

## Past, present and future



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### 1. Name

- HwangSan river in period of the three Kingdoms
- Nak-su in period of Koryo and Korea
- HwangSan river in period of the three Kingdoms

### 2. Means

- To the east the flowing river

### 3. Relics

- To have much inheritances



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### 4. Route of Rice

To transport rice in Korea period

### 5. Korean War

To be last bridgehead in Korean War season.



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### Environment Characteristics

- Beginning in "HwangJI" pond, to southern sea
- Length is 521.5km
- The longest river in South Korea. □
- Several multipurpose dams. □



Hwang-Ji

- Less rainfall all among the 4 river. □
- Nakdong river : 1,187mm      - Han river : 1,268mm
- Gum river : 1,269mm      - Youngsan river : 1,319mm
- Slant is SLOW (Riverbed Height(Andong) : 90m)

Case of overflows in flood period is much.

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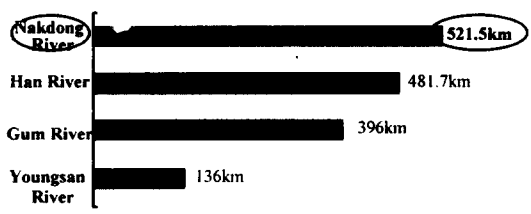
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### Environment Characteristics




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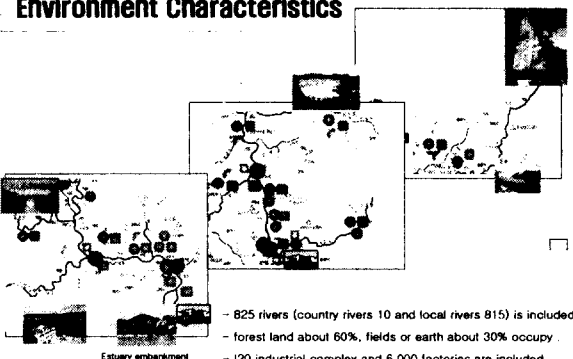
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### Environment Characteristics




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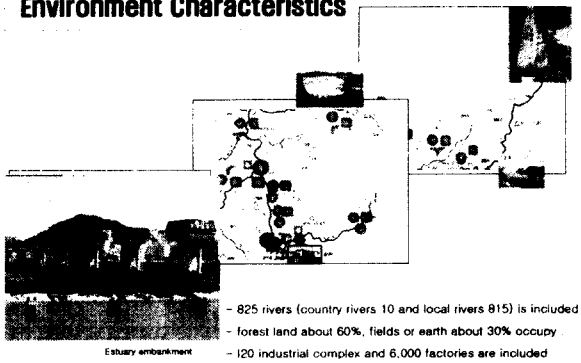
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## Environment Characteristics




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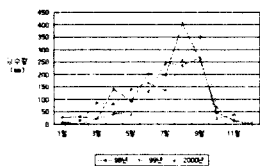
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## Environment Characteristics

- Rainfall is increased from June to September, but is not more to 20% of average rainfall year from October to April



Variation of rainfall in Nak-dong river

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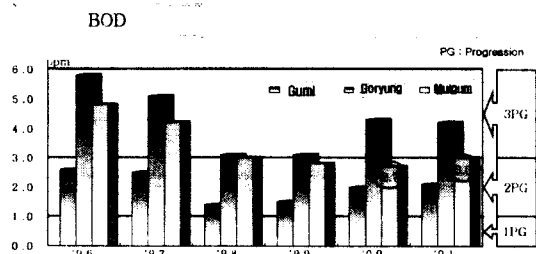
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## Water Quality



- Main point that aggravate water quality is 'GoFyung'.
- In the case of GoFyung, BOD was 21mg/L in 1988
- Water quality in Mulgum is improved gradually.

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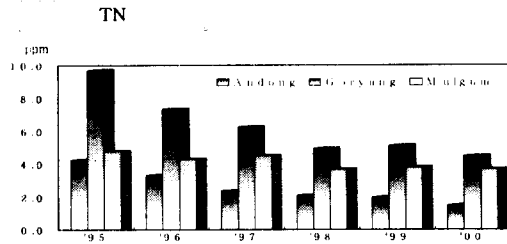
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## Water Quality



- Main point that aggravate TN is 'Goryong'.
- TN is decreasing continuously but is high yet.

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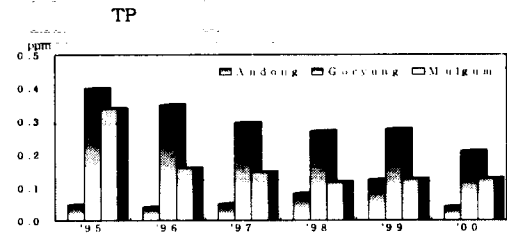
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## Water Quality



TP is decreasing too continuously but is high yet.

Therefore, Water quality in Nakdong river is keeping 2 to 3 progressions and is incongruent to water supply or water resources.

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## Policy for Water administration in Nakdong river

### Estimation of previous water policy

- Results
  - invested fund to "Establishment of environment basis equipment" for improvement of water quality
  - but the effect is low. E
- Causes
  1. Policy that handle after happened → Don't control pollution increase
  2. Insufficiency of government and local government support → Insufficiency of environment basis equipment
  3. Non-cooperation between upstream and downstream
  4. No administrative organization to take the responsibility of controlling water quality

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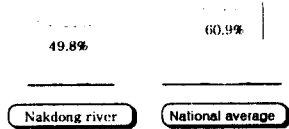
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**Policy for Water administration in Nakdong river**

- invested 2 trillion 5.4 billion wons from 1993 to 1998.
- Environment basis equipment : 50
- Drainage for sewage : 2918km.

- The rate of sewage treatment(1998):




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**Comprehensive countermeasures for Water administration in Nakdong river**

- announced at Jan 28, 1999

**Main contents**

**1. Prior prevention**

- 1) Administration by total amount
  - enforces gradually since 2002
- 2) Enforce administration of the sources of water supply
  - In case do not specify to protective area, mayor or provincial governor can specify.
- 3) Green area furtherance and Cultivation of the tree that contain water
  - 1) In upstream of Dam,
    - prohibit new construction like as eatery, accommodation, bathhouse, factory, cattle shed, apartment house and condominium
    - existing facilities enforce legal standard by double.(BOO,SS : 20 → 10 mg/l)
  - 2) Furtherance of artificial wet land and green area
  - 3) Cultivation of the tree that contain water : 50,949 ha(until 2007)
  - 4) Equip buffer-storage tank that prepare accident in the industrial complex

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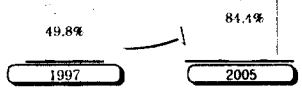
**Comprehensive countermeasures for Water administration in Nakdong river**

- announced at Jan 28, 1999

**2. Removal of water pollution**

- 1) Perfection of environment basis equipment
  - invest 4 trillion 227 billion wons

▶ Raising the rate of sewage treatment



▶ Addition of advanced treatment to removal N and P

▶ Drainage for sewage : 4,388 km(until 2005)

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**Comprehensive countermeasures  
for Water administration in Nakdong river**  
- announced at Jan 28, 1999

- 2) Resources of live-stock waste
  - Do max. composting live-stock waste that correspond to 17% of the loading.
  - Small live-stock farmhouse makes mandatory equipment that separate solid and liquid.
  - support part of expense by the treasury.

3. Development of water resources

- 1) Enlargement of river maintenance quantity
- 2) Diversification of water supply
- 3) Water demand administration

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**Comprehensive countermeasures  
for Water administration in Nakdong river**  
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4. Water utilization Allotment

- 1) Target area
  - All the area of Nak-dong river
- 2) The fund
  - used income fledgling or improvement fledgling or educational work for inhabitants who receive disadvantage
  - used to support investment or operational expense of environment basis equipment in dam area
  - used to afforest Green area

5. Improvement of administration system

- 1) Organization of administrating committee for Nak-dong river
  - Negotiation and control about water administration policy

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**Comprehensive countermeasures  
for Water administration in Nakdong river**  
- announced at Jan 28, 1999

Previous policy	Policy of this time
Simple (Water quality)	Overall (water quality, ecosystem, water resources)
Government is leading	Local and governmental cooperation
A policy target	Scientific and realizable target
After happens, countermeasure	prior prevention
Point source	Non-point source
Support about regulation local resident is insufficiency	sufficient support
Relation between upper stream and downstream was improper	Cooperation system

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**Quality of water view in the future**

	1996	2002	2005	Target
SangJu	1.33	1.0	0.92	1 PG
GuRyung	5.77	4.11	3.36	2 PG
NamJi	5.2	3.92	3.32	2 PG
MulGum	4.84	3.75	2.92	2 PG

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