Two Differential Equation Models in Hydrology
– Draught in Aral Sea and Floods in Bangladesh –

Hiroshi Yanai

KEIO University
Yokohama, Japan
e-mail: yanai@ae.keio.ac.jp

Water level of Aral Sea in Central Asia is going down since 1950's because of excessive withdrawal of water for irrigation from the upper streams of the tow rivers, Amudarya and Syrdarya; Aral Sea is now dying. On the other hand, in flat and low Bangladesh, located in the lower streams of three huge rivers Ganga, Megna and Bramaputra, they suffer floods every year. These two disastrous phenomena, although huge, are caused by imbalance between the amounts of inflow and outflow water. Hence, differential equations are applicable to describe the general behaviour of the water level. Simple differential equations models are established and some simulations are tried based on them, from which several fundamental facts are confirmed: possibility of the recovery of Aral Sea, feasibility of various means for flood control and so on.