(6) To bear commissions to the Japanese bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission.

(7) To ensure prompt payment of taxes, customs clearance at the port of disembarkation and facilitate prompt unloading and internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.

(8) To undertake incidental outdoor works such as security of the sites, if necessary.

(9) To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Sri Lanka with respect to the supply of the products and services under the verified contracts. To the extent any taxes or duties are to be paid, the implementing organization shall bear such liabilities.

(10) To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts, such facilities as may be necessary for their entry into Sri Lanka and stay therein for the performance of their work in accordance with the relevant laws and regulations of Sri Lanka.

(11) To obtain necessary permissions, licenses and other authorizations for implementing the Project, if necessary.

(12) To maintain and use properly and effectively the facilities constructed and the equipment provided under the Grant Aid.

(13) To bear all the expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project including provision of staff quarters for operational personnel.

(14) To assign the necessary staff and secure the necessary budgetary provision for operation and maintenance of the facilities constructed and the equipment provided under the Grant Aid.

2-4 Project Operation Plan

FIGURE 2.10 shows the present human resource allocation for the operation and maintenance of the facilities in the Matara water supply system.

FIGURE 2.11 shows the organizational structure of the Matara (O&M) (Matara Regional Office for Operation and Maintenance). This organization is a line and staff type structure. Someone from the branch office manages these facilities, which are usually housed in major facilities such as a water treatment plant, and then some of their subordinates are dispatched from the branch office to smaller facilities such as a intake works, for daily operation and

maintenance procedures. Managers in the branch office manage the subordinates and managers in the regional office manage and control the branch managers. Also, the regional office has their own units for responding to bigger maintenance issues such as the need to repair a big leakage and will always support the branch office in whatever way is necessary.

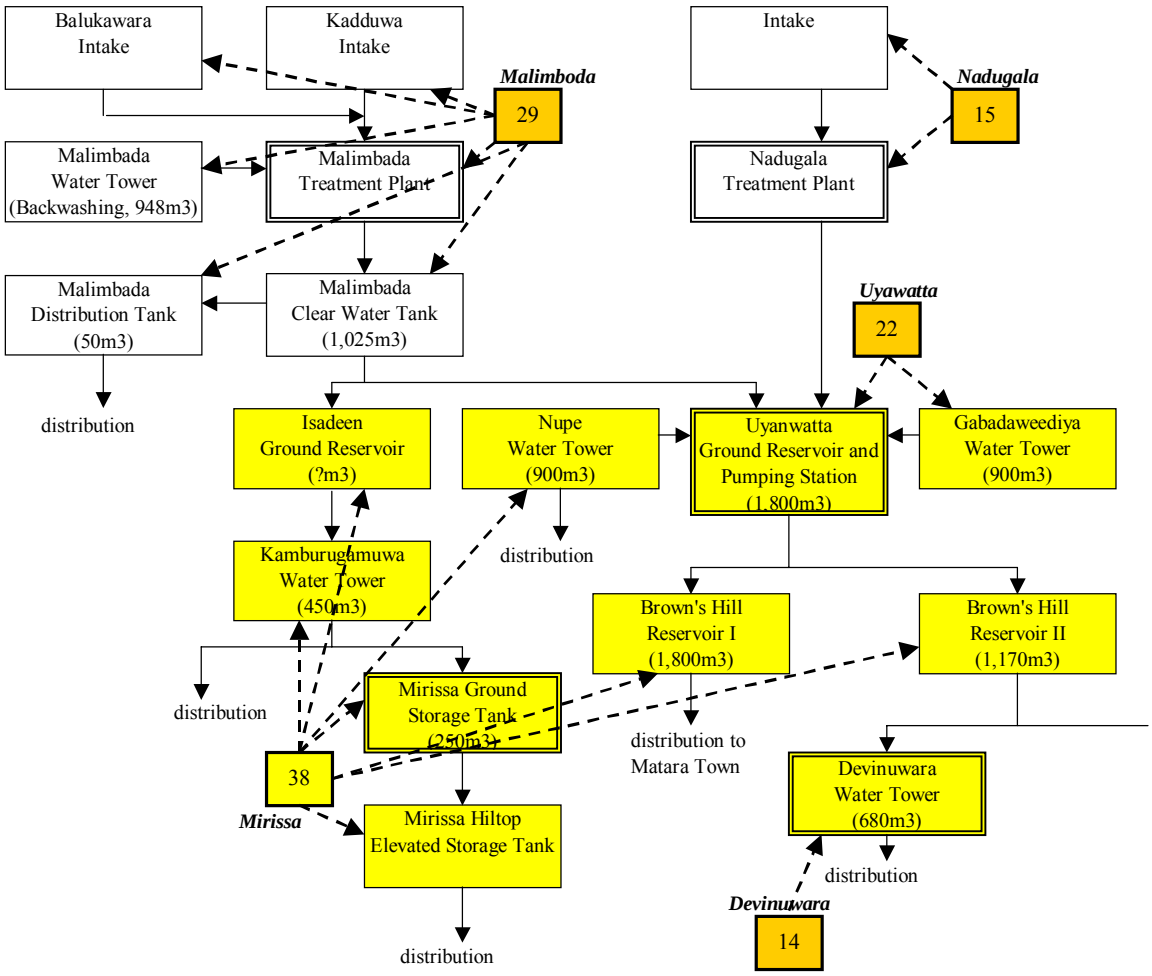
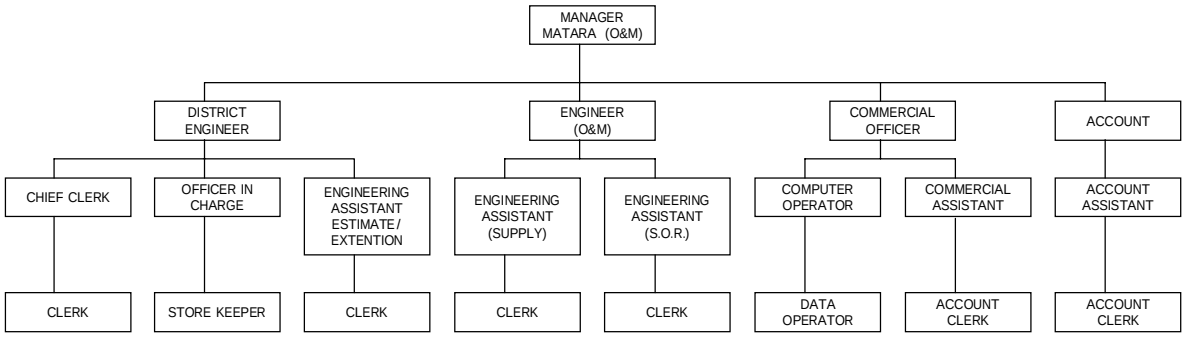


FIGURE 2.10 Operation and Maintenance Network of Matara Water Supply System (Part)

The figures in **FIGURE 2.10** show the staff allocation of the Matara (O&M) and for each of the branch offices. Daily routine maintenance is conducted by someone who is dispatched from the branch office. For example, there is always one person monitoring the intake volume and the condition of pumps in the Kadduwa Intake. This routine work is conducted in shifts of three. By looking at the daily maintenance logs, it is confirmed that they keep records of the intake volume and switching time of the pumps every hour. The annual maintenance schedule is listed on the wall and the daily maintenance work is checked off after completion.



O&M: Operation & Maintenance
S.O.R. System Operation and Repair

FIGURE 2.11 Organizational Chart of Matara (O&M)

This double covering system of Matara (O&M)→Branch Office → Facility, works effectively and maintains high performance in all areas. For example, this system keeps a Non-Revenue Water Ratio of less than 30%. Recently, they improved this NRW ratio to under 29%. From this evidence, It is believed that NWS&DB can keep operating and maintaining efficiently and effectively with the present O&M system.

An increase in three employees, to work the three separate shifts, is necessary for the constant monitoring of new facilities at the Diyagaha Service Reservoir. They will be managed by the chief of Gandara Service Reservoir, due to deep relationship between both reservoirs. Any more personnel is not necessary for the following two reasons:

(1) The double covering management system of the Matara (O&M) → Branch Office → Facility, is quite efficient and effective.
(2) This Project calls for expanding the current capability of the Malimbada WTP and other intake facilities. Additional, future, facilities will be built next to the present ones.
(3) Although the waste water treatment facility is located near the Malimbada WTP, the operation and maintenance work there is not so much and can be managed by the WTP personnel.

It's not necessary to conduct further special training for the strengthening of the present capability as long as the maintenance workers keep their present skill level, by using their present training plan. However, training to enhance morale and to maintain the hardworking mind of the employees is always welcomed.

TABLE 2.12 NECESSITY OF AN INCREASE IN EMPLOYEES

New and increased facilities	The Necessity of an Increase in Staff	Notes
Kadduwa Intake	Not necessary (they can operate 100% with the present staff)	
Malimboda Water Treatment Plant	Not necessary (they can operate 100% with the present staff)	Assume to keep the present level of staff
Dhiyagaha Service Reservoir	Needs 3 more staff for the 3 shifts	Or one staff is stationed.
Gandara Service Reservoir	Not necessary (they can operate 100% with the present staff)	

By the implementation of the Project, there will be the increase in the number of connections through the expansion of a service area and increase in population coverage that will surely lead to the increase in business volume to be dealt. However NWS&DB has been trying to reduce the ratio of the total number of staff to the total connections in thousands as a whole, hence the present man-power will basically cope with such situation.

However, the operation and maintenance cost will be certainly increase in the form of personnel, power, fuel, chemical and repair expenses, as the increase in facility and treatment capacity.

For personnel expense, Kadduwa Intake and Malimbada WTP will be operated with current man-power and three workers will be additionally employed to operate the new service reservoir to be constructed isolated from other existing water supply facilities. The fuel cost is estimated for the use of emergency power generators. The chemical cost is based on the actual consumption at the existing Malimbada WTP per cubic metre treated water. The repair cost is estimated at 0.2% of the equipment cost because most of the equipment in this Project have less maintenance requirements.

The annual expenditure were Rs. 500 million in NWS&DB RSC-Southern/Uva and 140 million in NWS&DB Matara Group in 2001. The incremental expenditure incidental to the increase in a treatment capacity of 15,000 m^3/day shares 6.4% in the former and 23.0% in the latter. For the latter, the value is within the incremental rate of a treatment capacity.

$$15,000 / (33,000 + 2,900 + 15,000) \times 100 = 29.5\%$$

The increase in the number of staff is minimized in this progaram, but there will be a little affect, even though increasing the number of staff at Kadduwa Intake and Malimbada WTP.

TABLE 2.13 Incremental Operation and Maintenance Cost (15,000 m^3/day)

Item	Calculation		O&M Cost (Rs/yr)	Remarks
Personnel	3×16,000Rs/month·capita×12＝576,000			
	Sub-total	576,000	600,000	
Power	・Kadduwa Intake			
	Basic charge：800+240kVA×400Rs/month×12＝96,800			
	Demand charge：4,950khW/day×365×7.1Rs/kwH＝12,827,925			
	・Malimbada WTP			
	Basic charge：800+350kVA×400Rs/month×12＝140,800			
	Demand charge：5,615khW/日×365×7.1Rs/kwH＝14,551,273			
	Sub-total	27,616,798	27,600,000	
Fuel	・Kadduwa Intake			Power Generator
	Diesel：18,500Rs/month×12＝222,000			
	・Malimbada WTP			
	Diesel：25,000Rs/month×12＝300,000			
	Sub-total	522,000	500,000	
Chemicals	・Alum			Actual Value
	15,000m^3/d×10mg/L×1/1000×22Rs/kg×365＝1,204,500			9.24 mg/L
	・Lime			
	15,000m^3/d×5mg/L×1/1000×8Rs/kg×365＝219,000			4.57 mg/L
	・Chlorine			
	15,000m^3/d×2mg/L×1/1000×67.5Rs/kg×365＝739,125			1.80 mg/L
	Sub-total	2,162,625	2,200,000	
Repair	・Mechanical Equip.：Equip. cost×0.5%/yr			
	(65,700＋132,650) ×10^3×0.005×1.25Rs/円×1000＝1,239,688			
	・Electical Equip.：Equip. cost×0.2%/yr			
	(36,000＋50,400) ×10^3×0.002×1.25Rs/円×1000＝216,000			
	Sub-total	1,455,688	1,500,000	
Total			32,400,000	

2.5 Other Relevant Issues

(1) Design Target Year

In the Project the design target year is set in 2009 when water demand will balance water supply. However, there is a possibility that it will be prolonged by the actual increase in design fundamentals used in the water demand projection, how to consider the present treatment capacity, priority of the area for water supply and so on as described below.

The design target year of the Project is set in 2009, but water demand is estimated based on