Policies, Measures, and Collaboration for integrated implementation of SDG 6.5, 11.3 and 11.5 toward sustainable IWRM and Water-Resilient City

Case Study: City of Nagoya, Japan

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**SDG6.5 : Implement Integrated Water Resources Management**
- SDG11.3: Sustainable Urbanization & Human Settlement through *Inclusive and multidimensional planning*
- SDG11.5: Reduce the loss by Water-related Disaster

*IWRM* is a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

- SDG6.5 is a broad framework for water management across sectors and stakeholders
- SDG6.5 is the entry for coordination within the SDG6 and the other SDGs
- SDG6.5 is foundation for Water-Resilient Cities

➢ To understand Water Cycle and recover it through the multi-partnership’s collaborative activities will be the milestone for IWRM (SDG6.5), economic & social welfare of river basin, and Water-Resilient Cities
Basic Act on Water-Cycle Policy is enforced from 2014
IWRM Efforts at river basin scale in Japan

(1) Development, operation, and maintenance of facilities
- Renovation and maintenance of existing facilities
- Efficient operation of water resources facilities
- Development of new facilities
- Crisis management during disasters such as earthquakes and accidental water pollution
- Effective use of natural energy of water resources

(2) Conserving river basins
- Restoring sound water cycle in basins
- Preserving water source areas

Challenges: implementation of actions under the institutional mechanisms in accordance with the jurisdiction of vertical administration

(3) Integrated management of volume and quality of water
- Securing water quality and quantity needed at specific points at a lower cost and using less energy

(4) Conservation and utilization of groundwater
- Groundwater use based on preservation & management

(5) Promoting facilitation / effectiveness of water use
- Water use coordination
- Promoting rainwater use
- Promoting use of recycled water
- Responding to drought

Source: Japan’s experience & Technology regarding Water Resources Management, MLIT, Japan
Promotion of the collaboration in river basin areas:
Case Study: the city of Nagoya

Characteristic of Water utilities in Nagoya City: **slow sand filtration is used**

- 100th year anniversary from its operation in 2014
- Implement the activities to support **marginal rural areas of upper river basin** to maintain purified water and the economic activities

<table>
<thead>
<tr>
<th>Length</th>
<th>Basin Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiso River:</td>
<td>5,275 km²</td>
</tr>
<tr>
<td>Nagara River</td>
<td>1,985 km²</td>
</tr>
<tr>
<td>Ibi River:</td>
<td>1,840 km²</td>
</tr>
</tbody>
</table>

Population: 2.27 million people
Municipal area: 326 km²
Precipitation: 1,506 mm

Source: Nagoya Waterworks & Sewaraqe Bureau
Rationale to proceed the actions for IWRM & water-resilient cities

Flood damage from the Tokai Heavy Rain (September 2000)

The cars and the bus were under water.

The city was under water because of washout.

The subway was flooded.

The city was under water.

Rainfall
(Sept.11~12,2000)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. rainfall over 1 hour</td>
<td>97.0 mm</td>
</tr>
<tr>
<td>Total rainfall</td>
<td>566.5 mm</td>
</tr>
</tbody>
</table>

※The mean rainfall for the year of nagoya: 1600 mm/y

Source: Nagoya Waterworks & Sewage Bureau
Rationale to proceed the actions for IWRM

Challenges for the upstream and middle areas

- Aging, depopulation
- Lack of leaders in agriculture and forestry
- Lack of revenue due to the pull back of private companies

Challenges facing all of the basin area including downstream areas

- Lack of awareness about water cycle

Devastation of the water source forests...

- Depression of the soil-percolation capability of forests
- Runoff of sediment and fallen trees
- Decrease of river flow rate
- Muddy stream in river of water source
- Increase the loss from water-related disaster

➢ Needs to find solutions with all the basin areas working together and sharing problems
4 Factors to realize sustainable IWRM

- Create the Mechanism (governance) to implement the measures through the discussion on mutual trust

- collaboration among the river basin areas toward their economic & social activation and self-sustainability
Backcasting approach for the realization of visions in 2050

Nagoya’s strategies to recover sound water cycle by 2050

Water cycle

Forestry & Biodiversity

People & Peace

Until 2020

Develop enabling environment to realize the targets and visions

2020

(2030: SDG)

2050

Water cycle Vision in 2050: Realization of Environment Capital Nagoya supported by abundant Water Cycle

Backcasting
1) Visualize ideal city for Sustainable Water Cycle in the long-term
2) Examine what city wants to realize

Items for realization
- Land for Agriculture
- Irrigation channel

Expected outcome
- Sustainable water cycle
- Preservation and restoration of wetlands and meadows
- Efficient water use
- Water quality improvement
- Ecological diversity

Source: Nagoya Waterworks & Sewage Bureau, 2016, p14-15
The structure of Policies & Measures to Realize the Visions & Targets of Nagoya City

City's Vision in 2050

Healthy & safety cities

- Vision for Environmentally Sustainable cities in 2050: Recovery of soil, water, green, and wind and activate all living in cities

- Water Cycle Vision For 2050: Realization of Environment Capital Nagoya supported by abundant Water Cycle

Sustainable resource circulated city

Harmony with economic development and nature

Low Carbon City

Target in 2020

Develop Nagoya for Environmental Capital City through the collaboration with multi-partnership making use of their nature

Measure 1:
Promotion of the participation of citizen and collaboration through sharing environmental information and environment studies

Measure 2:
Promotion of collaboration for sustainable 3 rivers' basin's development and recovery of Ise-Bay

Measure 3:
 Provision of safety and good quality water

Measure 4:
Secure health and safety living environment by improving water environment and land sinking, etc

Measure 5:
promotion of the reduction & recycle of waste

Measure 6:
Promotion for Sound water cycle

Measure 7:
Promotion of low carbon activities

Measures 1-7: Examples of measures by Nagoya Waterworks & Sewerage Bureau to achieve the targets in 2020
Technical countermeasures to reduce the loss from the flood
Improvement of stormwater reservoirs

Number of stormwater reservoirs: 96
Total storage capacity  About 750,000 m³

- Stormwater regulating reservoir with storage capacity of 2,000 m³ or more

Draw a comparison between before emergency storm water improvement projects and after

- Drainage pomp ability
  About 51,300 m³/min
  ↓ × 1.3
  About 64,700 m³/min

- Storage capacity of stormwater regulating reservoir
  About 140,000 m³
  ↓ × 6.3
  About 875,000 m³
Technical countermeasures to reduce the loss from flood using existing stock

– Developing networks of stormwater reservoirs (an example)
1. Strengthen mutual cooperation in basin municipalities

2. Promotion of public participation to conserve the water environment

3. Promotion of local economy through public-private cooperation
1 Strengthening Mutual Cooperation for regional development in Basin Municipalities

- Establishment of Council Meeting on the Kiso Three River Basin Municipalities in 2011 to protect the future of water environment and collaborate for regional development among the river basin
- 29 local government declaration to protect water, human, and biodiversity’s circulation

Since then:
- The participations in the council meeting from 44 cities, towns and villages of upper, middle, downstream
- The “Kiso Three Rivers Basin Municipalities Summit” every year
- Direct visits by municipal mayors to other basin municipalities

Focus on regional development
--- business matching between upper and lower river basin, training, inter-communication
2 Promotion of public participation to conserve the water environment

- Water quality improvement of rivers in collaboration with residents
- More than 50,000 supporters have carried out the activities
- Verify the effectiveness of activities

- Planting the trees in upper streams
- Observing living creatures
- Clean up activities
## 3. Promotion of Local Economy through Public-Private Cooperation

### Business meetings

<table>
<thead>
<tr>
<th>FY</th>
<th>Target</th>
<th>Number of Cases</th>
<th>Monetary Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>Food, water, forestry</td>
<td>6</td>
<td>JPY 1.304 million</td>
</tr>
<tr>
<td>2012</td>
<td>Beauty, food, healing therapy</td>
<td>28</td>
<td>JPY 4.322 million</td>
</tr>
<tr>
<td>2013</td>
<td>Delicacies</td>
<td>15</td>
<td>JPY 5.009 million</td>
</tr>
<tr>
<td>2014</td>
<td>Delicacies</td>
<td>34</td>
<td>JPY 9.191 million</td>
</tr>
<tr>
<td>2015</td>
<td>Delicacies, manufacturing</td>
<td>13</td>
<td>JPY 2.626 million</td>
</tr>
<tr>
<td>2016</td>
<td>Delicacies</td>
<td>Currently being calculated</td>
<td>Currently being calculated</td>
</tr>
</tbody>
</table>

- Provides a forum for negotiations between producers in the upstream and middle stream areas with purchasing companies in the downstream areas
- Themes set in accordance with needs, from food, beauty, and health to manufacturing
Response to the Flood
– Promotion of soft measures to encourage self-help

Vulnerability assessment
Development of Nagoya City’s resilient plan from the disaster
1. Improve capacity to respond to disaster
2. Develop the city’s strategies which are robust to the disaster
3. Improvement of local capacity for disaster prevention

Develop the targets and measures

Strengthen cooperation for
• self-help,
• mutual assistance, and
• public assistance

Official website of the Nagoya Waterworks and Sewerage Bureau
Publication of drainage pump operating conditions
Operations suspended
In operation
Shows operating status of pump
Actions Guideline for the evacuation
Hazard Map
Response to the Flood
- Promotion of soft measures to encourage self-help
Conclusion:
From the internal-communication to the collaboration among multi-stakeholders

Develop the circulation mechanism between information, human, resources, and money for IWRM (SDG6.5) and water resilient cities.
Conclusion: Enabling environment for IWRM and SDG6.5

In addition to the technical solutions,

- Create the coordination mechanism among multi-stakeholders to meet their multiple demand
- Share the common concepts and future visions for IWRM
- Political will
- Nurture mutual trust

Fill in the gap of vertical administration by the promotion of multi-partnership for IWRM of river basin and the regional development of water-resilient cities

Source and Credit: Dr. Kotaro Takemura, JWF Secretary-General
THANK YOU

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