The Yalu River

INTRODUCTION

The Yalu River used to be called Ba Water, and was given the present name in the Tang Dynasty (618-907) for its crystal-clear water and winding its way in the shape of a duck head. It lies between China(The People's Republic of China)and North Korea(Democratic People's Republic of Korea) as a boundary river, starting from Baitou Mountain, the highest peak of Changbai Mountains on the border of the two countries in the southeast of Jilin Province in China and running southwestward into the sea at Donggou County in Dandong City of Liaoning Province. It runs for 795 kilometers, and covers an area of about 400 square kilometers. The Yalu River runs through the wet region of temperate zone. It receives precipitation of 870 mm annually, and the distribution increases as it flows downstream. Every year when ice starts thawing, there will be spring flood. Along
its banks, there are five famous resorts, namely the Shuifeng Lake, the Taiping Bay, the Tiger Mountain, the Grand Bridge and the East Port. The Yalu River was selected to be a key national resort in 1988.

The Yalu did not become a political boundary until the Korean-Chinese border was established toward the end of the Korean Koryŏ dynasty in the 14th century. The river played an important political role in the Korean War (1950–53). In addition to serving as a political boundary, the Yalu River constitutes a dividing line between Chinese and Korean cultures. It is generally known abroad by its Chinese name, Yalu, instead of by its Korean name, Amnok. According to ancient writing, the Chinese name, which is derived from the characters ya (“duck”) and lu (“greenish blue”), is a comparison of the blueness of the river’s waters to the greenish blue of a particular species of domestic duck that inhabits it.

The Source of Yalu River

![Figure 2 Heaven Lake source of the Yalu River](image)

Heaven Lake (Tian Lake), source of the Yalu River, at the summit of Mount Baitou (Paektu). The Yalu rises in Tian Lake (known in Korean as Ch’ŏn Lake), a body of water
of indeterminate depth on top of Mount Baitou (Mount Paektu), on the Chinese–North Korean border, at an elevation of about 9,000 feet (2,744 metres) above sea level. Winding southward as far as Hyesan and then meandering northwestward for some 80 miles (130 km), the river reaches Linjiang, Jilin province, from which it flows southwestward for 200 miles (320 km) before emptying into Korea Bay. The lake covers 9.8 square kilometers; the average depth is 204 meters, and it holds 2.4 billion cubic meters of water.

History documentary with animation:
http://english.cntv.cn/program/documentary/20111014/118246.shtml

Dams and Cascade Hydropower Stations Along the Yalu River

![Figure 3 Dams and Power stations along the Yalu river](image)

There were four old in use dams before 1990 built by China and North Korea. Because of 2400m topography drop between upstream and downstream along the river, the river has a large average flow about Q=1005 m^3/s.
Based on the flow direction, the first cascade station is YunFeng station built by China and North Korea from 1958 to 1965, because the station is on the Chinese side, so China manages and operates the station. The second cascade station is WeiYuan which was built in the same city JiAn as YunFeng. Since WeiYuan station is on the North Korea side, it is managed and operated by North Korea.

<table>
<thead>
<tr>
<th>Hydropower station Name (Name)</th>
<th>Location (城市)</th>
<th>Built In (建成)</th>
<th>Installed Capacity (KW)</th>
<th>Average Annual Electricity Output (KW.hr)</th>
<th>Built By</th>
<th>Cascade Order</th>
<th>Managed and Operated by</th>
</tr>
</thead>
<tbody>
<tr>
<td>YunFeng (云峰)</td>
<td>JiAn city (集安)</td>
<td>1958~1965</td>
<td>400,000</td>
<td>1,350,000,000</td>
<td>China / DPRK</td>
<td>First</td>
<td>CHINA</td>
</tr>
<tr>
<td>WeiYuan (渭源)</td>
<td>JiAn city (集安)</td>
<td>1980~1988</td>
<td>390,000</td>
<td>1,200,000,000</td>
<td>China / DPRK</td>
<td>Second</td>
<td>DPRK</td>
</tr>
<tr>
<td>ShuiFeng (水丰)</td>
<td>KuanDian city (宽甸)</td>
<td>1937~1943</td>
<td>630,000</td>
<td>3,680,000,000</td>
<td>Japan---DPRK</td>
<td>Third</td>
<td>DPRK/CHINA</td>
</tr>
<tr>
<td>TaiPingWan (太平湾)</td>
<td>KuanDian city (宽甸)</td>
<td>1978~1986</td>
<td>1,900</td>
<td>720,000,000</td>
<td>China / DPRK</td>
<td>Fourth</td>
<td>CHINA</td>
</tr>
</tbody>
</table>

The third cascade station is ShuiFeng which has a quite story. In 1937, the ShuiFeng station was founded by Japan and finished by 1943. During the Korean war (1950-1953) part of the station was bombed and Japanese troops were pulled out North Korea at the end of Korea war. From 1953, ShuiFeng station was taken over by North Korea. In 1958 it was rebuilt by China and North Korea. In order to develop the Yalu River hydroelectric power, China and the DPRK signed an agreement in 1955 to establish the ShuiFeng hydroelectric power company on Yalu River and agreed to jointly operate ShuiFeng power plants, including joint investment in repairs and alterations. Two countries also agreed to share the electricity output in a half-half allocation.

The fourth cascade station is TaiPingWan station, which was invested by China and North Korea, and managed by China since the station is on the Chinese side.
In January 2010, the two sides signed an agreement known as the “Minutes of the Ninth Meeting on China-North Korean Construction of Yalu River Dams at Wangjianglou and WenYue” in which it was agreed to start the construction of the two power stations.

A ceremony marking the beginning of construction was held on March 31, 2010, attended by North Korean vice-minister of electricity industry Kim Man-su and Jilin vice-governor Chen Weigen.

Wangjianglou power station plans require $88 million invested by the Chinese government; Wen Yue power station plans require $73 million invested by the DPRK. In order to solve the shortage of construction funds, the DPRK asked China to take charge of the construction investment. After the completion of the power station, the DPRK will pay back the investment to China by supplying them hydropower from the station.

**Benefit sharing**

Since these hydropower stations are on both sides of the YaLu River, so they are managed separately by each country. Based on the agreement between China and DPRK, two countries share the annual output energy equally.

According to the agreement between China and North Korea, the width of the river determines the width of the boundary at any given time.

Two counties manage and use the river, including the navigation rights. In this regard, the border is not set by the main channel of the river. Therefore, boats from the two countries

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<th>Installed Capacity (KW)</th>
<th>Average Annual Electricity Output (KW.hr)</th>
<th>Built By</th>
<th>Investment ($)</th>
<th>Managed and Operated by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wangjianglou (望江楼)</td>
<td>JiAn city (集安)</td>
<td>2010~2013</td>
<td>40,000</td>
<td>150,000,000</td>
<td>CHINA</td>
<td>88,000,000</td>
<td>CHINA</td>
</tr>
<tr>
<td>WenYue (文岳)</td>
<td>JiAn city (集安)</td>
<td>2010~2014</td>
<td>40,000</td>
<td>154,000,000</td>
<td>North Korea</td>
<td>73,000,000</td>
<td>DPRK</td>
</tr>
</tbody>
</table>
can use the entire width of the river. In Dandong city of China, no exit formalities are required to enjoy the scenery of another country along the river.

**Fish in the river**

The climate along the river’s course is typically continental and characterized by cold winters and warm summers.

The river is frozen and thus closed to navigation during the four winter months (November through February). Because it is situated in mountain ranges and is not far from oceans, the river’s basin receives fairly heavy precipitation, much of which occurs as rainfall during June, July, August, and September. The abundant rainfall waters rich forests of conifers as well as deciduous trees. The forests provide a sanctuary for wildlife, including wild boars, wolves, tigers, jaguars, bears, foxes, and such birds as ptarmigans and pheasants. The river abounds in carp and eels.

**Responsibilities sharing Agreements**

After the founding of the People's Republic of China, in 1949, China and North Korea took actions to strengthen the protection and development of fish in the Yalu river.

In June 1959, China’s LiaoNing Province and DPRK’s south P’yong Province signed an agreement on releasing fish into the river: “Each side would release 1 million baby bighead carp and 3 million eggs in the Yalu river each year to enable the sustainable reproduction and growth of the fish species”.

On Dec 19, 1972, in Beijing, the Chinese and DPRK’s government signed an agreement on fish resources protection for the ShuiFeng reservoir: Both sides would create better
conditions for carp fish to lay eggs. Every year from May 15 to June 30 each side would deploy 30 thousand artificial fish nests at appropriate locations in the ShuiFeng reservoir.

In April 2011, authorities of China and North Korea signed a cooperative agreement on the management of the Yalu River. In the agreement, the two sides vowed to conduct joint patrols and rescue on the river.

Here you can reach the documentary:
http://english.cntv.cn/program/documentary/20111015/107483.shtml

Questions

1. Compared to other transboundary rivers or waters that we discussed previously, the YaLu River as a boundary of China and DPRK appears to be a peaceful and friendly. What do you think about it? What are the reasons bring two countries together to make agreements on benefit and responsibilities equally, will this last long?

2. We talked about sustainable and unsustainable development of water resources. Do you think YaLu River development is on the sustainable side or the unsustainable side? Why or why not?