

Research Study on Natural Resource Management, Ecosystems and Biodiversity in Afar, Ethiopia

Socioeconomic Assessment



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Abbreviations and Acronyms

AIDMP	The Afar Integrated Dry-land Management Project
APDA	Afar Pastoralist Development Association
ANRS	Constitution of the Afar National Regional State
BoPAD	Bureau of Pastoral and Agricultural Development
EC	Ethiopian Calendar
Ha	Hectares
NGO	Non Government Organisation
NRM	Natural Resource Management
PCDP	Pastoral Community Development Project
PSNP	Productive Safety Net Programme
SNNPR	Southern Nations, Nationalities and Peoples Region
SSD	Support for Sustainable Development
UNDP	United Nations Development Program
WPs	Water Points

Terms

Absuma	Cross-cousin marriage
Abukrati	Ancestral domain
Arkakis	A drought (Terrifying) 2002/03-2007/08
Booda	Hand made uncovered water points
Buyyi	Hand made wells
Coox Dacayri	Traditional protection of plantlife
Daagu	The practice of a verbal knowledge exchange
Dadaa	Third rainy season in December
Dooga	Clay walls
D'yat	Blood Money
Faage	Territory
Gereb	An organizational system created from Afar and Tigray Elders
Iddo	Process of reconnaissance
Idini	Protection
Ikoyta	Private Property
Isi	Mediators
Kalu	Natural water point
Karma	Primary Rainy Season lasting June to September
Keddo Abba	Clan Leader
Le Racenna	Water Point
Mablo	Afar Indigenous Court
Madqu	Prohibition
Mekabon	Afar Elders
Sugum	Secondary rainy season lasting March to April
Wammo	Primarily Inhabitants
Yehoraye/Horoye	Water Points

1 Executive Summary

This socioeconomic assessment of Natural Resource Management in Zone Four of Afar is part of the Baseline Study for GIZ's **Strengthening Drought Resilience of the Pastoral and Agro-pastoral Population in the Lowlands of Ethiopia**. Droughts and their detrimental consequences for the environment and local livelihoods are not unknown to the Afar. But the increasing rate of recurrent droughts has degraded soils and vegetation, weakening their ability to regenerate and impairing the resilience strategies of the Afar pastoralists.

The purpose of the following report is to examine the current state of Natural Resource Management (NRM) found within Ewa and Awra Woredas of Zone Four. Current and past NRM practices are investigated by analysing the transition processes found in Afar, a move away from indigenous methods towards the utilisation of introduced technologies and strategies. The research methodology employed included in-depth individual and group interviews, participant observation and a literature review of relevant documents.

The weakening of traditional, often well adapted systems is the result of numerous influences, such as a surge in the presence of local and regional governmental bodies which erode traditional clan rule and influence property rights and access to natural resources. Resources previously seen as communal, such as land, are now able to be privatised thus restricting access and utilisation rights. This change in property rights is further cemented through the introduction of new agricultural practices such as irrigated arable farming. Residents in 12 out of the 20 *kebeles* across Ewa and Awra have begun to farm, attempting to generate additional agricultural output and to diversify their livelihoods in view of rangelands depreciation and increasing frequency of droughts. Although agriculture has been incorporated to improve resident's resilience, its success is also affected by the change in rangeland conditions. Farming lands of agro-pastoralists found along perennial rivers is reduced and partly washed away through stream-bank erosion during rainy seasons. Riverbeds deepen and widen, and irrigation canals must be realigned. Stream-bank erosion has also brought about the loss of plants growing on river banks, flora used by pastoralist as dry season fodder.

Climate change has also limited water access. The three yearly recurrent rainy seasons became less reliable, so that rangelands receive only sporadic rainfall. Seasonal rivers and gullies once capable of pooling water no longer absorb and retain water. Unable to survive off traditional methods, residents increase their reliance on perennial rivers and modern techniques such as hand pumps and water schemes. Modified rainy seasons, paired with population growth and overgrazing, have brought about various forms of erosion. Short but strong rainfalls on dry grounds have led to the denudation of top soil, followed by rill erosion and the deepening of gullies. The amplified presence of gully erosion throughout *kebeles* has left residents feeling unable to combat or contain its expansion. Local combative measures taken are minimal, inadequate to match the expanding erosion. The found deficit in local accountability for communal land management exacerbates the problem. Concentrated action only happens when permanent communal buildings such as schools or health stations are threatened, with *kebele* residents endeavouring to prevent damage to them.

The decreasing availability of water and deterioration of rangelands reduces biomass production and thus fodder. Rangelands once rich and covered with fodder plants for grazers and browsers can no longer provide sufficient quantities, forcing migration into other regions.

Migration practices and destinations have changed from one done to provide livestock with a diverse range of fodder deemed critical to health and value, to a forced practice as consequence of insufficient fodder availability at formerly rich rangelands. Many Afar are no longer able to traverse great distances due to the weakness of their animals and insufficient resources along their routes. Many rangelands offer far less fodder unable to sustain herds as

previously, or their access is prevented, as seen in lands converted into sugarcane plantations. As a consequence of rangeland depletion Afar pastoralists increasingly move into new highland areas, providing ample opportunities for conflicts to arise between highlanders and Afar. However, residents reported that the frequency and ferocity of natural resource based conflicts in Afar have decreased over the past ten years. This has been credited to the removal of traditional rangeland restriction methods, paired with harsher fines and prison sentences for guilty parties, and the increase in government attention and co-operation between regions.

The upheaval of clan power has also impacted the way in which communities communicate with officials to express their concerns and demands. No longer does all communication run to and through the clan leader. Instead the *kebele* leader is now the focal point of inquiry and from him all problems and concerns flow through to the *woreda* then onto the regional government; a communication structure which relies wholly on the strength of the *kebele* and *woreda* leaders and community faith in their abilities. Residents also depend on *kebele* leaders to keep them abreast of relevant policies and projects.

2 Scope of Study

2.1 Background

The Afar region is one of the poorest and underdeveloped regions of Ethiopia. The chiefly pastoralist and (agro)pastoralist livelihoods of the Afar people are under increasing pressure due to changing natural and socioeconomic conditions. Natural resources such as land and water, previously used and shared as common property resources, have become limited and access increasingly restricted. This alongside climate change processes and a significant population growth, has directly impacted on proven livelihood strategies of the Afar.

The Afar utilise a sustainable drought resilient system based around a semi-nomadic pastoral lifestyle in both arid and semi-arid regions. This system has come under pressure and is no longer as effective as previously due to the land transformation of perennial river rangelands whose use is critical due to fodder presence during dry seasons and droughts, conflicts with neighbouring pastoralists, and alien plant invasion throughout the region. The already degraded vegetation cover is worsening, as a result of changing precipitation patterns, erosion, and overgrazing. The capacity of pastoralists to react and sustainably manage natural resources as well as to sustain their livelihoods is called into question.

2.2 Methodology

The methodology applied for the following study consisted of two specific elements:

- Field research in the study area including semi-structured qualitative interviews with local stakeholders (pastoralists, agro-pastoralists, farmers), members of regional and local government institutions, village elders and clan leaders, local researchers, and NGOs.
- Literature review and analysis of studies conducted, relevant policies, legislation and reports pertaining to Natural Resources Management (NRM) and property rights in Afar.

This study aims to provide a sound and comprehensive knowledge base of the current socio-economic conditions relevant to the subject material. Research has been conducted in order to provide an insight as to how the present numerous threats and challenges are perceived and managed by those concerned.

Field work was undertaken over two periods, during October and November 2013 and in March 2014. Altogether 35 in-depth interviews and 26 group interviews were conducted in the focus *kebeles*. Government workers, clan, youth, *kebele* and *woreda* heads, village elders, agro-pastoralists and pastoralists as well as members of various institutions were spoken to. During the first period additional observations were made in Urikooman, while in Semara and Logia in-depth interviews were held with officials from the Bureau of Pastoral and Agricultural Development (BoPAD) and Water Department as well as Afar cultural experts and NGO employees. In the second period, data was cross-checked through interviews held with clan and *kebele* leaders from six additional *kebeles*: Duba, Boolotamo, and Bilu of Ewa and Leekoomra, Leekora, and Alibrihi Mesgid of Awra.

2.3 Baseline Objectives

This baseline study aims to identify the current socio-economic conditions found within Zone Four of Afar. The main objectives of the study are

- to identify natural resource management (NRM) and utilization practices,
- to assess access to natural resources,
- to document indigenous NRM knowledge and skills and their role in today's society,
- to assess the impact of climate change and related risks and challenges,
- to understand water and property rights,
- to identify institutions of resource management,
- to investigate migration practices, routes, and destinations,
- to document natural resource based conflicts over the past 10 years,
- to identify communication methods between residents and government officials,
- to record community representation in and awareness of regional policies and programs, and
- to document resilience methods and highlight the support needed to strengthen resilience in Afar.

3 Research Sites

Administrative authority in Ethiopia is a formal two-layered system, consisting of the Ethiopian Federal Government and Regional Governments. Ethiopia's nine regions, the National Regional States, were constructed according to ethnic boundaries and each region sub-divided into zones (BROSIO 2000). Afar is one of the four major pastoral regions in Ethiopia and has five administrative zones (Fig. 1) sub-divided into *woredas*. The baseline study for *Strengthening Drought Resilience of the Pastoral and Agro-pastoral Population in the Lowlands of Ethiopia* focuses on Awra and Ewa *Woredas* of Zone Four, which is composed of five *woredas*: Yallo, Gullina, Awra, Ewa and Teru. *Woreda* officials are appointed by the Afar National Regional State Government. Each *woreda* is then divided into *kebeles*, with *kebele* officials elected as well as appointed. Unlike other regions in Ethiopia, Afar does not have the formal structure of the *sub-kebele*, rather different areas in the *kebele*

are broken down into villages and settlements. Inhabitants often name settlements, at times after land formations or flora found within the area (YILMAZ & VARSHA 2008).

The four focus *kebeles* for this study are Hida and Hiddalu of Awra, and 1st Badoli and Buti of Ewa (Fig. 1). These *kebeles* were chosen so as to comply with a series of conditions set to ascertain the current conditions and views of inhabitants: presence of residents which practice both agro-pastoralism and pastoralism, *kebeles* considered both rich and poor in terms of access to natural resources such as water and fertile rangelands, and the economic status of the population.

3.1 Awra Woreda – Hida and Hiddalu

Awra Woreda is composed of four agro-pastoralist *kebeles* and six pastoralist *kebeles*, and is 309,600 hectares (ANRS AWRA 2011). With a total population of 35,753 (ETHIOPIAN STATISTICS AUTHORITY 2007), Awra is serviced by one of the sub-basin's key perennial rivers, Awra River, which originates in the Amhara region as well as various seasonal rivers in each *kebele*. Located in the Teru sub-basin, it is heavily affected by wind and soil erosion (splash, sheet, rill, and gully) as well as by flash floods originating in the highlands of Tigray and Amhara regions resulting in stream bank or roadside erosion (TECHNICAL REPORT: LAND DEGRADATION ASSESSMENT 2011).

In Awra, the agro-pastoralist *kebele* of Hida and the pastoralist *kebele* of Hiddalu were selected. Hida has a population of 8,438 and in Hiddalu 2,485 (ANRS AWRA 2011). Both *kebeles* are serviced by the perennial Awra River and seasonal rivers.

3.2 Ewa – 1st Badoli and Buti

Ewa Woreda is composed of eight agro-pastoralist *kebeles* and two pastoralist *kebeles*, and is 123,700 ha in size (ANRS EWA 2011). The population of Ewa is 47,195 (ETHIOPIAN STATISTICS AUTHORITY 2007). Located in the Lower Awash Sub-basin, Ewa is considered to have greater economic potential than other *woredas* due to a higher presence of valuable natural resources (LAND USE LAND COVER ASSESSMENT 2012). It is a semi-arid *woreda* and as with the rest of the sub-basin, Ewa is categorised by low rainfall and also affected by flash floods and various forms of erosion (LAND USE LAND COVER ASSESSMENT 2012).

In Ewa, the agro-pastoralist *kebele* of 1st Badoli and the pastoralist *kebele* Buti were selected. 1st Badoli has a population of 5,771 and in Buti 3,973 (ANRS AWRA 2011). Both *kebeles* are serviced by the perennial Ewa River and several seasonal rivers.

4 Analysis of Natural Resource Management

Access to natural resources is intrinsically relevant to Afar. This chapter discusses the management of land, water, and fodder. Using resident perceptions, each sub-chapter begins by detailing the use of indigenous customs and property rights in resource management. The consequences of climate change and governmental interventions on utilisation and access rights, natural resource management and its institutions are assessed.

4.1 Land

4.1.1 Indigenous Customs and Property Rights

Rangelands are traditionally owned by a clan as a collective whole, the *wammo* (primary inhabitants) and it is they who have primary shared rights over the land in which they reside, their *faage* (territory) (HUNDIE, PADMANBHAN 2008; OBA 2012). A clan's proprietary over a region and its resources is communal; it belongs to a clan as a whole entity and is non-transferable. Regions are broken into territories typically marked by landscape features such as rivers, mountains, or forests. The size of a clan's territory is dependent on numerous variables: the ancestral domain, clan's size and strength, and the quality of natural resources.

These territories can be broken down further into *metaro*, settlements belonging to singular or multiple households with owners able to prevent even fellow clan members from accessing resources found within. Previously, the *wammo* had the power to permit or exclude entry to the rangelands, a decision reached by clan leaders (*Keddo Abba*), elders (*Mekabon*), and wise men (HUNDIE 2008). Each clan has a communal graveyard as well as ritual sites within its territory. Following the *wammo* are those outside clans who, despite not holding a primary claim over the land, have the right to utilise the land for purposes such as passage or access to resources. This is known as *isso* (lease), use under restrictions. *Isso* is conducted and allowed so long as secondary clans adhere to the stipulated rules and regulations, such as time restrictions (FLINTAN et al 2008). Rights are orally transmitted, as are clan access mandates.

Traditionally Afars reside in their ancestral domain. When forming a new *metaro* (settlement) within the territory of one's clan no permission is needed. Males creating a new household may choose to move out of the family compound but generally remain in the vicinity. Those from neighbouring clans are not prohibited from moving in and establishing a *metaro*, but must first seek the *wammo*'s permission.

Absuma, the tradition of joining clans together through marriage, is used by the Afar to ensure access to rangelands in other areas. Sons will marry daughters from their mother's clan to strengthen relationships (TESFAY et al. 2003). It is also customary for men to marry their brother's widow, an act that ensures that both the widow and any children are cared for and resources belonging to the brother remain within the family, preventing a widow from transferring ownership to her family. Under Afar law, unmarried and married childless women do not hold the same inheritance rights as males in the same position.

Desso is the traditional method of rangeland management. It is implemented to ensure that sufficient fodder remains in a clan's rangelands, done to safeguard fodder quantities so that its inhabitants are not required to relocate to find additional grazing stock. *Desso* consists of restricting access to an area designated by the community, with entry forbidden for a specified period; weeks, months or years, the time dependent on community intentions. There are three degrees of *desso*: the basic is a settlement or household fencing off a small area near or in their own settlement during the rains so that grass can grow, secondary is within the community with use only granted to members of the settlement, and the third grants access to community members and those related through marriage or blood.

Usage of pastures cannot be prohibited from others; under Afar law it is not permitted to completely bar access to rangelands, but it can be restricted. It is a punishable offense, which is taken to the Afar Tribunal Court, to completely deny other clans who request entry. If fodder is not sufficient then a limited time will be allocated to those seeking permission, i.e., two to three days. This compromise is made to ensure livestock have the necessary strength to continue on, as the death of livestock not granted entry shall be attributed to those who restricted access.

Traditional natural resource access was not defined by gender or wealth of individuals, rather through a clan's status and connections. However gender does influence ways of establishing access to natural resources; clan connections and alliances are created and built in a patriarchal setting. Access can be denied to certain clans and/or settlements if the past behaviour or actions of members resulted in conflicts or went against the host clan's customs.

4.1.2 *Climate Change Impacts*

Rangelands across all four *kebeles* were repeatedly described as previously presenting a vastly different appearance. On average, residents of focus *kebeles* stated climate change began to affect livelihoods seven years ago with initial signs appearing 18 years ago.

The disappearance of fodder plants was attributed to a change in rains and rangeland inability to retain water after rains, as well as to increased herds. Agro-pastoralists in Aleytily Village advised that soil previously perceived to be of a superior quality no longer remains, and that nowadays rangelands near erosion valleys have been depleted of quality soil and no longer provide the same amount of fodder. Popular opinions behind the reduction or in some areas even the disappearance of grazing fodder are centred on changes in the three rainy seasons *Karma* (June to September), *Dadaa* (December) and *Sugum* (March to April).

The predominant impact from the loss of flora and rains, combined with the increase in population, is the proliferation of erosion through the zone. Splash (Fig. 2) through to gully erosion (Fig. 3 and 4) cuts through rangelands, threatening settlements and washing away top soil. Stream-bank erosion (Fig. 5) removes trees, shrubs, and land from farming plots along rivers. Land bordering the road from Chifra through Ewa and Awra has been eroded, with gullies running parallel to the road and extending into the rangelands on either side. (Agro-) pastoralists stated past rangelands surrounding Hida were flat and retained water during the rainy season, however now rainwater flows right through and joins perennial rivers.

Traditional rangeland protection customs are also eroding: *Desso* lost relevance during droughts; rangelands incapable of regeneration do not require protection, as value is lost. Prior to the current period of sporadic and insufficient rains a significantly superior quantity of fodder grew and more communities chose to implement *desso*. A lack of rangelands worth protecting is becoming increasingly prevalent and is one reason *kebeles* no longer implement *desso*. Residents also have orders not to practice *desso*, to remove restrictions for other clans entering their *kebele*, as part of a government push to reduce natural resource based conflicts.

Residents reported despite living through a time of strong land alteration they have not acquired the knowledge required to live with the changed climate, to assist with the care for their animals, and to fight what has become a major foe, erosion. Inhabitants have no traditional techniques to deal with the depreciation of rangeland quality, as previous erosion was not as severe or as deep and grasses capable of rejuvenation. A common belief is that nothing can be done to save the land, to prevent erosion, and rangeland corruption.

4.1.3 *Formal Property Rights and Changing Land Access*

Officially, codified ownership over rural land is the common property of the Ethiopian Government and the Afar and as such should be legally managed by the two. The Afar National Regional State Rural Land Administration and Use Policy of 2008 legally stipulates that “the farmers of the region have the right to obtain land free of charge and the protection against eviction from their possession [and] Afar pastoralists have the right to free land for grazing and cultivation as well as the right not to be displaced from their own lands” (2008, 7).

Thus, these lands can be described, using BERKES' Property Rights Regime for Natural Resources, as common property (SCHLAGER, OSTROM 1992). Utilisation rights are managed by clan and government leaders. The most commonplace land category found is communal grazing land and at times within them, both communal and private small-scale farming plots. National parks (e.g. Awash National Park) and state farms (e.g. Tendaho Sugarcane Plantation) are governmental lands and restricted grazing access.

While the privatisation of communal property by the Ethiopian Government to create small-scale farming plots is not the most prevalent form of land title, it does demonstrate a significant change in property rights. An element of the settlement program, it's a move away from communal tenure over resources towards allowing specific group control over resources. This change allocates the rights of excludability to individuals; shrinking land ownership institutions, from communally clan based towards a household or cooperative institution. Critical to note is that this move has not only been introduced and implemented by the Ethiopian Government, with community members from all focus *kebeles* expressing interest in and attempting agriculture. Attempts failed and succeeded; failure due to numerous extenuating circumstances such as water shortages or lack of agricultural knowledge.

Codified property rights to rural lands are primarily granted by *kebele* and *woreda* government officials in addition to clan leaders. Using the example of Hida Kebele, small scale farming plots have had ownership titles granted to those farming the lands. 250 ha were cleared, one hectare split between two to three households;¹ the maximum allocation of land per person stands at one hectare due to water restrictions. The guiding principle grants half a hectare to each household; however the allotment size is flexible when the household is perceived to require more land and can manage it. Whilst female ownership is not prohibited, it is not common for land to be granted to females and the area is smaller than that given to males due to the understanding held by regional government officials that females are not as capable of managing larger plots. Females are discriminated against but are not completely thwarted from ownership.

There is no time limitation on the duration of ownership, once registered to an individual the land belongs to them. The Afar National Regional State Rural Lands Administration and Use Policy (2008, 8) states individuals with land ownership have the right to bequeath it, as well as transfer the title. Upon death land remains within the family, family members maintain ownership and land will not be returned to the government. Governmental bodies create plots with land given to those applying together and to close family members in an attempt to limit conflict. A certificate of ownership should be issued, with the owners photograph attached.

Shortage of land does not factor into distribution concerns, the perceived constraint is the lack of water. Land cleared and irrigated by the government is given to applicants on a 'first come, first served' basis. Government officials reported that every member of Awra, each resident, could benefit from the use and implementation of irrigation schemes. The Awra Woreda Government currently focuses on the four agro-pastoral *kebeles* (Hida, Lekura, Lekuma, Alibrihi Mesgid) and only those from *kebeles* with irrigation schemes are able to register for land. Un-married women or widows with children can register for land ownership, as can other ethnic groups but priority is given to Afar males or those who have lived in the area for a long period of time. Under the constitution individuals who have lived in the area for four years or more have the right to own land. Age does not affect ownership, as long as the interested party is able bodied and fit to manage land. The land is registered under the applicant's name – male or female.

¹ A household is defined by a man and his wife or wives, and his offspring who live with him.

Agro-pastoralists in Hida Kebele who received land according to the governmental plan have no documentation proving that their land belongs to them. They believe that the distribution of land by the government is beneficial, that it's a positive move because they're able to provide their families with more food, a greater variety, as well as feed livestock from the grasses that grow inside of the farming lands. *Woreda* agencies taught farming techniques; through the settlement project communities were collected and told to change their livelihood practices, to adopt a sedentary livelihood based around agriculture. That the lands surrounding the village are their ancestral domain was central in their decision to settle in Hida. An elder advised that where your parents and grandparents were, your *abukrati* (ancestral domain), there you'll find your home and land.

No ownership deeds have been given to those who cleared land without government support, but the community believes land belongs to those who worked it. As of 20/10/2013 no privately cleared land has been registered and does not officially belong to those who cleared it, however the government intends on distributing certificates recognising ownership. Ownership will be granted to those who cleared it; it will not depend on the size of the plot, a step taken to prevent potential conflicts.

In 1st Badoli, farming plots cleared in 1994 demonstrate non-codified property rights in play. Land was assigned according to the household size: 40 steps per households for a man with more than one wife, 30 for a man with one wife and 20 for single man (current government system is to measure allotment in hectares). If a single man was to marry, he could be awarded more land pending availability.

4.1.4 Current Management Institutions

Both formal and informal NRM management institutions are present. Traditional institutions have played and continue to play a central role in land management. Clan leaders and elders (*mekabon*) are key NRM stakeholders, working alongside local government officials. Committees utilising both modern and traditional practices have been constructed to facilitate NRM in *kebeles*. Informal NRM is also practiced by individuals and communities, the most commonplace being the prevention of erosion proliferation. Terracing and gabion construction is sparsely conducted by residents in affected areas without compensation. Erosion prevention for canals or protection for trees along river beds affected by stream bank erosion was not commonly found in the focus *kebeles* in areas not cultivated or irrigated. Some individuals carry out their own small-scale rangeland rehabilitation practices, done to protect and feed livestock. Occasional measures include filling rills and small gullies with dirt, sand or stone gabions, and constructing *dooga* (clay walls) along affected areas.

The Afar National Regional State Government is the public institution working on *woreda* and *kebele* levels. It is responsible for the creation of regional specific policies and legislation, as well as managing the activities and actions of the *woreda* and *kebele* governments (SANSULOTTE-GREENIDGE et al. 2012). The latter are responsible for governmental NRM projects and program implementation. The Afar Regional State Government has various programs to manage land, including the Productive Safety Net Programme (PSNP). In Awra the PSNP has implemented a small-scale pasture rehabilitation program, closing 25 ha of rangelands for five years to protect and restore vegetation. Preventing livestock from entering began in 2011 and the intended exclusion period is until 2015. Entry into the enclosure is not completely forbidden, the 'cut and carry' method of fodder provision for livestock is allowed.

Through PSNP, the Food for Work program carries out erosion prevention activities in Ewa and Awra Woredas. The bottom up approach is designed give *kebeles* the opportunity to identify problem areas and repair them using community participation. A central theme is

erosion control using locally found materials, through the construction of barriers made out of stones, sticks, and dirt or sand. Hillside terraces have been constructed in Hiddalu (Fig. 6) and stone gabions created in Buti for two consecutive years (Fig.7). In Hida, small canals have been dug which run parallel to erosion gullies and the intention is to continue construction including canals which run adjacent to existing erosion gullies (Fig. 8). For the most part these barriers and canals seldom last as highland flood water destroys them. Strong floods carry stones away, bypassing constructions and eroding soil. Existing constructions show slightly more flora than surrounding lands and sediment levels in gullies with gabions improves, but erosion persists.

The Afar Integrated Dryland Management Project (AIDMP), funded by the UNDP and Ethiopian Environmental Program Authority, was implemented in Dewe, Mile, Chifra, Ewa, and Awra Woredas in 2011. The project included water and soil conservation methods, the establishment of fodder banks, and introduces alternative technologies. Save the Children implemented a rangeland rehabilitation project in Buti, as part of their Community Development Disaster Risk Management Project - Pillar IV.

Land was originally used during the Derg Regime for farming and cultivated in 1972, in both Hida and 1st Badoli. In Hida, the initial 25 ha cultivated have expanded to 90 ha. During the Derg Regime, sorghum and maize grew and land was cultivated by tractors, following the socialist ideology of mechanisation. After the regime's fall, farming was abandoned. The area was cleared by pastoralists in 2004, using traditional methods. Residents believe, in hindsight, the traditional approach was less feasible and more time consuming. Specifically relating to water management, techniques such as rain harvesting proved insufficient.

Previously land bordering the Ewa River was distributed by community and clan leaders, it is now done by government and *kebele* leaders. 1st Badoli residents prepared the lands and re-established the irrigation system alone, however floods destroyed the structures constructed. They endeavoured to farm twice, but had difficulties storing water for longer periods of time. Attempts to grow sorghum resulted in dried and withered produce, causing them to cease.

Support for Sustainable Development (SSD) and Save the Children are two NGOs working in the research sites in NRM. SSD began their work in January 2003 in Awra with an initial intention of cultivating 80 hectares of land and awarding an average allocated irrigated plot of 0.3 ha per farming household. The project aimed to improve food-security and engage pastoral communities to strengthen livelihoods. They ran capacity building small-scale irrigation projects in Hida, Leekuma, Segentole, Leekora and Badoli Kebeles in both *woredas*, constructing gravity based irrigation infrastructures off Awra and Ewa Rivers to provide cleared plots with water from perennial rivers. Livestock is not permitted to enter into farming lands. SSD (2010) reported as of March, 2010, 360 ha of irrigated land have been developed with 2,290 households benefiting from the irrigation and rural development projects.

SSD introduced irrigation schemes, as well as provided the training and seeds required to expand crop cultivation. Irrigation canals provided much needed water for farming plots in 1st Badoli and further supported Hida farmers. The key difference for Omar, a Hida agro-pastoralist, is that prior to SSD's arrival he was able to harvest once a year, after the rains and only able to do so if the rainfall was sufficient. Now he can grow two crops a year, because of a constant water flow from the irrigation canals. Over the past years he has noted an increase in produce, a quality he attributes to the use of irrigation canals.

Two settlement projects have begun in Horongo (Ewa) and Hida (Awra). Methods of obtaining land through the settlement project at Horongo differ from previous practices. Beneficiaries of the scheme are selected by *kebele* leaders from every *kebele* in Ewa, meetings held during which the settlement program is discussed and interested parties register. During

each round, between five to ten households from each *kebele* are selected and moved to Horongo. In Buti, during the first round ten households registered interest and five were moved. The second round drew more applicants, selected residents were notified that they would be able to move by the end of March 2014. A preference to move is greater within females. Upon arrival pastoralists are directed towards an area where others from their *kebele* are based and a designated block of farming land. Housing is assigned around *kebeles*, farming plots are not.

Participants for the Awra settlement project in Hida are also selected by *kebele* leaders, however not all those relocated request to move. Those who moved during March, 2014, had not been allocated farming land, but as with Horongo, assigned plots for housing are created around the *kebele* of origin. Unlike in Ewa, where each *kebele* has sent households, only households from Leekuma, Leekora, and Alibrihi Mesgid have been told to move.

4.1.5 Current Access and Utilisation Rights

The Afar National Regional State Rural Lands Administration and Use Policy legally stipulates that ‘the right of pastoralists and/or agro-pastoralists to free access and use land is guaranteed’. In addition, it states that ‘women shall have equal land use rights with men’ (2008, 8). Afar land is the combined common property of the peoples and the state therefore if access for (agro)-pastoralists to land and its resources is restricted, the *wammo* denied entry to their domain have the right to be duly compensated. Unlike the past land use policies, such as those of the Derg Regime where a loss of access was not matched with compensation (PIGUET 2007; RETTBERG 2010), currently compensation is a legal regulation awarded to the *wammo* for the loss of access. It should be through a community consensus that land is privatised. Those with secondary level access are not compensated despite being affected by the reduction in accessible rangelands (ANRS RURAL LANDS ADMINISTRATION AND LAND USE POLICY 2008).

A prime example of access denied to pastoralists given by residents of Hida is the formation of sugarcane plantations. While no plantations have been established within the focus *kebeles*, residents’ inability to access grazing lands that now house sugarcane plantations was a driving force in their decision to turn to a more sedentary livelihood. The reduction of known grazing fodder such as *durfu* (*Chrysopogon plumulosus*) and *malif* (*Andropogon canaliculatus*) in a time of drought pushed them towards diversifying through agriculture.

Previously communal land that has been privatised will have restricted access. Once government officials or clan leaders grant ownership of land (*gratis*) to an individual or group then access to that land is controlled by the owner, who can restrict access as they see fit.

Table 1. Arable Land in Focus Woredas

Woreda	Arable Land /ha			
	Fallow	Grazing	Forest	Total
Awra	30,970	123,840	15,264	170,074
Ewa	600	2,000	200	2,800
Total	31,570	125,840	15,464	172,874

Source: BoPAD 2014

Access to the majority of the rangeland converted into the Horongo settlement project of Ewa is not currently denied. Ewa residents are still permitted to enter the area, but due to rangeland deterioration Horongo is no longer a preferred region. Access is only restricted into areas now converted into farming plots belonging to the 500 relocated households, an increase in the number of residents will result

in size of communally accessible land decreasing. As farming land has not been distributed in Hida, the loss of access remains as before, solely land that has already been converted into farming plots.

Access to natural resources is not defined by gender or wealth, rather through a clan's status and connections. This is not to say that gender does not play a role in establishing access to natural resources; clan connections and alliances are created and built in a male dominated setting. Access can also be denied to certain clans and/or settlements if the past behaviour or actions of members resulted in conflicts or went against the customs of the host clan.

4.2 Water

4.2.1 Indigenous Customs

Numerous *la racenna* (water points) exist and the most commonplace is the *buyyi*, a shallow well dug along flowing and dry riverbanks. Three stages and depths of a *buyyi* exist, traditionally lasting for between two to three weeks. The first dug should be a hands length deep, and would remain for one week. Following on, the depth matches a standing child and also remain for a week. The third is roughly the length of an adult and after a week should be dry. An *ela* is a deeper well, often over 10 meters, and less common. The collection of water along perennial rivers is the prime source of indigenous water collection. *Boodas* were also dug, uncovered wells in flooding plains.

4.2.2 Climate Change Impact

The major water concern is the change in the three rainy seasons *Karma* (June to September), *Dadaa* (December) and *Sugum* (March to April). *Karma* and *Sugum* are shorted and when rain does fall the intensity is far greater and *dada* now only lasts a few days. Rain coverage is patchy and many areas are left without water. Previously rains regenerated plant roots, but the effects of prolonged drought and shorter rainy seasons have led to roots drying out, thus unable to rejuvenate. The customary rain cycle was three times annually, one year of consistent rainy seasons following the next. These conditions, however, have been lost over the past two decades. Until the rain comes, the land stays dry, and intense soil erosion occurs, washing top soil away and deepening rills and gullies.

Erosion is a serious consequence of the changing precipitation patterns. The Awra riverbed is expanding in width, cutting arable lands at its edges through stream bank erosion. This stream flow alteration creates the yearly task of adjusting the irrigation canals, often needing to be redirected to meet new river necks. The same events were reported in Hiddalu along multiple seasonal rivers such as the Makoli River. The stream has changed its direction and placement and the water stream destroys trees along the shores by washing the soil away (Fig. 5).

Traditional water points (WP) found along seasonal river beds in Ewa no longer retain the same levels of water. People residing in settlements along the riverbanks on a quasi-permanent basis for the past seven to ten years reported that the duration of water retention has shortened, to a few days compared to up to a month in the past. Before, once the river dried up, *buyyis* constructed could last up to a month. Water points now dug along seasonal rivers produce limited to no water; only those dug in or by perennial rivers retain water. This has equated to residents travelling great distances to reach water, i.e., female residents residing along the Makoli and Laayeexe Rivers of Hiddalu make a return trip (11 hours in total) every two to three days to collect water from Kusrale along the Awra River.

The weakening of water retention in the soil has not only impacted traditional WPs, the water scheme in 1st Badoli has also felt the effect of a reduction in ground water.² During the initial year sufficient water was drawn by *kebele* residents. But the level has decreased since then so

²Built in 2004 by the Afar Regional Water Bureau, as part of a Water and Agriculture Ministry Project of the Federal Government.

that it is no longer possible to fill all four 500 litre tanks, and people have reverted to travelling to Ewa River to collect water.

4.2.3 Current Water Rights

Water flowing through rivers both perennial and seasonal is understood to be the communal property of Afar, and must be shared. However the method by which it is collected can alter its state of ownership. Once supplied through tools such as irrigation canals and water schemes then it becomes the property of those connected with the farms and schemes, and access is restricted and monitored.

4.2.4 Current Water Management Institutions

Water management changes throughout the year and is dependent on numerous factors. During the rainy seasons water can act as a migration catalyst causing pastoralists based near rivers or rangelands prone to flooding to move away until the rains have ceased. After rains have passed residents will move back into the area and livestock will consume regenerated fodder. Flooding can also cause pastoralists to move towards risk prone areas, as was the case in Hiddalu during the 2013 *Karma*. Residents from throughout the *kebele* came to the centre to construct preventative barriers around the school and clinic to prevent them from flooding. Barriers out of stones, dirt, sand and wood were established in a successful venture to divert the flood away from the buildings.

Various water points (WPs) have been constructed throughout the four focus *kebeles*. Birkads constructed in Hiddalu were done by the Pastoral Community Development Project (PCDP) and the Afar Pastoralist Development Association (APDA). Hand pumps and water schemes were installed by the Afar Regional Water Department. The newly constructed mega litre tank built for the government's Hida settlement project is supported by a 45 km pipeline extending throughout the *kebele* and will be managed by government workers.³ Construction began in 2012 and once completed the water will be provided free of charge to communities found along the pipeline. Authorities stated that once community is familiar with the benefits, ease and health wise, a fee will be introduced. The new government scheme will have 37 WPs in total, five of which will be in Hida. In the unspecified future, each WP will be managed by a committee.⁴

The management of water can be broken down into numerous factions. Once the source of water has been altered, for example through the construction of wells or irrigation canals, it is managed by committees made up out of community members. An example of this is the existing generator powered water scheme in Hida, managed by a Water Scheme Management Committee with five members who were selected by the community four years ago; the committee has the support of the *kebele* and *woreda* government. The head of the committee, Mohammed Amien, advised the committee is responsible for four WPs,⁵ of which the one in the town centre, installed in 1995, has been non-functional since 2010. Committee members work for free, participation stems from a belief that the previous committee performance was unsatisfactory and they embezzled money. Failed schemes are repaired by government employees and paid for by community members.

³ As of the 23/03/2014 was not connected, the diesel pump reportedly is still in Djibouti.

⁴ The sub-villages connected to the scheme in Hida are as listed: Derokooma, Damanlieyta, Bateanira, Wamaebi, Homra, Alayayloli, Adeekille Kalo, Amomalita, Abielledale, Diini masjid, Angoltooli, Haffraln, Masgiddo, and Mohamet Noormasgid.

⁵ One in town centre, one behind school, one in clinic and one outside of centre

The Water Scheme Management Committee in 1st Badoli was created by community members and Support for Sustainable Development (SSD).⁶ Approximately 40 to 50 households use the WP when functional. The scheme was initially managed by a single man who received payment from SSD in the form of food (a per diem of six kilos of barley, equating to roughly 750 to 900 Birr monthly). After his departure in 2008, a volunteer committee was formed.

Irrigation canals found in Hida and 1st Badoli are managed by water irrigation committees. There are 15 members in each committee: head, second in command, secretary and finance officer with the remaining acting as members, with members selected then elected by the complete co-operative. A 50 birr fee is paid per plot; funds are kept to assist in solving problems, current and future, such as erosion and drought.

The committee is responsible for the management and maintenance of land, problem solving, and the irrigation schedule. Water from irrigation canals is provided during two split shifts – night and day. If canals are altered by an individual, so that his lands get more water, this individual is punished (500 birr). If a man changes the direction of the water and those effected fights the culprit instead of alerting the committee, those caught fighting are also fined 500 birr. This rule was implemented in an attempt to prevent physical conflict; the fine has only been issued once. If punishment is not enough, the culprit’s land is given to another person. This also has only occurred once, during a farmer’s second year, when he blocked the water canals and his land was awarded to someone else. As two co-operatives use the Ewa River weir, water used to irrigate land rotates granting 15 days per co-operative. Water based conflicts increase during times of drought, when river water slows.

One recurring problem is that during rainy seasons the canals overflow and additional soil/clay/dust gets into the canals and clogs them. Erosion is also problematic; in some areas it destroys the human made canals, requiring rebuilding efforts. A key concern currently is the expansion of the Ewa riverbed, as in Awra. Small-scale farming which back the river bank loose land annually due to the yearly expansion of the Ewa perennial river banks through stream bank erosion; gabions built in 2012 with SSD were partially damaged during the 2013 Karma.

4.2.5 *Current Access and Utilisation Rights*

As a general rule, access to perennial and seasonal rivers should not be prevented. Only when the land bordering a river is privately owned is the right to use restricted. Although access to water cannot be denied under traditional laws, water collected from water pumps and schemes can be. Priority of use is demonstrated through the method of delivery and the function of the construction, i.e. pumps and schemes for human consumption, irrigation canals for farming.

Table 2. Water Access Across Focus Kebeles

<i>Kebele</i>	Sources
Buti	2 hand pumps, 1 generator powered WPs, Ewa Perennial River
1 st Badoli	Generator powered WP, Ewa Perennial River

⁶ The scheme was built in 2002 by the Afar Regional Water Bureau, as part of a Federal Water and Agriculture Ministry Project.

Hida	Water scheme with 4 WPs, 1 hand pump, Awra Perennial River
Hiddalu	1 hand pump, 2 birkads, Awra Perennial River

In Hiddalu Kebele, access to a hand pump is restricted to those who have children enrolled in the school. Managed by a committee and locked when committee

Source: Field Work

members are not present, the water is used by households near Karbabayu (hill near settlement). Usage is free, with the number of students enrolled in the school estimated to be 80. This rule was enforced by the *kebele* leader in an attempt to ensure that enrolment in school remained a priority for parents, not to limit water access to those in need. Livestock saturating is not allowed as water is solely reserved for human consumption. In both Hida and 1st Badoli, usage of the water scheme is generally limited to financial contributors however exceptions are made: those recognized within the community as the lowest income earners are granted usage gratis while use is prohibited for those who are perceived to be wealthy yet refuse to pay.

Wells or WPs built by residents are used only by inhabitants of that settlement. Residents will dig uncovered wells, *boodas*, which can retain water for up to a month after successful rains. The same stands for temporary hand dug wells such as *buuyis*; usage is for those who erected them. Private wells are catalysts for conflicts, areas such as Adu in Ewa facing repeat clashes between local residents and visiting pastoralists.

Water flowing through irrigation canals is restricted to farming lands. Due to the damage that livestock (camels and cattle in particular) bring to the foundations they are not permitted to use them. Priority of delivery is granted in order beginning with those with the highest need: examples being plots with poorer soil, with comparatively insufficient rain water, and those further from the weir.

4.3 Fodder

4.3.1 Indigenous Customs

The traditional protection of trees and rangelands is termed *Coox Dacayri*, a system based on a sound knowledge of existing flora and rangeland status. Protection of plant life found within a clan's territory is strict, clans are aware of the status of each tree and shrub's and alterations damaging flora are taken seriously. Initially those who break *Coox Dacayri* are warned, then punished if the responsible party continues to damage the rangelands. The punishment is decided upon by the community and *keddo abba* (clan leader), i.e. 100 birr per tree. Clan members must abide by the penalty, those from other clans are only penalised after being warned. But generally *Coox Dacayri*'s presence in society is waning.

4.3.2 Climate Change Impact

The loss of flora throughout Zone Four has had a resoundingly negative impact on residents. Repeated droughts, combined with overgrazing and population growth have led to the degradation of rangelands. Table 3 details the perceived loss of flora from the (agro)-pastoralists' perspective. The loss of fodder has led to weak animals, unable to provide the same amount of milk as before. Grass roots are scarce, and even when rains do come the quantity that regenerate shrinks yearly and is quickly depleted by livestock. Rangelands were described as smooth and covered in a variety of grasses essential for livestock health that grew to great heights, such as *durfu*, *malif* and *gorrob* used to construct houses. The loss of

gorrob forces residents to construct housing from other materials. Now it is not uncommon to bring grass from the irrigated lands near the river to settlements to feed the livestock, as well as to construct houses out of woven mats, plastic sheeting, and cloth (Fig. 9).

In addition to grasses, trees and shrubs which provided nutrients for both livestock during times of drought and for children including *hidda* and *madera* are no longer commonplace in rangelands. Currently they are occasionally found along riverbanks but bear inadequate fruits.

Another consequence derived from the change in availability of fodder and water is the weakening of livestock, rendering them unable to travel greater distances to reach suitable fodder (HEADEY et al. 2012). Buti was described by Clan Leader Nora Hamad Mohamed as an area which provided local residents with sufficient fodder to reside in the area annually, however a change has occurred over a nine year period and this is no longer the case.

The impacts derived from the introduction of alien plant species into the focus regions are not mirrored across all four focus *kebeles*. In 1st Badoli *garunta* (*Acacia nubica*), an invasive plant species that appeared 20 years ago, has covered the rangelands immediately surrounding the settlement site. Previous works conducted in 2011 by residents following instructions from the Kebele Head cleared the plant from the settlement site but not surrounding rangelands. The plant was removed in a one month, residents cutting the plant off at the root then pulling out the remnants. Residents cited problems including the inability of suitable fodder to grow whilst *garunta* remains and livestock reluctance to feed off it, as well as the plant providing coverage for hyenas and other scavenger animals. The view that *garunta* is an unfruitful plant was not mirrored in Hiddalu. Female elders at the Makoli River Settlement stated that the disappearance of *garunta*, beginning 17 years ago, is negative as the plant was used as camel fodder.

Other alien flora invading rangelands and pastures include *partinium*, commonly known as ‘democracy’, and on a smaller scale *prosopis*. Specifically *partinium* threatens farming plots in 1st Badoli, with farmers advising that a hectare plot can become overrun with the plant in as little as a month, if not strictly controlled.

Deforestation takes place out of necessity, such as feeding goats and camels from tree branches during droughts, and not done without the consideration of the ramifications. Traditional laws and customs protect forests, as they’re seen as a fundamental element of an ancestral domain (TESFAY et al. 2004). Altering flora without community permission is forbidden, a cultural trait developed as part of Afar culture is based around the protection of forests. As described by Hiddalu residents, trees are life’s life. However, with a higher frequency of droughts residents have limited options.

4.3.3 Current Access and Utilisation Rights

Rangeland and fodder access are similar and pastoralists should now have unrestricted access to rangelands not converted into farming. Despite this, the utilisation of fodder remains problematic; a direct result of the decreasing level of fodder. Rangelands now open to all lack fodder. When an area has been privatised or sectioned off then pastoralists are not permitted to access flora found within. Hida agro-pastoralists will allow pastoralist clan members and those associated with their clan to employ cut and carry techniques once they've finished harvesting so that livestock can feed off the remnants.

A push for a change in housing construction by regional government agencies through Alternative Technology Programs is an attempt to protect remaining forests. An integral part of the program is the instruction of new housing techniques and technologies: teaching people not to cut trees to build their houses, rather to prepare houses from mud bricks. This program

began in 2009 and has been implemented in eight out of ten *kebeles* in Awra. Hule, an agro-pastoralist who has lived a primarily sedentary life since 1977 in Agbielledale, is the only one in his settlement who has built a home under the project's guidelines.

5 Migration

5.1 Indigenous Customs

Migration is conducted to give rangelands and seed banks time to rejuvenate and to provide livestock a diverse range of plants. Traditional migration methods can be broken down into two categories: those migrating due to a lack of rain to find suitable fodder for their livestock, or due to abundant rain to avoid flooding. Each form of migration uses traditional means to ensure the safety of livestock and settlements. Most will move due to the scarcity of water and grass, but when an abundance of water exists those residing in areas which may be flooded have to leave and will return once the water levels have subsided. The most commonplace movement is a result of the scarcity of water and grass. Migration can occur weekly, the time span spent in one area is dependent on the quantity of natural resources. Those migrating must assess the duration of time possible to remain at one station: calculated according to the number of livestock, presence of other pastoralists, and the amount of fodder and water.

The migration routes taken by Afar pastoralists are not randomly assigned, rather the result of knowledge passed down from elders in conjunction with a complex preliminary survey of rangelands done by clan members. Migration is a strategic seasonal manoeuvre done to fully utilise and access natural resources found throughout the region, to not only feed their livestock but to decrease the potential of being negatively affected by natural (disease, flood, drought, etc.) and human made (conflict, overgrazing, etc.) occurrences (SULIEMAN 2013). Movement also decreases the risks attached to insects, prolonged grazing in a set area is conducive towards a suitable breeding ground for insects which can bring about illnesses in livestock.

Prior to movement, two or three people set out and investigate the conditions ahead, employing *iddo*, the process of reconnaissance. Criteria sought to critique the conditions prior to migration include the presence of water, fodder and conflicts. Scouts will seek out multiple places, four to five, and then rank them in order of preference for the conditions under which the pastoralists need to move. Knowing the level and availability of water and fodder is vital as well as the duration of time the grazing can support livestock. *Daagu* is a fundamental element of not only migration, but also Afar life. *Daagu* is the practice of knowledge exchange, a quick and reliable method of communication used by Afar throughout the region (RETTBERG 2010). Used to inform those migrating about rangeland conditions and WPs, as well as conflicts and dangers currently present along the routes they intend to follow.

Livestock are not necessarily moved together as cattle require different fodder to camels, goats and sheep, so scouts pay close heed to the conditions of grazer and browser fodder. Slow grazers such as cattle also require water more often than camels and goats. Cattle are not capable of traversing lengthy distance with scarce water as camels can. Camels will dictate their needs through actions, communicating with pastoralists by refusing to move in the suggested direction or movement without guidance. Pastoralists also use the condition of their livestock, their bodies and milk produce, to gauge fodder suitability and the need to move.

The Afar move with a varying number of animals; depending on the amount, the strength and health of the livestock, whether they have just given birth and/or have young livestock. Travel is conducted in packs made up out of more than one household's livestock, for safety and

practicality. It is the task of the women to prepare for migration, by taking down housing and re-building it once the destination is reached.

Stations, areas with fodder and/or water, assist in planning the route and are used to move herds from settlements to rangelands. At each station Afars rest livestock, ensuring animals have sufficient strength to move onto the next station. When planning, they must ensure that they reach each station in sufficient time and not put avoidable risks on livestock. The length of stay at a station and the duration of time between are again dependent on the livestock, their strength and health. Areas such as the escapement from Tigray to Shawa are able to sustain herds for longer durations of time, up to six months, whilst movement within arid lands is restricted to weekly blocks due to inadequate fodder and water.

Migration into another clan's territory requires permission from the land owners; the migrating clan should specify the number of their livestock and the duration of their intended stay. Rangelands require permission to enter prior to consumption and while it is possible to deny entry, the act of *madqu* (prohibition) must not take place as it may result in the death of the cattle. Traditionally, if the restriction into rangelands results in the death of livestock then those responsible for denying entry will be held accountable. The accused is brought before the *Mablo* (Traditional Afar Tribunal) and it is they who decide the amount of compensation required, money or livestock. A knowledge transfer also occurs when requesting consent to enter, both parties advising on current local and regional conditions.

Livestock migration routes can be broken into two categories: those within Afar and those outside of Afar. For those travelling within, Afar Laws are applied and local methods such as *mablo* are employed to solve conflicts; various clan and domestic practices are implemented to resolve issues and preserve the peace. However when leaving Afar grounds, issues and conflicts are brought before different councils, such as the *gereb*, an mutually established organizational system created from elders from both Afar and Tigray, to enforce laws and bring about peace in bi-clan conflicts. Meeting monthly to discuss issues and conditions in territories of participating stakeholders and is similar to *mablo*, compensation is paid to those wronged (TESFAY et al. 2004).

5.2 Climate Change and Government Impact

Climate change influences migration routes and strategies. Buti livestock owners reported that their herds are no longer capable of making lengthy journeys to reach grazing grounds such as Dobi. These grounds provided livestock, particularly camels, with required salty plants such as *mussa*, necessary for better milk and meat quality. This migration was made not out of necessity to find fodder, rather so that livestock could feed on diverse and strengthening fodder to increase their health which led to a rise in their value. Previously rangelands surrounding the *kebele* provided enough fodder.

A key adjustment is the change in herd composition, replacing cattle with camels (*Camelus dromedarius*). Factors contributing to the change in livestock preference include recurrent droughts and the overgrazing of rangelands. This has led to a decrease in suitable cattle fodder – cattle feeling the strongest ramifications of fodder shortages. Camels and goats are more apt to digesting dry-matter pasturages most commonly found during droughts and dry seasons (MIGONO-BAKE 2008). Thus, a reliance on cattle led to increased vulnerability during ecological changes to the rangelands. In addition, camels are capable of traversing greater distances, a trait useful in rangelands verging on a barren state, and do not require water as often as cattle; camels can remain without water for over two weeks while cattle require water at a bare minimum every third day (ANRS 2008).

Declining accessible rangelands, partially due to the conversion into state run and small-scale farming, as well as population growth has led to increasing difficulties when migrating, as distances needing to be covered increase and migration stations become overcrowded; rangelands are no longer given the time required for restoration.

5.3 Changed Migration Patterns

Traditional regulations still play a fundamental part of migration however, with the change from clan to government rule, new steps have been implemented. If pastoralists intended on leaving Afar and move into the highlands, they are required to notify their *kebele* leader. It is the task of the *kebele* leader to accompany migrating pastoralists to facilitate the smooth passing and entry into neighbouring regions. Migrating outside of Afar territory has traditionally resulted in conflicts between different ethnic groups: between Afar and Amhara, Afar and Issa, and Afar and Tigrey (BERHE et al. 2007). Pastoralists in Awra reported highlanders place strict restriction on Afar lowlanders entering their areas, preferring to prevent the Afar from entering with livestock. At times Amhara residents request payment for entrance into rangelands and Afars will ensure that livestock do not enter farmlands. Afar laws and customs are not applicable outside of Afar.

Table 4 indicates the widespread nature of migration from Ewa and Awra. Pastoralists have increased the level of migration into Amhara, particularly Habru, Kamise, and Kobo *Woredas*.

5.4 Potential to Strengthen Migration Practices

Despite the presence of recognised migration routes as documented in Table 4, to legally define viable migration corridors to improve security is problematic. Migration is highly dependent on the home locality of the pastoralists, rain patterns, and rangeland rejuvenation. Areas popular one year could remain empty during the following if insufficient rainfall, as can the popularity of rangelands once empty after receiving solid rains.

In order to strengthen migration practices, further cooperation between regional *woreda* and regional government bodies is advised. Current efforts from Afar and Amhara officials have reduced the severity of conflicts; however residents remain cautious of thieves and violent interactions between Afar and famers in Amhara. One of the key concerns while migration is the speedy depletion and degradation of natural resources at known migration stations, leading to both animals expiring and conflicts over access to the remaining resources. Rangeland rejuvenation work could be applied as an additional tool, working towards providing more reliable resources at stations. Improving the resilience of the Afar, in terms of adapting so as to cope with climate change, a growing population, and disaster risk reduction is possible through the strengthening of migration practices (LEVINE et al. 2012).

6 Natural Resource Based Conflicts

Natural resource based conflicts are dealt with and resolved in three different ways: personally without the aid of any outsider presence, on basis of traditional law and practices, or according to governmental rules involving the police and courts (TESFAY et al. 2004). Conflicts occurring within Afar which violated Afar customary law, *ma'ada*, were handled by local tribunals and resolved through negotiations conducted by the *mablo*. Upon reaching a solution, compensation was paid out to those who were wronged. Makoli River Settlement female elders stated that previously the power and capacity of *mablo* to resolve conflicts was

stronger. The introduction of *kebele* and *woreda* officials has diluted clan authority and undermined the power and position of the *keddo abba* (clan leader). The police, agencies such as the Special Forces, or the government are perceived to be better equipped to deal with larger conflicts. Once a group or conflict is too great and is understood to be one that the local people cannot handle, the Special Forces are called in thus undermining traditional practices.

Interviewees state that if officials do not act quickly, or are unable to reach the conflict scene before the conflict escalates, then it is likely that those affected will take the matter into their own hands. This threat, combined with the increased pressure regional government has placed upon conflict resolution, has led to authorities responding quickly when conflicts are brought to their attention. When authorities are notified, management is delegated to government officials, clan leaders, and elders. The most commonplace conflicts reported are based around the theft of livestock and guns. The *woreda* peace committee manages serious conflicts, their primary task is to find the culprit(s) and bring them to justice. The peace committee is responsible for resolving conflicts and draws on both governmental and clan power, utilising traditional and modern punishments: fines and prison sentence.

The change in rain patterns has also contributed towards more pastoralists than previously in one area. When it rains in one place and the rainfall is lesser in other areas, many clans will convene upon the rangelands thus raising the potential for conflicts. Pastoralists reported that conflicts were less likely to occur within Afar so long as those migrating adhere to the rules of the region they pass through.

Problems were most frequently reported as occurring not during the migration process itself, rather once the pastoralists have reached the rangelands. The primary concern while moving is not humans, rather animals such as hyenas and exhaustion. When leaving one's home region and entering other areas watchmen should remain awake throughout the night in order to ensure that thieves and animals don't come.

Conflicts based around usage of water in irrigation canals are managed by committees, such as those in 1st Badoli and Hida, whose primary function is to ensure that all participating members of the farming lands and co-operatives have equal and measured access to water. Conflicts based around water scheme issues are managed by committees who are responsible for service delivery.

Private WPs were the most commonplace scene for conflicts. Areas such as Adu in Ewa were referenced by 1st Badoli residents as a recurring problem region, as migrating pastoralists attempting to draw water from the private wells often resulted in fighting between the owner and those migrating.

6.1 Decline in Natural Resource Based Conflicts

The reduction in conflicts has been accredited to the increase in harsh prison sentences, stronger government attention to problem areas, co-operation between *kebele* and *woreda* officials from both Afar and neighbouring regions, and the removal of *desso*. As in Awra, the reduction of conflict is also accredited to increase in education, training, and a stronger presence of cultural and governmental punishment. Harsher punishments have led to the guilty party to be individually punished, a change from traditional practices where the clan would be held accountable for a member's actions.

Regular meetings of *woreda* and *kebele* heads, as well as with peace committees and religious leaders from Amhara and Afar have been held since 2003 to discuss how to resolve the conflicts. The co-operation between the two regions, in conjunction with *kebele* head presence

when initial yearly migration into a neighbouring region occurs, has been described as residents as a fundamental element of reducing conflicts.

The removal of *desso* by government officials has been praised by residents as a key tool in conflict management, a policy introduced in 2004. Residents have been ordered not to practice *desso*, to not place constraints on outsiders entering their *kebele*. Enforced by their *kebele*, clan, and youth leaders as well as *woreda* governments who advocated *desso's* removal to minimize conflicts. During *woreda* meetings, *kebeles* are assessed to see if they have complied with the new regulation and if not they are punished. During the 2009 meeting, Hiddalu Kebele officials were found to be the only *kebele* in Zone Four still using *desso*. Both the Clan and Youth Leader were sentenced to four months in Kelwen Prison.

6.2 Conflicts in Awra and Ewa

Data obtained from the Awra Peace Committee highlights the conflict between Awra and the Kobo Woreda of Amhara as the prime source of concern over the past ten years. Recurring conflict participants belong to Hida and Alibrihi Mesgid Kebeles (Awra) and Werke Kebele, Kobo Woreda, Amhara. Table 5 highlights the ferocity of earlier conflicts, as well as the decrease in death and theft. This decrease is further supported by data from the Kelwen Prison of Zone Four (Table 6), which shows the decline in the number of residents committed for natural resource based conflicts resulting in theft, fighting, and murder.

The central conflicts reported by the Ewa Peace Committee focus on struggles between Buti, 1st and 2nd Badoli, Boolotamo, and Bilu *Kebeles* (Ewa) and 24, 27, 28 *Kebeles*, Habru *Woreda*, Amhara. Conflicts gained momentum in 2008 and while they are still present today, as with Awra the severity of occurrences has decreased as well as fatalities, documented in Table 7. The reduction of natural resource based criminals being committed can also be seen in Table 6.

6.3 Pastoralist and Agro-pastoralist Conflicts

User conflicts are managed by numerous bodies: committees such as Water Usage Committees, Co-operative Management Board, and the Program Development Committee have been formed to manage hostilities and clashes.

In Hida conflicts connected to the irrigation canal and placement of lands arose, due to the re-building of irrigation canals and private clearing of lands upstream of the existing 250 ha cleared by government officials in 2002. The creation of 80 ha of new, unofficial lands put stress on water flowing through to government cleared blocks. Due to this conflict, elders in the community stopped farming altogether, to remove the threat. Residents also complained that 250 ha were not sufficient, considering the size and population of the Hida community. In efforts to resolve the rising conflict, the government supported the construction of an additional 60 ha upstream of the existing plots, however despite the new construction the existing 80 ha were not abandoned due to their good location and soil conditions.

Conflicts which occur inside of irrigated areas are managed by committees established to handle commonplace problems. Traditional laws are applied and problems are not brought before the government, rather the community and committee handle it themselves. Typical punishments are the slaughter or payment of a goat/camel. If the situation is beyond the control or management of the committee, then it is brought before the government.

Conflicts between agro-pastoralists and pastoralists are minimal; pastoralists reporting they have no issue and agro-pastoralists reporting that conflicts are decreasing. The introduction of strict fines had effectively reduced the number of pastoralists who lead their livestock into

farming plots, in both Ewa and Awra. In 2008, 90% of crops cultivated in 1st Badoli were eaten by livestock who had entered with the support of their owners. Fines were introduced and 2012 eight individuals sent livestock in; each was forced to compensate farmers (two from 1st Badoli, two 2nd Badoli, three Buti). During 2013 three different pastoralists sent in livestock and were also fined (one from 1st Badoli, two from 2nd Badoli).

A future potential area of conflict could centre around the inheritance of farming plots. Farmers with large households will be unable to bestow land to each child, leaving children without adequate land or livestock. When questioned over the topic of land ownership through inheritance officials stated that it has not been considered, as it is not a part of Afar culture. A lack of understanding as to how inheritance will impact the agro-pastoralist through the inability to bestow adequate plots of land for each child, male or female, is apparent.

7 Communication and Representation

7.1 Indigenous Customs

Communication and representation of community concerns and needs has traditionally been facilitated through clan leaders and elders. The demands and interests of residents were reported to the leader, who would then act as they saw fit. Intra-clan concerns would be handled within the clan, employing the support of neighbours, relatives, and friends of the parties concerned in an attempt to mediate and prevent larger conflicts (SANSULOTTE-GREENIDGE et al. 2012). If concerns traversed clan borders, involving other clans and ethnic groups, communication was done between the respective leaders of each affected party. Residents stated that while they were able to be involved in the process of resolution, the final decision was reserved for the clan leader(s) and his word was final.

7.2 Current Communication Patterns

The active agent (agro)-pastoralists speak with has moved from the clan leader to the *kebele* leader. The transition, from a clan based means of communication for concerns and conflict resolution, to one which involves government participation has retained some indigenous elements. Clan leaders and elders are still recognised by government officials for their important role in mediation and communication between clans and ethnic groups, however residents now speak directly with *kebele* leaders to inform authorities of their demands and interests. Depending on the size and complexity of the concern, the *kebele* leader will either answer or resolve the problem himself or report it to the *woreda*; the *kebele* leader maintains the power to decide about the relevancy of the concern.

Community demands and interests which need to be promoted to the *woreda* or regional level are also through *kebele* leaders. Communication between residents and the regional government follows a precise chain including all administrative levels. *Kebele* leaders reported an inability to speak directly with regional officials; those who attempted direct communication, such as the *kebele* leader from Hiddalu who travelled to Semera to discuss food aid concerns, were advised to return and employ correct communication channels by speaking with *woreda* officials.

Community members, specifically women, reported that the change between the two systems has enabled more residents to voice their concerns; assisting in reducing the gender imbalance. However, despite the increased communication between community members and their representatives, residents believe that their main concerns are not heard and no solutions are

provided. Smaller concerns, such as intra-clan conflicts, are dealt with however key demands are not. Problems repeatedly reported, centring on a lack of water and food for humans and livestock, in addition to insufficient or missing health and veterinary supplies and services, do not receive sufficient solutions or answers. Conflict is generally directly dealt with after being reported. Distance again factors in as a fundamental element; those living further away from *kebele* leaders felt disadvantaged, a common belief is that to have your problem address one must report it numerous times. The same stands for *kebeles* situated further away from the *woreda* centre.

7.3 Community Representation in and Awareness of Regional Policies and Programs

The level of (agro)-pastoralist awareness of regional policies and programs relevant or applied in their area is limited. Problems addressed by the regional government, with local awareness, include education, settlement projects, health (specifically anti female genitalia mutilation), and anti-conflict regulations. The policies and programs pastoralists are aware of are beneficial, however only when fully implemented.

On the whole, community awareness on how their concerns and demands are being met by the regional government is tenuous at best. Perceptions of regional and national development policies and strategies are scarce, the generic answer being that the settlement program is sole one addressing concerns. Residents are not fully aware of the responsible parties for projects planned or established in their regions, nor the goals of the projects; uncertainty is present when articulating whether the implementer is the government, a donor, or a private actor. For instance, changes in property rights are not widely known. Agro-pastoralists have a higher level of awareness, however even then the level of comprehension found there is basic.

8 Resilience

8.1 Indigenous Methods

The Afar have established numerous methods utilised during times of hardship, resilience based customs created to withstand harsh environments. Strong social networks are employed to support weaker community members. Traditionally, if members had insufficient means for their families to survive off then the community would band together. Those who had adequate or higher levels of livestock would donate a cow, camel, goat or sheep (dependent on their wealth) and all livestock was then given to poor families. Additional social support network stems from religion, such as *Zakat*, a yearly event during which wealthy members of society donate a percentage of their wealth to those less fortunate. The percentage determined by the number of livestock found in each household; i.e., in Awra one who has 40 goats will donate one goat, for five camels one goat, and for 30 cows one cow.

When looking into livestock management, various methods are employed. If an area has insufficient fodder, then branches of trees and shrubs will be removed and fed to browsers. Herd diversification also allows for households to reduce their reliance on a specific fodder, a concentrated preference on one type of livestock increases household vulnerability during drought if the fodder required is insufficient or not present. By compiling herds with a variety of livestock, pastoralists decrease pressure on one specific type of fodder.

Migration is fundamental to the resilience of the Afar. Pastoralists will separate herds, the time apart lengthened during droughts and dry seasons, and travel to find fodder. Grazers, such as cattle and sheep, migrate to rangelands bordering perennial rivers with palatable

grasses and remain away from home settlements during droughts. Browsers, camels and goats, feed from trees and shrubs. Livestock unable to migrate, weaker and young animals, remain at and near home settlements.

For temporary relief the intake of animal produce would be restricted as well as the removal of a daily meal. However this measure not only impacts the health of the household but also their income as animal produce could also be sold.

8.2 Climate Change Impact

Climate change has also been a fundamental push in the move towards an agro-pastoral livelihood. Recurrent droughts and limited food supplies have made it difficult to both feed and water livestock during times of hardship, and to replace perished livestock. Agro-pastoralists in Hida Kebele stated that they decided to remain after a drought known as *Arkakis* (Terrifying) which lasted from 2002/3 through to 2007/8 (ANRS 2008). Once grass grew dry and fodder became scarce the clan started looking for a more varied livelihood. The clan split in two with half retaining a purely pastoral livelihood and half settling in Hida in 2007. Reasoning behind this was that a key dry season grazing area around Asaita had been converted into a sugarcane plantation and pastoralists no longer had access. Livestock was split between the two groups and the pastoralists moved on. The current extended dry seasons, in conjunction with a change in times has seen a push away from traditional means towards alternative practices, strengthened a resolve to become more sedentary and to adopt an agrarian livelihood. The reduction in available grazing lands, resulting in decreasing fodder, has allowed for a change of mindset and the establishment of a livelihood not solely dependent on livestock.

The belief behind the move away from pastoralism, towards agro-pastoralism was given as a simile: “Pastoralism is honey because man is able to get the financial support he needs from the sale of livestock. Agriculture is like milk because when you drink milk your stomach is full and it cools you down. Both do not share the same advantages, but when the two are combined the quality of life improves.”

8.3 Current Methods

The presence of customary methods practiced is waning, the decrease in implementation connected to the ecological changes and the move away from indigenous authority. Some customs still hold strong, such as using branches from trees and shrubs for fodder provision, religious holidays, and household or family assistance. However with the overall wealth of the Afar decreasing the level of people in a position to provide assistance shrinks while the number of those in need of help increases.

New customs include the diversification of livelihood practices. In Zone Four, the increased level of interest in agriculture has allowed for those based along perennial rivers to expand their means of income. Farming is used for cash crop, fodder, and subsistence production. The move towards agriculture has facilitated the sedentarisation of pastoralists, as seen in the government’s settlement projects in Ewa and Awra.

Despite farming being successfully adapted into livelihoods in Hida and 1st Badoli, not all *kebeles* have been able to adopt the new practice. Reportedly after witnessing gains obtained from farming in other areas, farming was attempted in areas such as Finto and Sidihamilif. Farming attempts proved to be futile due to a lack of knowledge and suitable water supply;

locals reported that attempts to cultivate solely used insufficient rain harvested water, as the distance to a perennial river made it impossible to irrigate lands thus crops died.

Livestock migration still plays a critical role, however it has become more commonplace for cattle to remain away from home settlements for the majority of the year and in some areas only returning biennially. Traditional rangelands within Zone Four are no longer viable long-term destinations for pastoralists. Residents now venture into the new regions, such as areas of Amhara, or remain near perennial rivers and their connected rangelands.

Additional practices adopted include charcoal production and wage labour, however these two have had limited implementation in the focus areas. In *kebele* and *woreda* centres, some have also turned to commerce. These practices do not facilitate the strengthening of the pastoral system, rather are actioned in an attempt to reduce the strong reliance on livestock.

8.4 Climate Sensitive Production, Protection and Stabilisation Methods

Both government officials and agro-pastoralists explained that people will know the benefits of agriculture once they've witnessed it for themselves; that those hesitant need to first observe successful agro-pastoralists to learn how to implement beneficial and profitable land use and farming methods. An agro-pastoralist livelihood was seen by some participating local residents as an opportunistic move forward, towards a more secure livelihood.

In reaction to climate change and worsening land conditions, various steps have been undertaken to help improve livelihood conditions. A key adjustment has been the management of the prime biotic resource with the preference moving away from cattle to camels. Camels and goats are more apt to digesting dry-matter pasturages most commonly found during droughts and dry seasons (MIGONO-BAKE 2008). A reliance on cattle led to increased vulnerability during ecological changes to the rangelands, due to cattle fodder restrictions. In addition, camels are capable of traversing greater distances, a trait useful in rangelands verging on a barren state, and do not require access to water as often as cattle (ANRS 2008).

As well as the preferential change in livestock, a forced decrease in herd size has occurred. This decrease is due to numerous factors: the inability to recover lost livestock following drought periods and the decrease in fodder available, both leading to the need to diversify livelihood practices.

The limited establishment of 'zoos', areas fenced off with thorny trees and shrubs in order to facilitate rangeland rehabilitation, has been done with and without external support. Throughout the focus *kebeles* small sections have been isolated. In 1st Badoli residents have sectioned off land along seasonal rivers without outside assistance and there is a noticeable difference in flora conditions. Small-scale fodder production has also been utilised, with and without outside assistance. Residents from Buti, known as a pastoralist *kebele*, have begun farming along the Ewa River in farming lands belonging to other *kebeles*, producing fodder. Fodder is brought back to feed weak, ill or young livestock.

8.5 Support Needed

Numerous steps could be implemented to facilitate the strengthening of resilience practices of the Afar. A push for community awareness into the benefits of land management could assist in negating the strong belief that practices done and tools available in rural areas are insufficient to combat and prevent further erosion. In addition, capacity training done to sensitise residents could work towards increasing the level of responsibility awareness by

demonstrating that the role of NRM is not strictly for government and NGOs or agro-pastoralists, but for all residents of Zone Four.

Combative work done against severe erosion, such as the stream-bank erosion found along perennial rivers washing away land, would assist in reducing the eradication of farmland. Attention paid to seasonal rivers and water lost through flash floods would help fodder and water retention.

To further reduce natural resource based conflicts, increased attention should be implemented in known conflict regions, such as *Kobo* and *Habru Woredas* of Amhara.

Greater attention paid to facilities in settlement areas, such as Hida of Awra, is required. Increased veterinary services, both medicine and an increased presence of practitioners, not only in settlement areas but throughout Zone Four would improve livestock health.

9 Summary and Conclusions

Due to the evolving conditions found within Zone Four of Afar, residents have had to implement changes to their livelihood practices which have led to alterations in Natural Resource Management (NRM) traditions. Erratic rains and recurrent droughts, in conjunction with overgrazing of rangelands and population growth, have cumulated in inadequate rangeland conditions. Rangelands no longer provide adequate fodder and as a result the numerous constraints have impaired the health and quality of livestock and residents. Changes in land management and ownership have occurred as a result of the degraded conditions of rangelands and the increased government presence in the area. The unreliable rainy seasons and overgrazing have depleted vegetation cover and erosion has spread throughout the Zone. Practices utilised by residents to combat erosion are limited and generally only conducted if payment is given. The exception being residents banding together to protect permanent communal structures perceived to be under threat during rainy seasons.

Whereas land was once a communal domain, new laws and practices have facilitated the privatisation of land thus restricting access to rangelands. Management of land is conducted by public and private institutions as well as residents. While the privatisation of land for large and small-scale farming has restricted access to rangelands, generally those found along perennial rivers such as the Awash, the removal of traditional rangeland exclusion methods has allowed for equal entry rights into previously restricted rangelands within Zone Four. The increasing presence of smallholder farmers, paired with current government settlement projects being run in both Ewa and Awra, has spiked interest in agriculture. The conversion from pastoralist to agro-pastoralist is conceived to be one which can limit current pressures on livelihoods.

The change in rainy seasons has been an intrinsic actor in the reduction in traditional water management implementation. This change has forced residents to rely on perennial rivers and manmade water schemes for water provision, those who reside considerable distances from water sources are severely disadvantaged. Current management systems include the overseeing of hand pumps and water schemes drawing from underground water sources, and irrigation canals for small-scale farming, systems managed by both public and civil society groups. Access to rivers is free, restrictions on water only found for human-made devices.

The decreased nature of available fodder is also accredited to the change in rains as well as overgrazing, both leading to an increased demand for the limited fodder capable of regenerating. Traditional practices of protecting trees and shrubs have been neglected and are

no longer enforced, due to the waning of clan power and the heightened need for fodder. Access to fodder found in rangelands is not inhibited, only entry into private lands is forbidden.

Customary migration practices are still employed, in order to mitigate problems while moving. The alteration of land conditions has reshaped routes and destinations, allowing for migration rates outside of Afar to increase. Strengthening migration is a convoluted program. Current policies in place to limit conflict have proved to decrease incidents involving Zone Four residents. The lack, however, of sufficient resources found while moving remains a concern for pastoralists as past stations known to sustain herds while travelling no longer have adequate fodder.

Natural resource based conflicts, those involving disputes over access to rangelands and water, have decreased over the past ten years. The transition from a clan based conflict resolution system to one which involves government participation has retained indigenous elements. The improved conditions are accredited to increased pastoralist awareness of the consequences derived from conflicts, harsher punishments for those who violate laws, removal of indigenous customs to instigate problems, and increased clan and government support in known troubled regions. Conflicts brought on by small-scale farming have also decreased, due to the introduction of clear rules and harsh fines for those who disregard them.

Communication practices between residents and officials have changed, from one done through clan leaders and elders to one through the *kebele* leader. Problems are then either dealt with in the *kebele*, or directed towards *woreda* officials. Community awareness of regional policies and programs implemented in Zone Four is low, residents are often unaware of the responsible parties for projects which have been or are in a state of implementation. Changes in policies affecting the Afar are more commonly known in areas closer to *woreda* centres, and *kebeles* employing small-scale farming.

Various resilience methods, evolving from strictly traditional to those incorporating outside influences, are employed by residents. Small-scale climate sensitive stabilisation methods, such as enforced rangeland seclusion, have been adopted on a minor scale. The commonly held perception that land management is not that ought to be done by pastoralist is widespread, with pastoralists reporting that it is the duty of the agro-pastoralist, the government or NGOs. Training in land management, as well as capacity building to sensitise an increase in a community responsibly levels, would assist in increasing the resilience of the Afar. Outside support working towards combating serious erosion concerns, such as the expansion of perennial rivers, would further build up resilience levels. Additional attention paid to known conflict zones, both inside and outside of Afar, to assist in further reducing clashes.

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Figure 1 – Map of Study Area

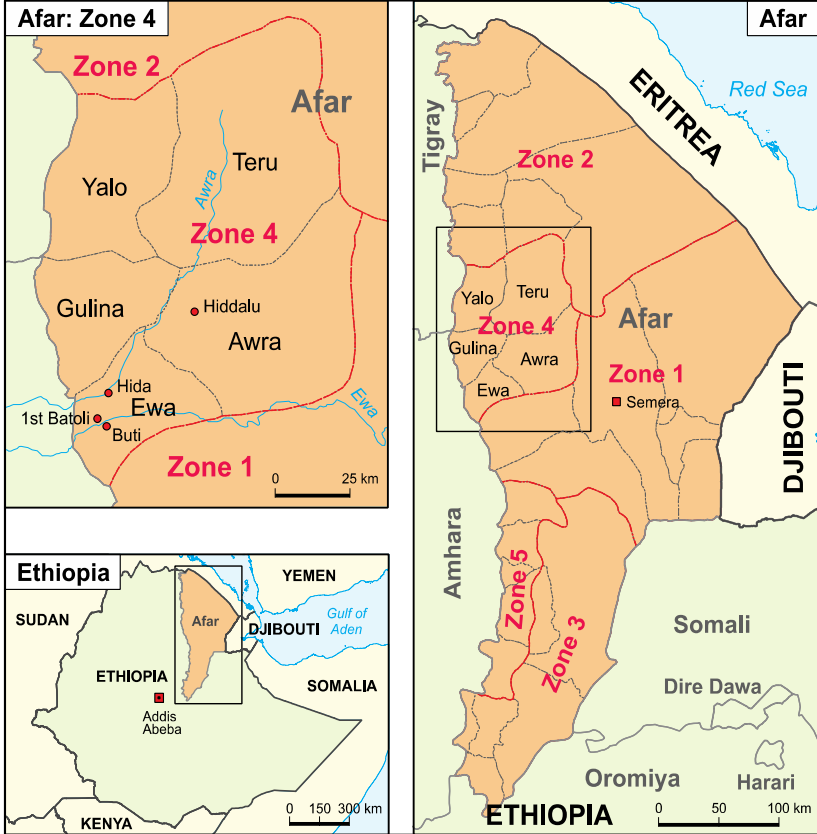


Figure 2 – Splash Erosion in Ewa



Figure 3 – Rill Erosion in 1st Badoli



Figure 4 – Rill Erosion in Hiddalu



Figure 5 – Stream-bank Erosion in Hida



Figure 6 – Hillside Terracing in Hiddalu



Figure 7 – Stone Gabions in 1st Badoli



Figure 8 – Erosion Prevention Practices in Hida



Image 9 – Afar Housing Constructed from Cloth, Fur and Mats



Table 3 – Lost Flora across Focus Kebeles

<i>Flora</i>	<i>Type</i>	<i>Area Mentioned</i>	<i>Began to Disappear</i>
<i>Alamto</i>	<i>Tree</i>	<i>Kadadawalu</i>	<i>7 years</i>
<i>Aytadoyta</i> <i>(Tragus beteronianus)</i>	<i>Grass</i>	<i>Tawalu River</i>	<i>5 years</i>
<i>Ayti</i>	<i>Grass</i>	<i>Tawalu River</i>	<i>5 years</i>
<i>Bunket (Tribulus terrestris)</i>	<i>Grass</i>	<i>Tawalu River</i> <i>Kadadawalu River</i>	<i>5 years</i> <i>7 years</i>
<i>Cayuuka</i>	<i>Tree</i>	<i>Kadadawalu River</i>	<i>7 years</i>
<i>Dongale</i>	<i>Grass</i>	<i>Tawalu River</i>	<i>5 years</i>
<i>Dubdubbe</i>	<i>Grass</i>	<i>Tawalu River</i>	<i>5 years</i>
<i>Durfu (Chrysopogon plumolosus)</i>	<i>Grass</i>	<i>Aleytily</i> <i>Hidda Central</i> <i>Tawalu River</i>	<i>18 years</i> <i>10 years</i> <i>5 years</i>
<i>E eb</i>	<i>Tree</i>	<i>Aleytily,</i> <i>Hidda Central</i> <i>Tawalu River</i>	<i>18 years</i> <i>10 year</i> <i>5 years</i>
<i>Esisu</i>	<i>Grass</i>	<i>Kadadawalu River</i>	<i>7 years</i>
<i>Halal (Ipomoea sinensis)</i>	<i>Grass</i>	<i>Aleytily</i>	<i>18 years</i>
<i>Hebelieta</i>	<i>Tree</i>	<i>Hidda Center</i> <i>Kadadawalu River</i>	<i>Totally disappeared</i> <i>7 years</i>
<i>Hotya (Aristida adoensis)</i>	<i>Grass</i>	<i>Tawalu River</i>	<i>5 years</i>
<i>Hida</i>	<i>Tree</i>	<i>Aleytily,</i> <i>Kadadawalu River</i>	<i>18 years</i> <i>7 year</i>
<i>Gasra</i>	<i>Tree</i>	<i>Kadadawalu River</i>	<i>7 years</i>

<i>Gorrobu (Panicum coloratum)</i>	<i>Grass</i>	<i>Aleytily Kadadawalu River</i>	<i>18 years 7 year</i>
<i>Ignida to</i>	<i>Tree</i>	<i>Tawalu River</i>	<i>5 years</i>
<i>Malif (Andropogon canaliculatus)</i>	<i>Grass</i>	<i>Aleytily</i>	<i>18 years</i>
<i>Madera</i>	<i>Tree</i>	<i>Aleytily Kadadawalu River</i>	<i>18 years 7 year</i>
<i>Subahi</i>	<i>Grass</i>	<i>Tawalu River Kadadawlu River</i>	<i>5 years 7</i>
<i>Udda</i>	<i>Tree</i>	<i>Kadadawalu River</i>	<i>7 years</i>
<i>Ure</i>	<i>Tree</i>	<i>Tawalu River</i>	<i>5 years</i>
<i>Urraamo</i>	<i>Tree</i>	<i>Tawalu River</i>	<i>5 years</i>
<i>Yamarung</i>	<i>Grass</i>	<i>Kadadawalu River</i>	<i>7 years</i>

Table 4 - Migration Stations and Routes of Focus Kebeles

Settlement	End Region						
1st Badoli	Adu, Ewa	Yalla Bura	Dulo	Masara	Adu		
1st Badoli	Ali raged, Gulena. Amhara –Afar border	Ali raged					
1st Badoli	Aware, Kobo Woreda, Amhara	Addamangi	Derdubbatte	Gurraw	Laage	Gubboq	Aware
1st Badoli	Derayitu, Awra	Sangantoli	Amo malita	Derayitu			
1st Badoli	Dulo, Ewa	Dulo					
1 st Badoli	Dulo Bora, Ewa	Yallo Bora					
1st Badoli	Ewa mountains	Dabardu ororu	Ususoli	Rammidduli	Dulli waydalili koomo	Marka toli	
1st Badoli	Fialo, Ewa	Fialo					
1st Badoli	Halasgera /Dabatohoror Mountains, Hida	Halasgera /Dabatohoror					
1st Badoli	Hara, Habru Woreda, Amhara	Gele					
1st Badoli	Hara, Habru Woreda, Amhara	Masada	Hora				
1st Badoli	Haro, Habru Woreda, Amhara	Mormoru	Bitimo	bakarle dar	Gcorke	Laste	Dooragibir
		Gobbiye	Hora	Haro			
1st Badoli	Manda, Ewa	Asmakena	Martu sunnunta	Manda			
1st Badoli	Taffa, Kamise Woreda, Amhara	Duba	Igu	Warbabu	Taffa		
1st Badoli	Yallo Buxux, Ewa	Cerabuji					
Bilu	Laalo, Habru Woreda, Amhara	Fialedara	Laalo	Dooragibir			
Bilu	Taffa, Kamise Woreda, Amhara	Yarra	Waanabu	Sansama	Bussidima	Barkarre	Olde
		Dawe	Taffa				
Bolotamo	Hara, Habru Woreda, Amhara	Murmur	Darimo	Hara			
Buti	Adgellu, Dubti Woreda, Zone 1	Fialo	Adgellu				
Buti	Allamata, Habru Woreda, Amhara	Bolotamo	Masala	Allamata			
Buti	Asaita, Zone 1	Marto	Faxodaaba	Gurrufatj	Asamagiolayto	Aladora	Aysita
Buti	Aware Woreda, Tigray	Murmur	Dooragrib	Goobiye	Gulena	Waayya	Aware
Buti	Doobil, Raya Azebo Woreda, Tigray	Horongo	Masara	Adaleytu	Gumali	Ambulli	Xawaytoli
		Alale	Loomax	Gablayto	Sardo Doobi		
Buti	Dulo Adu Mountain	Horongo					
Buti	Gobbiye, Kobo Woreda, Amhara	Hora					
Buti	Hara Laste, Habru Woreda, Amhara	Alali	Haro	Hora Laste			

Buti	Horongoro/Sahel Settlement Ewa)	Sahel					
Buti	Marsa, Habru Woreda, Amhara	Some	Marsa				
Duba	Awash River	Fialu	Adgellu				
Duba	Marsa, Habru Woreda, Amhara	Somo	Marsa				
Duba	Taffa, Kamise Woreda, Amhara	Mille	Wagantu	Burka	Bate	Unknown	Taffa
Hida	Aware, Kobo Woreda, Amhara	Danan elleyta	Garsa	Dero dubto	Asku	Igdu	Aware
Hida	Asaita, Zone 1	Ewa River	Geega	Asaita			
Hida	Giifu, Awra	Awra					
Hida	Yalo, Raya Azebo Woreda, Tigray	Awash	Yalo				
Hiddalu	Alena, Yallo Woreda	Asbole	Bakarru	Amado	Alena		
Hiddalu	Aleragid, Kalwen	Aleragid					
Hiddalu	Bagaraba	Awra River	Sidihamiflieft				
Hiddalu	Bedaitu						
Hiddalu	Diyay dulu, Tero Woreda	Ldaytali	Xadadodulu	Adkooma	Diyay Dulu		
Hiddalu	Doobil, Raya Woreda, Tigray	Awra River	Kalwan	Fokkisa	Doobil		
Hiddalu	Finto, Awra						
Leekumma	Horo, Hare Woreda	Hidda	Qasamasal	Horo			

Source: Participant Interviews 2013/14

Table 5 – Awra Peace Committee Conflict Data

Date	Duration	Conflict Region	Active Parties		Number involved	Reason	Conclusion
Sept, 2006	1 day	Madera Le Gurbe, Hida Kebele, Awra	Hida Kebele, Awra	Werke Kebele, Kobo Woreda, Amhara	50 Amhara, > 10 Afar	Murder and theft	Amhara attempted to steal camels. 1 Afar died, 4 injured. 1 Amhara died, 4 injured. No jail sentences or fines.
Sept, 2007	11 days	Alibrihi Mesgid Kebele, Awra	Alibrihi Mesgid Kebele, Awra	Werke Kebele, Kobo Woreda, Amhara	>10	Fighting and theft	Amhara stole 14 camels, Afar and Amhara fought with 1 Amhara injured and 2 Afar. 2 Amhara escaped with camels. Afar stole 125 cattle in retaliation. All livestock was returned, 11 Afar sent to prison, no Amhara jailed.
26th Sept, 2008	3 weeks	Ilaala, Hida Kebele, Awra	Hida Kebele, Awra	Werke Kebele, Kobo Woreda, Amhara	>10	Murder and theft	1 Afar was killed while sleeping, 4 Amhara stole 4 camels. Afar residents travelled to Amhara and stole unspecified number of camels. 1 Afar sentenced to 1 year in prison. No Amhara jailed.
May, 2009	2 weeks	Alibrihi Mesgid Kebele, Awra	Alibrihi Mesgid Kebele, Awra	Werke Kebele, Kobo Woreda, Amhara	>10	Murder and theft	1 Afar was killed while sleeping, 4 Amhara stole 4 camels. Afar residents travelled to Amhara 16 days later, killed one of the 4 culprits. 2 camels were returned. 1 Afar sentenced to 1 year, 6 months in prison. No Amhara jailed.
April, 2010	2 weeks	Kusrale Ele, Alibrihi Mesgid Kebele, Awra	Alibrihi Mesgid Kebele, Awra	Werke Kebele, Kobo Woreda, Amhara	>60	Theft	47 camels taken by Amhara, 23 returned. Afar travelled to Werke, took 121 cattle, 120 returned. 4000 paid for missing cow (eaten by Afar). 9 Afar sent to prison for 7 months each. Still working on finding Amhara culprits.
June, 2011	1 month	Daraitu Kebele, Awra	Werke Kebele, Kobo Woreda, Amhara	Werke Kebele, Kobo Woreda, Amhara	>6	Killed camel	3 Afar injured, 1 Amhara injured. No compensation paid for dead camel.
Nov, 2011	1 month	Alibrihi Mesgid Kebele, Awra	Werke Kebele, Kobo Woreda, Amhara	Unddarra, Alibrihi Mesgid Kebele, Awra	Unknown	Stolen livestock	20 Afar camels stolen, 13 returned. Conference was held to facilitate the return of livestock.
March, 2011	1 day	Basay, Daraitu Kebele, Awra	Daraitu Kebele, Awra Woreda	Werke Kebele, Kobo Woreda, Amhara	> 5	2 Afar children hurt	Children were hurt by Amhara residents while following camels. No punishments given.
5th Feb, 2013	1 Month	Kaada Aalaytu, Hida Kebele, Awra	Werke Kebele, Kobo Woreda, Amhara	30 Kebele, Habru Woreda, Amhara	> 10	Stolen livestock	Amhara stole 3 camels, Afar found stolen 3 and returned with an additional 4 (7 in total). Police were called, Afar returned 4 camels and were sent to prison for 3 months. No Afar camels were returned and Amhara residents didn't service prison sentences.

Source: Awra Peace Committee 2014

Table 6 – Kelwen Prison Prisoner Data for Natural Resource Based Crimes

Year	Total no. incarcerated		Murder		Theft		Fighting	
	Awra	Ewa	Awra	Ewa	Awra	Ewa	Awra	Ewa
2014	20	3	5	3	5	/	10	/
2013	30	4	6	4	14	/	10	/
2012	25	6	7	/	10	6	8	/
2011	35	8	10	3	20	2	5	4
2010	42	10	15	/	20	/	7	10
2009	50	12	5	5	15	/	30	7
2008	47	15	7	3	25	2	15	10
2007	60	22	9	2	21	15	30	5
2006	57	30	7	5	22	10	28	15
2005	65	56	15	20	23	20	27	15
Total	431	166	86	45	175	55	170	66

Source: Kelwen Prison 2014

Table 7 – Ewa Peace Committee Conflict Data

Date	Duration	Conflict Region	Active Parties		Number involved	Reason	Conclusion
March, 2006	1 day	Adu	Maxaddo – A'ado	Gobdura - 2 nd Badoli	2	Personal argument	1 died (1 st Badoli). No parties sentenced to jail
Sept, 2008 to Sept, 2009	Throughout the 2001 EC year	Edde Adi, Habru Woreda	Buli, Buti, Badoli, Boolotamo Kebeles, Ewa	24, 27, 28 Kebeles, Habru Woreda, Amhara	Unknown	Rangeland restriction	2 died (1 st Badoli). This led to the following larger conflict during Aug, 2010
August, 2010	Approx. 3 months	Edde Adi, Habru Woreda (between Amhara 24 and Bilu)	Bilu (30), Buti (15), Badoli (8), Bolotamo (10)	24, 27, 28 Kebeles, Habru Woreda, Amhara (unknown)	63	Follow on conflict from previous year	Afar: Bilu (2 died), Buti (3 died), Bolotamo (2 died) and 2 jailed. Amhara: 24 kebele (3 died), 27 kebele (1 died), 28 kebele (2 died) and 2 jailed. Held 2 conferences to resolve issues. D'yat (blood money) was paid, 5 out of 6 Afars paid and 2 payments from Amhara have been received.
March, 2011	2 weeks	Adu, Fialo, Ewa	Kiukhekebbat Clan, Fialo Kebele.	Misriire (Yarra Kebele, Chifra)	>4	Access to private WP	1 died (Chifra) and 1 imprisoned (Fialo). Resulted from conflict over access to Adu WP. Following a flight, Fialo residents travelled to Chifra and killed 1 man.
March, 2012	1 day	Horongo Rangeland, Ewa	Kikuk Cenkebbba - 1 st Badoli	Kikuk Cenkebbba – Qarabta (Arabta)	2	Afar Ball	Problem was dissolved at the time
December, 2012	2 months	Hora, Habru woreda, Amhara	Bolotamo (11), Buti (5), Bilu (4)	Habru Woreda, Amhara (unknown)	>20	Theft	20 camels were taken, 3 returned. 2 Conferences were held, decided it was best not punish anyone, to avoid bigger conflicts
June, 2013	1 day	Horongo Rangeland, Ewa	Kiuk Henkebbat, Buti Kebele, Ewa	Adginne Clan, 1 st Badoli Kebele, Ewa	2 to 3	Afar Ball	Collected the 100 players present for meeting about values and consequences
November to December, 2013	1 month	Hora, Habru Woreda, Amhara	1 st Badoli, 2 nd Badoli, Buti, Bolotamo, Bilu (>20)	Habru Woreda, Amhara (30)	>50	Desso and theft	Afar took 2 camels (both returned) Amhara took 15 (6 returned, 1 killed). Afar authorities visited and agreements were made. 2 Afar jailed, no Amhara jailed
December, 2013	few days	Kobo Woreda, Amhara	1 st Badoli, 2 nd Badoli, Buti, Bolotamo, Bilu (>20)	Gobbo Woreda, Amhara)	>30	Ox entered farming land	Amhara took ox and did not return it

Source: Ewa Peace Committee 2014