ASSESSMENT OF LAND DEGRADATION IN TAATS RIVER BASIN OF MONGOLIA USING SATELLITE IMAGES AND SOCIO-ECONOMIC DATA

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ABSTRACT:

Degradation of the rangelands of Mongolia is occurring in a large scale. More than 40% of the rangelands are affected and land degradation has been has increased by 8-10% over the last 10 years (Adyasuren and Dash, 2001). It is estimated that 78% of the total territory of Mongolia is at risk of desertification and nearly 60% of this is highly vulnerable. Over 70% of pastures have been degraded due to overgrazing. Vegetation biomass in the dry regions, notably desert steppe and steppe, has decreased by a factor of 6 (National desertification report, 2002). A significant portion of the land resources in Mongolia is degraded not only due to lack of rainfall, but also due to dust storms. However, these figures are only estimates and the true extent and continuing nature of the problem have proved difficult to quantify. This is because the dry ecosystems show non-equilibrium behaviour in which short-term rainfall variability imposes changes in vegetation cover that mask any downward trend in conditions except in the most extreme cases. The non-equilibrium behaviour also makes it difficult to determine whether the land is continuing to degrade, remaining in a stable condition, or improving.

Physical and biological factors were considered to identify physical vulnerability of the pasturelands to land degradation. Soil types and slope aspects were used to analyse the physical factors while above ground biomass (AGB) and leaf area index (LAI) were used to analyse the biological factors. AGB defines pastureland's carrying capacity, which is the number of livestock that can be raised economically in a sustainable manner for a particular grazing land throughout the grazing season. LAI also defines the ratio of exposed and protected land by

vegetation coverage, which is important to analyse impacts of climatic factors on land degradation. A physical vulnerability map to land degradation was produced, overlaying all these factors. Similarly, camp locations in different seasons, locations of water points, population density and livestock density were used to assess socio-economic factors for land degradation. A map combining these factors was produced to show the socio-economic impacts on pastureland degradation.

Finally, the physical vulnerability map and socio-economic impact map were combined to classify the level of land degradation in the study area. This map will be used to prioritize resource allocations and develop a sustainable pastureland management strategy. The result shows that remote sensing data can provide very useful information and understanding of different factors contributing in land degradation.