BOOK REVIEW

HYDROGEOLOGY – PROBLEMS WITH SOLUTIONS by Nandipati Subba Rao. Published by PHI Learning Private Limited, Delhi (ISBN: 978-81-203-5278-0), Eastern Economy Edition (2017), pages 265, Price Rs.350/-

President Kennedy, in his special message to Congress on management of natural resources had stated “our entire society rests upon and dependent upon our water, our land, our forests and our minerals. How we use these resources will reflect the condition of our health, security and well-being”. The message he so left nearly 55 years ago, has even to this day is carrying its meaning not just to America, but to the entire world. Looking into the global picture of earth’s water resources which is estimated at 1386 million cubic km, only 2.5% of it constitutes fresh water. Out of this quantity of fresh water, nearly 69% is in the form of glaciers and 30% groundwater. Fortunately, atmospheric precipitation, a natural replenishable fresh water resource for surface and groundwater is addressing the water needs of mankind. The atmospheric precipitation has a unique role in the hydrological cycle of the earth. Availability of surface and groundwater resources in an area depends upon the distribution of rainfall both in space and time, intensity, variability and frequency. Water resources are largely estimated, considering watershed as a unit. Surface hydrology and groundwater hydrology are the subjects which are interrelated. Hydrogeological studies of an area reflect both surface and groundwater aspects. The availability of water resources in an area under natural landscape, be it surface water or groundwater is dependent upon rainfall, geology, geomorphology, soil texture, vegetation, aquifer characteristics etc. In India, much of the agricultural and domestic needs are fuelled by rainfall dependent groundwater resource. Irony is, as long as these resources are available without any limit, the meaning of scarcity will not be realised by man!

Considering the complex aquifer characteristics and occurrence of groundwater under different hydrogeological set up, Prof. Nandipati Subba Rao in his book “Hydrogeology – Problems with Solutions”, has with a voluntary consciousness, put forth tremendous efforts to assimilate problems and focussed further to provide step wise solutions. The book highlights the importance of application of algorithms and formulae to determine hydrological, hydrogeological properties and characteristics. His efforts are to help the reader understand in simplistic terms, the mode of occurrence of groundwater, its availability and management and has focused on numerous numerical aspects of hydrology with pre-framed questions. He has provided ‘key concept’

of the issue before discussing the methodology adopted to solve each of the quoted problem.

The author has dealt hydrogeological problems with key concept and discussion under ten different chapters namely: Hydrological Cycle, Morphometric Analysis, Hydrological Properties, Groundwater Flow, Well Hydraulics, Well design and Construction, Groundwater Management, Seawater Intrusion, Groundwater Exploration and Groundwater Quality. In addition, there are 13 appendices to be considered as related explanatory material.

The discussions and solution of problems in regard to morphometric analysis, coastal aquifers, and groundwater quality are noteworthy.

It would have been appropriate and more convincing, had the author while dealing the problems regarding Hydrological properties (chapter 3), Groundwater flow (chapter 4), Well hydraulics (chapter 5), Well design and construction (chapter 6) of bore wells/tube wells, highlighted distinct and variable aquifer characteristics of alluvium and hard rocks, by quoting or referring to a few representative case studies carried out in different geomorphologic set up. Such information is available in an institution like Central Ground Water Board.

While assessing rainfall distribution by Thiessen Polygon and Isohyet methods (chapter 1), the author has skipped deriving important factor of weighted precipitation for the extent of area under each of the polygon and area under each of the two encompassed isohyets. Sum of the weighted precipitation values arrived for all such areas of encompassed isohyets or of the polygons will be the weighted precipitation of the given watershed area. That apart, there are a few glaring mathematical errors like in page 2 and 4.

Apart from these minor short comings, this volume is sure to serve as a comprehensive educative text for the students of hydrogeology at undergraduate and postgraduate level. Also, it can be a very useful and informative reference material for those who are interested in taking studies related to watershed development.

Hydrogeologist, Bengaluru
E: subcha@gmail.com

K.C. SUBHASH CHANDRA