

G-1 Study on Evaluation of Prevention and Remedies for Desertification (Final Report)

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Desertification is caused by a complex interaction of natural, human-induced, and socio-economic factors, which make the situation more delicate. Therefore, it is necessary to establish an appropriate land management system and technical measures based on the evaluation of carrying capacity to prevent desertification and restore desertified areas. Especially, it is necessary to develop a method for evaluating prevention and remedies for desertification, and plan a comprehensive development strategy adapted to meet the directions of socio-economic development.

(1) To evaluate the effects of measures to prevent and reverse desertification with respect to natural environmental and socioeconomic conditions in Naiman, China with the following results: 1) Three types of soil were broken down into 5 subtypes based on physicochemical properties. Naiman vegetation was also classified into main 3 types corresponding to these soil types. 2) The optimal stocking rate in the surveyed region is about 4 sheep per hectare. Because continuous grazing eventually adversely affects grassland vegetation. 3) The high correlation between red-band reflectance of TM3 and measured biomass enabled us to estimate grassland biomass and to determine most districts in northern to central Naiman were overgrazed. 4) Nitrogen fertilizer improves biomass production in this grassland most effectively. 5) We confirmed that overgrazing could be remedied without reducing the present number of livestock with bare feeding. 6) Desertification and its prevention and recovery depend on natural environmental and socioeconomic conditions.

(2) We chose Xinglongzhao district in Naiman, and examined the details of its comprehensive development plan for its desertification area. We found that the feasibility of the plan is doubtful. This is because the plan was made to attract subsidies and loans from the higher governments and because there is no systematic process to judge each plan to approve a subsidy and/or a loan in the higher governments. Consequently, the figures of the input-output effect of the plan are quite arbitrary: there is no standard method to measure the effect.

(3) Some useful techniques and plant species were accepted for rehabilitating desertified soil in Western Australia, such as distilled techniques using solar radiation energy, soil conditioner like super-water-absorbent polymer made from N-acetylamide, vesicular-arbuscular mycorrhizal fungi, humic fertilizer and desert stress tolerant plants originated in Australia.