Cheonggyecheon restoration: A process of paradigm shift in urban environment of Seoul

April 26th 2016
GDCI Webinar

Noh Soo Hong
Professor, Yonsei University
Director, Center for Eco-Smart Waterworks System
About Seoul

With a population of 10 millions in Seoul.
It occupies 605 square kilometers or 0.6 % of the nation’s territory.

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**Basic Statistics (2014)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>10.3 million</td>
</tr>
<tr>
<td>Foreign Residents</td>
<td>274 thousand</td>
</tr>
<tr>
<td>Area</td>
<td>605.2 km²</td>
</tr>
<tr>
<td>GRDP</td>
<td>285.6 billion USD</td>
</tr>
<tr>
<td>Companies</td>
<td>812,798</td>
</tr>
<tr>
<td>Park area</td>
<td>170 km²</td>
</tr>
</tbody>
</table>
Cheonggyecheon (cheon means stream)

Cheonggyecheon was opened by king Taejong, the third king of Chosun dynasty, to cross the heart of busy city, emptying into the Han-river in the form of natural stream 10.92 km in total length.

Old map of Seoul

Ref : https://namu.wiki/w/%EC%84%9C%EC%9A%B8%ED%8A%B9%EB%B3%84%EC%8B%9C
blog.naver.com/gomhk/130003688524
Cheonggyecheon

Place for washing in early 20 century

After the construction of elevated highway

After Korean War: urban squatter until 1970's

Ref: Back to a future Seoul Cheong Gye Cheon Restoration Project, Seoul Metropolitan Government, 2005
Step of restoration
The beginning of restoration

- 1991 Casual conversation between an engineer (Prof. Noh Soo Hong) and a historian (Prof. Lee Hee Duck) of Yonsei university
- 1998 A famous Korean novelist (Pak Kyung Li) got involved
- **2000 Cheonggyecheon restoration research group was founded by Prof. Noh**
- 2002 Became the major election issue for Seoul Mayor and Mr. Lee Myung Bak adopted the restoration plan and won the election (33rd Seoul Mayor)
- 2003 Restoration began
- **2004 Seoul policy grand prize granted to Cheonggyecheon restoration research group**
Paradigm shift

- Restore the cultural and historical heritages of downtown Seoul
- Bring back the ecosystem to the heart of the city
- Public-transit and pedestrian friendly transportation policies
- Balanced development of old and new city sections
Restoration step

1. Landscape Plan
2. Demolition Plan
3. River Plan
4. Sewage Improvement
5. Water Supply Plan
6. Bridge Plan
7. Adjacent Roads Plan
8. Heritage Restoration
Plan of Restoring the Upper Stream and the Lower stream of Cheonggyecheon

- **Upper stream** (Baegundongcheon~Junghakcheon) : Restoration planned for long run
- **Lower stream** (Shindab Bridge~Jungrangcheon) : Launching improvement plan in 2003
1. Landscape plan

**Fundamental Concepts**

- Gradual transformation from urban landscape to one incorporating nature
  - Section A: Bridge treading, Supyoseok (water gauge)
  - Section B: Ecological area, Rest Area, Deck, Stepping stones
  - Section C: Deck, Larger ecological parkland, Direct interactive with nature

**Segmentation diagram**

Ref: http://www.cheonggyecheon.or.kr
2. Demolition plan

- Step 1
- Step 2
- Step 3
- Step 4
- Step 5
3. River plan

**Design Criteria**

- Satisfy with the 2\textsuperscript{nd} grade local river standard
- Secure flood section for 200 years frequency rainfall

**Flood water level**

- 200 years HWL
- 50 years HWL
- Average HWL
4. Sewage improvement

**Design Criteria**

- Combined sewage system for rainfall and waste water
- Capacity: 3 times of planned sewer

**Combined sewer system**

- Sewer collecting weir
- Separation wall
- Excess rainfall
- Sewer box
- C.S.O box
5. Water supply plan

Amount of water supply: 120,000 m³/day
Average depth of water: 40 cm
Average speed of water: 0.25 m/s

Water is pumped from the Han-river to the head of the Cheonggyecheon to ensure even flow year-round and optimize the experiential quality of the river.

Ref: Back to a future Seoul Cheong Gye Cheon Restoration Project, Seoul Metropolitan Government, 2005
6. Bridge plan

Access point to stream

Stairs
Slope way

Ref: http://www.cheonggyecheon.or.kr
7. Adjacent embankment road plan

Design criteria

• Allowing 2 lanes per each side of restored riverbank to allow easy access to the stream
• Designate Parking Area for business in crowded areas
• Adhere to road design standard (speed : 60 km/hr, R = 240 m)
• Allow pedestrian convenience for latter development of area

Section plan

Unit : mm

Two lane road

Sidewalk
8. Heritage restoration

Restored Gwang Tong Gyo (廣通橋)
Starting the work *(July 1st 2003)*

Cheonggye and Samil elevated highway in History
Progress of construction

Before (2004. 7)

After (2003. 7 ~ 2003.10)
Progress of construction

Upstream

Midstream

Downstream
After construction

Before restoration

After restoration
After construction

Thematic places

Traces of the past Cheonggyeche

Willow marsh

Stone plate for clothes washi

Resting place
New attraction for citizens

Since 2005 opening, more than **200 million** people visited Cheonggyecheon until February 2016.

Ref: [http://www.cheonggyecheon.or.kr](http://www.cheonggyecheon.or.kr)
Lantern festival

Attracting investment

• Delegates from abroad visit to carry out case-studies
• Influx of people attracts more investments.
Culture along the stream

Historically

- Cheonggyecheon was not only geographical but also symbolic boundary in politics, society, and culture, dividing Seoul into the north and south.
- Bridges and the vicinity provided places for the people of lower classes to enjoy diverse cultural entertainment.

Ref: sunsooljip, Shin Yun-bok, 18c~19c
http://m.blog.daum.net/_blog/_m/articleView.do?blogid=03Z9K&articleno=15871165
Environmental & ecological improvement

- The stream declines 10~13% of temperature and reduces 7.1% of dust.
- Wind blows faster along the stream cooling down the heat-islands
- Recovering ecosystem in the heart of city refreshes citizens.

Average 36.3°C
Nearby street

Average 32.7°C
Cheonggyecheon

**Increase of species after restoration**

<table>
<thead>
<tr>
<th>Year Species</th>
<th>Before restoration</th>
<th>'06</th>
<th>'07</th>
<th>'08</th>
<th>'09</th>
<th>'10</th>
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</thead>
<tbody>
<tr>
<td>Total No. of species</td>
<td>98</td>
<td>421</td>
<td>573</td>
<td>626</td>
<td>788</td>
<td>864</td>
</tr>
<tr>
<td>Plants</td>
<td>62</td>
<td>268</td>
<td>312</td>
<td>308</td>
<td>314</td>
<td>300</td>
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<tr>
<td>Fish</td>
<td>4</td>
<td>23</td>
<td>19</td>
<td>25</td>
<td>27</td>
<td>25</td>
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<tr>
<td>Birds</td>
<td>6</td>
<td>33</td>
<td>29</td>
<td>36</td>
<td>34</td>
<td>37</td>
</tr>
<tr>
<td>Water insects</td>
<td>5</td>
<td>39</td>
<td>26</td>
<td>53</td>
<td>39</td>
<td>29</td>
</tr>
<tr>
<td>Land insects</td>
<td>15</td>
<td>46</td>
<td>174</td>
<td>192</td>
<td>206</td>
<td>248</td>
</tr>
<tr>
<td>Mammals</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>amphibians</td>
<td>4</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>9</td>
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### Transportation improvement

<table>
<thead>
<tr>
<th>plans</th>
<th>Main contents</th>
</tr>
</thead>
</table>
| Plans for cars passing cheongye elevated highway and cheonggyecheon road | - Improvement of traffic system around cheonggyecheon road  
- Measures for bypass and dispersion |
| Increase capacity of public transit | - Increase carrying capacity of subway  
- Designate bus-only lanes.  
- Downtown shuttle bus service |
| Management of downtown traffic demands | - Crackdown on illegal parking  
- Increase the parking rate in downtown  
- Citizen participation for public transportation utilization |
| Traffic measures for cheonggyecheon mall customers | - Four lanes in Cheonggyecheon road during restoration  
- Parking lots for trucks in Cheonggyecheon road  
- 1 hour free parking for visitors in Cheonggyecheon mall |

Ref: Cheonggyecheon restoration project white book, Seoul metropolitan government, 2006, p.289  
Transportation improvement

Plans for bypass and dispersion

Ref: Cheonggyecheon restoration project white book, Seoul metropolitan government, 2006, p.289~300
Transportation improvement

Change of average vehicle speeds before and after restoration in downtown Seoul

Average speed (km/h)

<table>
<thead>
<tr>
<th>Year</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
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<td>Average</td>
<td>15</td>
<td>20</td>
<td>20</td>
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<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Downtown (East-West)</td>
<td>15</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Downtown (North-South)</td>
<td>10</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
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Transportation improvement
The future of Cheonggyecheon
The future of Cheonggyecheon

- Restoration of up-streams
- Restoration of historical stone bridges
- Eco-friendly supply of maintenance water
- Sharing of Cheonggyecheon experience
Restoration of up-streams

- Baegundongcheon and Junghakcheon are upstreams of Cheonggyecheon and were also covered.
- These two streams will be restored by 2030 according to Cheonggyecheon 2050 Master plan.

Ref: Google maps, http://maps.google.com
Restoration of historical stone bridge

- Supyogyo is one of the bridges across the Cheonggyecheon and was built in 1420.
- Water level of Cheonggyecheon can estimated by the stones near Supyogyo.
- Supyogyo relocated to Jangchungdan park during restoration.

Eco-friendly supply of maintenance water

- MBR plant A: 40,000 m³/day
- MBR plant C: 20,000 m³/day
- MBR plant D: 20,000 m³/day
- MBR plant B: 20,000 m³/day
- MBR plant E: 20,000 m³/day
Sharing of Cheonggyecheon experience

Deconstruction/Construction, Harvard university graduated school of design 2011

Landscape Architecture China, The restoration of Cheonggyecheon in Seoul, 2011

General Geographic, bringing nature closer to home: Urban Park, April 2016

And so many articles and books


PBS, Lost rivers (Movie), 2012

Discovery, Man made Marvels, Seoul searching, 2005

Acknowledgement

- Assistance of Professor Hwang Gi Yeon of Hongik University, Korea is greatly appreciated.
- Data and pictures were provided by Seoul Development Institute, Cheonggyecheon Museum, and Seoul Foundation for Arts and Culture.
Cheonggyecheon Nature, History and Culture

Thank you