

Water budgets for freshwater aquaculture ponds with reference to effluent volume

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ABSTRACT

This paper presents the consumptive water use for freshwater pond aquaculture for semi-intensive carps farming practices. The consumptive use of water includes evaporation loss, seepage loss and water exchanges requirements. The water requirement has been estimated to be 10.3 m³/Kg of fish production under present study for semi-intensive culture and with supplemental feeding. Out of which 7.6 m³/Kg of fish production is system associated requirement. On an average the evaporation loss from the pond is 1498.3 mm/year and seepage loss per year is about 1182.60 mm/year. Seepage and water exchange losses recharge the ground water aquifers and if they are treated and recycled, the water use in aquaculture can be reduced significantly. A further reduction in fresh water use in pond aquaculture is possible through development of intensive and super-intensive culture systems and aqua feeds.

group. Average national production from still water ponds has increased from 0.6 tonnes/ha/year in 1974 to 2.2 tonnes/ha/year by 2001-2002 [2], with several farmers even demonstrating production levels as high as 8 - 12 tonnes/ha/year. The technologies of induced carp breeding and polyculture in static ponds and tanks virtually revolutionized the freshwater aquaculture sector and turned the sector into a fast growing industry.

Fish culture is a water-intensive endeavor and requires much more water than conventional agriculture [3]. The current expansion of freshwater aquaculture in the India may require large quantity of freshwater either groundwater or surface water. There already exists concern of adequate water supplies for traditional agriculture. Further, uncertainty in monsoon rain, scare and limited availability of freshwater resource have forced in rethinking wise-use of freshwater in aquaculture sector to increase water productivity. Nowadays water is increasingly becoming less available and costly to procure. World in general and India in particular, the freshwater supply and reserve are now under threat due to increased population following by increased demand of water in agriculture, aquaculture, industry and domestic sectors.