



Ecosystem-based DRR in the dry rangelands

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A case Study for Eco-DRR

Valuing benefits from
sustainably managing
rangelands in Jordan



Flock of sheep near Castle Shoback, Karak Governorate
(13.04.2015; Huda Odeh)



Ecosystem-based DRR in the Jordan Rangelands

How to value multiple benefits of ecosystem (services) ?

One tool is to approximate the economic value of such benefits (proxies).

Three main types of ecosystem valuation include (De Groot, 2010):

- direct market valuation;
- Indirect market valuation; and
- survey-based valuation;

For the third one, if data are lacking, economists often use “replacement or avoided costs”.

For instance the cost of destruction of an ecosystem

* such as **coral reefs** → the cost of replacing it by an engineered structure (i.e. seawalls); coral reefs are an important barrier to strong sea waves and protect cost shores.

- Such as **forests on mountain slopes** → the cost of having to rebuild infrastructure (i.e. roads, housing) that are no longer protected by this ecosystem.

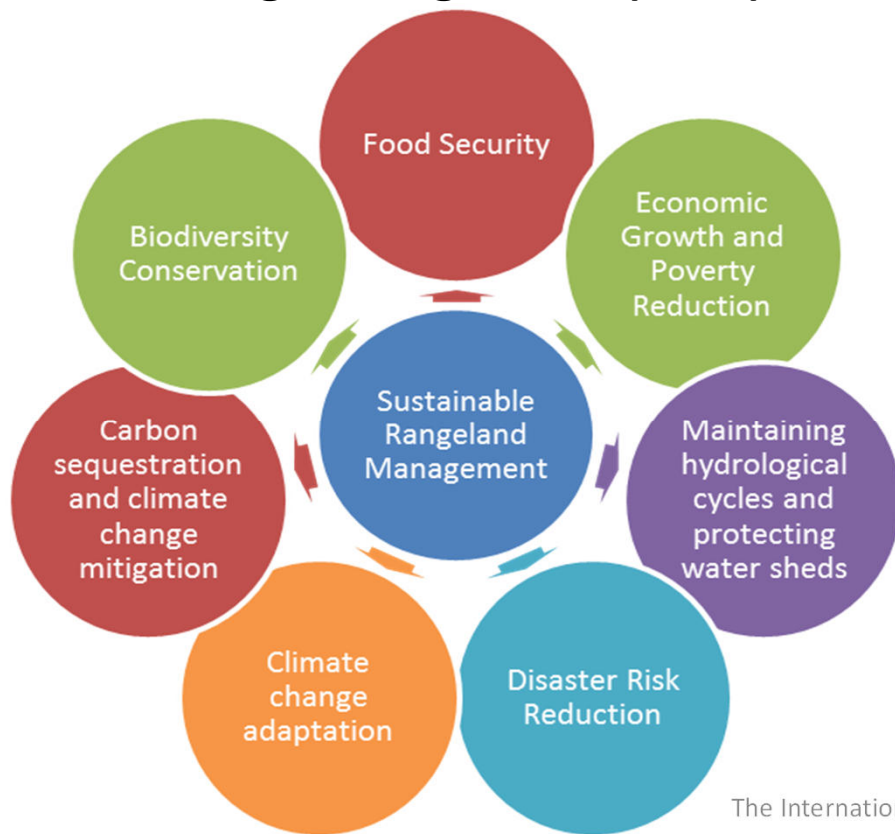
Emerton (2009) estimated that along the coast of Indonesia, the cost of replacing roads and houses in the event of strong waves is estimated at US\$50,000/km; and

the cost of maintaining sandy beaches for tourism is US\$1 million/km, both are protected and maintained naturally by coral reefs (Emerton, 2009), saving society large sums of money.



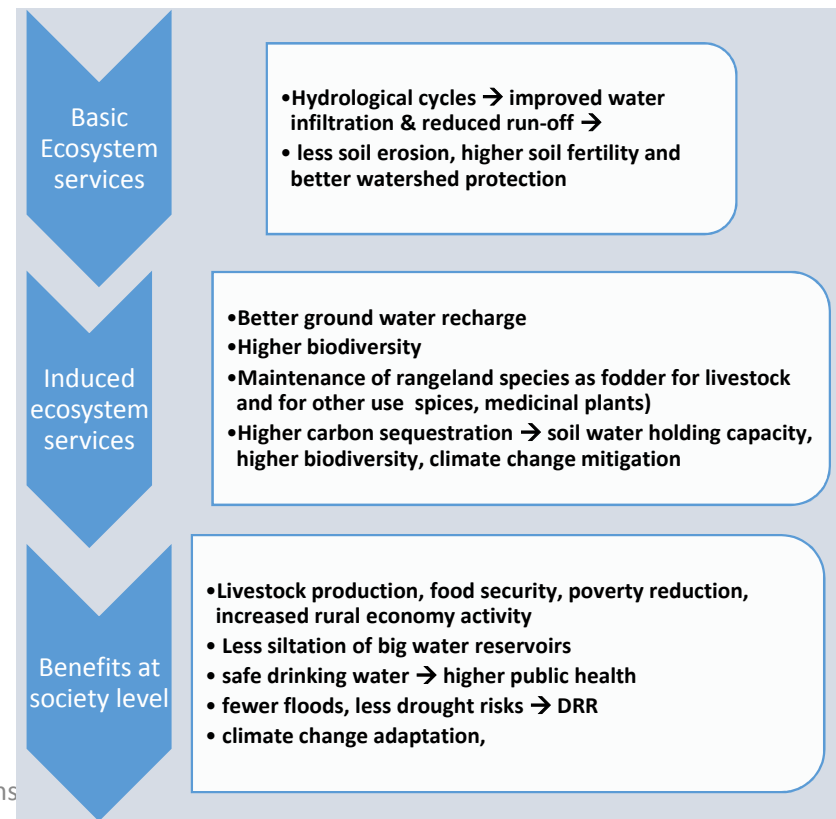
Ecosystem-based DRR in the Jordan Rangelands

Multiple benefits of sustainably managed rangelands (SRM)



The International Union for the Conservation of Nature

SRM and ecosystem service benefits; a possible hierarchy?





Ecosystem-based DRR in the Jordan Rangelands

How to value these multiple benefits of SRM?

In Jordan a number of valuation tools have been explored. Two, the most straight forward ones are presented here and fall in the category of “estimating avoided or replacement costs”.

1. The value of improved fodder/biomass production for animals was estimated by estimating avoided cost of importing dry animal feed.
2. The value of increased surface water collection (and implicitly enhanced groundwater recharge) by estimating the willingness of local people to pay for “tinkered water”
3. The value of reduced sedimentation in downstream dam reservoirs by avoided cost of the need for extra water storage capacity
4. Valuing additional carbon sequestration (dismissed as being too complex and too many assumptions)





Ecosystem-based DRR in the Jordan Rangelands

How to value the multiple benefits of SRM?

Value of improved vegetation quality and density (biomass) by social fencing

→ quite spectacular increase in forage production from 80 to 200 kg/ha in the Steppe areas and from 40 to 100 kg/ha in the Badia, as documented in the four rangeland sites.

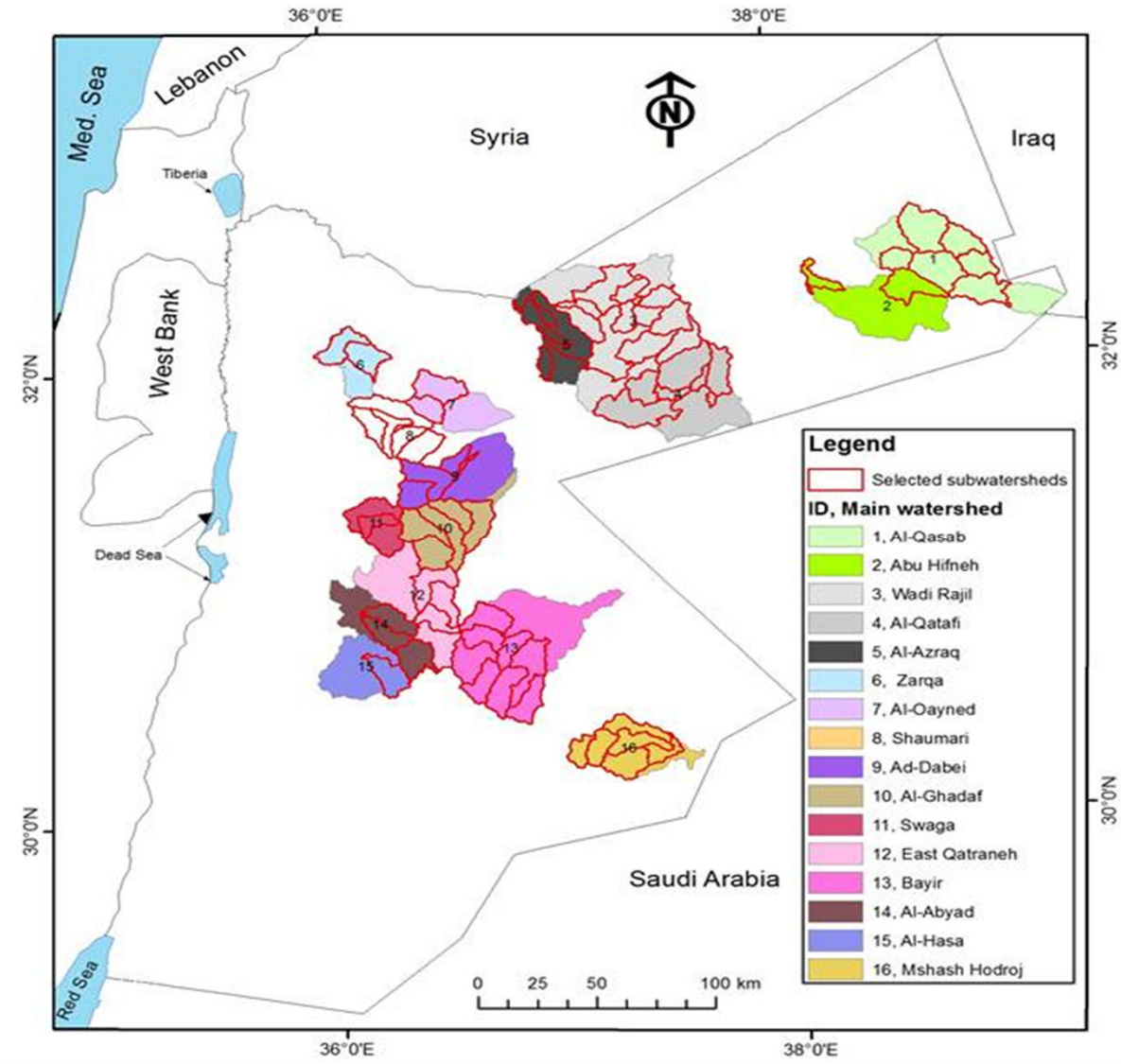
Bringing this to scale

A GIS study has identified watersheds that have good potential for range management (30 % of the steppes and 28.5% of the Badia desert)

If social fencing and grazing management is applied in this area, economic valuation indicates that the resulting increased forage production has an economic value of 6,7 Million JD/yr.

Similarly, increased surface water collection in these protected rangeland would translate in an economic value of 7.8 million JD/yr

GIS Map of the initially selected watersheds and sub-watersheds





Ecosystem-based DRR in the Jordan Rangelands

Results and impact of Hima community range management

The two benefits amount together to about 15 million JD/yr or 22 million USD/yr. This is without counting for the value of other evident benefits:

- Improved soil carbon sequestration
- Reduced soil erosion and increased soil moisture
- Improved groundwater recharge
- Enhanced local ownership for range management
- Increased economic activity in rural range areas
- **Reduce the risks of drought disasters**
- **Enhance climate change adaptation**



Ecosystem-based DRR in the Jordan Rangelands

Results and impact of Hima community range management

A study on sustainably investing in the Jordan Rangelands identified the following actions that could be combined in different investment packages:

- Hima integrated grazing management
- Soil, Carbon & Water Conservation
- Improved ecological livestock production
- Ecological production of valuable medicinal and aromatic rangeland plants
- Installing renewable energy (solar)
- Developing eco-tourism

(Laban, 2015)



Ecosystem-based DRR in the Jordan Rangelands

Results and impact of Hima community range management

Where economic valuation can be a good tool to provide proxies for the value of ecosystem services, there is also a strong need to qualify that.

It is not always possible or desirable to put a price-tag on ecosystem services. Many land users, for example, are motivated by the aesthetic, spiritual or cultural values of land, and these services may not be well-measured in financial terms. Economic valuation alone may not capture what is at stake in a social and ecological agenda. There are risks in relying exclusively on market triggers to achieve sustainability.

Market triggers or financial returns are not the only motive for people to invest, and relying on such financial motives would assume that the value of nature and environment is only dependent of the function it has for human production and consumption.

*ROWARTH, K., 2017. Doughnut Economics: Seven Ways to Think like a 21st Century Economist. Chelsea Green Publishers, US
(life as a doughnut between social and planetary ecological boundaries)*



Ecosystem-based DRR in the Jordan Rangelands

How enhancing Hima community range management in Jordan?

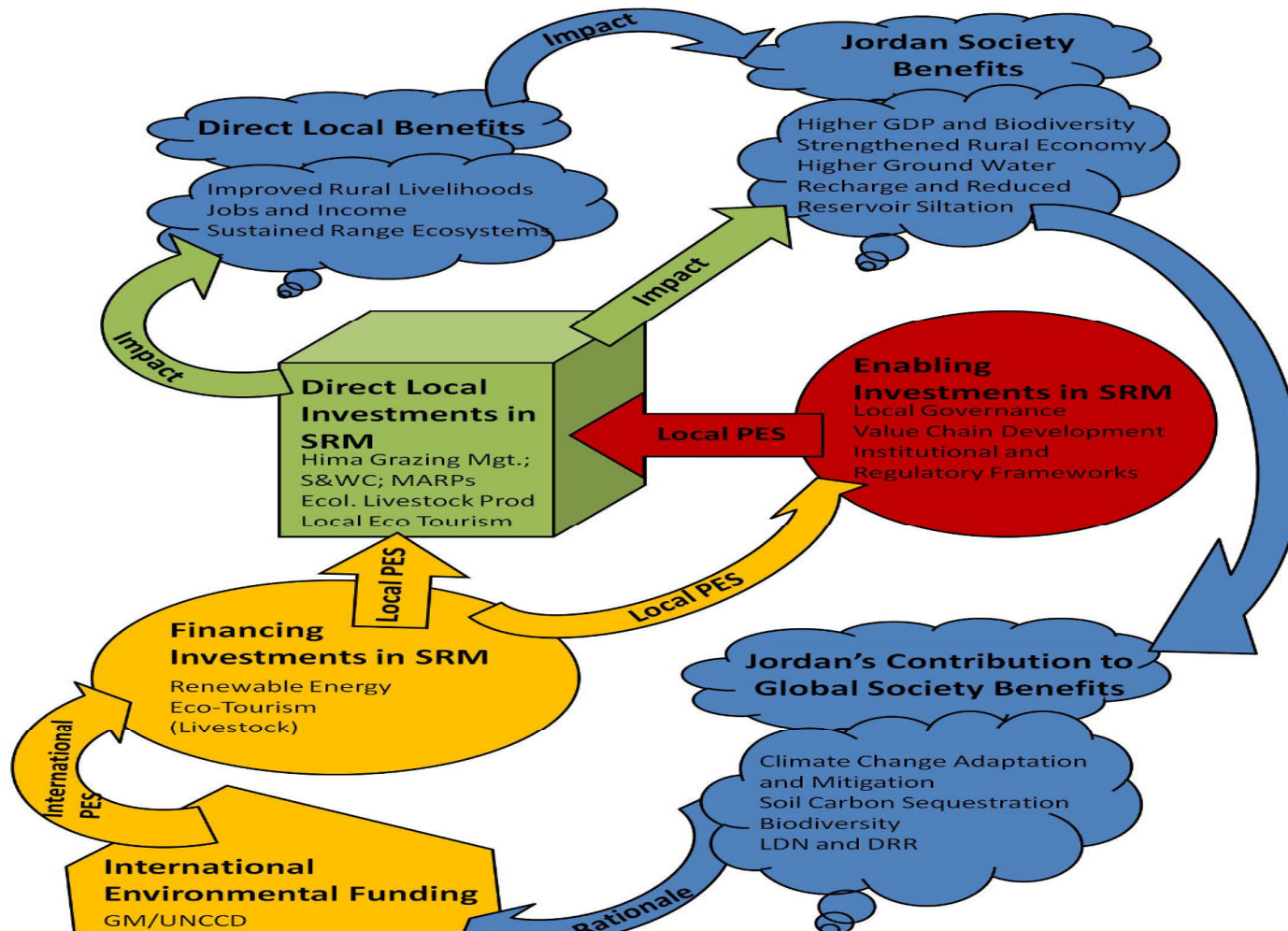
Still, economic and other valuation tools are useful for

- providing a financial rationale to bringing this to scale
- convincing and engaging policy decision makers, and hence enhancing conducive policy measures
- **Indicating the cost of not reducing the risks of disasters**
- providing a rationale that local land managers (herders) cannot be expected to pay the price of necessary investment where there are important other beneficiaries from such investments (what are the externalities?)
- finding ways to organize internal and external financial flows to finance the investments to be made (by herder communities and government agencies) – for instance through payments for ecosystem services (PES).



Investment Financial Flows for SRM

SRM = Sustainable Range Management





Sustainably investing in the Jordan rangelands

Top-line summary of Updated Jordan Rangeland Strategy (2014)

Strategy Main Goals (for details see MoA Strategy)

1. Rangelands sustainable development and management.
2. Improvement of social and economic conditions for livestock breeders and pastoral communities taking into consideration gender issues
3. Enhancement of capacity building (training and awareness)
4. Monitoring and evaluation of rangeland status
5. Engagement of local communities in sustainable rangeland development and management.



Sustainably investing in the Jordan rangelands

Top-line summary of Updated Jordan Rangeland Strategy

Main constraints observed in this 2014 Strategy

- ❑ The 2001 Strategy and the related legislations have not been effective mainly because of the absence of national consensus and the lack of integrated plans.
- ❑ The status of poor management and use of the rangeland resources has not changed, which led to destruction of plant cover and weakening of productive capacities of rangelands.
- ❑ At present the rangelands of Jordan cannot provide animal feed for more than 3 month during the good rainy seasons and less than one month or none during the drought years.
- ❑ In addition vast rangeland areas (about 10 million dunum) known as claimed tribal lands have been allocated to private owners without proper plans for their restoration, development and management.
- ❑ This facilitated promotion of real-estate business in the rangeland areas and use of large areas for non-agricultural purposes.