

Chapter 11

Environmental And Ecological Aspects

11.1 General

The development of water resources, while providing food, shelter and fibre to the man kind, may cause some adverse impacts on environment. Basically there are two schools of thought in so far as environment is concerned. One school of thought holds that ecological system is fragile and highly unstable. It is implicit therefore, that environment should be left untouched as much as possible, in its natural state and its diversity should be preserved at any cost. Modification for the purpose of development should be minimal and confined to the range of tolerance limits of elements of ecological system. The second school of thought assures that the environment is globally stable and there is large element of built-in resilience in ecological system.

The impacts of environmental implications attributed to Water Resources Development can be broadly classified as (1) Physical impacts, (2) Biological impacts and (3) Impacts on human life.

Some of the important implications under physical impacts are (i) sedimentation in storage reservoir which is the main cause in reducing the life of the reservoir, (ii) Changes in hydrological regime due to large impoundments and (iii) water quality modifications, water logging and salinity caused by the excessive irrigation & seepage. The construction of dam creates large volume of standing waters which are subject to biological and chemical changes. Over the years the reservoirs tend to become rich in nutritive substances. This process known as Eutrophication, encourages increasing population of algae which may adversely affect the quality of water. The serious impact of storage reservoir in tropical countries is spreading of water borne diseases such as Malaria and Shistosomiasis.

The displacement of people living in areas which may be submerged is of vital concern. Since the benefits also accrue to a large number of unaffected population, it creates resentment among directly affected persons.

However, above adverse impacts are unlikely in the present link proposal since the transfer of water is from an existing reservoir through SRMC

system and natural streams. However, a brief description of various aspects of environmental impact is given in the following sections:

11.1.1 Existing Land Use in the Vicinity of the Link Canal

Since no enroute irrigation is proposed under the link canal, description regarding land use statistics is not given.

11.1.1 Submergence Area

There is no submergence area under Krishna (Srisaillam)-Pennar link. Only embankments are proposed to pass the required discharge through the existing natural streams. Diversion weirs are proposed for four mini power houses for power generation. Because of construction of these weirs, a negligible area is expected to be submerged and the same will be confined within embankments only.

11.1.2 Land Acquisition

The land to be acquired for construction of the embankments along both sides of the natural streams wherever required and for power house installation at four locations is only 45.5 ha and 24 ha respectively.

11.1.3 Water Logging

Since the groundwater table is very low in the vicinity of the link alignment no water logging problem is anticipated.

11.1.4 Flora and Fauna

No adverse impact is expected on the flora and fauna due to the link canal as the water is proposed to be transferred through existing/ongoing canals and natural streams.

11.1.5 Industrial Development in Project Area

Since power is proposed to be generated along the link, new small scale industries may develop in the project area.

11.1.6 Population Density

The link canal passes through Kurnool and Cuddapah districts. The population of Kurnool and Cuddapah districts as per 1991 census was 29.7 lakh and 22.61 lakh respectively. The density of population in Kurnool and Cuddapah districts was 168 per km² and 147 per km² respectively according to 1991 census.

11.1.7 Villages Affected and Population Displaced

The existing Srisaillam dam is proposed to be utilised as the head works of Krishna (Srisaillam) - Pennar link, therefore, no new area/village is envisaged to come under submergence.

11.1.8 Proposed Period of Construction

Krishna (Srisaillam) - Pennar link is proposed to be completed in two phases. Phase-I consists of construction of flood embankments enabling to pass the proposed discharge through the existing natural streams of the link. Phase-II consists of construction of powerhouses and weirs at power generation points. The whole project is proposed to be completed within a period of five years.

11.1.9 Labour

A large force of labour will be required during execution of the project. The labourers both skilled and unskilled are available in the vicinity of the project area.

11.1.10 Physical Aspects

The transfer of water through Nippulavagu, Galeru and Kunderu streams may improve the groundwater recharge in the adjoining areas. It is expected that the seepage will be less as the transfer of water takes place during the monsoon period from July to December and the natural streams will have their self discharge during this period. The transmission losses have been worked out to be 215 Mm³ for a total transfer of 2310 Mm³ of water. Hence, a quantity of 2095 Mm³ is expected to reach Somasila reservoir on Pennar River. Landslides are not expected in the periphery of the natural streams. There would be improvement of land use pattern in practice. The transfer of water through the natural streams will improve their ecology.

11.2 Impact of Link on Regime of Natural Streams

The transfer proposal through Krishna (Srisailam) - Pennar link, consists of the streams of 14.41 km of Nippulavagu from the confluence of Escape Channel, 24.09 km of Galeru and 141.82 km of Kunderu. For the entire stretch of Nippulavagu, embankments are proposed enabling to pass the designed discharge of 163 cumec. Out of 24.09 km of Galeru river stretch, embankments are proposed for a total stretch of only 6.75 km at different locations and the remaining stretches of Galeru can carry the proposed discharge of 163 cumec in addition to its self discharge. The entire Kunderu river stretch can easily carry the proposed discharge as per the discharging capacities worked out at each cross section of Krishna (Srisailam) - Pennar link.

Water is drawn from the reservoir from higher levels (266.70 m) for transfer through the streams. Water at that level will be fairly clear and the problem of siltation will be minimum.

11.2.1 Impact on Natural Resources

There are no identified deposits of mineral wealth, monuments and valuable properties in the land to be acquired for proposed embankments for entire Nippulavagu (stretch of 14.41 km) and Galeru (stretch of 6.75 km) streams. As the transfer is through the existing natural streams there is no impact on natural resources.

11.2.2 Environmental Aspect

The flow of water in the natural streams during the transfer period will create more greenery in the area. Power generation is proposed at four power generation points enroute of the link. Two are in Nippulavagu stretch at RD 2.00 km, RD 13.02 km, one is in Galeru stretch at RD 22.11 km one in Kunderu stretch at RD 127.70 km. Land along the natural streams on both banks will have to be acquired for the construction of embankments and installation of the power houses wherever required.

The discharging capacity of Kunderu river at Alladupalli G & D site has been worked out. By using surveyed data, the cross section of Kunderu was plotted at the G & D site. Then the cross-sectional area, perimeter and hydraulic mean depth were computed. By using

Manning's formula, the discharging capacity has been worked out to be 2060.32 cumec. Maximum ten daily flood discharge observed at Alladupalli G & D site of Kunderu river is 591.50 cumec and the historical maximum flood discharge observed on 9th October, 1994 at the G & D site was 1836 cumec. Hence, the normal flood discharge of Kunderu in addition to the link discharge of 163 cumec can pass through the Kunderu river stretch safely. In case of extreme flood condition, the link discharge will be regulated at Pothireddipadu head regulator. Year-wise high flood levels observed at Alladupalli G&D site are given in Table 11.1.

Table 11.1
High flood levels observed at Alladupalli G&D site

Year	HFL (m)	Discharge (cumec)
1985-86	100.100	1332.5
1986-87	97.900	442.5
1991-92	98.575	761.7
1992-93	98.080	542.7
1993-94	99.660	800.4
1994-95	-	1836.0

Source : Central Water Commission

The G&D site at Alladupalli was started in July/August, 1985. The observed HFLs for the years from 1987-88 to 1990-91 are not available.

The operation policy of the Krishna (Srisaïlam) - Pennar link will be evolved at the pre-construction stage of the link in consultation with the state authorities for safe passage of the link discharge and high flood of the natural streams, as the regulating structures viz. Pothireddipadu head regulator and Banakacherla cross regulator are maintained by the state authorities.

11.3 Socio-Economic Conditions

The occupation of the people in the region is mainly agriculture. The existing Kurnool – Cuddapah Canal, the ongoing Srisaïlam Right Branch Canal and Telugu Ganga Canal will be providing irrigation facilities in the entire region in the vicinity of Srisaïlam – Pennar link. Therefore, no enroute irrigation by the link canal is proposed. The water so diverted to the river Pennar through this link project will be utilized in the water short areas located south of Pennar. With the present link proposal, the

power position will improve in the vicinity. Employment avenues at various levels will also improve. Hence, there will be a general rise in the standard of living of the people in and around the region.