

## CHAPTER 11

# PUBLIC HEALTH DELIVERY SYSTEM

### 11.1 GENERAL

The creation of a huge and an artificial water body will certainly change the micro-climate of the surrounding area, particularly raising the humidity levels. These changes are likely to reflect in creating conditions for human diseases directly and indirectly. Direct causes include water-borne diseases, while indirect causes include breeding grounds for carriers and vectors. Malaria could be the major vector-borne disease in the area. During the survey, at present, the other water borne diseases like diarrhoea, jaundice, cholera, typhoid etc. are not found to be prevalent in the project area. The main breeding seasons of the anopheline mosquito (malaria vector) are the months of September and March. The preferred habitat is stagnant or slow moving fresh water open to sunshine or moderate shade. Mosquito control and mosquito proofing measures can control malaria.

The water resources project consists of various components and each requires a set of specific management measures. Mosquito control measures aim at destroying the habitat and interrupting the life cycle by mechanical or biological or chemical means. In order to have effective control measures to eradicate malaria-causing mosquito the project dispensaries have to work closely with the Primary Health Centres in the nearby villages and Hospital at District Head Quarters. The suggested measures are explained in following paragraphs:

### 11.2 MEDICAL AND HEALTH CARE FACILITIES

As the population density is low in the project area, the health care facilities are also distantly placed in the region. The existing medical facilities in the around the project area are as follows:

District Hospital (at Roing)	-	1
Community Health Centre	-	1

Primary Health Centres	-	3
Health Sub-centre	-	7
Health Units	-	1
Dispensaries	-	2

### **11.3 TRADITIONAL MEDICINAL PRACTICES**

In the remote areas of Arunachal Pradesh the traditional medicinal practices are prevalent and the rural population used to adopt and get cured various illness by using the traditional medicines. These practices may be given a formal boost up by the project authorities by keeping at least one practitioner in the hospital. This kind of practitioner in rural terms is called “Bamunies”. By providing these facilities the rural population’s medicinal faith also will be kept intact.

### **11.4 RESERVOIR**

The Reservoir basin should be cleared and prepared prior to filling for removing unwanted materials in the reservoir, which may lead to unhealthy condition giving rise to breeding ground to mosquito. It involves removal of trees, undergrowth, etc. and clearance of shoreline subjected to erosion to the extent to which the wave action is anticipated. It also involves clearance of Mats of logs and other floating debris, so that it does not provide mosquito-breeding sites.

### **11.5 RESIDENTIAL COLONIES FOR THE WORKERS**

The site selected for habitation of workers should be properly planned and should not be in the path of natural drainage. Adequate drainage system to dispose storm water drainage and sewage water from the labour colonies should be provided.

Strict procedures will be followed in importing labour force from outside the state. Quarantine measures will be adopted and any possibility of importing any fatal diseases such as cerebral malaria, would be eliminated by keeping close vigil on the potential carriers. A thorough medical screening of the labours will be conducted for all the labour coming from outside.

## 11.6 OTHER MEASURES

The project authorities would ensure that all preventive measures and norms are strictly enforced to avoid outbreak of any such eventuality. Surface sprays on the reservoir waters to eliminate breeding of disease bearing insects, like mosquitoes, etc. will be made from time to time. These sprays will be intensified particularly during hot and humid season.

- Adequate vaccination and immunization facilities should be provided for workers at the construction site.
- The labour camps and resettlement sites should be at least 2 to 3 km away from a main water body or quarry areas.

## 11.7 DEVELOPMENT OF MEDICAL FACILITIES

Labour colonies will be developed for the construction work. It is estimated that a population of about 5000 is likely to congregate during the construction phase. The labour population will be concentrated at two or three sites. It is recommended that one Dispensary should be developed at a site, which is easily accessible from the three labour colonies.

The details of manpower, infrastructure requirement for this dispensary are given as below:

### 11.7.1 Manpower

2 Doctors of having M.B.B.S./M.D qualification can be employed in the dispensary and it is advisable that the doctors reside in the staff quarters adjacent to the dispensary. The Para-medical staff required for assistance to these doctors is given in Table 11.1

**Table 11.1: Details of Para-medical staff for Dispensary**

Para medical staff	Numbers
Auxiliary Nurse	5
Male Multipurpose Health worker	2

Attendants	2
Driver	2
<b>Total</b>	<b>11</b>

### **11.7.2 Proposed Health Facilities at Construction sites and labour camp**

It is possible that during the construction work, the technical staff operating different equipment is not only exposed to the physical strain of work but also to the physical effects of the environment in which they are working. The workers and other technical staff may come up with common manifestations such as insect bites, fever, diarrhoea, work exhaustion and other diseases, which they are suffering. In addition they may invariably come up with injuries caused by accidents at work site. Under all circumstances, workers need immediate medical care.

At least three first aid posts are to be provided at each of the major construction sites, so that workers are immediately attended to in case of an injury or accident.

This first-aid post will have at least the following facilities:

- First aid box with essential medicines including ORS packets
- First aid appliances-splints and dressing materials
- Stretcher, wheel chair, etc.

The first aid post can be housed in temporarily erected structure and should be managed by one Health Assistant and assisted by one dresser/first aid attendant. Doctors from the dispensary can attend First Aid post regularly every day at a fixed time. There should be communication to establish link between the dispensary and then first-aid post, so as to enable doctors from dispensary to reach the work site in case of an emergency. The first aid post should have facilities such as fire fighting equipment; telephone connection, one vehicle or ambulance van for effective functioning.

## **11.8 SURVEILLANCE**

In water resources schemes it is imperative to develop a proper surveillance

system. If facilities for diagnosis and treatment of parasitic diseases are available, then the data obtained should be reported systematically and reviewed at higher levels, where operational decisions on specific interventions can be made. The systematic surveillance may be followed as per the following:

### **11.8.1 Malaria control activities**

One of the doctors may be designated as “Expert Medical Officer for Malaria” and will be permanently posted at the dispensary. It is suggested that the anti-malarial campaign be carried out under his immediate personal supervision. A systematic campaign should be conducted amongst the labour population in the months of March and September, which are the breeding months of mosquito. Surveillance for malaria is very important as during the construction phase, stagnant pools for water, wastewater, etc. are created which can lead to greater incidence of malaria. One male multi-purpose health worker along with one attendant will visit the labour camps and surrounding areas once a fortnight and will inquire:

- Whether there is a case of fever in the house, and
- Whether there was a case of fever in the house between his previous visit and the present visit.

If the answer to either of these two questions is 'yes' then the health worker will collect a blood sample and a single dose of chloroquine (600 mg for adults and proportionate dose for others) as a presumptive treatment. The blood sample is then sent to laboratory at the dispensary for testing. If the test is positive then infected person is administered a course of Radical Treatment.

There should be regular fumigation and sprays of insecticides in the areas where water is likely to be stagnant, to prevent the growth of malarial larvae. Normally, DDT is used for this purpose. However, since, it has been conclusively proved that DDT is non-degradable, its use is no longer favoured. Malathion could be used for spraying purposes in place of DDT. Though DDT is no longer a preferred option, it must be mentioned that

amongst other insecticides, DDT is more effective for mosquito control and is least expensive. Hence expert opinion may be sought by project authority before selecting the appropriate insecticide for malaria control. The frequency of monitoring could be once in 15 days. For this purpose a special van may be arranged.

### **11.8.2 Vaccination and Health Check-up Camps**

Regular health check-up will be held at the construction sites for the labourers in order to assess general health conditions and any other communicable diseases. Vaccination camps also will be held for the labourers as well as their family members in the labour colonies. A provision for adequate quantity of medicine distribution also will be kept for the requirement of the labourers. Sufficient stock of medicines also will be ensured for meeting the requirement in case of epidemic situation.

### **11.8.3 Health Extension Activities**

The health care activities proposed in the plan shall also be extended to the PAPs and the locals residing in project area. It is important to inculcate hygienic habits of environmental sanitation especially with respect to water pollution by domestic wastes. There would be possibility of the transmission of communicable diseases due to migration of labour population from other areas at the construction site.

The doctors from the dispensary will make regular visits to these villages and organize health promotional activities with the active participation of the local village leaders, NGOs and available local health functionaries. The health functionaries would undertake the following tasks as a part of health promotional activities:

- Collect water samples to ascertain the potability of water from different sources so as to monitor regular disinfections of drinking water sources.
- Maintain dose surveillance on incidence of communicable diseases in these villages.
- Maintain close liaison with the community leaders and health

functionaries of different departments, so that they can be mobilized in case of an emergency.

## **11.9 COST ESTIMATES**

The Expenditure involved in establishing a health care system will have two major components. One is the fixed cost of construction and other variable cost.

### **11.9.1 Fixed Cost (Non-recurring)**

#### **A Infrastructure**

##### **(a) Dispensary**

The project authority has proposed to construct a hospital at the colony which will be located nearby the project site. The construction area proposed for the same is estimated as 1000 sq m (plinth area 500 sq m; double storey) and the estimated cost of cost of construction is Rs. 90 lakhs. This expenditure is earmarked under the project construction cost. Till the construction of project hospital, the infrastructure for the dispensary is to be provided by the project.

##### **(b) First Aid Posts**

Three first aid posts are is proposed for the project site so as to provide easy and immediate access to the laborers, which can be built up purely for the construction phase and hence may be of temporary nature and 'will be constructed with asbestos sheets, bamboo, etc. It will cost @ Rs.1,20,000/First Aid Post. The total cost for constructing of three (3) First Aid Posts will be of the order of Rs. 3.60 lakhs.

##### **(c) Miscellaneous**

- i) Rs 14,00,000 /- for two (2) Vehicles (Closed Jeep) @7,00,000/-
- ii) Rs 90,000 /- Furniture etc
- iii) Rs 7,00,000/- for one (1) Van for mosquito control spray

### **11.9.2 Variable Cost (Recurring)**

- (a) Sprays for control of insecticides, drugs and medicine Rs.32, 000/month (Rs. 3,84,000/ Year)

- (b) Malaria control-dosage of chloroquine, spray for mosquito control, blood testing etc Rs 22,000/ month (Rs 2,64,000/-)
- (c) Expenditure in Manpower utilization
1. Rs 50,000/ month for Two (2) post for Doctor@ Rs. 25,000/month. (Yearly Rs. 6,00,000/-).
  2. Rs 40,000/month for five (5) post for Nurse @ Rs. 8,000/month. (Yearly Rs 4,80,000/).
  3. Rs 12,000/month for two (2) post for Multipurpose Health Workers @ Rs. 6,000/month (Yearly Rs 1,44,000/).
  4. Rs 10,000/month for two (2) post for Health Workers / Attendants @ Rs. 5,000/month (Yearly Rs 1,20,000/).
  5. Rs 8,000/month for two (2) post for Driver @ Rs. 4,000/month (Yearly Rs. 96,000/-).
  6. Rs 15,000/month for three (3) post for Health Assistants @ Rs. 5,000/month (Yearly Rs 1,20,000/).
  7. Rs 12,000/ month for three (3) post for Dressers @ Rs. 4,000/month (Yearly Rs1,44,000/-).

Hence total manpower cost would be Rs. 17,04,000/- yearly.

### **11.9.3 Overall Expenditure**

#### **Non-Recurring Expenditure**

Infrastructure (Construction of 3 First Aid Posts)	: Rs 3.60 lakh
Vehicles (Van & Jeep)	: Rs 21.00 lakh
Furniture	: Rs 0.90 lakh
<b>Total</b>	<b>: Rs. 25.50 lakh ...(A)</b>

#### **Recurring Expenditure**

Expenditure on salaries	: Rs 17.04 lakh/Year
Expenditure on materials and supplies (Sprays for control of insecticides, drugs and medicine & Malaria control-dosage of chloroquine, spray for mosquito control, blood testing)	: Rs 6.48 lakh/Year
<b>Total</b>	<b>: Rs 23.52 lakh</b>



**Total expenditure for 8 years construction period : Rs 188.16 lakh ...(B)**

**Total Expenditure for Health care (A) + (B) : Rs 213.66 lakh**

**Say, 214 lakh.**