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# Environmental assessment & monitoring

## Tomura, Japan

Ecological investigations 20 years following the completion of Japan's Tomura Power Station Development indicate that no decline of downstream riverine ecosystems has occurred.

### Overview

By the early 1970s, the capacity of Hokkaido Electric Power Company to generate electricity for eastern Hokkaido, Japan, had been exceeded by demand and additional electricity was sourced from western Hokkaido. In this climate, the construction of a power scheme on the Tokachi River, in the Mt. Daisetsuzan National Park was considered.

The Tomura Hydroelectric Power Plant is a dam-and-conduit type facility with a headrace and a total tailrace length of 1,203m, a total branch conduit length of 5,690m and a total trunk conduit length of 8,570m. Construction of the scheme commenced in October 1975, with the 40MW power plant operational by August 1978.

### Dam name

#### Scheme operator

Hokkaido Electric Power Co. Inc.

#### Size of scheme (MW)

40

#### Country

Japan

#### Catchment area

#### River

Tokachi and Tomuraushi

#### Effective reservoir capacity

#### Construction years

1975-78

#### Reservoir size

## External recognition

Nil

## Details

The Tomura project initially received mixed acceptance from stakeholders, being the first such development approved within a Japanese national park. As a result, the project underwent comprehensive ecological assessments prior to approvals, and a number of mitigation measures were implemented during the construction and operational phases of the project. Significant ongoing ecological monitoring is a feature of the project.

The ecological investigations performed during the planning phases of the Tomura Hydropower Project provided a baseline against which the effectiveness of environmental mitigation strategies could be assessed. Investigators believed that some impact of altered flow regimes on the aquatic biota was inevitable, but the overall stability of the river ecosystems would be maintained if predetermined minimum flow rates were maintained.

The major environmental challenges were deemed to be:

- Altered flow regimes in the downstream environment;
- Terrestrial habitat losses due to inundation of land;
- Aesthetic impacts of landscape change;
- Impacts during the construction phase;
- Disturbance of ecosystems.

The desire to adequately protect the environment at all stages of the Tomura project was clearly high priority for community stakeholders. Thus, a commitment was made for ongoing monitoring of environmental performance during the operational phase of the project.

- Nine post-commissioning ecological investigations were conducted between 1978 and 1998 to assess the impacts of power station operation on the downstream natural environment. These investigations indicate that in the years since the Tomura Power Scheme was commissioned:
  - No changes have occurred to fish populations within the Shii Tokachi River;
  - There have been changes in fish populations in the Tomura River, with rainbow trout and Ezo chub becoming more dominant. These changes are due to fish stocking activities, rather than power station operations;
  - There has been a slight increase in the biological diversity of benthic macro-invertebrates below the dam site;
  - No changes in riparian zone insect populations have been observed;
  - Slight changes in the way some mammals utilise the area are more attributable to deforestation, hunting pressures and typhoon damage than dam operation; and,
- Utilisation of the area by birds was initially affected, but has recovered to pre-project levels as rehabilitated areas have matured.

In 1998, the investigations were reduced to 4 priority areas. This was the result of expert advice that many of the parameters being routinely monitored had displayed no significant changes since commissioning of the dam.

The four priority areas are

- Flow Rate and Water Quality;
- Fishes and Benthic Organisms;
- River Basin Vegetation; and,
- Riverbank Birds

## Other Aspects

### Environmental flows

The potential impact of altered flow regimes in the Tomura River below the project site was recognised early during the planning process and was of concern to stakeholders. Environmental investigations prior to construction identified that the impacts of the project on downstream biological communities could be minimised through the implementation of a minimum environmental flow release. Since commissioning of the dam, efforts to maintain at least 30cm depth of water in the river at all times have been rewarded with slight increases in benthic macro-invertebrate diversity.

### Community Engagement and Acceptance

This project set a precedent for Japan, being the first dam and hydropower facility constructed within a national park. The concept created significant opposition at first, but was eventually accepted by the community after rigorous environmental studies and an intensive period of stakeholder consultation and negotiation.

## Further information

Source: Hydropower Good Practices Workshop, Annex VIII - Examples for Good Practice Report, Villach, Austria, October 2005. International Energy Agency.

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