Study the Native Vegetation around the Al Hosh Highway Slope in Sudan (Gezira State) as Bioengineering Method of Slope Erosion Protection

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Abstract
Soil erosion occurs due to rainfall intensity and soil movement had become one of the disasters faced by Al Hosh highway today. And the carelessness (Where there is no any type of protection) it has also caused occur the soil erosion due unprotected embankment side slope of the Al Hosh highway, which affect widely of the loss of human lives according to traffic accidents, the destruction of cars and large vehicles. Although the area is usually categorized as eroded area because of high rainfall intensity during the autumn season time, the Middle East states of the Sudan as Gezira state is known by the heavy rainfall. As stabilization of slopes using mechanical structures is costly to establish and maintain, biotechnical slope protection is an alternative which is more aesthetically pleasing and cost effective. Hence, in this research, an overall study on the positive impacts of the presence of native vegetation for the slope stability were studied in the Al Hosh embankment side slope. Trying to use native vegetation as the local grasses to restore the Al Hosh highway slope as a new bio-engineering method in Sudan. This paper explores the review the native vegetation and its ability to use it in protecting Al Hosh slope erosion with different slope angles by identification, categorization and studying of the salient features of them according to the soil classification for relevant slope by using both Unified Soil Classification System and US Department of Agriculture. This research recommends suitable native vegetation against soil erosion and subsequent slope failures in cut slopes.

Keywords
Slope Stability, Native Vegetation Slope, Erosion Control, Ecological Protection, Bio-technical Techniques, Rainfall Intensity, Geotechnical Properties, Soil Fertility

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References
Importance of vegetation for slope stability in urban areas. Assessing the role of vegetation on soil slopes in urban areas. Joanne e norris & john r greenwood 1 2.

INTRODUCTION In the urban environment, vegetation is generally utilised along railways, highways, canals, river channels, or on artificially made sloping ground such as mine waste slopes for its green aesthetic landscaping qualities rather than its ability to stabilise soil slopes. Vegetation, especially mature trees, when growing in the wrong environment is known to cause millions of pounds worth of damage to buildings and infrastructure annually. The report assesses the main factors which constrain the sustainable development of the Gezira Scheme (GS), to develop medium, to long term plans, including short-term actions, to address those constrains. The GS, is described as a large and complex enterprise, because although it is one the world’s largest irrigation systems, it has become one of the least efficient, irrespective of the fact that it uses thirty five percent of Sudan's current allocation of Nile water, producing two-thirds of the country’s cotton exports. Abstract: Slope is often non-uniform along the hillslope, with variations describing concave and convex shapes associated with natural hillslopes. This is because runoff generations vary significantly over short distances, with changes in surface alteration during or between flow events on different slope shapes. The aim of this research is to determine the effects of slope shapes on runoff and soil erosion. The study was carried out in the Dallica Village experimental area in the northern part of the city of Bartin (northwestern Turkey - 46° 12’ N, 44° 38’ E) at an altitude of 146 m. The area features a humid mesothermal climate with a mean annual precipitation of 1038.2 mm.

PDF | The use of bio-engineering methods for soil erosion protection and slope stabilization has a long tradition. Old methods with rocks and plants, | Find, read and cite all the research you need on ResearchGate. The above construction can duplicate set of fascines every 2-3 meters in slope direction according, the conditions of slope stabilization. The upside of slope and behind of the fascine can filled with soil or planted (plants cuttings) or seeded. (Figure 1). Soil erosion by water increases as the slope length increases due to the greater accumulation of runoff. Consolidation of small fields into larger ones often results in longer slope lengths with increased erosion potential, due to increased velocity of water, which permits a greater degree of scouring (carrying capacity for sediment). Cropping and Vegetation. The potential for soil erosion increases if the soil has no or very little vegetative cover of plants and/or crop residues. Plant and residue cover protects the soil from raindrop impact and splash, tends to slow down the movement of runo...