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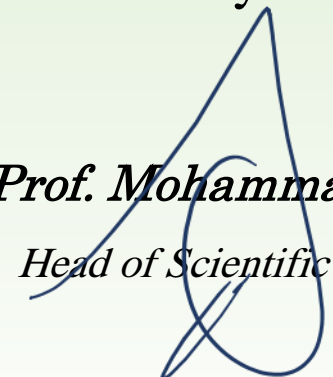
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# The 1<sup>st</sup> International and the 8<sup>th</sup> National Conference on Rangeland Management in Iran



## Economic Evaluation of Rangelands

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### Abstract

Rangelands are one of the greatest gifts of existence to human beings. The goods and services of rangelands determine the hue of the human race that the lack of proper understanding and knowledge of this compromising body, has led to the formation of auction beads. The values embedded in this security network guarantee human life and underlie the sustainable development and drive of ethical behaviors. Therefore, valuing rangeland functions is a big step to prevent destruction in order to maintain social livelihood. This study examines rangeland ecosystem services from an economic perspective and distinguishes the most widely used valuation methods in proportion to rangeland goods.

### Introduction

Today, natural habitats are a manifestation of civilizations, and pastures are part of these natural ecosystems, which, in addition to being a sanctuary, are also responsible for the production of market and non-market goods and services. Therefore, in addition to their productive role, rangelands can be the main guardians of biodiversity. For this reason, being aware of the economic value of pastures or rangelands preserves the land and the human race. As we do not value nature enough, we have allowed its transformation to a lowly alternative. In fact, it is felt that the degradation of rangelands has occurred (Karimzadegan *et al.*, 2007) due to the lack of understanding of the true value of rangelands and ignoring this unique blessing means choosing between being and not being (Karimzadegan 2012).

Pasture is a public good. Every rangeland-related biological service is offered in a way that benefits everyone, but the problem is that there is no market for some goods and services. As a result, there is no charge for it. The value of such rangeland goods is not known, while these unlabelled goods are not free and have a considerable latent economic value which is often more than the market value. Thus, these functions are considered free and exploited indiscriminately. Due to our failure to engage with the rangelands sustainably our demands have far exceeded nature's capacity to supply us with the goods and services we all rely on (Dasgupta, 2021). Thus, pasture degradation is a warning of the loss of the green value of life (Hashemibekab and Rafiei 2013). Extensive destruction has become one of the utility views of modern man. According to this view, the value of pastures is such that it brings satisfaction and prosperity to human beings. Over time, economists have espoused this view because they have based the main components of cost-benefit analysis. The range of human satisfaction is so wide that it is compatible with the preservation of natural resources so that the use of wood, medicinal plants, for example and pastures provides a value that provides physical and mental health (Dialy 1997). In terms of need in this context, mechanisms were designed to facilitate the receipt of value for non-market goods and services by integrating legal institutions, government oversight, environmental standards and fiscal policies (Kengen 2014).

Estimating the economic value of rangeland in the preservation, sustainability, development and utilization of resources by any of the methods available in non-commercial valuation or public goods requires a set of information or data. Undoubtedly, the accuracy of each of these estimates depends on the type, amount, accuracy and method or methods chosen (Telory and Shadmani 2006). According to the law of the fifth five-Year development plan, estimating the economic value of natural resources and the costs of environmental degradation and pollution, in advancing development goals and calculating these costs in national accounts is essential providing attempts to value the economic calendar. (Nasri *et al.*, 2017). The reserves of a rangeland ecosystem lead to the supply of goods whose value is a function of annual functions. Natural Resources specialists believe that economic valuation of ecosystem (non-market) benefits is a necessity that, if ignored



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in the long run, will cause irreparable damage to natural resources and affect the upward trend of development and sustainability for generations (Shrestha and Alavalapati 2004).

There is a high potential for natural habitats (rangelands) to improve the quality of human life. Economies, livelihoods and well-being depend on nature and the biodiversity of the rangelands (Dasgupta, 2021). Views which consider the rangelands in terms of exchangeable or marketable products such as wood, fodder, by-products (medicinal plants) and human use multiplier value alone neglect to understand that the rangelands also provide food, water and shelter while regulating climate and disease (Dasgupta, 2021). There are many non-market functions of rangelands such as regulatory (gases), plant genetic diversity, pollination, soil formation (soil formation), soil fertility, biological control, flood control, hydrological flow regulation, water protection, water erosion, wind erosion which need to be preserved to enable human existence. Maintaining favorable environmental conditions and ecological balance between humans, plants, soil and in fact the necessary foundations for sustainable development are necessary to overcome the degradation of the Rangelands (Nasri *et al.*, 2017). Therefore, this study hopes to introduce and examine value methods, including ecosystem goods and services to help managers improve rangeland planning and management.

## Evaluation methods

Ecosystem services need to be valued, in the first place, to estimate the value of each service using certain indicators. Therefore, in this research, by introducing and explaining the various dimensions of valuation that are mostly used by researchers, we try to rely on the institutionalization of quantitative methods and tools (Table 1). In general, valuation methods are divided into two categories: market and non-market. Market methods are based on economic valuation, production standard or natural resource services that are offered and sold to the market. These goods have direct consumption, such as wood, non-wood products such as fruits, mushrooms, etc., or non-forage pasture products, including aquatic trade, tourism, fishing, plant materials and components that have medicinal, food and industrial properties. By-products are called rangeland ecosystems (Mansory 2015).

Table 1- Evaluation methods for different ecosystem services and goods

Ecosystem services and goods	Evaluation methods
Production	Direct market valuation
Gas regulation	Replacement cost
Climate regulation	Production function
Diversity	Production function
Pollination	Production function
Pest control	Replacement cost, Averting
Water protection	Replacement cost
Water erosion control	Expenditure and Replacement cost, Avoided cost
Wind erosion control	Replacement cost
Soil construction	Production function, Direct market valuation, Replacement cost
Soil fertility	Production function, Avoided cost
Biological control	Production function, Replacement cost, Avoided cost
Flood control	Replacement cost, Avoided cost
Hydrological flow control	Production function
Plants genetic stocks	Production function, Production function
Rangeland	Environmental (transfer of benefits)
Agricultural	Environmental (transfer of benefits)
Gardens	Environmental (transfer of benefits)
Protectively	Conditional valuation
Recreational or Ecotourism	Travel-cost

But the non-market valuation method is related to the situations when there is no specific market for ecosystem services, and so are forced to use indirect capabilities to identify values. Hence, indirect market valuation includes the revealed preference method and the stated preference method. The stated preference method includes selection tests and the conditional valuation method, and also the apparent revealed preference method includes methods such as: transfer of benefits, hedonistic principle and travel cost, cost or market value.

Ultimately, the result of these valuations helps to show the inherent satisfaction of human beings in the form of utilitarianism, because by calculating the value of pastures and predicting the aging face of nature, it will be easier to understand the needs of future generations and improve quality of life.

## Review of studies

Table 2 shows the value of goods and services in different rangelands per dollar per hectare per year in different countries. Differences compared to the geographical location of the region, region, type of goods and services, valuation methods and so on. This table contains rows that do not have numbers to compare or are written in dollars for only one area, and for other cases there is no amount due to the unavailability of data, including insufficient rangeland studies in some areas reluctance of experts for evaluation, lack of funding for evaluation in the area or archiving of some studies in secret.

Table 2- Different studies on economic estimations of rangelands in different countries

Ecosystem services and goods	Study area	Value (\$/ha/yr)	Reference	Ecosystem services and goods	Study area	Value (\$/ha/yr)	Reference
Production	America	-	-	Hydrological flow control	America	-	-
	Europe	229.75	Sannigrahi <i>et al.</i> , 2018		Europe	-	-
	Iran	41	Hosseini <i>et al.</i> , 2017		Iran	3	Telory and Shadmani, 2006
Gas regulation	America	-	-	Plants genetic stocks	America	-	-
	Europe	24.016	Sannigrahi <i>et al.</i> , 2018		Europe	-	-
	Iran	97.74	Nasri <i>et al.</i> , 2017		Iran	-	-
Climate regulation	America	-	-	Rangeland	America	232	Kreuter <i>et al.</i> , 2001
	Europe	166.264	Sannigrahi <i>et al.</i> , 2018		Europe	-	-
	Iran	-	-		Iran	145.52	Nasri <i>et al.</i> , 2017
Diversity	America	-	-	Agricultural	America	-	-
	Europe	164.416	Sannigrahi <i>et al.</i> , 2018		Europe	-	-
	Iran	-	-		Iran	-	-
Pollination	America	-	-	Gardens	America	-	-
	Europe	-	-		Europe	-	-
	Iran	108.25	Hosseini <i>et al.</i> , 2018		Iran	-	-
Past control	America	-	-	Protectively	America	-	-
	Europe	-	-		Europe	-	-
	Iran	-	-		Iran	54.12	Hosseini <i>et al.</i> , 2018
Water protection	America	-	-	Recreational or Ecotourism	America	-	-
	Europe	11.084	Sannigrahi <i>et al.</i> , 2018		Europe	7.39	Sannigrahi <i>et al.</i> , 2018
	Iran	606.22	Hosseini <i>et al.</i> , 2018		Iran	0.54	Hosseini <i>et al.</i> , 2018
Water erosion control	America	-	-	Soil fertility	America	-	-
	Europe	-	-		Europe	-	-



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Ecosystem services and goods	Study area	Value (\$/ha/yr)	Reference	Ecosystem services and goods	Study area	Value (\$/ha/yr)	Reference
	Iran	-	-		Iran	7.36	Hosseini <i>et al.</i> , 2018
Wind erosion control	America	-	-	Biological control	America	-	-
	Europe	-	-		Europe	-	-
	Iran	-	-		Iran	-	-
Soil construction	America	-	-	Flood control	America	-	-
	Europe	103.453	Sannigrahi <i>et al.</i> , 2018		Europe	-	-
	Iran	1	Telory and Shadmani, 2006		Iran	2	Telory and Shadmani, 2006

## Conclusion

The purpose of this article is to express the most important and most widely used methods of rangeland valuation along with their quantitative comparisons, which can be followed by a collection of figures and waiting for the attachment of appropriate tools and formulas for valuation. Therefore, familiarity with the methods and qualitative studies of rangeland economic valuation is the beginning of an emotional flow in the most blocked human arteries. An understanding that our economies are embedded within nature and are not external to nature will provide solutions to reduce the degradation of rangelands (Dasgupta, 2021)

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