Land and Water Management Issues in Large Irrigation Scheme

-Case Study of the Hetao Irrigation District in the Yellow River Basin-

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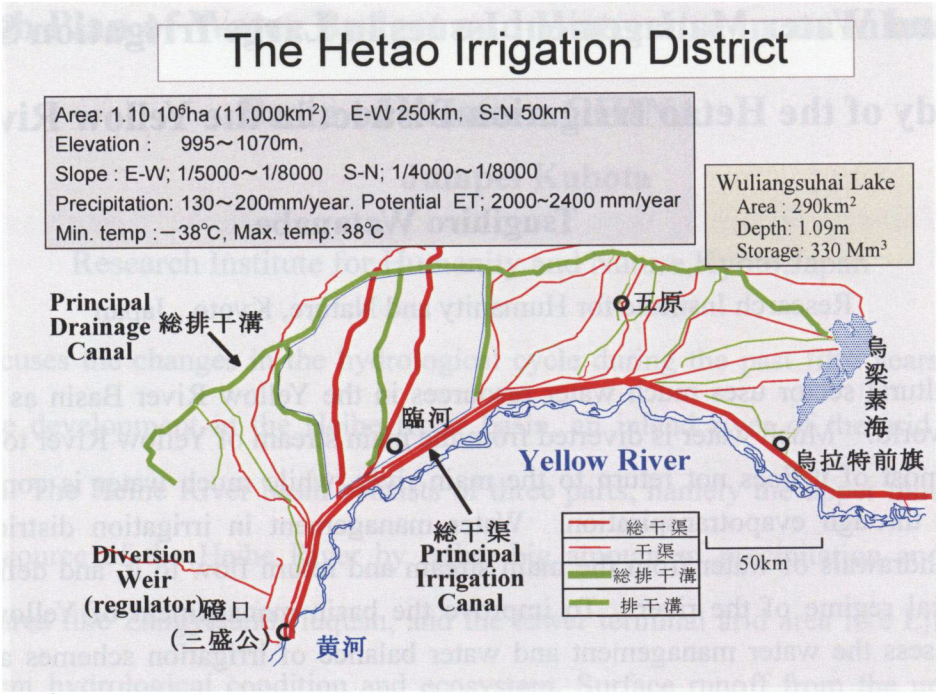
Agricultural sector uses much water resources in the Yellow River Basin as well as other basins in the world. Much water is diverted from the main stream of Yellow River to the irrigation scheme, and most of it does not return to the main river, while much water is consumed in the irrigated field through evapotranspiration. Water management in irrigation district determines amount of withdrawals of water from the main stream and return flow to it, and definitely affects the hydrological regime of the river. To improve the basin management of Yellow River, it is essential to assess the water management and water balance of irrigation schemes as the biggest water users.

From agricultural points of view, assessment of water management in irrigation district is also required to enhance water use efficiency and to save irrigation cost, simultaneously with land and cropping management evaluation, which is inseparably connected with water management. Especially in arid areas, since irrigated land might suffer from soil salinity problem, appropriate soil and water management is crucial issue.

The case study area Heato Irrigation District is the largest Irrigation Scheme in the Yellow River Basin, which is located in the Inner Mongolian Autonomous Region. Its irrigated area has reached to about 600 thousand hector, and its annual diversion is about 5 billion m^3, which is considerably big amount. While water use in this region affects water use in the downstream regions, water balance of this district is not clear. On the other hand, there is soil salinization problem in this district. According to the continued field reclamation program, the salinazation problem is gradually being alleviated, with field measurement and analysis on soil and water movement from soil hydrological aspect. The most effective measure to control salinity problem is to leach out the accumulated salt with much water application to field. The salt balance of the whole district, however, is also not clear as well as water balance. In this district, to save water in the basin, the diversion amount is to be reduced from previous 5 billion m^3 to 3.8 billion m^3 per year. The question is how can the reduction be realized and what will happen in the future.

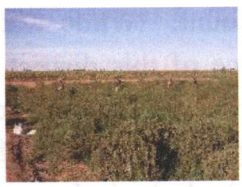
In this paper, identification of the problems and research framework are discussed, based on some diagnostic studies and review of the previous research results. This research plan is being implemented as a part of the RIHN Yellow River Research Project and the CREST Yellow River Research Project.



Farmland and Salinization

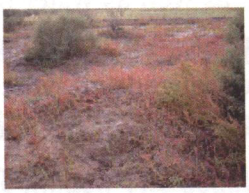
Maize and wheat

Fields with and without salinity problem



Field under reclamation with salt tolerant crop

Field suffering from salinity problem



Salinity problem in a field

Salt accumulation