5. SUMMARY
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1. In the present treatise a detailed ecological study was carried out on the newly formed waterbodies in the abandoned pits left after limestone mining.

2. Five such water bodies were selected for the present study. They are
   a. Tancem Mines 1 pond
   b. Kalinga yeri pond
   c. Tamin pond
   d. Fixit pond and
   e. Tan India pond

3. These water bodies except Tancem Mines 1 are neither used for aquaculture nor for any other economically useful purpose. TANCEM Mines 1 is used as reservoir of drinking water for TANCEM quarters.

4. Fortnight integrated samples were collected from August 1999 to August 2000.

5. Investigation on physicochemical and biological characteristics of water, physicochemical characteristics of sediments were carried out.

6. Water quality - Integrated water samples were taken and the parameters such as temperature, pH, dissolved oxygen, conductivity, solids, free CO₂, chloride, residual chlorine, ammoniacal nitrogen, nitrate nitrogen, phosphate, sulphate, iron, hardness, calcium, magnesium, BOD, COD, GPP, NPP and Community respiration were studied.
7. Plankton, macroflora and ichthyofaunal were also surveyed during the investigation.

8. Mathematical relationship of NPP and calcium showed cubic model as best fitted in Kalinga Yeri, Tamin, Fixit, and Tan India ponds. In Tancem Mines 1 pond the power model was best fitted.

9. With a view to develop a general model to explain the role of various physicochemical characteristics on productivity of alkaline ponds, the data on the physicochemical of all the ponds were pooled and the relationship is expressed as.

\[
Y = 3.4274436 + 0.003X_1 - 0.001X_2 - 0.008X_3 - 0.022X_4 + 0.004X_5 + 0.001X_6 - 0.001X_7 + 0.036X_8 - 0.004X_9 - 0.001X_{10} + 0.005X_{12} + 0.004X_{13} - 0.001X_{14} - 0.003X_{15} - 0.003X_{16} + 0.002X_{17} + 0.001X_{18} + 0.008X_{19} + 0.002X_{20} - 0.001X_{21} - 0.001X_{22} + 0.00X_{23} + 0.020X_{24} - 0.016X_{25} - 0.002X_{26} - 0.001X_{27} + 0.999X_{29} + 0.037X_{30} - 0.001X_{31} + 0.007X_{32} + 0.00X_{33} - 0.001X_{34} - 0.004X_{35} + 0.00X_{36} + 0.002X_{37}.
\]

10. Selected parameters such as pH, conductivity, sulphate, chloride, nitrate, phosphate and organic matter were studied using sediment samples.

11. Thirty phytoplankton and five zooplankton species were identified during the study.

12. Seven species of macroflora and ten species of ichthyofauna were identified.

13. Tan India and Fixit waterbody had extremely high pH. Waterbody needs bottom sediment manipulation for moderating the pH.
14. Nutrients are found below the required limit and hence addition of nutrients is recommended for increasing production.

15. Providing shelter, Plankton, macrophytes, manure was recommended to induce ecological succession before introducing fishculture.

16. Adoption of above said management strategies would lead to the conversion of these unutilized waterbodies into highly productive aquatic ecosystem.