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The XXIII International Grassland Congress (Sustainable use of Grassland Resources for Forage Production, Biodiversity and Environmental Protection) took place in New Delhi, India from November 20 through November 24, 2015.

Proceedings Editors: M. M. Roy, D. R. Malaviya, V. K. Yadav, Tejveer Singh, R. P. Sah, D. Vijay, and A. Radhakrishna

Published by Range Management Society of India

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Payments for ecosystem services based the cost of soil conservation function of range plants vegetation in North of Iran-Lar Dam

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Keywords: PES, Range plants vegetation, Soil conservation

Introduction

Rangelands provide a variety of non-monetary goods and services essential to human survival and well-being such as regulate climate and water, generate cultural benefits such as recreation, create habitat for biodiversity and soil conservation. Perhaps the most important problem our society currently faces is how to allocate ecosystem structure between conversion to economic production and conservation to provide ecosystem services, both of which are essential to our well-being and also has an important role in economic interaction between suppliers and users as PES. The "payment for ecosystem services" (PES) is one of economic instruments which have been widely used throughout the world in recent years. It has been providing positive results. The participation of corporate stakeholders and local communities are among the advantages of this method. This is one of the essential approaches for sustainable range management. The main aim of this study is to give an experience on Payments mechanisms for Ecosystem Services (PES) based provided by rangelands based "soil conservation of range plants vegetation". This policy associated to the transition from the government that must pay to the stakeholders or landowners of rangelands in exchange for managing their land to reduce soil erosion and sediment by *Lar* dam in downstream. However, there is shortage of scientific studies and publication on these aspects.

Materials and Methods

This research was conducted in Polour rangelands in the north of Iran in 2014 (Lat: 52° 02' - 52° 08' E, Long: 35° 50' - 35° 53' N). The area is mainly covered with loamy-loess formation, with a mean annual precipitation of 350 mm and average temperature of 17 °C. *Polour* range plants remove sediments accumulation cause damage to the downstream (*Lar*) dam. Avoided damage cost of sedimentation with *Lar* dam used for evaluation and consideration payment of ecosystem services. Data collection was performed through According to table (1). Total rate of soil erosion and sediment by water (tons/ha/year) was obtained by applying the Universal Soil Loss Equation (RUSLE) empirical model. Total weight of yearly sediment calculated by multiplying useful life of *Lar* dam and total area of the region (round 5000 ha). By considering average apparent specific weight of soil (2.65), total volume of rangelands sediment yield estimated 24.7 million/m³/year.

Table (1). *Lar* dam primary information in 1970

Useful life (year)	Sediment yield (million.m ³)	Building cost (milliard Rial)	useful volume (million.m ³)
100	0.1	20	860

Results and Discussion

The average of plant cover in *Polour* stand was 52.3%±18.2 of the surface area. *Astragalus gossypinus-Thymus kotschianus* was the main type of species. In the light of results, it was concluded that high lands of Polour yield 23.82 ton/ha/yr soil erosion and 6.56 ton/ha/yr sediment. Total cost of sediment of rangelands dam building up year estimated 268 million Rials in 1970 *(around 884.4 milliard US\$). The future value of the cost of building per m³ *Lar* dam calculated "203.2" Rial (around 700000 US\$). Taking in to the account total yearly inflation index (18.8%), total avoided cost of damage, estimated 110.7 milliard Rials in 2014 (365310 US\$). Removing sediments incur 110.7 Milliard Rials/year cost for the government that must pay to the stakeholders or landowners of rangelands in exchange for managing their land to reduce soil erosion and sediment; that impact the efficiency of dams.

* Conversions in this article use the average annual exchange for 2014, US \$1 =3300 Rial.

Conclusion

This study discussed how policy makers can be sensitized about ecosystem services programmers to achieve environmental and economic benefits for pastoral development; and improve flow of ecosystem services. These environmental assets should be further measured and accounted.