Camel farms: a new idea to help desert ecosystems recover

Novel solutions to combat desertification processes are needed, since excessive livestock grazing in the Arabian Peninsula has become a primary cause of ecological degradation. Now, a scheme has been developed centred on camel farms to help desert ecosystems recover.

Steadily increasing camel populations over the last few decades have dramatically reduced the indigenous biodiversity of desert ecosystems. Today, intensive livestock grazing is the greatest threat to desert ecosystems, already affecting about 90 percent of the Arabian Peninsula (Gallacher & Hill, 2006). Vegetation cover, normally protecting the soil from erosion, is mostly drastically reduced by overgrazing, leading to a considerable increase in sand movements. Landscapes with good vegetation cover have been transformed to *man-made* deserts. A new concept, developed in a proposal by the UNESCO Office in Doha (Qatar), suggests that camel farms could be a novel contribution to combat desertification through excluding excessive numbers of camels from the desert. The number of camels must be reduced below the ecological carrying capacity to allow the recovery of desert ecosystems. Additionally, the farms will provide an innovative alternative source of income, contribute to saving irrigation water for conventional fodder crops, and assist the conservation of the local flora.

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Non-sustainable production is gaining ground

In the past, during traditional times of husbandry in the Arabian Peninsula, Bedouins and their camels lived in a symbiotic relationship in tune with their environment. The Bedouins evolved the *hema* system, where certain areas of common tribal pastures were protected from grazing for a fixed period. A balance existed between the components of the rangelands and the traditional nomadic husbandry. This changed dramatically during the 20th century. Extensive oil and gas exploration led to rapid social economic changes. Traditional husbandry was converted into a non-sustainable system associated with an overexploitation of desert rangelands. "Nowadays the camel densities are exceeding the ecological carrying capacity in various parts of the Arabian Peninsula," says Professor Abdulaziz Abuzinada, former Secretary General of Saudi Arabia's National Commission for Wildlife Conservation and Development (NCWCD). Fodder production and the use of water tankers caused an increased demand on natural water resources, and the desertification of previously well-vegetated areas. This high grazing pressure pushed natural desert ecosystems close to extinction (Kefi et al., 2007). A wise decision by the government of

Modern milking machinery for camels on a farm in Dubai (UAE). Currently 600 camels produce around 6,000 litres milk a day. With improved feed, water availability and veterinary care, daily yields could rise to 20 litres milk per day and camel.

Photo: Ulrich Werney

Desertification: The magnitude of the problem

In 1992 the United Nations established the Convention to Combat Desertification, and 2006 was designated as the "International Year of Deserts and Desertification", starting to face the problem world-wide. "Nowadays, the effects of desertification are taking place much faster than ever before and climate models additionally predict that the world's driest regions will even become drier," says Walter Erdelen, Assistant Director-General for Natural Sciences at the UNESCO. Today about 41 percent of the earth's surface are drylands, harbouring around 38 percent of the global population, and the consequences of desertification are estimated to affect approximately 250 million people (MEA, 2005, Reynolds et al., 2007).

the United Arab Emirates (UAE) some years ago has banned cows, goats and sheep from the open desert rangelands. They are now kept in closed pens, but camels still wander freely throughout the desert to graze. The new proposed sustainable livestock industry needs to be developed simultaneously with strict grazing laws and regimes, set up by the authorities to protect the desert environments in the Arabian Peninsula from overgrazing and general misuse.

Camel milk: The "white gold of the desert"

Today the increasing demand for milk and dairy products in the Arabian Peninsula is satisfied by raising domestic cattle. Air conditioners and water sprinklers must be used to keep the ambient temperature cool enough for the cows to be productive; otherwise they produce only two litres of milk daily. Camels, being much better adapted to the local climate, can produce up to ten times more milk per day without wasting energy and water for cooling. It has been shown that camels can be managed in closed farms. In Dubai, one such camel farm already exists where, since 2007, some 600 camels have been producing milk and meat which is commercially sold, however currently only as a niche product. There, a specialized camel milking machinery was developed, which makes the camel farm a modern and practical dairy farm.

"Camel milk is the white gold of the desert," says Ulrich Wernery, Scientific Director of Dubai's Central Veterinary Research Laboratory (CVRL). "It is a rich source of proteins with a potential anti-microbial and protective activity, has high concentrations of niacin and vitamin C and a low fat content and is therefore healthier. Also milk allergy and lactose intolerance, very common in the western world, are unknown diseases with camel milk. However, the reason is yet not known." So camel farms could become a serious business not only in the Arabian Peninsula. The UN's Food and Agricultural Organization estimated that the global market in camel milk is potentially worth over 10 billion USD. In addition UNESCO's proposal suggests the use of indigenous plants as camel fodder, since these are perfectly adapted to desert climate conditions with modest water requirements (Peacock et al., 2003).

The present novel proposal of establishing camel farms provides an innovative solution to combat desertification and may hence present a valuable approach to relieve natural areas from the ongoing degradation due to overgrazing. Moreover, it will provide a model that might encourage camel owners to adapt this innovative approach of camel farming. It will also assist in the process of reversing desertification and restoring desert ecosystems. Nevertheless, the idea needs to be tested in order to find out if this form of husbandry is culturally acceptable and profitable. There are a number of Biosphere Reserves in the Arab Region, and these would be perfect places to conduct necessary feasibility studies and experiments. UNESCO Doha Office will discuss this with the concerned national authorities and encourage them to include this aspect in the Biosphere Reserve management plans.

A full list of references can be obtained from the authors or at www.rural21.com.

Zusammenfassung

Die stetig wachsenden Kamelpopulationen auf der arabischen Halbinsel haben die einheimische Biodiversität des wüsteneigenen Ökosystems dramatisch reduziert. Die Vegetationsdecke, die den Boden sonst gegen Erosion schützt, ist durch Überweidung stark zurückgegangen, was zu einer deutlichen Zunahme der Sandbewegungen führt. Landschaften mit ehemals guter Vegetationsdecke haben sich durch den Einfluss des Menschen in Wüsten verwandelt. Ein neues Konzept schlägt vor, die fortschreitende Desertifikation durch die Einrichtung von Kamelfarmen zu bekämpfen. Mit ihrer Hilfe können große Kamelherden aus der Wüste entfernt werden, so dass sich die wüsteneigenen Ökosysteme wieder erholen können. Die Kamelfarmen bieten eine innovative, alternative Einkommensquelle, ermöglichen das Einsparen von Wasser für die Bewässerung im Futtermittelanbau und unterstützen den Erhalt der lokalen Flora.

Resumen

Las poblaciones de camellos en constante crecimiento en la península de Arabia han reducido dramáticamente la biodiversidad de los ecosistemas del desierto. La cobertura vegetal, que protege a los suelos de la erosión, está disminuyendo drásticamente debido al sobre-pastoreo, lo cual ha llevado a un considerable incremento de los desplazamientos de arena. Los parajes antes cubiertos por una vegetación abundante podrían haberse transformado en desiertos hechos por el hombre. Un nuevo concepto indica que las granjas de camellos podrían representar un novedoso aporte a la lucha contra la desertificación, pues evitan la sobrepoblación de los desiertos por un número excesivo de camellos. Esto permite que los ecosistemas del desierto se recuperen. Las granjas constituyen una innovadora fuente alternativa de ingresos, contribuyen a ahorrar agua a partir de los sistemas de irrigación para cultivos convencionales de forraje y ayudan a conservar la flora local.