Introduction

Drylands constitute about 80 percent of the IGAD region (The Intergovernmental Authority on Development in Eastern Africa) and are home to almost 70 million residents, many of whom practice a pastoral way of life. Dryland ecosystems contribute to the economy through two important pathways. First, they provide production amenities such as the goods and services consumed by pastoralists in producing milk, meat, hides, and other livestock products. Secondly, dryland goods and services contribute directly to consumers' well-being through consumption amenities, such as medicines, housing materials, and subsistence foods or by providing the spatial and ecological basis for the way of life and cultural identity of pastoral communities.

Drylands also provide benefits directly to consumers on larger scales, including those outside the dryland borders, by regulating the movement of water, nutrients, wildlife, and human communities, through sustaining the world's biological diversity, and by regulating levels of carbon dioxide and other gases in the atmosphere. These global benefits are generally undervalued and poorly compensated, but when they are lost the cost that is felt is tangible and is increasingly understood.
The drylands of the IGAD region also form an important reservoir of biodiversity. Drylands are home to some of the most charismatic species, support high species endemism and comprise many unique ecosystems and biomes, including savannas, dry forest, coastal areas and deserts. However, currently drylands are neglected, under-valued and increasingly degraded. In the current context of Global Climate Change, this degradation means not only a loss in biodiversity of the drylands with concurrent livelihood failures, but also a profound loss in globally important ecosystem services, such as carbon sequestration and water supply. Furthermore, many other ecosystems, such as riparian or forest ecosystems in drylands are under tremendous risk.

Economic value of dryland ecosystem goods and services

Dryland ecosystems enable residents during most years to survive, maintain a way of life they cherish, and pursue improvement in their standard of living, although rapidly expanding populations are increasing the pressure on these critical resources. Goods and services derived from the drylands also contribute to the food supplies, foreign-exchange earnings, job opportunities, and gross domestic products (GDP) of IGAD countries. The overall value of these goods and services remains unknown, but the limited, relevant research provides useful insights.

Much of the value for dryland ecosystems materializes as drylands provide forage and water for pastoralists and their livestock, a primary source of milk, meat, and hides. Some of these products are consumed directly whilst others are sold, with many of the benefits accruing to urban dwellers. Studies of forage, water, and other dryland goods and services that support livestock production vary across the region, with studies documenting annual income values of about $9–$80 per hectare per year, with an average value of about $45 per hectare per year. A separate line of research has found that dryland forests, woodlands, and bushlands can offer building materials, medicines, natural foods, firewood, and other elements of domestic consumption and commercial trade with a value of about $30–130 per hectare per year.

Table 1. Estimated Potential Value of Livestock-Related and Natural Products that Might be Derived from Dryland Ecosystems, by Country

<table>
<thead>
<tr>
<th></th>
<th>Livestock</th>
<th>Natural Products</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Djibouti</td>
<td>$40 mil.</td>
<td>$170 mil.</td>
<td>$210 mil.</td>
</tr>
<tr>
<td>Eritrea</td>
<td>$600 mil.</td>
<td>$800 mil.</td>
<td>$1.4 bil.</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>$3.4 bil.</td>
<td>$3.4 bil.</td>
<td>$6.8 bil.</td>
</tr>
<tr>
<td>Kenya</td>
<td>$2.5 bil.</td>
<td>$3.6 bil.</td>
<td>$6.1 bil.</td>
</tr>
<tr>
<td>Somalia</td>
<td>$1.9 bil.</td>
<td>$4.8 bil.</td>
<td>$6.8 bil.</td>
</tr>
<tr>
<td>Sudan</td>
<td>$5.5 bil.</td>
<td>$2.0 bil. a</td>
<td>$7.5 bil.</td>
</tr>
<tr>
<td>Uganda</td>
<td>$1.2 bil.</td>
<td>$500 mil.</td>
<td>$1.7 bil.</td>
</tr>
</tbody>
</table>

Source: ECONorthwest

1 Data and analysis presented in this briefing note are taken from the IUCN study “Economic Importance of Goods and Services Derived from Dryland Ecosystems in the IGAD Region”. http://www.iucn.org/about/union/secretariat/offices/esaro/our_work_drylands/drylands/making_the_linkages__idrc__project_overview/
Case study 1: Small-Scale, Irrigated Agriculture and Other Reductions in Water Supply — Garba Tula, Kenya

A study of 2,000 people irrigating 176 hectares on the Bisanadhi River in Garba Tula found that farmers were unable to earn enough from the sale of crops to sustain the irrigation infrastructure, and instead incurred significant cost on the region’s dominant pastoral production enterprise. Village elders feared that the scheme would collapse within a decade and expressed a belief that they and their families would be better off if they lived a pastoralist lifestyle. Similar diversions of water for irrigation and other purposes along the nearby Ewaso Ngiro river has greatly diminished the flows reaching the Lorian Swamp, that has long provided refuge to pastoralist communities, their livestock, and wildlife. The rivers that flow through Garbatula play a key role in sustaining households, livestock production, and wildlife across vast areas by providing water and forage during stressful dry periods. Diverting river water to support small-scale irrigated agriculture necessarily diminishes this on-going activity. Increased production of irrigated crops can come only with losses to the commercial livestock and tourism industries, accompanied by the displacement of thousands of people in pastoralist households.

However, these data do not reflect the total value of all goods and services derived from drylands, such as supply of natural products, regulation of water, or sequestration of carbon. Indeed, the asset value of wetlands within the drylands, such as the Lorian Swamp in Garba Tula and the Tana River Delta, would be higher, reflecting the key role they play in insulating communities, livestock, and wildlife from the risks of dry periods. Analysis indicates that just the goods and services supportive of livestock produced by wetlands in the IGAD drylands are worth $140–600 per hectare per year.

At first glance, many residents of the IGAD region, investors, and representatives of international agencies conclude that investments in irrigated agriculture or other economic activities in drylands offer a quick and sure way for countries to improve food production and promote economic development. This study however indicates that the actual outcomes may be just the reverse. For instance rivers that flow through the Garbatula area in North Eastern Kenya play a key role in sustaining households, livestock production, and wildlife across vast areas by providing water and forage during stressful dry periods. Diverting river water to support small-scale irrigated agriculture necessarily diminishes this on-going activity. Increased production of irrigated crops can come only with losses to the commercial livestock and tourism industries, accompanied by the displacement of thousands of people in pastoralist households. The elders in the community fear that their way of life would collapse within a decade and most of the community will have to leave the area.
Case Study 2: Large-Scale, Irrigated Agriculture in the Tana River Delta, Kenya

The ecosystem of the Tana River Delta provides numerous goods and services that have great economic value locally, nationally, and globally. Local communities pursue diverse livelihoods, such as pastoral livestock production, small-scale farming, and fish production, to take advantage of these goods and services and new initiatives are capturing additional value through tourism. A proposed irrigation scheme of 20–30,000 hectares to produce sugar cane in the delta has the potential to yield considerable economic benefit for some residents and investors, but only by degrading the ecosystem and disrupting existing economic activities. Evidence indicates that, at all levels – local, national, and global – the losses from such development could outweigh the gains. The societal costs would include the loss of livestock production, displacement of pastoralists up to 100 km distant who depend on the area to survive dry periods, harmful impacts on at-risk species, and general reduction of river flows and the loss of habitat in a delta ecosystem of high biodiversity value. Further research is needed to improve valuation and to determine the potential benefits and costs of any specific proposal for large-scale irrigated agriculture in the Tana River Delta.

Recommendations and conclusion

Drylands are complex and extensive systems and the value of components within any system need to be clearly understood. The value of critical resources within the drylands for example need to be understood in the context of the overall system, otherwise the costs of their conversion to shift uses risk being greatly underestimated. The drylands of the IGAD region currently provide goods and services of paramount importance to the millions of residents and to the overall economies of the member nations. It is therefore imperative to maintain the integrity and health of drylands and to ensure that investments are balanced to optimise overall economic output across the system, rather than to maximise productivity at a localised level. This requires joint actions of different user and non user groups:

- **Leaders** – should acknowledge that dryland ecosystems provide multiple goods and services important to economic well-being across the IGAD region and beyond, and should avoid decisions that jeopardize these values.
- **Macroeconomic and sectoral planners** – need to recognize the value of dryland goods and services despite the absence of markets, and should devise policies and investments to enhance this value whilst avoiding those that would reduce them.
- **National accountants** – should incorporate the effects of development actions and resource-management decisions on the value of the goods and services derived from dryland ecosystems.
- **Environmental and economic experts** – should undertake extensive research into drylands ecology and economics to inform decision and underscore the importance of dryland goods and services.
- **Leaders in pastoral communities** – should advocate for practices, programs, and policies that improve the value of goods and services their communities derive from drylands.
- **Business leaders and investors** – should look for opportunities to derive higher returns from sustainable management of drylands.
- **Everyone seeking to improve economic well-being in the IGAD countries** should oppose investments that would degrade the ability of dryland ecosystems to provide valuable goods and services unless the costs and benefits are explicitly weighed.