



Management of wood resources: A dilemma between conservation and livelihoods in a rural district in the Aral region



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ABSTRACT

This study focused on black saxaul (*Haloxylon aphyllum*) and tamarisk (*Tamarix hispida*), which are economically and environmentally important trees in one of the most arid parts of the Aral region. Black saxaul is the main local fuelwood species. However, its extraction was banned after it became critically endangered in the 1990s. Planting this species is now regarded as essential for rehabilitating the Aralkum Desert in light of the Aral Sea crisis. Tamarisk is another fuelwood species that supports local livelihoods. We administered questionnaires among residents in Karateren district and conducted interviews with some residents and with policymakers responsible for regulating forest management. The findings revealed a significantly higher preference for black saxaul than for tamarisk among residents, with a high potential demand for the former. Moreover, some residents observed a decrease in tamarisk biomass, which could accelerate as a result of constant population growth in the study district. We recommend conducting an assessment of logging sites and establishing a feedback system involving local communities to develop risk management that can address future shortages in wood supplies and over logging. Political decision making should also consider the uneven preferences of residents of this region for fuelwood species.

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Introduction

The Aral Sea was previously the fourth largest inland lake in the world. However, commencing from the 1960s, large-scale and inefficient irrigation has occurred in the upper river basin leading to a decrease in the water volume flowing into the Aral Sea and causing its shrinkage (Micklin, 2004, 2007; Glantz et al., 1993; Aladin et al., 2005). Consequently, an extensive man-made desert has been created along the dry seabed, becoming the main source of salt dust storms (Wucherer et al., 2005; Breckle et al., 2012), although there is room for discussion to scientifically prove the exact extent of damage on the region (Martius and Lamers, 2016). This human-induced disaster has led to severe ecosystem destruction, regional climate change, as well as health and socioeconomic problems within local populations (Micklin, 2007; Glantz et al., 1993).

Severe sand storms, entailing high salt levels have become common occurrences, impacting the livelihoods of local residents of this region (Small et al., 2001; Whish-Wilson, 2002). To alleviate the damage caused by increased amounts of sand, and to improve the region's

vegetation, the government of Kazakhstan and international organizations such as the World Bank and the United Nations Development Programme have implemented large-scale reforestation projects involving a native tree species, black saxaul (*Haloxylon aphyllum* (Minkw.) Iljin), which has a high degree of tolerance for aridity and salinity (Micklin, 2007; Sehring, 2012; World Bank, 2007, 2011).

Black saxaul has long been an essential fuelwood resource for local residents. However, massive deforestation in the 1990s led to the depletion and endangerment of black saxaul, which was threatened with extinction (Breckle et al., 2012; Sehring, 2012). Consequently, commencing from 2004, logging of saxaul species has been completely prohibited in the Aral region (Постановление Правительства Республики Казахстан, 2004). The use of black saxaul has been replaced by tamarisk (*Tamarix hispida*), another tree species as a major source of fuelwood (local forest office). Because the arid climate of the Aral region permits very limited vegetation, human activities can have a significant impact on the environment of this region. Therefore, policymakers need to ensure a balance in management priorities relating to the conservation and consumption of fuelwood species in the region. However, in recent decades, there have been few studies conducted on fuelwood consumption and forest management at the level of local communities. An understanding of local people's criteria for evaluating fuelwood, their predicted marketing activities, and their attitudes toward management

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