CHAPTER 8

CONCLUDING SUMMARY

Study on feasibility of Srisailam Left Bank Canal by simulation result, the demand of water for SLBC project by simulation result of CROPWAT and the design of various components according to the demand is summarized in this summary.

1. A Stochastic Dynamic Programming model ($SDPM$) is developed for the optimal operation of Srisailam Reservoir without considering SLBC demand. The system performance is studied through simulation. The percentages of overall reliability and resilience values obtained through simulation for irrigation & drinking release, power generation release and total releases are worked out as 79.43%, 43.16%; 73.60%, 57.11% and 73.58%, 50.60%; respectively.

2. Based on the optimal operating policy developed through simulation of Srisailam Reservoir without considering SLBC demand, the expected excess flow after meeting all the requirements that could be available during monsoon months to SLBC are July, August, September, October are $2279.52 \text{ Mm}^3 (80.50 \text{ TMCft})$, $5956.20 \text{ Mm}^3 (210.34 \text{ TMCft})$, $2391.09 \text{ Mm}^3 (84.44 \text{ TMCft})$ and $2408.36 \text{ Mm}^3 (85.05 \text{ TMCft})$ respectively.

3. The overall performance indicators through simulation with considering SLBC demand for irrigation & drinking release, power generation release, SLBC release and total release are 72.53%,
43.45 %; 73.38%, 57.03%; 77.43%, 40.90 % and 73.40%, 49.58% respectively.

4. SLBC release reliabilities for July, August, September, October, November, December and January are 94.4%, 98.4%, 93.4%, 84.6%, 88.8%, 63.0% and 19.4% respectively. Hence it can be concluded that SLBC project is a feasible project.

5. For the proposed command area of about 3 lakh acres under Srisailam Left Bank Canal (SLBC) and for proposed cropping pattern (Cotton, Chilies, Groundnut, pulses) in both kharif and rabi seasons of a dry year, crop water requirement and irrigation schedules have been evolved based on the simulation results of CROPWAT.

6. Net Irrigation Requirement for the crops Cotton, Chilies, Groundnut Kharif, Groundnut Rabi and Pulses under SLBC command area for dry year are 451.3 mm, 345.3 mm, 207.4 mm, 355.3 mm and 283.9 mm respectively.

7. Gross irrigation requirements for all the crops of a dry year is estimated to be 878.96 Mm³ (31.04 TMCft) per year.

a. The crop wise Gross Irrigation Requirements for the Irrigated dry crops of SLBC namely Cotton= 120.34 Mm³ (4.25 TMCft), Chilies=276.94 Mm³ (9.78 TMCft), Groundnut (kharif)-83.25 Mm³ (2.94 TMCft), Groundnut (Rabi)=284.30 Mm³ (10.04 TMCft) and Pulses – 114.12 Mm³ (4.03 TMCft).
b. The month wise Gross Irrigation Requirements for dry year during July, August, September, October, November, December and January are 9.07 Mm³ (0.32 TMCft), 50.40 Mm³ (1.78 TMCft), 42.19 Mm³ (1.49 TMCft), 122.33 Mm³ (4.32 TMCft), 212.94 Mm³ (7.52 TMCft), 269.29 Mm³ (9.51 TMCft) and 172.73 Mm³ (6.1 TMCft) respectively.

c. Gross Irrigation Water requirement for SLBC command area using CROPWAT run for an average year is 726.61 Mm³ (25.66 TMCft). CROPWAT results are checked with manual calculations in every step and found to be satisfactory.

8. Irrigation schedules are developed for the crops of SLBC command area in order to know the timing and amounts of irrigation water applications to increase crop yields. It is a “Management Tool” used to help farmers to get their share of water supplied between different fields of crops, and by the project manager to allocate water to canals and project area.

9. Monthly demand of water includes Crop water requirement and drinking facility for SLBC gravity scheme are needed outflow from Dindi Balancing Reservoir. Water demand of SLBC gravity scheme during the months of July, August, September, October, November, December, January are respectively 20.39 Mm³ (0.72 TMCft), 61.73 Mm³ (2.18 TMCft), 53.52 Mm³ (1.89 TMCft), 133.66 Mm³ (4.72 TMCft), 133.66 Mm³ (7.52 TMCft), 269.29 Mm³ (9.51 TMCft), 172.73 Mm³ (6.1 TMCft).
10. The peak demand of water is observed in the month of December and i.e., 269.29 $Mm^3$ (9.51 $TMC^f$). As the maximum discharge is in the month of December, the canal is designed for 100 $cumecs$ to attain the peak demand. The duty at the head of the Dindi Balancing Reservoir of SLBC gravity scheme is 10258.4 $hal/cumec$ (88 acres/cusec).

11. The comprehensive irrigation system is designed for conveying the water from the reservoir to the agricultural field. The system components include.

   a) Canal head regulator on the left bank of Srisailam reservoir designed as per IS code 6531-1994 for the capacity of 113.28 $cumecs$ (4000 cu sec s) and the overall length of the water way calculated as 20.20 $m$.

   b) Canal transition from the Canal head regulator to the inlet of tunnel I designed by using Mitras method of hyperbolic transition.

   c) Tunnel 1 of 9.2 $m$ height is checked for the carrying capacity.

   d) Dindi Balancing Reservoir capacity is estimated and is found to be 655 $Mm^3$ (23.13 $TMC^f$) based on inflow and outflow.

   e) Tunnel 2 of 9 $m$ height is checked for carrying capacity.

   f) Udayasamudram tank capacity, based on inflow and outflow is estimated and is found to be 62.86 $Mm^3$ (2.22 $TMC^f$).

   g) The unlined portion of main canal, designed with a base width of 28 $m$ and with a side slope of 1:2 as per the Bureau
of Indian standard code IS.7112 – 1973. The Lined portion of main canal designed with a base width of 23 m and with a side slope of 1:1 as per Bureau of Indian Standard code IS 10430 – 1982.

Any discussion or study or investigation should be culminated with fruitful and relevant conclusions. Otherwise, the whole effort would be a futile exercise. The present thesis, without its conclusion is half done. Therefore, conclusions of the present study are

- The excess flow from Srisailam Reservoir can be efficiently utilized to irrigate 3.00 lakh acres of drought hit Nalgonda region which gives a feasible and fruitful result for the development of Nalgonda district.

- The other major problem of drinking water is solved, as 22 mandals (516 villages) of Nalgonda district are badly affected with fluorosis a major health hazard, a problem ensolved from the day of independence.

- The financial and economic condition of Nalgonda region will be drastically improved with increase of agricultural productivity and health conditions.

8.1 SCOPE FOR FURTHER WORK

The present study can be efficiently completed with more detailed data. By maximizing the data collection and minimizing the relaxations, the present work can be continued further. The proposed model can further be improved and made more general. Therefore scope for further research in this area is also presented.
Further small interval periods like ten days and weekly, within a year also may be considered to know corresponding operating rules for the reservoir.

One can develop fuzzy dynamic programming models for optimal operation of the reservoir for better operating policy and for effective utilization of the available resources.

A decision support system can be developed for selection of method that should be adopted for accurate estimation of crop water requirements in the study area.

The capacities of Dindi Balancing Reservoir and Udayasamudram tank can be accurately estimated by taking more reliable inflow data and outflow data.

The model can be extended to a real time integrated reservoir operation and irrigation scheduling model by incorporating a reservoir component and by updating the forecasted meteorological and hydrological input data.