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Resource Availability Assessment Methodology for Land and Water
Related Interventions in the Wabi-Shebele and Genale-Dawa Basins, Ethiopia

VOLUME VII

**SOCIOECONOMICS SITUATIONS and
RESOURCE BASED INTERVENTIONS
REPORT**

Resource Availability Assessment Methodology for Land and
Water Interventions in the Wabi-Shebele and Genale-Dawa
Basins of Ethiopia

Volume VII. Socioeconomics Situations and
Resource Based Interventions Report

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ABBREVIATIONS AND ACRONYMS

BHU	Broader Homogenous Unit
GCM	Global Circulation Model
GD	Genale Dawa
GDRB	Genale Dawa River Basin
MOA	Ministry of Agriculture
MoWR	Ministry of Water Resources
MoWIE	Ministry of Water Irrigation and Energy
NMA	National Meteorological Agency
RCP	Representative Concentration Pathways
SDC	Swiss Agency for Development and Cooperation
SNNPR	Southern Nations Nationalities and People Region
UNEP	United Nations Environment Program
WLRC	Water and Land Resource Centre
WS	Wabi-Shebele River Basin
WSRB	Wabi-Shebelle River Basin

Executive summary

This report presents an assessment of the socioeconomic resource base, and existing challenges and opportunities for socioeconomic development in Wabi-Shebele and Genale-Dawa river basins along with possible intervention options. Two approaches that complement each other were followed to generate the required data. The first approach was preparation of preliminary intervention options in the form of socioeconomic Development Intervention Matrix (DIM) based on literature review and secondary data, and the second approach was validation of the identified development intervention options based on primary data generated from eight purposively selected case study sites (districts) in the target basins mainly using focus group discussions, key informant interviews and site observations.

The results indicate that the dominant livelihood options in both basins are related with pastoral and agro-pastoral systems, mainly in the dominant lowland areas followed by mixed crop-livestock production systems in the intermediate and highland areas of the basins. Depending on the stated production systems, the socio-demographic structure, access to services, livelihoods, household and community vulnerability, resource use and management practices, and agricultural marketing systems vary considerably. In addressing the development challenges in both basins, there have been historically a number of policies and strategies put in place that emanated from the respective regime's national policies and/or policies specific to the production systems. Different policies were implemented through a number of programs and projects, generating key lessons and challenges in the areas of production, marketing, human capacity and intervention management that have contributed to undermining sustainability. The production related challenges were (i) the focus on traditional livelihood options and limited exploitation of potential enterprises, (ii) challenges associated with limited availability of financial and/or required inputs, (iii) limited attention to post harvest losses in the public programs, and (iv) limited linkage between research and development endeavors.

Market related challenges were highly associated with focus of development programs on boosting production and productivity with limited attention to agricultural marketing issues that have resulted in (i) poor marketing facilities for major products, (ii) poor market accessibility and information, (iii) lack of organized market places, and (iv) limited farmers/pastoralists marketing skills and strategy (often they sell when there is financial need) resulting in often depressed farm gate prices of products, and (iv) limited group action to improve bargaining power with other market actors and to create scale economy for improved competitiveness. Human capacity related challenges are limited attention of public programs in capacitating farmers/pastoralists in household resource management, limited implementation capacity of woreda and zonal level experts due to lack of adequate skills and experience, and limited capacity to resolve conflicts over resources.

There were also intervention management related challenges that are limited focus to mechanisms to ensure sustainability of use, limited integration of interventions, limited consideration of indigenous knowledge and practices, and prevailing gender disparities.

Addressing these socioeconomic related development challenges and taking lessons for future intervention design is crucial, considering the uniqueness of the two major production and livelihood systems. In order to ensure effective implementation and sustainable impact, it is important to consider the following key implementation strategies for the identified interventions: (i) ensuring relevant stakeholders and community participation, (ii) ensuring efficient intervention management arrangements through proper integration and alignment of on-going public and non-public development efforts, (iii) ensuring sustainability through establishing adequate incentive mechanisms for improved management and also through better linkages with available public structure, and (iv) proper documentation of policy and technical evidence for wider scaling up.

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2 Methods

2.1 Study area description

The study areas are Genale-Dawa and Wabi-Shebele river basins that share territories in Oromiya, Somali, SNNPR, and Harari regions (Figure 1). The basins include high potential, drought prone, and pastoral and agro-pastoral areas.

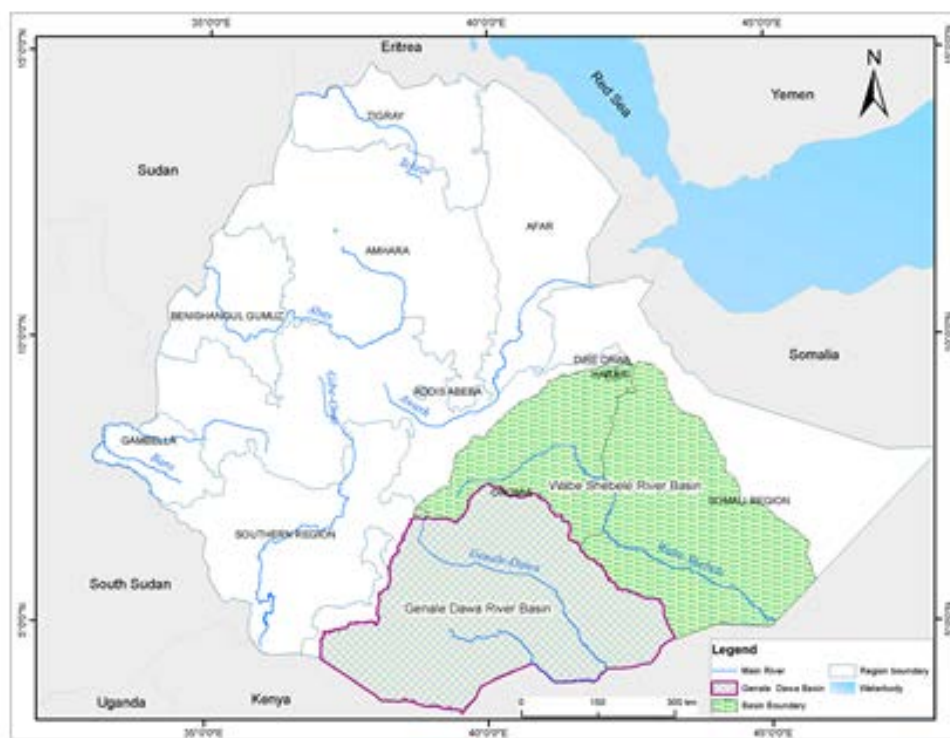


Figure 1. The study area - Genale-Dawa and Wabi-Shebele River Basins

2.2 Method of data collection

Two approaches that complement each other were followed to generate the required data. The first approach was the use of secondary data and information, and preparation of preliminary intervention options in the form of Development Intervention Matrix (DIM). The second approach was validation of the identified Development Intervention options based on selected case study sites (districts, known as woredas in Amharic).

The case study woredas were selected through large and smaller homogenous development unit selection process considering: (i) agro-ecological gradients (highland, intermediate and lowland); (ii) representation of major farming systems, and (iii) socio-cultural setup. Accordingly, eight woredas (four from each basin) were selected. The selected woredas in the Genale Dawa river basin were Dolo Mena, Dire and Arero in Oromiya and Bensa in SNNPR. In the Wabi Shebele river basin, the selected woredas were Adele and Kombolcha in Oromiya region and Jigjiga and Gode in Somali region (Table 1).

Participatory rapid appraisal technique using key informant interviews (KIIs) and Focus Group Discussions (FGDs) with woreda experts, administrators and elders (community leaders) were employed to validate the



pre-prepared DIM. An attempt was made to have two approaches in the appraisal process. The first was to have researcher-led and the second stakeholder-led, mainly in the FGDs. However, the discussion agenda and the level of engagement of participants were more or less similar in both cases though the researcher-led FGDs were more focused towards the objectives of the study.

Table 1 Case study woredas by basin

Basin	Selected woreda	Agro-ecology	Major farming system
Genale Dawa	Dolo Mena	Intermediate/lowland	14 Pastoral and 8 crop-livestock mixed farming kebeles
	Arero	Intermediate/lowland	15 pastoral kebeles and 5 agro-pastoral Kebeles
	Dire	Lowland	14 pastoral kebeles
	Bensa	Highland	37 enset based mixed crop-livestock farming kebeles
Wabi Shebele	Adele	Highland	Mixed crop-livestock mixed farming system
	Kombolcha	Intermediate	Chat based mixed crop-livestock production system
	Jigjiga	Intermediate/lowland	Agro-pastoral and mixed crop-livestock production system
	Gode	Lowland	Pastoral and agro-pastoral production system

3. SOCIOECONOMIC SITUATION ANALYSIS

The socioeconomic situation analysis is made in terms of (i) the socio-demographic characteristics related with the demographics and access to services and status of vital infrastructure (education, health, road and water); (ii) livelihood options and vulnerability, (iii) resource use and management practices, and (iv) the structure, conduct and performance of agricultural markets and their linkages.

3.1 Socio-demographic characteristics

3.1.1 Demographic situation

a) *Wabi Shebele River Basin*

The population distribution varies by the major agro-ecologies, where there is relatively higher population and population density in the highland part of the basin compared to the lowland pastoral areas. The average population density in the basin is estimated at 29 persons per square km (Table 2). The Wabi Shebele river basin inhabitants are dominantly Oromos with 67.1% of the total population estimated at about 9.5 million followed by Somalis with 24.4%, and Amharas with 8.4% the rest (less than 1% belong to Harari ethnic group (MoWE, 2005).

The average household size in the basin is 5.3 persons with almost the same estimate for households in urban and rural areas. However, there seems to exist considerable difference in family size by agro-ecology and ethnicity. The MoWE (2005) estimate indicates that the average household size is much higher in the Somali region, ranging from 5.9 in Jigjiga to 8.4 in Korahe. The Zones in Oromiya region of the river basin show relatively lower household size, with the lowest household size observed in Harari region with 4.3 persons per household.



Table 2 Key socio-demographic characteristics of Wabi Shebele River Basin

Category	Indicator	Estimates
Population	Population in 2010 (000)	9,489
	Growth Rate (%)	3.9
	Density (Persons/km ²)	29
Urbanization	% of total population	7
Other Social Indicators	Productive Force (%)	50
	Illiteracy (%)	80
Administration	Regions	Oromiya, SNNPR, Harari, and Somali
	Woreda	76

Source: MoWE (2005), updates from the 2007 Population and Housing Census of Ethiopia

b) Genale Dawa River Basin

Like the case of Wabi-Sheble river basin, the population distribution in the Genale Dawa river basin varies by the major agro-ecologies, where there is relatively higher population density in the highland part of the basin compared to the lowland pastoral areas. The average population density in the basin is estimated at 32 persons per square km (Table 3). There are four ethnic groups in the Genale Dawa river basin, which are Oromo (Borena, Bale and Guji clans), Somali (Digodin, Ogaden, Gire, and Dir clans), Sidama, and Gedio (MoWE, 2005). Of the estimated population of 5.1 million, 60.6% live in Oromiya, 20.2% in SNNPR, and the remaining 19.2% in Somali. In terms of area coverage, 53.2% of the basin is in Oromiya, 45.1% is in Somali and the remaining 1.8% in SNNPR (MoWE, 2006).

The average household size in the basin ranges from 4.7 persons in Bale Zone of Oromiya to 6.3 persons per household in Liben Zone of Somali Region with almost the same estimate for households in urban and rural areas. However, there seems to exist considerable difference in family size by agro-ecology and ethnicity (CSA, 2007). Though the household size seems lower in part of the basin in Oromiya and SNNPR, the population density is higher in the two regions compared to Somali. The MoWE (2005) estimate indicates that population density in the basin is about 26.2 persons/Km² with a range of 7.4 persons/ Km² in Afder Zone of Somali Region to 568.2 persons/ Km² in Gedio Zone of SNNPR.

Table 3 Key socio-demographic characteristics of Genale Dawa River Basin

Category	Indicator	Estimates
Population	Population in 2010 (000)	5,100
	Growth Rate (%)	-
	Density (Persons/km ²)	31.9
Urbanization	% of total population	9.8
Other Social Indicators	Productive Force (%)	46.7
	Illiteracy (%)	81.5
Administration	Regions	Oromiya, SNNPR, and Somali
	Woreda	43



3.1.2 Access to general services

a) *Wabi Shebele River Basin*

Access to education, health, road and water is highly associated with the level of infrastructure related investments to ensure availability of these services. In general, access to these services is very low even compared to the national averages. In terms of access to education, among the population of 10 years of age and above living in the basin, only one out of five is literate indicating that 80% of the basin population are illiterate. This proportion is even worse in rural and women populations with around 85% of them being illiterate. Some parts of the basin like Harari have a higher (55%) proportion of literates, which is an exceptional case as over 90% of its population live in Harar town having good educational facilities.

Access to health services in the basin is very low with considerable variability across zones in the basin. The MoWE (2005) report indicates that the ratio of physician to population was 1:35513, and the ratio of health center to population was 1:102,329. This is by far lower than the WHO standard estimated at 1:10,100 for physician to population ratio and 1:25,000 for health center to population.

The road density per 1000 people in the basin is estimated to be about 1.02 km with considerable variability across zones in the basin and about 30 km per 1000 km² areas (MoWE, 2005). The current status is expected to be much higher as there has been considerable investment in road infrastructure based on the Road Sector Development Program (RSDP IV) in general and the universal rural road access program under the Growth and Transformation Program (GTP 2010 - 2015).

Access to potable water in the Wabi Shebele river basin is very low with relatively better access in urban areas compared to rural areas. The estimated proportion of households with access to potable tap water is only about 9% in Afder, 16% in Liben, and about 13% in Gode zones of the Somali part of the basin (CSA, 2010). The rest use water from unprotected sources like springs, streams, deep and shallow wells, and rain-fed ponds.

b) *Genale Dawa river basin*

Even though there has been considerable public investment in education, access to schools in the basin is still relatively low especially in woredas where there is limited road accessibility like parts of the Guji Zone of Oromiya and Afder Zone of Somali. As a result, literacy rates are very low. CSA (2010) estimates the average literacy rate in Afder Zone to be 12%, 18% in Liben Zone, and 12% in Gode Zone. Overall, literacy rate in the basin is estimated to be about 14% with considerable variation by gender where 15% is estimated for males and 12% for females. A close look into the challenges indicate that even in places where there is access to education, there are considerable drop outs highly associated with overall livelihood challenges. Data from Arero woreda of Borana Zone indicate that there was 8% drop outs from grade 1 to 8 in 2013 (911 drop outs from grade 1 to 8 out of 11486 pupils) with higher proportion in higher grades and for girls. The main reasons reported for dropouts in the woreda are (i) food insecurity due to drought, (ii) pastoral households' mobility, (iii) challenges associated with households' limited capacity to cover costs for sending students to nearby towns where there is school especially beyond 8 grade. An attempt is underway to promoting boarding school for girls along with mobile schools as remedial to reduce drop out. Food insecurity was cited as a source of drop out hence school feeding was proposed to maintain enrollment. In addition, there is no preparatory school in the Woreda hence students have to travel to Yabelo when they pass the grade 10 national exam. Therefore, only few students continue their education as only those who have parents who can afford to send to Yabelo. The school dropout is



even more serious in woredas like Dire, where it was reported that the dropout was 11.6% (1,260 out of 11,670 pupils).

There has been considerable expansion of primary health care services in the basin linked with the National Health Extension Program and promotion of improved participation of the community. MoWE (2006) figures indicate that there are seven hospitals, 47 health centers, 256 clinics, 200 health posts, 34 pharmacies, 20 drug stores, and 226 rural drug vendors in the Genale - Dawa basin. These health facilities are very low to provide adequate health services for the total estimated population of 5.1 million. As a result the health challenges are still very serious. In the case study sites like Dolo Mena and Arero woredas, it was reported that malaria is still a very serious problem even though there are attempts to provide malaria nets.

Considering average values of the Regional States in the basin, the proportion of woredas with access to all weather road is about 35% in Somali region, 49% in Oromiya, and 68% in SNNPR. This indicates the limited access to road in the lowland areas of the basin especially in the part of the basin in the Somali region (Abeje Teffera, 2014).

Access to potable water in the Genale-Dawa basin varies for urban and rural areas considerably, and the estimated proportion of households with access to potable water is about 36% in Bale, 27% both in Borena and Guji, and 42% in Sidama and Gedeo Zones that are found in the basin (CSA, 2010). The rest use water from unprotected sources like springs, streams, deep and shallow wells, and rain-fed ponds. The lowland parts of the basin mainly use groundwater mostly from community shallow hand-dug wells and community managed rain-fed ponds. The assessment made in the case study sites like Arero and Dire woredas in the Genale -Dawa river basin indicates that there are a number of water related projects but only few are operational. The result of the researcher-led FGD in Dolo Mena woreda indicates that the performance of many of the irrigation schemes in the woreda is far from desired level due to technical problem in irrigation water management and low maintenance capacity.

3.2 Livelihoods and vulnerability in the two basins

This part presents the major livelihoods and agricultural production systems along with the status of vulnerability in both basins. There are four generic livelihood types in both basins (i) pastoralism, (ii) agro-pastoralism, (iii) farming (sedentary, rain-fed and irrigated) and (iv) urban. The distribution and composition of these livelihood types vary considerably across the basins but there exists a general trend that highland areas of the basins are more dependent on sedentary farming and the lowland areas more on pastoralism and in between a mix of livelihood types. The livelihood systems are reflections of the production/farming prevalent in respective areas of the basins. The production systems together with the resource endowments and socioeconomic circumstances determine the level of vulnerability. In general, pastoral communities in both basins are more vulnerable compared to farming communities in the highland areas. In this section, we present the overall characteristics of the major production systems in each basin followed by the nature of vulnerability.

3.2.1 Major farming/production systems in the two basins

a) *Wabi Shebele River Basin*

There are four major farming systems in the Wabi Shebele river basin that demonstrate the livelihood options in the respective areas. These are (i) the Arsi-Bale highland cereal -mixed crop-livestock production system, (ii) the Chercher highlands sorghum-based mixed crop-livestock production, (iii) the Gedeo horticulture-based mixed crop-livestock production system, and (iv) Somali lowland pastoral and agro-pastoral production system.



- i. The cereal based mixed crop-livestock farming system in the basin is found in the Arsi-Bale highlands, where the dominant crops are wheat and barley. The smallholder farmers play dominant role. In this part of the basin, there are considerable number of commercial farms because of the investment during the previous government in state farms. This has resulted in a relatively better level of mechanization in the area even compared to the national standard.
- ii. Chercher highlands sorghum-based mixed crop-livestock production is known for mixed crop production and almost zero-grazing livestock management. Cash crops like chat, vegetables, and groundnuts are important enterprises in the area. The area is known for water shortage and serious land degradation. Due to land degradation, mainly due to the terrain of the land and over use, land reclamation measures have been promoted in the last decade. The Haramya Lake, which dried up due to siltation, and other endangered lakes are found in this part of the basin.
- iii. Gedeo horticulture based mixed crop-livestock production is known for production of diverse types of crops like vegetables, enset, coffee, pulses and cereals.
- iv. Somali lowland pastoral and agro-pastoral production system is one of the major pastoral systems in the Great Horn of Africa heavily dependent on livestock and range management. As the result of the recent public settlement program, irrigation-based sedentary farming is coming into the picture.

b) Genale Dawa river basin

There are three main production systems in the Genale-Dawa river basin. These are (i) the Sinana plain cereal-based mixed crop-livestock production system, (ii) Sidama and Gedio enset-based mixed crop-livestock production system, (iii) and the Guji and Borena pastoral and agro-pastoral production system.

- i. Sinana plain cereal-based mixed crop-livestock production system represents partly a typical highland production system, and the major crops grown are barley, wheat, faba bean, field pea, maize and sorghum. There is also a wide variety of minor crops such as linseed, rapeseed, rye, and vegetables around homesteads. The major crops serve as a staple food and a source of cash. Faba beans and field peas also contribute to cash earnings. Farmers sell livestock to meet emergency cash requirements. The topography of most of the system ranges from flat plateau to gently sloping inclines with annual rainfall ranging from 819 – 1291 mm. The soil texture ranges from light to heavy clay and the soils are vulnerable to erosion.
- ii. Sidama and Gedeo enset-based mixed crop-livestock production system: much of the agricultural land is found in hilly areas with altitude ranging from 1650 to 1850 m and average rainfall is about 1525 mm with most rain falling between March and September. Soils are red-brown to dark-brown clays, slightly too strongly acidic and high in N and low in P. All farmers grow coffee and maize. Most farmers own oxen. Oxen are few because of the lack of grazing areas and limited area that need ploughing. About half of the farmers own cows; less than 10% have other livestock such as sheep, goats and donkeys.
- iii. Guji and Borena pastoral and agro-pastoral production system: this is a production system dependent on livestock and range management. This system is highly influenced by drought risks. Historical data indicates that the area has been affected considerably due to cyclical droughts (Little et al., 2010). Drought incurred pastoralists' 37% loss of herd in 1985, about 42 % in 1991 and about 62% in 1999. Coppock (2004) argues that the pattern in livestock loss is not only explained by the drought frequencies but also with the required time length to recover and achieve restocking and estimates the overall pattern of a crash every 6-7 years.



3.2.2 Agriculture related vulnerability in the two basins

Farmers and pastoralists living in semi-arid and arid lowlands of the country are heavily reliant on rain-fed agriculture and livestock rearing. In times of water scarcity due to drought or erratic rainfall, crops fail, livestock perish, and pastoralists and farmers have to travel longer distances searching for water for their households and animals. The prevalence of climate shocks in terms of drought and/or flood in Ethiopia is very frequent and it is more serious in pastoral areas. The two basins are more of semi-arid and arid lowlands, where pastoral livelihood is prevalent making many of the inhabitants of the two basins vulnerable to these shocks.

Drought is one of the most frequent climate shocks, regularly affecting food production, livestock production and livelihoods of the rural poor in Ethiopia. Since the 1970s, the severity, frequency and impacts of drought have increased and areas affected by drought and desertification are expanding (World Bank, 2009). Economic losses due drought is also increasing accordingly from time to time. For instance, Tenna (2013) estimates the total economic loss of livestock and livestock products in Borena at USD 384 million, equivalent to approximately USD 297 per person due to the 2011 drought in the area. Ayana (2011) reports that droughts of the 1980s and 1990s in Borena area caused 49% herd losses under the communal land use while 57% of the cattle mortality under ranch management was attributed to droughts of the 1990s. The same is true with Somali region, where pastoralists, agro-pastoralists, farmers and traders have suffered a series of livelihood shocks in recent years; some of the disasters are natural ones like droughts, livestock diseases, and others are social like trade related and clan conflicts (Devereux, 2006).

The ever increasing severity of challenges in pastoral areas are reportedly associated with (i) the considerable decline in people : livestock ratios in pastoralist households falling to a level below 3 TLUs/person, which is deemed to be a 'viable' amount for sustainable livestock production, due to a combination of human population growth and declining rainfall (Devereux and Scoones, 2008), (ii) continuous reduction of land for grazing and livestock production mainly for cropping, and (iii) inability of productivity increases through range management, veterinary and other interventions to make up for the gap. With these realities, the way forward seems to look into diversified intervention options. Devereux and Scoones (2008) suggested three major areas of policy options for improvement of livelihood in pastoral areas: (i) linking market opportunities to local growth, (ii) expanding livelihood portfolios in ways that encourage local growth linkages, and (iii) establishing new livelihoods outside pastoralism / livestock keeping which avoid destitution.

In addition to the drought conditions across much of the Somali region, floods also affect many pastoral areas along the Shebelle River. In 2011, many parts of Gode Zone along the Shebelle River were affected by flooding. These floods caused temporary displacement of people, loss of crops and livestock, and damage to infrastructure and other property (Shanko, 2013).

3.3 Resource use and management practices in the two basins

The resource use patterns in the two basins can be understood by considering the two main livelihood systems, namely the pastoralagro-pastoral production system and the sedentary mixed crop-livestock production system.

3.3.1 Pastoral and agro-pastoral production systems

a) *Role of traditions and institutions in resource management in pastoral areas*

Though institutions, rules and traditions vary among the different pastoral communities in the country in general and in the basins in particular, the main targets of traditional interventions are related with (i) ensuring



proper rangeland resources use and maintenance through negotiation among pastoral groups on the use of water and pasture and allocating range and water resources; (ii) how conflicts and disputes are arbitrated, and (iii) managing mobility through discussions and decisions about when and where the community should move. The main difference in institutions, traditional rules and regulations emanate from belongingness to major pastoral groups and clans and even in some cases to sub-clans. Table 4 presents the main ethnic groups, pastoral groups and clans found in the basins.

This indicates the need for consideration of ethnic and clan issues and their respective indigenous resource management practices in the design and implementation of development interventions.

Table 4 Major clans of the main pastoralist groups in the two basins

Pastoral Ethnic group	Main group	Clans
Borana	Sabo	Karayu, Digalu, Matari
	Gona	Fullele, Haroressa
Somali	Garri	Tufi, Kuran
	Irir	Harire, Ge'dere, Hobor,
		Gurre, Meyle, Gerrire, Hamere
	Dir	Madahwayne, Isse, Medelug (Gadabursi), Mehe
	Digil	Jiddo(Jarer), Garre
	Darod	Kablalah, Sede, Tanade
	Shekhal	Aw Qudub

Source: UNHCR (2004) and PFE, IIRR and DF (2010)

b) Pastoral resources and their management

In general, the main resources for pastoral and agro-pastoral communities in the basins (Somali, Borena, and Guji pastoral areas) are livestock; mainly cattle; sheep/goats (shoats) and camels; the rangeland; water points; and in agro-pastoral cases the agricultural land that tends to be inherited and individually owned although it is often managed by the community or clan/sub-clan. Ownership may be limited near rivers where irrigation water is accessible but household capacity to cultivate is usually the limiting factor.

The dependence of the livestock production on the rangeland and water points is a key factor for movement of pastoralists in search of these resources. Especially, in times of drought, the movement of pastoralists with their livestock in search of water and animal feed becomes more intensive leading to conflicts with other pastoralists competing with the same resources. Moreover, in most parts of the basin, there is serious reduction both in terms of quantity and quality of productive range land, which is highly associated with the environmental degradation, water scarcity, increasing human and animal population, and expansion of crop cultivation (Muhyadin, 2012).

Traditionally, pastoral communities used to have conflict management mechanisms; however, as scarcity of the key resources, animal feed from the rangeland, and water is getting severe, the magnitude and intensity of conflicts over these resources have increased considerably in recent years.



These challenges have pushed the pastoral communities with the support of government at all levels and NGOs to adapt a number of strategies, that are (i) livestock-related, (ii) rangeland-related, (iii) water-related, and (iv) weather-related strategies.

i. **Livestock-related strategies**

These strategies are associated with herd mobility, traditional social insurance, shift of herd structure and type to more drought tolerant animals like shoats and camels, destocking for effective herd management, and maintaining animal health.

- Herd mobility: pastoralists in the basin travel with their livestock in search of water and pasture. Movement is dictated by season, the availability of forage, personal relationships, family structure, and immediate demands. In addition, herd mobility is aided by a network of watering points and wells maintained by the pastoralists.
- Traditional social insurance: though this varies among the different pastoral ethnic groups (Bonana, Guji, Somali), there is a social insurance system during drought times when pastoralists lose their animals. It can have a form of gift of animals, temporary provision of lactating cows or community-based re-stocking for pastoralists who lost their herd.
- Drought-tolerant livestock: As the landscape in southern Ethiopia in general and the basin in particular has become drier, the presence of drought-tolerant livestock has increased. Currently, proportions of different types of cattle in pastoral herds especially in Borena area are being reduced relative to goats and camels, which are more drought tolerant and disease resistant. Livestock diversification has become one of the most universally adopted coping mechanisms, especially in the Borana area.
- Destocking: pastoralists in the basin use reducing their herd size as a coping mechanism.
- Maintaining animal health: along with traditional knowledge of pastoralists in animal health, the public vaccination program is well organized and executed in recent years liked with the expansion of animal health services through public programs and projects like PCDP.

ii. **Rangeland-Related strategies**

Range related strategies are the traditional systems of managing grazing lands during wet and dry seasons, increasing number of enclosures for grazing, controlling bush encroachment in pasturelands, voluntary villagization program for improved pasture, grazing land management, and engagement in crop cultivation.

- Traditional Systems of delineating Wet/Dry Grazing Areas: pastoral communities have sophisticated traditional systems of managing land and water resources. For instance, in Borena areas, grazing lands are designated as wet season grazing areas and dry season grazing areas. The dry season grazing areas tend to be areas of relatively lower elevation where water accumulates, thereby allowing pasture growth even in the absence of significant rainfall.
- Kallos: these are enclosures in Borena areas, which are reserved for lactating, sick or young animals so that these animals do not have to travel the longer distances traveled by the rest of the herd for pasture, particularly in the dry season.



- Bush clearing: in order to reduce the possible bush encroachment to pasturelands, pastoralists often clear bushes mainly by burning, which has been banned by the government since the Derge regime.
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- Voluntary villagization program: with the main objective of promoting better use of the rangeland, avoiding haphazard settlement and growth of villages that have resulted in conflict over grazing areas, improving the provision of government services. For instance, in Somali region, 140 Commune Centers were so far identified in 18 woredas of Wabi Shebele and Genale-Dawa river basins based on water potential areas of both surface and groundwater. In these 140 Commune Centers, 140,000 households (650,000 individuals) have been settled, diversifying their way of life and improving their income. In connection with the settlement in these Commune Centers, 840 potable water, 505 primary education, 417 human health, 279 animal health and 370 pastoral training centers have been constructed (Shanko, 2013)
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- Crop Cultivation: pastoralists in southern Ethiopia, especially the Borena pastoralists, have started cultivation of crops (Desta, 2011) as one of the adaptation strategies.

iii. **Water-related strategies**

The water related strategies of pastoralists are (i) the traditional water management systems that have been playing key role for centuries, (ii) the major water projects in pastoral areas of both basins promoted by the government along the rivers and also using groundwater like the 1500-2000 km water network project in Borena area, (iii) the smaller ponds and wells in both basins, and (iv) the emergency water trucking capacity built in pastoral areas.

iv. **Weather-related strategies**

The application of the above three strategies depend on the pastoralists' interpretation and understanding of available climate information (Hurst et al., 2012). Within pastoral communities, probabilistic forecasts, use of indigenous climate forecasting methods, and awareness and access to external information are three important sources of climate information (Hurst et al., 2012 and Luseno et al., 2003).

Hurst et al. (2012) describe the traditional system of weather prediction in pastoral communities in southern Ethiopia as (i) reading livestock intestines; (ii) locating and identifying specific species of plants that are in leaf or flower; and (iii) interpreting astrological signs. However, due to increased information from external sources like from government and NGOs through different early warning systems, pastoralists are increasingly depending on external sources than their traditional weather forecasting systems.

3.3.2 Mixed crop-livestock production systems

As discussed above, the mixed crop-livestock production systems are found in the highland and intermediate areas of the two basins, and the resource use and management is highly linked with sedentary way of farming. However, the resources and their management vary based on the agro-ecological potentials of the different areas. Within the basins, three major areas can be identified, namely the Sinana plain and Arsi-Bale highlands, the Chercher highlands, and the Sidama-Gedeo intermediate areas.

- The Sinana plain and the Arsi-Bale highlands in the two basins are known for cereal production, mainly wheat and barley but also highland pulses like faba beans and field peas. Cattle and sheep production



is also very important. These areas often get reliable rains. There is also relatively better public service in agricultural extension. The role of cooperatives in these areas is very important especially in (i) required agricultural input provision, (ii) primary value addition to agricultural produce like grading and milling, and (iii) improving access to better markets through linkage to processors like Assela malt factories and flour factories in the country.

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- Chercher highlands are known for serious land degradation, shortage of rainfall in some years, and high population density. Sorghum among cereals, haricot beans among pulses, groundnut among oil crops, potato, sweet potato, other vegetables, and chat are the crops that are dominantly produced in this part of the basin. Traditional shallow wells are very popular for human and animal water use and irrigation, especially for vegetable and chat production.
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- Sidama-Gedeo area are known for relatively high population density and small farm sizes. Enset is the most important food security crop but other cereals like maize and sorghum also play important roles. Chat and horticultural crops under irrigation are also produced in this part of the basins.

3.4 Agricultural markets and linkages

The market structures in both basins are similar to other parts of the county with larger Zonal markets located in the administrative zone headquarters and smaller woreda markets within each woreda capital. This is also true with market structures in pastoral areas of the basins. This has influenced targeting of investments in market infrastructure in both basins.

In Ethiopia, pastoralist and agro-pastoralist areas such as Borena, Afar and Somali are considered as the traditional sources of livestock, supplying 95% of livestock destined for export market. Among these major supply areas, Borena Zone is the major livestock supply area where almost all live animal and meat exporters are competing. The livestock markets in most parts of the country are characterized by seasonality in flow and prices of animals. Particularly, in the pastoral lowland areas where it is considered as traditional source of animals, complex factors contribute to this phenomenon. Shifts in supply could occur as a result of factors including seasonality of consumption demand (fasting and other ceremonial periods) in domestic and export markets, drought, disease outbreak, lack of information, availability of food aid, clan conflicts and others (Getachew et al, 2008). Factors like prevalence of non-market oriented livestock production system, lack of a well-coordinated livestock supply chain that links many producers and buyers, and problem of access to untapped areas like many parts of Borena and Bale zones contributed to reduced contribution of livestock for local economic growth.

The livestock market is structured so that the marketable livestock from the major producing areas reach to the final consumer or end-user passing through complex channels along the supply chains involving various market actors such as producers, middlemen, livestock trading cooperatives, traders, live animal exporters, and meat exporters. Most of the export abattoirs and live animal exporters collect animals either through their own purchasing agent assigned in major livestock markets or through other small- and large-scale traders. Sometimes, livestock trading cooperatives are also directly supplying animals to the exporters. Exporters' purchasing agents will in turn collect animals either from collectors, small traders, livestock trading cooperatives, farmer groups or directly from producers. Producers have the option of selling their animals to the collectors in their village, small traders, and livestock trading cooperatives or directly to the exporters. Some farmers also form groups and supply animals to markets (ibid). These have been confirmed in all case study woredas in both basins, where there is critical challenge in marketing of products mainly due to the challenges associated with (i) poor market infrastructure (roads, information, storage etc), (ii) malfunctioning



of the market due to structure of the market (for some products, delalas (brokers) dictate prices and farmers and pastoralists are just price takers), and (iii) limited marketing capacity of farmers and pastoralists mainly due to lack of group action.

In order to address the market challenges especially for livestock from pastoral and agro-pastoral areas, it will be important to improve the market infrastructure mainly in the areas of (i) establishing purchase points in supply markets, (ii) strengthening the transportation link in areas with poor road infrastructure, (iii) establishing efficient and accessible market information system, and (iv) establishing holding grounds in lowlands and carrying out uninterrupted livestock purchases. It is also important to empower communities in terms of (i) strengthening the local conflict resolution institutions, (ii) upgrading the marketing/management skills of livestock producers and their cooperatives, (iii) exploiting the traditional clan based livestock marketing systems, (iv) structuring participatory market supply chains, and (v) developing and disseminating research output on improving reproductive efficiency, nutrition, production management practices and slaughter management (Getachew et al, 2008). As livelihood options get diversified, the marketing system in the pastoral and agro-pastoral areas needs to develop to cater for emerging non-livestock sector, which will be much important as the road infrastructure and access to market improves.

4. Past socioeconomic development efforts in the Wabi Shebele and Genale Dawa river basins

4.1 Policies, strategies and approaches to enhance socioeconomic development

The historical evolution of policies and strategies over the years depended on the overall respective regime directions. Before the 1970s, the agriculture sector received very little attention and agriculture related interventions in pastoral areas were even lower except the interventions related to developing land for commercial irrigated agriculture along rivers. Towards the end of 1971, the Minimum Package Program (MPP) was introduced to bring about economic and social changes. The MPP included credit for the purchase of items such as fertilizers, improved seeds, and pesticides; innovative extension services; the establishment of cooperatives; and the provision of infrastructure, mainly water supply and all-weather roads. The program, designed for rural development, was first introduced in a project called the Chilalo Agricultural Development Unit (CADU), which later facilitated the establishment of similar internationally supported and financed projects like Wolaita Agricultural Development Unit (WADU). Measures and policies implemented under the Derg regime (1974–1991) were (i) land nationalization in the highlands, (ii) collectivization and sedentarization, (iii) aggressive promotion of agricultural expansion in the form of state farms, (ii) creation of peasant Associations (PAs) as lowest level administrative units, which had serious implications for pastoralists, and (iv) prohibition of controlled burning to manage the rangelands, which saw an increase in bush encroachment and shrinkage of the land usable for grazing.

After 1991, when the current regime came into power, the agricultural policies and strategies were crafted considering the new decentralized governance structure in the country. In general, the rural development policies and strategies that are relevant to the two basins emanate from (i) the overall national macro polices that follow the administrative arrangements and (ii) national river basin development Master Plans. The key macro level directions for rural development in general and agriculture sector in particular as stipulated in the



agricultural GTP are promoting (i) the capacity and extensive use of labor, (ii) proper utilization of agricultural land, (iii) agro-ecology based/differentiated interventions, (iv) linking specialization with diversification, (v) sector and value chain-wise integrated development, and (vi) efficient agricultural marketing system. These policy directions are, therefore, cascaded based on the country's administrative governance structure by region, zone, woreda and even kebele levels.

The second policy direction is based on a national river basin development master plans, which do not consider the administrative zonation. According to the FDRE Constitution, the management of water and other natural resources in Ethiopia falls within the federal jurisdiction. To effectuate the regionalization and decentralization policy, however, the Federal Government may delegate all or some of its powers and duties in the field of water resources management to Regional States or River Basin Organizations (RBOs). So far, there are only three RBOs, (i) Abbay Basin Authority, (ii) Awash Basin Authority, and (iii) Rift Valley Lakes Development Authority. The Genale – Dawa and Wabi Shebele river basins that occupy parts of three regional states, namely Oromiya and Somali National Regional States and the Southern Nations, Nationalities and Peoples' Region (SNNPR) do not have RBOs. Therefore, the two basins are formally administered by the Basin Administration Directorate of the federal Ministry of Water, Irrigation and Energy (MoWIE) with partly delegated powers to the three regional states.

Both basins have master plans where water and agriculture sector development are the key components. Within each basin, there are identified development zones based on the point of view of spatial relationships, i.e. the settlement hierarchy, the roads network and the main orientations of the flows of goods and services, and most importantly administrative manageability (woreda based). Accordingly, the Gelale Dawa river basin water and agriculture sector development targets six development zones: Sidama-Guji-Borena highland, Bale highland, Bale transition, Borena-Guji agro-pastoral, Liben pastoral and Afder pastoral development zones. On the other hand, the Wabi Shebele basin has 8 distinct development zones: (i) Arsi-Bale-Sidama highland (Development zone 1), (ii) West Hararge (Development zone 2), (iii) East Hararge (Development zone 3), (iv) Bale lowland (Development zone 4), (v) Jigjiga, Fiq and Degehabour zones (Development zone 5), (vi) Gode and Korahe zone (Development zone 6), (vii) Afder zone (Development zone 7), and (viii) Warder zone (Development zone 8) (MoWE, 2005 and 2006). The stated strategic approaches clearly indicate the need to consider alignment in designing any intervention in these river basins.

As a federal state, Ethiopia has decentralized governance structure with stated mandates of the different layers in planning and implementation of development efforts. The key administrative layers are national, regional, zonal, and woreda levels. Regional plans are part and parcel of the national planning hierarchy which comprises macro-economic planning, and sectoral and regional planning. In general, regional governments have the main responsibility of (i) setting standards for primary and secondary education and regional health, (ii) provision of vocational and technical training, and managing teacher training institutions and medium level colleges, (iii) construction and maintenance of hospitals, (iv) setting policies on regional water resource development and protection, (v) administering secondary cycle of secondary education, and (vi) designing regional agricultural extension programs. The woreda administrations have the responsibility of (i) provision of primary and secondary education (up to 10th grade), (ii) provision of primary health care (health posts and health centers), (iii) construction and maintenance of Woreda roads and access roads among kebeles, (iv) development of drinking water supply, and (v) provision of agricultural extension services.

The plans at the different levels do not necessarily consider water or any other single resource as the major limiting factor for development. They rather integrate all resources and economic and social sectors, which are relevant to a particular region, in a coherent spatial development framework. However, the extent of responsibility of the different administrative layers varies from sector to sector. In general, infrastructure related



development efforts are more of the responsibility of the federal government. Water and natural resource related are more of regional governments. Moreover, there are different approaches in mobilization of communities from woreda to kebele levels to mainly promote infrastructure development like rural road, and water and natural resource conservation. Important units in this regard are Woreda Development Committees (WDCs) and Village Development Associations (VDAs) that have been playing key role in mobilization of community inputs, prioritization of interventions and managing the execution of priority interventions mainly rural roads (MoWE, 2006).

Due to the governance challenges of administrative units vis-a-vis River Basins, the Ethiopian water resources management policy envisages the establishment of River Basin governance structure as one of the main instruments of an integrated water resource management (FDRE, 2007). From the 12 river basins in Ethiopia, three basins have established Basin Authorities namely, Abay, Awash and Rift Valley Lakes.

The Wabi Shebele and Genale-Dawa river basins cover territories in four regions of the country namely, Oromiya, Somali, SNNPR and Harari and part of Bale, Borena and Guji zones of Oromiya, and Afder Zone of Somali Region are found in both River Basins. So far, both basins do not have river basin organization yet even though the national water policy clearly indicates the need to establish for each basin. Therefore, the basin related resource management interventions are left to the regional governments with the guide of the basin master plans considered in regional planning process.

4.2 Development programs, projects and approaches

The different development programs within these river basins are based on agro-ecology (highland, moisture deficient and pastoral) and local administrative units (zone and woreda). Accordingly, the key agriculture and rural development related interventions in the potential areas with adequate moisture are associated with scaling up of all best practices in the area of land and soil management; irrigation and improved water use; technology multiplication, supply and distribution; natural resources conservation; livestock resources development including feed development; and strengthening research-extension-farmers linkage. In moisture deficit areas, the interventions are related with watershed development and promotion of underground and surface water use linked with small ruminants, poultry and honey bee development, and food security programs. In pastoral areas, the priority interventions are focused on livestock, water and pasture development. Cross-cutting issues, mainly gender and nutrition, are mainstreamed in all these interventions (MoA, 2010 and case study woreda annual reports). These are implemented through the office of agriculture or office of pastoral and agro-pastoral development at different levels.

In addition to these agriculture related public regular interventions, there have been a number of interventions in both river basins that are implemented through regional and federal public offices mainly by Ministry of Agriculture (MoA), Ministry of Water, Irrigation and Energy (MoWIE), and Ministry of Federal Affairs (MoFA). Since the dominant production system that provides livelihood for the majority of the population in both basins has been livestock dependent pastoral and agro-pastoral production system, programs and projects that have been implemented have mainly been oriented more towards livestock sector development. These programs and projects have been mainly financed by the World Bank, African Development Bank (ADB), International Development Association (IDA), and other bilateral cooperation. The main programs and projects with interventions in the two basins are discussed considering road, rangeland and livestock, water, irrigation and energy, and food security issues.



4.2.1 Road infrastructure in the basin

Historically, the road infrastructure built in early 60s that connect Addis Ababa to the different lowlands, including the two basins, were mainly targeted at establishing contemporary trade routes and socio-economic linkages between the highlands and lowlands, which included roads from Addis Ababa to Negele, Moyale, Jijjiga and Assab (Coppock, 1994). These roads have remained the main connection to the lowlands and pastoral areas in general and the two basins in particular. Following the change of regime in 1991, the implementation of four consecutive Road Sector Development Programs have resulted in an expansion of road coverage from 26,550 km in 1997 to 85,966 km in 2013 at a national level. This includes the federal, regional and woreda roads that have been promoted in the two basins. The main asphalted routes that currently link the two basins are (i) Addis Ababa-Assela-Goba-Yabelo-Moyale, (ii) Addis Ababa-Shashemene-Dilla-Yabello - Moyale, and (iii) Addis Ababa-Adama-Harar-Jijjiga-Gode. The planned road and railway connection through Moyale to the Kenyan Lamu port is also expected to play an important role in the socioeconomic situation of the two basins in terms of increased access to markets, investment opportunities, and cultural and social exposure.

The increasing trend in access to roads will have both opportunities and challenges unless required support to basin households are provided. The main opportunities are the improved access to markets due to improved road networks, and the challenges are conflict between the traditional way of life and emerging externally influenced way of life. This will require capacitating farmers and pastoralists to adapt to new rules of the game of the market and institutional arrangements.

4.2.2 Rangeland and livestock sector development

The available literature indicates that the first initiative in rangeland and livestock development was a joint Ethiopian-USAID project named, “Pilot Rangeland Development Project (PRDP)” in 1965. The project targeted areas within 50 km of Yabelo town in the Borana Plateau with the construction of ponds with the aim of reducing pressure on wet-season grazing and improving efficiency of range use. The PRDP project managed the development of 20 ponds (Coppock, 1994). Coppock argues that the indicative results of the PRDP project led to the then MoA to formulate a more comprehensive strategy on pastoral development related with the 1974 proposal of the Third Livestock Development Program (TLDP) with the objectives to develop infrastructure (roads, market facilities, veterinary clinics), natural resources (water and forage) to stimulate animal production and off-take, and to increase incomes and welfare of pastoral producers. It had three units, namely the Southern Rangelands Development Unit (SORDU), North-east Rangeland Development Unit (NERDU) and the Jijjiga Rangeland Development Unit (JIRDU). TLDP was implemented from 1975 to 1990 (Coppock, 1994, Little et al., 2010). When the TLDP phased out there was no permanent organizational setup to represent rangeland interests within the MoA and many of the national range professionals subsequently became the management entity for the South-East Rangelands Project (SERP), initiated in fiscal year 1991 following government change in 1991 and emergence of decentralized governance. Since then, the main projects implemented in the two basins are related with the following:

1. **Pastoralist Livelihood Initiative (PLI)**, which was implemented from 2005 to 2008 in pastoral areas of the Somali, Afar and Oromiya Regions with a focus on animal health, livestock marketing, drought cycle management, rangeland management, and water rehabilitation;
2. **Regional Enhanced Livelihoods for Pastoral Regions (RELPA)**, which was implemented from 2007 to 2009 in southern part of Ethiopia and northern part of Kenya with the objectives of conflict mitigation, regional cross-border cooperation, and pastoral livelihoods;
3. **Pastoral community Development Project (PCDP)**, which is a fifteen-year period



development program targeting selected pastoral areas in Afar, Somali and Oromiya regions. The first phase of the project was implemented from 2003 to 2008, the second phase from 2009 to 2013 and PCDD III started early 2014. The first phase targeted the facilitation of the decentralization process, ensuring early warning, and associated capacity building of implementers, the second phase focused on community education, risk management and livelihood enhancement in the target woredas, and the third phase is expected to focus on the provision of basic social services such as education, health care and water supply to under-served communities and, through its Community Demand Driven (CDD) approach, supporting the development of grassroots-level institutions and their active engagement in local development as well as promoting participation of pastoral and agro-pastoral communities in local decision making processes and oversight of public services (World Bank, 2013).

The projects implemented in the 70s and 80s were not sustainable and recorded failure. Little et al. (2010) document that the large-scale water developments on the Borana Plateau under TLDP were an environmental and institutional disaster, and the outcome of the ranch experiment has been the same as elsewhere in pastoral Africa as it was framed with the Western ranching concept, which has failed to transform traditional pastoralism in Africa. The government's ban on bush burning that have continued throughout the 1980s (and even until the 2000s) under the premise that local pastoral practices were inconsistent with modern range science and, thus, harmful to the environment has resulted in bush encroachment and reduction of rangelands (Coppock, 1994). However, in recognition of these failures, recent projects are shifting away from natural resource management and livestock production and refocusing on community development, service provision and public advocacy.

4.2.3 Water, irrigation and energy

Though annual national and regional plans guide economic development in the two basins, the long-term development is highly influenced by the respective Basin Master plans. In case of the Genale-Dawa basin, the Basin Master plan was approved in 2006 and according to the master plan, the major projects are (i) lower Genale irrigation project, (ii) Welmel irrigation project, (iii) Negele water supply scheme, (iv) Yabelo water supply scheme, (v) GD-6 Hydro-power project located approximately 50 km south-east of Negelle town, and (vi) Bonora integrated watershed management project. In case of Wabi Shebele basin, the master plan considers six projects within the basin. Two of them are multipurpose dams at Gololcha and Erer Rivers; the other two are hydropower projects at Weyib and WS 18, and two are livestock projects related to improved Dairy Development and Range Rehabilitation and Management.

Linked with the dominance of pastoral and agro-pastoral communities in the two basins, the public policy of promoting accelerated and sustainable development through sedentarization of pastoralists is a very crucial dimension. The process of settling pastoralists requires making a number of key services available, mainly related with water, health and education. In general, public programs have so far adhered to a policy of developing pastoral areas with large irrigated schemes operated either by the commercial sector or the state, combined with pastoral settlement schemes for small holders. No significant effort has been made to explore the productive potential of the extensive livestock production systems indigenous to the lowlands and that produce both live animals and products for a range of different markets, including export.

4.2.4 Productive Safety Net Program (PSNP)

PSNP is a national program targeting food insecure woredas designed to replace food aid. Basically, it is meant to reduce household vulnerability to shocks and to improve household and community resiliency in the face of shocks and it involves public works such as terracing, tree planting, groundwater development, work on



school infrastructure, road rehabilitation etc for food and/or money transfer on monthly basis. Though, there are differences across regions, PSNP has managed to improve household and community vulnerability to shocks especially drought due to investments on community assets, and a number of PSNP households have graduated. At national level, the number of PSNP beneficiaries has decreased from 7.7 million in 2010 to 6.89 million in 2013 (MoFED, 2014).

Within the above implementation frameworks, the assessment made in the case study woredas indicate that there are a number of socioeconomic challenges and opportunities that need to be further addressed and/or exploited in the stated public programs/activities. The detail of these challenges and opportunities are discussed in the next part.

5 Lessons, challenges and options for future socioeconomic related development interventions

5.1 Current socioeconomic related development challenges

Based on the above socioeconomic situation analysis and review of the past efforts made in both basins, the key socioeconomic challenges and lessons can be categorized into four, which are (i) production related, (ii) capacity related, (iii) market related, and (iv) intervention management related challenges.

5.1.1 Production related socioeconomic challenges

The current socioeconomic related challenges as per the literature review and the case studies in the selected woredas are presented below:

1. The focus on traditional livelihood options and limited exploitation of potential enterprises: in most of the case study woredas, it was identified that there are agricultural enterprises that can provide alternative livelihood options for improved diversification and reduction of dependence on few options. For instance, Dolo Mena woreda is endowed with huge bamboo resource and high potential for apiculture but these options did not get full attention in the current public programs. The dilemma in this case for pastoral areas in terms of the concepts of “developing pastoralism” against “developing pastoral areas” needs further investigation as there is no any evidence so far about the productive potential of intensive production system compared to productive potential of the extensive livestock production systems indigenous to the lowlands and that produce both live animals and products for a range of different markets, including export (Little et al., 2010).
2. Challenges associated with limited availability of financial and/or required inputs: in order to improve animal health services, through the public programs, a number of animal health posts (Kelas) have been constructed across the basins; however, very few of them are providing adequate services. For instance, in Dolo Mena woreda, there are 14 animal health Kelas i.e. one Kela in each kebele; however, the discussion with experts and community leaders indicated that there is lack of effective livestock health service mainly due to shortage of drug supply and there is a serious livestock disease incidence like anthrax, blackleg, foot and mouth disease (FMD), pneumonia (CBP), and tick infestation.
3. Limited attention to post harvest losses in the public programs: the discussions in the case study woredas indicate that there is considerable postharvest loss in crop and livestock products mainly due to the following: (i) the attention given by public programs is very limited, (ii) the skill and knowledge of farmers and pastoralists is also limited, and (iii) the marketing system and access to required infrastructure like storage facilities are poor.



4. Limited linkage between research and development endeavors: the application of improved agricultural technologies in many of the case study woredas was reported to be very low and the experts and community leaders dominantly were not aware of the research or knowledge institutions/centers that are established to serve them. This clearly indicates the loose linkages of relevant stakeholders in many of the public programs.

5.1.2 Market related challenges

The main focus of development programs on boosting production and productivity with limited attention to agricultural marketing issues: marketing of agricultural products in the case study woredas was reported to be one of the key challenges associated with (i) poor marketing facilities for major products, (ii) poor market accessibility and information, (iii) lack of organized market places, and (iv) limited farmers/pastoralists marketing skills and strategy (they often sell when there is financial need) often resulting in depressed farm gate prices of products, and (iv) limited group action to improve bargaining power with other market actors and to create scale economy for improved competitiveness. For example, in Dolo Mena woreda, there are 14 multipurpose primary cooperatives and one cooperative union established to support farmers to market their produce and improve access to required agricultural inputs. However, the discussion with experts and community leaders revealed that the service they provide is unsatisfactory and none of them is involved in providing market service for the farm produce of member farmers.

5.1.3 Human capacity related challenges

1. Limited attention of public programs in capacitating farmers/pastoralists in household resource management: Because of the lack of skills and inherent traditions, household financial and other resource management skills are reported to be very poor in all the case study woredas. The discussion with experts and community leaders indicate that there is no tradition of household financial saving except in the form of increased number of herds etc.
2. Limited implementation capacity of woreda and zonal level experts due to lack of adequate skills and experience: The different public programs are reported to be seriously affected due to lack of expertise especially associated with high staff turnover.
3. Limited capacity to resolve conflicts over resources: in both basins, there are serious conflicts over resources. In the pastoral and agro-pastoral areas the conflicts mainly emerge whenever there is a shortage of pasture and water like many woredas of Borana and Guji Zones in the Genale Dawa basin. Similarly, in the highland areas, where there are irrigation possibility, like in Adele and Kombolcha woredas of the Wabi Shebele basin, conflicts between upstream and downstream communities over water for irrigation is very prevalent.

5.1.4 Intervention management challenges

1. Limited focus to mechanisms to ensure sustainability of use: The discussion in Arero and Dire woredas of Borana zone indicate that the modern water sources developed recently do not often provide services because of the challenges of maintenance (pump, pipe). To maintain a water pump, it may take a week, if not a month, during which time animals may face serious shortage of water.
2. Limited integration of interventions: The discussions made with experts indicate that due to lack of integration of different interventions, the impact that could have been achieved was minimal. The case reported in Dolo Mena woreda was related with the development of water points for pastoral kebeles without considering pasture development, livestock health service provision, and market improvement. Many of the water points could not provide adequate service because of the fact that animals have to travel to far places in search of animal feed/pasture.
3. Limited consideration of indigenous knowledge and practices: the discussions with experts and community leaders at Dire and Arero woredas indicate that many public programs related with water, land, and livestock



management do not consider local communities' indigenous knowledge and practices resulting in failure or limited sustainability in many cases. The specific issues where indigenous knowledge and practices are important were identified to be strategies of settlement, pasture allocation during wet and dry seasons, and grazing practices of the different livestock types.

4. Though gender issue is mainstreamed in all interventions, the disparities linked mainly with local traditional setups still remain. Lower access to education, more school dropouts, and overload of household and farm activities were identified as the major challenges facing women in many of the case study woredas.

5.2 Options for socioeconomic related development interventions

Biophysical development related interventions like water resource, livestock development, crop and rangeland improvement interventions, socioeconomic development interventions are very critical. The main socioeconomic related intervention options for both pastoral and agro-pastoral and sedentary farming areas are related with the main challenges stated above and are grouped into production, market, human capacity, and intervention management options.

5.2.1 Development intervention options in pastoral and agro-pastoral areas of the basins

The main socioeconomic related intervention options in pastoral and agro-pastoral areas are grouped into production related, human capacity, markets, promotion of development support institutions, associated resource management options, and strengthening intervention approaches to be gender sensitive and integrated sector wise (see Annex 1).

5.2.1.1 Production related socioeconomic intervention options

The production related socioeconomic interventions are related with the need to explore new agricultural enterprises in addition to traditional livelihoods including new livelihood options outside of farming; facilitation of the access and use of agricultural inputs and technologies through improved inputs delivery systems and improved linkage with agricultural research system; and provision of due attention to post harvest management.

5.2.1.2 Market related intervention options

Market interventions are related with the need for new and improved approach for pastoral development, in recognition of the current situation where there is major resource constraint (pasture land, water etc.) and significant challenge to the traditional pastoral livelihoods. Available knowledge in this regard suggests three major areas of market interventions, which are creation of wider market opportunities to local growth, expansion of pastoral livelihood options through diversification in a manner that encourages local growth linkages, and establishment of new livelihoods outside pastoralism and livestock rearing. Specifically, this is linked with promotion of group action either through strengthening and/or establishing development support through formal institutions like farmers cooperatives and association, and informal institutions, which is highly associated with promotion of group action to create the possibility of aggregation for scale economy and improved services like market information, primary value addition etc. In addition, intervention in strengthening and/or establishing marketing infrastructures like market information system, storage etc. is crucial.



5.2.1.3 Human capacity related intervention options

This category of interventions is linked with the above stated interventions, and it is about the possibility of building on local rules, norms and regulations to strengthen the efficient and equitable utilization of available resources in a sustainable manner with no conflict over resources. It has to do also about empowerment of local communities in managing the resources they are endowed with and also in managing newly made available services through development efforts. In addition to capacity building to pastoralists and agro-pastoralists, it is important to build the implementation capacity of experts and officials of relevant public offices.

5.2.1.4 Intervention design and management related options

The last category of interventions are related with intervention approaches mainly in terms of (a) setting mechanisms to ensure sustainability, (b) ensuring integration of interventions for synergy through alignment of interventions (both public and non-public) across the different sectors mainly among education, health and agriculture, (c) consideration of indigenous knowledge and practices, (d) making interventions gender sensitive at grassroots levels, and (e) following up of scaling up of best practices based on demonstrated evidence and lessons.

5.2.2 Development interventions in sedentary farming areas of the basins

5.2.2.1 Production related socioeconomic intervention options

Linked with the low input and low output production systems prevailing in the highland and intermediate areas of both basins, the production related intervention options are associated with promotion of intensification through (a) irrigation, (ii) better use of improved agricultural technologies, and (iii) improved production practices (agronomy, plant and animal health, postharvest management etc.)

5.2.2.2 Market related intervention options

Market interventions in highland and intermediate areas of both basins are related with (a) strengthening established farmers' cooperatives and their respective unions to ensure group action and smallholder commercialization, (b) strengthening the economic linkages between highland and lowland areas in both basins, (c) facilitation of value addition for improved market access, (d) promotion of basin-wide market information system and its linkage with the national market information system, along with strengthening marketing infrastructure.

5.2.2.3 Human capacity related intervention options

Alike in pastoral and agro-pastoral areas, interventions in the area of capacity building in the highland and intermediate areas of both basins are related with capacitating farmers to manage household resources (both financial and agricultural resources). Similarly, the capacity building for public program implementers should ensure efficient public services and sustainability of the other biophysical and socioeconomic interventions.

5.2.2.4 Intervention design and management related options

Intervention design and management related options are related with promotion of linkages with pastoral



and agro-pastoral areas of both basins for local economic growth through (a) strengthening the pull-push strategy through market linkages between the highland (farming) and lowland (pastoral) areas of the basins to ensure flow of products from surplus to deficit areas within the basins, (b) exploring complementarity in available resource use, (c) strengthening the market information systems within the basins and their linkage with national market information, and (d) mobilizing farmers' and pastoralists' cooperatives as a mechanism of farmer to pastoralist/agro-pastoralist linkages. Similarly, options related with ensuring that interventions are more gender sensitive and more integrated in terms of ensuring the alignment of interventions (both public and non-public) across the different sectors mainly among education, health and agriculture should be considered (see Annex 2). In addition, it will be important to follow progressive approach in scaling up of best practices based on demonstrated evidence and lessons to ensure a steady and sustainable development.

6 Enabling environment and Implementation strategies

The key implementation strategies for the identified interventions are (i) ensuring relevant stakeholders and community participation, (ii) ensuring efficient intervention management arrangements through proper integration and alignment of on-going public and non-public development efforts, (iii) ensuring sustainability through establishing adequate incentive mechanisms for improved management and also through better linkages with available public structure, and (iv) proper documentation of policy and technical evidence for wider scaling up.

6.1 Policy issues

Given the dominant share of pastoral and agro-pastoral production systems in both basins, the issue of developing pastoralism against developing pastoral agro-pastoral areas, will emerge as key policy issue in any development interventions in both basins. Little et al. (2010) argue that “there is an important potential difference between developing pastoralism and developing pastoral areas”. They argue that developing pastoralism implies support for and exploitation of the productive potential of extensive livestock systems, where pastoralism persists and evolves in response to modern market and other conditions. Whereas, pastoral area development involves the expropriation of pastoral resources and replacing livestock production with alternative, and supposedly more productive, land use systems. Though, the different regimes in Ethiopia have implicitly promoted the notion of the development of pastoral areas, there is no evidence that show the comparative advantage and sustainability of promotion of intensive production system as opposed to the productive potential of the extensive livestock production systems indigenous to the lowlands and that produce both live animals and products for a range of different markets, including export.

6.2 Planning

For detail planning of the implementation of the identified interventions, three activities are critically important. The first is comprehensive stakeholder analysis at a local level, which can help in understanding who the different potential resource users are (the ‘community’ who will benefit) and also who may stand to gain or lose from interventions (e.g. upstream and downstream users along rivers). As part of this process, exploration of current access patterns to resources is recommended to identify local customary institutions and representatives, and understand existing resources management strategies and relationships between groups. Engaging with community leaders in an area is important to avoid conflict over identified resources (Magda and Mulugeta, 2012, Abbink et al., 2014). The second is ensuring community involvement and participation in the planning phase to identify local concerns and needs, with room for dialogue and negotiation between planners and communities on the most suitable type/placement/size of interventions.



In general, interventions can have three forms following the validation during the stakeholder analysis and community participation in the planning process. These are (i) removal of existing inappropriate interventions and replacing with new interventions, which is often common in water point development, where the interventions could be inappropriate for many reasons, including being beyond the financial or technical capacity of local people to use or repair or being placed in contentious locations; (ii) rehabilitation of non-functional or poorly performing interventions, or (iii) development of new interventions, which is often an option reserved for instances where the above options have been exhausted and the need for and potential impacts of introducing new intervention has been carefully evaluated, with remedial measures identified to tackle negative effects.

It is very important that the available technological options are explained to communities through a process of dialogue and knowledge-sharing to select the most suitable technology to satisfy local needs. This requires attention to cost, technical issues like hydrological and geological context in case of water resource development, expressed needs and capacities of the community, familiarity and simplicity of the technology, and local availability of construction materials, spare parts and technical support.

6.3 Implementation

To ensure effective implementation of planned activities, it is important to put in place adequate management arrangements, which could be based on customary arrangements or through establishment of resource management committees. In the pastoral context, a combination of formal management committees and customary institutions is often recommended as a better way of management arrangement. The key issues for consideration in the implementation process are related with provision of focus on (a) awareness creation of beneficiaries and relevant stakeholders, (b) alignment and creation of institutional linkages with relevant stakeholders at all levels (federal, regional, zonal, and woreda levels), (v) consideration of capacity building for beneficiaries and if possible for relevant stakeholders, (d) policy engagement based on demonstrated evidences.

6.4 Sustainability

Though measures to ensure sustainability vary by type of development interventions, the key measures are related to (i) establishment of incentive mechanisms for communities to maintain resources developed, (ii) introduction of cost recovery mechanisms to enhance community commitment to maintaining developed resources, (iii) promoting and enhancing linkages among communities, local government and the private sector for effective engagement in addressing emerging challenges, (iv) provision of training to ensure the transfer of know-how and understanding about the importance of the interventions.



7 Conclusions

This report presents an assessment of the socioeconomic resource base, existing challenges and opportunities for socioeconomic development in Wabi-Shebele and Genale-Dawa river basins along with possible intervention options based on analysis of secondary data and primary data generated in eight case study woredas in the two basins that were selected in a systematic random sampling procedure.

The results indicate that both basins cover diverse agro-ecologies and farming systems; however, the lowland agro-ecology with pastoral and agro-pastoral production systems are more dominant. In general, both basins are seriously affected by socio-demographic dynamics (population pressure, reduction of rangeland, reduction of farm size, increased food insecurity etc.), bio-physical changes (recurrent drought, floods, natural resources degradation etc.), and associated low investments and limited access to main services (education, health, markets etc.).

In recognition of major resource constraints (pasture land, water, and other natural resources) and significant challenge to the traditional pastoral livelihoods in pastoral and agro-pastoral areas, the socioeconomic development intervention options are more related with development of markets and its enabling environment, promotion of development support institutions, resource management options, and strengthening the approaches of interventions to be gender sensitive and integrated sector wise (education, health, agriculture, etc.). However, in sedentary farming areas of the basins, the socioeconomic development interventions are suggested to be more focused on (i) promotion of intensification, (ii) promotion of linkages with pastoral and agro-pastoral areas of both basins for local economic growth through (a) strengthening the pull-push strategy through market linkages between the highland (farming) and lowland (pastoral) areas of the basins to ensure flow of products from surplus to deficit areas within the basins, (b) exploring complementarity in available resource uses, (c) strengthening the market information systems within the basins and their linkage with national market information, and (d) mobilizing farmers' and pastoralists' cooperatives as a mechanism of farmer to pastoralist/agro-pastoralist linkages.

Given the dynamic nature of agriculture, there is a need to consider the following strategies in the process of implementation of the interventions: (i) ensuring relevant stakeholders and community participation both in the planning and implementation phases, (ii) ensuring efficient intervention management arrangements through proper integration and alignment of on-going public and non-public development efforts, (iii) ensuring sustainability through establishing adequate incentive mechanisms for improved management and also through better linkages with available public structure, and (iv) promoting progressive implementation based on demonstrated evidence and their scaling up.



8 REFERENCES

- Abbink Jon, Kelly Askew, Dereje Feyissa Dori, Elliot Fratkin, Echi Christina Gabbert, John Galaty, Shauna LaTosky, Jean Lydall, Hussein A. Mahmoud, John Markakis, Günther Schlee, Ivo Strecker, David Turton. 2014. Lands of the Future: transforming pastoral lands and livelihoods in eastern Africa. Working Paper No. 154 . Max Planck Institute for Social Anthropology. Halle / Saale, Germany. ISSN 1615-4568.
- Abeje Teffera. 2014. A bird eye view on Ethiopian rural road service. A report accessed on March 28, 2014 at esap2.org.et/wp-content/.../06/11.-Ethiopian-Rural-Road-Service.docx.
- Ayana Angassa. 2011. Effects of drought on cattle herd dynamics and its implication on local livelihood systems in Borana, Ethiopia. Food Security Center. Universität Hohenheim, Wollgrasweg 43, 70599 Stuttgart, Germany.
- Coppock D Layne (ed.). 1994. The Borana Plateau of Southern Ethiopia: Synthesis of pastoral research, development and change, 1980-91. ILCA (International Livestock Centre for Africa), Addis Ababa, Ethiopia. 393 pp.
- Coppock Layne. 2004. Overview of the PARIMA project and relevant issues. In: Gebru, G., Desta, S., and D.L. Coppock (eds.) 2004. Pastoralism in Ethiopia and the Policy Environment: Linking Research, Development Actors, and Decision-Makers. Summary of Proceedings for a Meeting Held 15 August, 2003, at the International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia. Report produced by the Pastoral Risk Management (PARIMA) Project of the Global Livestock Collaborative Research Support Program (GLCRSP). Utah State University, Logan, Utah, USA. 30pp
- CSA (Central Statistical Agency). 2010. Population and Housing Census 2007, Ethiopia Population Census Commission.
- Desta, S. 2011. Transitions in pastoral practices and livelihoods under changing climate: the case of Borana pastoralists in Southern Ethiopia. Paper presented at “Climate Change Vulnerability and Risk Assessment of Agriculture and Food Security in Ethiopia: Which Way Forward?” July 6-7, 2011. Addis Ababa, Ethiopia.
- Devereux Stephen and Ian Scoones. 2008. The crisis of pastoralism? Discussion Paper 003. The Future Agricultures Consortium. University of Sussex, UK
- Devereux Stephen. 2006. Vulnerable Livelihoods in Somali Region, Ethiopia. Institute of Development Studies, at the University of Sussex, Brighton, BN1 9RE, UK. ISBN 1 85864 612 X. pp 196.
- FDRE. 2007. River Basin Councils and Authorities Proclamation. 534/2007. Federal Negarit Gazeta No 40.
- Gebru, G., Desta, S., and D.L. Coppock (eds.) 2004. Pastoralism in Ethiopia and the Policy Environment: Linking Research, Development Actors, and Decision-Makers. Summary of Proceedings for a Meeting Held 15 August, 2003, at the International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia. Report produced by the Pastoral Risk Management (PARIMA) Project of the Global Livestock Collaborative Research Support Program (GLCRSP). Utah State University, Logan, Utah,



USA. 30pp.

- Getachew Legese, Hailemariam Teklewold, Dawit Alemu and Asfaw Negassa. 2008. Live animal and meat export value chains for selected areas in Ethiopia. Constraints and opportunities for enhancing meat exports. Improving Market Opportunities. Discussion Paper No. 12. ILRI (International Livestock Research Institute), Nairobi, Kenya. 56 pp.
- Hurst M, Jensen N, Pedersen S, Sharma A, Zambriski J. 2012. Changing climate adaptation strategies of Boran pastoralists in southern Ethiopia. Working paper no. 15 Cali, Colombia: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).
- Little Peter, Roy Behnke, John McPeak, and Getachew Gebru. 2010. Retrospective Assessment of Pastoral Policies in Ethiopia, 1991-2008. Report Number 1. Pastoral Economic Growth and Development Policy Assessment, Ethiopia.
- Luseno, W. K., J. G. McPeak, C. B. Barrett, P. D. Little, and G. Gebru. 2003. Assessing the value of climate forecast information for pastoralists: Evidence from Southern Ethiopia and Northern Kenya. *World Development* 31(9): 1477-1494.
- Luseno, W., B.M. Swallow, and A. Kamara. 1998. Pastoralism in Ethiopia, Kenya and Somalia: A Selected Annotated Bibliography. SR/GL-CRSP Pastoral Risk Management Project Technical Report No. 04/98. Utah State University, Logan. 36 pp.
- Magda Nassef and Mulugeta Belayhun. 2012. Water Development in Ethiopia's Pastoral Areas: A synthesis of existing knowledge and experience. Save the Children USA Contents and Overseas Development Institute.
- MoA (Ministry of Agriculture). 2010. The Agriculture Sector Five Year Development Plan (2010/11-2014/15). Ministry of Agriculture. Addis Ababa, Ethiopia.
- MoFED (Ministry of Finance and Economic Development). 2014. Annual Progress Report for F.Y. 2012/13 of Growth and Transformation Plan. Addis Ababa Ethiopia.
- MoWE. 2005. Wabi Shebele river basin integrated development master plan study project. Master plan main report. Vol I. Ministry of Water and Energy. Addis Ababa, Ethiopia
- MoWE. 2006. Genale-Dawa River Basin Resources Development master plan study project. Master plan main report. Vol A. Ministry of Water and Energy. Addis Ababa, Ethiopia
- Muhyadin Mohammed. 2012. Forage seed research and development in Somali regional state. In: Getnet Assefa, Mesfin Dejene, Jean Hanson, Getachew Anemut, Solomon Mengistu, and Alemayehu Mengistu (eds). Forage seed research and development in Ethiopia. Ethiopian Institute of Agricultural Research.
- PFE, IIRR and DF. 2010. Pastoralism and Land: Land tenure, administration and use in pastoral areas of Ethiopia. Pastoralist Forum Ethiopia (PFE), International Institute for Rural Reconstruction (IIRR), and the Development Fund (DF). ISBN 9966 - 754-07-5.
- Shanko D. 2013. Commune Program in Pastoral Areas-Current Practices, 2003 and 2004 E.C Achievements, Challenge and next Steps part II. Pp 34-37. In : Proceedings of national Workshop on



Pastoralization by Jigjiga University. February 25-26, 2013.

Tenna Shitarek. 2012. Ethiopia Country Report. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197474/Econ-Res-Ethiopia-Country-Report.pdf

UNHCR. 2004. Genealogical table of Somali clans. UNHCR - The UN Refugee Agency.

World Bank. 2009. Global Facility for Disaster Reduction and Recovery: Disaster Risk Management Programs for Priority Countries. Global Facility for Disaster Reduction and Recovery GFDRR Secretariat. Washington. USA.

World Bank. 2013. Ethiopia: Pastoral Community Development Program. Phase III. Addis Ababa, Ethiopia.



9 Annexes

Annex 1 Socioeconomic Development Interventions for pastoral and agro-pastoral areas of the basin (Arero and Dire woredas of the Genale-Dawa river basin and Jigjiga and Gode woredas of the Wabi Shebele basin)

Category	Development challenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree significance of risk	Risk mitigation measures	Indirect opportunities	Externalities
Production related options	Narrow livelihood options	New livelihoods outside farming	Youth and energetic leave farming	local	medium	low	Create incentive mechanisms for educated farmers	Improved productivity of sub-sector and livelihoods	-
	Limited linkage with agricultural research	Strengthening research extension linkages	No risk						
	Limited access to agricultural inputs and technologies	Strengthening/establishing input delivery system	Genetic erosion	Local / regional	high	high	Promote genetic conservation	Market creation for input suppliers	
	Considerable post-harvest losses	Promoting improved post-harvest management	No risk						



Category	Development challenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree significance of risk	Risk mitigation measures	Indirect opportunities	Externalities
Market related options	Market problem (livestock, livestock products, sesame, bamboo, coffee, vegetables, honey, gum and resins)	Creation of new market dynamics (value addition, access, system)	Traditional support systems compromised	local	Medium	Low	Establish alternative coping mechanisms	Reliable institutional system created	Ethio-kenya highway
			Exposure invasive foreign species	Local / regional	high	high	Put in place quarantine and on site monitoring system	Surveillance mechanism established	
			Genetic erosion	regional	high	high	Breed conservation/ Ranch system regulation	National branding of livestock resource	
			Market failure (monopoly etc.)	Local	low	high	Market regulation system	Fair income distribution / economic transformation	



Category	Development challenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree significance of risk	Risk mitigation measures	Indirect opportunities	Externalities
	Limited group action for scale economy	Use of local and traditional institutions to promote group action	No risk						
		Promotion of formal institutions like farmers cooperatives and associations	Weakens traditional/customary institutions	Local	high	medium	Establishment of coops to base itself on traditional ones	Improved institutions	-
	Limited infrastructure development (roads, market, telecommunication)	Targeted investments into infrastructure development	No risk						



Category	Development challenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree significance of risk	Risk mitigation measures	Indirect opportunities	Externalities
Human capacity building	Limited capacity of resource management at community and household level	Promoting efficient management of available resources and services at community levels	No risk						-
		Household capacity development	No risk						
	Conflict over resources	Establishing conflict prevention and resolution mechanisms including indigenous systems	No risk						



Category	Development challenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree of significance of risk	Risk mitigation measures	Indirect opportunities	Externalities
Intervention design and management options	Limited highland-lowland economic linkage	Promotion of basin level market information system	No risk						
	Gender inequality	Strengthening mainstreaming gender issues across interventions	No risk						
	Limited alignment of interventions (both public and non-public)	Facilitating the integration of sectoral programs across the different sectors mainly among education, health and agriculture	No risk						
	Limited consideration of indigenous knowledge	Consideration of indigenous knowledge	No risk						

Note: The Intervention options are based on case study assessment at Arero and Dire woredas of the Genale-Dawa river basin and Jigjiga and Gode woredas of the Wabi Shebele basin



Annex 2 Socioeconomic Development Interventions for sedentary farming areas of the basin (Intermediate and high-land area - Dolo Mena and Bensa woredas of the Genale-Dawa river basin and Adele and Kombolcha woredas of the Wabi Shebele basin)

	Develop-ment chal-lenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree signifi-cance of risk	Risk mitigation measures	Indirect oppor-tunities	Externalities
Production related	Low input, low output production system	Strengthening the intensifi-cation of the farming systems (irrigation, improved tech-nologies and practices etc.)	Overlap of activities with other develop-ment efforts	local	Medium	Medium	1) Focus on demon-stration of best practices for wider scaling up, 2) Alignment with other public and donor programs	-	-
	Considerable post-harvest losses	Promoting improved post-harvest management	No risk						



	Develop-ment chal-lenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree signifi-cance of risk	Risk mitigation measures	Indirect oppor-tunities	Externalities
Market related options	Limited market ties among different production systems	Strengthening the market information systems within the basins and their linkage with national market information	High re-quirement in infrastructure development	local	High	High	1) Align with public interventions 2) Strengthen local market information systems	-increased trade of other goods and services	- - -
		Mobilizing farmers' and pastoralists cooperatives as a mechanism of farmer to pasto-ralist/agro-pas-toralist linkages	Cultural di-versities	Local	Low	Low	1) Awareness creation 2) Capacitate target coops in providing efficient services	-	-
	Limited in-frastructure development (roads, mar-ket, telecom-munication)	Targeted in-vestments into infrastructure development	No risk						



	Develop-ment chal-lenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree signifi-cance of risk	Risk mitigation measures	Indirect oppor-tunities	Externalities
Human capacity	Limited capacity of resource management at commu-nity and household level	Promoting effi-cient manage-ment of avail-able resources and services at community level	No risk						
		Household capacity devel-opment	No risk						
	Conflict over water for irrigation b/n upstream and down-stream com-munities	Establishing wa-ter management mechanism	No risk						



	Develop-ment chal-lenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree signifi-cance of risk	Risk mitigation measures	Indirect oppor-tunities	Externalities
Intervention design and management options	Limited alignment of interven-tions (both public and non-public)	Promotion of integrated approach across the different sectors mainly among educa-tion, health and agriculture)	No risk						
	Limited linkage b/n highland and lowland systems	Strengthening the pull-push strategy through market link-ages between the highland (farming) and lowland (pastro-ral) areas of the basins	Risks associ-ated with lack of focus	local	Medium	Medium	1) Engage with priori-ty focus areas 2) Aligning with other governmental and non-governmental interventions	<ul style="list-style-type: none"> • Cultural syner-gies • Reduced clan and ethnic con-flicts 	-



Development challenge	Intervention	Risk	Scale of effect	Probability of risk occurring	Degree significance of risk	Risk mitigation measures	Indirect opportunities	Externalities
Limited complementarity in resource use	Designing interventions to ensure complementarity in use of available resource	High requirement in infrastructure development	local	High	High	1) Align with public interventions 2) Promote the involvement of private sector	Reduce resource use conflicts	-
Gender inequality	Mainstreaming gender issues across interventions	No risk						

Note: The Intervention options are based on case study assessment at Dolo Mena and Bensa woredas of the Genale-Dawa river basin and Adele and Kombolcha woredas of the Wabi Shebele basin



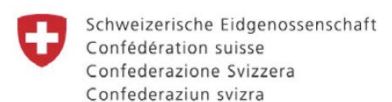


The Water and Land Resource Center (WLRC) is an autonomous research for development center established in 2011 affiliated to Addis Ababa University (AAU), Ethiopia and Center for Development and Environment (CDE) of University of Bern.

The WLRC is basically a reorganization of the previous Soil Conservation Research Programme (SCRIP), which was initiated by CDE in collaboration with Ministry of Agriculture in 1981, and it builds itself on SCRIP's research database and set-ups. Both SCRIP and the core functions of WLRC has been supported by the Swiss Development Cooperation (SDC). The Center is governed by a Steering Committee constituted from four state ministers - MoA, MoWIE, MoFED, MoST, and the director of CDE as a member. These is co-chaired by AAU and SDC. The Center has been instrumental in generating pertinent information that helps in supporting and informing the current Integrated Water and Land Resource Management (IWLRM) activities in the country both in highlands and lowland pastoral areas.

The core mandate of WLRC is research for development in sustainable water and land management which it delivers through three functions: i) Knowledge Generation (research) of hydro-climate, hydro-sedimentology, Sustainable Land Management (SLM), land use, SLM and Integrated Water Resource Management from closely monitored learning watersheds and observatories some over 30 years, ii) Knowledge Management for cross-sector and cross-scale policy and development actions and iii) Capacity Development of key partners on IWLRM and geo-information technologies and techniques. WLRC has established a web-based and the state of the art Water and Land Resources Information System (WALRIS) (www.wlrc-eth.org; walris.wlrc-eth.org) which is openly accessible for academics, researches and development partners including policy makers.

WLRC closely collaborates with international and national research universities and research institutes in undertaking water and land related researches. It also undertakes a commission research on monitoring and evaluation of IWRM & IWM interventions.



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