

MAPPING OF KEY NATURAL RESOURCES

IN THE CROSS-BORDER AREA
BETWEEN KENYA, ETHIOPIA & SOMALIA





**MAPPING OF KEY NATURAL RESOURCES IN THE
CROSS-BORDER AREAS OF KENYA, SOMALIA & ETHIOPIA**

**BUILDING OPPORTUNITIES FOR RESILIENCE IN
THE HORN OF AFRICA**

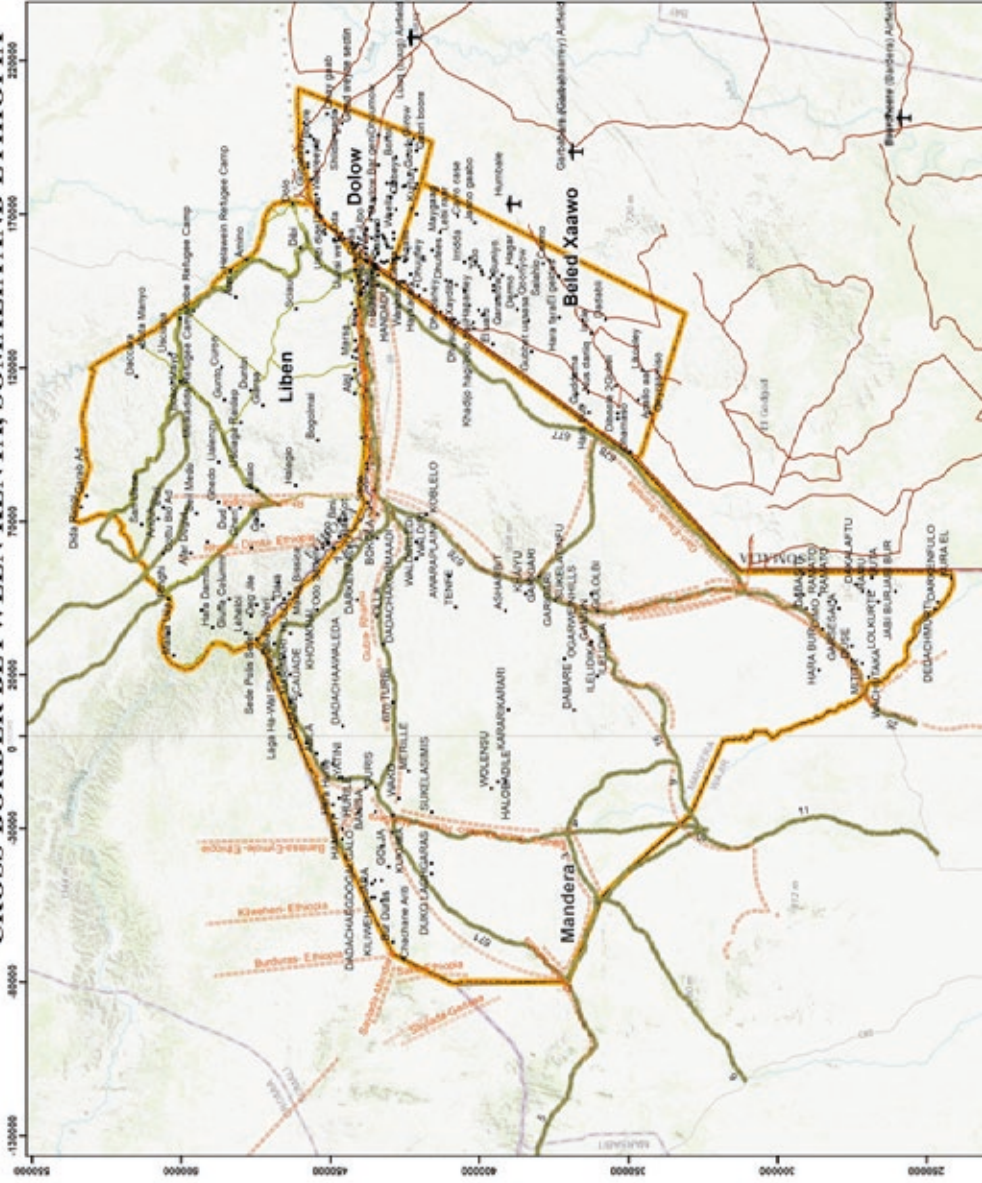
EXECUTIVE SUMMARY

Executive Summary

BACKGROUND: The *Building Opportunities for Resilience in the Horn of Africa (BORESHA)* project is a cross-border intervention targeting community NRM management in the Mander Triangle which covers parts of Kenya, Ethiopia and Somalia. The project is led by a consortium led by Danish Refugee Council (DRC) and comprising of CARE International, WYG and World Vision International (WVI). Under the BORESHA Consortium, CARE International is taking the lead in cross border rangeland and other shared natural resources programming to ensure they are equitably and sustainably managed.

OBJECTIVES: This NRM Mapping study was carried out as part of the inception phase of the BORESHA project so as to develop a number of GIS layers of the areas targeted by the project. These included **Infrastructure:** mapping key features (roads, rivers, mountains, urban centres, refugee camps); **Water resources and infrastructure:** existing resources water resources/sources, (dry season wells, rivers, boreholes); an infrastructure potential map to inform the 3R approach of Recharge, Retention and Reuse; **Land cover and land use:** wet and dry season grazing areas including dry season reserves, key land use types and vegetation types; **Resource use and management:** document resource uses and management, traditional systems of natural resource and management (NRM) in the area; **Human and livestock mobility:** patterns of mobility (livestock and people) within and outside the area, and **NRM related problems:** document any significant NRM related problems and issues.. The study was conducted in the cross-border area comprising Mander county (Kenya), Doolow district in Gedo region (Somalia) and Dollo Ado district in the Somali Region (Ethiopia).

CROSS-BORDER BETWEEN KENYA, SOMALIA AND ETHIOPIA



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Data Sources:
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Methodology:

The study design used a mixed-methods approach, incorporating both quantitative and qualitative methods. The mapping methodology included use of satellite images that were analysed in conjunction with ground truthing observations and participatory community mapping exercises. To obtain data for ground-truthing, Global Positioning System (GPS) points were obtained corresponding to the various land uses and land cover forms, location of invasive species, rainfed agriculture, irrigated agriculture, shrublands, woodlands, and water bodies/sources. The study used at least two time-period data sets to detect changes such as land use and land cover.

FINDINGS & ANALYSIS: The findings of this NRM mapping study are based on a systematic analysis of the primary and secondary data collected. The findings and analysis presented follow the six themes identified for this study.

1

Infrastructure

Existing Transportation infrastructure is poorly developed especially in key cross border towns of Suftu, Doolow and Dollo Ado which are served by non-paved road. Mandera has recently benefited from up-grading of some of the roads within the town to bitumen standard through investment by the county government of Mandera. In Ethiopia, Siftu is connected to the capital of Somali region (Jijiga) through an all-weather road. However, the connection between the Kenya/Ethiopia Daawa River crossing at Suftu and Dollo Ado, there is a loose surface road which becomes inaccessible during heavy rains resulting to residents across border to use makeshift rafts to cross along River Daawa. Roads in Doolow, Somalia are loose surface and would pose access challenges during wet weather conditions. Air transport for the three areas is via airstrips with unpaved runways.

Mobile telephone communication is well-developed with Safaricom & Airtel (Kenya), Hormuud Telecom (Somalia) and EthioTel (Ethiopia) networks available. Communities along the border tend to use whatever network is available irrespective of the country where the service provider is domiciled.

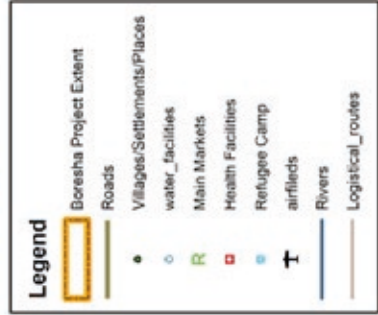
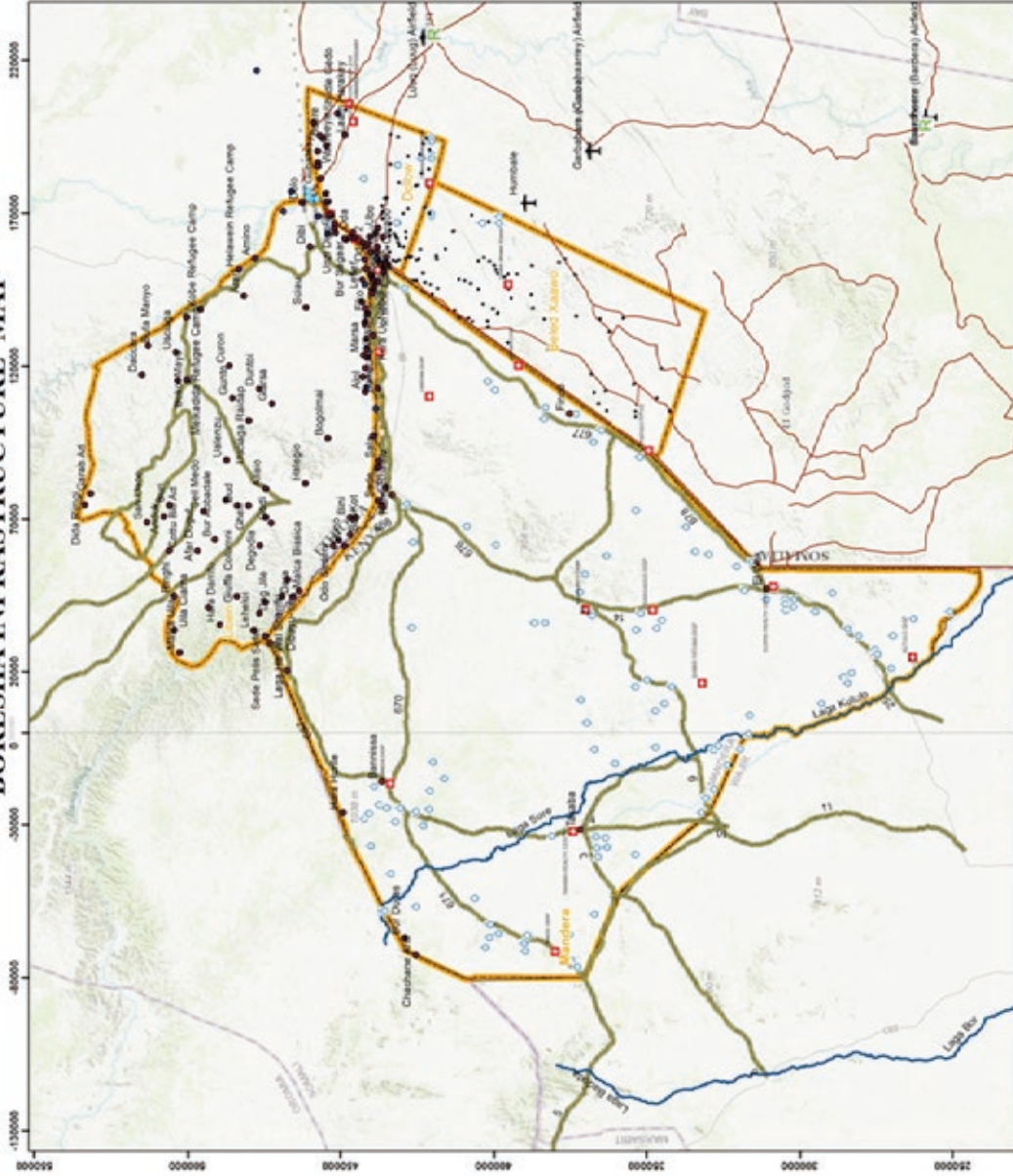
Compared to Doolow and Dollo Ado, Mandera offers advanced health and education services in the region. This serves to attract communities from the neighbouring countries, who access health services in local hospitals in Mandera and also enroll their children in schools across the border.

Existing flood control infrastructure comprises of gabions along the river banks at certain heavily populated sections of the river bank such as Rhamu. In this respect, most investment in flood control on the River Daawa occurs on the Kenya side of the border.

Markets in Dolo Ado are well organised via a cooperative that supports trade of farm products in Mandera and Doolow in Somalia. Though this consists of poor infrastructure for the farmers' market. Most of the agricultural produce grown by communities within the triangle is supplied to local markets such as Rhamu and Mandera for Kenya, Suftu for Dollo Ado and Doolow and Belet Xaawa for Somalia.

Key livestock markets are located at Mandera and Dollo Ado. Mandera and Elwak both have slaughterhouses, while other markets offer slaughter slabs. In Mandera, livestock products are sold in Banisa, Rhamu and Mandera, as well as other Kenyan counties of Wajir and Nairobi. Livestock from Gedo are transported to markets in the Bay region, Bokol, Mogadishu and Lower Juba (specifically, Kismayo). In addition, traditional cross-border livestock markets have existed in Doolow, Mandera and Garissa in Kenya. In Ethiopia, key livestock markets are in Dollo Bay and Dollo Ado towns. In addition, small-scale livestock trading occurs within the villages.

BORESHA INFRASTRUCTURE MAP



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 Datum: WGS 1984

Data Source: ESRI BaseMap
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2

Water resources and infrastructure

The cross border area between Kenya, Somalia and Ethiopia is drained by the Laag Dheera and Genale-Dawa sub-basins. Major surface water sources are the Daawa River which begins from the Ethiopian highlands and traverses Kenya, Ethiopia and Somalia, the Genale River which runs from the Ethiopian highlands and onto the border with Somalia before joining with the Daawa River to form the Juba River. Major underground aquifers are the Juba (transboundary between Ethiopia and Somalia) and the Daawa aquifers (transboundary between Kenya, Ethiopia and Somalia). An assessment of the condition of existing water supply infrastructure revealed that most of water infrastructure which are mainly wells and boreholes are complete and fully operational. However, there were cases of incomplete and non-operational infrastructure as well.

Water samples were obtained from both ground and surface water sources and analysed for physico-chemical parameters. For surface water, river samples tested has turbidity levels above the recommended 5 Nephelometric Units (NTU). Samples obtained from the R. Daawa had the highest turbidity levels (863-800 NTU) for the Kenya/Ethiopia section followed by R. Ganale in Ethiopia (562-670 NTU). The Doolow section of R. Daawa had turbidity values of (596-619 NTU). Total Suspended Solid (TSS) values were significantly above the recommended 30mg/l the Kenya/Ethiopia section of the R. Daawa at 812-924 mg/l but significantly lower for the R. Ganale (20-60 mg/l) These values are evidence of high sediment attributable to upstream farming activity. The groundwater tests revealed two sites where the salinity levels exceeded acceptable drinking water standards at Eymole (Kenya) with TDS of 3794mg/l against a recommended 1000 mg/l, Af Arro (Ethiopia) with Cl of 1309mg/l against a recommended 250mg/l. Interventions to minimise sediment loading for the two rivers will be required. Regarding ground water, the two affected villages require additional investment in drinking water sources water of acceptable quality.

The major water uses in the Manderia Triangle are irrigated farming (both abstraction and are flood/spate irrigation) and livestock watering. Spate Irrigated farming or flood recession farming is practiced on the lower reaches of the Genale and Daawa rivers of the Somali region of Southern Ethiopia and at Rhamu Dimtu, Malkamari and Harere areas of Kenya/ Ethiopia section of the Daawa river. Most of the irrigation infrastructure comprises earth canals and diesel run pumpsets. The irrigation canals in all three countries are in need of investment to more efficient concrete canals. recent flooding has damaged a significant proportion of pumping equipment and this need to be replaced.

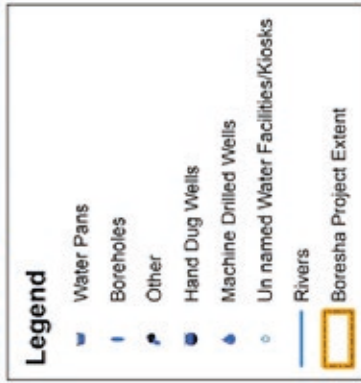
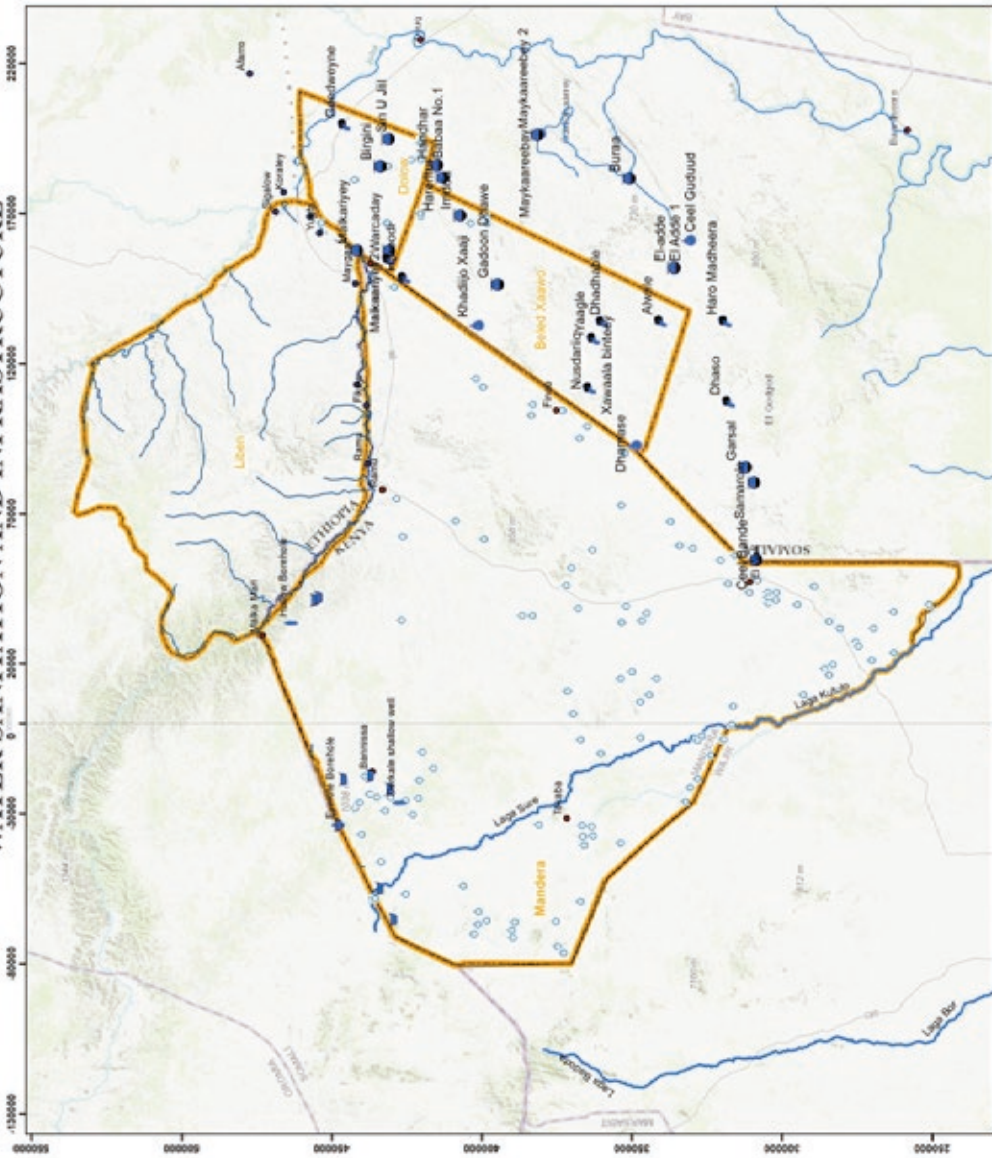
3

Land cover and use

Livestock production is the dominant land use pattern in the Manderia triangle. Along the riverine areas i.e. Daawa River (Manderia, Dollo Ado, Doolow), Genale River (Dollo Ado) and Juba (Doolow), agro-pastoralism is a dominant land use pattern with majority of the farmers practising irrigated farming. Land Use Change analysis for the project area was conducted for the period 2015 to 2018 to determine *Prosopis juliflora* invasion. In normal circumstances land cover analysis is done over long time epochs (standard 20 years) for a large spatial coverage. The extent of *Prosopis Juliflora* invasion on the project area is small compared to overall spatial extent hence the need to shorten land cover analysis period for the purpose of demonstration on a map. Findings indicate that proliferation of invasive *Prosopis juliflora* has increased, largely caused by changing settlement patterns with decreasing human mobility while retaining mobile pastoralist herds, especially in along R. Dawa and Ganale. The increased spread of *Prosopis juliflora* is attributed to livestock movement towards watering areas. This,

combined with rapid and unregulated clearing of land for farming and dry season pasture along the riverine sections creates a conducive environment for spread of the species. This rapid spread of *Prosopis* could cause an ecological shift, where the dominant vegetation types are displaced by *Prosopis*.

WATER SANITATION AND INFRASTRUCTURE



Data Sources:
 Satellite imagery: ESRI Basecamp
 Date of Acquisition - 02/2017

File Code: BORESHA/KE/2008/RS/100_04
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Resource use and Management

A major issue with transboundary water resources management (WRM) is the conflicting assumptions on resource availability and lack of agreement by riparian states on sharing arrangements. Communities in the 3 states within the triangle are heavily dependent on surface water and shallow ground water for riverine communities and ground water for communities settled away from the river.

Thus these assumptions and lack of agreements on WRM will have a huge impact on the communities reliant on the shared water resources. For example, the Shabelle basin, lacks integrated planning efforts by both Somalia and Ethiopia administration and thus is projected to create a situation where demand surpasses available river flows in the future.

There is a slight increase in land under farming from 0.2%-3.2% on the overall land use patterns within the region could be attributed to increase in population, and increased adoption of alternative livelihoods especially agropastoralism.

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Human and Livestock mobility

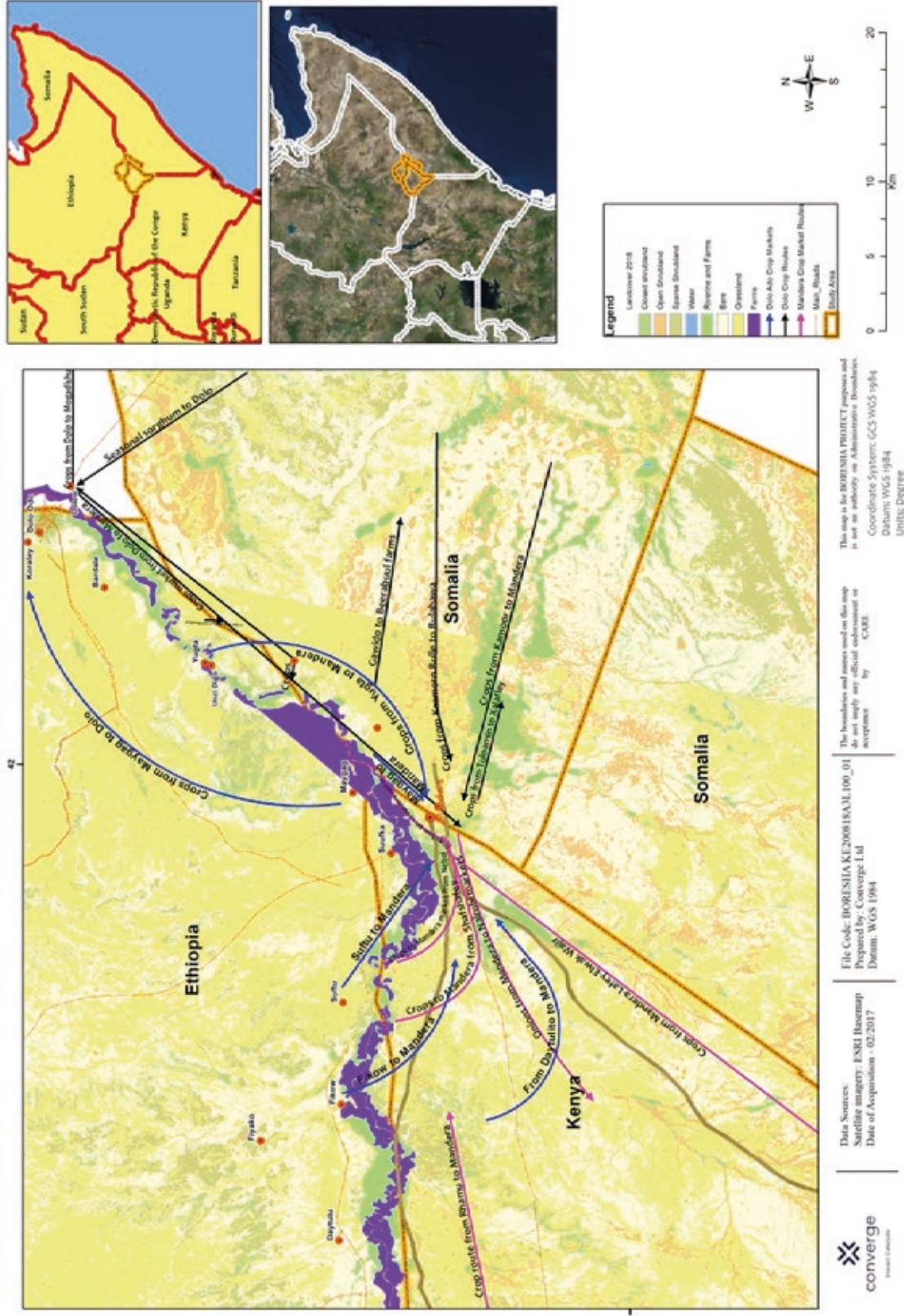
This study found that livestock mobility is seasonal in nature and is influenced by availability of pasture and water for livestock. Human and livestock mobility are dependent on the grazing pattern seasons between the dry and wet seasons. In addition, other factors include trade and conflict as elements that also influence the mobility patterns of the population.

Livestock movement has significantly shifted in some areas in Mandera. Before 2016, livestock from Kenya would be moved into Somalia to access pasture at Weyel, Odha, Farda Jilloo and Unsi. The construction of the security fence along the Kenya/Somalia border has restricted movement by Kenyan pastoralists to these locations. Currently, the livestock move towards Rhamu and Qalalio in search of pasture. During the long dry season, livestock are moved to 'Jilal – Oraled'. There is in-migration from the south to pastures referred to as 'Bandia' with pastoralists coming to access the pasture around the River Daawa.

Movement of livestock within Somalia occurs towards the Bay/ Bakool regions and to the south towards the lower Juba. Some of the communities along the Somalia/ Ethiopia border move across the international borders in search of pasture. However, this movement only occurs during critical dry seasons.

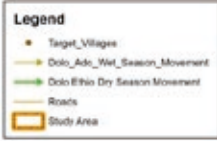
Factors that contribute to population movement in cross-border Area of Kenya, Somalia and Ethiopia include education, trade, medical care and employment opportunities. Inhabitants from Doolow and Dollo Ado move to Kenya in access for these opportunities. movement to Somalia and Ethiopia from the Kenya side is less pronounced and could be largely attributed to security concerns and increased border controls.

CROSS-BORDER BETWEEN KENYA, SOMALIA AND ETHIOPIA LANDCOVER MAP SHOWING MAJOR FARMING AREAS AND CROP MARKET ROUTES



DOLO ADDO LIVESTOCK MOVEMENT DRY AND WET SEASON MAP

Countries: Kenya
Ethiopia
Somalia



Data Source:
Satellite imagery: ESRI BaseMap
Date of Acquisition: 02/2017

File Code: BOREMIA/KE/2008/BAU/100/01
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Somalia



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6

NRM Related Problems

Conflict:

Conflict in the pastoralist land of the Horn of Africa has been attributed to the customary raiding for cattle, competition over natural resources such as pasture and watering-points, and the proliferation of small arms. The main drivers of conflict include extreme weather condition such as frequent and prolonged drought which force affected communities to move into areas that are not traditionally occupied by their clans; prevalence of diseases due to mobility of livestock; mushrooming settlements in Mandera from IDPs and other community members who have lost their livestock (pastoral dropouts) especially in the peri-urban centres, and instigation of local politicians. During the dry season, increased tensions between the herders and farmers along the River Daawa has been experienced as they share the same source of water.

Cross-border conflict within and between Kenya, Somalia and Ethiopia related to NRM, needs to be viewed in the broader context of the political instability in both Somalia and the Ethiopian Ogaden. Factors that contribute to broader insecurity that need to be considered in Somalia would include the segmented nature of the Somali social fabric, constituencies that benefit from armed conflict and ill-informed donor assistance and foreign policy agendas. A key threat in this area is the presence of Al-Shabaab as reported by the community around Elwak region and sometimes they move inwards towards Wargadud area. In Finno, Communities in Dolo Bay indicated that there's are potential conflict zones towards the border with Somali and within Ethiopia towards Barrey. In addition, Belet Xaawo and Doolow in Somalia were known to be potential conflict zones for a long time. Administration of these towns would change hands between Militia groups and the Federal Government of Somalia.

Several mechanisms for the mitigation of conflict have been documented for communities in the Mandera triangle including disarmament and use of inter-clan peace initiatives. Communities in the three countries mentioned the existence of traditional conflict mitigation systems through the councils of elders. The elders work closely with the decentralized government to resolve conflicts at the community level.

Gender:

The gender roles in pastoral society are often biased, hindering women's access to resources and extension services and their participation in decision-making. Ownership of assets such as land, livestock and small businesses is majorly by men due to the patriarchal culture of the pastoral community. Few women own assets and majority of ownership of assets for the women was associated with their husbands, brothers or fathers. Land is managed by both men and women based on their gender roles and cultural norms though effects such as drought and flooding increases the vulnerability of women and children as they are heavily dependent on agricultural produce as their main source of livelihood. Decentralized systems of governance in Kenya have destabilized the social organisation that were once supported by the national government such women and youth group organizations.

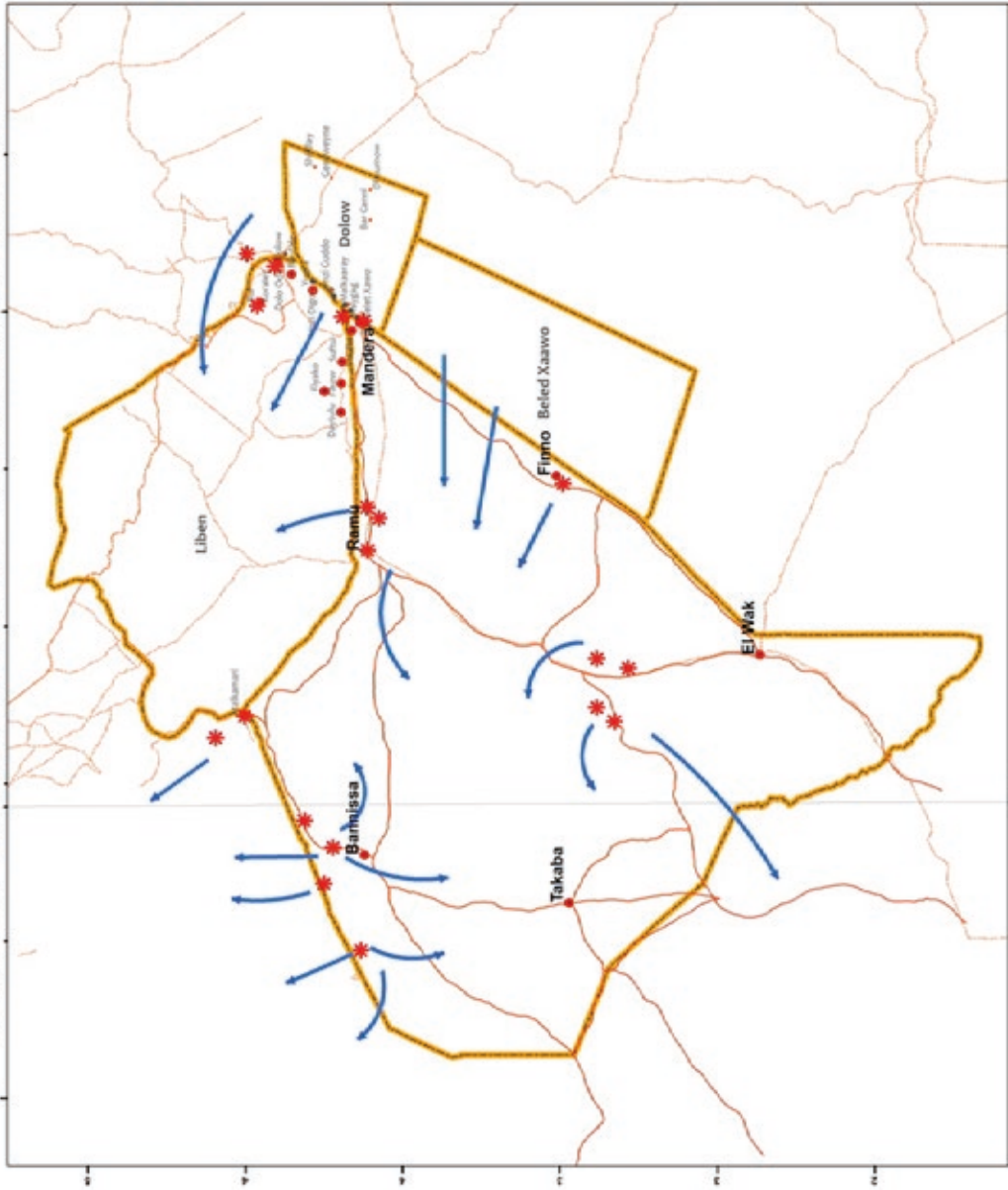
Social Inclusion:

In the three countries the Somali bantu farming communities (Neboi, Bardale, Doolow) emerge as having lower access to opportunities including investments by government entities. Planning tends to focus most of its efforts on pastoral livelihood activities for the communities alienating the agro-pastoralists and the increasing number of pastoral dropouts affected by either drought or conflict that have migrated into the peri-urban centres.

A significant number of youths were unemployed and do not practice pastoralism. There is heavy reliance for white collar jobs among the youth though majority of them have not received tertiary education and also lack vocational skills.

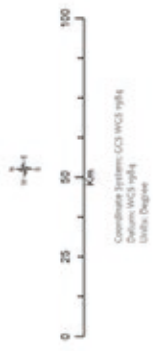


CONFLICT HOTSPOTS AND POPULATION MASS MOVEMENT



Legend

- ★ Conflict Hotspots
- Settlement/Villages
- Unstable Region
- Population Movement



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Conclusions and Implications For Boresha Project:

The conclusions and implication for BORESHA project are based on the findings and analysis of the NRM mapping of data collected through interviews, focus groups, secondary data and participatory mapping are organized according to the NRM mapping criteria areas.

Policy and Institutional Environment

Cross-border NRM: institutional structures for cross-border NRM related to livestock and irrigated farming are largely informal. These will need to be enhanced and adopted into mainstream working of the three governments.

Gender and Social Inclusion: All efforts should be made to enable women and youth to be part of the formal cross border trading structures. This will require support and recognition by the formal government structures whereby their contribution will be recorded and documented.

The study identified certain vulnerable and marginalized communities such as the Somali bantu. Deliberate effort needs to be made to include them in decision-making and resource allocation processes.

Migration: at the moment migration across the three countries within the cross-border region is largely irregular. The level of interdependence of cross-border communities requires that more investment is made in facilitating border crossings including having conveniently situated border control points and possible investment in river infrastructure e.g. Mandera and Dollo Ado.

Trade and Markets: a common policy on enhancing trade and development of markets for both livestock, livestock products and horticulture produce is necessary to enhance both pastoral and agro pastoral livelihoods.

Youth empowerment: The high proportion of youth in the cross-border region necessitates that the three countries develop strategies of meeting the aspirations of this constituent. Cross-border policy on Technical Vocational Education and Training (TVET), creating market employment opportunities, and access to capital for youth needs to be agreed upon. An additional dividend of this is that it also acts as a counter-terrorism measure and mitigates conflict.

Community Attitudes to Cross-Border NRM

The study revealed that communities living in the cross-border areas of Kenya, Ethiopia and Somalia share common social-cultural backgrounds and livelihoods. These are form the fabric of natural resource management and utilization in the area. In addition, these communities all have progressive aspirations towards (a) improving their economic situations, (b) enhanced livelihoods and coping capacities, (c) reduced conflict over utilization of shared resources.

This was evident across multiple sectors as evident in (a) the increased adoption of irrigated farming as both complementary to and as an alternative to primarily pastoralist lifestyles (b) interest in adoption of coping strategies such as investment in fodder cultivation and storage, (c) establishment of farmers marketing cooperatives, (d) a desire for youth to be engaged in income-generating activities (e) desire for marginalized and vulnerable communities to be included in decision-making and to have access to development opportunities. Any intervention on cross-border NRM management will need to establish the necessary partnerships (or incentivize existing partnerships) to respond to, and build on the aspirations of these communities.



Potential Investments towards Resilience

Investment needs to be made in critical transport infrastructure to enhance cross-border movement and improve opportunities for resource sharing. This also calls for support to communities to diversify their livelihoods activities.

There is an apparent weak organizational base for women groups particularly with regard to trade facilitation. Concerted efforts should be placed in including funding in trade focused institutional capacity development.

More research should be conducted to document experiences of women traders at (a) key local markets in Mandera, Rhamu, Dollo Ado and Doolow, and (b) border points with a view to informing future support to enhancing access to capital, linkages to farms and access to markets for local produce.

Implications for BORESHA Project

Investment planning: the NRM mapping exercise has clearly identified opportunities for future investment in enhancing livelihoods for pastoralist communities within the Mandera Triangle. The study has also marked out investment priorities that BORESHA could incorporate in current or future programming.

Choice of Interventions: BORESHA will need to emphasize interventions that (a) maximize impact on beneficiary populations in terms of enhancing livelihoods and promoting resilience, (b) address the root causes of conflict related to cross-border sharing of natural resources by promoting understanding amongst communities and cooperation by governments of neighbouring countries.

Targeting: Targeting of interventions under BORESHA needs to take into consideration (a) inclusion of marginalized sub-clans and other vulnerable populations who are not currently served by the dominant Garre-Degodia-Marehan Somali clan socio-politico-economic systems (b) ensuring that livelihood and economic enhancement opportunities reach the women, youth, physically challenged.

Importance of establishing partnerships: it is evident from the NRM mapping study that more need to be done to enhance cross-border working relationships between state and non-state actors. BORESHA is an opportunity to build and enhance such partnerships in line with existing regional agreements (most visibly IGAD). Such partnerships will need to be cross-sectoral and cross-border in nature in order to maximize on benefits to target communities and sustainability of interventions.





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