



FROM 'UNWANTED' AND 'UNKNOWN' TO ALTERNATIVE SOURCE OF LIVELIHOOD

Community Management of The Invasive *Prosopis* Plant

TECHNICAL BRIEF 2

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BACKGROUND

Across northern Kenya in areas bordering Ethiopia and Somalia as well as parts of the coastal region, *Prosopis Juliflora*, an aggressive leguminous shrub, has invaded areas of indigenous vegetation and is having a negative impact on rural landscapes and health of both human and livestock.

In Kenya, *Prosopis Juliflora* is commonly known as Mesquite or *Mathenge*, and in Somalia as *Ali Garoob* or *garanwaa*. It was introduced in the late 1970s to Kenya and other arid and semi-arid countries to address deforestation, desertification and fuel shortage. *Prosopis* has survived where other tree species have failed, creating a green cover but also manifesting itself as a difficult to manage plague. In 2004, the International Union for Conservation of Nature (IUCN) identified it as one of the world's top 100 least wanted species (ICRAF, 2005).

On the flipside, *Prosopis* trees are the source of valuable multipurpose products and a source of income for agricultural communities (Pasicznik, 2001).

Efforts to manage *Prosopis* trees have emerged with varying environmental, social and economic impacts.

The combination of a long-life cycle, ability to survive droughts, tolerance to saline soils, high seed production and dormancy of its seeds in the soil, makes *Prosopis* an extremely resilient invader which can quickly take advantage of a suitable environment and dominate the entire ecosystems (CRC, 2003). *Prosopis* trees grow anywhere including along the riverine areas, close to human settlements, and along roads and cattle tracks. Livestock and flooding are its major seed dispersal agents.

The plant is threat to the grazing ecosystem, and in agro-pastoral farmlands, it leads to land degradation, decrease of soil quality resulting in food insecurity (CRC, 2003). In livestock, it contributes to tooth decay or even death due to indigestion. The sharp thorns hurt animals and human beings, and destroy vehicle tyres (Omungo, 2018). The BORESHA programme is working with the communities to devise means of utilizing this invasive plant while contributing to household resilience.

Costs, Damages and Benefits Derived from *Prosopis*

Cost & Damages

- Altering Hydrology
- Loss of access to infrastructure
- Loss of grazing potential through impenetrable thickets
- Loss of native Species
- Tyre damage and injure humans and livestock through thorns

Benefits

- Medicinal products
- Timber Source
- Livestock and Bee Fodder
- Shade and Shelter
- Fuel Source

Prosopis is potentially of high commercial importance. Beyond timber and pods, other products from *Prosopis* include firewood, charcoal, building materials, floor tiles, furniture, and handicrafts. Additionally, it can be processed for livestock feed, human food, possible medicinal products, gum and honey production, and tannin extraction. The plant also provide shade, soil stabilization and carbon sequestration to the ecosystem (Jama and Zeila, 2005).

About BORESHA & DDG

Building Opportunities for Resilience in the Horn of Africa (BORESHA) is a 3-year (2018-2020) cross border project implemented by a consortium of the Danish Refugee Council, World Vision, WYG and CARE International with funding from European Union Trust Fund for Africa.

BORESHA works with local communities and public authorities to establish transformative processes to enhance the cross border socio-economic integration and support resilience in the fragile and underdeveloped borderland areas between Kenya, Ethiopia and Somalia.

This technical brief was produced through a collaborative workshop between BORESHA and the Danish Demining Group (DDG), a Humanitarian Mine Action and Armed Violence Reduction Unit within the Danish Refugee Council (DRC).

JUSTIFICATION

Despite the benefits of *Prosopis*, certain species have encroached on valuable fertile farmlands and rangelands inhibiting optimal land use. The spontaneous, uncontrolled spread of *Prosopis* plants has become a problem outside the initially intended purpose (CRC, 2003). The invasive *Prosopis* plant has covered extensive areas in the Mandera triangle - Mandera County in Kenya, Dolo Bay and Dolo Ado Woredas in Ethiopia, and in Dolow and Belet Hawa district of Somalia (BORESHA, 2018). It has reduced access to prime grazing land and suppressed growth of other indigenous plants. The total eradication of *Prosopis* plants is not only ecologically risky but also technically and economically impossible. The plant is able to re-generate within a short period making control efforts unsuccessful. Thus, future efforts must concentrate on integrated management to control its spread while deriving maximum socio-economic benefits (BORESHA Sheko, 2019).

TECHNICAL APPROACH

BORESHA project has built the capacity of local communities to control the spread of *Prosopis* plants while deriving the possible economic and livelihoods benefits. The project has trained natural resource management (NRM) groups, farming associations, government extension agents and other community groups on the use of simple technologies to make charcoal briquettes and livestock feed from the pods of *Prosopis*.

The project trained 305 people (among them, 95 females) from 18 project targeted villages in Kenya, Somalia and Ethiopia with more than 1,800 people benefiting indirectly from the *Prosopis* utilization skills training. The project supplied seven briquette-making machines and thirteen *Prosopis* pods millers to groups and associations. A locally fabricated miller costing about 300 USD is used to mill pods and crop residues.

The processed feed is then packaged for sale to supermarkets or farmers during dry season. The feed block is an important adaptation to drought and contributes to the resilience of communities. Each group can produce about 18 sacks of charcoal briquettes per week. Average cost of a sack is USD 7.5 - 8. Each group also produces range feed blocks or cubes. Every 2 weeks each group processes on average, 480 range cubes from the crushed *Prosopis* pods for enriching their livestock feed.

“Prosopis utilization technology that BORESHA introduced to our group has changed our perception of the prosopis. BORESHA brought us two machines. One for grinding and mixing Prosopis pods with grass and farm residues to make livestock feed, and the other helps in producing the charcoal briquettes from Prosopis. Before this, our animals struggled with feeding on very dry grass and maize cobs, but now, these machines have changed our experience.” -

Hassan Sheik Mohammed, Chairman of Berir Farmer’s Field Group.

RESULTS

These engagements in *Prosopis* management have provided communities with additional opportunities for employment, extra income and renewable energy source. Below are some highlights.

Improved livestock productivity through animal feed supplement

The production of *Prosopis* pods as feed supplement involves mixing the dried and milled seed pods with other locally available farm residues like sorghum and maize to enrich quality feeds for livestock. *Prosopis* pod meal adds value to these crop residues and enhances livestock productivity. It is also a feed conservation strategy for use during drought.

Access to sustainable renewable energy through Quality Charcoal Briquettes

Charcoal briquettes from *Prosopis* plants provide an alternative sustainable renewable energy source, and is less destructive on the environment, compared to charcoal made from slow growing indigenous trees. BORESHA supported communities through associations to innovate production of charcoal briquettes from the *Prosopis* trees. The use of *Prosopis* as a source of energy presents an opportunity to adequately manage and control this rapidly propagating species. The invasive species is a source of quality charcoal that has been commercialized in many producing areas, with distribution reaching cities and towns far from where trees grow.

“I used to think that Prosopis was useless, but not anymore. I have learnt of its benefits. After training, I took 10 pieces (of charcoal briquettes) to use at home. I was able to cook vegetables, rice, and tea, and the heat lasted till evening. It is also gentle compared to as the ordinary charcoal.” -

Fatuma Ibrahim Hassan, a member of farmers group in Manderla County.



Community elder showing the *prosopis* pods in Manderla. © Maslah Mumin / DRC



Prosopis briquettes gives better quality charcoal that burns 3 times longer, clean with less smoke and easy to transport to markets © Job Mainye / CARE

Additional potential uses of *Prosopis*

Prosopis plant has been used as timber, wood chips, *Prosopis Juliflora* for land reclamation, honey and gum production, human food source e.g. *chapatti / mandazi*. BORESHA has empowered communities to innovately explore other opportunities that the tree can offer.

Crushing the pods of *Prosopis* plants to process livestock feed supplements reduces the amount of *Prosopis* seeds that goes into the environment and from which more *Prosopis* plants grow and spread out.

Prosopis training and provision of machines for milling livestock feed from *Prosopis* pods and farm residues has motivated some individuals and farmer groups in Kenya to improve their livestock husbandry practices. They are now asking for the suppliers' detail to purchase and improve their animal feed and plan for dry season.

Through management of *Prosopis* by utilization, the associations and groups working together have had an unintended benefit of cohesive communities bound by a common problem and solution, and are able to learn from each other.

CHALLENGES

The technology of processing charcoal briquettes and livestock feed from *Prosopis* plants is relatively new and thus slow adoption process. Training of project beneficiaries on utilization, and basic maintenance of production equipment has the multiplier effect for enhanced adoption and production.

Kenya is developing a national strategy for the management of *Prosopis* through utilization, while Ethiopia and Somalia have no policy. In the absence of a harmonized government policy, it is unlikely that people will invest in *Prosopis* control and management practices. Additionally, the logging ban and restrictions on charcoal transportation and sale, especially in Kenya, may discourage intense use of *Prosopis* products.

Restrictions of cross-border movement of staff, experts, and project participants hinder effective extension of technology, cross-learning, technological transfer and capacity building.

The Mandera triangle administration lack harmonized approach in dealing with control or management of the plant.

Controlling *Prosopis* presents climate change risks with possible desertification, soil erosion and a reduction in carbon sinks. In addition, burning of charcoal briquettes releases carbon dioxide back into the atmosphere, thus contributing to greenhouse gas emissions. There is need for increased research on greener management and utilization of *Prosopis*.

LESSONS AND RECOMMENDATIONS

Geographical areas covered by *Prosopis* are predominantly pastoralist and agro-pastoralist communities who have exhibited conflict in search of pasture. The spread of *Prosopis* has only heightened this need as grazing land increasingly diminish. Training communities on managing this aggressive plant enabled them to rediscover the value of their crop residues initially wasted.

Mixing crushed *Prosopis* pods with crop residues to produce nutritious and highly palatable feed for their animals is not only beneficial to the animals, but can also prevent conflict. This ensures 100% utilization of farm residues including dried maize stover, sorghum straw, dry grass and dried beans.

The approach of controlling *Prosopis* spread through effective utilization to make charcoal briquettes and livestock feed from its pods has demonstrated capacity of communities to adapt. And with appropriate plant management practices ,communities can be more resilient, improve livelihood alternatives and be self-reliant.

CONCLUSION

Prosopis Juliflora is an unwanted invasive plant that has occupied vast grazing areas, suppressed growth of other plants, and reduced productivity of pastoral systems. Efforts to control the spread of the plant in unwanted areas by physical removal have not been successful due to its prolific nature.

Efforts must be concentrated on integrated management - far-sighted and sustainable control of the species, including prevention of spread, selective eradication and full exploitation of the resource, while respecting its potential to fight desertification, provide fuel, good-quality fodder and sometimes even human food.

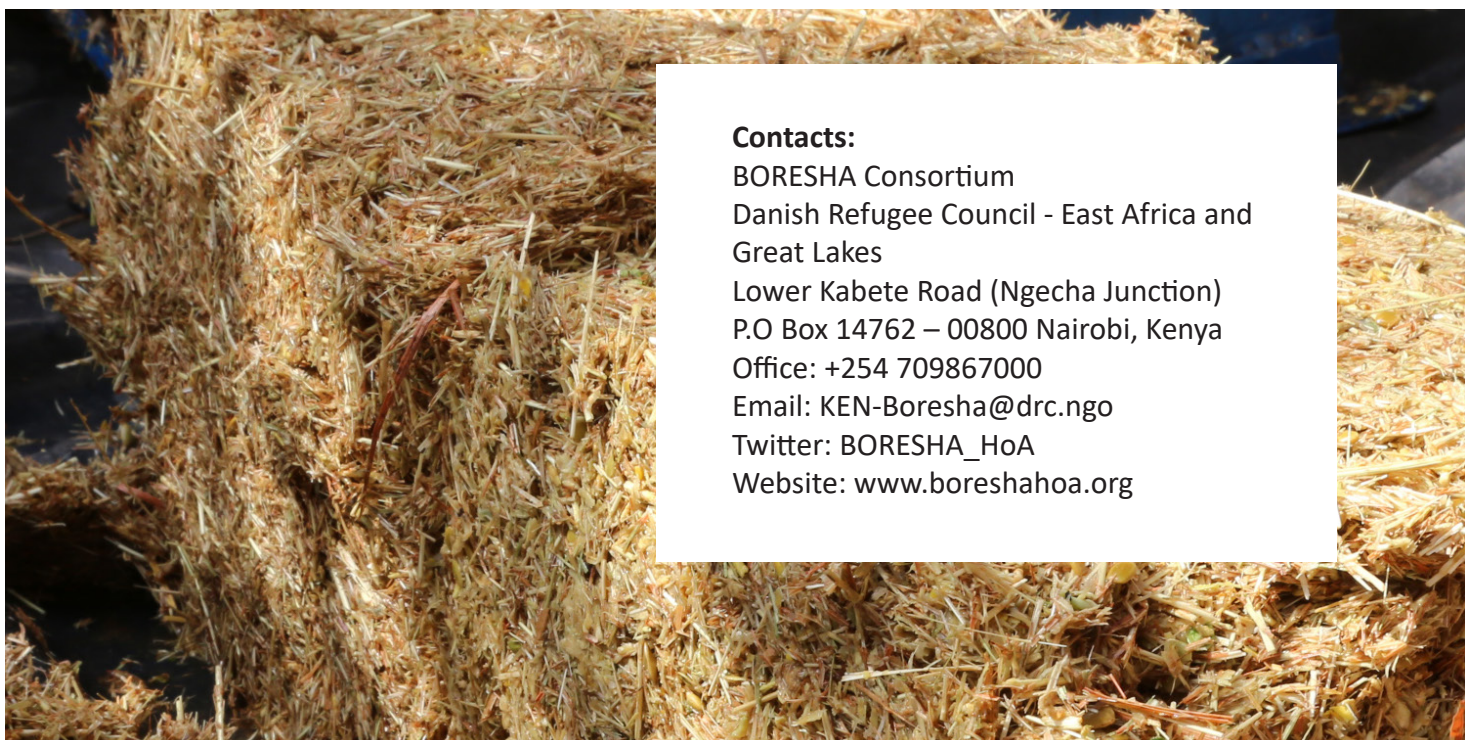
BORESHA has supported various community groups from 18 villages in Mandera County (Kenya) and Gedo region (Somalia) with technologies to process *Prosopis* into charcoal briquettes and livestock feed. Utilizing the *Prosopis* plants to produce these products has not only provided extra employment opportunities, income, livestock feed, and high-quality household energy sources to the community, but also controlled its further spread.

As a result, the community is now increasingly seeing *Prosopis* as a valuable local natural resource rather than “unwanted” and “unknown” plant. On February 24, 2017, the government of Kenya declared a moratorium on logging in public forests, which includes areas colonized by *Prosopis*. The ban affects logging in county, national and community forests. The government is yet to make a decision on the implication of the policy to the *Prosopis*-infested areas raising a dilemma.

Leveraging on best practices and lessons learnt from BORESHA and other similar interventions, there is evident opportunity to scale up and diversify livelihoods. There are also opportunities to create extra jobs and income for individuals and households through enhanced investment in *Prosopis* value chain.

REFERENCES

- Aboud, A. A., Kisoyan, P. K. and Layne, C. D (2005): Agropastoralists wrath for the prosopis tree: the case of the Il Chamus of Baringo, Kenya. PARIMA, USA
- BORESHA (2018): Mapping of Key Natural Resources in the Cross- border Areas of Kenya, Somalia & Ethiopia.
- CRC Weed Management. 2003. Weed management guide: mesquite – Prosopis species. Queensland, Australia (<https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/wons/pubs/prosopis.pdf>)
- ICRAF, Mwangi E. and Swallow, B. (2005): Invasion of prosopis juliflora and local livelihoods Case study from the Lake Baringo area of Kenya. Working Paper no. 3
- Jama, Bashir, and Zeila, A (2005): Agroforestry in the drylands of eastern Africa: a call to action. ICRAF Working Paper no. 1, Nairobi: World Agroforestry Centre 72
- Omungo, R. (2018): Kenyan charcoal businesses trying to nip invasive tree in the bud. Mongabay (<https://news.mongabay.com/2018/10/kenyan-charcoal-businesses-trying-to-nip-invasive-tree-in-the-bud/>)
- Pasiecznik, N., Felker, P., Harris, P., Harsh, L. N., Cruz, G., Tewari, J. C., Cadoret, K., and Maldonado, L. J. (2001): The Prosopis juliflora – Prosopis pallida Complex: A Monograph. HDRA, Coventry, UK
- Pasiecznik N., Harris P. and Smith S. J. (2004): Identifying Tropical Prosopis Species: A Field Guide. HDRA, Coventry, UK
- Shackleton, R. T., Maitre, D.C., Pasiecznik, N.M., Richardson, D.M. (2014): Prosopis- a global assessment of the biogeography, benefits, impacts and management of one of the world’s worst woody invasive plant taxa. AoB Plants. 2014; 6: plu027



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