THESIS

PROSPECTS AND CHALLENGES FOR RAISING OF SMALL DAMS

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ABSTRACT

Pakistan is an agricultural developing country. Timely good quality water is essential for maximum yield of crops. However, adequate amount of water is usually not available in various parts of the country. There are many areas in Pakistan where canal irrigation is also not possible, such as Pothohar. Various small dams have been constructed on streams in these areas to harness the excess runoff. The useful life of every dam is constantly reduced due to sediment deposition. Thus a time is likely to come when a particular dam will stop its useful service as a result of loss of its reservoir capacity. In order to keep the same pace of prosperity in its service area creation of regular water storage is imperative but construction of another new dam to achieve this purpose shall be unfeasible. Moreover, dam construction sites in Pakistan are limited. Removal of silt from an existing reservoir to regain its lost capacity is too expensive and cumbersome. Thus there is no other practicable way except to raise the height of existing small dam to enhance the gross capacity of the reservoir. Raising the height of a dam is a complex process. There are always various challenges which are needed to be met adequately to achieve the goal. Prospects and challenges for raising of small dams, and to investigate the preliminary engineering aspects, quantitatively have been explored in this research study. The affects of raising the dam on dam foundation, dam reservoir, freeboard, dam outlet structures, spillway, seepage pattern and dam stability have been brought to light using the example of Tainpua-1 dam6. Results of this study showed that raising the Tainpura-1 dam by 25 feet will increase its reservoir capacity by 91 %. This research study shall provide basic guide lines to those Dam Engineers who will like to work for raising of any small dam in future.