

# Advanced Technologies for Upgrading Dams under Operation

Many dams under operation have been upgraded with advanced technologies, which enable to reduce COSTs, CONSTRUCTION PERIODs and ENVIRONMENTAL IMPACTs.



## **Tsuruda Dam**

operated since 1966

upgraded since 2006



Water and Disaster Management Bureau  
Ministry of Land, Infrastructure, Transport and Tourism, Japan



# Points of Upgrading Dams in Japan

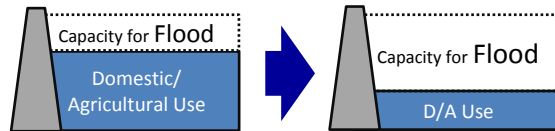
Comprehensive water management realize following activities

## Planning

Unity of command for water resources and against floods  
Agile and concentrative investment by national expense on large disaster risk management projects.

## Coordinating

Change from a part of volume for water resources to for flood control.



## Constructing

### River projects

- River improvement
- River burdening
- Flood control channel

### Dam projects

- Building dams
- Upgrading dams (flood control, hydroelectric power etc)

## Accumulating

Accumulating knowledge into National Institute for Land and Infrastructure Management and Public Works Research Institute

## Key technologies of upgrading dams

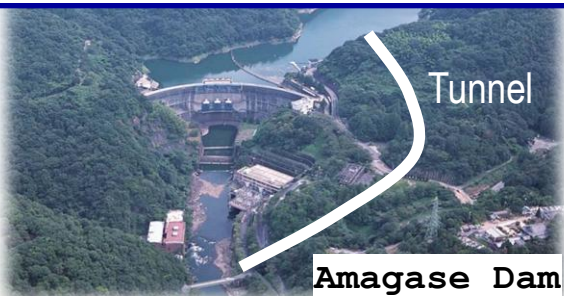
### Marine Technologies



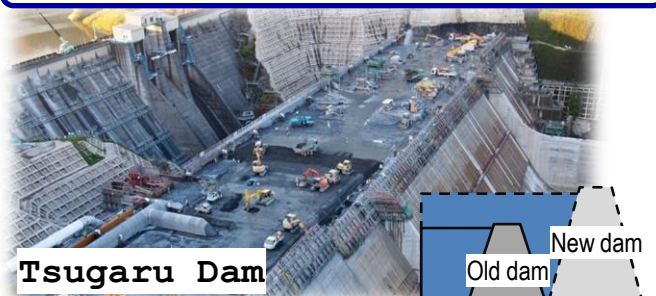
### Drilling Technologies



### Tunnel Technologies



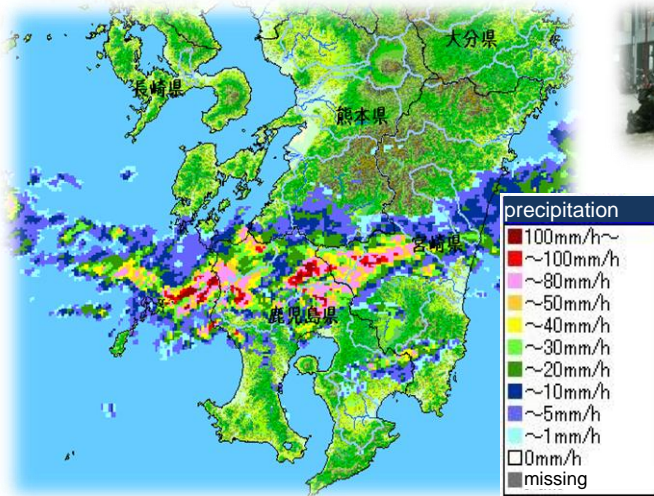
### Increasing capacities (flood control, hydroelectric power etc)



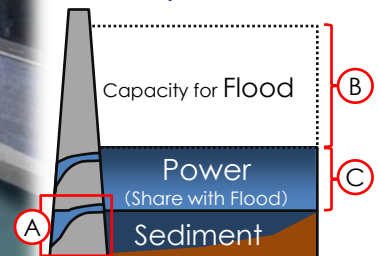
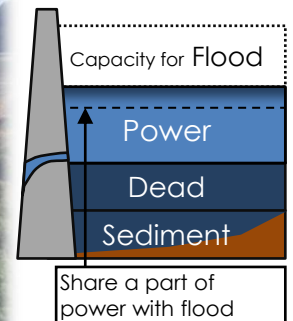
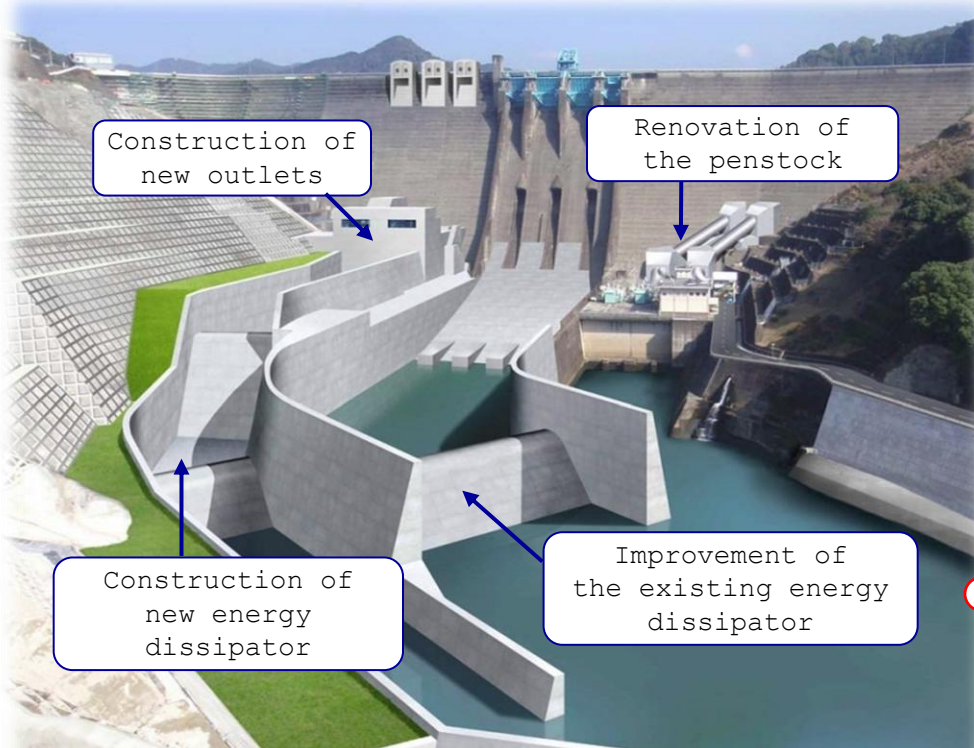
We also have skills to reduce water environment impacts and manage sediment.

# Upgrading Tsuruda Dam

A large flood happened in Sendai river(Kyushu) in July, 2006.  
About 2,777ha area was flooded and 2,347houses were damaged.



Comprehensive flood control measures were performed within half a year. River improvement projects started within 3 month. Upgrading Tsuruda Dam applied within 5 month.



(A) Adding new outlets

(B) Increasing flood volume  
(Buying power volume)

(C) Share power with flood  
(Coordinating with water users)

Upgrading under operation  
(Exploiting diver skills for marine technology)

# Upgrading dams under operation (National Projects)

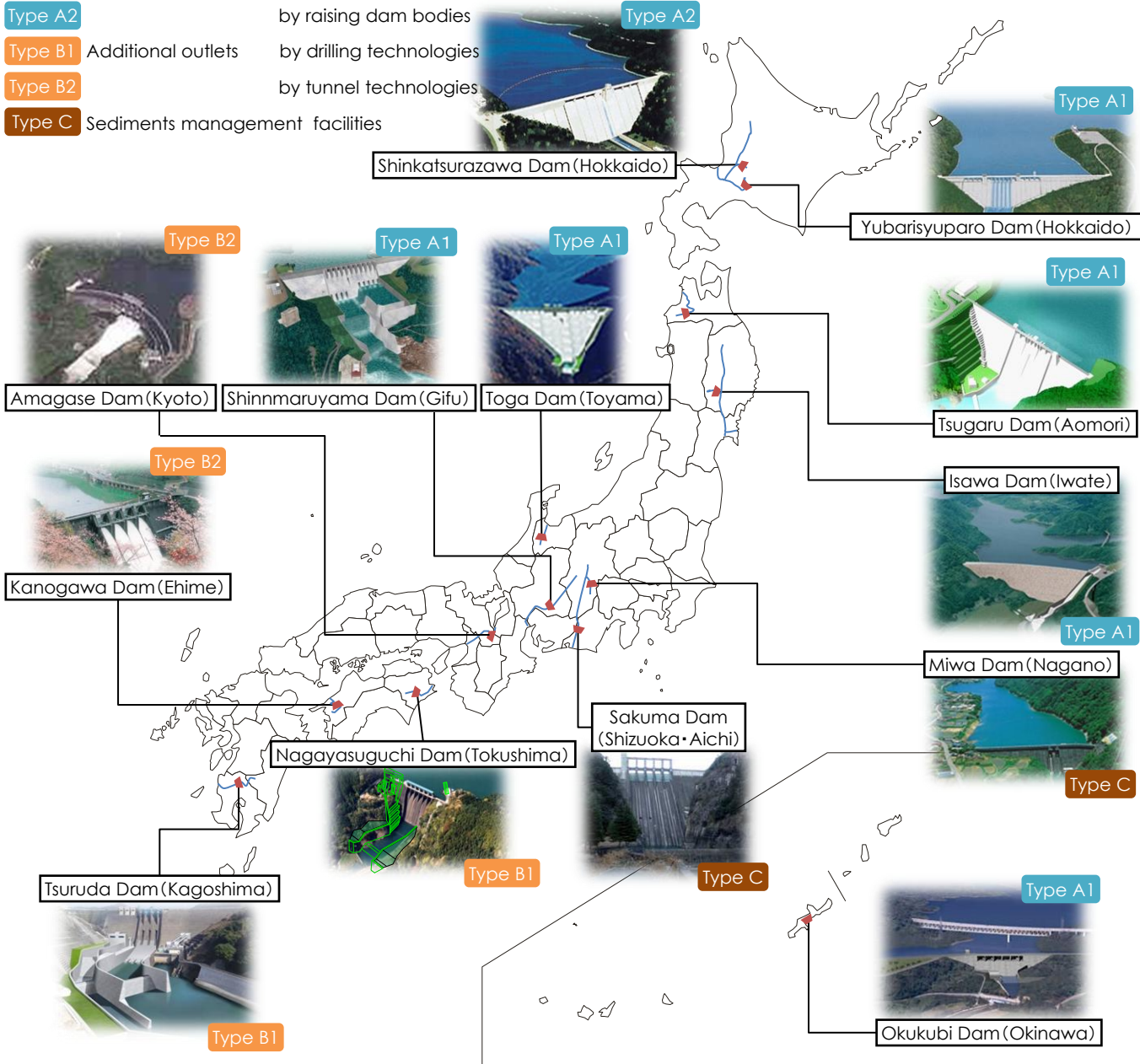
**Type A1** Increasing capacities by constructing new dam body

**Type A2** by raising dam bodies

**Type B1** Additional outlets by drilling technologies

**Type B2** by tunnel technologies

**Type C** Sediments management facilities



## (Contact Information)

Tomoo INOUE, Director for Water Management Coordination

Yoichiro IBI, Assistant Manager

River Planning Division,

Water and Disaster Management Bureau,

Ministry of Land, Infrastructure, Transport and Tourism, JAPAN

tel: +81-3-5253-8444 fax:+81-3-5253-1602