The artificial recharge to aquifers in India is imaginative and commonly used particularly in the semi-arid regions and it is often the only solution to attempt arresting the depleting water-levels and the water shortage in the aquifers. The small watershed of 55 Km$^2$ in a granitic terrene, heavily exploited for irrigation, resulted in lowering of the water table and making all the 160 dug-wells in the area, perennially dry and defunct. The experiment to recharge the aquifer through these defunct dug-wells by allowing the water from a surrounding catchment to fall into the well and seep through the bottom as well as walls of the dug-well has been carried out. The collection of water in the dug-well out of the runoff during different episodes of the rainfall has been fed to the aquifer model and the effect of such an experiment in time and space was evolved. The extent and time lag of the recharge could be quantified for planning and optimizing further experiments. It has been proved that in the given simulation, artificial recharge through defunct dug-wells are the best method to revive the aquifers and at almost no cost. Further, a number of scenarios prepared by taking the possible variability in the rainfall expected due to the climate change, have been studied and it was found that even in the drought years with 25% of normal rainfall, the artificial recharge through dug-well will not be much affected except the surplus runoff to the downstream that would be affected.