



**Climate change and resource use
conflicts: The case of
Northern Kenya drylands**

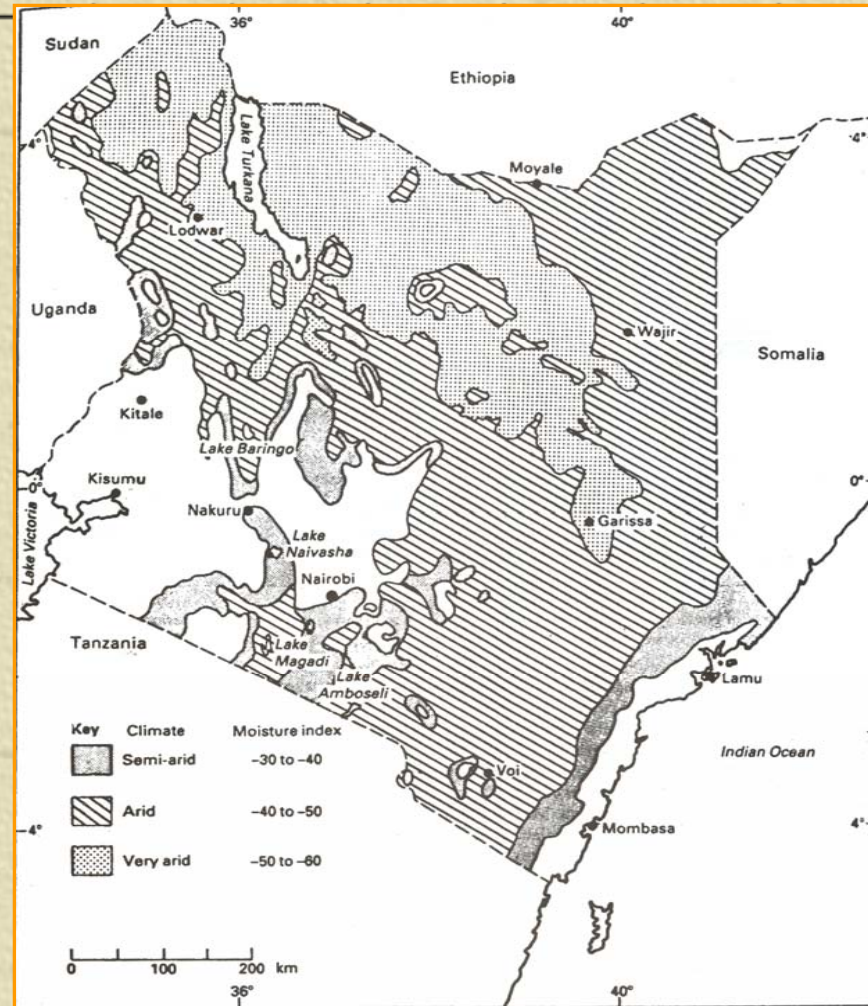
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Characteristics of Kenya's drylands

- ✦ Low-lying plains covering about 80% of the country with isolated hills
- ✦ Hot and dry climate, brief and erratic low rainfall, 150-750 mm annually - flooding
- ✦ Poor soils with scanty thorny vegetation cover
- ✦ Agriculturally (crops) marginal

Drylands of Kenya and neighbouring countries



Importance and use of Kenya's drylands

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- ✦ Suitable land use is nomadic pastoralism and wildlife conservation
 - ✦ Support about 25% of the rural population
 - ✦ Support more than 70% of the livestock population
 - ✦ Support 90% of the national parks and game reserves

Importance and use of Kenya's drylands (cont)



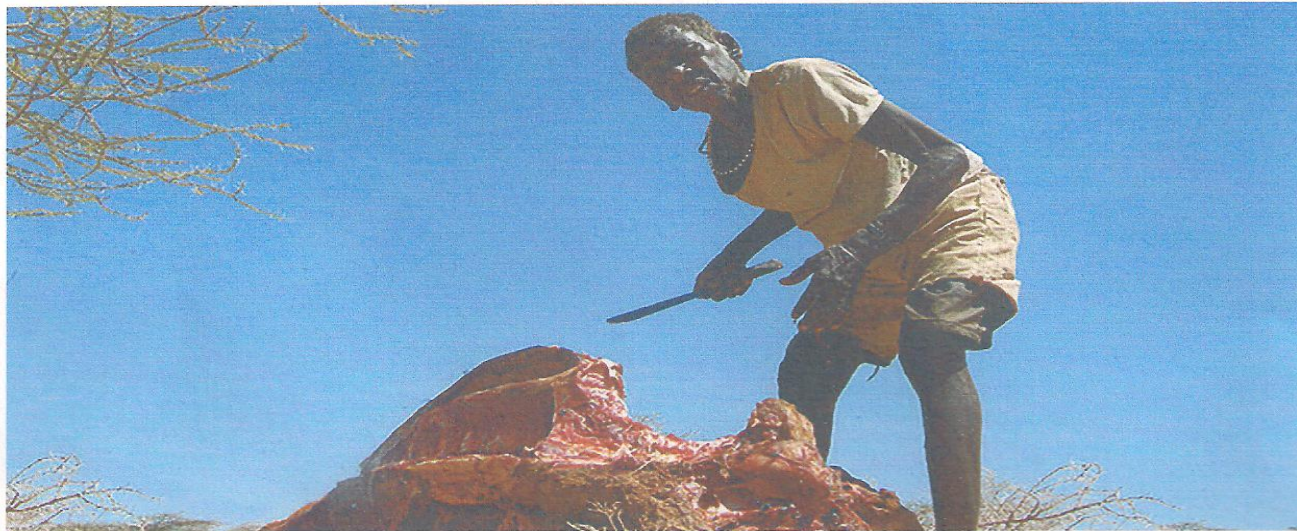
Effects of climate change in Kenya's drylands

- ✦ Frequent, prolonged and severe droughts
- ✦ Rivers, dams, wells drying up, quality affected
- ✦ Migration in search of pasture and water
- ✦ Resource use conflicts, bloody confrontations
- ✦ Loss of lives in both human and livestock
- ✦ Reduced income, higher incidence of poverty
- ✦ Hunger, poor health, hopelessness
- ✦ Poor pastoralists turn to plant gums & resins

The aftermath of drought and cattle rustling

31 killed in Laikipia cattle raid

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A man scavenges on a carcass at Acher's Post in Samburu on June 11, 2009. Recent spate of cattle rustling is being blamed on severe drought in the area. PHOTO/ JOSEPH KANYI

By ALPHONCE SHIUNDU Posted Tuesday, September 15 2009 at 13:57

What are gums and resins?

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- ✦ Gums and resins are dried exudation from stems & branches of *Acacia*, *Commiphora* and *Boswellia* spp.
 - ✦ Form a major component of the vegetation in drylands, *Acacia-Commiphora* woodland
 - ✦ Products of commerce, with potential to generate cash income and alternative livelihood in drylands

Major commercial gums and gum-resins resources

✦ Gum arabic

Acacia senegal

Acacia seyal

✦ Myrrh

Commiphora myrrha

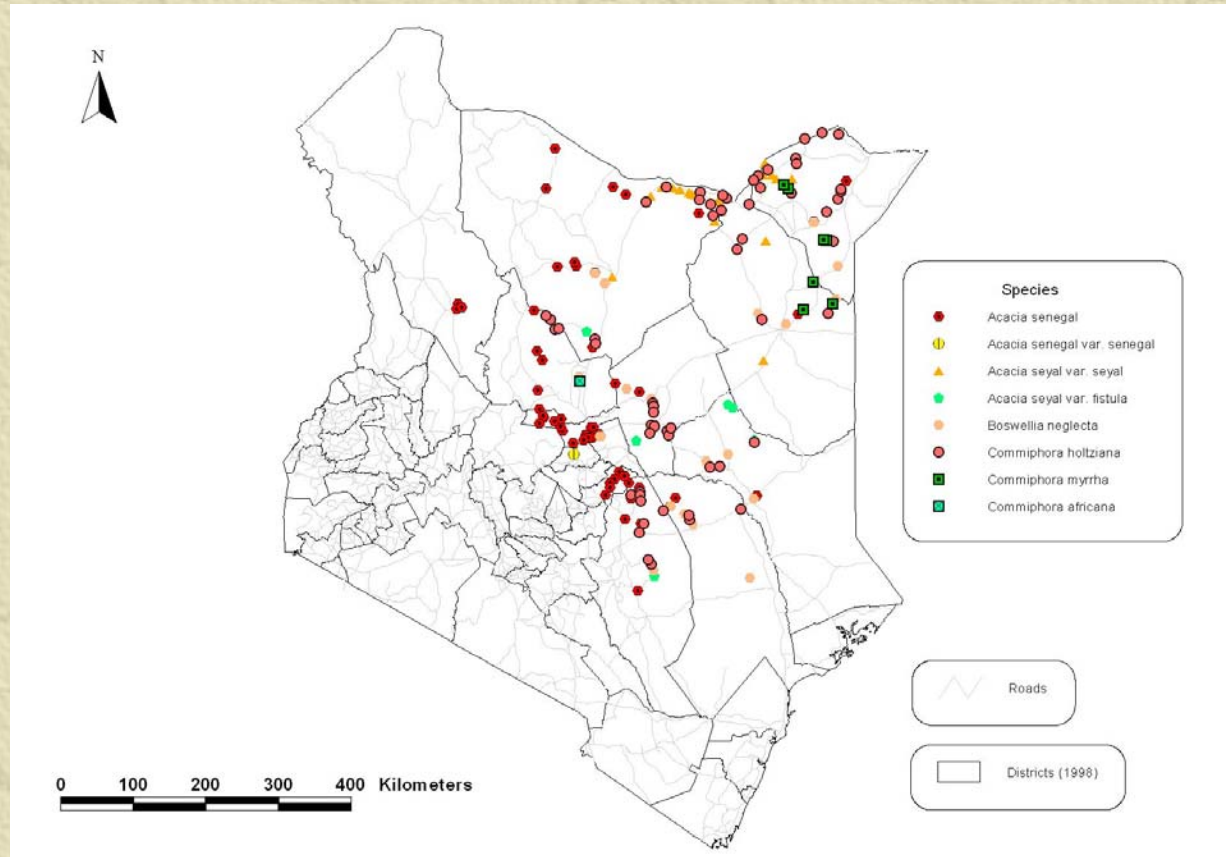
✦ Hagar (opoponax)

Commiphora holtziana

✦ Frankincense

Boswellia neglecta

Distribution of commercial gums and gum-resins resources



Gum arabic from *Acacia senegal* var. *kerensis*

- ✦ Dried exudates from stems or branches of *A. senegal*
- ✦ Whole, round tears, pale to orange in colour, matt surface texture



Gum arabic from *Acacia seyal*

- ✦ Dried exudates from stems or branches of *A. seyal*
- ✦ More friable, rarely in whole lumps, pale to orange in colour, with brittle surface texture



Collectors of gum arabic

✦ Gums collected by women and children



Transporting gum arabic

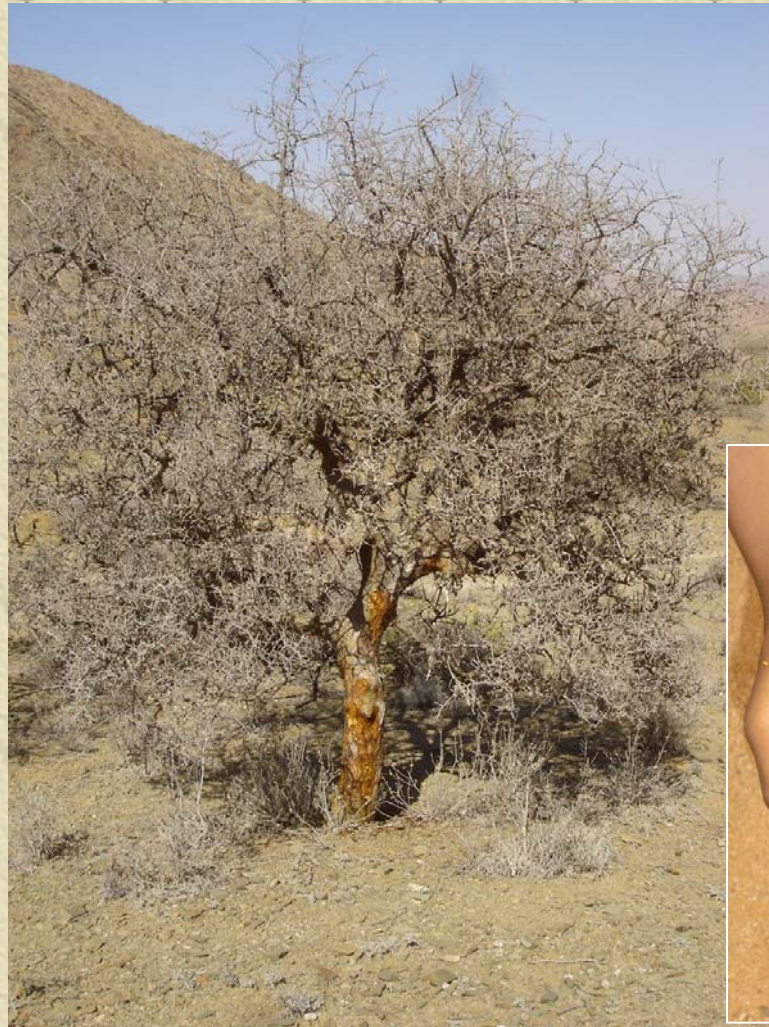


Sorting gum arabic

Uses of Gum arabic

- ✦ Local – eaten as food (human & animals), medicine for various diseases
- ✦ Commercial – food and confectionery - prevent crystallization, emulsifier and stabilizer
- ✦ Pharmaceutical – coating/binding and suspending agent
- ✦ Adhesives – office glue, Paint – viscosity, Printing – prevent oxidation of plates

Myrrh from *Commiphora myrrha*



myrrh

Uses of myrrh

- ✦ Oily gum resin exudates from stems or branches of *C. myrrha*
- ✦ Colour variable from red, brown to dark brown
- ✦ Local uses – ink used in quranic schools, burn to repel snakes and insects, medicine
- ✦ Commercial uses – essential oil, cosmetics, flavours, medicines, antiseptics

Hagar (opoponax) from *Commiphora holtziana*



Tree



Main stem/bark



Gum hagar

Uses of hagar (opoponax)

- ✦ Oily gum resin exudates from stems or branches of *C. holtziana*
- ✦ Colour variable, yellow to dark brown
- ✦ Local uses – acaricide against ticks, treats snake and scorpion bites, foot rot, mange
- ✦ Commercial uses – essential oils, herbal medicine in China, cosmetics

Collectors of myrrh and hagar (Malmaley)



Frankincense from *Boswellia neglecta*



Tree



White incense



Black incense



Branch with angled fruits

Uses of frankincense

- ✦ Gum resin from stems or branches of *Boswellia neglecta*, small droplets harden to form nodules of large lumps
- ✦ Generally of two types, black and white
- ✦ Local uses – chewing gum, burnt as incense, perfumes, medicine
- ✦ Commercial uses – essential oil in perfumery, cosmetics and flavour industries

Collectors of frankincense

✦ Collected by women and children



Collecting frankincense



Sorting frankincense

The hills in the drylands



The importance of the hills in the drylands

- ✦ Water catchments, vital for the people, livestock and wild animals
- ✦ Dry season fodder, food plants, herbal medicines
- ✦ Hold unique forests with different flora and fauna
- ✦ Herders converge for water pasture wild food plants and medicines – conflicts

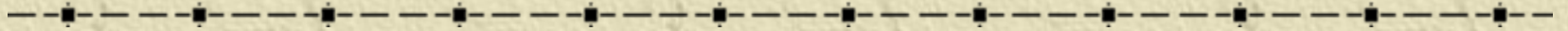
Opportunities in gums and resins in Northern Kenya drylands

- ✦ Gums and resins are Non Wood Forest Products
- ✦ Sustainably exploited for household income and economic development in drylands
- ✦ Conserve biological diversity, increase overall productivity of land
- ✦ Create new jobs and alternative livelihood opportunities for pastoralists in drylands
- ✦ Reduce dependence on livestock hence reduce resource use conflict

Conservation of the hilltop forests

- ✦ All conservation initiatives for the hilltop forests must be people-focused and community-driven guided by proper understanding of the interaction between socio-cultural and environmental factors affecting the various community livelihoods in order to reduce conflict in resource use.

Ahsante Sana



Thank you

May God Bless You