

Prioritization of Small and Medium Domestic Dams in Dry Lands

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The feasibility of small and medium dams in arid environments is studied. A novel method for prioritization of dam commissioning is proposed. The method focuses on key hydrologic and economic factors that affect the investment decision-making process. Ranking for priorities is developed in a geographic information system (GIS)-aided environment. Evaluated parameters are based on extensive field data including topographic surveys and site visits, land cover and soils data, precipitation data, runoff data, demography, construction costs, and operation and maintenance costs. Reservoir yield, reliability, and annualized cost per satisfied demand are the three main criteria used in the methodology. Results of a case study on 12 proposed dams in Assir Region, Saudi Arabia, indicate that assessment of these criteria is crucial prior to investment decision-making in arid areas. More than three quarters of the small and medium dams proposed have been found to have a high cost of water productivity and very low reliability, despite a high yield. The developed method highlights the degree of the economic and hydrologic feasibility of small and medium dams in arid areas.