3. **AIM AND SCOPE**

The necessary studies on such aspects as determining the optimum depth of brine in the condensers and more particularly in the crystallizer pans in the solar salt works has been carried out under the normal prevailing process adopted in the manufacture of salt in the salt works.

Series feeding system to the crystallizer pans has been shown to be advantageous over parallel feeding adopted in the country, with respect to increased yield and the distinct varieties of salt it yields in addition to simplifying the process of control of the pans. The modified system of series feeding has been worked out, which is suitable to solar salt works in India in particular and elsewhere, where such conditions prevail.

Addition of manganese in trace quantity causes increased rate of evaporation, as well as, forms hard and compact crystals of high purity and comparatively less in moisture content. The mechanism by which addition of manganese in trace quantities causes the increase in the rate of evaporation has been studied, and optimum conditions worked out for its addition to the saturated brine.

The heat energy lost to the underground in the conventionally prepared crystallizer pans has been worked out to be from 7 to 9 percent of the total energy used for evaporation of the brine. To resist percolation losses and conserve heat energy losses, a new process of lining the crystallizer pans with polythene film has been worked out.
Study has been made of the crystal formation, size and shape to suit the particular requirement, in the conditions of the solar salt works. Low bulk density flaky salt, hopper shaped crystal of low bulk density, high bulk density, fine and uniform grained high purity salt to meet the requirement of dairy and canning industries and on coating as table salt, calcium, iron, manganese and phosphate fortified salt, iodised salt and hard and compact crystals of salt by such additives as manganese in trace quantities have been prepared and the processes are fully developed.

The inclusion of mother liquor with the salt crop extracted, determines the limit of the purity of salt obtained in the solar salt manufacture. Optimum conditions for washing crude and common salt with fresh saturated brine to obtain salt suitable for human consumption and industrial purposes respectively, have been worked out in details. No separate process is involved in washing of salt in pans and salt works of all categories can employ this process, based on the extensive data presented.

The study on "Solar Pond" system is made. This technique has use in such regions which are otherwise advantageously situated for the manufacture of solar salt, but for high humid conditions and interruptions due to rains in the manufacturing season. Solar pond combined with multiple evaporators can economically be used for manufacture of salt of high purity. A "Solar Pond" is a stratified system containing salt solutions which increase in density and temperature with
depth and due to the elimination of convection currents in shallow bodies of water results in the concentration of energy at the bottom layers. Based on the data available from the laboratory "Solar Pond", an experimental solar pond of the size 154 x 70 ft has been designed and constructed and is expected to go into operation within the next few months.

The above studies have enabled to derive quantitative expressions in the selection of suitable sites for the establishment of salt works to work out the ratio between the crystallizer vs. condensers on varying conditions with respect to evaporation, rainfall, percolation losses, etc., and to determine the working conditions for the process of salt manufacture on scientific basis, which hitherto has been considered as an art based on personal experience gained in the salt manufacture. It has been possible to understand the gaps and provide the explanation for the same. It is hoped that these studies will fill up the major gap in providing scientific basis for the layout of the solar salt works in various regions - even to the regions so far considered not suitable for salt manufacture, and provide a process for the manufacture of salt of different grades and of high purity, economically.