

RE-ASSESSMENT OF DUTY IN IRRIGATION CHANNEL—A SUGGESTIVE APPROACH FOR VALUATION

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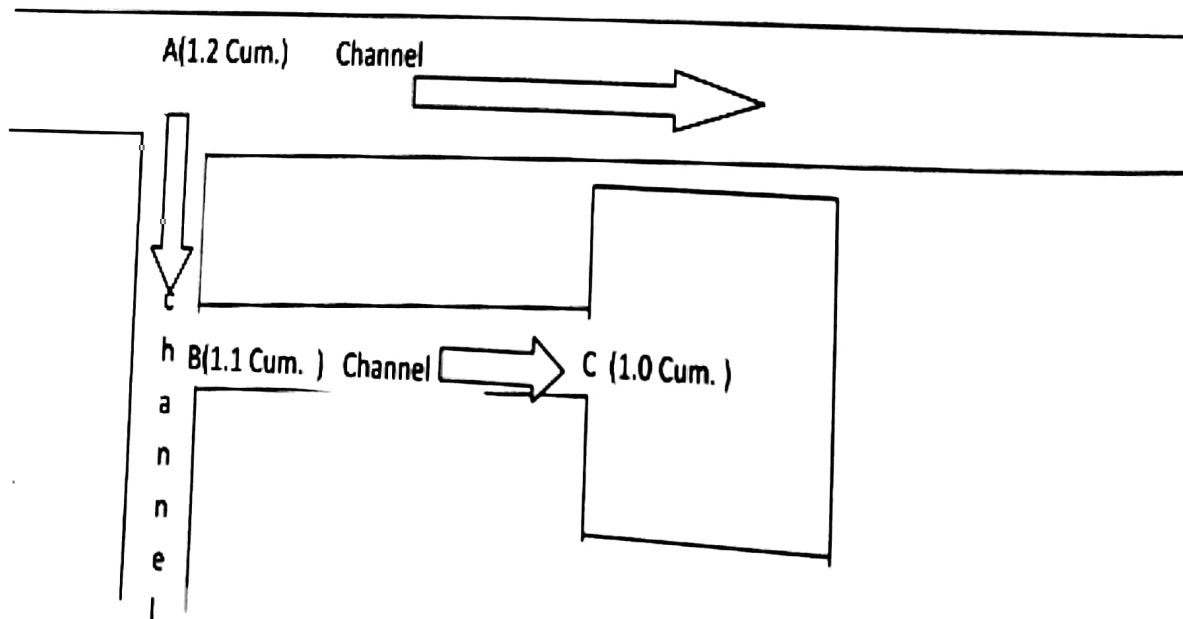
Introduction:-

Civil engg. is one of the primitive, prime & basic branch of engg., wherein building, roads, bridges, over head tanks, water supply, sewerage, airport, tunnel, railway tracks and other similar works are included in the form of their construction, design ,execution, planning ,laying, estimation ,surveying and erection etc. Civil engg. has similar subjects, for covering all aspects as cited above. Irrigation engg. an important subject ,is existing hitherto, for- upcoming aspirants.

Duty's definition is something confusing while assessing duty at different points during flowing of water in canals. So far DUTY is concern, which represents, the area irrigated in hectare by per cumec of water, discharged during base period. Here hectare means area of 10000 sq. metre and cumec means volume of water, that is 86400 cubic metre for B- base period.

Here high duty represents more area irrigated and less duty means less area irrigated by unit volume of water, which concludes, more water more duty & less water less duty while factor remains constant viz. soil porosity, surrounding temperature and viscosity of flowing water etc.

But so far the duty, measured nearby the main canal point and at the water course point, is concern, wherein less and high duty respectively has been explained in all books of said subject, to which I am not satisfy. From all books the statements are described & figured as under.



If at C, water is 1 cubic meter. Hence $DUTY = D/1 = D$ hectare per cubic meter. At B, water will be more than 1 cubic meter, say 1.1 cubic meter. Hence $DUTY = D/1.1 = 0.9D$ hectare/ cubic meter. At A point, water will be more than B, say 1.2 cubic meter. Hence $DUTY = D/1.2 = 0.8D$ hectare/cubic meter.

Here water is reducing gradually from points A to C but duty is increasing from points A to C.

Here the theme regarding the existing form is concern, which belongs to hydraulics Bernoulli's Theorem, that shows, more flowing velocity contain less lateral pressure and less velocity consists more lateral pressure. So at point A, where velocity is more, there lateral pressure will be less. Due to this, lateral flowing of water will be less, hence this will reduce the irrigated area. By this lateral flow on farther points to A, will be increased, which will enable more irrigated area, because of lesser and lesser flowing velocity at mid of successive channels. At tail end, the water will be no more and the channel will be shallow, certainly water will be spread on larger areas, that will cause for more irrigated area. It shows that reduction in water will increase the area of irrigation. This can be seen and observed at delta where rivers/channels fall onto sea. There area of water covers more wet land due to being shallow.

Here my theory exist with that conclusion where more water is there, more the quenched area. In real sense, we have seen & observed that much water will fulfill the quench of more thrusters, rather than less water. An illustration before all is that, if we have 10 cumec water, we may irrigate more area, rather than 2 cumec water in comparable.

Another illustration if velocity exists 10metre per second and we have time of 5 seconds, certainly we will cover 50 meter distance, and 80 meter if time is 8 sec.

Conclusion:

Finally, I conclude and communicate to mergers that Duty at far end will be less rather than more, due to less available of water, because less water will quench less thrusters & more will saturate more thrusters rather than vice versa. Hence my individual opinion exist different, than concept available hitherto in all books of various authors. I lastly request to all readers not to include this term of duty to base period & delta. A set aside value of Duty has been taken in feasible & viable condition.