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Research Application Summary

Climate variability: Pastoralists' perception, practices and enhancing adaptive pasture use for food security in Choma District, Southern Zambia

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Abstract

Pastoralists have managed their production system for many centuries and have had detailed knowledge of the biodiversity and environment of their grazing lands. Feeding of livestock is though still a major challenge to sustainable productivity of pastoral communities in the dryland areas in view of the current changes in climate. The day-to-day impacts of climate change such as higher temperature and erratic rainfall are increasing the pastoralists' inability to feed their animals. There is need to understand the impact of climate change on the change in the utilisation of the feed resources by the pastoralists so as to mitigate the negative effects. This will help to know which indigenous forage species have become less used or even become extinct and which ones are becoming more adaptable and therefore more important. Currently in sub-Saharan Africa, and Zambia in particular, there is lack of information concerning the pastoral production systems and their adaptive use of forages in view of the changes in climate. It is therefore important to identify the indigenous forage species which are used more than before and promote their utilisation to ensure sustainability of livelihoods of the pastoralists. This paper therefore looks at the changes in use of grass and browse species as an adaptation to climate change and through this process improve their usage in feeding livestock in dryland pastoral areas.

Key words: Browse trees, climate change, indigenous forage species, pastoral farming systems, Zambia

Résumé

La réserve d'azote des sols agricoles doit être renouvelée périodiquement afin de maintenir un niveau adéquat pour la production agricole. Ce remplacement d'azote du sol est généralement accompli par l'ajout d'engrais ou de produits de fixation biologique d'azote (BNF). La symbiotique BNF permet à beaucoup de légumineuses de répondre à leurs besoins en

azote de l'atmosphère plutôt que de sol, mais dans certains cas, la population résidente de bactéries rhizobium, le micro symbiote associés aux légumineuses fixatrices d'azote, pourraient fonctionner comme un partenaire symbiotique efficace. L'augmentation de céréales, d'arbres et production de légumineuses et de pâturages correspondant à ces légumineuses avec les microsymbiotes corrects sont donc un élément clé de l'amélioration de l'agriculture et les services éco-systémiques dans les zones tropicales. L'identification des créneaux pour les légumineuses BNF dans les systèmes agricoles existants est d'une importance capitale comme les prix des engrais inorganiques continuer à augmenter.

Mots clés: Arbres people, le changement climatique, les espèces fourragères indigènes, des systèmes agricoles pastorales, la Zambie

Background

Currently in Sub-Saharan Africa and Zambia in particular there is lack of knowledge concerning the pastoral production systems and their adaptive use of forages in view of climate variability. It is therefore important to identify the indigenous forage species which are used for climate adaptation and promote their utilisation to ensure sustainability of livelihoods and food security of the pastoralists. More emphasis need to be put on the use of identified climate adaptable browse trees. Promotion of better browse tree utilisation through lopping, proper feeding to animals and planting more browse trees helps to reduce deforestation. This also arrests the loss of biodiversity which is necessary for sustainable environment and for the well being of the local people.

Literature Summary

Pastoralists have managed their production system for many centuries and have had detailed knowledge of the biodiversity and environment of their grazing lands. Despite the existence of such valuable knowledge, researchers and development experts have previously deliberately overlooked the indigenous knowledge in the evaluation of rangeland (Abate *et al.*, 2009). A combination of pastoral indigenous knowledge and modern scientific information would be helpful in providing a better understanding of the environment from the perspective of those utilizing the resources (Ayana and Gufu, 2008). Feeding of livestock is still a major challenge to sustainable productivity of pastoral communities in the dryland areas in view of the current climate variability. The day-to-day impacts of climate change such as higher temperature, erratic rainfall and floods are increasing the pastoralists' inability to feed their animals leading

to loss of a source of livelihood and food insecurity. For example droughts have the effect of favouring some trees and shrubs while adversely affecting others. (PRIMEFACT, 2007). There is therefore need to understand the impact of climate variability on the change in the utilisation of the feed resources by the pastoralists to mitigate the negative effects. This will help to know which indigenous forage species are becoming more adaptable and therefore more important for livestock feeding.

Study Description

A survey was conducted to determine the pastoralists perception, livelihood coping practices, livestock management and pasture use by the pastoralists to cope with climate variability in order to enhance food security. A focus group discussion and a questionnaire survey were used to collect the information from eight villages in Choma district in Southern Zambia.

Research Application

Of the respondents 75% indicated that climatic variability and its frequency had increased over the years. The major livelihood practices for the pastoralists in times of extreme weather conditions included livestock sales and engaging in non agricultural activities (Table 1). Among the respondents 99 % indicated that there had been a reduction in the grazing area and quantity of indigenous pastures for their animals. The main causes of inadequate pastures were increase in livestock numbers, increase in human population and conversion of grazing land to crop agriculture. Charcoal burning, indiscriminate cutting of trees and uncontrolled bust fires were other contributing factors to reduced pastures. Pastoralists were adapting to climate variability by increasing the use of upland pastures during floods and lowland, river and dambo pastures in periods of drought.

Table 1. Non-agricultural livelihood strategies of patoralists during extreme weather conditions.

Livelihood practice	Respondents %	Ranking
Charcoal burning	20	1
Carpentry	15	2
Piece work	15	2
Bricklaying	8	3
Carving	4	4
Wild fruit collection	4	4
Moulding bricks for sale	4	4
Bee keeping	4	4
Knitting	4	4
Selling fire wood	4	4
Trade	4	4
Selling thatching grass	4	4

Pastoralists also indicated that in times of droughts they depended on climate adaptable browse species such as *Parinari curatellifolia* because these species had a tendency to bear excessively in years of severe drought. Other important browse trees during drought were mentioned as *Julbernadia globiflora* and *Piliostigma thinningii*. About 62.5% of the respondents indicated that they did not carry out any pasture improvements practices due to lack of knowledge and 99% did not know how to establish the indigenous browse species.

Recommendation

The study showed that climate variability was affecting pastoralists livelihoods and the way they are using indigenous pastures. There is need therefore to encourage alternative livelihood strategies and improve the management and replanting of more climate adaptable indigenous pastures to increase livestock productivity and enhance food security. Replanting of climate adaptable indigenous browse species would also help in reforestation of the drylands.

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