

BAMBOO DRIP IRRIGATION: TRADITIONAL WAY OF IRRIGATING CROPS IN MEGHALAYA

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INTRODUCTION

Meghalaya is well-known for having the highest rainfall in the world of about 11500 mm recorded annually. This makes Meghalaya the wettest places on earth. Though, the state gets plenty of rainfall during the monsoon season, a well-managed irrigation system is required during the dry spell. Hill farming is subject to a number of serious constraints such as undulating topography, steep-slopes, poor and shallow soils (prone to erosion). Majority of the fields in the region are situated across the hilly slopes. Therefore, the water-retention capacity of the terrain is poor and bringing water from distant water sources to the fields is a big challenge for the farmers in the rural areas. Ground channeling is also impractical due to the harsh landscape. Confronted with such adverse conditions for irrigation, the traditional farmers of Meghalaya have come up with an innovative way. The farmers of the Jaintia and Khasi hills have developed unique bamboo drip irrigation system of trapping

springs and stream water normally to irrigate the betel leaf or black pepper crops planted in areca nut orchards or in mixed orchards.

BAMBOO DRIP IRRIGATION SYSTEM

The bamboo drip irrigation system is based on gravity and the steep slopes facilitate in implementing it. Water from an uphill source is trapped and brought to the plantation by a main bamboo channel. Usually these water sources are far off from the plantations and the main bamboo channel runs hundreds of meters - in some cases even few kilometers. The water is then regulated through a complex bamboo network of secondary and tertiary channels to all the parts and corners of a plantation, right up to the bottom of the hill.

Bamboos of varying diameters are used to build the channels, support structures, diversion pipes and strips. Channels are held above the ground by bamboo or wooden Y shaped sticks. About a third of the outer casing in length and internodes of bamboo pieces have to be removed while fabricating the system. One stretch of channel is lashed to another by thin bamboo strips. Indigenous tools like a dao, a type of local axe, and chisels of various shapes and design are used to build the bamboo network. Two labourers

can construct a network covering 1 hectare of land in 15 days. They are built with such skill that water wastage by leakage is minimal. The construction is based on a simple thumb rule that the ratio of diameter of primary channel to tertiary channel determines the quantity of water which will reach the trees. It is a subtle skill which comes with years of observation and experience. It is so perfected that about 18-20 litres of water entering the bamboo pipe system per minute gets transported over several hundred metres and finally gets reduced to 20-80 drops per minute at the site of the plant.



The cost involved in building the system is minimal. Bamboo is available freely in this region. Usually the farmer himself sets up the system in his plantation with some help from 1 or 2 labourers. The region gets heavy rain and as a result each installation lasts for about 2-3 years. After the rainy season the undergrowth is cleared and reinforcements are provided. Old bamboo is left to rot, which over time returns to the soil as humus. Cooperatives are formed and each farmer provides his skill and labour to build and maintain the system. The distribution of water from one plantation to another is done by diverting water at fixed timings. This avoids the occurrence of conflicts between various farmers. By this method the whole community works harmoniously - sharing the limited resources judiciously.



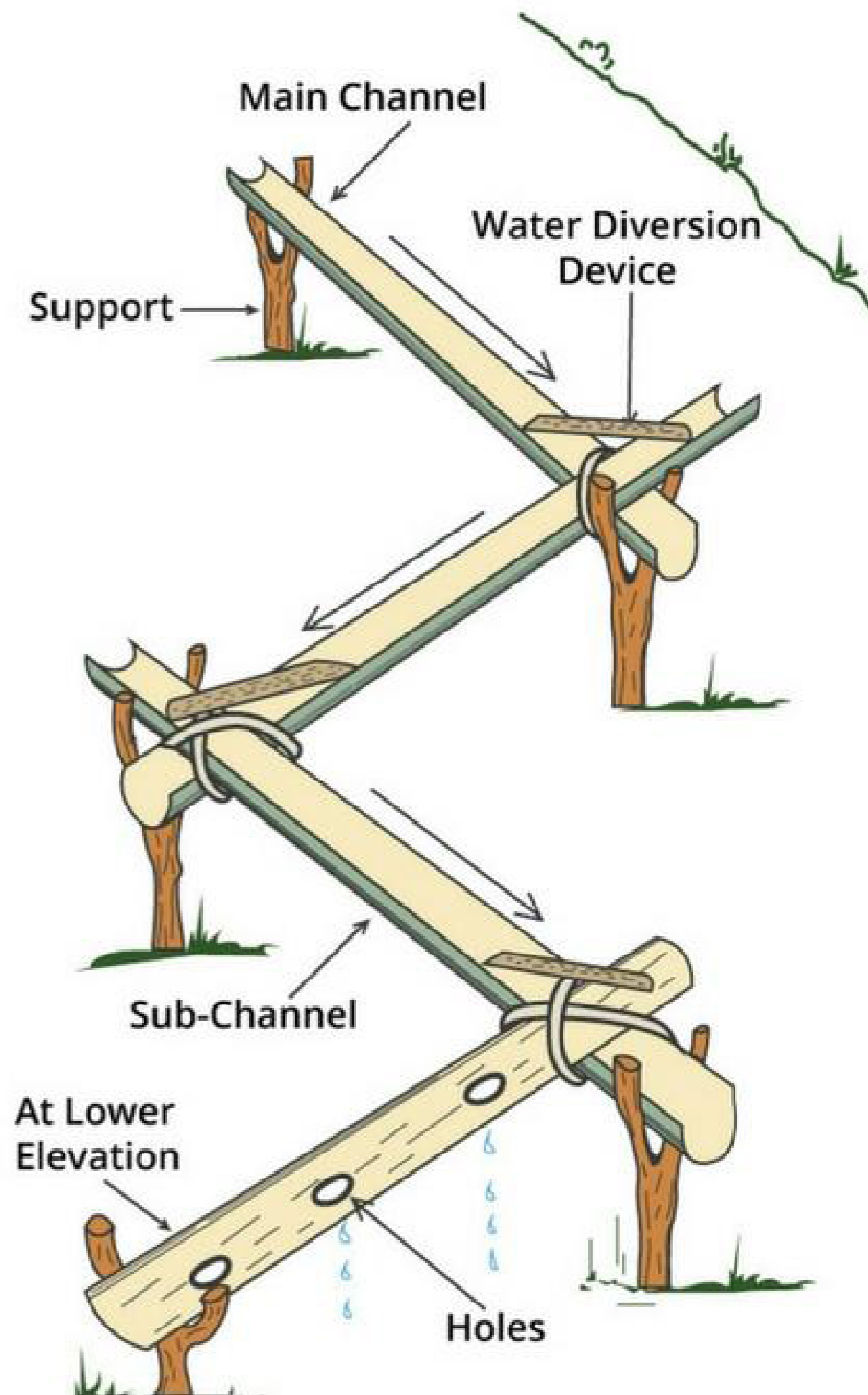
MODIFIED BAMBOO DRIP IRRIGATION SYSTEM



Bamboos are laid down from the water source which is the mainline and from there lateral line bamboos are connected. Bamboos are laid just above the properly spaced crop plants with the hole so that water can just drip on the particular plant only. The height of bamboo placed above the plant should be enough for the farmers to move under for inter-culture operations like manual weeding. Both the end of the mainline should be closed. Holes are made in the mainline through that water is conveyed to the laterals. The laterals also consist of small holes just above the individual plant to drip water. For efficient utilization of water, tying of some woolen thread with the cap in the holes of the laterals is also recommended to manage the speed of drip or to irrigate only the desired particular crop area. If the wetting is completed, it can be pulled down for seizing the flow of water for its efficient utilization. In the mainline, holes can be either closed with the help of mud or thread just like in the laterals for seizing the flow with respect to particular plant. It leads to better utilization of rainwater which would have been washed out if not harvested during rainy season. It has also been observed that about 25-30% water can be saved by modified bamboo drip irrigation followed by straw mulching, although it is cost effective only for cash crops like potato, capsicum, tomato, strawberry, etc. which are grown with definite spacing.

CONCLUSION

The uniqueness of bamboo drip irrigation system and modified bamboo drip irrigation system is their suitability to the local conditions, their economic feasibility and easy implementation.



DRIP IRRIGATION USING BAMBOO