Integrating drought response and recovery through crisis modifier mechanisms to protect livelihoods during drought periods.

Box 2: Save the Children's CB/PNRM strategy

Overall goal: Enhanced community resilience to shocks, especially drought, through strengthening of pastoral livelihood systems and their resource management.

Strategic objectives:
1. Stronger stakeholder institutions, cooperation and cohesion.
2. Institutionalised, mutual learning for enhancing adaptive capacities and transformation.
3. Improved land use (including secured assess) and sustainable NRM in the context of increasing climate variability.

For CB/PNRM Guiding Principles, see Annex 4

assets for livelihood sustainability. Pastoralist communities themselves have also increased in number, contributing to an overall increase in human population size in research study areas. Widespread bush encroachment has increased pressures on reduced rangeland resources, and changes in government regional administrative boundaries between Oromia and Somali states has resulted in many Boran and Guji pastoralists losing land that was previously available to them. Furthermore, state government administrative influence has increased at the local community level, resulting in a reduction in power and influence yielded by leaders of traditional customary institutions. This shift has seen traditional pastoralist processes ignored by formal administrative bodies who have provided legal backing and policy support to permanent settlements and farming, therefore reducing access to, for example, existing migration routes and water points that are key to pastoralist livelihoods. Additional changing trends that have increased livelihood vulnerability for the majority of pastoralist households in the research study sites include increasing social and economic differentiation combined with weakened indigenous safety net systems, resulting in smaller herd sizes per household with increasing poverty levels.

The non-Save the Children site in Horbtor Kebele, Yabello District, was chosen because of similarities with the Save the Children sites above. Similarities include livelihood systems, agro-ecological conditions and the implementation of existing government interventions in the area, such as the Joint Emergency Operations Programme (for drought relief) and Productive Safety Net Programme (for national food security), which were therefore not a source of key differences between sites. The key contrast between Save the Children's CB/PNRM intervention sites and this control site relate to the absence of implementation of Save the Children's Pastoral Livelihoods Initiative II upgraded CB/PNRM work with pastoralists and agro-pastoralists.

Expected climate change impacts in the study sites

The Ethiopian National Adaptation Programme of Action (NAPA 2007) describes how for mid-range greenhouse gas emission scenarios, mean annual temperatures are likely to increase across Ethiopia, with increases of 1°C, 1.8°C and 2.9°C expected for areas in which the study sites fall by 2030, 2050 and 2080 respectively when compared to 1961-1990 levels. Warming has already been experienced with annual mean temperature over the last 55 years increasing by about 0.37°C every ten years. Hot days and hot nights have become more frequent, and the number of cold days throughout the year has decreased (Conway *et al.* 2007; Levine *et al.* 2011). In Borana, local observations are consistent with these scientific observations (Riché *et al.* 2009). These trends are set to continue and will likely be associated with more frequent heatwaves and higher rates of evaporation from soils and water bodies in the future (Conway *et al.* 2007).

Precipitation patterns are less clear. Historically these are characterised by strong inter-annual and inter-decadal variability, making it difficult to identify long-term trends, and also significant regional trends. UNDP/DFID comment that "There is not a statistically significant trend in observed mean rainfall in any season in Ethiopia between 1960 and 2006. There are insufficient daily rainfall records to identify trends in daily rainfall variability."[1] In south-east/eastern areas where the study sites are located, trends between 1980 and 2005 show sharp declines in March/September rainfall (Funk *et al.* 2005). Riché *et al.* (2009) describe how local and scientific observations in the Borana zone show that rainy seasons have become shorter over the last decade, and rain frequency, distribution and predictability seem to have decreased. This has led to scanty or no pasture growth, increased water scarcity, depletion of resources and

[1] http://www.adaptationlearning.net/climate-data/ethiopia-country-level-climate-data-summary

increased competition and conflicts over pasture and water resources. Rain intensity seems to have increased causing soil erosion and damage to pasture, crops, houses, roads and water points (Riché *et al.* 2009).

In the coming years, models tend to suggest that modest increases in rainfall can be expected, but confidence in predictions is not high (Conway *et al.* 2007; NAPA 2007) and other models suggest a reduction in rainfall can be expected. The Ethiopian NAPA expects increases of 1.4%, 3.1% and 5.1% in areas where the study sites are located by 2030, 2050 and 2080 respectively when compared to 1961-1990 levels (NAPA 2007). A further complication in projecting climate impacts is that Ethiopia's exposure to drought and floods is heavily influenced by the El Niño/ La Niña phenomena, and the impacts of climate change on these phenomena are not yet clear (ACCRA 2012). Models are, however, broadly consistent in suggesting that rainfall across the country will fall more in heavy events (McSweeney *et al.* 2007).

The above information on rainfall and temperature is inadequate for farmers and pastoralists willing and able to plan ahead for a climate change constrained future. Information is not available at temporal and geographic scales that can help with planning at the local level, and information on how changes in temperature and rainfall will affect key ecological systems and natural resources – for example soil moisture evaporation rates or increasing pest/ disease outbreaks – is almost entirely absent. The need to combine scientific observations and predications with past and current trends experienced by communities is therefore important. Pastoralists have noted an increase in climatic variability and weather extremes, for example. They have also observed an increase drought frequency and have been adjusting the composition of their herds (integrating camel production in a previously cattle dominated system) accordingly for the last 10-15 years. In light of uncertainty regarding what the future holds, the need to build broad local resilience and adaptive capacity in order to facilitate adaptation to an uncertain future is, therefore, clearly important.

Many consider Ethiopia one of the most vulnerable countries to the impacts of climate change (World Bank 2010; Adem and Bewket 2011). Ludi *et al.* (2011) point out that this is in part because of existing chronic food insecurity and land degradation, high population growth rates resulting in decreasing availability of land per household, low levels of development, and low capacity to address the negative impacts of climate change within government, civil society and the private sector. Whilst Flintan and Cullis (2009) acknowledge growing concerns about what climate change and resulting increasing incidences of drought are having on rangelands in the Horn of Africa, "it is also clear that the lack of a coherent approach to decision-making in the rangelands has done more to undermine former levels of rangeland productivity than cyclical droughts could ever achieve." Ced Hesse (pers. comm. 2013) stresses that a key underlying cause of Ethiopia's vulnerability stems from government failure to promote policies and intuitions that recognise and 'embrace' drylands characteristics (including variability and unpredictability), and genuinely include people in decision-making.

Changing rainfall patterns and temperature increases will particularly affect the more than 70 million poor Ethiopian people whose survival depends on rain-fed agriculture through farming and/or pastoralism (Ludi *et al.* 2011; Riché *et al.* 2009; World Bank 2010). The frequency of droughts and floods has increased in many areas of Ethiopia in recent years, and these people are already struggling to cope with the impacts of current climate variability and poverty (Adem and Bewket 2011; Venton *et al.* 2012). The NAPA (2007) identifies pastoralists as amongst those most vulnerable to climate change impacts and states that "drought is the single most important climate related natural hazard impacting the country." In the Borana zone, Riché *et al.* (2009) describe how "according to communities and government officials at the Pastoralist, Food Security and Disaster Preparedness Offices in Borana, drought frequency in the region used to be every 6-8 years, but has now increased to every 1-2 years."

When presented with expected future climate change scenarios in the Borana zone (i.e. increasing temperatures and increasing rainfall but falling in heavier events over shorter periods of time), Borana communities predicted a number of impacts on their livelihoods (see Table 1). It is likely that climate change is one of several causes of the impacts projected in this table. For example if traditional resource management systems breakdown, it is likely to be in part because of the marginalisation of customary institutions by a succession of governments seeking control over critical resources. Likewise, reduced rangeland productivity is partly because of bush encroachment, and not just higher temperatures and changing rainfall patterns, and scarcity of resources is in part due to loss of access

to land. Ambani and Nicholles (2012) note, for example, that "land enclosures or land concentration with disregard towards pastoralist communities can cause conflicts over access to resources and critically limit the adaptive capacity of communities." What seems clear, however, is that climate change will provide an additional stressor for Borana communities.

Table 1: Projected climate change impacts on local livelihoods in the Borana Zone (Riché *et al*. 2009)

Livestock	People	Natural resources
• decreased livestock disease resistance, weight, productivity and numbers due to longer dry seasons • increased livestock death due to droughts and heavy precipitation events • lower livestock prices • reduced livestock products, particularly milk (mostly mentioned by women) • disturbance of animal breeding cycles	• increased human health problems • decreased human labour productivity • increased food insecurity, malnutrition and human death • decreased efficiency of traditional coping mechanisms • increased student drop-outs • breakdown of traditional resource management systems (because of the increasing scarcity of resources) • increased conflicts between and within ethnic groups over limited resources • decreased dependence on / giving up agricultural activities • sharp increase in crop prices as a result of reduced availability in the market • decreased household incomes and increased poverty • increased dependence on emergency aid unless long-term aid instruments in place • separation of families for longer periods due to increased migration (to find labour work or better pastures) • youth frustration • heavy rainfall events damaging ponds, wells and soil-roofed houses	• greater soil erosion and decreased soil fertility • heavy rainfall taking away grass seeds and damaging pastures and crops • decreased pasture and water resource availability • increased competition over grazing lands and overgrazing • drying up of water ponds • decreased rangeland productivity • wilting of crops and decreased crop yields due to higher temperatures and water scarcity • rainy seasons becoming too short for the growth of pasture grasses and crops like teff, maize and sorghum • increased deforestation (due to increased fuel wood and charcoal selling as a coping strategy)

Riché *et al*. (2009) describe how pastoralists' ability to adapt to expected changes *"is constrained by many factors including increasing land degradation; conflicts over scarce resources, which limit movement and destroy assets that are key for adaptation….; limited access to information (including that on weather, climate change, markets, as well as pest and disease outbreaks); limited education, skills and access to financial services and markets required to diversity their livelihoods; inadequate government policies, capacities and coordination; demographic pressures; and social and gender inequalities and marginalization, which reduce the voice and adaptive capacity of the most vulnerable."*

4. Methodology

Measuring adaptation benefits

Assessing climate change adaptation effectiveness is not easy for a number of reasons. First, adaptation is a relatively new concept to many - notably the development community - although it is a fast moving arena and a number of frameworks to assess the effectiveness of Community-Based Adaptation (CBA) initiatives are emerging, on which this methodology builds. Second, climate change occurring to date is slight compared with future projected change in many areas, and in many instances, knowledge about future climate change risks is uncertain. Third, there is little agreement on what constitutes successful or effective adaptation (Spearman and McGray 2011), with various scientists proposing a number of ways to measure adaptation, for example in terms of feasibility, acceptability, effectiveness, efficiency, equity and legitimacy (for example Yohe and Tol 2002; Adger *et al*. 2005). Many characterise successful adaptation as an improved resilience of those who are vulnerable to climate change, and this can be characterised as either 'bouncing back' to the status quo after a shock or moving beyond this towards achieving longer-term development in light of, or in spite of climate change (Dodman *et al*. 2009; DFID 2011).

Much early literature took the Sustainable Livelihoods Framework (SLF), and its five capitals (natural, social, financial, human, and physical) as being synonymous with adaptive capacity. But such asset-oriented approaches typically mask the role of processes and functions in supporting adaptive capacity. Recognising this, the Africa Climate Change Resilience Alliance (ACCRA)'s Local Adaptive Capacity framework (LAC) tries to incorporate intangible and dynamic dimensions of adaptive capacity, as well as capital and resource-based components, into a more holistic conceptualisation of local adaptive capacity. The framework identifies five distinct yet interrelated characteristics that contribute towards adaptive capacity at the local level (Jones *et al*. 2010; Ludi *et al*. 2011). These are designed to guide the choice of indicators to help measure adaptation and adaptive capacity in either 'development' or 'climate change adaptation' projects (see Table 2).

Box 3: Definitions from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report

Resilience: The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.

Adaptation: Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Adaptive capacity: The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences

Table 2: Characteristics of high adaptive capacity at the local level from the ACCRA Local Adaptive Capacity Framework

Asset base	Availability of key assets that allow the system to respond to evolving circumstances
Institutions and entitlements	Existence of an appropriate and evolving institutional environment that allows fair access and entitlement to key assets and capitals
Knowledge and information	The system has the ability to collect, analyse and disseminate knowledge and information in support of adaption activities
Innovation	The system creates an enabling environment to foster innovation, experimentation and the ability to explore niche solutions in order to take advantage of new opportunities
Flexible forward-looking decision-making and governance	The system is able to anticipate, incorporate and respond to changes with regards to its governance structures and future planning

Source: Jones *et al.* 2010

Climate change is a long-term issue, and much recent work places greater emphasis on the longer-term forward-looking considerations required for sustained adaptive capacity. A recent assessment of World Bank experiences of adaptation also stresses the importance of adapting to future as well as current climate risk, which means acting now to avert severe but long-term threats, and to keep options open for the future (Independent Evaluation Group 2012). Recent work by ACCRA (see Beautement 2012) stresses the need to assess whether the five ACCRA characteristics are met both now but also have the capability to be met in the future, and Ludi *et al.* (2011) acknowledge, "one of the biggest challenges within development programming is how to ensure that individuals and societies can adapt beyond the programme-cycle of an intervention." Guidance on participatory monitoring and evaluation of CBA projects produced by CARE and the International Institute for Environment and Development (IIED) also proposes using 'outcome statements' to look beyond current impacts, vulnerability and response mechanisms and explore what local communities see as key components of high adaptive capacity in their household and their community 20 years ahead. Examples of outcome statements include 'people have the information and resources to prepare for disasters' or 'households have better access to safe drinking water close to their home and the supply system is safe from landslides.' These outcome statements can then be clustered and prioritised to form a basis for future monitoring (Ayers *et al.* 2012).

In their manual on participatory monitoring, evaluation, reflection and learning for CBA, CARE and IIED argue that good CBA is grounded in good development practice, because vulnerability to climate change has strong overlaps with poverty and marginalisation (Ayers *et al.* 2012). The manual argues, however, that whilst CBA should be based on local priorities, needs, knowledge and capacities, it also needs to be more than community development – it needs to focus on building resilience to both current and future climate stresses. Climate change increases existing development challenges but also brings new ones. Long-term development planning thus needs re-thinking in the context of climate change,

and CBA activities need to be informed by knowledge and information of current and projected climate risks, incorporating as far as possible scientific climate information as well as local, traditional knowledge into local adaptation planning. But planning ahead in this way is difficult when knowledge about what climate change risks to expect is uncertain. Ayers *et al*. (2012) thus argue that the following four key elements are required for successful adaptation at the local level, and use these as a basis for assessing adaptive capacity. Adaptation planning in all of these elements is informed by climate knowledge and risks:

1. Promotion of climate-resilient livelihood strategies such as diversification of land use and incomes;
2. Disaster risk reduction strategies to reduce impacts of increasing climate-related natural disasters on vulnerable households;
3. Strengthening capacity in: a) community adaptive capacity such as in access to climate information and managing risk and uncertainty and: b) local civil society and governmental institutions to better support communities in adaptation efforts; and lastly,
4. Local and national level empowerment, advocacy and social mobilisation to: a) address the underlying causes of vulnerability, such as poor governance, gender-based inequality over resource use, or limited access to basic services, and b) influence the policy and enabling environment.

To measure adaptation effectively, several authors have divided adaptive capacity indicators into those that focus on 'upstream' and 'downstream' indicators. 'Upstream' indicators look at whether or not mainstreaming is occurring and the institutional environment in which vulnerable groups are located enables long-term adaptation. For example, whether there are changes in food prices, markets, policies and governance that affect vulnerability. 'Downstream' adaptive capacity indicators that look at whether 'good development' coupled with access to and ability to use information related to climate risks are in place. Indicators for 'good development' can relate to access to assets, strong diverse livelihoods, poverty, food security, health, disaster risk reduction and so forth. Together, these 'upstream' and 'downstream' indicators will influence whether people and institutions are adapting and innovating in response to climate risks (Brooks *et al*. 2011; Ayers *et al*. 2012).

Recent literature on ecosystem-based adaptation (EbA) stresses the importance of ecosystems and ecosystem services as a key component of adaptation (Reid 2011;

Table 3: Selected principles for effective ecosystem-based adaptation

Principles	Requirements	Details
Promote resilient ecosystems	• Modelling of projected climate change • Revise systematic planning • Revise protected area systems design • Involve local communities in restoration and management • Adjust management programmes and actions	EbA approaches cover a broad spectrum of land management, policy and project activities. Promoting ecosystem resilience for the benefit of communities is the first and most obvious set of actions.
Maintain ecosystem services	• Valuation of ecosystem services • Determine climate change impact scenarios • Identify options for managing ecosystems or managing use • Involve user communities in adaptation action • Trade-off analysis	Maintaining ecosystem services is key, and conservation practitioners must improve their understanding of how to design and implement actions to do this, and their ability to effectively measure benefits provided.

Source: adapted from Travers *et al*. (2012) and Thomas (2011)

Girot *et al.* 2012; UNEP 2012; Munroe *et al.* 2011). This is because many of those who are most vulnerable to climate change are also highly reliant on ecosystems and ecosystem services for their lives and livelihoods. This is particularly important in Ethiopia where sustainable management of the nation's biodiversity is crucial given Ethiopia's reliance on its stock of natural resources for the bulk of its economic activities. Adem and Bewket's (2011) comment that "Overall, vegetation resources in Ethiopia are mined rather than managed and their degradation has reached a critical stage" is thus of particular concern.

Central to the concept of EbA, however, is the importance of seeing beyond the role of ecosystems as providers of a set of static 'natural resources' and instead seeing them as providers of a number of interconnected ecosystem services such as pollination, climate regulation, genetic diversity and water provision (see Table 3). Proponents of EbA argue that a holistic approach to maintaining ecosystem structure and functioning and ecosystem service provision can support adaptation. Recognising that ecosystems have limits, undergo change (due to climate change and other stressors) and are interconnected is central to this approach (Girot *et al.* 2012). This is particularly important in the context of the Save the Children CB/PNRM initiatives, where it is the resilience and management of the rangeland ecosystem and the resources and services it provides that form the basis for pastoralist and agro-pastoralist livelihoods in the region.

Methodological framework used for this study

This section describes the methodology developed to assess the effectiveness of Save the Children CB/PNRM interventions in building livelihood resilience to climate change risk for pastoralists and agro-pastoralists at a project scale. The framework used here is based on a monitoring and evaluation for community-based adaptation (M&E for CBA)[2] framework developed by Action Research on Community Adaptation in Bangladesh (ARCAB) – a long-term action research programme on community-based adaptation in Bangladesh (ARCAB 2012a; 2012b).[3] ARCAB's goal is 'transformed resilience', which means achieving resilience at scale, resulting in the successful longer term adaptation of the climate vulnerable poor to climate change impacts through sustainable adaptation strategies (ARCAB 2012a; 2012b). The ARCAB framework has been developed in line with current international thinking on the M&E of adaptation summarised above. It provides a coherent approach to identifying key indicators guiding what to assess at project level to evaluate what role Save the Children's initiative has contributed to delivering current and potential future adaptation benefits and support for target beneficiaries, including the poorest, most marginalised and women.

ARCAB describes the range of stakeholders and scales across which change needs to occur in order for adaptation to be resilient. These include: 1) the climate vulnerable poor, who are generally the poorest and most marginalised people in society (Smith *et al.* 2003) 2) the local formal and informal institutions needed to deliver adaptation services to these groups at the local level, including community-based organisations, local NGOs and local government service delivery providers, and 3) the wider 'community of practice' including national governments, international finance institutions and funds, and national and international learning forums such as the annual international community-based adaptation conferences.

[2] Community-based adaptation (CBA) is the generation of locally-driven adaptation strategies that address both climate change impacts and development deficits for the climate vulnerable poor (Ayers and Huq, forthcoming; Reid *et al.* 2009).
[3] ARCAB is an action research programme under the International Centre for Climate Change and Development (ICCCAD).

Box 4: The ARCAB framework is based on the following hypothesis:

Supporting 'transformed resilience' for the poorest and most marginalised communities vulnerable to climate change impacts requires strengthening the knowledge (K) and capacity (C) of the climate vulnerable poor[4] to improve their long-term adaptive capacity[5] in light of changes in climate and other risks. It also simultaneously requires the climate vulnerable poor to have access to an enabling environment facilitating their ability to adapt through local institutions having the knowledge (K), capacity (C) and incentives to provide adaptation services and benefits to them. Together therefore, these two components should result in evidence that people and institutions are actually adapting to climate change impacts through changing practice (P) as a result of improved adaptive capacity and access to adaptation services.

ARCAB also describes three interlocking 'domains' which need to be affected in order to realise the goal of 'transformed resilience' in CBA projects (see Figure 3). These domains are then used to help identify indicators to assess the contribution/effectiveness of Save the Children Ethiopia's CB/PNRM intervention in building resilience to climate change impacts (see Annex 2). These are:

1. Meaningful and locally relevant **knowledge** (K) about climate change and adaptation science. This knowledge is to be generated locally and merged with that developed by climate change 'experts' in order to design feasible, credible and useful adaptation options.
2. Knowledge is not enough unless people and institutions have the **capacity** (C) to act on it. This means having the skills, power and ability (including finances) to turn knowledge into practice. This applies in the context of both the individual - in terms of having access to the basic assets, resources and institutions that enable them to adapt to climate variability and change - and to institutions too, which need access to resources and incentives to turn knowledge into action, and the mandate to do this.
3. Supporting knowledge and capacity will lead to changes in **practice** (P). These can be adaptive strategies undertaken by local people, or shifts towards a more integrated, long-term, flexible, strategic and participatory way of development planning.

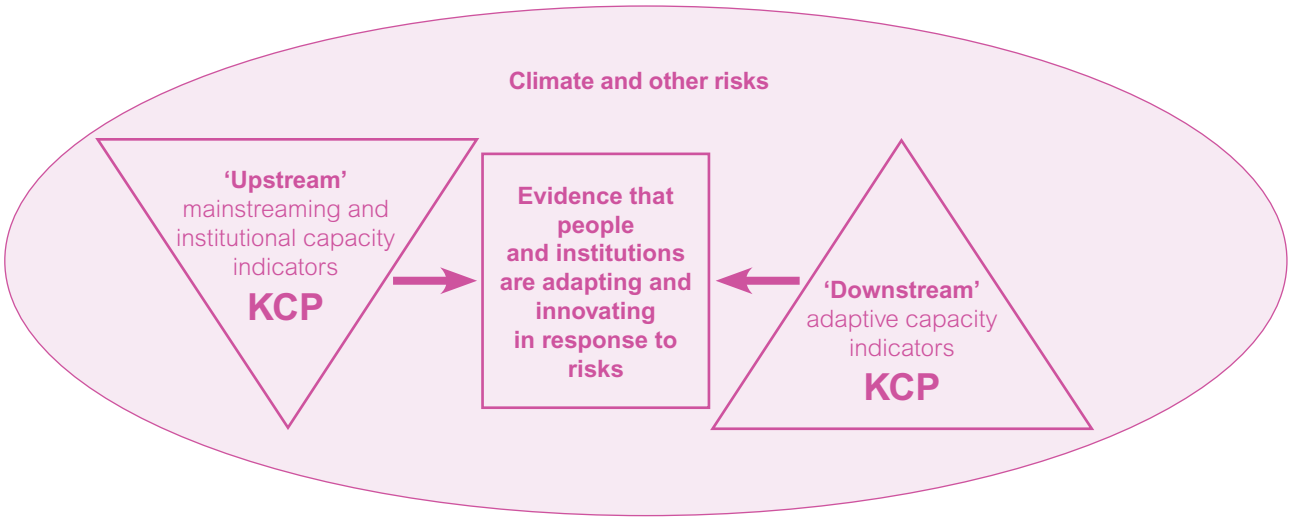


Figure 3. Conceptual framework for outcome indicator areas used in the ARCAB M&E for CBA framework translated to fit Save the Children's CB/PNRM intervention (adapted from Brookes *et al.* 2011).

[4] The climate vulnerable poor refers to the poorest and most marginalised people living in regions that are vulnerable to climate change and who have low adaptive capacity (Ayers and Huq, forthcoming).

[5] There are many models of adaptive capacity, and ARCAB does not prescribe to one. However, common components of adaptive capacity include access to the necessary assets, livelihoods, and institutional systems that enable people to adapt to climate and other stresses. The ARCAB M&E for CBA framework is therefore coherent with The Africa Climate Change Resilience Alliance (ACCRA) 'Local Adaptive Capacity' framework and its five characteristics for building adaptive capacity at local level (Levine *et al.* 2011).

The ARCAB M&E for CBA framework focuses on 'upstream' indicators around evidence of mainstreaming and capacity building of relevant local institutions and service providers that are identified as important by vulnerable communities in providing climate risk management and adaptation services. This refers to indicators assessing institutional and service accessibility and inclusiveness, including the knowledge and capacity of these institutions to deliver adaptive benefits. It also includes assessing the knowledge and capacity of these institutions to integrate and manage climate risk management into existing planning and provision. In the context of this assessment, relevant institutions are district government line departments,[6] customary institutional leaders from Aardha to Deedha level, and Save the Children themselves.

The ARCAB framework also focuses on 'downstream' indicators around adaptive capacity at household and community level, based on the understanding that in development deficit situations,[7] good development coupled with access to and ability to use information related to climate risks are pre-requisites for adaptation. This means one set of indicators for adaptive capacity focus on basic development indicators as proxies, including evidence of changes in poverty levels, livelihood outcomes and asset-bases. Disaster Risk Reduction (DRR) is also included based on the premise being that people who are well adapted to environmental hazards will also be able to manage many climate risks. A second set of indicators focus on sources, availability, levels of and use of relevant and locally-meaningful climate and non-climate information. In the context of climate change adaptation, it is not only climate risk that needs to be assessed, but also non-climatic risk as climate change impacts are likely to intensify and exacerbate current risks already experienced at the local scale. In the context of this assessment, this includes livestock market prices and information on mobility access to appropriate wet and dry season grazing areas.

Building on this understanding, context-specific indicators in the above outcome areas were developed to assess Save the Children's CB/PNRM intervention (see Annex 2 for further details). Spearman and McGray (2011) argue that "Indicators must be chosen based on the relationship between planned adaptation activities and the socio-economic, environmental and climatic context in which they will be implemented." Ayers *et al*. (2012) also stress the importance of not only "selecting indicators that are 'the most scientifically rigorous,' but [of] selecting indicators that are based on local knowledge and experience." The choice of specific indicators was therefore guided by strong collaboration with Save the Children staff with good local knowledge, and also an extensive review of literature and external expert advice on the specifics of adaptation in the context of dryland pastoralist systems.

Strong collaboration with Save the Children staff ensured the emerging indicator framework was locally relevant, meaningful and context specific. It also ensured that indicators built on existing processes used, including monitoring and evaluation frameworks already in place, and results obtained from CBNRM/PNRM activities at the project sites. The CARE/IIED manual (Ayers *et al*. 2012) argues that most of the information collected to establish an effective participatory monitoring, evaluation, reflection and learning framework for CBA projects is needed at the beginning of the intervention. This helps measure 'baselines' and set indicators at the beginning of planning, which helps focus plans on achieving those indicators by allowing comparison of 'before' and 'after' situations. The CB/PNRM initiatives undertaken by Save the Children with pastoral communities in Oromia Regional State were designed as development rather than CBA projects, however, and the baselines and indicators chosen to measure project success reflect this. Despite this, many of these measures are also useful in the context of assessing adaptation benefits because good CBA is grounded in good development practice. The framework used here therefore added key climate change components to existing assessment frameworks.

[6] The district government line departments relevant to this study are the Liben District Pastoral Development Office, the Liben District Land & Environmental Protection Office and the Liben District Water Office.

[7] In development deficit situations, people do not have access to the basic assets, institutions and services they need to fulfil their basic capabilities. Addressing the development deficit is therefore a first step in enabling people to cope with and manage the additional stresses presented by climate variability and climate change (Ayers and Huq forthcoming; ARCAB 2012b; Burton 2004).

An extensive literature review and expert advice on adaptation in dryland pastoralist systems in Ethiopia and East Africa also influenced indicator identification. Literature reviewed included that on new programmes of study and work relating to adaptation, resilience-building, adaptive capacity, CB/PNRM and climate change impacts in the drylands. This included relevant materials on how to identify and measure the key components of successful adaptation, and results from a similar assessment of adaptation and disaster risk reduction activities conducted for Save the Children in Somalia / Somaliland (Faulkner 2012). A review of dryland literature and feedback from relevant experts at IIED stressed the importance of the 'three pillars' of pastoralism that all need to be functioning for 'successful adaptation' to take place: pastures/water, livestock and institutions for their management (Save the Children USA *et al*. 2011). These three pillars will help communities harness the ephemeral, variable and unpredictable distribution of resources, and also cope with periodic extremes such as drought. In practice, this means that interventions need to support institutions and strategies that have the capacity to (i) maintain common property type tenure arrangements over the landscape to facilitate access to good pastures in the wet season, thus maximising milk and meat production, and during the dry season, thus maintaining household food security and livelihoods during stress periods; (ii) regulate water access such that dry season pastures do not 'run out' before rains allow for new growth; (iii) support livestock mobility, including negotiated access to resources in areas that are not necessarily on 'home territory'; (iv) practice selective breeding of livestock that are good at maintaining production and reproducing during seasonal periods of stress (with insufficient fodder and water during dry periods, and disease pressure) as well as having the genetic potential to perform well in periods of good rains and pasture; (v) access markets and beneficial trade terms between livestock and, for example, cereals; (vi) manage herd structures (including species composition, for example including camel in household livestock) that enable people to feed their family today and in the medium to long-term future (in keeping with changes in the balance of family dynamics); and (vii) maintain peace. Other factors such as controlling land degradation and disease, drought, and the threat of fire or wildlife may also be important (Ced Hesse pers. comm. Nov. 2012).

Following the development of the indicator framework (Annex 2), fieldwork methodology was designed to capture all required information for evaluation purposes during the practical operationalisation of the framework.

Data collection in the field

Mixed methods of data collection were employed during fieldwork. This included predominately qualitative measurements of evidence, although quantitative dimensions were also ascertained. Primary and secondary data sources were collected from Save the Children project sites that experienced droughts in 2011, and similar sites in Yabello District that also suffered from drought but had no Save the Children interventions. Research validity was strengthened through the triangulation of data sources where possible.

Primary data was collected as a result of fieldwork undertaken by IIED with support from Save the Children Ethiopia from November 22 to December 2, 2012. Respondents from two different field sites were engaged for research purposes. At Save the Children's CB/PNRM intervention site in Liben and Gorodola Districts, a number of stakeholder groups were targeted: male customary institutional leaders at Deedha level,[10] male and female community members (including women representatives at Deedha level),[11] male district level government representatives from the Pastoral Development Office and Land & Environment Protection Office, and male Save the Children staff from Save the Children's CB/PNRM intervention site. At the non-Save the Children site in Yabello District, male and female community members were targeted to aid a comparative assessment of adaptation and related outcomes between sites. For a complete list of stakeholder details, please see Annex 1.

[10] This is the highest rangeland management unit of customary institutional leaders within the Borano pastoralist system.
[11] Women representatives were involved as a direct result of Save the Children's PNRM intervention.

Data collection methods comprised of focus group discussions (FGDs), key informant interviews (KIIs), participant observation and field notes. Seven FGDs and three KIIs were conducted in total across both field sites during fieldwork. Households from different gender, wealth, age and livelihood systems were requested by Save the Children to partake in relevant data collection methods. Selection of respondents was based on random sampling. Questions asked were framed using language and terms understood by respondents.

In addition to the secondary data sources collected prior to fieldwork to support indicator development, supplementary secondary evidence was collated during fieldwork to support information required for quantitative data analysis. This primarily consisted of information from Save the Children PNRM project documents.

Research challenges and limitations

This assessment aimed to contribute to knowledge gaps on how Save the Children PNRM interventions in the Oromia Regional State of Ethiopia benefit the poorest and most marginalised pastoralists and agro-pastoralists vulnerable to climate variability and climate change risk (Napier and Desta 2011). However, accessing relevant information during fieldwork in response to this request was challenging. All respondents felt the community received certain livelihood benefits from Save the Children's PNRM intervention as a homogenous unit, making it difficult to analyse results from the perspectives of different wealth and vulnerability groups. This also follows the approach taken by Save the Children here, which unlike other Save the Children interventions does not target poor households alone or follow wealth, age or sex differentiation. The reason for this more inclusive approach is because PNRM activities at the project sites are community-driven and as such communities have decided how they will work. Moreover, in the natural resource management sector, a specific focus on poor or women, which would exclude other community parts, is not practical.[12] Similarly, according to local traditions, it was customary leaders who predominantly responded to questions. Input from other community members was harder to collect. Fieldwork findings thus reveal that whilst the poorest and most marginalised are included in PNRM processes, the extent to which they have received specific adaptation benefits from Save the Children's intervention is hard to ascertain.

Another challenge was that the IIED researcher undertaking data collection did not speak the local dialect at the field study areas. Complete reliance on translation of respondent information from Save the Children staff was therefore depended upon during fieldwork. Possible interpretation of questions and therefore answers due to language differences is acknowledged for all respondents and translators. In addition, the time allocated to undertake data collection was limited with fieldwork taking place in a restricted number of sites. This research therefore is not representative of all Save the Children's PNRM beneficiaries. Similarly, respondents interviewed for data collection purposes were not equally disaggregated between pastoralist and agro-pastoralist groups. Only one female FGD comprised of agro-pastoralist respondents. Similarly, scheduling did not allow KII at Liben District Water Office to take place. Lastly, lack of rigorous baseline data from Save the Children's PNRM intervention site used in this study did not support ease of comparison of fieldwork findings.

Ethical considerations

False expectations of research outcomes were addressed by voicing clear intentions and conditions under which the assessment was to be administered to respondents before fieldwork began. The right to not participate was adhered to, and for those that chose to contribute to this study, time kindly given was subject to respondents' discretion to ensure livelihood and household activities were respected. All photographs were taken with permission.

Male customary institutional leader with female agro-pastoralist project participants, Kobadi Pastoral Association, Borana Zone, Oromia Regional State, Ethiopia (27 November 2012)
Photo credit: Lucy Faulkner

[12] Save the Children's PNRM intervention does, however, include a focus on increasing the participation of women and on systematically including poorer households and addressing their specific needs as the later results section will show. The poor are thus benefiting proportionally more from PNRM than richer households (see Tables 4 and 9).

Analytical framework used

To aid analysis of the effectiveness of Save the Children's CB/PNRM intervention in building resilience to climate change risk, and delivering adaptation benefits for the pastoralists and agro-pastoralists their initiative engaged with, the following analytical framework has been developed. This CB/PNRM Resilience Scale[13] (Figure 4) provides a framework for analysis that can be used to explore, unpack and assess the process used and the results obtained by Save the Children's initiative.

The CB/PNRM Resilience Scale moves horizontally from development, to adaptation to climate variability including disaster risk reduction (ACV/DRR), to adaptation to climate change (ACC). Vertically, the scale moves from 'conventional' approaches to development, ACV/DRR and ACC, to those that are 'transformative'. To move towards sustainable adaptation to climate change for Save the Children's ultimate beneficiaries (what is called 'transformed resilience' under ARCAB), progress towards the bottom right hand box is recommended – 'transformative ACC.'

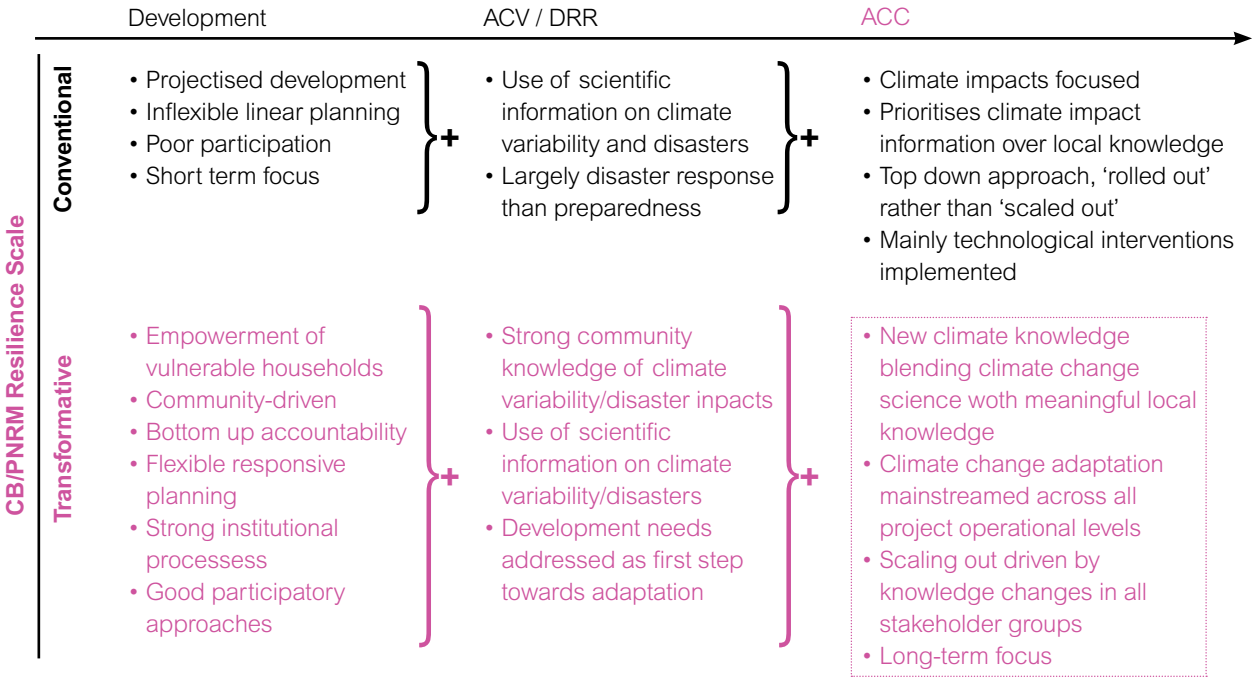


Figure 4. An analytical framework for assessing CB/PNRM through a climate change lens – the CB/PNRM Resilience Scale

To move towards this goal, changing the methods undertaken and approaches used under what is classed 'conventional' development and ACV/DRR in Figure 4 above is required. This includes:

- Revisiting conventional development and ensuring that the basic needs of the poorest and most marginalised people vulnerable to climate change are being addressed
- Empowering climate vulnerable poor groups to ensure that their knowledge and demands are reflected in decision-making processes
- Moving beyond short-term projectised approaches to planning towards integrated approaches that engage with and build the capacity of local to national institutions, with associated sustainable institutional and resource-bases
- Creating spaces for knowledge sharing and knowledge transfer, to support the scaling up and scaling out of effective processes and practice, and
- Ensuring flexible approaches to planning that can respond to changing needs and incorporate a range of knowledge bases, especially that generated by ultimate project participants.

[13] This scale is adapted from ARCAB 2012b and Faulkner and Ali 2012. The explanation of this scale is taken directly from Faulkner and Ali 2012.

It is important to stress that moving towards transformative ACC is not just about new climate change information and adaptation science. It also requires transformative development and transformative ACV/DRR approaches to be operationalised (along with associated transformations in attitudes, skills and actions) to support moving towards this goal. This is shown on the scale by the addition signs (+). Transformative ACC requires transformative development, plus transformative ACV/DRR approaches, plus other components that may be required. This is particularly important for this assessment, where project activities were not initiated with improving climate change resilience as a key goal – and yet many of the development-oriented interventions implemented will likely still make important contributions to transformed climate change resilience.

Similarly, making the distinction between conventional and transformative ACC is important, because moving towards more sustainable and transformative resilience does not advocate undertaking 'any' adaptation measures. Adaptation interventions can be viewed on a continuum (Callow 2011; McGray *et al.* 2007). On one hand are adaptation measures targeted to address specific climate impacts, such as building dams and raising sea defense walls. On the other are those required for both adaptation and development, such as improved household access to safe water sources. On the CB/PNRM Resilience Scale in Figure 4, conventional ACC takes the former 'impacts-based' approach to adaptation. This means climate change impacts such as droughts or floods are taken as the starting point for vulnerability assessments, giving rise to largely technological adaptation solutions that target the specific impacts of climate change through a top down approach. In comparison, transformative ACC takes the latter 'adaptation as development' approach (Ayers and Dodman 2010). This views adaptation as increasing the adaptive capacity of people to climate and non-climate risk by taking a livelihoods-based view to assessing vulnerability. Consequently, this results in adaptation interventions that target the underlying drivers of vulnerability as specified by climate vulnerable poor groups themselves. Such an approach is also important in the context of this assessment where confidence in what to expect in terms of specific climate change related impacts for project sites in the coming years is not high.

Moving towards transformative resilience to climate change is largely driven by the integration of new knowledge about adaptation and future climate change. This knowledge is co-produced from both improved scientific information about future climate change impacts and adaptation science, and locally-generated knowledge from the climate vulnerable poor about past climate trends and the interaction between climate impacts, vulnerability and adaptation. This blending of scientific and local knowledge is transformational, because it forces development practitioners to re-think the way development planning and implementation are undertaken. Scientific information specifies that climate impacts are becoming more uncertain, hence a lens that provides more dependable information on possible outcomes at the local scale is needed in order to understand what matters to local people. Relying solely on scientific expertise is not enough. Local knowledge is also needed to develop a new kind of knowledge that all stakeholders can use in practice.

5. Results

Based on fieldwork findings, the following assessment of Save the Children's CB/PNRM intervention has been made to provide insight into how much it contributes to building resilience to current and potential future climate change impacts for the pastoralist and agro-pastoralist households engaged in the project. These results are to be viewed as 'headline reflections' of data collection findings that are responsive to the indicators identified prior to fieldwork (Annex 2). Due to the substantial number of indicators identified for evaluation, Save the Children's CB/PNRM results here and in Figure 5 below do not necessarily present one result for each individual indicator. Rather, indicator findings have been combined where deemed relevant and summarised to produce more targeted results that facilitate discussion to support assessment analysis. However, this does not mean that individual indicator findings are not drawn upon. They are used when describing the results found under each headline reflection below on which later analysis is based.

Results from the Save the Children study site

District government engagement supporting revitalisation and potential sustainability of upgraded traditional pastoralist rangeland management systems

Evidence shows that Save the Children's CB/PNRM intervention has strengthened the existing relationship between relevant district level government line departments, customary institutional leaders, and male and female community members – an important factor for adaptation. All respondents perceived district level government support being central to the revitalisation of the traditional pastoralist rangeland management system, which was weakened by the past political context.[14] With the use of wet and dry season grazing areas in decline rendering access to key resources and migration routes problematic for pastoralist and agro-pastoralist communities, livelihood vulnerability increased, which was further exacerbated by recurring drought conditions.

As part of Save the Children's CB/PNRM intervention, revitalisation of the community-based management system has been facilitated by pastoralist by-laws being "enforced by local government partners."[15] This means that indigenous "seasonal-based rangeland management facilitating access to scarce resources during wet and dry seasons" has "government recognition."[16] Consequently, "the system cannot be breached by individuals or groups."[17] As a result, respondents stated their ability to claim support from government bodies on improper land use.[18] This increased empowerment and change in land use patterns, has rendered respondents to perceive "more secure access to and control over land and resources."[19]

This perceived strengthened government-community partnership[20] is also stated to facilitate future CB/PNRM intervention sustainability, despite the end of Save the Children's role in project processes in early 2013. This means respondents feel that they will continue to reap the benefits of the project beyond its time boundaries – an important aspect of building sustainable resilience as it involves moving beyond short-term projectised approaches to planning towards longer-term approaches that are integrated with key institutions. As discussed in further detail below, indigenous knowledge is combined with new government-led knowledge to inform a modern land use and NRM system that[21] "will continue in the future for as long as we are alive."[22]

This evidence shows that Save the Children's CB/PNRM intervention has initiated an institutional environment supportive of building community resilience to local risks. This has been achieved by institutional systems enabling access to assets that project beneficiaries need to help them build their adaptive capacity.[23] This highlights that project beneficiaries at risk from lack of access to key natural livelihood resources are vulnerable mainly because of the social factors that make them vulnerable to the hazard in the first place rather than the potential hazard of climatic factors on NRM processes themselves.

Reducing development deficits through appropriate seasonal mobility and improved access to nutritious pasture, water sources, salt licks and forest areas facilitating increases in wealth, livestock health and food security

The revitalisation of the traditional pastoralist management system has enhanced respondents' ability to access key livelihood resources (Table 4 opposite) that community members themselves have identified as important in the context of the project. Exploring this enhanced access in further detail reveals specific changes in assets and livelihood outcomes that help build respondents' development capacity (also Table 4 opposite).

[14] All respondents stated that over recent years the role of customary institutional leaders has been challenged. Traditional pastoralist processes have been ignored by formal administrative bodies who have legally backed permanent settlements, including farmland, through policy support.
[15] Aardha CI FGD 28 November 2012.
[16] This quote is from the Deedha CI FGD, 25 November 2012. The same notion was expressed in Reera and Aardha CI FGDs, 26 November and 28 November 2012 respectively.
[17] Deedha CI FGD, 25 November 2012.
[18] Deedha CI FGD, 25 November 2012.
[19] Deedha CI FGD, 25 November 2012 and all FGDs and KIIs undertaken during fieldwork.
[20] Female respondents expressed their relationship with district government as a "road" that has been created, facilitating access to useful advice on required livelihood information-bases, including mobility, forest management and rehabilitation of degraded land, 27 November 2012.
[21] KII Liben District Land & Environmental Protection Office, 29 November 2012.
[22] Reera CI FGD, 26 November 2012; with the sentiment expressed in all other FGDs and KIIs undertaken during fieldwork.
[23] This statement is supported by evidence that all Save the Children and district government stakeholders interviewed had sound knowledge of indigenous pastoral management and production systems.

Table 4: Example results, short-term benefits and outcomes as a result of traditional pastoralist rangeland management processes being revitalised under Save the Children's CB/PNRM intervention.

Result of Save the Children PNRM intervention[24]	Short-term benefit	Outcome
• 2,000,000 hectares of rangeland under improved management, including wet season grazing areas • 4,365 hectares of private enclosures dismantled • 16 settlements relocated • 10,396 hectares of communal enclosures established/upgraded	Increased access to nutritious pasture for livestock during dry seasons (see the enclosures pictured in Photo x below) leading to improvements in livestock body condition and reduced livestock mortality	• Increase in livestock market price • Shift in livestock market value from wet season, to wet and dry season • 2 year old bull increase in price during dry season from 1000-2000 Ethiopian Birr (ETB)[25] without access to communal grazing enclosures, to 3000-4000 Birr with access under PNRM • One year old shoats and calves now hold market value • Perceived shift in livestock market access: traders now come to the community ("The market is now coming to us")[26] • Increase in number and type of livestock owned
	Increase in meat and milk production due to access to increased number of improved (nutritious pasture quality and size of pasture available) communal grazing areas for livestock in dry seasons	• Increased food security for children and households[27] • Change from no milk prior to PNRM to 2-3 caps of milk per day per cow in the dry season • Ability to sell excess milk produced in the dry season in the local market
• 67 migration routes re-opened • 55 salt lick routes re-opened • 9 traditional water points rehabilitated • 7 shallow well water points rehabilitated • 3 pond water points rehabilitated	• Better access to existing grazing and water sources due to reopening of roads/migration routes • Salt licks re-opened facilitating improved access to a key natural resource for livestock health	• Improved access to water sources for livestock during wet seasons after the rainy season has ended, although secure access still problematic leading to potential early migration to dry season grazing areas • Increase in access to mineral and salt lick sites resulting in improved livestock health especially during wet seasons • Farmers reducing enclosed land holding areas to perimeters of cultivatable agricultural land rather than extended plots blocking road and migration route access and privatizing large areas of key rangeland resources that were previously 'common' property
	• Reduced water collection time for women due to improved access to water sources (from a 3am start and 6pm finish, to a 10am start to 3pm finish)[28] and change in water management structures reducing manpower required to physically retrieve water (from 8 to 4 people needed)[29] • Reduced time searching for grass for livestock during dry seasons due to wet/dry season grazing divisions and new hay making skills fostering availability of grass in dry seasons	• Increased time for alternate household responsibilities, including attending decision-making meetings for women engaged in PNRM processes

[24] These PNRM statistics are from Save the Children Ethiopia M&E activities and are based on the areas in which research for this study took place.
[25] Birr is the Ethiopian currency.
[26] Reera CI FGD, 26 November 2012.
[27] Male and female respondents stated perceived increases in food security levels, however they found it challenging to quantify this statement with evidence.
[28] This evidence is the result of the female FGD on 28 November 2012.
[29] This evidence is the result of the female FGD on 28 November 2012.

In addition to increases in household income due to increased livestock market prices and milk production, fieldwork findings show changes in respondents' perceptions of wealth have also occurred as a result of Save the Children's CB/PNRM intervention due to increases in the number and type of livestock owned by different community groups. Respondents consider camels to be the highest value livestock available due to their ability to produce more milk during dry seasons than other livestock types, and their overall greater resilience to increasing drought conditions.[30] Table 5 is the result of Reera CI FGD with wealth group classifications (better off, medium and poor) identified by respondents.[31]

Table 5: Changes in perceived wealth status of respondents as a result of Save the Children's CB/PNRM intervention.

Perceived changes in wealth status					
'Better off'		**'Medium'**		**'Poor'**	
No. livestock pre-PNRM	No. livestock post-PNRM	No. livestock pre-PNRM	No. livestock post-PNRM	No. livestock pre-PNRM	No. livestock post-PNRM
Cattle = 50-60 Camel = 15-20 Shoat = 50 Donkey = 2	Cattle = 80-90 Camel = 30 Shoat = 80-90 Donkey = 3-5	Cattle = 10 Camel = 5 Shoat = 20 Donkey = 1	Cattle = 20 Camel = 8 Shoat = 30 Donkey = 2	Cattle = 2-3 Camel = None Shoat = 5 Donkey = None	Cattle = 5 Camel = None Shoat = 10 Donkey = None

The above evidence shows that the re-instigation of appropriate seasonal mobility, supported by the dismantling of permanent settlements and enclosures at sites that reduce livestock mobility, re-opening and rehabilitation of water sources, and reopening of roads, has lead to improved access to key natural resources required for livelihoods for different respondent groups. Evidence shows that Save the Children's CB/PNRM intervention has therefore been responsive to respondent perceptions of risk through the following means:[32] improving access to nutritious pasture in dry seasons; improving access to water sources in wet seasons and an increase in the number of drought tolerant pack animals owned more able to trek longer distances to access water; and improved access to salt licks in wet seasons when livestock demand is at its highest due to disease prevalence. As a result, Save the Children's CB/PNRM intervention has helped build respondents' ability to adapt by reducing community livelihood vulnerability in the current context of climate variability through increases in wealth, livestock health, and human and livestock food security. Moreover, evidence shows that in conjunction with new hay making skills, as discussed in further detail below, respondents' feel that these changes in assets have strengthened their ability to cope with and adapt to drought conditions.[33]

Building community cohesion through bottom-up participatory approaches leading to a shift in mindset from 'individualism' to 'communal' use of rangeland and natural resources and wider stakeholder solidity across the broader institutional landscape

To support target beneficiaries in progressing towards transformative adaptation to climate change, moving beyond conventional development planning and project processes that focus on 'outcomes' rather than 'process' is required. This means engaging in collaborative, inclusive and participatory approaches; flexible, timely and informed decision-making that is responsive to ongoing changing circumstances and uncertainty; awareness and ability to plan long-term; and proactive learning mechanisms to inform practice and innovation over time, including learning-by-doing approaches and operational monitoring and evaluation (M&E) systems that facilitate learning from and for change.

Evidence shows that Save the Children's CB/PNRM intervention operates on a bottom-up, participatory paradigm. The intervention aims to "provide a conducive environment to participate actively in managing resources properly."[34] Results suggest success in this arena, with perceptions of improved community cohesion and a change in mindset from 'individualism' to 'communal' use of rangeland and natural resources.[35]

[30] Female FGD, 28 November 2012.
[31] Reera CI FGD, 26 November 2012. This FGD consisted of 10 respondents from a mix of wealth group classifications.

Similarly, district level government respondents recognise that this approach is "useful as we share ideas together. Everything is decided in participatory manner. Everything decided by consensus. Previously we didn't work like this."[36] Evidence shows perceptions of stakeholder cohesion across the broader institutional landscape. "Before all stakeholders worked separately. PNRM is best as it brings people together."[37]

Likewise, evidence shows that the process used by Save the Children's CB/PNRM initiative has increased and improved levels of accessibility to government institutions identified as important for livelihood support at the community level. Customary institutional leaders hold "regular meetings with government to discuss resource management…from which we can develop our land management plans."[38] This was stated not to have occurred prior to the intervention. Similarly, district level government respondents perceive a change in their relationship with community members as a result of the CB/PNRM intervention. Now there are "open and free discussions with local communities" where "communities can raise problems with us."[39]

Utilisation of participatory resource mapping and action plans supporting collective problem solving and consensus building, possible reduced conflict situations and perceived system flexibility

Female respondents stated that learning how to undertake rangeland and resource mapping has aided their understanding of key natural resource location and status. "We lived here before, but now we have the whole picture of the area."[40] With women community members being largely less mobile than their male counterparts, they do not necessarily have the same opportunity to assess the complete natural resource landscape, hence this new knowledge is important. Increased understanding of the natural resources available to them is likely to facilitate improved female empowerment as well as provide instrumental support to community strategies on how to access essential natural resources through enhanced female engagement in the planning and decision-making process.

Resource mapping has provided community members with "an opportunity to discuss different problems we have and review them to come up with solutions through community plans."[41] This evidence of collective problem solving and consensus building reflecting priorities of all rangeland users, including the poorest, most marginalised and women as stated by respondents, is central in supporting resilience building to current and potential future climate risk. Moreover, supporting spaces where people empowered with knowledge can unite to discuss, share and generate meaningful information deemed important by them is also key. Respondents perceive such space through that generated by the resource mapping and community planning process.

Another stated benefit is that "from Save the Children we understand different users needs in different areas so conflict is reduced through sharing and saving resources."[42] This perceived potential of, and reduction in conflict situations reflects the integration of 'Do No Harm' processes into community PNRM analysis and planning. In light of an uncertain future climate where potential demand and competition for natural resources and ecosystem services may increase, this outcome is important.

In addition, the participatory approaches used are perceived to provide current and future system flexibility. "It will adjust to changes due to participatory processes."[43] Although not yet tested, the belief in system potential to adjust and adapt to changing circumstances is clear. "It's a flexible system so this will be possible."[44] As a facet of flexible, timely and informed decision-making that is responsive to uncertainty, fieldwork findings show that community plans are regularly monitored and changed if required. "If change in situation, good or bad, or we see problems, we identify gaps and adjust plans as needed."[45] This reflects the stated intention of the intervention: "Designed to mitigate the effects of drought on pastoralists and to increase the sustainability of pastoralist livelihoods, the interventions included in PLI II were designed for flexibility and responsiveness within the drought cycle model" (Save the Children USA 2011).

[32] Deedha CI FGD, 25 November 2012; Reera CI FGD, 26 November 2012; Female FGD, 28 November 2012.
[33] Female FGD, 28 November 2012; Deedha CI FGD, 25 November 2012; Reera CI FGD, 26 November 2012.
[34] Deedha CI FGD, 25 November 2012; Reera CI FGD, 26 November 2012.
[35] Aardha CI FGD, 28 November 2012.
[36] KII Liben District Pastoral Development Office, 26 November 2012.
[37] KII Liben District Land & Environmental Protection Office, 29 November 2012. PNRM is stated to bring the following stakeholders together: community members, district level government; NGOs; CIs (elders); Zonal level government; development agents (DAs) and PA administrators.
[38] Reera CI FGD, 26 November 2012.
[39] KII Liben District Land & Environmental Protection Office, 29 November 2012.

Nevertheless, as the current context is not necessarily indicative of the future climate, it is not possible to presume that current ability necessarily holds potential for future success in light of uncertainty. Current perceived levels of flexibility are set to be strengthened by the implementation of a community-led M&E system[46] in early 2013 as part of Step 11 of the PNRM process - participatory learning and action cycles and updating of plans (see Annex 3 for further details).[47] This participatory M&E (PM&E) system needs to ensure that community members and government stakeholders learn from and for change. This means not only learning from past experience, but having proactive learning mechanisms in place such that the lessons learnt and knowledge generated from them can inform future practice over time - a central element supporting transformative adaptation to climate change.

As a process within itself, PM&E is key to empowering communities and building resilience to future climate risk by supporting sustainable knowledge generation systems that enable project beneficiaries to assess progress against community plans; assess the performance and delivery of institutional bodies integrated into the CB/PNRM system; and assess changing risk contexts and their impacts (ARCAB 2012b; Ayers *et al*. 2012). This last point is important – system flexibility will be enhanced if those adapting possess the knowledge of, and access to, regularly updated and locally meaningful climate and non-climate information that can be used to inform planning and decision-making processes. Although it is understood that climate change was not a specific focus during CB/PNRM intervention design, consideration of improved scientific climate information in planning and decision-making from community up to local institutional level is required if Save the Children project interventions are to withstand the additional challenges that climate change will bring. This is discussed in further detail below.

To further strengthen household and community adaptive capacity to current and future climate risk, fostering knowledge and skills sharing between community members (and ultimately target and non-target project beneficiaries) in regards to resource mapping would be beneficial. Project activities emphasised community discussion, analysis and plan implementation following resource mapping, but evidence reveals that those trained in resource mapping have not shared this skill with other respondents in the CB/PNRM intervention.[48] Considering this possibility, however, may help scale out successful practice - a key component of resilience building to climate change risk - and also contribute towards sustaining intervention benefits after the Save the Children project has ended.

Whilst children participate in community PNRM decision-making and planning meetings, engaging children in knowledge sharing processes through specific child-focused activities is recommended to aid building their current and future capacity as active agents of adaptation. Evidence shows that CB/PNRM system sustainability would be enhanced with systematic knowledge transfer mechanisms for younger generations.[49]

Implementation of new and improved livelihood and rangeland management practices increasing respondent knowledge and capacity skill sets leading to improved livelihood outcomes, land productivity and biodiversity management

Another important benefit of Save the Children's CB/PNRM intervention for the community members it has engaged with is access to relevant and meaningful knowledge and capacity-bases for the implementation of new and improved livelihood and NRM practices. Good climate change adaptation practices need to build resilience to current and future climate change impacts in this context. Table 6 presents NRM-related knowledge, skills and competencies gained from Save the Children and district level government line department interaction under the CB/PNRM intervention as expressed by all respondents.

[40] Female FGD, 28 November 2012.
[41] Deedha CI FGD, 25 November 2012.
[42] Reera CI FGD, 26 November 2012.
[43] Deedha CI FGD, 25 November 2012; with the same implication conveyed in Reera CI FGD, 26 November 2012.
[44] Deedha CI FGD, 25 November 2012; with the same implication conveyed in Reera CI FGD, 26 November 2012; Aardha CI FGD, 28 November 2012, and KII Liben District Land & Environmental Protection Office, 29 November 2012.
[45] Reera CI FGD, 26 November 2012.
[46] This part of programme design was not yet implemented at the time this research was undertaken.
[47] Save the Children USA, December 2011, PNRM steps.
[48] Female FGD, 28 November 2012.
[49] Deedha CI FGD, 25 November 2012; Reera CI FGD, 26 November 2012; Aardha CI FGD, 28 November 2012; Female FGD, 28 November 2012.

Table 6: Examples of new and improved NRM related knowledge, skills and competencies learnt by respondents under Save the Children's CB/PNRM intervention.

Proficiency sets			
'Hard' asset oriented		**'Soft' process oriented**	
New	Improved	New	Improved
• Hay preservation and storage • Debarking for bush clearing • Aloe vera soap production	• Hay making (cut/carry system incl. early cutting of grass to preserve nutritional value and scythe mowing increasing amount of grass cut in shorter time periods resulting in reduced work load for women) • Selected bush clearing • Re-introduction of prescribed fire management regimes • Credit saving • Soil/water conservation • Sowing/planting grass species • Salt production • Forest resource management • Use of crop residue (for livestock fodder) • Upgrading specific drought reserves for weak and lactating livestock • Gum and incense production • Water management point processes • Beekeeping	• Participatory resource mapping • Development of a longer term vision for land use • Shift in understanding from land and water being only perceived key resources to inclusion of forest capital (leading to forest protection)	• Ability to organise wet/dry season grazing areas leading to herders and households undertaking appropriate seasonal mobility • Ability to review community problems and identify solutions in a collaborative fashion • Ability to assign and reallocate appropriate settlement locations • Using market linkages for selling forest and other products

In addition to those outlined in Table 4, the following outcomes provide further insights into key benefits gained by respondents from the utilisation of new and improved natural resource related information and skills.

Table 7: Additional key outcomes of Save the Children's CB/PNRM intervention.

Action/benefit	Additional outcome of action/benefit
Strengthening wet/dry season mobility with new and improved enclosure management techniques to preserve and store hay resources for dry and drought times	• Increased ability to cope with crisis periods and prepare for future drought conditions • More children accessing education due to women storing hay in dry seasons for livestock fodder ("We can send children to school due to hay kept in dry season. We tie cattle to trees to feed them so children not have to look after livestock so free for school")[50]
Undertaking conservation of degraded land through soil/water conservation techniques, planting grasses and/or other bushes and fencing off enclosures where needed	• Reduction in degraded land leading to strengthened ecosystem services and land productivity including reduced resource competition and potential conflict situations • Supporting diversification of livelihoods (e.g. beekeeping) • Increase in wildlife due to vegetation improvement

What is interesting to highlight in further detail here is the outcome of respondent shift in interaction with forest resources. As shown in Table 6 above, evidence reveals a shift in understanding from land and water being perceived key resources to the inclusion of forest capital, leading to the protection of forest areas as a result of Save the Children's CB/PNRM intervention. "We used to think water and pasture were are only key resources, now we additionally think forest resources are also useful for us for gum and incense. We now look after trees. We didn't before."[51]

However, evidence also suggests that respondents are beginning to view their surrounding ecosystem and its services in a holistic manner, rather than just as the provider of natural resources - an important component of resilience building.

"The forest is very important to us. It's part of fodder for livestock, but it's also about the balance of the ecosystem. When there are trees and forest area, soil is preserved, there are no dust storm – dust storms erode soil. Forest area gives us forest cover, natural water springs occur without having to dig a pond – it supports our sustainable livelihood system. Forest areas can be used for protection for livestock and people. Vegetation cover also contributes to other livelihood systems, such as bee keeping as hives are hung in trees to avoid damage from wild animals. Forest areas also supports soil enrichment – branches fall off trees and decay and decompose in soil contributing to additional nutrients of soil. Forest areas supports our whole sustainable livelihood system."[52]

Moreover, perceived understanding of the linkages between increased vegetation cover and climate patterns is also shown. "Vegetation cover areas also contribute to a decrease in temperature - regulates our environmental conditions in that area."[53] Similarly, "trees and wood regulate our environment. Trees bring rain. Reduced forest area means reduced rain for us."[54]

Community openness to test indigenous knowledge systems with external relevant information-bases supporting learning-by-doing approaches

Evidence shows that Save the Children's CB/PNRM intervention has facilitated merging traditional knowledge with external expert information in order to generate improved stakeholder outcomes. For example, male respondents stated that, "Save the Children told us to enclose an area but we knew this before; but what is different now is that we use new skills in this area such as pilling of hay so the area of land is more productive for us."[55] Evidence shows that respondents are open and accepting to move beyond the boundaries of their own traditional knowledge-base and adjust systems with relevant information to meet community needs in light of changing circumstances.

Similarly, fieldwork findings show that Save the Children's CB/PNRM structure has facilitated a learning-by-doing approach. This is important in the context of adaptation, as not all future climate change impacts are known, so learning about what adaptation works and what doesn't will need to be iterative. New skills and capacities are taught and shared with community members through action, enhancing community ownership of knowledge. "We are learning by doing, for example, prescribed fire. We had traditional knowledge of this in past but not used over past years, now revitalizing it with updated information. We see the difference between area burned and not burned. On burnt land there is good pasture and no disease and good regeneration of pasture."[56]

Another interesting point to highlight is the community-driven process through which knowledge and skills are introduced, shared and implemented. Evidence shows that although communities may not be aware of what specific information they require to help them adapt now or in the future,[57] they are open to "new information and skills that we will need"[58] if it meets their requirements. "We don't know if we have the additional information we need or not, but we're open to learn information and we're ready to learn."[59]

[50] Female FGD, 27 November 2012.
[51] Reera CI FGD, 26 November 2012.
[52] Deedha CI FGD, 25 November 2012.
[53] Deedha CI FGD, 25 November 2012.
[54] Female FGD, 28 November 2012.
[55] Reera CI FGD, 26 November 2012.
[56] Reera CI FGD, 26 November 2012.
[57] Deedha CI FGD, 25 November 2012; Reera CI FGD, 26 November 2012; Aardha CI FGD, 28 November 2012.
[58] Reera CI FGD, 26 November 2012.
[59] Deedha CI FGD, 25 November 2012.

Also important for climate change adaptation is the capacity for innovation. Evidence shows that respondents are altering or scaling up adaptive practices on a small scale, illustrating that the CB/PNRM process has fostered an enabling environment for experimentation. This can been seen, for example, through the improved rangeland management processes and upgraded natural resource management techniques highlighted above. However, respondent foresight and awareness to adapt practices shared by Save the Children and district level government could be further enhanced to strengthen the transformative nature of the above evidence and further strengthen the proactive learning mechanisms initiated through the CB/PNRM initiative. This ability would continue to inform practice over time, and enable respondents to take advantage of new opportunities – a key component of innovative practice (Ludi *et al*, 2012).

Two-way knowledge exchange on NRM processes from local government to community and community to local government facilitating improved practices in a climate variability context

From the district level government perspective, the importance of the CB/PNRM process is fostering a two-way knowledge exchange on NRM processes and practices - from government to customary institutional leaders and community members, and from customary institutional leaders and community members to government. "I appreciate their traditional knowledge and capacity. I learn from them. I regret not working with them before."[60] Similarly, it is stated that their role within the CB/PNRM system has enabled government officials to utilise their knowledge and skills, which other job responsibilities have not always required.[61] This merging of knowledge to create new knowledge is important as it suggests, to a certain extent, possible potential future sustainability of CB/PNRM processes in light of changing contexts. "We can continue with PNRM because we have the knowledge, skills and capacity to manage resources effectively."[62] This improved capacity to combine local knowledge and 'expert' scientific knowledge is important in the context of building resilience to climate change impacts as scientific predictions at a geographical and time scale that would help pastoralists plan livelihood activities accordingly are currently lacking and are not always in agreement with local knowledge of what has been experienced so far, and what changes local people feel are likely to be experienced in the future.

Awareness of, access to and integration of weather and seasonal forecasts in planning and decision-making processes at community and local institutional level

For local institutions to provide a long-term enabling environment for sustainable community adaptation, having the knowledge, skills, resources and mandates to support long-term adaptation in an uncertain climate is needed. Evidence shows that community and local institutional stakeholders have access to up-to-date weather and seasonal forecasts that are used in planning and decision-making processes. Community respondents[63] stated they are able to access weather-related information from traditional community weather forecasters, the radio, Save the Children and district level government line departments. Information accessed through Save the Children to date is stated to be useful, and accompanied with suggested relevant preparedness measures.[64] However, respondents feel better access to more and earlier information on weather forecasting is needed.[65] Although Save the Children support ends in early 2013, this recommendation is to be addressed through the next and third stage of the Pastoral Livelihood Initiative.

Moreover, government information sharing is reported to be infrequent. Input received is perceived to occur when government bodies foresee imminent problems that may affect community members, rather than facilitating regular access to information that would build informed communities more able to "prepare properly for climate risks"[66] and respond to changing circumstances. Government knowledge and capacity gaps relating to relevant climate, and non-climate information therefore need to be addressed to support future adaptation efforts.[67]

[60] KII Liben District Pastoral Development Office, 26 November 2012.
[61] KII Liben District Pastoral Development Office, 26 November 2012.
[62] Deedha CI FGD, 25 November 2012.
[63] Deedha CI FGD, 25 November 2012; Aardha CI FGD, 28 November 2012; female FGD, 28 November 2012.
[64] Aardha CI FGD, 28 November 2012. For example, respondents have received information from Save the Children on rises in temperature and decreases in rainfall with advice to undertake early destocking or increase storage of crop residue and hay for livestock fodder.
[65] Deedha CI FGD, 25 November 2012.
[66] Deedha CI FGD, 25 November 2012.
[67] Insights from KII Liben District Pastoral Development Office, 26 November 2012, reveal that access to weather-related information is granted through televised and twice yearly written reports from the Meteorological Office. Similarly, district level government offices lack internet to support access to and use of climate and non-climate information. "There's no internet access in our office…I don't access information from any other sources."

Furthermore, discrepancies between information received from traditional weather forecasters and that from government sources are perceived to exist, as "information we are given does not match."[68] This does, however, provide a positive insight into respondents' current ability fostered through CB/PNRM processes to adjust indigenous and external weather information-bases to meet their needs by "sitting as a community to discuss how to harmonise the information together. We don't ignore government information."[69]

Table 8: Respondent perceptions of local changing climate contexts.

Locally perceived changes in climate	
Male customary institutional leaders	• Less rainfall/no rainfall/untimely rainfall/increase in intense rainfall events/insufficient rainfall for crop and grass production. • Increase in temperature. • Most of our livestock are already in danger. There's less pasture, and increase in livestock and human disease. • It will continue to get worse in the future.
Women	There's extreme weather now. It's very hot when hot and very cold when cold. • There's uneven rainfall and weather is unpredictable. Two years ago there was drought, but rainfall has been quite good this year. • Rainfall has decreased. There's only 2-3 rainy days now. • Temperatures have increased. • It will become more unpredictable in the future with an increase in more extreme weather events. • Before livestock would graze with their heads up as grass was long. But now grass is less so their heads are down. Milk was abundant before, but not now. • Mobility to dry season grazing areas is reduced due to lack of availability of livestock fodder. Changing rainfall patterns have depleted natural resource availability in other areas.
Save the Children	• Rainfall variability has increased resulting in increasing levels of uncertainty. • Drought frequency has increased causing reduced recovery periods in between drought episodes. • Less rainfall is experienced, though its extent varies in different areas. • Changes in vegetation are occurring. Certain species of grass for livestock fodder may be eradicated and replaced by other species not suitable. • Water sources are also depleted. Water run-off has increased and agricultural crop production has reduced.
District level government	• Rainfall is erratic with dramatic decrease in the number of rainy days. During the main rainy season, rainy days have decreased from 60 days to 10-15 days over the last 20 years. During the short rainy season, rainy days have reduced from 15 to one to three days. • In the future, drought will recur frequently. However, if vegetation cover changes through ecological/physical/biological interventions, we can modify future weather impacts.
Male non-Save the Children CB/PNRM site beneficiaries	• Before there was less frequency of drought. It was every 5-10 years now it's every 2 years. • There has not been three consecutive years with rainfall. Rain amount is very small, and if it does rain, it's erratic. The rain doesn't solve our pasture and water problems anymore, whereas it used to. Quality of rainfall is not good • Before changes in weather and pasture, livestock was worth 6000-8000 birr. Now with changes at crisis times, each livestock is worth 300-1000 birr.
Female non-Save the Children CB/PNRM site beneficiaries	• Climate has changed greatly. When we were younger there was good pasture, good water, grain germinated well. • Now there's less milk and less grass as there's insufficient rainfall. • Without grass, there's no livestock. Without livestock, there's no food. Without food, we can't exist.

[68] Reera CI FGD, 26 November 2012.
[69] Reera CI FGD, 26 November 2012.

In addition, current weather-related information provided by local institutions is primarily short-term in focus. Moreover, weather information is not the same as rigorous scientific information on changes in longer term climate change trends. As voiced by female respondents, "We don't consider longer-term changes in climate in our decision-making. We consider the here and now."[70] Examples of the 'here and now' are illustrated in Table 8. Similarly, district level government respondents highlighted that while project beneficiaries envision a longer term view of how they would like their rangeland to be through the PNRM visioning map process, current awareness of the need and ability to integrate longer-term climate change risk into it to reach desired outcomes is not clear.[71]

As previously stated, however, this intervention did not consider climate change from its outset, hence this finding of weak integration of climate change foresight is unsurprising. Moreover, it does not mean that respondents are not open to integrating new scientific knowledge into their planning systems if their capacity to understand the need for it is enhanced. "If scientific climate information is necessary and relevant for us, we will use it in our planning."[72] To support target beneficiaries in adapting to current and additional stresses presented by potential future climate changes, engaging with the scientific community to provide access to locally meaningful scientific and adaptation information is needed. People will be better placed to adapt if they are more appropriately informed and able to use information given to undertake changes in practice leading to stronger resilience outcomes. It is not just what is being done that is important, but why and with what knowledge that is significant. Save the Children agree that integrating locally relevant climate change information into CB/PNRM decision-making processes is needed and it is to be addressed in the next phase after the Pastoral Livelihood Initiative II.

Shift from seasonal planning to more forward-thinking longer term foresight, including community perceptions of increased ability to cope with and adapt to future drought conditions

Following on from the above, although existing climate change foresight may not be strong for those respondents engaged in this study, it is important to stress that the 'here and now' is a reflection of the pastoralist planning mindset that focuses on the current situation in light of changing circumstances. As shown above, community planning processes initiated through the CB/PNRM initiative have enabled respondents to be responsive to their existing situation, with decisions made and activities implemented reflecting a shift from seasonal planning to developing a longer term vision that supports planning in light of more longer term contextual trends. For example, community plans are more long-term in focus with their aim of promoting sustainability of key natural resources that moves beyond the immediate confines of a seasonal planning approach. This is highlighted for example, through by the proper utilization of wet and dry season grazing areas. This change in planning foresight is a strong entry point to build upon for adaptation to future climate change risk through the incorporation of locally meaningful scientific climate change information discussed above.

Increased female inclusiveness in decision-making processes from Aardha to Deeha level, including women empowerment with perceived ownership of and right to rangeland and natural resources coupled with shift in male mindset on cultural role and value of women

Female inclusiveness in CB/PNRM decision-making processes presents a considerable change in cultural values within the traditional male-orientated pastoralist system. Perceived benefits of this inclusion are stated not only by female respondents themselves, but also by male customary institutional leaders and district level government officials. The shift in male community mindset from women as unknowledgeable on NRM to understanding their key contribution to its processes is illustrated by the following quote. "The past system is wrong. Women are equal in NRM. They actually have more of a role to play than us so they should be part of the process. Previously we assumed only men know about NRM, but women know the problems we face so it's advantageous for us to have them as part of the process."[73]

Female respondents voiced the benefits experienced from their change in role in CB/PNRM processes. This includes going to meetings and discussing problems with fellow community members; receiving information during planning meetings that can be shared with other community members; and perceived increase in rights and empowerment within the NRM setting ("We now understand resources belong to us. We monitor and follow up on them now"), and homestead context ("Our husbands no longer

[70] Female FGD, 28 November 2012.
[71] KII Liben District Pastoral Development Office, 26 November 2012.
[72] Reera CI FGD, 26 November 2012.
[73] Aardha CI FGD, 28 November 2012.

do what they want. We speak up now at home and in community meetings").[74]

Women attendance at decision-making meetings from Aardha to Deedha level is evident in Save the Children's CB/PNRM intervention. For example, two women in one FGD now attend Deedha level meetings.[75] Data collection shows that no female community members attended decision-making meetings prior to the Save the Children CB/PNRM intervention. Although women do not perceive any overt challenges to their attendance, the extent and level of influence of their participation requires further monitoring. Evidence shows that female customary institutional participants are yet to articulate any female-centric needs or demands during meetings. Similarly, no women-specific priorities are perceived to be included in stakeholder action plans from all stakeholders interviewed. "Men and women sit together to make plans. There are no different interests as livelihoods depend on same resources."[76] Nevertheless, female and male project beneficiaries view community rangeland management needs as homogenous with perceptions that male and female priorities are therefore catered to through the CB/PNRM system – "All priorities for men and women are covered in plans and implemented."[77]

Responding to the needs of the climate vulnerable poor through an inclusive community approach respecting pastoralist traditions, including benefit sharing mechanisms, resulting in reduced livelihood vulnerability and improved coping capacity

The climate vulnerable poor refers to the poorest and most marginalised people living in regions that are vulnerable to climate variability and climate change and who have low adaptive capacity (Ayers and Huq forthcoming). Evidence in Table 9 below shows different respondent groups perceive different community stakeholders to comprise of the climate vulnerable poor for varying reasons. All respondents are likely to have high dependency on climate-sensitive resources due to pastoralist and agro-pastoralist livelihood strategies, combined with inadequate access to assets, institutions and other resources that would enable them to adapt to climate change impacts. However, this does not necessarily mean that potential climate change impacts and social vulnerabilities will be distributed evenly across all respondent groups.

Hay stack from improved hay making skills learnt during upgraded Save the Children PNRM project, Kobadi Pastoral Association, Borana Zone, Oromia Regional State, Ethiopia (27 November 2012)
Photo credit: Lucy Faulkner

[74] Female FGD, 28 November 2012.
[75] Two women out of a total of 80 meeting participants at Deedha level, equating to 2.5% of women attend PNRM decision-making meetings at this level.
[76] KII Save the Children Negele Office, 29 November 2012.
[77] Female FGD, 28 November 2012.

Table 9: Respondent perceptions of most vulnerable community members to climate risk.

Respondent	Respondent perceptions about which community members are most vulnerable to climate change (in order of priority, most vulnerable first)
Deedha and Reera customary institutional leaders	**Poor:** They lack assets to survive risks and drought. They don't have animals. **Women:** They are usually pregnant or taking care of children. They also have household responsibilities such as fetching water/firewood/hay for calves – they are under stress due to wide range of responsibilities. They don't have time to look for other sources of income. **Children and orphans:** They are not engaged in productive activities. **Elderly:** They are not engaged in productive activities. Adults/elder youngsters cope better as can migrate to productive areas for work.
Aardha customary institutional leaders	**Elderly:** They are weak to cope with difficulties. **Children:** They are also weak and need looking after. **People with less livestock:** They don't have livestock to sell if needed. **Women (pregnant and lactating):** They have to keep working, can't rest as needed.
Women	**Livestock owners:** Those with livestock will be most vulnerable to changes in climate.
Save the Children	**Women:** They are most vulnerable to all problems because women undertake most activities for NRM. They are at frontline if any problems occur.
Liben District Pastoral Development Office	**Women:** They have great workload in drought times, as they fetch water from very long distances. There's a lot of hardship for women. **Children:** They suffer from malnutrition so are weak.
Liben District Land & Environmental Protection Office	**Poorest:** They have low livestock and land holding capacity. **Women:** They have few livestock.

As highlighted in the earlier 'research challenges and limitations' section of this report, evidence reveals that those respondents considered most vulnerable to current and potential future climate change impacts are included in Save the Children's CB/PNRM intervention, however to what extent they elicit benefits that specifically address their individual needs is challenging to ascertain. As discussed above, this is primarily because respondents interviewed for this study view the community as a unified group based on pastoralist tradition. "I represent all community. Not specific elements of it."[78] Institutional fieldwork findings also echo this notion.

Even so, Save the Children has systematically integrated the needs of more marginalised households in CB/PNRM activities and processes. This has resulted in, for example, more equitable benefit sharing from upgraded community enclosure resources. Napier and Desta (2011) comment that prior to 2012, improved grazing areas benefited better-off households whose larger numbers of livestock could take advantage of improved nutritious pasture space. Save the Children's CB/PNRM initiative aimed to address this by shifting the process of allocation from livestock grazing to hay making, resulting in less well-off households incurring more benefits (sometimes even more than better off households because more poorer households were engaged in improved hay making practices). This also reflects a further point that higher priority has been given to poorer households for diversified livelihood and income opportunities. Likewise, within community natural resource management action plans, less well-off households without livestock are assigned designated areas to practice improved irrigated farming to help reduce livelihood vulnerability and improve coping capacity. In addition to Save the Children's CB/PNRM activities, respondents felt that the needs of the poorest community members are addresses through government-led safety net programmes.[79]

To help Save the Children secure solid evidence to identify specific climate vulnerable poor benefits from CB/PNRM processes, detailed wealth and gender differentiated project monitoring is recommended.

Results from the non-Save the Children study site

To aid comparative assessment of adaptation and resilience building outcomes to current and potential future climate change impacts of Save the Children's CB/PNRM intervention, evidence was also collected from a non-Save the Children intervention site during fieldwork. The process used to generate Save the Children's CB/PNRM intervention results was also used for data sourcing and analysis at this site. For ease of comparison, Table 10 presents the results from respondents at both the Save the Children and non-Save the Children field sites with evidence on similar result topics placed together.

The differences between the results generated at Save the Children's CB/PNRM intervention site and those at the non-Save the Children site are summarised in Table 10. Nevertheless, some key differences are discussed in further detail below.

Male-orientated decision-making processes undertaken with lack of female inclusiveness and empowerment

Women respondents in the non-Save the Children intervention site were not included in community rangeland management planning and decision-making processes and were not empowered. The traditional cultural male-centric context dominated community processes with female respondents unable to raise their voices due to lack of opportunity to do so. Consequently, female respondents were not aware of the possibility that their role could be any different; they seemed to accept their lack of rights. "We are not part of the system. We don't decide when to open or close kallos.[80] We hear from our (all male) community committee, they share info with us. Our only role is to give information to committee if we see something wrong in the kallos."[81] When asked what they do if they do not agree with decisions that their committee makes, female respondents replied, "Nothing. We don't ask."

[78] Female FGD, 28 November 2012.
[79] Deedha CI FGD, 25 November 2012; Reera CI FGD, 26 November 2012; Aardha CI FGD, 28 November 2012; Female FGD, 28 November 2012; KII Liben District Pastoral Development Office, 26 November 2012; KII Liben District Land & Environmental Protection Office, 29 November 2012; KII Save the Children Negele Office, 29 November 2012.

Table 10: Fieldwork results from respondents at Save the Children's CB/PNRM intervention site and non- Save the Children intervention site.

Results from Save the Children's CB/PNRM intervention site	Results from the non-Save the Children CB/PNRM intervention site
Awareness of, access to and integration of weather and seasonal forecasts in planning and decision-making processes at community and local institutional level	Lack of access to and integration of short-term weather and longer term climate information in planning and decision-making processes at community level, but understanding of need for longer term climate information to support community preparedness measures to increasing drought risk
Shift from seasonal planning to more forward-thinking longer term foresight, including community perceptions of increased ability to cope with and adapt to future drought conditions	Lack of long-term, forward thinking foresight in planning processes including ability to trade-off possible futures and consequences given uncertainty
District government engagement supporting revitalisation and potential sustainability of upgraded traditional pastoralist rangeland management systems	Good relationship with local government institutions offering community support with rangeland management through by-law enforcement
Implementation of new and improved livelihood and rangeland management practices increasing respondent knowledge and capacity skills sets leading to improved livelihood outcomes, land productivity and biodiversity	Implementation of existing livelihood and land use strategies despite perceived climate variability changes to local context leading to reduced livelihood outcomes, land productivity and biodiversity
Two-way knowledge exchange on NRM processes from local government to community and community to local government facilitating improved practices in a climate variability context	Lack of community access to new and improved information and capacity-bases required for alternate livelihood strategies, improved rangeland management practices and adaptation
Reducing development deficits through appropriate seasonal mobility and improved access to nutritious pasture, water sources, salt licks and forest areas facilitating increase in wealth, livestock health and food security	Appropriate seasonal mobility restricted due to reduced access to nutritious pasture and water sources in wet and dry seasons facilitating increased livelihood and livestock insecurity
Community perceptions of increased ability to cope with and adapt to future drought conditions including appropriate seasonal mobility and new knowledge and capacity to produce and store hay	Community perceptions of inability to cope with and adapt to current and future climate/drought conditions due to lack of access to new and improved knowledge and capacity-bases required for adaptation
Increased female inclusiveness in decision-making processes from Aardha to Deeha level, including women empowerment with perceived ownership of and right to rangeland and natural resources coupled with shift in male mindset on cultural role and value of women	Male-orientated decision-making processes undertaken with lack of female inclusiveness and empowerment, but new understanding and insight into the beneficial role of women in NRM processes
Utilisation of participatory resource mapping and action plans supporting collective problem solving and consensus building, possible reduced conflict situations and perceived system flexibility	Evidence of collective problem solving and consensus building through discussion within male community committee members
Community openness to test indigenous knowledge systems with external relevant information-bases supporting learning-by-doing approaches	Community openness to improve traditional NRM knowledge-bases through expert information integration and learning-by-doing approaches
Responding to climate vulnerable poor needs through an inclusive community approach respecting pastoralist tradition, including benefit sharing mechanisms, resulting in reduced livelihood vulnerability and improved coping capacity.	Inclusion of poorer and more marginalised households in community planning with specified benefits and needs addressed unclear

New understanding and insight into the beneficial role of women in NRM processes

Despite the point above, evidence shows that male respondents in the non-Save the Children intervention site show signs of a potential shift in mindset on women's role in NRM processes starting to occur based on observation of female practice. "Our previous thinking was that women are not fit for our work as it requires strength. But now we realise that women would be beneficial. A kallo protected by women in another area is in much better condition that ours."[82]

Implementation of existing livelihood and land use strategies despite perceived climate variability changes to local context leading to reduced livelihood outcomes, land productivity and biodiversity

Non-Save the Children respondents were notable for their lack of understanding, ability and innovation regarding how to adapt their livelihood and rangeland management strategies to address perceived climate variability changes. "We're still keeping livestock in the old ways when there was grass and water."[83] As shown in Table 11, this has resulted in a decline in livestock body condition with individual livestock value stated to have reduced from 6000 to 8000 ETB in pre-changes in weather and pasture times to current prices of 300 to 1000 ETB.[84] Similarly, female respondents stated insufficient milk availability for household consumption in dry seasons affecting household food security levels due to lack of access to nutritious pasture leading to decline in livestock body weight.[85]

Moreover, finding pasture for livestock in wet and dry seasons is stated to be difficult. Although kallos are reserved for dry season grazing, large numbers of livestock severely reduce land holding capacity. "The problem is grass availability. We have land but no good pasture on it."[88] Previously respondents were able to access nutritious pasture from surrounding areas, but this is no longer possible. Despite male respondents trekking over 150km into neighbouring territory, lack of resources rendered neighbouring rangeland users to ask respondents to return to their homeland.[89] "We have good relationships with people. Problem is with resources."[90] These sites thus showed a lack of understanding,

Table 11: Results showing lack of rangeland resilience and its consequences for non-Save the Children respondents.

Absence of new/improved action	Outcome of absence of new/improved action
• Wet/dry season mobility operational but ineffective in providing access to sufficient pasture and water access in changing context circumstances • Increasing lack of access to water in dry season for livestock and households • Lack of access to salt lick resources • Lack of conservation of degraded land (e.g. through soil/water conservation techniques; planting grasses) • Lack of diversified livelihoods (e.g. beekeeping, aloe vera soap making, hay making) • Lack of improved crop cultivation techniques	• Pasture in dry season enclosures being consumed quickly due to increased number of livestock rendering insufficient pasture for length of dry grazing seasons • Reduction in livestock body condition and livestock price • Reduction in milk availability for household consumption • Livestock able to migrate when grass is available • Salt licks not easily accessible as located in far distances • Teff/crop residue/straw/hay purchased from highland areas at high prices • Understanding of need to keep hay for crisis periods • Donkeys used for water collection from far distances to support access to water, especially for weaker calves • Women undertake a 14 hour journey to collect and carry 20 litres of water from nearest town areas • Trees and plants drying out and dying ("Our juniper trees are all destroyed").[86] • Reduction in wildlife • Reduction in land productivity and ecosystem services • Shift from multi to mono crop cultivation ("We can't cultivate crops anymore – only beans survive now. We've lost all our wheat")[87]

[80] 'Kallos' means communal enclosures.
[81] Female non-Save the Children intervention site FGD, 30 November 2012.
[82] Male non-Save the Children intervention site FGD, 30 November 2012.
[83] Male non-Save the Children intervention site FGD, 30 November 2012.
[84] Male non-Save the Children intervention site FGD, 30 November 2012.
[85] Female non-Save the Children intervention site FGD, 30 November 2012.
[86] Female non-Save the Children intervention site FGD, 30 November 2012.
[87] Male non-Save the Children intervention site FGD, 30 November 2012.

knowledge and capacity to undertake alternative new and improved livelihood strategies in light of changing circumstances. Additionally, respondents appear to be more tied to the notion of their ecosystem providing key natural resources that their livestock depend on rather than a holistic functioning whole system. "We only know about livestock and that depends on water and pasture availability."[91]

Lack of community access to new and improved information and capacity-bases required for alternate livelihood strategies, improved rangeland management practices and adaptation

With lack of alternate income generation activities ("we don't know any other livelihood options"),[92] livestock is the prime economic commodity of non-Save the Children respondent livelihoods. As a result, respondents "want to know how to look after our livestock in crisis and also have better land management techniques on how to use land more efficiently."[93] Save the Children's CB/PNRM intervention has facilitated access to external 'expert' information-bases from Save the Children themselves and district government stakeholders in regards to these concerns. In comparison, non-Save the Children respondents lack access required to relevant and locally meaningful external information-bases.

Non-Save the Children respondents in this study do have access to local government institutions, but evidence shows that government capacity to support respondents is lacking. "Government share some skills with us orally, but they don't follow through with practical training. We want practical training so we can learn properly."[94] Despite this, the community is open to improving traditional NRM knowledge-bases through expert information integration and learning-by-doing approaches.

Lack of access to and integration of short-term weather and longer term climate information in planning and decision-making processes at community level

Evidence shows that non-Save the Children respondents lack access to weather and climate-related information. It is therefore not integrated into community planning or decision-making processes. Nevertheless, understanding of need for climate information to support community preparedness measures to increasing drought risk is perceived. "Climate information would help us as if we had information ahead we could make plans accordingly."[95]

[88] Male non-Save the Children intervention site FGD, 30 November 2012.
[89] Male non-Save the Children intervention site FGD, 30 November 2012.
[90] Male non-Save the Children intervention site FGD, 30 November 2012.
[91] Female non-Save the Children intervention site FGD, 30 November 2012.
[92] Female non-Save the Children intervention site FGD, 30 November 2012.
[93] Male non-Save the Children intervention site FGD, 30 November 2012.
[94] Male non-Save the Children intervention site FGD, 30 November 2012.
[95] Male non-Save the Children intervention site FGD, 30 November 2012.

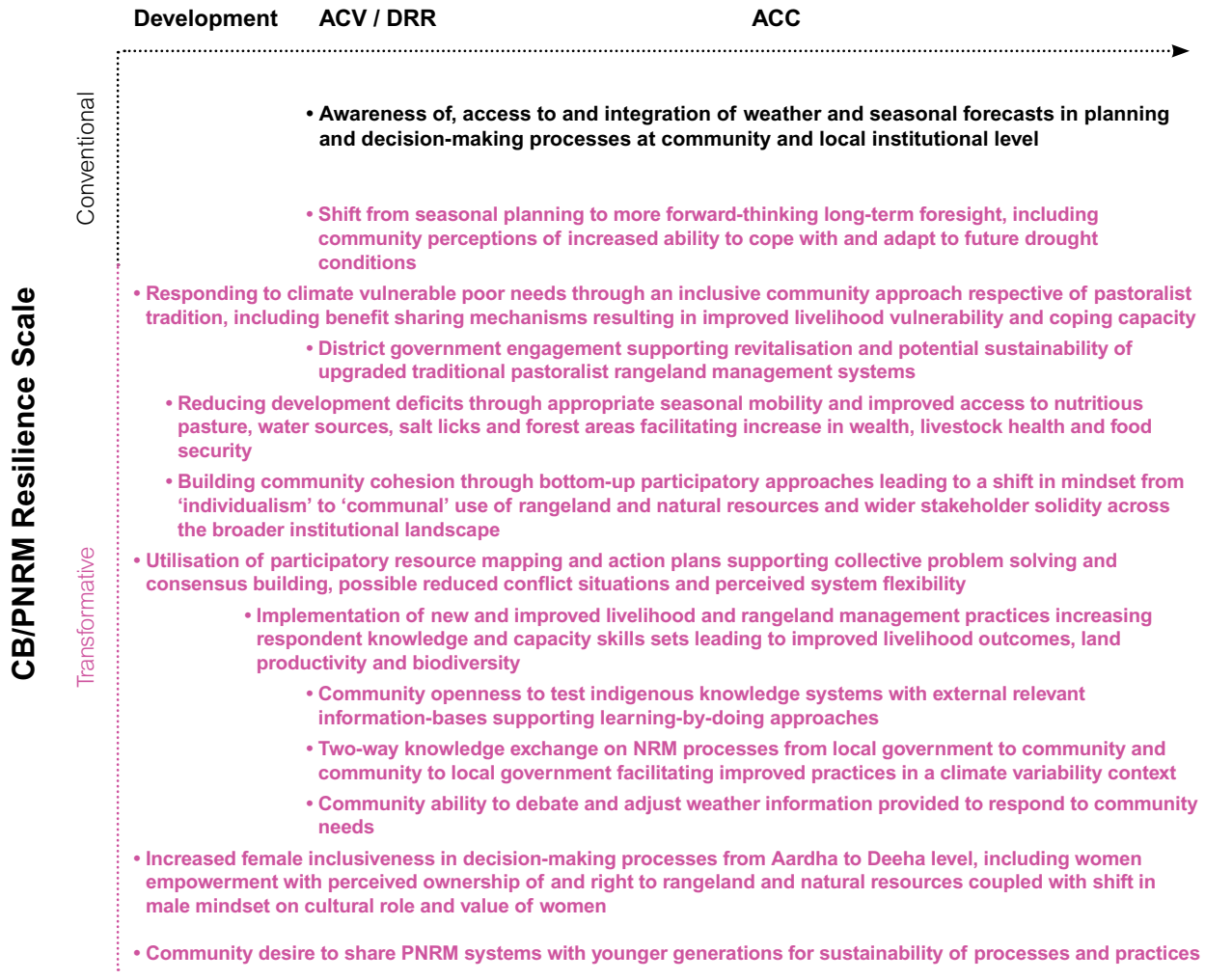
6. Analysis

Analysis of results from the Save the Children site

Using the CB/PNRM Resilience Scale in Figure 4 as a guide, Figure 5 below provides a graphic representation of key data collection findings that form the results of this assessment.

The analysis presented in Figure 5 does not consider some components more conventional or transformative than others. All components in the conventional and transformative sections of the scale hold the same value. To aid differentiation between conventional and transformative headline reflections, different colours have been used. Conventional headline reflections are in black. Transformative headline reflections are in red. Justifications to support why fieldwork results are placed in each position on the CB/PNRM Resilience Scale are provided below.

Figure 5.
Assessment of Save the Children's CB/PNRM intervention in building resilience to climate change risk for pastoralists and agro-pastoralists



Awareness of, access to, and integration of weather and seasonal forecasts in planning and decision-making processes at community and local institutional level

This result is placed under 'conventional ACV/DRR' on the CB/PNRM Resilience Scale in Figure 5. This is primarily due to the use of weather and seasonal forecasts rather than scientific longer term climate change information in planning processes, coupled with limited access to existing information weakening community preparedness capacity. Using information on changing weather patterns is not the same as thinking and planning long-term in light of meaningful climate knowledge. There is a difference between undertaking practice, and undertaking practice with new climate change knowledge driving the change in practice. The former reflects more of a coping paradigm if it is not planned action based on climate change foresight. If it were, it would move further towards 'transformative ACC.'

Shift from seasonal planning to more forward-thinking long-term foresight, including community perceptions of increased ability to cope with and adapt to future drought conditions

Following on from the point above, although long-term climate change foresight has not been fostered under Save the Children's CB/PNRM initiative as this was not a key project objective, evidence shows that respondents are shifting their community planning processes from seasonal approaches towards those considered more longer term. Although scientific climate change information is not used, community plans have shifted to focus more on the promotion of longer term sustainability of key natural resources supporting improved capacity to adapt to current climate variability impacts. For example, this is illustrated through the appropriate use of wet and dry season grazing areas and the systematic management of increasing herd mobility. As a result, this evidence is placed under 'transformative' on the CB/PNRM Resilience Scale. Similarly, it is considered 'ACV/DRR' as the result of this outcome is supporting community adaptation to current climate risk.

Responding to the needs of the climate vulnerable poor through an inclusive community approach respective of pastoralist tradition, including benefit sharing mechanisms, resulting in reduced livelihood vulnerability and improved coping capacity

In the context of climate change, ensuring the needs of the climate vulnerable poor are identified and addressed is important as climate change impacts are likely to increase respondent vulnerability levels. Save the Children targets the needs of those who are most vulnerable through an inclusive community approach that is culturally appropriate for pastoralist groups. This evidence is viewed as 'transformative development' on the CB/PNRM Resilience Scale. Similarly, this evidence is placed under 'transformative development' as empowerment of the climate vulnerable poor has largely been increased through benefit sharing mechanisms and an increase in inclusive decision-making processes.

District government engagement supporting revitalisation and potential sustainability of upgraded traditional pastoralist rangeland management systems

On the CB/PNRM Resilience Scale in Figure 5, this evidence is considered 'transformative' because it facilitates institutional processes that currently, and can potentially, enhance longer term access to resources communities require to adapt to a range of risks, including climate risk. It is considered 'ACV/DRR' because this institutional engagement helps community members reduce their development deficits as the first step towards adaptation. By improving access to the institutions and key assets people need to fulfill their basic capabilities, the ability of Save the Children's project beneficiaries to cope with and manage the additional stresses presented by climate variability and climate change are likely to be enhanced (ARCAB 2012b; Burton 2004). Moreover, this institutional engagement signals a strong basis for project sustainability beyond the end of the project life cycle.

Reducing development deficits through appropriate seasonal mobility and improved access to nutritious pasture, water sources, salt licks and forest areas facilitating increases in wealth, livestock health and food security

Evidence suggests that development capacity to cope with and respond to climate variability and environmental hazards is improved by ensuring that the basic needs of project beneficiaries are being addressed. Similarly, results reflect a more integrated approach to intervention planning through increased institutional engagement. Looking through a climate change lens on the CB/PNRM Resilience Scale therefore, this means that this evidence is considered to be moving beyond conventional development and ACV/DRR approaches towards those more 'transformative.' In addition, the processes used to facilitate the generation of this evidence also show how Save the Children is changing the way conventional development is undertaken.

Building community cohesion through bottom-up participatory approaches leading to a shift in mindset from 'individualism' to 'communal' use of rangeland and natural resources and wider stakeholder solidity across the broader institutional landscape

By initiating good participatory approaches, and with project participants meaningfully engaged and empowered to lead the decision-making processes that affect them, the evidence above signals 'transformative development' on the CB/PNRM Resilience Scale in Figure 5. Similarly, working together towards achieving a common vision, as is the case with respondents involved in Save the Children's CB/PNRM intervention,[96] is also considered 'transformative development'. This is because it breaks the boundaries of conventional practice that often isolate different stakeholders and their needs from each other. Collaborative practice is central to the challenge of climate change. Community responses during fieldwork also suggest the CB/PNRM process has strengthened bottom-up accountability mechanisms – another component of 'transformative development' on the CB/PNRM Resilience Scale.

Utilisation of participatory resource mapping and action plans supporting collective problem solving and consensus building, possible reduced conflict situations and perceived system flexibility

The results provide solid examples of 'transformative development' processes: community-driven responses; flexible planning approaches; and empowerment of respondents through increasing knowledge and capacity-bases. Consequently, the overriding headline reflection of this section is placed under 'transformative development' on the CB/PNRM Resilience Scale.

Implementation of new and improved livelihood and rangeland management practices increasing respondent knowledge and capacity skill sets leading to improved livelihood outcomes, land productivity and biodiversity management

It is evident that fieldwork findings have helped build respondents' adaptive capacity through increasing knowledge and capacity-bases with relevant information to improve livelihood practices. Consequently, this result is placed on the CB/PNRM Resilience Scale in Figure 5 under 'ACV/DRR' because of respondents' improved ability to adapt to current climate variability. This evidence is placed more towards 'transformative' approaches than those considered conventional because outcomes address community needs through learning-by-doing methods. Correspondingly, evidence regarding the appreciation of the surrounding ecosystem and the services it provides supports the position of this headline reflection under 'transformative' rather than conventional approaches, and more towards 'ACV/DRR' than 'development' with increased knowledge improving conditions.

Community openness to test indigenous knowledge systems with relevant external information-bases supporting learning-by-doing approaches

Results suggest a move beyond conventional approaches to those that are more 'transformative,' and closer to 'ACV/DRR' than 'development.' This is because the mechanisms in place facilitate improved practice in the current context of climate variability. This includes merging traditional knowledge with 'expert' information in regards to, for example, improved hay making and prescribed fire for rangeland management. Results here reflect those from an earlier study in the Borana Zone, which note that communities "have many ideas on how to prepare for future climate change, demonstrating a strong motivation to move out of poverty and take their future into their own hands" (Riché *et al.* 2009).

Two-way knowledge exchange on NRM processes from local government to community and community to local government facilitating improved practices in a climate variability context

This evidence is placed on the CB/PNRM Resilience Scale in Figure 5 under 'transformative ACV/DRR.' It is 'transformative' based on the strong network between community respondents and local government, and the corresponding two-way flow of knowledge sharing between these stakeholders. It is considered ACV/DRR based on the outcome of this process that results in improved respondent resilience an ability to adapt to climate variability risk. This result would move closer towards 'transformative ACC' if knowledge sharing included the integration of longer term scientific climate information with local vulnerability insights to form new knowledge required to support changes in planning and practice.

Community ability to debate and adjust weather information provided to respond to community needs

This evidence is placed under 'transformative ACV/DRR' in the CB/PNRM Resilience Scale, as it illustrates respondents' current capacity to undertake beneficial strategies for adaptation.

[96] Fieldwork findings shows that all respondents have complementary objectives, interests and mandates for CB/PNRN.

Increased female inclusiveness in decision-making processes from Aardha to Deeha level, including women empowerment with perceived ownership of and right to rangeland and natural resources coupled with shift in male mindset on the cultural role and value of women

Evidence of female inclusiveness contributes towards moving beyond 'conventional development' processes towards those that are 'transformational.' This is reflected in this position of this evidence in the CB/PNRM Resilience Scale. Save the Children's upgraded CB/PNRM intervention has facilitated processes that have contributed towards changes in attitude towards women by their male counterparts, including practical changes in their role, responsibilities and participation in decision-making within the community CB/PNRM landscape. With female engagement and empowerment enhanced for those women targeted by the Pastoral Livelihood Initiative II, their current role in supporting community adaptation is highlighted.

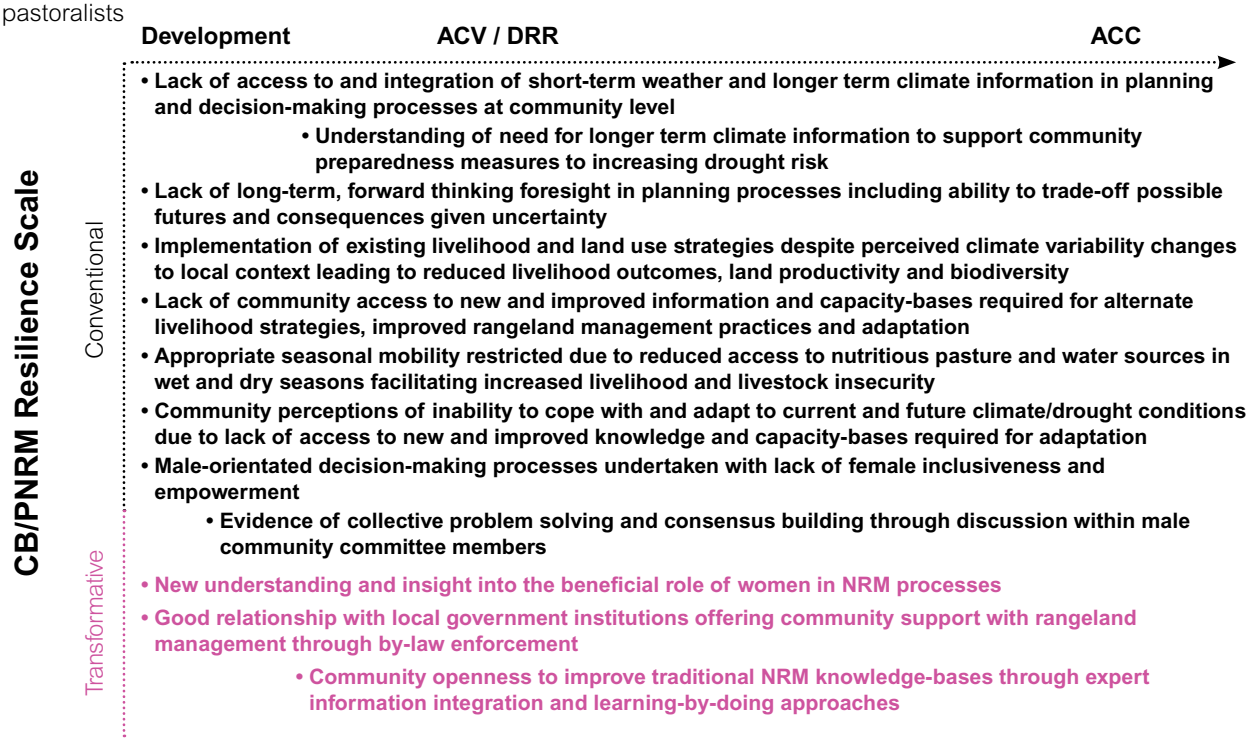
Community desire to share PNRM systems with younger generations for sustainability of processes and practices

The desire for better integration of the needs and responses of youth and children into CB/PNRM is illustrated as 'transformative development' in the CB/PNRM Resilience Scale.

Analysis of results from the non-Save the Children site in comparison to the Save the Children site

Analysis of results from the non-Save the Children site is presented in the CB/PNRM Resilience Scale in Figure 6 below. The overriding comparison to make between Save the Children's CB/PNRM intervention results and those of the non-Save the Children intervention site, is that Save the Children's results primarily fall between 'transformative development' and 'transformative ACV/DRR,' while results from the non- Save the Children intervention site fall largely under 'conventional development.' Key differences are described in more detail below.

Figure 6.
Assessment of the non-Save the Children CB/PNRM intervention in building resilience to climate change risk for pastoralists



One important difference between respondents in Save the Children's CB/PNRM intervention and those in the non-Save the Children site relate to issues of gender. Evidence from the non-Save the Children site in this context is considered 'conventional development' as lack of female inclusiveness in NRM processes means women's role as strategic agents of community adaptation processes is not facilitated. Earlier research in the Borana Zone also reflects this with (Riché *et al*. 2009) noting that "gender inequalities and marginalisation" are limiting pastoralists' ability to adapt. The observations regarding potential for a shift in mindset regarding the understanding of and insight into the beneficial role of women in NRM processes, however, mean that this result is placed under 'transformative development' on the CB/PNRM Resilience Scale. Although this evidence is far from the results achieved by Save the Children's CB/PNRM intervention in regards to female inclusiveness and empowerment, it is nevertheless significant in the local context of the comparative field site.

Evidence regarding the implementation of existing livelihood and land use strategies despite perceived climate variability changes to local context leading to reduced livelihood outcomes, land productivity and biodiversity is placed under 'conventional development' on the CB/PNRM Resilience Scale. This is because existing livelihood and rangeland management practices are not facilitating non-Save the Children respondents' ability to cope with and adapt to current changing circumstances. Respondents stated the primary reason for this is the lack of access to relevant information and capacity to do so.

A further difference between respondents engaged in Save the Children's CB/PNRM intervention and those not, relates to perceptions of mindset towards their environment. Evidence suggests that respondents from Save the Children's project site are beginning to view their surrounding ecosystem and its services in a holistic manner, rather than just as the provider of natural resources, which is an important component of resilience building. In comparison, evidence suggests that non-Save the Children respondents do not yet possess a similar viewpoint.

Save the Children respondents have access to new and improved livelihood and rangeland management practices that are felt to support the ability to cope with and adapt to drought conditions. Evidence reveals that the complete opposite is true for non-Save the Children respondents, hence this result is placed under 'conventional development' on the CB/PNRM Resilience Scale. The willingness and understanding of the need to generate new information through more beneficial learning mechanisms to be able to cope with and adapt to changing circumstances, however, places this result for non-Save the Children respondents under 'transformative development' on the CB/PNRM Resilience Scale.

Weather and climate information is not integrated into community planning or decision making, making it 'conventional development' on the CB/PNRM Resilience Scale. Previous research in the Borana Zone mirrors these observations, finding that "most local organisations and communities have no access to seasonal forecasts and other climate information" (Riché *et al*. 2009). An understanding of the need for such climate information is, however, perceived by non-Save the Children respondents, thus placing this result under 'conventional ACC/DRR' on the CB/PNRM Resilience Scale, as to be transformative, new climate change and adaptation science that integrates local knowledge with relevant and meaningful scientific climate information is needed.

7. Discussion

Many of the findings above resonate with information emerging from work with similar pastoralist systems in the context of climate change elsewhere in Africa. For example, ongoing research in Kenya and Tanzania has found that strong engagement with district level government can help revitalise and sustain pastoralist rangeland management systems, but that these relations also need embedding in policy at higher levels so they can continue even with government staff changes. Likewise, the benefits of participatory resource mapping and action plan development at Save the Children sites here were similar to those in Isiolo, northern Kenya, where the Boran communities found that such resource mapping exercises enabled them to articulate to planners and others the extent, complexity and richness of their resources, which they fully appreciated but which others didn't (Ced Hesse pers. comm. February 2013).

Two interesting differences emerge from work in northern Kenya and the Save the Children sites described here. First, whilst children's education was perceived as a key benefit (see Table 7) from Save the Children's CB/PNRM intervention, pastoral management systems in northern Kenya and the national education system are felt to be in conflict with each other, and the Boran see the current primary education system as undermining pastoral systems both in its delivery model and curriculum.

Secondly, observations at the Save the hildren sites suggest that the community is starting to see their surrounding ecosystem and its services in a holistic manner. At the non-Save the Children site, however, the ecosystem is seen more as a provider of natural resources. This is unlike the situation among the Boran in Kenya who have a rich and holistic appreciation of their environment, society and economy (Ced Hesse pers. comm. February 2013). This may be because forests and trees are less frequent in northern Kenya than at the study sites in Ethiopia, hence they are more valuable and also protected / managed than at the study sites. In the Save the Children CB/PNRM sites, as long as there was sufficient pasture and thus milk, there was no need to use forests intensively for alternative food and income. With more competition for rangelands and increasing climate variability and thus stress, however, the need to use additional (forest) resources is growing. Additional income from honey or gum and incense has become more important. Save the Children CB/PNRM activities include all natural resources and not just the rangeland alone, so this has facilitated the adoption of a more integrated approach to ecosystem and natural resource management, which will help strengthen community capacity to cope with changes to their environment. This is important, because observations show that rangeland species composition is changing, probably due to changes in rainfall amounts and distribution. The percentage of highly nutritious species in the pasture is decreasing and unpalatable species (including bush encroachment, mainly from *Acacia drepanolobium*) have increased over roughly the last 20 years. This reflects the results of research in 2009, which found that environmental degradation, including deforestation rates, pasture degradation and desertification, are important drivers of vulnerability in Borana (Riché *et al.* 2009).

Whilst it is clear that many of the activities implemented by Save the Children have helped improve local adaptive capacity and resilience, the points above remind us that this does not necessarily hold true for all development interventions. Whilst 'good adaptation' is grounded in 'good development' (Ayers *et al.* 2012), it is wrong to assume that any development intervention will be 'good' for adaptation. A broad study of development initiatives by government and development organisations in Ethiopia conducted by Ludi *et al.* (2011), for example, showed that although initiatives had helped build adaptive capacity, "they often fall short of their full potential to enhance the capacity of households and local communities to adapt". Ludi *et al.* (2011) argue that development initiatives often focused on broadening a community's asset base, the provision of hardware and the maintenance of existing systems. Less attention was given to fostering innovation and improving institutional arrangements and accountability, and initiatives often did little to address the institutional barriers and power structures that increase the vulnerability of some households. Additionally, "interventions are often carried out in isolation, different actors do not consult each other sufficiently, which leads to duplication and inefficiency, and different actors are not learning sufficiently from experiences of others." The research also found that projects were not being designed using the best possible short- and long-term

climate information, prediction and scenario analysis. "More than once findings were ambivalent on whether or not an introduced technology is leading to better adaptation to future conditions or to maladaptation."

An example of 'good development' for building adaptive capacity can be found in the approach Save the Children has taken to adjust previous structures that did little to support the poorest and most marginalised households engaged in NRM processes. An earlier review of the Pastoral Livelihoods Initiative conducted by Napier and Desta (2011) found that although the number and size of rangeland enclosures had steadily increased since the 1990s with a view to rehabilitating degraded or bush-invaded rangeland and providing a reserve for animals during the dry season or drought periods, "relatively better-off households benefit relatively more since they have more livestock to take advantage of the improved/enclosed grazing." The review suggested that the "enclosures will not enable poorer households to rebuild their herds to a viable level or prevent them from exiting pastoralism" (Napier and Desta 2011). Learning from this critique, Save the Children shifted the main process of allocation from livestock grazing to hay making through their upgraded CB/PNRM work in 2012, to reduce inequitable benefit distribution (and sometimes provide greater benefits for poorer households as more of them were involved in improved hay making practices).

8. Conclusions

The aim of this study has been to assess the effectiveness and contribution of Save the Children's upgraded CB/PNRM intervention compared to CBNRM with no external support in building resilience to current and potential future climate change impacts for the pastoralists and agro-pastoralists engaged in the project at local scale. In order to achieve this, the process Save the Children has used and the results that have been obtained have been analysed in light of local climate and non-climate risk factors, as well as up-to-date scientific predictions on potential future climate scenarios in Save the Children's intervention sites.

Save the Children's upgraded CB/PNRM intervention was implemented in 2012 under Phase II of the Pastoral Livelihoods Initiative funded by US-Aid. Project activities focused on improving and strengthening the lives and livelihoods of target pastoralists and agro-pastoralists through improved community-based natural resource management processes, and new and improved livelihood strategies, among others. Within this context, CB/PNRM focused on three strategic objectives: stronger institutions through cooperation and cohesion; institutionalised mutual learning for enhancing adaptive capacities and transformation; and improved land use and sustainable NRM in the context of increasing climate variability. Based on the long-term presence and existing rapport between Save the Children and project stakeholders in the CB/PNRM intervention sites, together with a thorough understanding of the pastoralist systems in play and a more conducive institutional environment for change supported by recent government learning, Save the Children's upgraded CB/PNRM work has produced strong results.

Results show that much has been done towards moving from conventional approaches to development (and adaptation to climate variability including disaster risk reduction) to 'transformative development' approaches that empower local people and support bottom-up, participatory, flexible decision-making and planning processes within a strong institutional context. This includes incorporating local and scientific climate knowledge focused on climate variability trends into planning. However locally meaningful scientific climate change information still needs to be merged with local knowledge-bases so it can be mainstreamed into community and institutional decision-making processes across scales to support adaptation to uncertain future climate change impacts. Much has also been done towards moving from standard development approaches towards those that support adaptation to climate variability including disaster risk reduction (ACV/DRR). Although project activities were not initiated with improving climate change resilience as a key goal, evidence shows that many of the development-oriented processes implemented have made important contributions towards this outcome. In an adaptation to climate change context, this is significant as it means that Save the Children has largely moved beyond conventional development and ACV/DRR methods that typically lack the ability to foster sustainable resilience-building in an uncertain and changing environment.

Save the Children's CB/PNRM intervention has achieved this through the following means: moving from a short-term projectised approach to planning towards the facilitation of longer term change processes; application of an integrated project approach that has engaged local institutions and improved partnerships between government and community members, including joint action between government and traditional customary institutions; strengthening local institutional processes fostering an enabling environment for addressing basic needs through improved access to key assets and resources and new and improved livelihood strategies leading to enhanced local adaptive action; meaningfully engaging respondents in PNRM community-driven planning and decision-making processes, especially women, through strong participatory and collaborative methods increasing individual and community empowerment plus bottom-up accountability, especially for those most marginalised community members; project participants shifting their mindset from viewing their ecosystem as a provider of natural resources to a more holistic understanding of environmental system linkages; and targeted community members possessing improved development capacity to cope with, respond and adapt to current context situations including climate variability, with subsequent decreases in poverty levels, and increases in food security and livelihood outcomes.

As a result of these changes, respondents feel they now possess the knowledge and capacity required to cope with and adapt to increasing drought scenarios. Joint community and local government action plans

and agreements by local government authorities facilitating improved access to appropriate wet and dry season grazing areas combined with new livelihood and rangeland management techniques, have led to an increase in adaptive capacity that evidence suggests is likely to increase respondent resilience in light of, or in spite of, climate risk. This means that Save the Children's CB/PNRM intervention has helped strengthen the local institutions and strategies required by respondents to ensure higher productivity levels and thus greater accumulation of assets, improved diet and income and the increased capacity to protect these gains, in a context of unpredictable distribution of resources and periodic extreme events.

In stark comparison, a site visited without Save the Children interventions to provide comparative results of project and adaptation outcomes, showed that existing pastoralist livelihood systems were no longer producing effective results in light of local changing circumstances with respondents unable to adapt with change. Evidence showed that respondents' were not bouncing back to previous productivity levels before changing drought conditions, with productivity levels appearing to be in slow decline over time. Coping strategies undertaken were not forming the basis of successful long-term adaptive strategies needed to address current and future climate change risk (OECD 2009). This reflects the results of previous research in the Borana zone, which found that whilst communities were in agreement "that diversification of financial resources and income generating activities is key to adapting to changing conditions, whether this means engaging in petty trade, sale of firewood and charcoal, construction and renting of houses, honey and alcohol sale, business creation and management, or learning to save money using financial institutions", limited access to information and "limited education, skills and access to financial services and markets required to diversity their livelihoods" limited pastoralists' ability to adapt (Riché *et al*. 2009). The research found that a lack of appropriate knowledge and experience meant that communities suggested different and sometimes contradictory adaptation strategies in light of expected changes: "For example, pure pastoralists suggested that agro-pastoralism would be a better livelihood strategy to deal with climate change, while agro-pastoralists would like to drop out of their farming activities due to increasing crop failure" (Riché *et al*. 2009).

The results of Save the Children's CB/PNRM intervention have therefore together contributed towards reducing livelihood vulnerability and increasing resilience for its project participants by leaving behind a legacy of empowered people more able to cope with and adapt to current climate variability risk through strong development-based outcomes of 'good' development and improved institutional governance.

However, more progress needs to be made to further strengthen respondents' ability to adapt to current climate variability risk, and importantly to future climate change impacts. Undertaking 'transformative development' and 'transformative ACV/DRR' approaches are a necessary but only part of the process towards the long-term goal of transformed climate change resilience. This means achieving resilience at scale, resulting in the successful longer term adaptation of the climate vulnerable poor to climate change impacts through sustainable adaptation strategies (ARCAB 2012a; ARCAB 2012b). Among others, improvements in generating and integrating new knowledge about adaptation and future climate change across scales from community to local institutional levels is greatly needed.

9. Key recommendations

This study has shown the value of CB/PNRM as an adaptation strategy in the context of the Ethiopian dryland pastoralist communities. Whilst climate change was not a specific focus of the Save the Children CB/PNRM intervention design, many of the activities implemented made important contributions to building local adaptive capacity. Comparisons with the non-Save the Children site, where most activities were closer to conventional development than 'transformative development' or 'transformative ACV/DRR,' reinforced these observations. This suggests that the potential role that development actors, such as Save the Children, can play in the context of building adaptive capacity merits further attention amongst governments and policymakers. Likewise the role that sustainable natural resource management can play as an adaptation strategy, particularly for poor and vulnerable groups such as the Borana pastoralists, merits further attention when compared to alternative infrastructure or technological adaptation solutions. Chishakwe *et al*. (2012) and Munroe *et al*. (2011) argue for the need for newer fields of study such as community-based adaptation to learn from older disciplines such as CB/PNRM, and this study reinforces this recommendation.

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Annex 1

Details of data collection undertaken during fieldwork for IIED's assessment of Save the Children's CB/PNRM intervention.

1. Save the Children Office, Negele, Liben District, Guji Zone (25-26 November 2012)

Focus group discussion conducted with Dheeda level male customary institution (CI) leaders:

No.	Participant name of Dheeda level resource management unit	PA (Pastoral Association)
1	Liben Jilo	Korati
2	Tura Liben	Gobicha
3	Jemal Aden	Miesa
4	Dub Dhebanu	Karsamale
5	Korme Ali	Siminto
6	Ahmed Mohammed	Arada Bururi

Focus group discussion conducted with Reera level male customary institution (CI) leaders:

No.	Participant name of Reera level resource management unit	PA (Pastoral Association)
1	Hussen Weybo	Kobadi
2	Abdikerim Oba	Kobadi
3	Teyib Liben	Gofi Ambo
4	Rashid Kasim	Gofi Ambo
5	Geda Negessa	Karsamale
6	Abdiraham Ibrahim	Miessa
7	Tura Liben	Ciminto
8	Abdi Abdillahi	Aradaa Bururi
9	Doyo Guyo	Legegula
10	Hassen Godana	Legegula

2. Negele, Liben District Pastoral Development Office, Guji Zone (26 November 2012)

Key informant interview with Mulugeta Bekele, Rangeland Development and Natural Resource Conservation Process Owner.

3. Kobadi PA (27 November 2012)

Focus group discussion conducted with women project beneficiaries (agro-pastoralists):

No.	Participant name
1	Zeynalo Abdo
2	Mune Mohammudo
3	Radiya Hussen
4	Halime Gobena
5	Habiba Abdi
6	Abdiya Gobena
7	Duniya Hussen
8	Magalo Abdi
9	Rugiya Aden
10	Sadiya Roba
11	Shegero Hassen
12	Dehabo Hussen
13	Dido Hassen
14	Momino Aden
15	Rugiya Umer
16	Amin Ebro
17	Zeyneba Godama

This focus group discussion was facilitated with support from:
Hussen Wybo – PA leader (male)
Kassim Hussen – Ardaa leader (male)

4. Bulbul PA (28 November 2012)

Focus group discussion conducted with women project beneficiaries (pastoralists):

No.	Participant name
1	Loko Oda
2	Orgole Godana
3	Suke Kesuna
4	Ilad Godana
5	Chole Charfi
6	Adi Guyo
7	Nuho Kenchoro
8	Loko Liben
9	Jaro Boru
10	Dadhi Gutu
11	Chole Halkeno

Focus group discussion conducted with men project beneficiaries (pastoralists):

No.	Participant name
1	Ketelo Boru
2	Gelgelo Kubi
3	Rebesa Wago
4	Godana Jarso
5	Haro Qampare
6	Dido Begeja
7	Dhadecha Gelgelo
8	Korma Jarso
9	Turo Godana

5. Save the Children Office, Negele, Liben District, Guji Zone (29 November 2012)

Key informant interview with Hossian Miyo, CB/PNRM Officer, Save the Children.

6. Negele, Liben District Land & Environmental Protection Office, Guji Zone (29 November 2012)

Key informant interview with Shole Emanyo, Vice Head of Land & Environmental Protection Office.

7. Horbtor, Yabello District (30 November 2012)

Focus group discussion conducted with women non-project beneficiaries (pastoralists):

No.	Participant name
1	Kashu Malicho
2	Sake Guracho
3	Dabo Ganya
4	Adi Haiake
5	Eelema Liiban
6	Qoye Moiu
7	Jiio Jarso
8	Narele Plense
9	Sake Godana
10	Dima Borw
11	Dalati Jilo
12	Ioko Dabaso
13	Eelemo Dalacha
14	Jiio Phadocha
15	Eelema Dhibo
16	Adi Goiicha
17	Bariti Klako
18	Loko Shuka
19	Adi Haiake
20	Narele Moiis
21	Gordolle Klako
22	Dadhi Kloko
23	Sake Dubo
24	Sessa Murz

Focus group discussion conducted with men non-project beneficiaries (pastoralists):

No.	Participant name
1	Golo Boru
2	Gaima Guyo
3	Dambala Huka
4	Gofare Garbiche
5	Boru Guyo
6	Duba Guyo
7	Klako Gaigalo
8	Maliche Korme
9	Phokata Boru
10	Kanu Dureti
11	Tari Oibz
12	Roba Huko
13	Guracho Abduba
14	Cale Hara
15	Shibiru Guyo
16	Aphite Klako
17	Moiu Korme
18	Daiu Korme

Annex 2

Framework to assess the contribution/effectiveness of Save the Children Ethiopia's CB/PNRM intervention in building resilience to climate change impacts and delivering adaptation benefits to pastoralists and agro-pastoralists at project scale

Outcome area	High level indicators	Sub indicators
'Upstream' indicators: institutional capacity to manage climate risks and deliver adaptation benefits to pastoralists and agro-pastoralists (including the poorest, most marginalised and women)	Level of knowledge, capacity and practice of relevant identified local institutions: district government, customary institutional leaders and Save the Children.	Current knowledge levels including future potential to access, share and generate relevant knowledge-bases: • % of local government/Save the Children staff with and level of knowledge of indigenous pastoral management and production systems[97] • % of people with and level of knowledge of PNRM roles and responsibilities, including future potential to access, share and generate this information • % of people with, level of access to and future potential to access, share and generate regular and updated sources of meaningful scientific and traditional climate information • % of people with, level of access to and future potential to access, share and generate regular and updated sources of relevant and meaningful non-climate information[98] • % of people with and level of knowledge of conflict resolution strategies, including future potential to access, share and generate this information • Current level of, and future potential to access, share and generate knowledge on climate risk and vulnerability by institutional key agents of change, including needs of poorest/most marginalised/women • Current and future awareness of responsibilities to the poorest/most marginalised/ women by institutional key agents of change • Evidence of awareness and acceptance to test and potentially adjust indigenous knowledge systems and other relevant information to meet user[99] needs in light of changing circumstances now and in the future[100] Current capacity levels including future potential to access, share and generate relevant skills, abilities, competencies and resources: • Evidence of local institutions present and operational according to good practice[101] • Evidence of complimentary objectives/interests/mandates of different stakeholders engaged in the PNRM system • Evidence of clear identification, understanding and agreement of new PNRM stakeholder roles and responsibilities, including the poorest/most marginalised/women[102] • % and level of influence of active engagement of the poorest/most marginalised/ women in planning, decision-making and management processes, including future potential to do so • Evidence of collective problem solving and consensus building reflecting priorities of all users, including the poorest/most marginalised/women • Evidence of current and future ability to move beyond 'business as usual' development planning towards more transformational processes required for climate change adaptation[103] • Evidence of sense (agency) of current and future ability to discuss, generate and adapt existing capacity/practices to changing circumstances if required[104] • Evidence of awareness and potential current and future ability to trade off possible futures and consequences given uncertainty in planning and decision-making processes[105] • Evidence of current and future potential level of access to appropriate capacities/ resources to undertake and test new/improved livelihood/rangeland management practices • Evidence of reciprocal relationships with neighbouring rangeland users and institutions • Evidence of support for PNRM land use/activity plans, and climate change planning, by higher levels of government and policy • Level of access to current and future funding streams with capacity to use funding received effectively

Outcome area	High level indicators	Sub indicators
		Current practice levels including potential for future action: • Evidence of strengthened and functioning indigenous pastoral rangeland management systems, including potential future sustainability • Evidence of strengthened partnership, and level partnership has been institutionalised, between customary institutions and local government, including potential future engagement • Evidence of priorities of poorest/most marginalised/women reflected in current and potential future local level plans and activities • Evidence of equitable access and opportunities to new/improved livelihood strategies and rangeland resources for poorest/most marginalised/women • Evidence of current and potential future use (including potential for scaling up) of new information, including changed rangeland management approaches and diversified livelihood strategies • Evidence of action plans to be regularly reviewed and revised now and in the future in response to changing circumstances/new information/user needs with results facilitating action-reflection phases for learning and subsequent adjustments in planning and implementation • Evidence of, and relevance of, wet and dry season grazing areas re-established (including livestock grazing between them) for CCA and resilience building • No. of hectares of private enclosures and inappropriate farmland dismantled • No. of hectares of new communal enclosures • No. of hectares of existing enclosures enlarged and strengthened/improved (through bush clearing/seed harvesting leading to reduction in degraded land) • No. of livestock supported by access to the above enclosures during wet and dry seasons (including % poorest % most marginalised) • No. of kilometres of road reopened providing access to key resources • No. of mineral and salt lick sites reopened (providing access to no. of livestock) • No. of settlements (villages) re-located out of dry season grazing areas • No. of water points re-opened and rehabilitated • No. of water points with improved access due to re-opened migration routes

[97] This includes traditional knowledge on coping with climate variability, conflict, food security, migration routes and access to grazing reserves (Frankenberger *et al.* (2012): p23).
[98] 'Non-climate' information includes new and improved livelihood strategies (with co-benefits of management of ecosystem services); livestock market prices and other information deemed necessary by project stakeholders.
[99] 'Users' refers to all community members using rangeland/natural resources.
[100] This indicator is adapted from ACCRA LAC Characteristics 'next steps' slide.
[101] This includes having M&E systems in place and operational, record and documentation systems well maintained and operational, and other processes according to policy requirements.
[102] This indicator is to assess coordination and the strengthening of linkages between different stakeholders engaged in the PNRM institutional set-up.
[103] This includes flexible, timely and informed decision-making responsive to ongoing changing circumstances/uncertainty. This also includes current and future awareness and ability to plan long-term.
[104] This indicator refers to current and future potential for innovation (adapted from Ludi, E *et al.* (2012): p7). This includes access to spaces to discuss, share and generate knowledge and skills to inform climate resilient adaptive practices. Similarly, evidence of current and future participatory and proactive learning mechanisms to inform action/practice over time (Huq, S and Rabbani, G. (2011), including learning-by-doing approaches and operational M&E systems that facilitate learning from and for change.
[105] This indicator is adapted from ACCRA 'next steps' slide.
[106] This includes local government enforcing traditional pastoralist by-laws as necessary.

Outcome area	High level indicators	Sub indicators
'Downstream' indicators: changes in adaptive capacity of pastoralists and agro-pastoralists (including the poorest, most marginalised and women)	Number of people experiencing improvements in adaptive capacity in light of climate and other stresses All indicators to be disaggregated by gender, age, wealth, livelihood vulnerability	Coverage: • No. of direct project beneficiaries compared with % of total population of the intervention area • % of direct project beneficiaries disaggregated by the poorest/most marginalised/ women/children Current knowledge levels including future potential to access, share and generate knowledge-bases: • % of people with and level of knowledge of PNRM roles and responsibilities, including future potential to access, share and generate this information • % of people with, level of access to and future potential to access, share and generate regular and updated sources of meaningful scientific and traditional weather (including seasonal forecasts) and climate information • % of people with, level of access to and future potential to access, share and generate regular and updated sources of relevant and meaningful non-climate information[107] • % of people with and level of knowledge on conflict resolution strategies, including future potential to access, share and generate this information • % of people with improved knowledge of analysis, planning and implementation strategies of new/adapted/innovative technical practices and management systems Current capacity levels including future potential to access, share and generate relevant skills, abilities, competencies and resources: Changes in value of assets and relevant livelihood/development outcomes (in light of climate risk) • Human: increased skills and resources to undertake new and improved livelihood strategies and PNRM practices; increased skills to undertake situation and trend analysis and associated planning to reduce climate change vulnerability of livelihoods systems; increased access to education for children; reduced water collection time for women; reduced time spent searching for pasture in dry seasons for women • Natural: increased and equitable access for livestock of all users to productive pasture/water sources/salt licks/forest areas in home territory (Booranaland) during wet and dry seasons without comprising dry season pasture areas; strengthened rangeland management and new practices retaining ecosystem services; increased and equitable access to the above resources for livestock of all users in neighbouring territory during wet and dry seasons • Physical: increased meat, milk, hay and off-spring production; increased livestock and household food/water security; increased livestock health; reduced livestock mortality; livestock diversification to more drought-resilient species; increased number of household livestock; strengthened water resource management structures • Political: enhanced community engagement and level of participation in planning, decision-making and rangeland/natural resource management forums, especially for women • Social: strengthened social networks and community cohesion; increased access to diverse social networks; evidence of the poorest/most marginalised/women able to identify, prioritise and articulate livelihood/natural resource management needs in planning and decision-making meetings; strengthened rights of ownership, access and management of rangeland and rangeland resources for all community members • Financial: improved income levels (and potential income levels) from improvement in livestock body condition in wet and dry seasons; increased off-spring; excess milk and hay production; diversified income streams from alternate livelihood strategies; change in poverty levels

Outcome area	High level indicators	Sub indicators
		Current practice levels including potential for future action: • Evidence of use (and potential future use) of new knowledge, skills and capacity to implement improved collective rangeland management practices[108] • Evidence of use (and potential future use) of new knowledge and skills and capacity to implement new and improved livelihood strategies • Evidence of use (and potential future use) of new knowledge and skills in planning and decision-making processes (including resource mapping and stakeholder action plans) • Level of change in project beneficiary perception and ability to manage future drought risk measured from a departure from pre-intervention perceptions and coping strategies • Evidence of maintained ecosystem services/NRM enhancing sustainability of community pastoral livelihoods • Evidence of change in attitude and use of competencies to plan and implement innovations • Evidence of seasonal mobility to appropriate wet and dry season grazing areas

[107] This includes information on new and improved livelihood practices; livestock market prices; where to move to during wet and dry season grazing areas; and any other relevant information identified as important by disaggregated community groups.

[108] Proxies include no. or % of households and livestock moving to appropriate wet and dry season grazing areas; evidence of people preserving and storing hay for livestock fodder during crisis times; evidence of people undertaking hay making, bush thinning, soil and water preservation techniques, seed harvesting).

Annex 3

Save the Children PNRM Steps: 2012

Step 1
Identify NRM stakeholders and users (at various levels) and carry out stakeholder analysis (bringing all actors together, including temporary users and women).

Step 2
Re-vitalise customary institutions (CI), if necessary. Conduct CI and government stakeholder SWOT analysis and develop mutual capacity strengthening plans. Support CI's and government in their ongoing capacity development.

Step 3
Identify NRM indigenous management units.

Step 4
Facilitate innovation platforms with CI, community representatives (gender, clan, wealth groups, children), government experts/authorities, private sector, research, NGOs/CBOs, etc. as required.

Step 5
Facilitate mapping (present situation and vision), including all resources and land uses, migration pattern, settlements, social infrastructures, markets, conflicts, etc. Stimulate analysis of trends, challenges and opportunities. Digitise maps.

Step 6
Facilitate Do No Harm Analysis (DNH) 1-3: understand the conflict contexts, analyse dividers and tensions, analyse connectors and local capacities for peace.

Step 7
Facilitate development of stakeholders' action plan (SAP). Support CIs', government's and other stakeholders' NRM and land use negotiations. Facilitate setting of new roles and responsibilities. Integrate indicators for monitoring of SAP implementation progress.

Step 8
Facilitate Do No Harm (DNH) 4-6: analyse the SAP, analyse SAP's impacts on dividers and connectors, re-plan if necessary.

Step 9
Support CIs' and government's formalization of land use agreements.

Step 10
Support stakeholders' implementation of their action plan.

Step 11
Facilitate participatory learning and action cycles and updating of plans.

Annex 4

Save the Children CB/PNRM Guiding Principles:

- aims at community-based adaptation and resilience outcomes;
- is people-centered, demand-driven, community-owned;
- builds on customary management systems and units;
- ensures inclusiveness, especially of vulnerable poor, women, and marginalised groups;
- is community-based and integrates various stakeholders (customary institutions, community groups, government, science, CSO, private sector);
- applies a systems approach (agro-ecological zones, natural resources, land use/tenure, livelihoods, social networks, markets & financial sector, private sector, stakeholders, institutions, power, hazards, vulnerability context, food prices, policies/regulations/legislation, dynamics & trends, climate change, ...);
- uses participatory learning and action for facilitating transformative learning processes, innovations and action;
- promotes strong partnerships;
- incorporates conflict mitigation and reduction;
- lays strong emphasis on effective structures & processes;
- is embedded in government systems, structures and policies;
- builds stakeholders' capacities, especially in problem solving and making use of opportunities;
- upgrades local know-how & skills and promotes development and use of appropriate technologies for increasing productivity (intensification) and adaptation;
- aligns with drought cycle management (DCM); the four phases and transitions between them;
- interconnects with other sectors and interventions, such as early warning, education, health and economic strengthening.
- ensures scalability.

Submission guidelines

Content

The series is open to the submission of papers by IIED staff and partners, and in exceptional circumstances by others doing research that is directly applicable to IIED's strategy and approach. Two types of papers will be considered: first, 'pre-publication' drafts of research or review articles that are intended to be subsequently published in a refereed journal, conference or book publication; second, innovative technical papers that are not necessarily intended for subsequent review and publication.

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All papers submitted to the series should adhere to the following style guidelines:

- All papers should be submitted with an abstract of maximum 150 words.
- All papers should aim to be between 8,000-11,000 words. However, in some cases longer articles will be accepted where the additional length is justified and seen as necessary by the editors.
- Research articles should present and discuss findings from a piece of original research. Research articles should include an introduction (including a research question or hypothesis), a description of the methods, an explanation of the results, and a discussion of the relevance of those results.
- Review articles should discuss and assess the state of knowledge in a particular field.
- All articles must be fully referenced using the Harvard system of referencing.
- Authors are encouraged to use visuals (tables, boxes, figures, photographs). All photographs must be sent in jpeg format. We may not be able to publish all visuals in colour.

Language

- Although the main working language of the series is English, authors wishing to submit articles in another language should contact the series editors.
- All articles will initially be published in English, although each article will also be reviewed on a case-by-case basis for publication in other languages.

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IIED is an independent, non-profit organisation promoting sustainable patterns of world development through collaborative research, policy studies, networking and knowledge dissemination.
The Climate Change Group works with partners to help secure fair and equitable solutions to climate change by combining appropriate support for adaptation by the poor in low- and middle-income countries, with ambitious and practical mitigation targets.

The work of the Climate Change Group focuses on achieving the following objectives:

- Supporting public planning processes in delivering climate resilient development outcomes for the poorest.
- Supporting climate change negotiators from poor and vulnerable countries for equitable, balanced and multilateral solutions to climate change.
- Building capacity to act on the implications of changing ecology and economics for equitable and climate resilient development in the drylands.

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