Background

The activity of Soil Survey under the commands of irrigation projects were initiated as early as in 1920 by the British Govt. at the instance of Sir C. C. Inglis, who was an eminent Scientist Engineer. It was started with a small unit for Soil Surveys in Pune under the P. W. Department and further developed into Sub-Divisions headed by Soil Physicists (class II). At the time of bifurcation of Gujarat from old Bombay State (July-1960), a full-fledged Soil Survey Division with five Sub Divisions was created in the state under PWD.

The need for pre irrigation soil surveys has been emphasized by various Central and State agencies including the Central Water Commission, FAO and IARI. The activity of ‘Soil Survey and Investigations’ in irrigation commands have been increased as felt needed from time to time.

Presently, In addition of the Soil Drainage and Reclamation Circle with Soil Survey Divisions and Sub Divisions functioning under Narmada, Water Resources, Water Supply and Kalpsar Department, two Soil Survey Divisions one each at Ahmedabad and Patan and seven Soil Survey Sub Divisions namely at Bharuch, Vadodara, Ahmedabad, Viramgam, Surendranagar, Patan and Harij are functioning for Soil Survey and Investigation activities in Sardar Sarovar Project command under Sardar Sarovar Narmada Nigam Ltd.
Soil Surveys are, therefore, carried out to determine the nature, distribution and extent to different types of soils existing in various regions. Since the type of cultivation and the crop management practices for efficient agriculture depend on the nature and type of the soil.

Properties of soil may change after the introduction of an irrigation system in the region due to the development of salinity, alkalinity, water logging, etc. An exhaustive soil survey should, therefore be conducted during the planning stage of a river valley project with particular emphasis to the suitability of soils for irrigation, reclamation, drainage and also in command areas where is to be used for irrigation after impounding in a reservoir or running a canal.

Soil Surveys of the catchment and command areas help in formulating measures for mitigating reservoir siltation, prevention of soil erosion and suggesting remedial measures for drainage and water logging problems. Soil surveys should provide for examination of the physical, chemical and biological properties of the soil. From agricultural point of view it help in determining the availability of plant nutrients in the soil and the need for correcting the deficiencies. Thus, soil surveys furnish information required not only for agricultural purposes but also for reclamation and conservation purposes and for engineering construction activities.

For irrigation project command areas the knowledge of soils of the area is most essential for economic as well as technical reasons. The high cost of development of irrigated agriculture revere detailed soil studies to ensure selection of potentiality productive soils for irrigation, to determine reclamation needs, erosion control needs, to determine suitable cropping pattern and the management practices for optimum benefits from irrigation.

Under canal irrigation, there is the danger of lands becoming water logged or saline or both. Therefore, taking preventive measures pre-irrigation soil surveys are carried out and/or post irrigation soil and water monitoring is carried out as preventive measure to control damage to lands done to water level and soil survey.
Objectives

1) To classify the area into different Land Irrigability Classes with a view to manage better irrigated agriculture.

2) Field Work to study the important characteristics of soils and external land features.

3) Laboratory analysis to supplement the field observations and to generate data on the physio-chemical characteristics of the soils.

4) To find the correlation and classification of soils into defined taxonomic units

5) Soil Survey interpretation to make predictions about the potential of soils and ascertaining their management requirements for sustained production.
Justification

- The benefits of irrigation through river valley projects are numerous; however, maximization of the crop production need a careful study of the soils as the heterogeneity of soils has variegated response to irrigation. The high cost of development for creating irrigation facility ever detailed soil studies to ensure selection of crops, achieve potential production, to determine the need of reclamation and erosion control needs, to determine suitable cropping pattern and the management practices for optimizing the benefits of irrigation.

- Soil survey of any areas proposed for irrigation brings out the existence of problems in the soil, which could aggravate after introduction of irrigation. The need for carrying out pre irrigation soil survey is easily realized in view of large-scale deterioration of lands, which has resulted after introduction of irrigation, through development of saline, alkaline and waterlogged conditions. Therefore, it is imperative to ensure sustainability of irrigated agriculture in the command areas.

- The term “sustained use under irrigation” does not mean perennial irrigation but some irrigation year after year in the same soils. Sustained use under irrigation means a reasonable expectancy of permanent profitable production under irrigation, measured in terms of anticipated relative net farm income by consideration of potential productive capacity of soils and cost of production.

- In order to achieve sustained land use under irrigation, a close system of monitoring should be in place by observing affecting parameters such as the soil quality, ground water depth and quality, surface water quality, pesticide residues, soil health card etc. from time to time, that determine the irrigability status.
Usefulness

- Provide information needed for developing optimum land use plans & for bringing new areas under irrigation and drainage network.

- Demarcating the problematic soils, such as saline, alkali, water logged or flooded, eroded and waste lands, and areas subject to erosion and in suggesting soil and water conservation measures to overcome these problems.

- On the basis of such type of inventory farmers can be advised to grow crops according to the soil parameters, such that to take optimum and sustained production.