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Abstract: Water is the most precious gift of nature and is the most crucial elements for the sustainability of the life. The strategic role of irrigation as an essential input for crop production can't be denied. As a traditional productive input, it ensures production by acting as an agent of insurance against inadequate and inconsistent monsoon. Ultimately the outcome provides agricultural production stability. The various irrigation methods under different system of irrigation differ with regard to extent of control, timeliness and adequacy of supply of irrigation water for crop cultivation. Consequently, the economic benefits and the costs due to these irrigation methods vary among different irrigation systems. Keeping in view the above facts, the present study has been undertaken in five block of Ranchi district with a purpose to address the issues particularly with respect to examine the effect of methods of irrigation on water supply, average yield, expenditure under different irrigation techniques, water productivity, and the fertilizers requirements of major vegetable crops, on the sample farms. For this purpose five blocks viz. Nagri, Bero, Khunti, Itki, and Ratu were selected randomly from the list of vegetable growing blocks of Ranchi using drip irrigation system. Among selected five blocks, 50 farmers were selected randomly. The selected farmers were mostly growing chilli, ginger, tomato and cabbage under drip irrigation facility. For comparing the benefits under drip irrigation method over conventional irrigation method, the data were collected through survey method in the cropping year 2014-15. The study revealed that under the two study irrigation techniques, farmers were saving more than 70 per cent of water were in all four crops under consideration, maximum being under chilli cultivation i. e. 84 per cent higher by using drip irrigation over conventional methods of irrigation. Apart from water requirements, farmers of selected blocks also saved fertilizer cost under drip irrigation system. Maximum saving was registered in chilli cultivation (i.e. average 35 %) and minimum in the case of ginger crop by using drip irrigation. The overall productivity of the vegetable crops also registered mean yield increase tremendous growth in the range of 53 per cent to 71 per cent under drip irrigation system over the conventional irrigation system. It is also important for the farmer to save direct cash from the system what they are using. Here the mean saving by farmers was 45 per cent in cabbage cultivation under drip irrigation, whereas minimum saving was from chilli cultivation under drip i.e. 37 per cent. The observations also revealed that maximum water productivity was under drip in ginger cultivation i.e. 54.34 Kg/acre/mm and minimum under cabbage i.e. 11.36 Kg/acre/mm while under conventional method it registered 2.68 Kg/acre/mm and 3.50 Kg/acre/mm of these two crops, respectively. It was further observed that all vegetables registered better benefit-cost ratio under drip irrigation system as maximum benefit-cost ratio were in the case of cabbage cultivation i.e. 7.90 which were followed by chilli (7.35), tomato (6.09) and ginger (5.30) cultivation. The efficiency of different inputs used on the vegetable cultivation indicated that almost all the resources used were found to be efficient under drip irrigation system over conventional method of irrigation. Hence on the basis of above findings it can be concluded that among two irrigation methods drip irrigation was the most efficient in terms of increased yield ,water productivity and economics as compared to conventional method of irrigation.

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