Chapter 11

Environmental and Ecological Aspects

The National Council of Applied Economic Research (NCAER), New Delhi was entrusted with the studies of socio-economic and environmental implications of 6 inter-basin water transfer proposals of NWDA, and the present link is one among them. The details on Environmental and Ecological Aspects of the project furnished here are mostly based on the conclusions drawn in their report.

11.1 Basic information

11.1.1 Existing land use in the catchment

The catchment area upstream of the three dam sites combinely consists of:

a)	Agricultural land	19 ha
b)	Reserved Forests	46294 ha
c)	Forest Plantations	587 ha
	Total	46900 ha

11.1.2 Submergence area (ha)

The details of area of submergence including the area occupied by the river portion are as follows:

Area of Submergence

Sl. No.	Land Classification	Punnamedu Reservoir ha	Achankovil Kal Ar reservoir ha	Achankovil reservoir ha	Total ha
1)	Forest	440.000	871.672	86.000	1397.672
2)	Forest plantation	-	369.000	218.000	587.000
3)	Cultivated and habitated land	-	-	19.000	19.000
	Total	440.000	1240.672	323.000	2003.672
				Say	2004 ha

The forests in the submergence area belong to evergreen forests, semi-evergreen moist deciduous forest and green land categories. The prominent species of timber available in the forests are Aini wood, Hopea, Kindal, Laural, Kinotree, Teakwood and Bamboo. The man-made plantations consist of teak, eucalyptus, cloves and rubber etc. About 125 ha. of forest and forest plantation land is proposed to be acquired for construction of roads, colonies

and other uses of the project. The project is planned for completion within a period of 8 years.

11.1.3 Availability of Labours

a)	**Estimated strength (Peak)**	
i)	Total	3400
ii)	Skilled and semi-skilled	600
iii)	Unskilled	2800
b)	**Availability of labour from the affected area**	
i)	Total	200
ii)	Skilled and semi-skilled	Nil
iii)	Unskilled	200

11.1.4 Population density

The population density in the submergence area is about 111/ km^2 and in the catchment is about 5 / km^2.

11.1.5 Villages affected

The submergence areas of Punnamedu and Achankovil Kal Ar reservoirs are uninhabited. About 297 persons will be affected due to submergence of Achankovil reservoir in Achankovil village. The details are given below :

Scheduled Caste	10
Scheduled Tribe	-
Others	287
Total	297

11.1.6 Occupation of affected people

a) Agriculturist	10
b) Ordinary labour	70
c) Others	217
Total	297

11.1.7 Resettlement

i) Resettlement & Rehabilitation committee will be constituted soon after the project is sanctioned.

ii) Families whose lands are affected will be granted equivalent land subject to a minimum of 1 ha as per the accepted policy. Provision for the irrigation facilities will be made available by the project authorities.

iii) Families whose houses are acquired will be provided with built up house of plinth covering 30, 50 and 70 m^2 on a plot area of 150, 250 and 350 m^2 based on categorization of economically weaker section, low income group or middle income group respectively.

11.1.7.1 Resettlement of Project Affected People (PAPs)

i. All the affected persons are proposed to be rehabilitated in new settlement centres near the existing Achankovil village.

ii. The model village will be developed for resettlement of the PAPs with the basic amenities like safe drinking water, access road, schooling facilities, electricity, post office, bank, police station etc. to the inhabitants. The provision for the same has been made in the project estimate.

iii. The affected persons who are not allotted agricultural land will be given alternate employment or allotted shops for restoring to their original trade occupation at the expense of the project. A rehabilitation grant of Rs. 10000/- per family and maintenance allowance of Rs. 500/- per month per family will be paid to all the affected families for a period of one year or until employment / occupation is restored whichever is earlier.

Of the 297 affected people, about 200 can be engaged in the project construction work.

11.1.8 Details of developmental activity in the affected area

There are no development programmes in the affected area, since most of the submergence area is coming under the reserved forest and forest plantation.

It is also observed that there are no industries, thermal power plants or mining operations in the project area.

11.1.9 Sedimentation of reservoir

The expected rate of sedimentation is 5 ham / 100 km^2 / year. The bed load is assumed as 15% of the suspended load. The reservoir is being planned

with a life of 100 years. The reservoir water spread area and most of the catchment confined to reserve forest and forest plantation. Hence, no soil conservation measures may be required. To avoid the problems of slips and slides on the periphery of the reservoir, the cutting of trees will not be resorted to.

11.1.10 Ground water (command)

The depth of ground water in the command area of the project varies from 8 to 15 m during monsoon and goes further lower down in summer season. The quality of ground water is generally good and potable. The existing ground water utilisation in the command area is of the order of 19% of the available ground water resources. Canal irrigation in the proposed command area will causes additional recharge to ground water resources. As a result, the ground water levels will rise gradually year by year. Part of this augmented ground water reserves find its way into streams. Considering the low ground water table in the region, it is not likely that the canal irrigation creates problem of water logging. The drainage system will however dispose of the surplus recharge along with surface drainage and will avoid rise in water table.

11.1.11 Wild animals and birds

The following wild animals and birds are available in the project.

i) Wild Animals	Elephants, Bisons, Tiger, Leopard, Bear, Spotted Deer, Sambar, Monkey, Lizard, Great monitor, Python, Cobra.
ii) Birds	Jungle fowls, Quails, King Crow, Woodpecker, Horn bills.

There are no rare/dying species in the area. The project area does not contain any feeding areas or migration routes and there is no wild life sanctuary in and around the region of submergence.

11.1.12 Tourism development

Presently the area is not having any tourist or archaeological importance. However, provision is made in the estimate to develop the project site to enhance its aesthetic aspects i.e. recreation and water sports facilities and picnic sites etc.

11.1.13 Salinity Problem

No change in salinity or deterioration of water quality is anticipated. Reduction of natural flow in the river during lean season may cause increase in the salinity in coastal areas. However, the regulated discharge of 5.72 m^3 / sec from the Achankovil Kal Ar dam and 1.43 m^3 / sec from Punnamedu will maintain the quality of ecology in the down stream areas.

11.1.14 Aquatic life

No provision of fish ladder is made in the proposals since migratory fish is not present. The reservoir being perennial, water source can be used for development of fisheries.

11.1.15 Mineral Resources

There are no mineral resources in the submergence area. Commercial timber grown in the area of 587 ha will be getting submerged.

11.1.16 Water Borne Diseases

Increase in incidence of water borne diseases is normally not anticipated in the area. Impounding of reservoirs may lead to growth of mosquitoes and snails, for the control of which suitable remedial measures are to be initiated while execution of the project.

11.1.17 Aquatic Weeds

The impounded reservoirs may lead to growth of aquatic weeds like salvinia, water hyacinth etc. Suitable remedial measures against this will be taken while executing the project.

11.1.18 Climatological Change

The evaporation from the submerged areas is too small. However, the presence of water bodies may moderate the temperature, increase humidity and wind speed.

11.1.19 Impact of reservoir loading on Seismicity

Reservoir induced Seismicity phenomenon is not noticed in the nearby existing reservoirs and hence the problem is not expected in these reservoirs also.

11.1.20 Arrangements made for fuel requirement and forest fire

a) Fuel required for labour force during construction will be provided through forest depots.

b) The schemes for compensatory afforestation can be drawn up and executed. The cost of the afforestation programme will be born by the project.

c) Antipoaching laws will be framed and enforced by the forest department.

d) Special squad will be deployed to take care of forest fires and appropriate control measures to minimize the impacts in and around the regions, during and after construction periods.