



River law

Old River Law (1986)	Flood management
New River Law (1964)	Flood management + Water resources management Long-term master plan
Revised River Law (1997)	Flood management + Water resources management + Environmental conservation Vision (long-term) + <u>Master plan</u> (completion within 30years) with <i>Public Involvement</i> process

Flood management

(1) Flood Protection by continuous levee and flood control dam (in mountain area) or retention pond

Protected area=human activity in flood plain

(human lives and properties)

Flood protection plan ←'return period' Example, once in 100 years

Probabilistic heavy rainfall or flood discharge

→transformable by "Runoff model"

Return period for respective rivers depends on

Size of river or river basin (or flood plain), population of river basin (or flood plain),  
importance of cities along river, .....

↓

Design flood discharge ←Peak discharge of hydrograph ( $Q \sim t$ ) without dam

↓ peak cut by dam (flood control)

Peak discharge for river improvement (levee design and construction)

"Design flood for Vision" and "Design flood for Master Plan"

↓

For example 1/200

↓ 1/50 (experience max.)

On the way of process, or when the process is delayed by various reasons

(Finance, public opinion, environmental problems,...)

(2) Insufficient safety level against flood (under the design plan)

→Prediction of inundation depth for designed flood

in case of the present infrastructure condition (Equipment of levee, river course and dam)

=River manager's responsibility

←River Management

Then, the municipality should issue a "Hazard Map" for evacuation based on the above information  
for citizens (inhabitant)

Mayor, Flood fighting teams

←Disaster Management

River management

→Safety of flood plain area surrounded by levee against flood from river.

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Inundation due to insufficient rainfall drainage → *Urban Drainage* ← Municipality's role

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Sewage system = pipeline system + treatment facility + pumping station

Urban drainage + Waste water treatment

Separate Sewage System or Composite Sewage System → *Composite Sewage Overflow*

(newly developed cities) (early developed cities)

↓

*serious water pollution*

## Water Resources Management

River manager's role for Water Resources Management

### (1) "Water right" issue

Water resources in Japan = sharing water resources from river flow (surface flow)

Underground water usage → *serious land subsidence*  
(in 70's)

Long-term hydrograph (a year) *statistical*

→ "draught discharge"  $Q_D$  Daily river discharge is larger than  $Q_D$  on 355 days in a year.

$Q_D$  is shared among registered water users by issuing "water right" ← River manager

+ Conventional water use + environmental discharge

Amount of water supply ← *river manager*

Demand of water by user ← *prefecture or community*

Agriculture (irrigation), hydropower, industry, city water (drinking water)

*350lit/day/person average in Japan*

At reference stations along a river, "Normal water discharge" is watched by river manager.

### (2) Water resources development

New water use ← supply water from reservoir by dam (water storage)

*Construction of dam + running cost*

→ expensive water price for new users

If it is authorized, dam construction is planned and constructed then managed  
as river management.

By monitoring the river discharge, the river manager supply water from dam reservoir  
when the "normal discharge" is not satisfied.

Draught management:

Water resources management is planned (water rights are issued)

by setting "return period" of draught.

*Usually 10years*

On risk of "draught" → Draught management (negotiation of usage saving)

## Environment Conservation

### (1) Water quality

Criteria ← MOE (Ministry of Environment), MHLW (Ministry of Health, Labor and Welfare)

Source management ← MAFF (Ministry of Agriculture, Forestry and Fishery)

← METI (Ministry of Economy, Trade and Industry)

River management → monitoring, water purification (in river)

(2) Land management in river area

River area (between flood levees) is occupied by government (principally).

Land management possible for river manager

Environmental purpose → Recreation, Amenity, Sports,

↓

Habitat (natural area) preservation, ...

*Zoning*

(3) Environmental Flow

Keep “environmental flow”

Particularly for the interval of no (seriously decreased) discharge ← environmental flow release

(in downstream of intake) *based on agreement between METI and MLIT*

(4) Ecosystem Conservation

New strategy ← River restoration, river ecosystem conservation

↑

Census of natures along rivers (plants, benthos, birds, fish, insects, animals, ...)

(5) Environmental Assessment

1997 Environmental Impact Assessment Law

Ecosystem Assessment ← Pollution Assessment

Without EIA, the project cannot be realized.

(dam construction etc.)

Before EIA Law = Cabinet-agreed assessment procedure (since 1984)

2008 Guideline for SEA (Strategic Environmental Assessment)

Assessment in planning stage (master plan for river-related project)

REFERENCES :

Characteristics of Rivers in Japan

[http://www.mlit.go.jp/river/toukei\\_chousa/](http://www.mlit.go.jp/river/toukei_chousa/)

Vision and Master Plan of Class-A river

[http://www.mlit.go.jp/river/basic\\_info/jigyo\\_keikaku/gaiyou/seibi/index.html#map](http://www.mlit.go.jp/river/basic_info/jigyo_keikaku/gaiyou/seibi/index.html#map)

Exercise:

What is the important factor to decide the level of river management?

(For example, the correlation between return period for flood protection and population of floodplain)