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MEASUREMENT OF STREAM DISCHARGE AND TRAVEL TIME IN SRI LANKA, USING NUCLEAR TECHNIQUES

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Total counting of gamma radiation of an injected tracer has been used to estimate relatively low stream discharges and travel times in some selected streams of Sri Lanka. Use of dyes as a tracer proved to be of little use, except in studying mixing patterns of tracers in streams. Use of tritiated water as a tracer had the limitations of sampling and laboratory analysis. I^{131} was proved successful in the above studies with instantaneous injection, by crushing a glass vial with the tracer under water, and *in situ* measurement. A depth type-scintillation detector, connected to a ratemeter and a chart recorder, was used. The estimated discharges ranged from 0.07 to 19.54 M^3S^{-1}. The longest travel time observed was upto 4 hrs. This technique can be used successfully under very difficult conditions like irregular river geometry, turbulance and very low discharges, where the conventional current meter method gives poor results. The tracer method is the only approach in estimating travel time. The overall error in estimation can be upto 5%.