

**The Ecosystem services framework: Ecosystem services classified, valued independently, then aggregated**

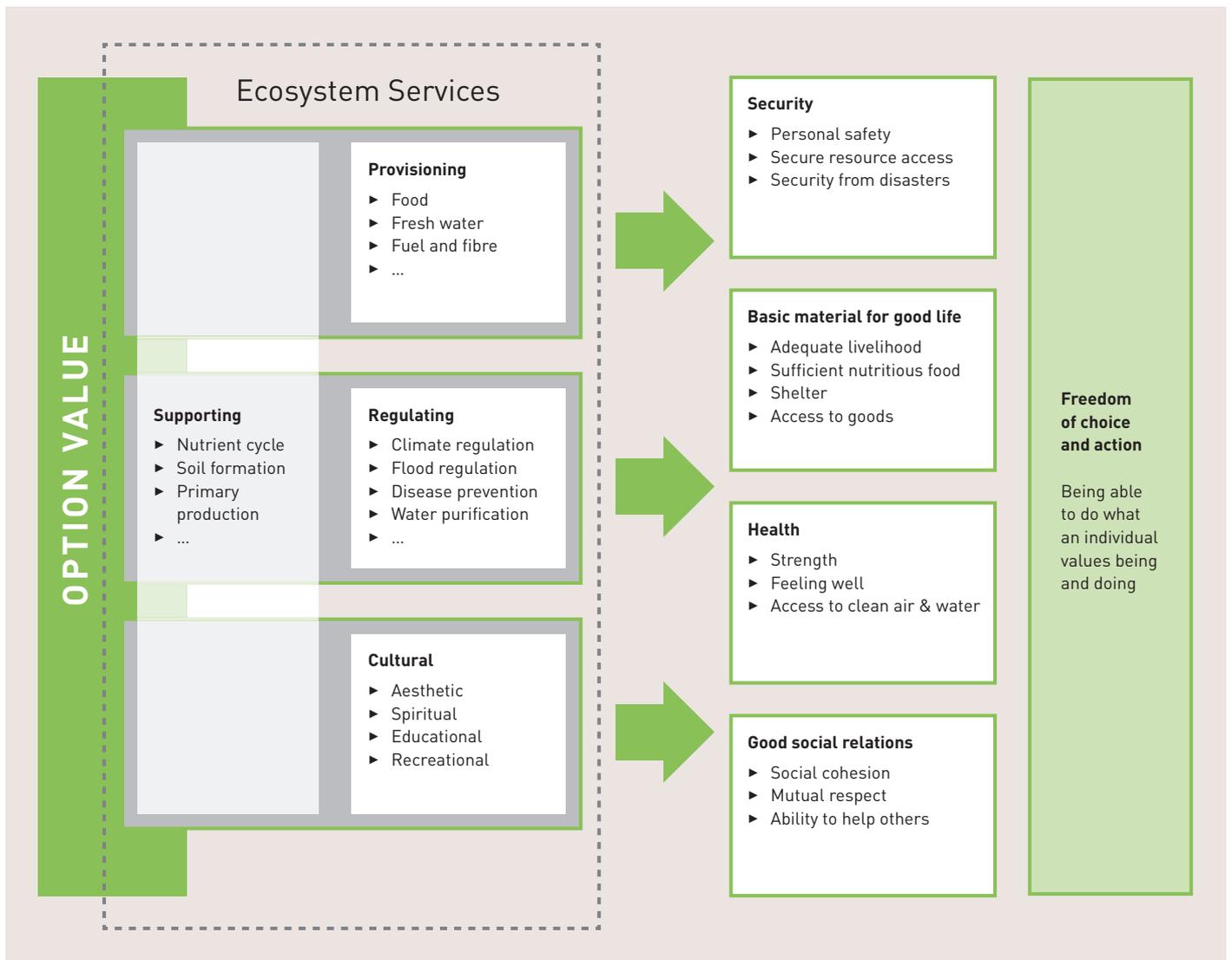
Estimating the true economic value of land is not easy or straightforward, as land provides society with so many different services. The method suggested here is to deconstruct these services into independent categories that can be valued separately without duplicating the value of a single service across categories. The total economic value of the land is then the sum of the values of the identified individual services.

Decision-makers can use the ecosystem service framework developed in the Millennium Ecosystem Assessment<sup>1</sup> to identify a complete list of services provided by land that have an economic value to society as a whole. There are four general types of services: *provisioning* (food, water, fibre, timber, fuel, minerals, building materials and shelter, and biodiversity and genetic resources), *regulating* (benefits from regulation of processes such as climatic events, water flows, pollution, soil erosion, and nutrient cycling), *cultural* (mostly experienced through tourism or religious practices) and *supporting* (primary production, soil

FIGURE 2

**The provision of ecosystem services from natural capital: Linkages between ecosystem services and human well-being**

(adapted from Millennium Ecosystem Assessment 2005, Figure A, pg. vi<sup>1</sup>)



## BOX 2

### Examples of improved land management derived from economic valuations of ecosystem services

#### Provisioning services

- The estimation of the costs of soil erosion and the assessment of whether investment in soil erosion is economically viable, using productivity loss, replacement costs, and participatory contingent valuation methods.

#### Regulating services

- The estimation of non-agricultural and non-timber values can be used to inform the amounts of carbon payments.
- The estimation of pollution costs can be used to inform the establishment of payments for pollution clean up.

#### Cultural services

- The estimation of recreational values can be used to estimate the potential benefits from establishing or developing the tourism industry.
- The estimation of aesthetic and spiritual values can be used to inform the protection of high value cultural and spiritual assets.

formation, and nutrient cycling). These ecosystem services collectively provide the basis of human well-being and economic welfare. In such a context, and seen from an economic perspective, land degradation is the loss or reduction in services provided by land to society as a whole. This definition also includes the reduction of land on which these services are based, even if the services themselves are maintained through time (e.g., a forest with a river running through can be reduced in size as a result of external development pressure, even though the river itself is still providing its services). The reduction in this natural capital threatens the long-run sustainability of current pathways of exploitation (this is referred to by economists as the *strong sustainability concept*).

Figure 2 shows the relationship between ecosystem services and well-being, and the flow from ecosystem services to human sustenance and well-being and ultimately to freedom in choice and action. There exist several variations of Figure 2, with more

or less details<sup>25, 46, 47</sup>, but the main concepts and structure behind all of them is essentially the same.

Box 2 details some examples of what valuations of these ecosystem services could be used for, in terms of both the type and scale of economic incentives that can be set up.

### The Total Economic Value framework and valuation methods

Increasing competition for land demonstrates that an assessment of the total economic value of land is urgently required, so that land is not undervalued nor overexploited. This will allow concerned parties to make the most of all of their potential economic opportunities. However, the following challenges of this type of assessment must be considered: (i) total economic valuation is currently perceived as too complicated, too costly to estimate, and/or its results are not considered appropriately in the decision-making process, (ii) there is no unique method to measure total economic values, (iii) there is not yet a complete set of methods that are simple to implement and lead to robust estimates of the total economic value of land, and (iv) there are no studies to date that estimate the full economic value of a piece of land based on the range of provided services. Valuations have thus always been only partially complete, making comparisons between sites difficult, if not impossible, as different aspects of land and ecosystem services can be measured in very different ways.

Nonetheless, valuation methods can capture various components of the total economic value for a given service. The fundamental idea is to deconstruct the total economic value into components that can then be summed up together again, while avoiding overlap between these components and preventing duplicate counts. This framework has already been used in ZEF and IFPRI's initially commissioned work on the Economics of Land Degradation<sup>25</sup> and their current ELD project<sup>26</sup>, as well as in complementary initiatives like the Economics of Ecosystem and Biodiversity<sup>48</sup> and the UK National Ecosystem Assessment<sup>27</sup>. What remains a necessity is a systematic, empirical estimation of total economic value in relation to land management, in order to get a sounder economic assessment of current land management practices and alternative options.