



ABSTRACT BOOK

2nd International Conference on Arid Lands Studies

Innovations for sustainability and food security in arid and semiarid lands

10-14 September, 2014
Samarkand, Uzbekistan



Ministry of Higher and Specialized Secondary Education of the Republic of Uzbekistan



Ecological Movement of Uzbekistan



Samarkand State University



Samarkand Agricultural Institute



ICBA
AGRICULTURE FOR TOMORROW



筑波大学
University of Tsukuba



USAID
FROM THE AMERICAN PEOPLE



ICARDA
Science for Better Livelihoods in Dry Areas



UNDP
Uzbekistan



GLOBAL SOIL PARTNERSHIP



ECFS



UNESCO
United Nations
Educational, Scientific and
Cultural Organization

Tashkent Office

Desertification in foothill territories of Uzbekistan and the measures to combat it using alternative sources of energy (in case of Nurata mountains)

Muhtor NOSIROV¹⁾, Arzimurod RAKHMATULLAEV²⁾, O. ODILOVA³⁾

Author affiliations:

1) Department of Botany and Plant physiology, Samarkand State University, University Boulevard 15, Samarkand, Uzbekistan

2) Department of Hydrometeorology and Landscape Studies, Samarkand State University, Uzbekistan

3) Faculty of a Technique of Teaching of Geography, Jizzak State Pedagogical Institute, Jizzak, Uzbekistan

Contact details:

E-mail: muhtorn@yahoo.com

Address: Department of Botany and Plant physiology, Samarkand State University, University Boulevard 15, Samarkand, 140104, Uzbekistan

Phone: +998 90 602 41 93

Abstract

Mountain areas occupy 21,3% of the total territory of Uzbekistan of which more than fifty percent belongs to arid and semi-arid mountains. Nurata mountains are typical of arid mountains covering the most west ranges of Pamir-Alay mountain systems. Despite the rich biodiversity of Nurata mountain ecosystems, natural resources of the region have been currently facing serious anthropogenic load of various origins. Overgrazing and uprooting of natural vegetation are major factors of land degradation and deforestation in Nurata mountains. Rising the number of population increases the need for food and fuel to support livelihood of local people. In such conditions, combating land degradation and preventing further deforestation is a major concern in the region. Alternative sources of energy may enable reducing anthropogenic load on natural resources of Nurata mountains.

Nurata mountains are rich in solar energy. Annual sunny days comprise of 320 days in west plain part and 300-310 days in east part. In this territory each square santimeter surface receives 145-140 large calories. If this amount is transferred to electrical energy then it becomes 1 kilowatt electrical energy per hour from 1 square meter area. This amount of electrical energy is sufficient for average need of the single household to electrical energy.

Wind resources are one of the next abundant natural resources in Nurata mountains. According to the data of Nurata meteorological station, average annual wind speed is 3 m/s. Wind with 5 m/s or more consists of more than 100 days per year. As known, wind generators produces electrical energy when wind speed exceeds 3 m/s. Taking into account existing natural resources in Nurata mountains it is worthwhile to establish solar panels and wind generators together in a certain area. When solar energy gets scarce during winter period wind generators support to produce energy.

The territory of Nurata region is rich in resources for biogas. According to Eshbekova and Atabaev (2012) 1 kg/DM manure of cattle produces 0.250-0.340 m³, of poultry 0.310-0.620 m³, of sheep 0.300-0.620 m³, of wheat straw 0.200-0.300 m³, maize straw 0.380-0.460 m³ biogas. As seen from above given figures, manure of poultry, sheep and straw of maize is rich in biogas which can be found in enough quantity in each typical household. Due to the absence of individual and collective biogas producing equipment and absence of experience of people this type of alternative energy has not been developed.

Use of alternative sources of energy opens a way for sustainable management of natural resources in the territory of Nurata mountains. Taken electrical and heat energy from solar, wind and biogas sources significantly reduces logging and uprooting of trees and shrubs in mountain areas and it gives a way for self regeneration of the natural vegetation. Moreover, use of alternative sources of energy gives an opportunity for better and consistent use of rangeland vegetation through providing of additional watering points for livestock in remote rangeland areas.

Keywords: land degradation; deforestation; alternative energy; Nurata mountains