

Preparation a corrective- Supplementary Pattern of Watershed Management Programs to Sediment Rate reduce in the Haftan Watershed, Tafresh

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Extended Abstract

1-Introduction

Soil erosion is a major environmental problem that has devastating effects on natural and ecosystem. Although soil erosion has existed throughout history, but in recent years has intensified related to inappropriate land use. So, due to the damages caused by the increase of deposition in rivers, watershed management planning in area scale (slope) and linear (channel) to reduce the soil erosion are applicable. Also the project evaluation for before, during and after the implementation, according to the project objectives and environmental effects on watershed and its outside to verify the effectiveness of watershed management programs is essential.

The more researchers aim is the investigation of effects watershed management measures to reduce erosion and sedimentation and flooding potential in output of watersheds. However assessment of spatial distribution programs in most of these studies has been ignored. With attention to high cost in watershed management planning these measured planning must be on based priority of critical areas of erosion rates. Identify and priority, while will provide a correction- supplementary pattern of watershed management programs, lead to cost management and also projects efficiency increasing in related to stakeholders welfare.

2- Methodology

In this study for a more investigation of spatial distribution the watershed programs, was selected the Haftan watershed, because the diversity of measures in slope and channels and also age 18 years of the project. Haftan watershed with 40.67 km² is located in the Markazi province, Tafresh city that has annual average precipitation equal to 304 mm and temperature with 10.6 C°.

For the estimation erosion and sediment the before of watershed practices, was used MPSIAC model. In this research, nine factors the model was scored in ArcGIS 10 software. Then with overlay of nine layers, was prepared sediment rate map by calculating the sediment degree of each pixel. For after of watershed practices, with field survey, GPS and technical issues

reports, the condition of vegetation and erosion were reviewed. Then factors of land use, land cover, runoff, and surface and channel erosion were updated. So erosion and sediment were estimated on based updated distribution maps after of watershed practices. In finally, with comparing the difference percent of sediment degree for before and after conditions using paired T-test in SPSS software was assessment the spatial distribution of watershed management measures.

3– Discussion

The results showed that land cover and land use have been the least variability with 1.1 and 1.8 percent, respectively. However the most variability is for channel erosion factor with 30.8 percent. These results are entirely consistent with the type and volume of practices in the Haftan watershed. So that biomechanical programs affecting on slope, has been implemented only in 101 hectares; but check dams are large numbers in the streams.

According to results, sediment rate degree is focused in classes of 25-50 and 50-75. After of watershed practices, the area class 50-75 is decreased equal to 8.4 percent. Also sediment variability in sub-watersheds is 0.7 to 8.7 percent that with attention to T-test statistical method, difference for before and after practices is significant. Although the results showed that watershed protection programs in slope scale of type almonds- contoured traces has high performance, but the volume it is low. So sediment decreasing is only 4.1 percent for whole the watershed.

4– Conclusion

Since biomechanical programs properly were implemented in slopes within sediment rate of class 50-75, but only 3.6 percent of area is covered. Therefore it is necessary that the cover protection program such as seeding and almost planting will become in the more area of class 50-75.

Because the most area of Haftan watershed is Eocene volcanic units with resistive category of medium, it is necessary to implement of biomechanical project that slopes with high potential of erosion and sediment. Therefore other slopes will be under biological practices that has lower cost.

With attention to high potential of erosion in marl unit, conservation practices in this zone must be on based management and biological practices. Due to the impact of 30.8 percent channel erosion factor, the protection and repair check dams is essential. Biological practices such as land use change and cultivation pattern in buffers can be effective for channel stability and diversity increasing in ecosystem. Since stakeholders have a key role in land management programs, it is suggested that will prepare further researches on based multiple objectives in a comprehensive and integrated watershed management.

Keyword: Soil conservation programs, spatial distribution Assessment, sediment rate decreasing, MPSIAC, Haftan watershed