

Dynamics of Salt and Change in its Composition on Irrigated Lands and on Non- Irrigated Lands in Arid Region

–A Case Study on Hetao Irrigation District, Inner Mongolia, China–

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In arid land agriculture, irrigation gives decisive influence on movement and chemical state of salt in the soil. Therefore it is important to understand the process in planning to avoid salt accumulation and to improve the salinized land by irrigation. The objectives of this study is to investigate the movement, reservation and change of salt in the soil in relation to water movement pathways from soil to the ground water and drainage canal water. For this purpose, field measurements and analysis in the laboratory were carried out. Total salt concentration and composition of salt in irrigated water, in soil solution and in ground water were measured at an irrigated land and a non-irrigated land as well as irrigation water and drained water, in Hetao Irrigation District, Inner Mongolia.

The major obtained results are as follows;

- (1) At the intake from the Yellow River, the water quality was comparatively good (EC: 1 mS/cm, SAR 3-5), however, after passing the soil the quality of the ground water was deteriorated both in EC (3 - 7 mS/cm) and SAR(7-20). The water quality of the ground water was almost the same as that of the drainage canal water.
- (2) While the EC of the ground water of the non-irrigated land was the almost same as the ground water of the irrigated land, SAR of the non-irrigated land was higher than that of the irrigated land.
- (3) Na⁺ ion was predominant in water-soluble cations, and the rate of Na⁺ in all the cation was higher when the total salt concentration was high.
- (4)By acetic-acid ammonium extraction, the rate of dissolved Ca increased dramatically. It means that there exists much calcium in the soil as water-insoluble salt.
- (5)Both the ground water and the saturation extracts were in the status near the saturated dissolution of calcium carbonate.