Ecosystem Services 15 (2015) 103–112

Contents lists available at ScienceDirect

Ecosystem Services

journal homepage: www.elsevier.com/locate/ecoser

Reweaving stakeholder networks: Promoting climate mitigation and Maasai culture using medicinal plants in Kenya

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ARTICLE INFO

Article history:
Received 12 August 2013
Received in revised form
9 December 2014
Accepted 25 May 2015

Keywords:
Carbon sequestration
Ecosystem governance
Indigenous curative knowledge
Medicinal plants
Monetary valuation
Social network analysis
Kenya

ABSTRACT

Studies indicate that medicinal plants are threatened by climate change impacts. In Kenya, this sector is further threatened by lack of formal recognition and neglect of indigenous curative knowledge by the allopathic healthcare and education sectors. Though a significant reduction of medicinal plants and knowledge could increase vulnerability in rural areas, few studies have analysed governance of this important ecosystem service. Therefore, I use the ecosystem service governance approach that incorporates monetary valuation, climate governance and social network analysis to holistically assess the herbal medicinal sector in Loitoktok district. Findings reveal the lucrative income earned by herbalists, diverse coping measures implemented to sustain local supply of medicinal plants and the disassociated social network structure that hinders capacity development, promotes illegal medicinal plants' trade and perpetuates negative view of herbal medicine. To resolve these structural hindrances, my suggestion is to use the network weaving process to optimally position the medicinal plants sector in enhancing carbon sequestration, poverty alleviation, medical tourism, plant conservation and the Maasai culture.

1. Introduction

Indigenous people learnt about the medicinal values of their plant biodiversity and how to use these resources sustainably in a complex relationship perfected over time (Hachfeld, 2003; Wane, 2000). These medicinal benefits are obtained from herbs, herbal materials, herbal preparations and finished herbal products that contain active pharmaceutical ingredients from parts of plants or combinations from other plant materials (World Health Organization, 2002). Currently, due to either limited availability or affordability of pharmaceutical medicines, about 80% of the rural population in sub-Saharan Africa still depend on traditional herbal remedies for primary health care and veterinary use (Bussmann et al., 2006; World Health Organization, 2002). Unfortunately, medicinal plants are a classic example of common pool resources that are declining in the wild due to extensive habitat change (Irwin et al., 2007), climate change impacts (Hawkins et al., 2008; IPCC, 2007) and overharvesting (FAO, 1995). This reduction in the plant resource base could increase human vulnerability to vector, water and air-borne diseases, especially in communities with inadequate health infrastructure (Boon and Ahenkhan, 2011).

In Kenya, medicinal plants do not have a nationwide management plan such as those for crops, livestock and wildlife resources. Also, relegation of indigenous curative knowledge to the periphery by the allopathic healthcare and education system characterises the dismal support by the government for this otherwise crucial sector (Wane, 2000). Furthermore, most literature on this topic focus on the ethnobotanical aspects of medical plants such as Bussmann et al. (2006), Gachathi (2007) and Kokwaro (2009), whereas few detailed studies exist on rural governance of this important ecosystem service. There is therefore need for a comprehensive governance analysis of the strategies implemented to sustain this traditional medicinal sector against impending climate change and indigenous curative knowledge decline.

To accomplish this task, I use the hybrid ecosystem service governance approach that integrates the monetary value of herbal medicine, coping activities against impacts from climate change and notions from social network analysis to document each local actor's responsibility and governance potentiality at the community level (Ngaruiya, 2014b). This study is carried out in the predominantly Maasai district of Loitoktok in southern Kenya. The principal premise of the paper is to investigate how coordinated stakeholder actions can be used to integrate the medicinal plants sector with climate governance, conservation and culture promotion. This discussion contributes to the climate & culture discourse and the results may facilitate formulation of a holistic management plan or policy for the sector by the newly instituted Kajiado County government.

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http://dx.doi.org/10.1016/j.ecoser.2015.05.010
2212-0416/

The paper begins with a brief overview of the gaps in allopathic healthcare that draw people to herbal medicine in Kenya. This is followed by a discussion on two challenges facing the herbal medicinal sector: climate change and negative perception of indigenous curative knowledge. Thereafter, the conceptual framework is described together with a detailed profile of Loitoktok district and the methodology used in the study. It then discusses the results that reveal current governance status of the herbal medicinal sector in Loitoktok. Using network weaving, five governance components within the network structure are suggested to improve climate mitigation and positive indigenous curative knowledge. The paper concludes with brief discussion on the topic.

2. State of allopathic healthcare in Kenya

The per capita health expenditure in Kenya was estimated at $33 in 2009 by the Ministry of Planning and National Development; this is commendable as it also comprises of free treatment for Malaria, Tuberculosis and antiretroviral therapy for HIV^+ persons (MOH, 2012). However, all is not rosy as a study done by Transparency International – Kenya chapter (2011) gave a poor grade to this same healthcare system based on four main factors that are also characteristic of sub-Saharan healthcare systems (African Union, 2007; Kayombo et al., 2013).

1) The Ministry of Health's strategic development plan is formulated to attract donor funding and not tailored to meet the needs of the community.
2) There is an acute shortage of medicines such as malaria drugs, rehydration salts, Antiretroviral drugs (ARVs), antibiotics such as Amoxicillin and treatments for sexually transmitted diseases (STDs) across the country (MOH, 2012).
3) The poor state of road infrastructure and additional costs of transport to any formal health-care facility located at an average distance of 30 km or more worsen the patient's situation especially in remote rural villages.
4) The neglect of indigenous herbal medicine as a viable option equal to allopathic medicines is a direct result of poor consultative governance of the sector.

Existence of such challenges consequently drives many patients to consult the readily available indigenous curative knowledge and affordable herbalists for treatment of their ailments (Schippmann et al., 2006; Transparency International, 2011). However, the herbal medicinal sector also suffers from several interconnected challenges that are discussed below.

3. Climate change and medicinal plants

Climate change is the greatest global contemporary threat to biodiversity and livelihoods in developing countries (Handmer et al., 1999; IPCC, 2007). In Kenya, evidence of climate change is supported by the diminishing glaciers of Kilimanjaro (specifically on Kibo) that have shrunk by ~85% from 12.06 km^2 in 1912 to 1.85 km^2 in 2007 (Thompson et al., 2009). Kenya is also projected to experience more intense and frequent droughts in the 21st century (IPCC, 2007) which is now evidenced by the contracted drought cycle, that has changed from every ten years to five years and now nearly occurs every two years.

Though increased levels of CO_2 (associated with global warming) in the atmosphere can increase plant productivity, this is likely to be a temporary effect as plants acclimatise to the change (Hawkins et al., 2008). Some studies predict that unpredictable climate conditions could result in the extinction of up to half the world's plant species by the end of the century due to increased respiration rates and reduced water supply (Bramwell, 2007). In particular, climate change may affect net primary production and net ecosystem production by altering an ecosystem's moisture regime, nitrogen availability, and growing season length, among other things (Hawkins et al., 2008). These changes will ultimately cause a shift in plant geographical locations (latitudes or altitudes) or even extinction of some species as plants try to adapt to changing environmental conditions (Hawkins et al., 2008). Unfortunately, two other activities are currently also threatening the availability of wild medicinal plants: extensive habitat degradation which reduces distribution of natural vegetation that would have been the natural source of supply of herbal plants (Hawkins et al., 2008) and overharvesting of the remaining fruits or seeds of endangered medicinal species which inhibits plant regeneration to the point of local extinction (FAO, 1995).

Climate governance refers to all the purposeful mechanisms and measures aimed at steering social systems toward preventing, mitigating, or adapting to the risks posed by climate change (Jagers and Stripple, 2003). Of high interest to this study is that plants play a major role in mitigation through afforestation, reforestation, improved forest, cropland and rangeland management, and agroforestry by increasing carbon uptake (CBD, 2003). In Kenya, the National Climate Change Response Strategy (NCCRS) proposes "intensified and sustained afforestation and reforestation programmes by the government, individuals, schools, private sector, multilateral organisations and development partners" using an estimated budget of KES 32.26 billion ($ 367 million). But, the NCCRS *only* mentions funding rural afforestation programmes of *Aloe vera* and *Acacia senegal*, leaving out other pharmaceutically important plants with direct economic benefits to rural communities. Such narrow focus negates prescribed rural development because most medicinal plants can provide a significant source of income for rural people or other economically marginalised sections of the population through the sale of wild-harvested material (Schippmann et al., 2006).

4. Trends in indigenous curative knowledge

Few topics in rural development are as surrounded by mysticism and misconception as traditional medicine (Dery et al., 1999). In Kenya, this misconception was formally endorsed during the colonial rule that outlawed herbal medicine practices under the "Witchcraft Act" of 1925 (Sindiga et al., 1990; Wane, 2000). Though parts of this law were subsequently revoked after independence in 1963, the negative undertones have not yet diminished.

Similarly, the "westernised" education system has neglected integrating indigenous curative knowledge into the school curricula (primary to tertiary levels) which indirectly continues to perpetuate the misunderstanding in Kenya. This is despite the fact that a traditional healer's knowledge may be as significant, epistemologically, as that of a general medical practitioner, and the knowledge of a naturopath or homoeopath (Horsthemke, 2008). As a result, many urban "educated" persons still associate herbal medicine with witchcraft. Since traditional medicinal knowledge was orally transmitted and associated with households, communities or ethnic groups, this division between formally educated and lay persons heavily contributes to loss of this region-specific information (Dery et al., 1999; Hamilton, 2004).

At the national level, poor financial support by the government hinders widespread research collaboration between herbalists and scientists to validate "presumed" efficacy of medicinal products and advance product development. Hence, appeal for herbal products which are still traded as bitter powder and liquid concoctions is really low to new users especially young people as compared to conventional medicine that are available in more patient friendly formulations such as syrups, capsules and tablets (Kigen