Tapping Indigenous Knowledge in Livestock Feeds

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Livestock plays an important role in Kenya's economic development, providing 45% of agricultural gross domestic product (GDP)[1]. About 10 million people in the arid and semi-arid lands (ASALs) derive their livelihoods from livestock[2]. The ASALs produce 70% of the beef and most of the goats and sheep consumed in the country[3]. Livestock supply 13% of energy to the world's diet but consume one-half the world's production of grains which is also feed for human consumption hence creating competition. Therefore there is need for constant and extra source of feed for continuous livestock production.

Drought is the prime recurrent natural disaster in ASALs of Kenya which has led to many families becoming vulnerable to food insecurity and resulting in community conflicts due to scarce resources. Moreover, climate change factors such as high temperatures, unreliable rainfall and sometimes floods have led to farmers in these areas being faced with several challenges such as migration with livestock, loss of livestock, loss of crops including livestock feeds, and frequent famines. To curb these challenges, farmers in Kitui and Makueni maintain their livestock herds by utilization of acacia pods ('*Ngaa*'), dry leaves of various trees, pawpaw stem and barks of trees[4]. Recently, farmers accidentally identified another plant they can use as an animal feed during dry

[1] ICPALD (IGAD Center for Pastoral Areas & Livestock Development) (2013) The Contribution of Livestock to the Kenyan Economy. Nairobi: IGAD Center for Pastoral Areas & Livestock Development (ICPALD), ICPALD Policy Brief No: ICPALD 4/CLE/8/2013.

[2] Zwaagstra, L., Sharif, Z., Wambile, A., de Leeuw, J., Said, M.Y., Johnson, N., Njuki, J., Ericksen, P. and Herrero, M (2010) An assessment of the response to the 2008 - 2009 drought in Kenya. A report to the European Union Delegation to the Republic of Kenya. ILRI, (International Livestock Research Institute) Nairobi, Kenya, 108 p.

3 Republic of Kenya (2008). Session paper No 2 of 2008 on national livestock policy. Nairobi: Ministry of Livestock Development.

[4] Kimbwarata, J (2010) Alternative fodder. In: Baobab Magazine: Published by Alin for community development workers, Issue 7, January 2010.

periods. The plant, known as "*Kithunzu*" in local language (*Kamba*), is utilized by chopping its root tubers and feeding them to livestock[5].

Machakos University (MksU) is one of the institutions of higher education located in the ASAL areas and, community its community and outreach services has set out to conduct research into this new feed. Through research and information dissemination, MksU intends to enhance sustainable development in Agriculture and Livestock sectors towards the realization of Kenya's Vision 2030 and the current government's "Big Four Agenda".

In response to this a team of this, a researchers from the visited *Wandei, Masaku Ndogo* and *Ulilinzi* villages in the *Athi River* basin in Kibwezi East Sub-County, Makueni County. This was a fact finding mission about *Kithunzu* and it involved interviews about the history, agronomic and economic value of the plant and collection of plant samples for identification.

The plant, confirmed by the farmers as *Kithunzu*, was accidentally identified as an animal feed in 2009 during land preparation by one farmer. Upon exposure of the root tuber to the surface, the farmer noted that the oxen pulling the plough started feeding on it. The curious farmers became interested in the plant and in small quantities they started harvesting the root tubers (Figs 1 and 2) as a complement fodder not only for oxen but also for the goats. Since then, *Kithunzu* was reported to have become one of the main sources of animal feeds during droughts. Additionally, given that the plant has a succulent root tuber; it also provides animals with the much needed but scarce water. One of the farmers interviewed also mentioned that the plant also had some medicinal uses this was corroborated by some farmers, though with some reservation, as there was no evidence of widespread usage for this purpose.

Samples of the plant's stem, leaves, root tuber and flowers were collected during this inaugural visit, and later submitted to Kenya National Museums in Nairobi for identification. The plant was identified as *Thunbergia guerkeana* (Lindau); Family: Acanthaceae, in January 2018. *Kithunzu* is a climber that grows at the base of many other hard woody trees and shrubs that can offer it support, but from preliminary observations, it did not seem to parasitize the plants. It has a large root tuber system with a white succulent 'flesh', an indication that it stores a lot of water. The team gathered that livestock that was fed on the chopped root tuber drink less water, hence its

[5] Ambaka, D (2010) Alternative fodder. In: Baobab Magazine: Published by Alin for community development workers, Issue 7, January 2010.

additional advantageous during the dry season since it reduces the number of trips farmers have to make to the water points, which can be quite a distance for the farmers that are not within Arthi River basin.

MksU is currently investigating the propagation biology and agronomic traits of *Kithunzu*, with the aim of multiplying the plant and later distributing it to farmers for adoption as a dryland fodder crop. Research underway to determine nutritive value of *Kithunzu* as a livestock feed, formulation of feed rations, and assess its medicinal value and industrial uses such as starch extraction. In line with this, a proposal have been prepared by research team and submitted for funding consideration. Machakos University aims at playing a critical role in impacting on farmers' livelihoods through research and outreach programmes that address the needs of farming communities.

Fig. 1: Farmers loading *Kithunzu* root and tuber (A) and *Kithunzu* stem (B)

Fig 2: Machakos University research team with farmers admiring the *Kithunzu* root and tuber at Wandei, Makueni County