

A SHORT REPORT ON THE ADOPTION OF ROAD SIDE WATER HARVESTING TECHNOLOGY AS A MEANS OF CLIMATE CHANGE ADATATION IN AFAR PASTORAL AREAS



Photo: by Abrha Tesfay (Oct. 2015)

Abrha Tesfay (MSc.)

Afar Pastoral Agricultural Development Bureau

Productive Safety Net Program

Environmental and Social Management Specialist

November, 2015

Samara, Afar

Table of contents	Page
1. Introduction	3
2. Scope and structure of the report	4
3. Objectives of the report	4
4. Methodology/procedure	5
5. Findings	5
6. Challenges to pastoral water harvesting structures	8
7. Conclusion	9

1. Introduction

The Afar Regional State is located in north-eastern part of the country sharing international borders with Eretrea in North-East and Djibouti in the East. The region is primarily inhabited by pastoral and agro-pastoral communities who dominantly lead their livelihoods through the production of livestock liked with the availability of pasture and water.

The region is naturally endowed with ambient natural resources like large arable land, huge herds of livestock, perennial and seasonal rivers, mineral wealth, historical places, wildlife reserves, deep-rooted traditional institutions, well-coordinated and functioning government structure, as well as vibrant government and non-governmental development projects operating in the area.

The regional pastoralists have distinctive culture and diverse coping and adaptive mechanisms to natural and human-induced hazards through their longstanding customary capabilities cascading from generation to generation. However; the global, national and local climate change has contributed a lot for the recurrence of drought by changing the normal rainfall season and distribution. At the same time pastoral fertile areas fall in the eyes of internal and external investors which oust pastoralists from their century old living areas and restricted from grazing of protected areas which forces them compute for the remaining scarce resources such as grazing land and water and ends up in resource induced conflicts between clans and neighboring regions .

There are a lot of opportunities by which they can engage in small scale irrigation along the *Awash, Mille, Awra, Golina Konbe, Borkena*, rivers among others so that they can settle and ensure their food security. Nevertheless; pastoralists have not developed the habit of farming crops as they are people whose livelihoods is sustained by livestock and livestock products. During the occurrence of drought, pastoralists particularly the poor with less number of livestock holdings and less developed social support networks suffer most because once they lost their limited asset it will be difficult for them to rehabilitate or restock.

The impact of disasters on human and non-human elements can be systematically managed at the national, regional and community level by having disaster management policy. The Disaster

Risk Reduction (DRR) approach is vital in pastoral areas in terms of community managed resource identification, planning, implementation and Monitoring and Evaluation. The DRR approach follows the construction and development of locally available resources like construction and rehabilitation of roads, construction and rehabilitation of strategic water harvesting structures (ponds, *Ellas* (hand dug wells), *birkas*, subsurface and surface dams, boreholes etc.), development and rehabilitation of rangelands.

Therefore; this report is focused all about what other vital water harvesting options are there beyond the already going water development projects in the region. According to the MetaMeta research organization, roads can be used as an agent of water harvesting means *Ellas* and ponds constructed along the upstream and downstream roads can be a very good water storage facilities whereby communities can use during the dry periods of the year. Therefore; if such technology is introduced in a well coordinated and managed way, pastoralists will have an option to the already deteriorating surface water resources.

2. Scope and structure of the report

This simple field report is all about the current situation of Afar region with regard to water constructions and developments undertaken by both governments and NGOs in various *woredas*. It also tried to retrieve the challenges of pastoral communities with regard to water supply both for human and livestock consumption. The report has particularly covered the zone 1 and zone 2 of the region along the main high way from Djibouti to *Mekele* via *Afdera*.

3. Objectives of the report

Pastoralists in Ethiopia occupy 60% of the total landmass and represents 12-15% of the total population of the nation. Because of their location away from the central government they are usually marginalized from developments and face many problems and challenges to support their livelihood. Pastoralists livelihoods solely depend on livestock production means dependent on pasture and water however these resources are diminishing from time to time and challenges their life.

There are various projects run by the government like the productive Safety-Net Program (PSNP) and NGOs working on rangeland development and water development. However; due to

lack of technical design, inappropriate site selection, lack of full community involvement among others, most of the constructed water harvesting structures are either damaged or abandoned within a short period of time. Therefore; this report is aimed at assessing, what other options of water collecting structures like the option of borrow pits, natural pans, construction of small and medium ponds and others along constructed roads.

4. Methodology/ Procedure:

The field assessment was conducted from October 3-10, 2015 in Zones 1 and 2 of the region. The data collections methods used were field observation, interview and discussion with local people, agricultural office heads, water office heads, agricultural experts.

5. Findings

Pastoral communities have been seriously suffered from water and pasture shortages as a result of local and global climate change. Though not enough; however today; the government and NGOs are trying to construct water storage structures like boreholes, ponds, *Ellas*, *Birkas* (underground cistern or underground water storage), development of springs, surface dams, sub-surface dams, among others. All these water harvesting structures usually serve the pastoralists for at least six to seven months during a very good rain and flood.

The findings were based on the field survey in two zones and in depth interview with *woreda* administrators, agricultural development offices, water development offices, and agriculture and water experts at *woreda* level.

The report has also tried to investigate or document few of the main all weather roads and asphalt roads in the region.

Table. Some of the roads in the region

From	To	Kms	Status of road
Serdo	Abala	350	Asphalt
Mile	Chifra	102	Asphalt
Abala	Berahle	110	Asphalt
Berahle	koneba	60	All weather

Chifra	Yalo	95	All weather
Yalo	Megale	65	All weather
Megale	Abala	80	All weather
Samara	Golina		All weather

The above table shows some of the rural roads constructed and can be a potential source for water harvesting both on the upstream and downstream as well as source of runoff water. Pastoralists around *Dubti, Kori, Bidu, Afedera* are benefiting from ponds constructed along the road sides. This time, due to rainfall shortage in the region and highland regions like *Tigray, Amhara* who are bordering Afar, most pastoralists are now migrating to other places in search of pasture and water where as pastoral communities near these ponds have not been migrated for water.



Figure 1. pond constructed along the main Ethio-Djibouti highway. *Sordo kebele* (Oct, 2015)

Figure 1 shows a small pond constructed on road side where water is channeled through the culvert. the pond is located 42 km away from the capital Samara. This pond is constructed by an individual person for his camels. There are pastoralists around this pond who sell milks to track drivers and get income.

The construction of ponds on road side is not limited to the above but there are also other water storage facilities in other places like the figure below indicates a pond constructed on the main asphalt road just 25kms off *Afedera* town along the way to *Mekele* situated on the right side of the

road. The area is one of the dry and hot places in the country in general and Afar in particular with a daily temperature raises to 45°c-50°c and sometimes above 50°c with an altitude of 1100m where life is hard to lead. The area is the main salt mining site in the country.



Figure 2 Afdera kebele road side pond on the upstream of the Asphalt road to Mekele

The figure below depicts a small dam constructed above the main asphalt road located 37 km away from *Serdo* town on the way to to *Afdera*. This site was once a borrow pit used as a source of construction material for the main road and now it holds water and stretches back 600 to 700 meters. Now the dam is serving the community almost throughout the year and changes the local climate as well as improved the vegetation cover used as livestock pasture and shading.



Figure . 3 *Serdo kebele* micro-dam constructed above the Asphalt road

Kori woreda is situated between *Dubti* and *Bidu kebeles*. This *woreda* is characterized by dry and hot climate where life without pasture and water is difficult for the pastoralists. In the *woreda* different water harvesting structures have been constructed by the Productive Safety-Net Program (PSNP), Afar Development Association (APDA), FAO, and other NGOs like ponds and *birkas*. The following figure 4 is a pond near the town *Kori* 55 kms from *Serdo* is located in *Guyihle kee ella kebele* just on the left side of the road on the way to *Afdera* direction. Because of this pond the nearby areas are green and used as livestock feeding sites.



Figure 4. Pond on the lower side of the main asphalt road

6. Challenges to pastoral water harvesting structures

Water is an important element of life without which life is difficult to sustain. Water for pastoralists means life. Pastoralists all over the world depend their livelihoods on the production of livestock and livestock products mainly milk and in order to secure food the livestock must have pasture and water on the fields if not they migrate somewhere with better pasture and water.

Today; pastoralists are at risk of losing their old age rooted livelihoods as the global and local climate change intensifies its impacts on their rangelands and water. Because of the global climate disorder, these innocent people are suffering most from environmental degradation. The once reach rangeland and water areas now become bare lands and water points get dry, reduced

livestock herd, reduced milk production and pastoralists are now forced to engage in other livelihoods activities.

The already existed water points in the region are facing the problems of siltation. This is primarily due to inappropriate site selection, poor project technical design and quality, lack of clear Operation and Maintenance guidelines, Tragedy of the Commons (lack of clear responsibility and ownership), lack of environmental and Social safety issues applied before construction, poor watershed management, high rate of evaporation (Figure 5) as well as huge livestock population.

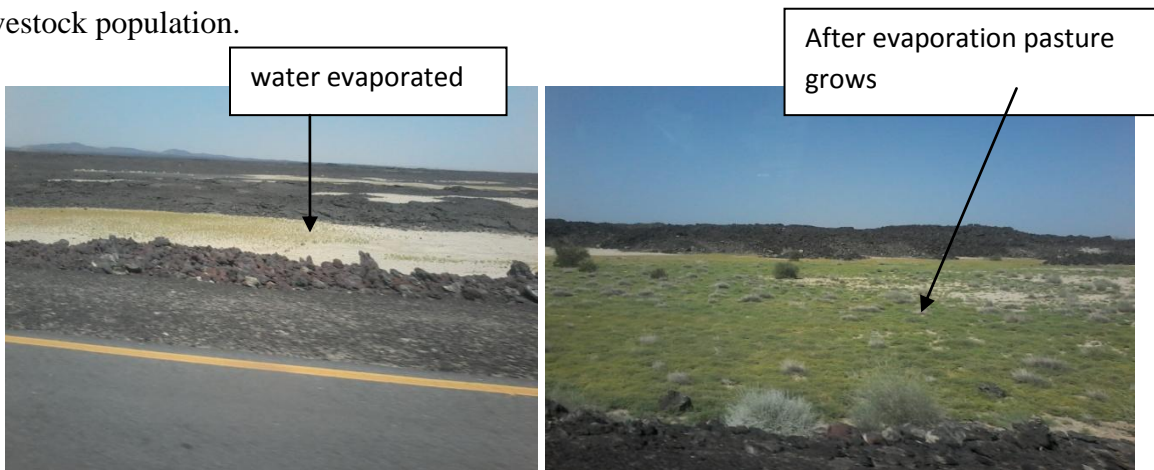


Figure 5. *Afdera kebele* road side pond on the upstream of the Asphalt road to *Mekelle*

7. Conclusion

The Afar National Regional State is endowed with vast natural resources like wild life reserves, National Parks, vast irrigable plains, huge herds of livestock and other minerals too. However, due to lack of skilled human power and other problems these resource are not well exploited and benefited the pastoral people. Most of the pastoral rangelands and water resources are on the brink of devastation and the pastoralists are changing their way of life.

Water harvesting points of various types are developing. However; due to lack the required technical design and quality most are either damaged by livestock and siltation or abandoned due to lack of water which a result of inappropriate site selection. There are few ponds constructed in some *woredas* following roads sides and well serve for both human and livestock. These new

innovation has to be scaled up to other places with careful site selection and result oriented technical design and full community participation.