Artificial Recharge has now been accepted world-wide as an effective method to augment ground water resources in areas where, there is continuous over-exploitation of ground water much beyond recharging potentials. This has resulted in various undesirable consequences like decline in groundwater level declining and quality deterioration. Central Ground Water Board (CGWB) has taken up many demonstrative artificial recharge projects under centrally sponsored schemes during the last two decades to develop the methodology and to transfer it to the state agencies for implementation in varied hydrogeological environments. Under the demonstrative projects, sub-surface dykes, check dams, percolation tanks, recharge bore wells have been constructed to demonstrate the efficacy of these structures, and their impact on ground water regime for sustainable management as in the hard rock terrain of Andhra Pradesh.

**Sub-surface Dyke**

After detailed investigations, a site was selected for the construction of sub-surface dam near Mandi Gauravelli village, Yachanam Mandal, Ranga Reddy district, A.P., in a well-defined micro-watershed having an area of 3.24 km². A trench was dug out with a top width of 9m, bottom width of 3m and depth of 7m, across a stream having a width of 40m. This trench was back-filled with clay and compacted for making it impermeable to conserve the water column in the upstream side. The top 2m of the trench was, however back-filled, with excavated material, to retain the original character of the soil and allow excess ground water to flow downstream.

With the construction of the sub-surface dyke, additionally 54 ha.m ground water was conserved due to which ground water levels have become shallow, and sustainability of wells increased tremendously and the farmers were able to cultivate additional vegetable crops during summer. The quality of water improved, particularly the fluoride levels were reduced considerably. The construction of demonstrative sub-surface dyke proved that it is mostly suitable in hard rock area and it can be constructed with locally available material like brick, rock masonry, etc., the cost for maintenance of the structure being negligible.

**Percolation Tank and Check Dam**

Projects were taken up in Lingala, Pulivendula Venmula and Vennupalli mandals in chronically drought affected Kadapa district, Andhra Pradesh. Based on the hydrogeological and geophysical surveys, 7 percolation tanks and 15 check dams were constructed.

After construction of these recharge structures, during pre and post-monsoon period, rising trend in water level was observed from 0.8 to 11.16 m/year and 0.1 to 10.92m/year respectively in the vicinity of recharge structures, and some dried up dugwells were rejuvenated. About 50 hectares of land has been brought under additional irrigation in the influenced zone. The average pumping hours of the wells increased by 30 to 40% and farmers stopped purchasing water, from far off places. Recharge structures have also helped in considerable dilution of fluoride content in drinking water from 6.15mg/l to 2.9 and 3.7.4 to 2.5 mg/l. The distinct change in post-construction ground water scenario has proved the efficacy of these structures as an effective sustainable ground water management tool.

**Roof Top Rain Water Harvesting**

During the Fresh Water Year-2003, demonstrative Roof Top Rain Water Harvesting Project was taken up in Osmania University which is located centrally in Hyderabad city with the objective to draw the attention of the learned and the opinion builders of the future who go through this portal and to bring awareness among the people. Further, it was also perceived that, such projects will facilitate researchers to pursue, educate and assess the impact of the artificial recharge structures on a scientific basis. So, in order to harvest the roof top rainwater, two major buildings viz., Arts College & Library buildings have been identified which have a potential of creating 900m² and 1200m² per year respectively for rain water to recharge. To accommodate rain water, one sump and 3 recharge pits with recharge bore wells were designed. The roof top water collected through pipes is led to a sump passing through channels and
number of de-silting chambers. The excess water is diverted into recharge pit with recharge bore well (point recharge structure) through a filter bed. The excess water again goes into the successive two such recharge pits with recharge bore wells. The capacity of the recharge pits have been designed to accommodate maximum rainfall even (60mm/hr) for each building.

Two piezometer wells (one shallow and deeper) were also constructed to monitor the behavior of water level in shallow and deep aquifers respectively. The ground water level monitoring indicated that the water levels in the shallow and deep aquifers behaved differently in response to the recharge. The water levels have dissipated into the vast shallow aquifer immediately after cessation of monsoon and attained pre-monsoon water levels. In contrary, in deeper aquifer even after the cessation of the monsoon, water level remained shallow showing a distinct rise in water level.

The harvested water in the sump is used for general utilities in Arts College and Library buildings instead of pumping ground water or municipal water. Sustainability of nearby pumping wells has increased considerably.

The recharge experiments have successfully created awareness among the NGOs and student community.

(Gist of K.R. Karanth Endowment lecture)

Padmabhushan for Prof. K.S. Valdiya

The Council Members and Fellows of the Geological Society of India, Bengaluru congratulates Prof. K.S. Valdiya on being conferred Padmabhushan by the Government of India for his outstanding contribution in the field of Earth System Sciences.

Prof. Valdiya is recognized internationally for his pioneering work in the fields of geology and environmental science. In 2007, he was awarded the Padmashri. Valdiya’s field of specialization are tectonics with special reference to active faults and environmental geology.