

Lecture 7

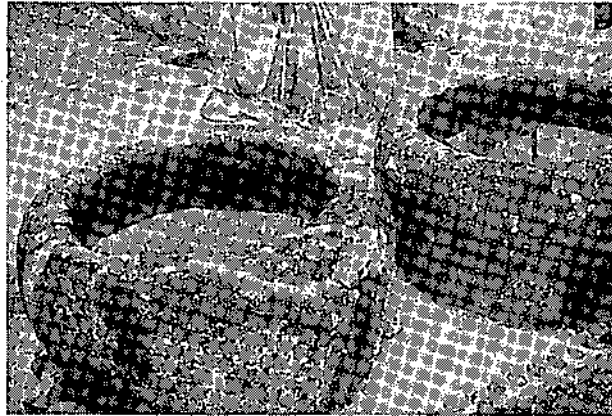
Case of OKINAWA

—Integrated Dam Management and the
Development of Okinawa's Water Resources—

Mr. Tamio SHIMOGAMI

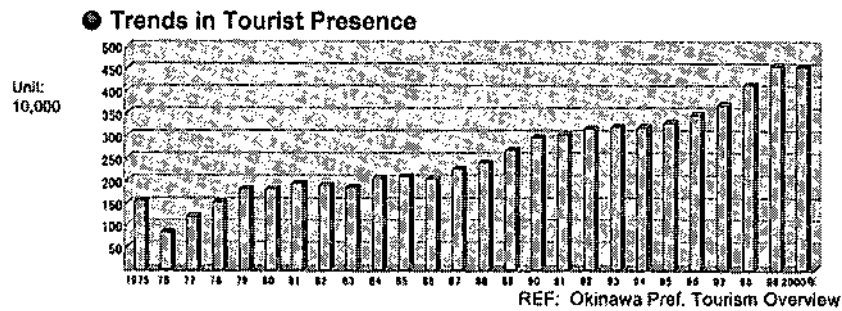
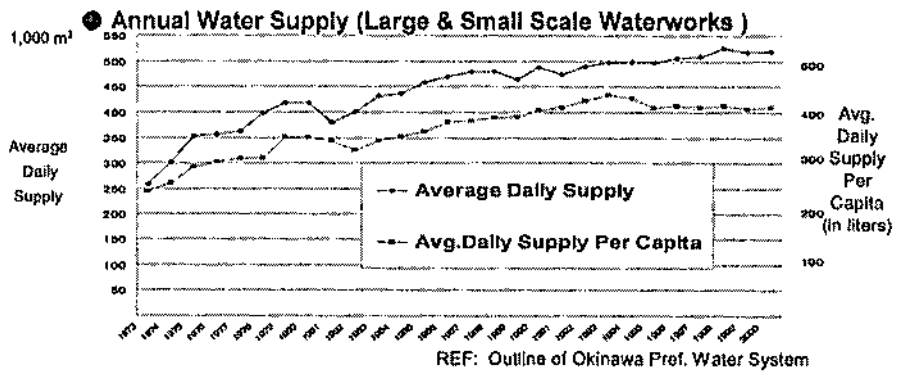
Deputy Director

Okinawa General Bureau



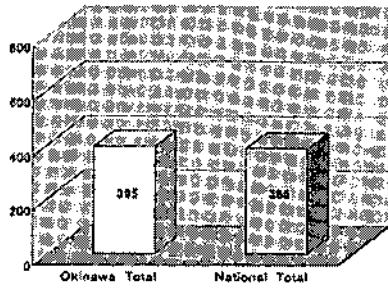
Integrated Dam Management and the Development of Okinawa's Water Resources

Tamio SHIMOGAMI
Deputy Director, Okinawa General Bureau
Cabinet Office, Government of Japan

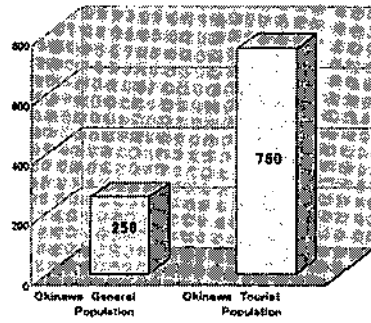


Per Capita Water Consumption

**Okinawa vs.
National Consumption**



**Okinawa General Population
vs. Tourist Consumption**



Approx. liter/per capita/per day

Average Annual Rainfall



Okinawa Island
2,037 mm/year
(Naha Average)

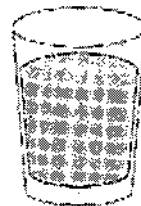


Nationwide
1,714 mm/year

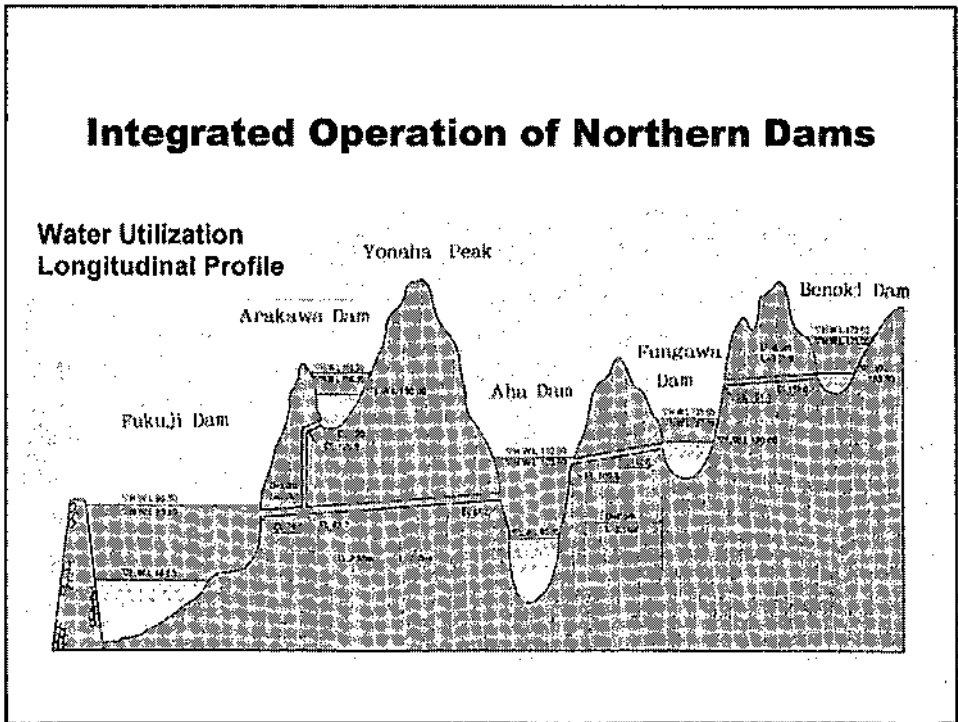
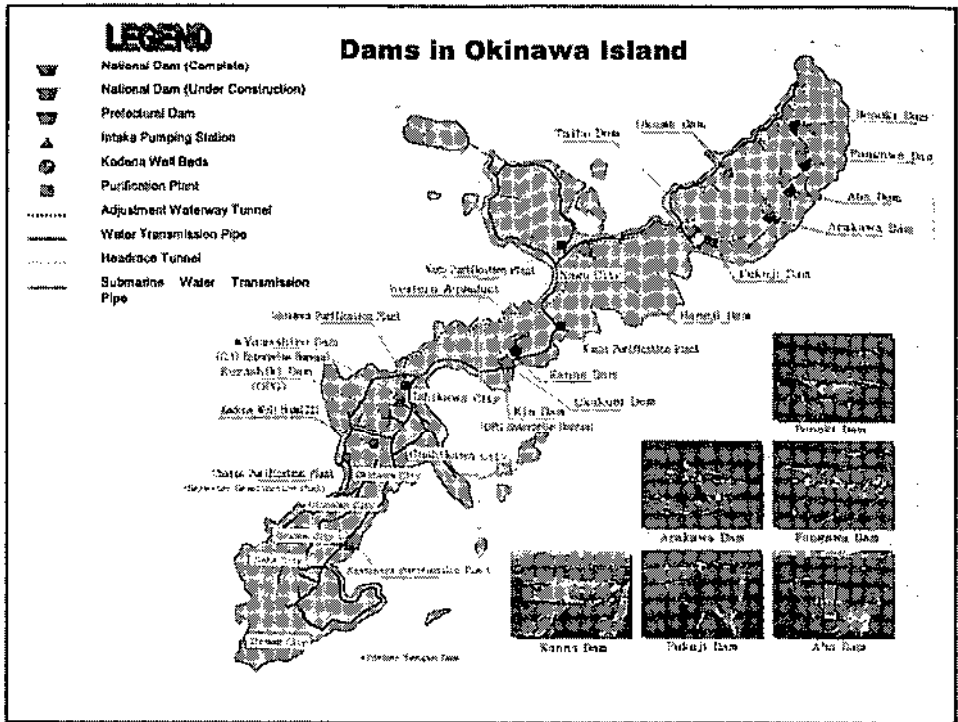
Average Per Capita Rainfall



Okinawa Island
2,880 m³
per capita
per year



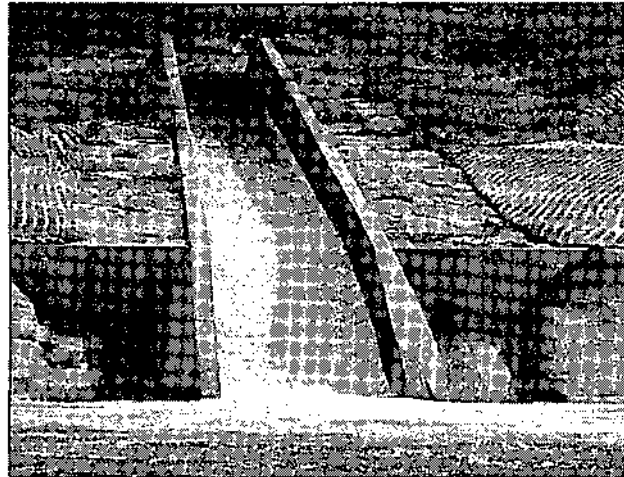
Nationwide
5,150 m³
per capita
per year



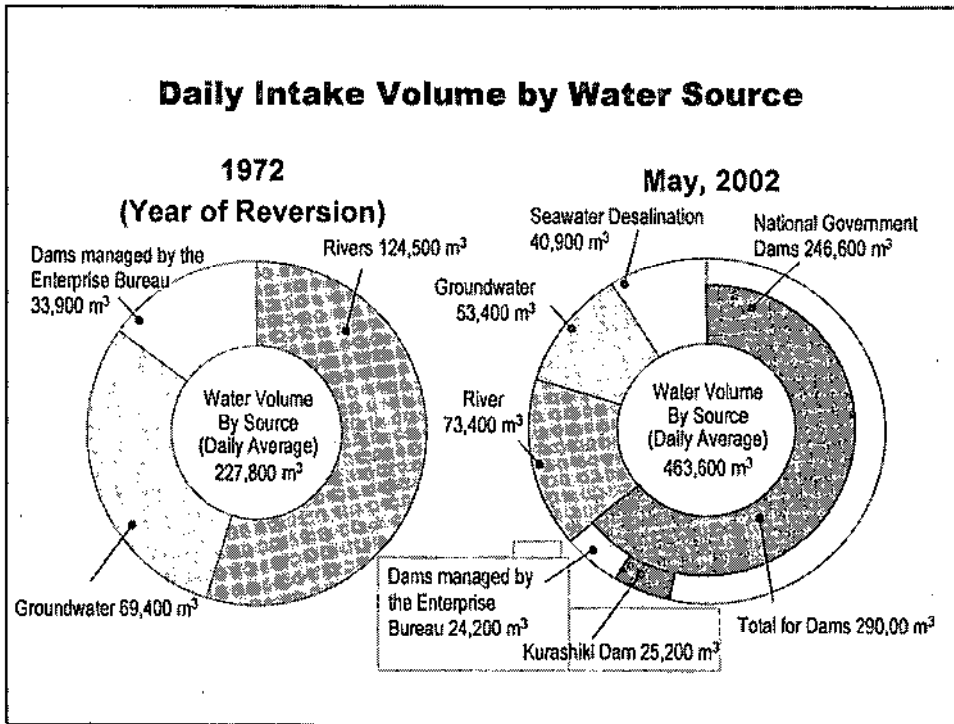
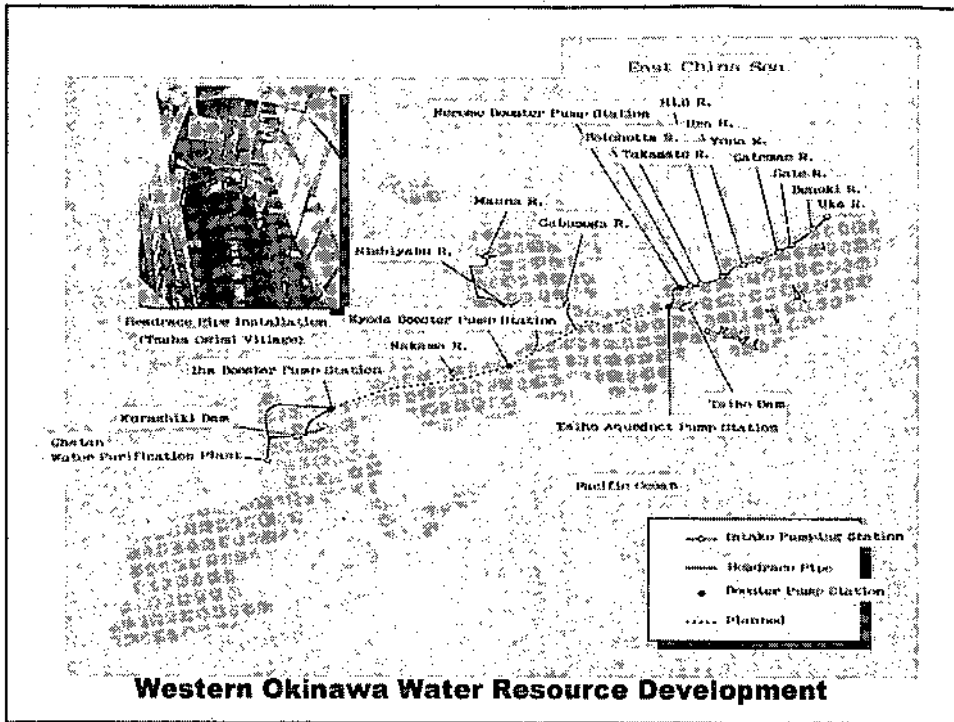
Water Available Through the Northern Dams

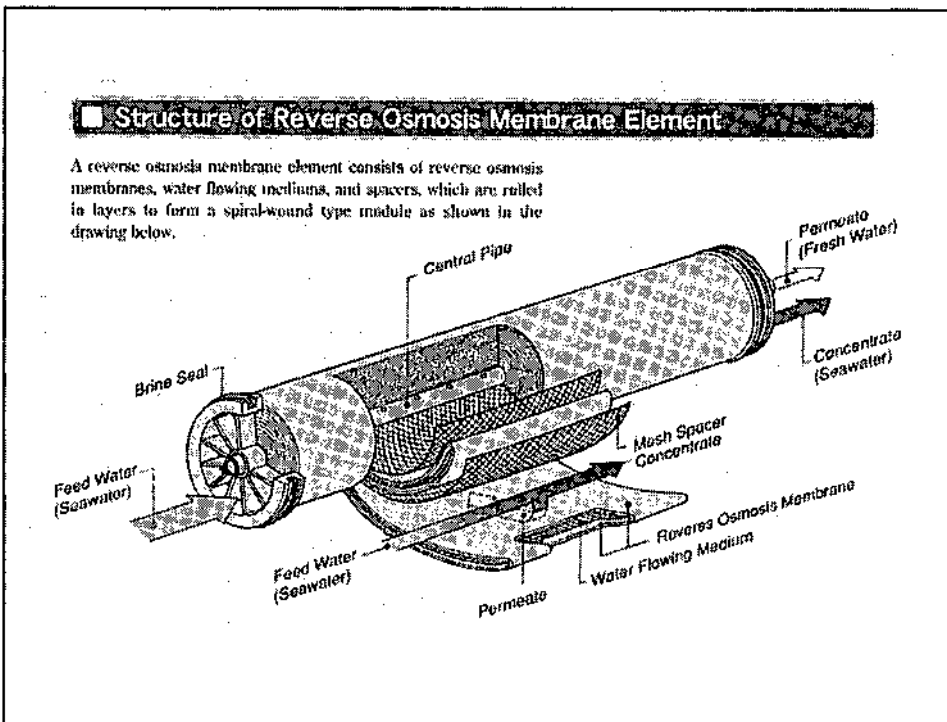
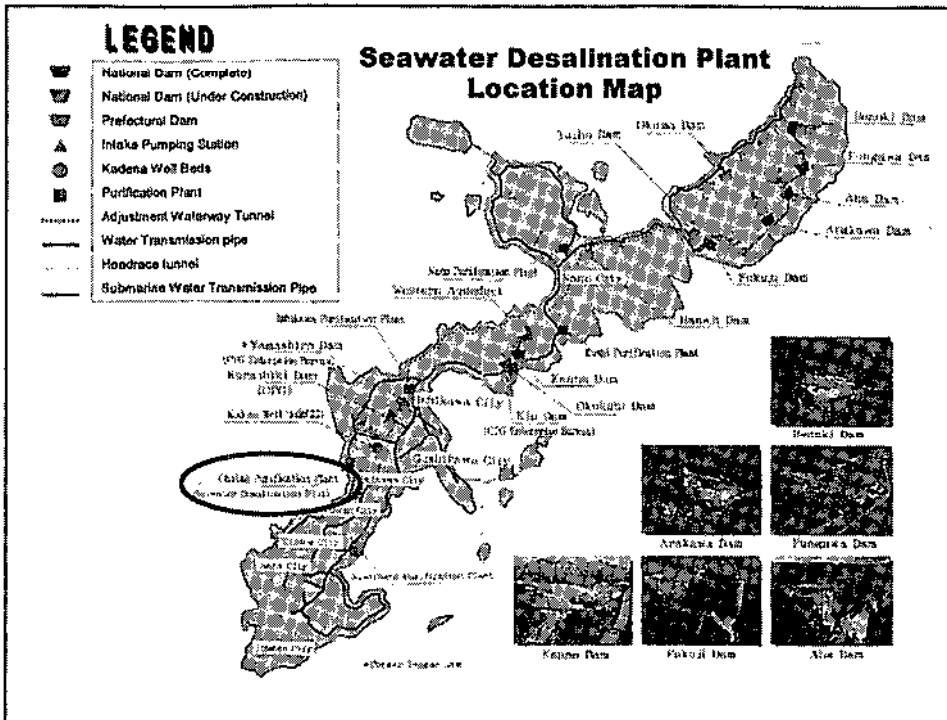
Name of Dam	Urban Water Utilization Volume (thousand m ³)	Urban Use Water Development (m ³ /day)		
		Independent Operations	Combined 5 Dam Operations	Increase from combined Operations
Fukuji Dam (Existing)	37,000	100,000	100,000	259000-216000 =43000
Fukuji Dam (Redeveloped)	5,700	6,000	18,000	
Arakawa Dam	500	5,000	18,000	
Aha Dam	12,400	75,000	75,000	
Fungawa Dam	800	12,000	27,000	
Benoki Dam	1,450	18,000	21,000	
TOTAL	57,850	216,000	259,000	

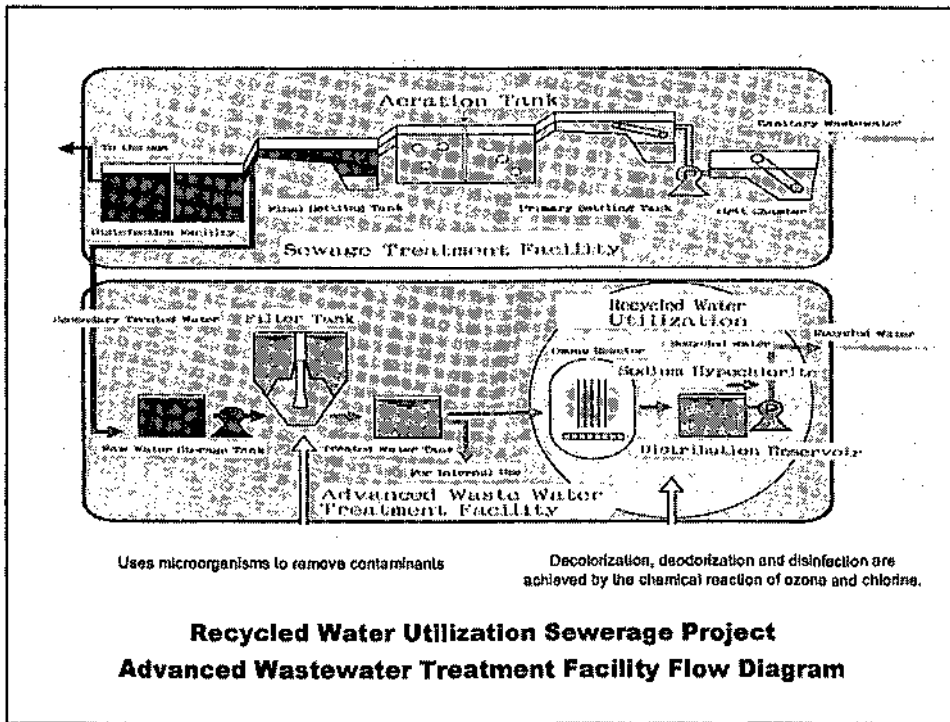
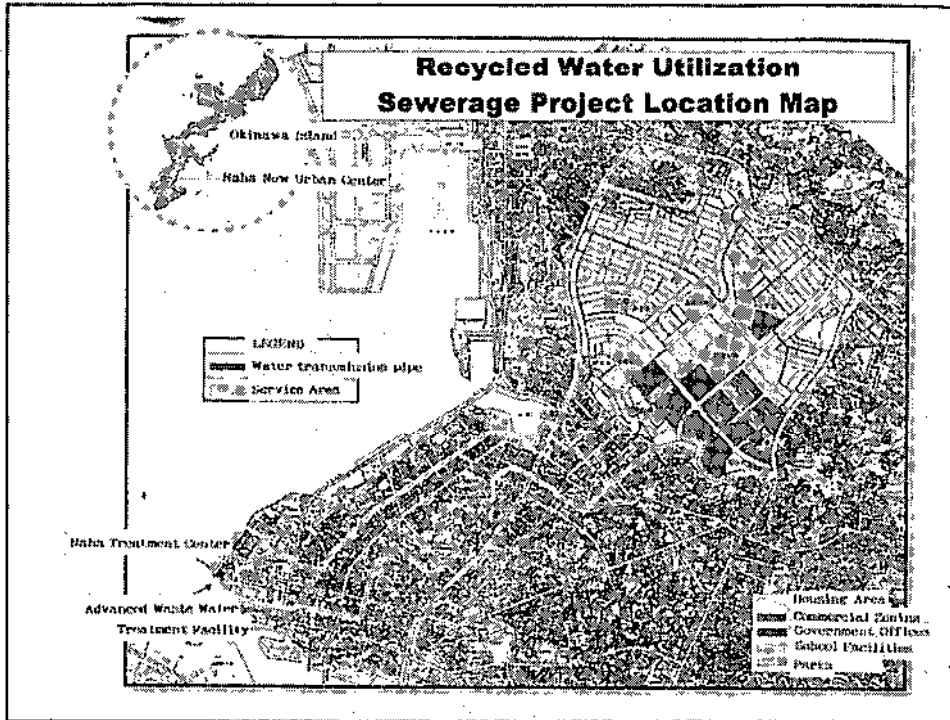
Urban Water Utilization Volume = Drinking Water + Industrial Water



Adjustment Waterway Tunnel







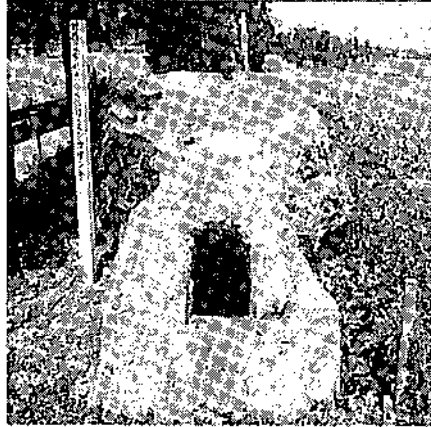
Quality of Recycled Water

After advanced treatment, recycled water meets the following standards and is considered safe to use.

- **PH Value: 5.8 – 8.6**
- **Residual Chlorine: Less than 0.4 mg/liter**
- **Bacteria Count: Non detectable**
- **Odor: Non discernable**
- **Color: Non discernable**



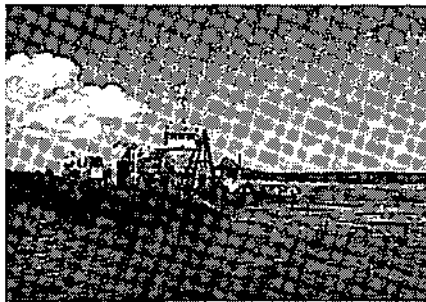
Huge water tanks made of concrete are found in all homes



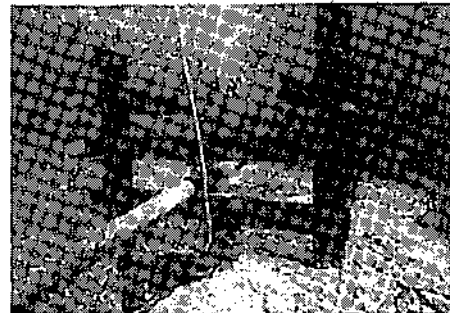
Rainwater is collected and stored as drinking water for farmers (Minkazanto).



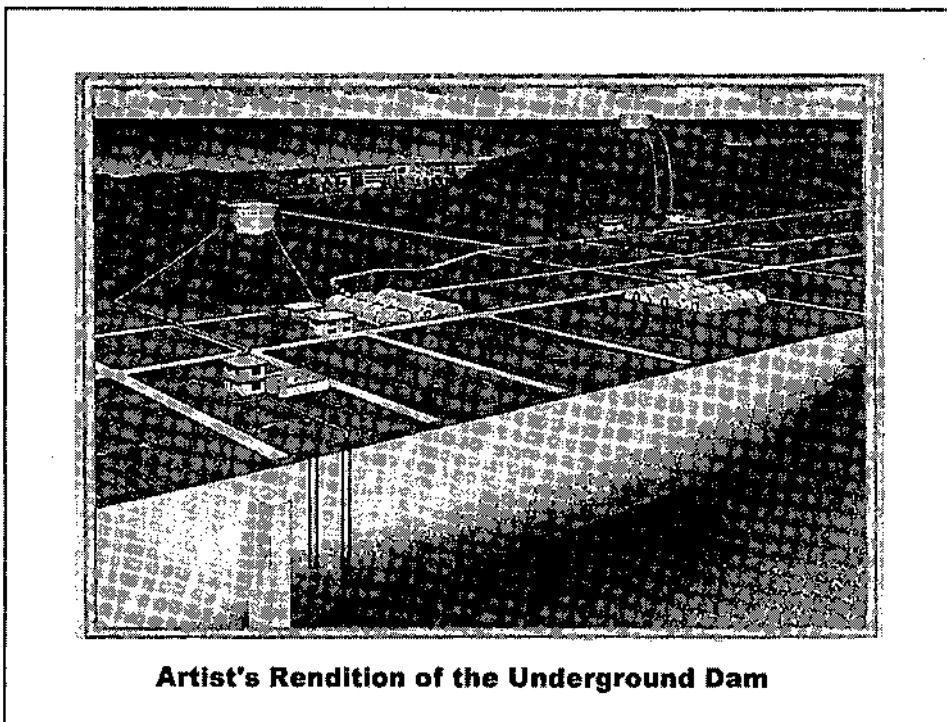
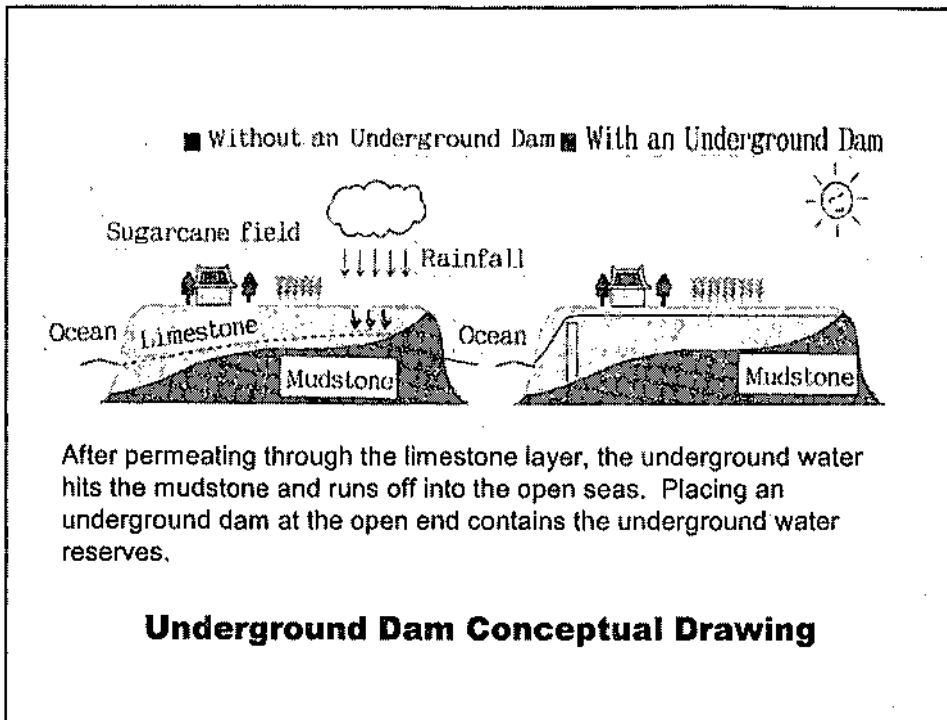
The caved rock is used to collect the rainwater that fell on the tree.



Laying of the Submarine Water Transmission Pipe



Protective Works for the Submarine Water Transmission Pipe



Komesu Underground Dam



Construction Method: In-situ Mixing Method

Dam Height: 69 m

Crest Length: 2320 m

Reservoir Capacity: 3,460,000 m³

Active Storage Capacity: 1,810,000 m³