geohydrology of aquifer rock is likely to be uniform, and the drainage lines are also interlinked, for the movement of their base flow maintaining slope and direction. The management of water resource of the state shall be decentralized, from basin to sub basin to the lowest possible level on the basis of hydrological or hydrogeological homogeneous units for development and management in terms of watershed.

Government of India has already issued clear guidelines as laid-down in the National Water Policy, 2002, for preparing Integrated Water Resources River Basin, Development and Management Projects. The water management projects should be based on the available surface water and groundwater resources together within the watersheds of each sub-basin of major basins. The Government of India also started giving incentives to plan and complete such projects speedily and economically.

In a comprehensive Integrated Watershed Development and Management of Water Resources the benefits of development should have dispersal and equitable effects focusing to minimize the disparities amongst the different sections, groups people, areas and regions. Participation of users of water, at various levels, stages of development and management should be the main focus of planning. The involvement of users from the stage of planning of water resource in the watershed for the well being of the people residing in watershed for their minimum need of drinking water, food and energy at the watershed level and industries, tourism, aquatic, life, ecology road, communication, marketing at the sub-basin/basin level, i.e. infrastructure development, simultaneously at the same time. Integrated Water Resources Development Plan should be an integral part for holistic development and management from watershed level/sub-basin level, so that all stakeholders can reap the development peacefully and environmentally free circumstances. Infrastructure development plan such as roads, railways, creates facility for transport of agriculture

in the real sense of integrating all other activities, concerning to water, which constitute formulation of comprehensive plan of development and management, in such a way that the views of stake holders and water uses should be incorporated, from the stage of watershed itself, so as to form a integral part of the sub-basin/basin as a unit of water resources planning, implementation and management in the principle of holistic approach of development.

Water is a scarce and precious national resource, to be planned developed, conserve and managed judiciously and equitably on an integrated and environmentally sound basis, considering socioeconomic aspects and needs of the habitant in the watershed/sub basin/basin. Planning and implementation of water resources projects involves a number of socioeconomic aspects and issues such as environmental sustainability, appropriate resettlement and rehabilitation of the project affected people and live-stock, public health concern of water impoundment, dam safety, etc.

Problems of waterlogging and soil salinity have emerged in some irrigation commands, leading to degradation of agricultural land, complex issues of social justice in regard to water distribution are required to be addressed.

The intensive development causing overexploitation of groundwater and thereby depleting water levels in wells or tube wells in many parts of the country particularly, in most of the hard-rock states of the country have raised the concern and need change in policies for regulating, judicious and scientific resources management and conservation before it is getting damage further, an causing effect of salinitization. All these issues are to be integrated in over all planning of the integrated water resources development plan from *in situ* level of precipitation, i.e. watershed/sub-basin to basin, as a integrated unit for the mode of water resources development and management in the country, for sustainable development and securing for drinking and food, requirement by 2025 and 2050 A. D.

increasing in food production. Since, agriculture productivity depends on availability of water, there is increased demand of water for irrigating agriculture land. Naturally, for meeting the increased demands of water for agriculture sector, it is significant to economize the use of water by adopting various measures, like peoples participation of users group in management and development programme, increasing the use of water efficiently and increase the crop production per ton, "in more quantities as against each TCM" use of water applied for crops, vigorous efforts would be needed from all walks of life in a water conservation efforts. It is a collective responsibility of every citizen in the country to address the problem of water shortage assuming the proportionate risk of crisis, by conserving every drop of water and suggested for conducting water audit for all sectors of water uses.

6.III IRRIGATION

In India the estimated utilizable surface water, groundwater and run-off for augmentation together is 1222 bcm. Out of this nearly 72% surface water and groundwater is available in Northeastern regions of India, comprising in 37% of the geographical area of the country. These areas are also enriched in groundwater availability due to occurrence of older alluvium and sedimentary rocks as aquifers ranging in depth from 100 to 1000 meters. The use of ground and surface water is also low and availability may increase further if reassessed correctly and on further exploration in deeper zones.

6.III.1 Increasing Water use Efficiency in Irrigation Sector

It is estimated that currently 83 percent of the developed water resources is used for irrigation purpose alone. This may get progressively reduced to about 75 percent in future, due to increasing demand under other different sectors. Irrigation projects in general, are underperforming since the 1st five year plan itself. The gap between potential created

structures or canals or village tanks are not provided, so as to lessen the overburden of groundwater use for irrigation and prevented overexploitation and depletion of water levels in well.

Construction of major and medium projects are time-consuming, costly and coupled with number of problems of acquisition of land under submergence, resettlement, etc. Therefore, the groundwater development being quickest, fastest, cost effective and more particularly in the land of cultivators, cultivators resorted for adopting construction of open well/borewell/tube wells with their own finances or finances under institutional schemes for boosting food production since, the First Green Revolution commenced during 1968, should be protected from overexploitation under any cost.

The National Water Policy, 2002, stress on the conservation of water. It has been empathized that the efficiency of utilization in all diverse uses of water should be optimized and an awareness of water as a scarce resource should be focused. Optimizing efficient utilization of water resources and curtailing demand side management, are the key issues before the water resources planners, for achieving optimum water use efficiency for sustainable development for water resources.

As far as the irrigation sector is concerned the present use efficiency of surface water resource is only 35 to 40 percent that means nearly 60 to 65 percent of the stored water in reservoir is being lost by different means like evapotranspiration, leakages in catchment area, leakages in unlined canals and seepages from flooding of fields instead irrigating land and thus creating problem of waterlogging and salination.

The efficiency of groundwater is 65 to 70 percent, which is fairly good, but still requires modification at the level of watering crops by sprinkle and drip irrigation. It should be possible to achieve 50 to 60 percent efficiency in surface water