BORESHA SHEKO

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ALTERNATIVE UTILIZATION OF PROSOPIS PLANT

IN THIS ISSUE

CONTENTS

BORESHA

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FOREWORD

INTRODUCTORY NOTE

I am delighted and feel honored to introduce this 6th edition of the BORESHA Newsletter -SHEKO. This is a special edition that sheds light on natural resources management interventions of BORESHA consortium in cross border areas of Mandera –Kenya, Dollow –Somalia and Dollow Ado of Ethiopia. CARE is the leading implementing agency for Outcome 3 of the project aimed at enhancing sustainable and equitable management of cross-border rangelands and other shared natural resources.

The communities targeted by the project are largely pastoralist and agro pastoralist households who are endowed with a range of dry land resources to sustain their livelihoods. They extract from their immediate environment the basic needs they require for their survival. The key shared natural resources in Mandera triangle include grazing land, surface water resources such as the Daawa River and groundwater resources including the transboundary Daawa-Juba and Juba-Shebelle aquifers.

Another abundant natural resource available in the project area are the invasive Prosopis plants, locally known as *aligarob* or *garanwaa* in Somali. Prosopis juliflora plant is a major threat to the grazing ecosystem and in agro-pastoral farmlands. Due to its invasiveness, it suppresses growth of indigenous pastures causing reduction of grazing areas and traditional farming fields along the Rivers, negatively affecting pastoral production system.

The prolific nature of the Prosopis plant allows it to re-regenerate within a short time, hence efforts to control its spread by physical removal has not been very successful. However, opportunities exist to control the spread of the plant by adopting management by utilization practices. The key challenge to effective utilization and commercialization of Prosopis products are lack of effective extension of technologies and marketing strategies. To address this, BORESHA is building the capacity of the local communities to manage Prosopis plants while deriving economic and livelihoods benefits. This also entails bringing about change in perceptions- looking at Prosopis plants as a resource rather than a problem. Through use of simple technologies, CARE has trained NRM groups on use of various parts of the plant to make charcoal briquettes and livestock feed. This provides improved opportunities for employment, extra income and renewable energy source.

Biomass is the main source of household energy for rural and urban households amongst project affected population. Excessive clearing of woody indigenous trees for making charcoal has led to degraded grazing lands, diminished livelihoods, and reduced resilience of pastoralist communities to climate change and variability. With the adoption of appropriate technologies and practices, charcoal briquettes from Prosopis plants provides alternative sustainable renewable energy source, and it is less destructive on the environment compared to using biomass from highly valuable indigenous trees to make charcoal. Leveraging on best practices and lessons learnt from BORESHA and other similar interventions, I belief vast opportunity exists to upscale and diversify livelihoods, create extra jobs and income for individuals and households through enhanced investment in Prosopis value chain.

Abdullahi Iman

Country Director

CARE Somalia/Somaliland

INTERVIEW

WITH DR. OSCAR KOECH, RANGELAND SCIENTIST

Dr. Oscar Koech - Rangeland Scientist
July, 2019 | Photo | Oscar Koech

About Interviewee

Dr. Koech Oscar Kipchirchir is a Lecturer and Researcher at the University of Nairobi, Department of Land Resource Management and Agricultural Technology (LARMAT). He holds Ph.D. in Drylands Resource Management, MSc and BSc degree in Range Management from the University of Nairobi, Kenya.

1. What is Prosopis Juliflora?

Prosopis juliflora, locally known in Somali as *Ali Garoob* or *Garaanwaa* meaning the unknown tree is an evergreen tree native to South America, Central America and the Caribbean. In the United States, it is well known as mesquite. It is fast-growing, nitrogen-fixing and tolerant to arid conditions and saline soils. Under the right conditions, Prosopis can produce a variety of valuable goods and services: construction materials, charcoal, livestock feed resources, human food, soil conservation and rehabilitation of degraded and saline soils.

2. When was the tree introduced to the Horn of Africa and why?

Concern about deforestation, desertification and fuel wood shortages in the late 1970s and early 1980s prompted a wave of projects that introduced Prosopis and other hardy tree species to new environments across the world, Including HoA. The tree has survived where other tree species have failed and in many cases have become invasive and a major nuisance to the environment. Prosopis has invaded, and continues to invade, millions of hectares of rangeland in South Africa, East Africa, Australia and coastal Asia. In 2004 it was rated one of the world's top 100 least wanted species (Invasive Species Specialist Group of the IUCN, 2004).

3. Which is the most appropriate strategy to control or eradicate Prosopis Juliflora?

The need to maximize on the management by utilization of the tree is becoming important. This creates the opportunity to utilize technologies for use, which includes value addition to products.

4. What are the costs and benefits to local communities living with Prosopis?

The tree has invaded key grazing resource areas, greatly affecting the traditional pastoral production system, with a major blow to loss of indigenous and native grass and tree species. The trees restrict undergrowth and is a big challenge in pasture fields. The agro-pastoralists have also been affected from invasion to farmlands and irrigation sites within the rangelands. The tree has proved to be well adapted and out-compete most indigenous vegetation, being highly tolerant to droughts and other biophysical conditions like salinity and low nutrient soils.

Despite being a notorious weed, the tree offers a number of uses, making it a multipurpose tree for the drylands ranging from source of energy through fuel wood, charcoal, direct feed to livestock from pods and leaves, nitrogen fixating being a legume, making furniture and hand crafts, shade to humans and animals, soil erosion control among many others.

5. How can utilizing Prosopis to make charcoal briquettes reduce invasion?

The technology utilizes all the plant material including small twigs and branches, including the charcoal dusts after carbonation, thereby reducing tree biomass and more benefit to producers.

PROCESS OF TRANSFORMING PROSOPIS FROM A PLANT TO CHARCOAL BRIQUETTE & LIVESTOCK FODDER

From Prosopis to Livestock Feed

a) Process of making Prosopis feed meal and feed block

The ripe seed pods are dried and milled to make flour. The milled flour can be stored as protein concentrate. The flour can also be used to add value to other crop residues such as maize, sorghum and wheat straws. The milling of pods and crop residues is done using a simple locally fabricated miller costing about 300 USD.

b) Why do we mill Prosopis pods?

The crushing/milling of the pods is a very important step in controlling Prosopis spread and invasion by breaking the viable seeds. Every pod crushed is an equivalent of avoiding more that 6-12 future trees that could have germinated. When one ton of the pods are crushed, it is an equivalent of millions of trees and huge forest of Prosopis invasion avoided.

From Prosopis to Charcoal Briquette

a) Why Prosopis trees for quality charcoal briquettes?

Prosopis tree is very prolific and offers great potential for a sustainable charcoal production, with the much needed environmental benefit of saving the many important and indigenous tree species that are slow growing. Traditional charcoal production technologies characterise the community practices at the present, and has been a source of employment and incomes to many households. Making briquettes gives better quality charcoal that burns 3 times longer, clean with less smoke, easily packaged and easy to transport to markets, as well as potential for branding for the formal market chains in supermarkets.

b) Prosopis Briquette making process

The process involves normal carbonation of the whole tree parts, including small twigs that are not used in traditional charcoal making process. Thereafter, the carbonated material is milled in a hummer mill top make charcoal particles. This are later lightly mixed with water to form moistened material that is then passed through a charcoal briquette machine that uses the compression technology to make high density charcoal briquettes. The briquettes are then dried and become ready for use.

UPDATE

KEY PROJECT ACHIEVEMENTS

1. Contingency Budget activated and approved in readiness to mitigate against impacts of climatic shocks.
2. Mid term reflection workshop conducted in Addis Ababa
3. 51 Grant facility beneficiary businesses were approved by the joint technical committee
4. LCIGs members continued to receive training on good livestock management practices
5. TVET Trainees from the three countries graduated, others are ongoing
6. Cash for Work activities and beneficiaries have been identified across the board and the rates have been harmonized.

UPCOMING MAJOR ACTIVITIES

1. BORESHA/ICPALD Collaboration to conduct cross country epidemio surveillance analysis
2. CFW activities in the three countries
3. Disbursement of Grant Facility to 51 Selected businesses
4. Mass vaccination campaign against PPR and deworming across the target areas
5. Promotion of alternative utilization of invasive species (Prosopis)
6. Second cycle of IBLI will kick off
7. Arid and Semi Arid Lands (ASAL) Conference in Kajiado County, Kenya

NEWS

FARMERS TRAINED TO UTILIZE INVASIVE PROSOPIS WEED IN MANDERA

In Mandera County, Prosopis Juliflora plant also known as *Aligaroobe* has an aggressive nature and it's detrimental to animals health also spreads easily and fast. It's an invasive weed in this area, occupying large tracks of communal grazing land displacing indigenous trees and pastures leading to deterioration of grazing lands and negatively affected the pastoral production system. Through BORESHA project, CARE is working with farmers in Mandera seeking to address this hoping to turn the pain to gain.

CARE Senior Project Officer, Abdi Hussein conducting a training for Berir Farmers Group on how to value prosopis weed in Mandera .
June 2019| Photo | Job Mainye| BORESHA

While traversing through Border Point 1 zone in Mandera town, from a distance the Prosopis trees look very attractive but looks can be deceiving. This plant has created havoc across the County especially to farmers. It grows along irrigation canals affecting the flow of water. From farms, roadsides to homesteads it continues to colonize the landscapes.

Training farmers on how to value to Prosopis weed

The Prosopis pods are rich in nutrients (digestible crude protein) and can be used to feed animals. Farmers are taught how to make animal feeds from the pods. The process involves mixing the pods with other farm residues like sorghum and maize which are readily available in this area to enrich quality feeds available to the livestock.

Mandera County Director of Livestock production, Hussein Madey believes that the expert trainings will help farmers with practical knowledge how to convert Prosopis seeds to cakes, livestock feeds and value adding hay. Hussein has been able to train the sub-county officers involved in BORESHA project. "Prosopis juliflora is problem along the river from Border Point one to Malkamari and some parts of Mandera West. If this value addition process is adopted and streamlined by the County, it can create employment for the youth through charcoal burning.

Berir farmers field group

Berir farmer's field group located in Border Point 1 village is among farmer groups in Mandera that CARE is training on how to utilize the plant and benefits to locals.

Through use of simple technologies, CARE has trained pastoralists and agro-pastoralists households on better use of the plant. By use of the skills gained they are making charcoal briquettes and livestock feed from the different parts of the Prosopis plants. This has provided employment opportunities, extra income, renewable source of energy and readily available quality livestock feeds enabling them to get better products from their livestock

After the 3 days training, Berir farmers group members are able to grind the Prosopis seeds mixed with grass or any other crops to produce better feeds for their cattle. Further in the value chain, Prosopis pods are cut and burnt to charcoal then processed to charcoal briquette which is durable. Abdi Hussein is CARE Kenya staff that is overseeing this activity in Mandera. "Take grinded Prosopis then mixed with grass to feed livestock or used to improve nutritive value of the livestock feeds. This can also be packaged and sold to supermarket or sold to farmers during dry season," Abdi added.

Fatuma Ibrahim Hassan, a member of the group believed that the life skills they have on briquette production was a process that is 'God sent' – "We grind the seeds and during drought it can help us. Initially we thought it was useless but I have learnt its benefits. We need many of these machines in Mandera and all its locations so that all farmers

can benefit," she said. I took 10 briquettes during training and used at home. I cooked vegetables, rice and tea and the heat lasted till evening. This was like a miracle to me," she smiled. Fatuma sees this as an advantage to environment conservation. During drought she can sell Prosopis feeds and the briquettes for more income.

Dr. Oscar Koech, a consultant from Nairobi University trained Berir farmer group on the use of Prosopis. "The species despite having negative perceptions by the community has a lot of benefits that we have known and we are trying to show them the benefits they can get from the tree. We are looking at ways the community can benefit through feed conservation for dryer seasons as well as for supplementing their lactating animals to improve their own household food security. The tree can also be used to make charcoal briquettes which is more durable, environmental friendly and cheap source of energy," Dr. Koech said.

Once the BORESHA project is fully implemented in Mandera County, conservationists believe it will save the acacia tree which is widely used in charcoal making.

Facts

• BORESHA is working with 9 groups to benefit from the value addition machines. Estimated 18 machines will be distributed.

• Facts about the 2 value addition machines, the industrial names and cost Multipurpose silage/feed chopper/miller, Driven by a 7.5 H.p Honda petrol or Diesel engine. With three sieves of different sizes (For grass cutting, grinding crop residues and fine flour sieve).

• Petrol or Diesel engine chopper (Petro or Diesel depending on user preference) used for grinding and chopping animal feeds. Estimated Price: 45,000 Ksh Petrol 60,000 Ksh Diesel.

STORY

MAKING MONEY OUT OF A MENACE – Jamado's Story

Jamado Abdi has applied for and won a BORESHA grant aiming to expand her business to the neighbouring countries. She is pictured here at her farm. June 2019, Dolo Ado, Ethiopia| Photo | Awale Degewione| BORESHA

Somali Regional State in Ethiopia suffers from natural calamities such as drought, flood and disease and conflict over natural resources. Local populations move across borders to access markets but also to reach livestock pastures and social services and markets, schools, and health services.

This is the story of Jamado Abdi Sid born and brought up in Dollo Ado in the Somali Region of Ethiopia. Jamado, aged 40, has 11 children alive out of the 14 she gave birth to. One of her children is now a school graduate but others are still at school. The family relies on farming using irrigation water from River Dawa. Nine years ago, her family was farming 70 hectares of land and used to supply fresh produce to the town, but then Prosopis started to invade the farm and the land productivity declined. Recalling those days, Jamado says "as the Prosopis plant went deep in to our farm, what we could produce decreased dramatically. The plant has also invaded the neighbouring farms and our area became very food insecure. In the end, we had to abandon our farm and move to Dollo Ado. By the time we left, Prosopis covered more than 65 hectares of our land, leaving hardly any area where we could grow enough food for the family. We even had to send some of our children to relatives so that they could eat and survive. We had no income so we could not pay school fees for the 7 children who needed to be in school. Even the neighbours were suffering, so there was no support within or even from outside the community".

The invasive species is now covering over 100 hectares where Jamado and her family lived but there has been no intervention to curb its spread. Other farmers are also being forced to migrate due to increasing poverty in that area. Jamado meanwhile came up with a great business idea which she is implementing successfully. She took the first steps in the setting up of a Prosopis charcoal making cooperative. She established the first cooperative in Dollo Ado back in 2011, using the Prosopis pods from the abandoned family farm as her first start up. From the onset she knew there was demand for charcoal in the market and supply was limited, it is then that her entrepreneurial mind set kicked in taking full advantage of the opportunity that presented itself.

She first began by cutting the plant and selling it as firewood then later as charcoal for the local market. She observes "at the beginning, the marketplace was not very profitable, and the product sales were limited as most of the people did not use Prosopis firewood or charcoal at home and it was very challenging to convince them to give it a try. Also, the local government believed that the cooperative was using other sources of wood and destroying the natural forest but that was not true, however I stuck to my business and let the government know about the source of the wood and charcoal that I was selling."

She later heard about a few local NGOs in the area that were promoting the utilization of Prosopis charcoal, she submitted a proposal to one of the agencies and successfully received a small fund to establish the business formally and to transport the charcoal to refugee camps and neighboring villages. This is a lady with great business acumen, she is truly an inspiration and a role model in her community, she saw an opportunity and decided to take full advantage of it, what is profound is the fact that she stood to her guns and never let anyone or anything discourage her from the path she decided to take.

She applied for and has won a BORESHA grant and aims to expand her cooperative business to the neighboring countries. She said, "I have experience and learnt much about the Prosopis business and I want to expand it to the level that it benefits not only communities but also livestock in the form of animal feeds". Through her creativity and hard work, Jamado has set an example on how to convert misfortune into success. She will be supported in further learning through business skills training at the BORESHA Business Development Support Center (BDSC) in Dolo Ado which will continue providing services in the coming years to business-minded community members like her.

Prosopis Charcoal produced by Jamado gives better quality that burns 3 times longer, clean with less smoke, easily packaged and easy to transport to markets. June 2019| Photo | Job Mainye | BORESHA

CULTURE

HISTORY OF THE PROSOPIS SPECIES IN MANDERA TRIANGLE

Contributed by Abdikadir Abdulsalam| NRM Manager | BORESHA

The economic characteristic of the plant can be exploited and utilized for commercial purposes. June 2019| Photo | Job Mainye | BORESHA

Just like in most of the other arid areas, the invasive Prosopis plant has spread to and covered extensive areas in Mandera triangle - Mandera county –Kenya, Dolo Bay & Dolo Ado Woredas in Ethiopia, and in Dolow and Beled Hawa district of Somalia. There are different types of Prosopis plants but the most common and notorious are the Prosopis Juliflora species. The areas most affected by Prosopis are along the rivers and natural water ways due to dispersal of the Prosopis seeds by water. It has also occupied and rendered inaccessible prime grazing lands including natural livestock salt lick areas.

Community elders participating in NRM consultative meetings facilitated by CARE staff narrated that Prosopis was introduced into the area in the 70s and 80s by humanitarian organizations supported by the governments to curb land degradation, check desertification and provide reliable sources of fuelwood. In Gedo region - Somalia, it was initially introduced in Luuq in 1984 by international charity as a reforestation project for sand dune stabilization, fuel wood supply and wind break shelters in refugee impacted area and gradually spread to other areas. In Kenya it was first introduced in 1973 for rehabilitation of quarries near the coastal town of Mombasa and later spread to other Arid districts such as Baringo, Tana River and Mandera. Efforts to control Prosopis weeds through bush clearing did not bear much fruit due to regenerative properties of the plant.

In conclusion, it is good to note that the remarkable economic and physiological characteristics of Prosopis juliflora can be exploited and the plant converted into a prime contributor to the development of many arid regions, especially if its invasive habit and the thorns that limit its widespread acceptance are controlled and or utilized for other commercial purposes.

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