

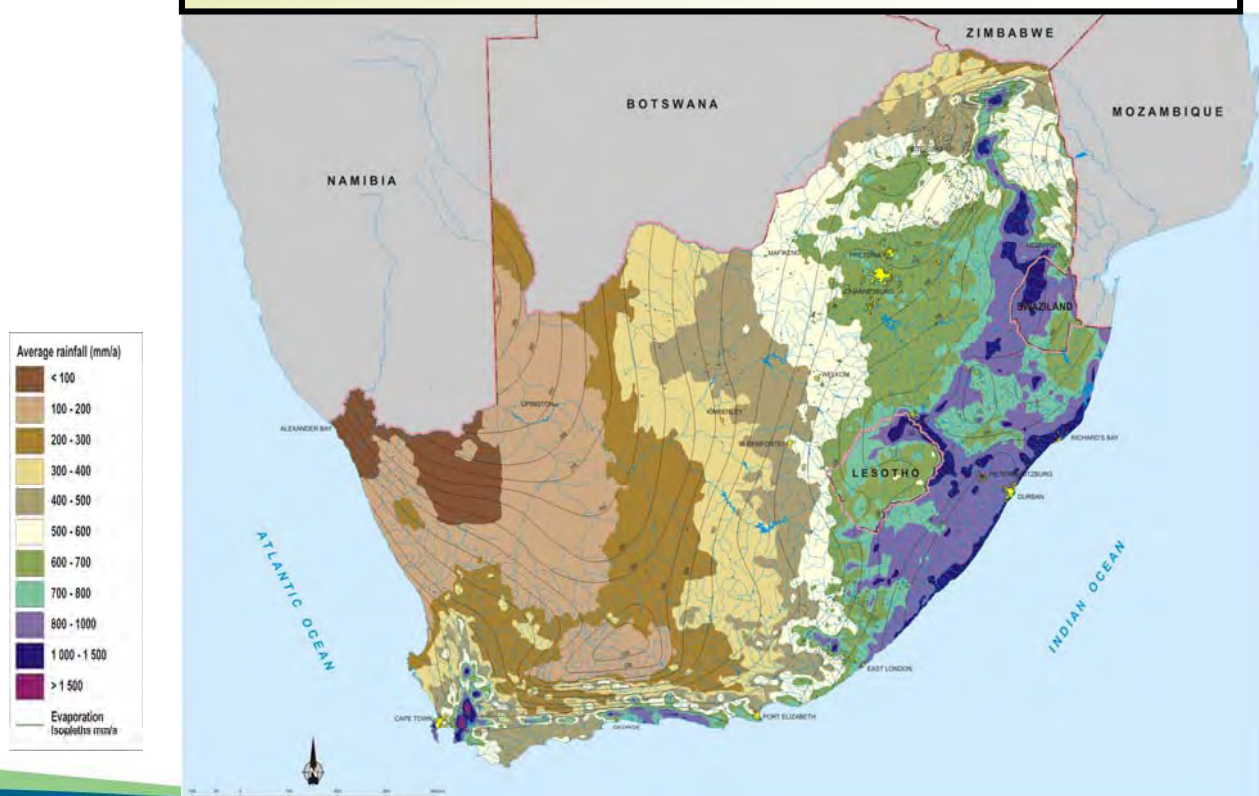
資料 1 0 南アフリカ水インフラセミナー配付資料

Water Infrastructure Development in South Africa

Director General
Mr M Sirenya

16 February 2012
Tokyo, Japan

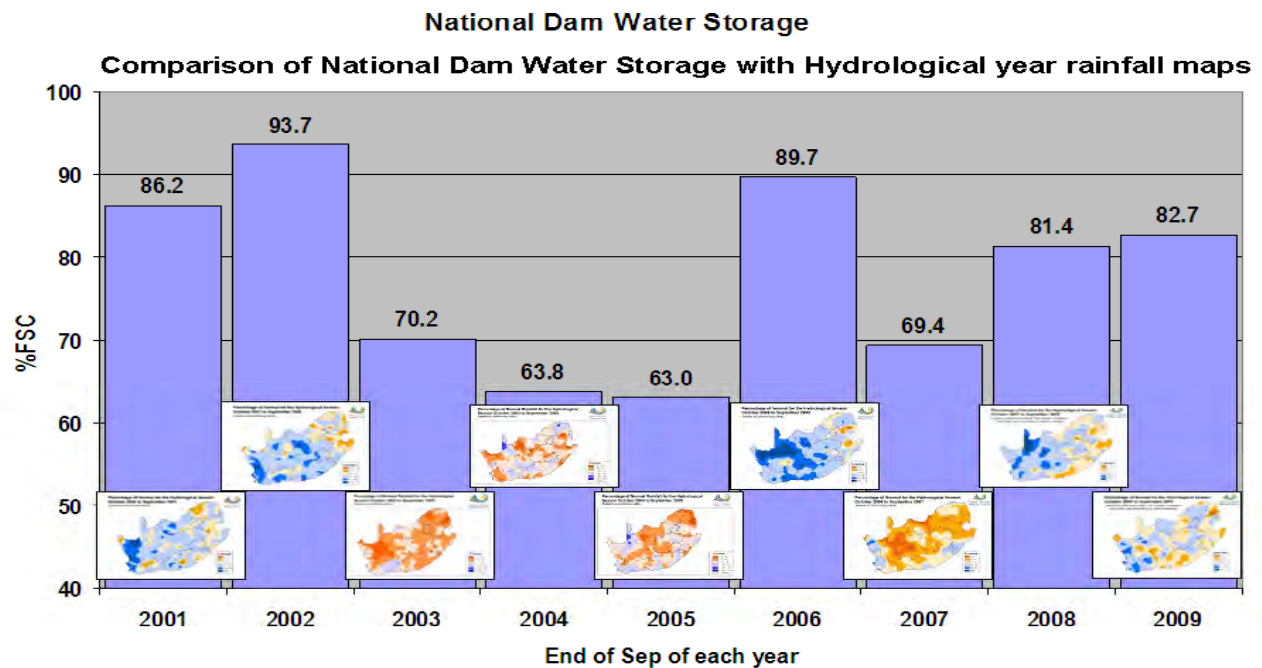
National Rainfall and Evaporation



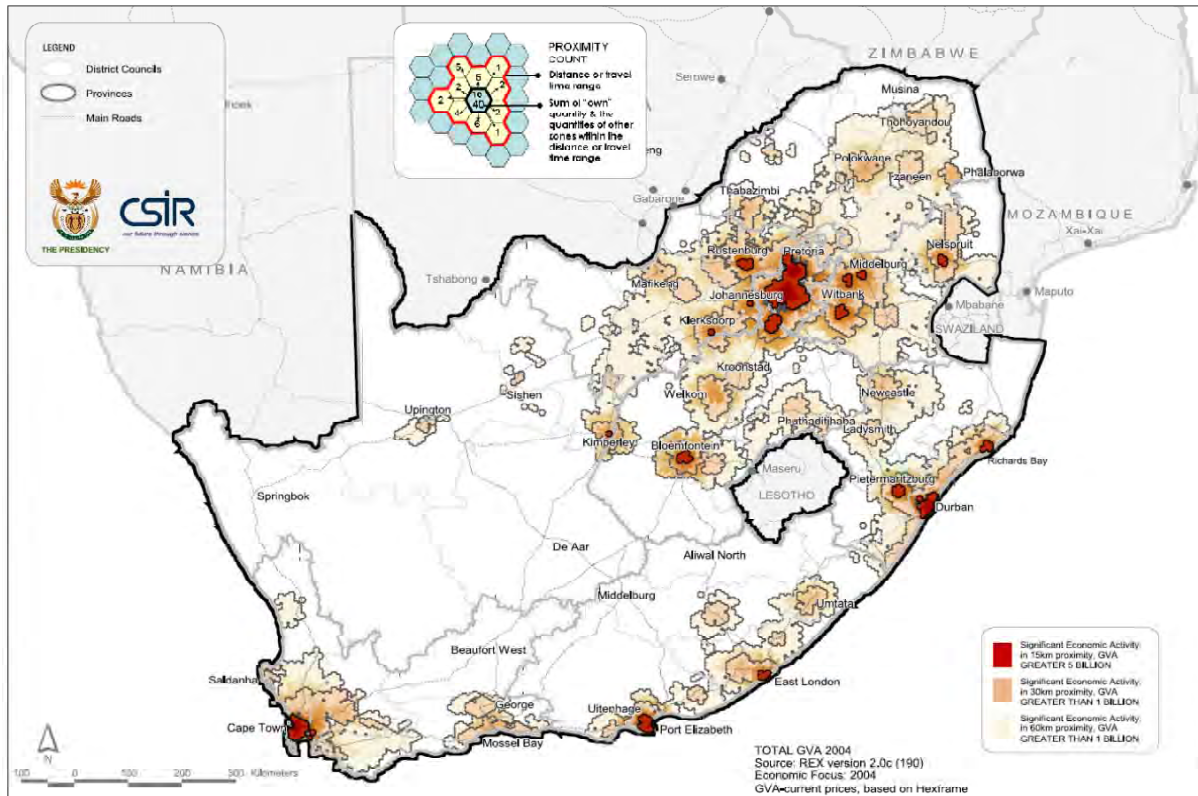
International Rivers shared by South Africa



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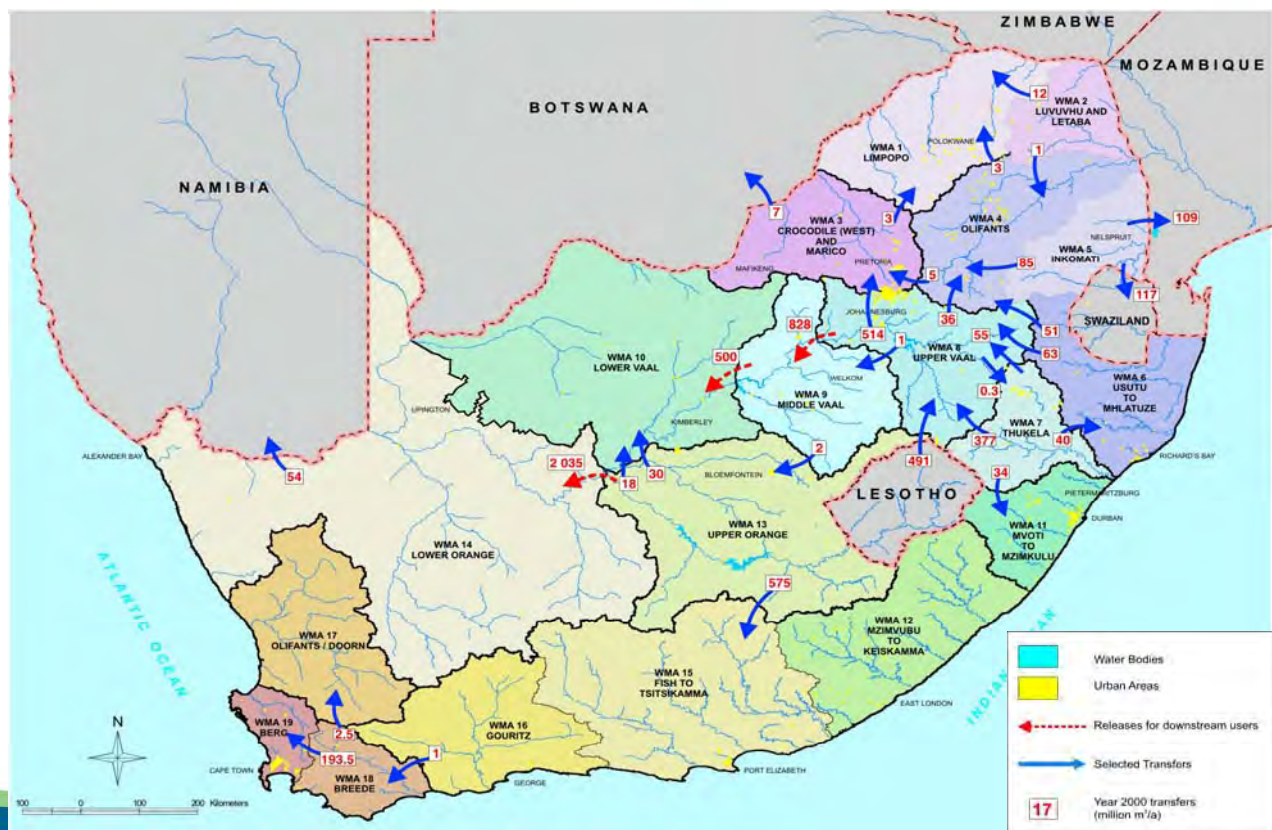


National Spatial Development Perspective, 2006 South Africa. Prepared for the Presidency by the CSIR Built Environment.



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Water Management Areas and Main Water Transfers



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Conclusions from Current Water Resource Planning Work

- Water Conservation & Water Demand Management is extremely important in all areas
- Groundwater important (even for big cities like Cape Town and Nelson Mandela Bay Municipality)
- Huge potential for increase in re-use of effluent, at coast but also in inland in the Vaal River system
- More dams and inter-basin transfers inevitable in certain areas
- Acid mine Drainage
- Desalination of Seawater
- Virtual Water

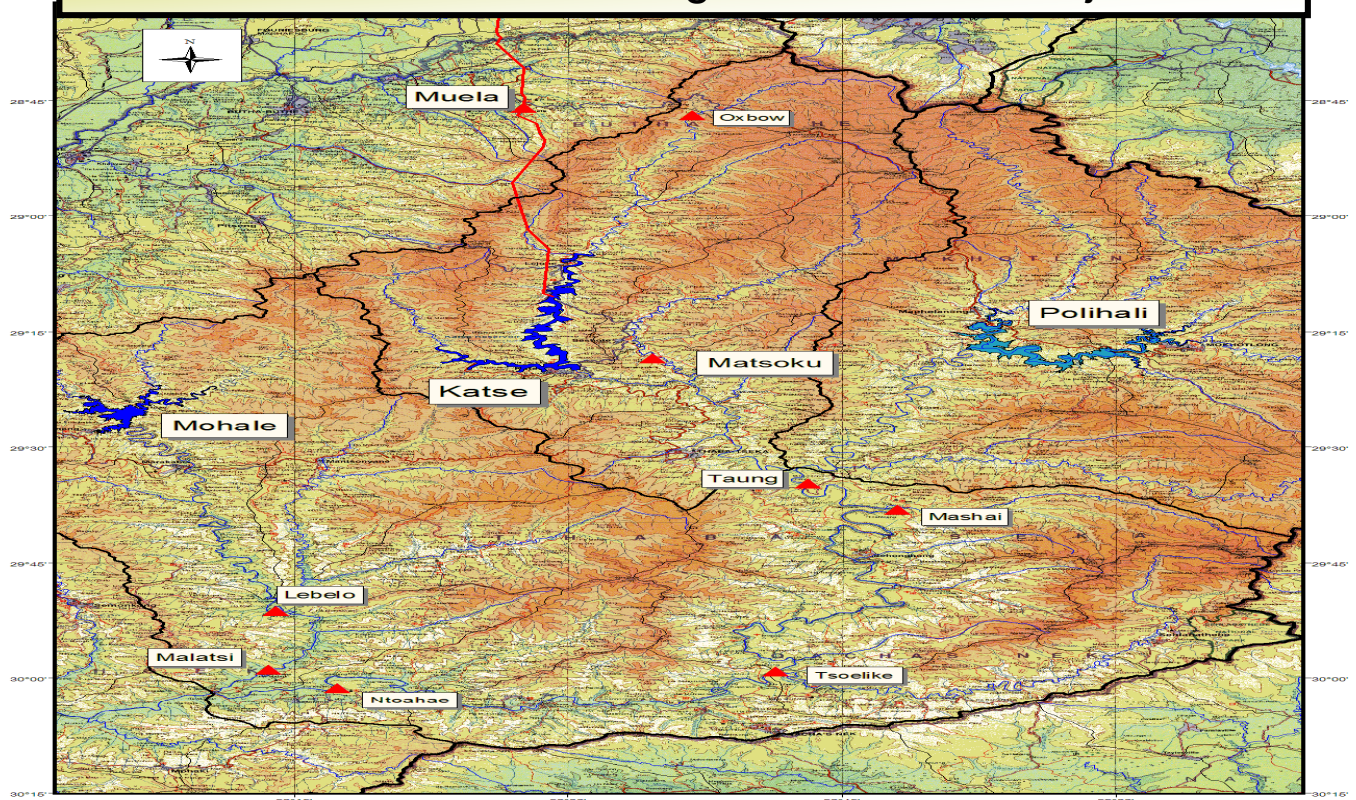
Conclusions from Current Water Resource Planning Work Cont'

- Water is going to be very expensive in future, needs to be taken into account by all
- Implementation is now the great challenge
 - Infrastructure – funding issues
 - WCWDM – spread over many institutions, new methods & technologies needed
 - Re-use of treated effluent – acceptance by public, clear communication strategy needed
 - Compliance and enforcement (curbing unlawful use, efficient water quality management needed)

Current Mega Water Projects under Development

- Olifants River Water Resources Development Project (De Hoop Dam and Associated Works) (Under Construction)
- Phase 2 of Mooi-Mgeni Transfer Scheme (Spring Grove Dam & Associated Works) (Under Construction)
- Mokolo-Crocodile Water Augmentation Project (supply to Waterberg Coalfields in Limpopo Province) (Phase 1: Construction – Phase 2: Feasibility)
- Phase 2 of Lesotho Highlands Water Project (Decision Stage)
- Management of Acid Mine Drainage in the Witwatersrand Area (Gauteng Province) (Emergency Works: Construction – Long -term Solution: Feasibility Stage)

Phase 2 of Lesotho Highlands Water Project



Polihali Dam Site



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Polihali Dam's Contribution to Vaal system

- **LHWP Phase 1: Katse and Mohale Dams Yield**
780 million cubic meters per year
25 cubic meters per second
- **LHWP Phase 2: Polihali Contribution to System Yield**
465 million cubic meters per year
15 cubic meters per second
- **Total LHWP Phase 1 and Phase 2 Yield**
1271 million cubic meters per year
40 cubic meters per second



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Water Services Infrastructure

- Water Services are a Local Government responsibility making municipalities (and water boards) responsible for infrastructure investment, and asset management.
- National Government is assisting development of infrastructure with the Municipal Infrastructure Grant (MIG) and as of recent the Regional Bulk Infrastructure Grant (RBIG).
- The operations and maintenance of these services are generally funded from revenue generated from water services tariffs.

The Role of Department of Water Affairs with Municipal Water Services and Infrastructure

- To Regulate Water Services:
 - This regulation is based upon incentive-based regulation programmes (e.g. Blue Drop Certification for drinking water quality; Green Drop for wastewater services). These regulation programmes promote excellence within all Key Risk Areas identified.
- To develop the sector:
 - Developing of policies and guiding frameworks
 - Facilitate provisioning of specialist support where so required.
 - Manage the Regional Bulk Infrastructure Grant (RBIG)



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Arigatoo

Hitachi's Water Environment Solutions

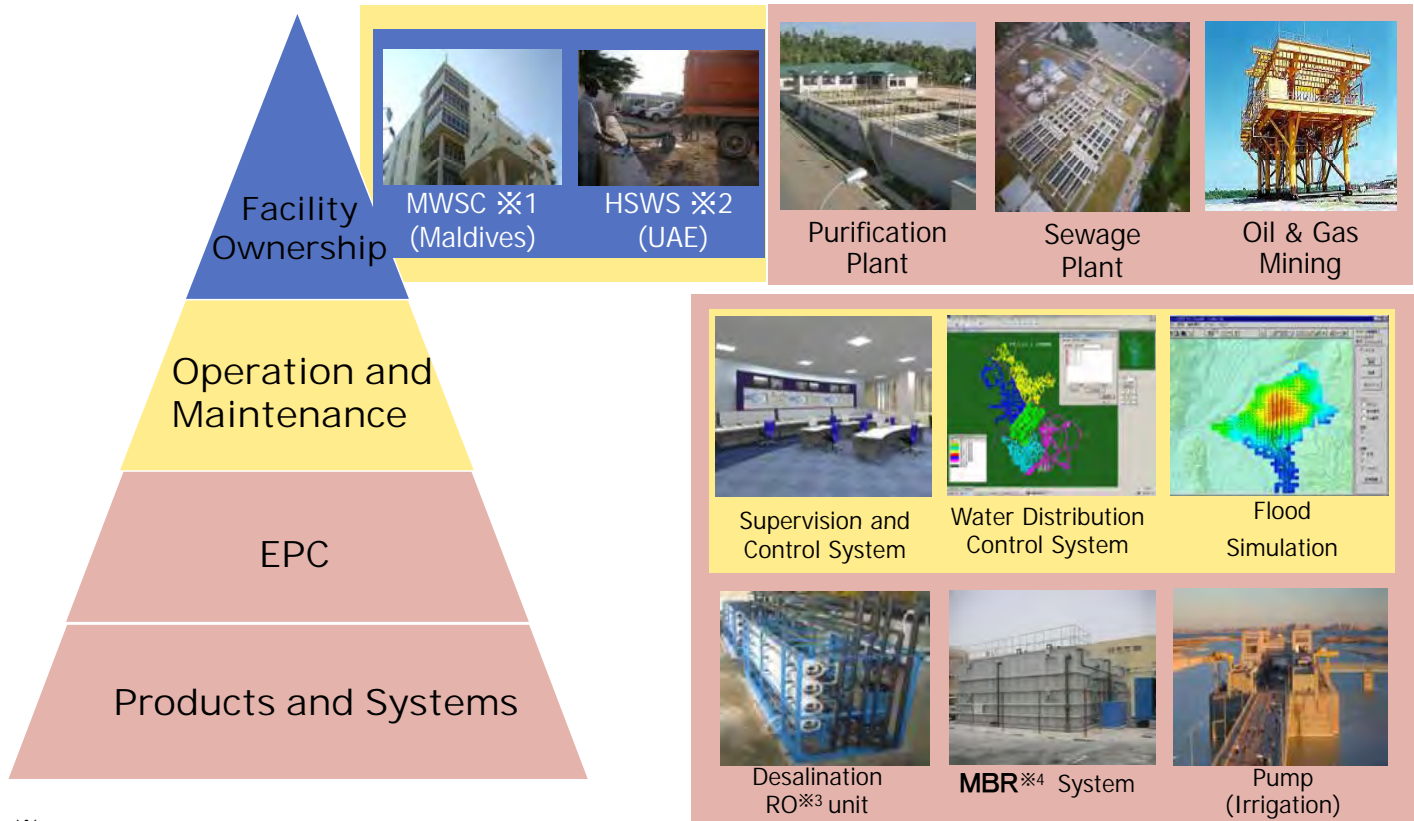
Hitachi, Ltd.
Hitachi Plant Technologies, Ltd.

Contents

1. Outline of Water Business of Hitachi
2. Solution for Water Treatment Systems
3. Solution for Information & Control Systems

1.1. Water Business of Hitachi

From Equipment and EPC to Business Operation



※1. Male Water and Sewage Company Pvt. Ltd.

※2. Hi Star Water Solutions LLC ※3. RO: Reverse Osmosis

※4. MBR: Membrane Bio-Reactor © Hitachi, Ltd. 2012. All rights reserved.

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1.2. Technology Portfolio

Advanced Water Treatment Systems

- Water Purification systems
- Sewage Treatment systems
- Seawater Desalination systems (RO)
- Membrane Bio-Reactor (MBR)
- Industrial wastewater treatment systems
- Pumps

Information & Control Systems

- Supervision and Control system
- Water Distribution Control system
- Pipe Routing Data Management system

Energy Saving Systems

- High Voltage Inverter
- Cogeneration system
- Solar Energy Generation

1.3. Hitachi's Water Business Record

Record in Japan

Water purification Plant : More than 700

Sewage Treatment Plant : More than 600

Factory : More than 500

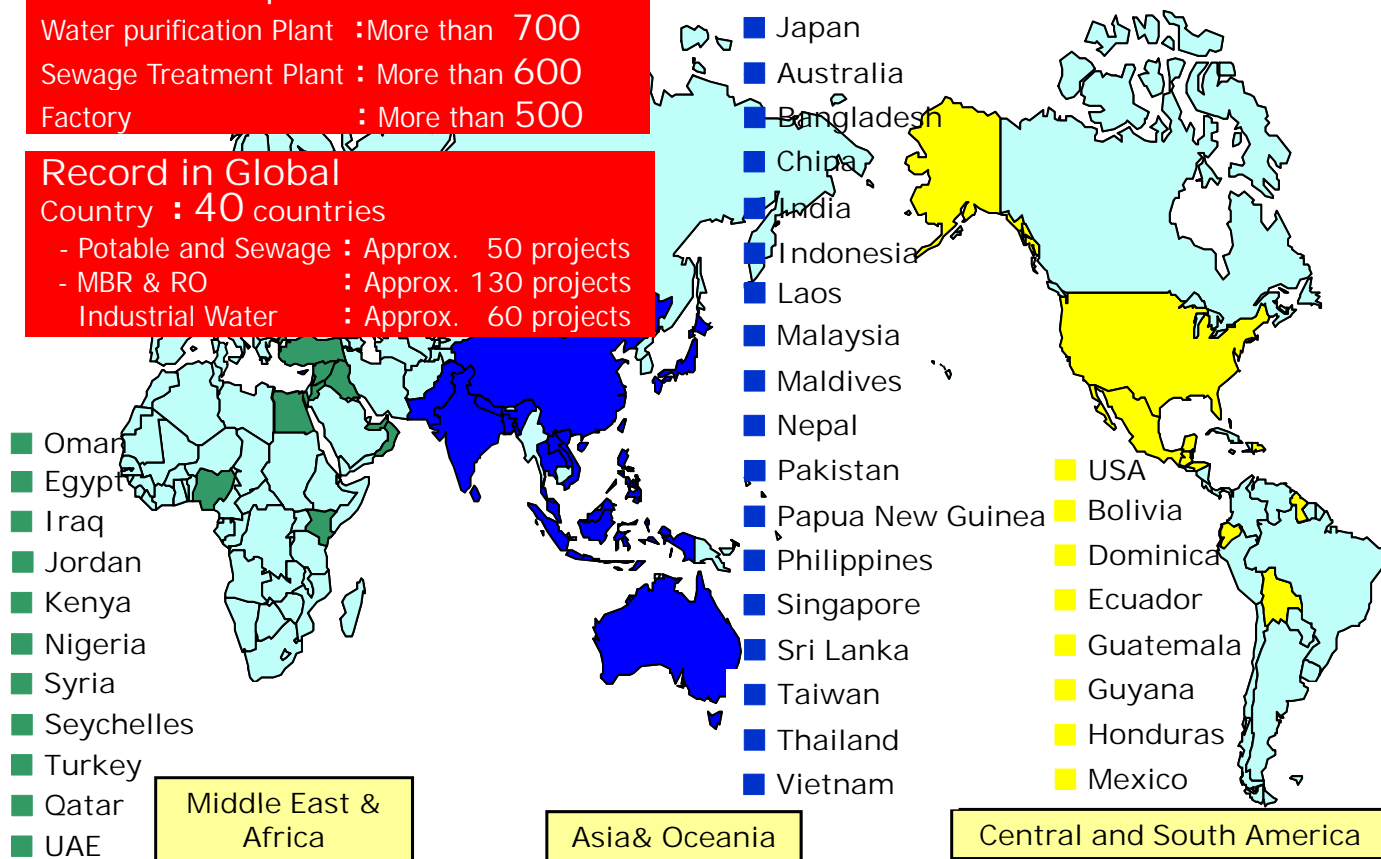
Record in Global

Country : 40 countries

- Potable and Sewage : Approx. 50 projects

- MBR & RO : Approx. 130 projects

Industrial Water : Approx. 60 projects



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2. Solutions for Water Treatment Systems

Hitachi Water Environment Solutions

for effective utilization of water resources and for CAPEX and OPEX reduction

Problems

Water resources security

Water environmental conservation

Revenue ratio improvement, Energy reduction

Equipment maintenance management

Customer service improvement

Solutions

Water treatment systems

✓ Water treatment system for supplying clean water

✓ Advanced water treatment for pollution load reduction

✓ Wastewater recycling system for water resource reutilization

✓ Seawater desalination system for water shortage

Information & Control systems

✓ Water management system and water distribution control system for efficient water use

✓ Asset management system promoting business efficiency

✓ Integration of control systems and business systems for operational efficiency improvement

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2.1. Record of Water Purification

i) Renovation work



Balara water plant
Capacity: 1,600,000m³/day
(1997, Philippines)



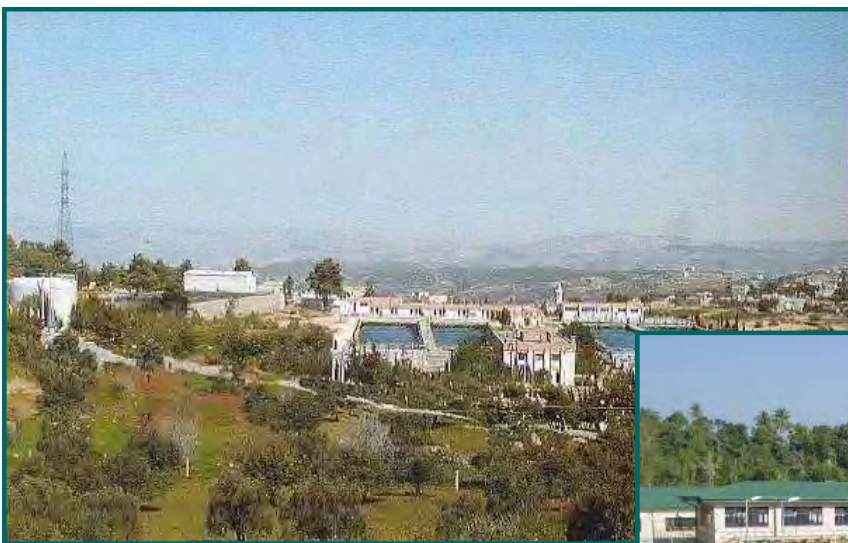
Amirya water plant
Capacity: 430,000m³/day
(1998, Egypt)

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2.1. Record of Water Purification

ii) Expansion & upgrading work



Zay water plant
Capacity: 125,000m³/day
(2002, Jordan)



Kandy water plant
Capacity: 36,600m³/day
(2006, Sri Lanka)

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2.2. Record of Water Pumps

Egypt Mubarak Pumping Station

Year: 2004
Type: Single Suction Volute Pumps
Sets: 21
Capacity: 16.7 m³/s (per pump)
Head: 57m (per pump)



USA/CA, Edmonston Pumping Plant

Year: 2007
Type: Vertical, Multi-stage Centrifugal Volute Pumps
Sets: 4
Capacity: 9 m³/s (per pump)
Head: 600m (per pump)

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2.3. Record of Sewerage Treatment

Malaysia Waste water project



Capacity increases in 4 times



Population Served: 352,000
Capacity: 87,000 m³/day
Treatment system
: standard-activated sludge process

Population Served: About 85,000
Capacity: About 19,000 m³/day
Treatment system: Oxidation pond



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2.4. Record of Wastewater Recycling System

Burj Khalifa Water Recycle System (3,000m³/day)



Application

- Spray Pond (Max height: 150m)
- For cooling tower

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2.5. Record of Solar RO System

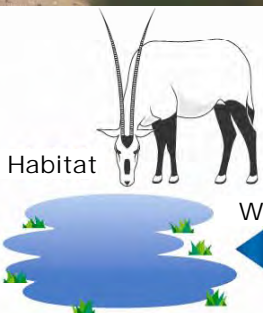
Hitachi Solar RO System contributes preservation of endangered species 'Arabian Oryx' in Abu Dhabi, UAE.



Hitachi RO Unit

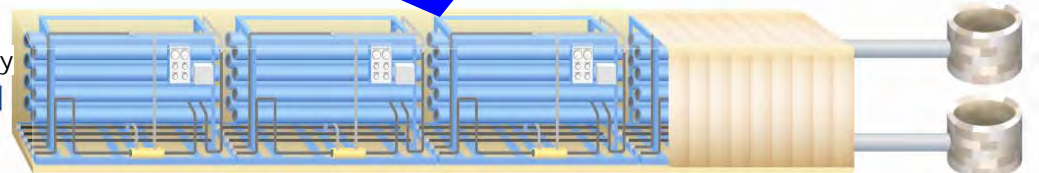


Well



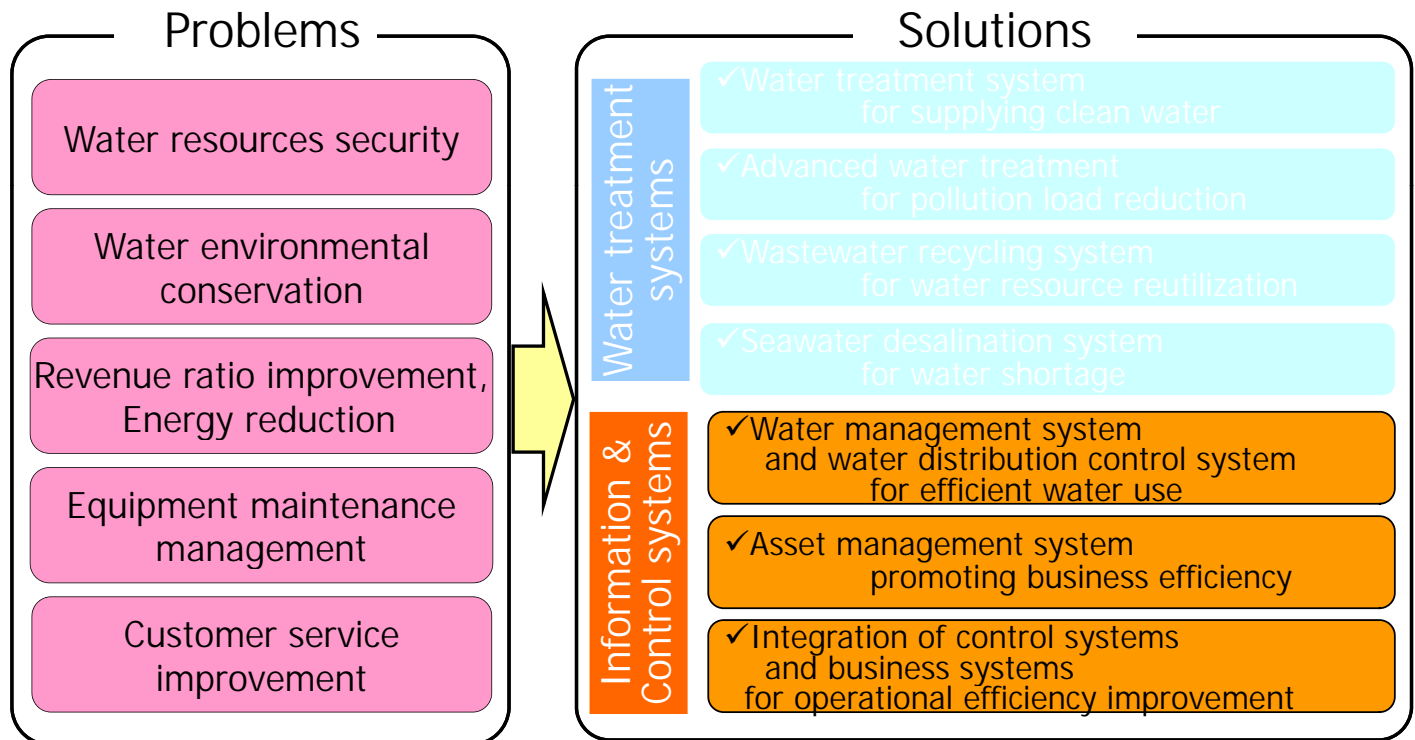
Habitat

Waterway



Hitachi Water Environment Solutions

for effective utilization of water resources and for CAPEX and OPEX reduction



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3.1. Record of Water Distribution Control System

Model Project Report (on going in China)

- Profile (expected in future)
 - maximum supply amount : 30,000m³/day
 - supplied Population : 150,000
- Benefits of introducing (expected from simulation)
 - energy saving by optimizing pipe network planning : **21%**
 - energy saving by introducing the water distribution control system : **15%**
 - Total 36% Energy Saving (510,000kwh/year Power Saving)**



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3.2. Water Business in Maldives

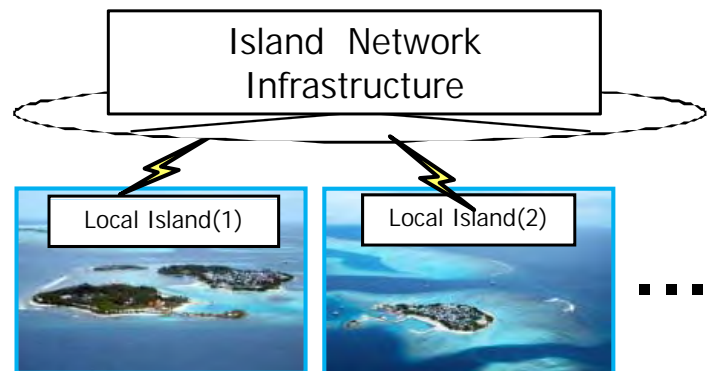
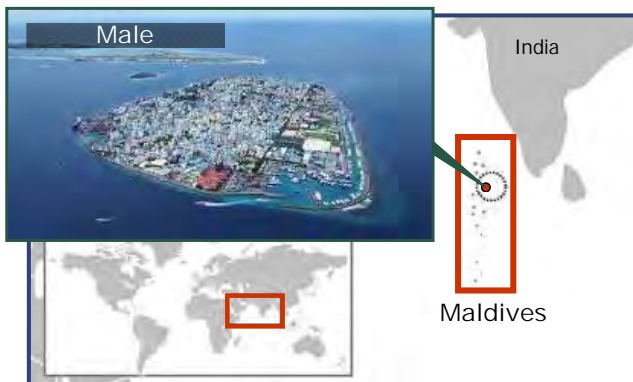
HITACHI is operating Maldives's water supply and wastewater treatment.



Hitachi Plant Technologies purchased a 20% share in the Maldivian company, "*Male' Water and Sewerage Company Pvt. Ltd. (MWSC)*". MWSC supplies clean water to approximately 40% of the total population of the Maldives.

Improve management efficiency of MWSC by utilizing Hitachi solution

- ✓ Geographic Information System (GIS)
- ✓ Island Network SCADA



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For the Future of Our Lives,
We Think About a Future of Water.

HITACHI
Inspire the Next