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Livelihoods and Landscapes

Eco-compensation for Balancing Conservation and Development at Miyun Reservoir Watershed

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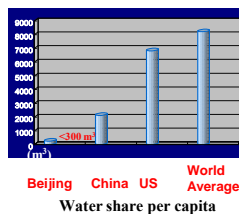


Background

Miyun reservoir, located in Northeast Beijing Municipal, supplies 70% of the water to 17 million Beijing residents. It was established in 1960 with 13,800 km² watershed land area, which sits 1/3 in Beijing and 2/3 in Hebei Province. Beijing is suffering serious water shortage. Per capita water resource share is only 255 m³, 1/30 of the world average.



Miyun Reservoir



In the past few decades, Miyun reservoir has been suffering from pollution, sediment deposit ion and reduced recharge amount as a result of harsh natural conditions. The designed water storage capacity of the reservoir was 4,400 million m³, but since 2000 only about 1,000 million m³ water is left.

75% forest in Beijing are un-healthy

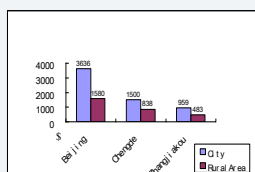
Despite a significant increase in the forest cover from 1.3% in 1949 to 36% in 2005, the quality and ecological functions of forest are relatively low. 75% of the forests in Beijing belong to sub-healthy forests. Ultimately, this has resulted in a reduced biodiversity, apparent instability of the forest ecosystems, and the forest's inability to conserve soil, water and biodiversity. Therefore, forest management improvement has become the overarching challenge for forestry in Beijing.



Local residents of the watershed have been disadvantaged economically

Over the last few decades, local residents of the watershed have been disadvantaged economically, compared to urban residents, as a result of the strict regulations on logging and access to forests. Few income-generating opportunities are available where cash incomes have traditionally been associated with forest product collection.

- **Ban of logging:** 85% ecological forest
- **Ban of grazing:** Since 2003, ban of 120,000 households raising livestock
- **Ban of mining:** By 2007, only 15% of 851 mining companies left
- **Big industry company moved:** 2007, Beijing Steel Corporation moved to Hebei, 60,000 workers were laid off



2008 Annual Income of Residents of Miyun Watershed

Eco-compensation measures

Policymakers in China have become increasingly interested in developing new approaches for environmental policy to address the country's multiplying conservation challenges and resource constraints in face of break-neck economic growth. Large investments and transfer of compensation to rural areas has occurred in the past 10 years in the watershed. These measures are summarized below.

Measure 1: Farmland Conversion Program



In Beijing, all the farmland above 25 degree slope was converted to forest.

- **Scope:** 294,000 farmers
- **Area:** 70,000 hectares
- **Compensation Period:**
 - 1st phase: 2000-2008
 - 2nd phase: 2008-2016
- **Compensation Standards:**
 - Grain: 1,500 kg/ha/year
 - Cash: 300 Yuan/ha/year (\$45)

Total investment: 420 million RMB (62 million USD)

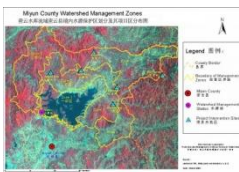


Measure 2: Ecological Migration



There are more than 100,000 people living in the protection zones in Miyun reservoir watershed. Government planned to arrange ecological migration for half of them from the protection zone.

- **Past:**
 - 2000 ~ 2004:** 2,480 people moved, 10,000 Yuan/person (\$ 1,470/person)
 - 2005 ~ 2007:** 11,340 people moved, 14,500 Yuan/person (\$2,130/person)
- **Future: ~ 2020** move another 50,000 people



Measure 3: Create Job Opportunities

In order to further protect the forests in the watershed, improve the quality of water to reservoir, and diversify the income for the local villagers, Beijing government created job opportunities.



- **Forest Warden**
 - 46,908 farmers were hired by 2007
 - Salary: \$60/person/month
 - Tasks: Fire, pest and disease control
- **Water Warden**
 - 10,800 farmers were hired by 2008
 - Salary: \$70/person/month
 - Tasks: Well checking and water body cleaning

Measure 4: Trans-boundary cooperation

1. High level politicians' commitment between Beijing and Hebei Province for watershed management



- Restore 59,700 ha forest in Hebei Province side of watershed
- Beijing government will invest \$1,100/ha
- Total investment: \$15 million

2. Convert 12,200 ha rice plantation to corn in Hebei Province



Beijing government will compensate Hebei farmers by 550 yuan/mu/year (\$1,200/ha/year).

- Saved water = 900 m³/mu (13500 m³ /ha)
- Total saved water = 64 million m³/year
- Reduced fertilizer use = 11,000 tons/year
- Reduced pesticide use = 71 tons/year
- Reduced herbicide use = 18 tons/year

The main problems of current eco-compensation policies and practice

- Compensation standard lacks scientific basis and flexibility
- Eco-compensation mechanism mainly relies on the projects or programs, lacks stability
- Stakeholders didn't have enough chance to be involved and voice their opinions
- Funding channel was simple - it is mainly from government budget
- There was a lack of using marketing measures
- Lack of monitoring and evaluating system for the ecological function of the restoration
- Vulnerable groups are mainly involved in the programs

Common challenges in China and US

- Lack of cooperation among different agencies for landscape conservation
- Lack of trans-boundary cooperation
- It is difficult to monetize ecosystem services
- It is difficult to identify buyers of eco-system services
- The evaluation process is complex, and makes the transaction cost high
- It takes time to set up a market to trade eco-system services



Advantages in China



Government leadership

- Chinese government has taken the leading role to organize the Payment for Ecosystem Services
- It is more efficient to rescue threatened and degraded ecosystems, making decisions fast.
- Government allocates lots of resources and money on the ecological construction

Advantages in the US

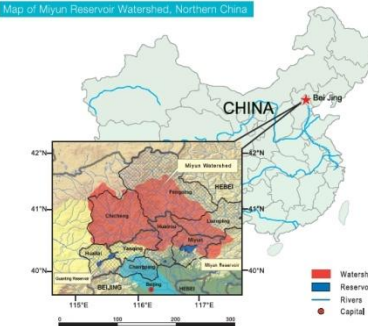


Government debate

- Less population, less pressure on the ecosystem services
- Non-profit organizations are more active to promote compensation for ecosystem services. e.g. Ecotrust, Willamette Partnership
- Tax system encourages public and donors to contribute to conservation
- More stakeholder participation for decision making.

Conclusion and Recommendations

Map of Miyun Reservoir Watershed, Northern China



- Ban of logging doesn't mean good forest management. There has been a growing interest in replacing the strict logging ban with a sustainable forest development strategy that better serves watershed functioning, forest conservation and forest-based incomes for local residents.

- Besides the eco-compensation from public sector, developing market of Non Timber Forest Products (NTFPs) for poorest households needs to be introduced to the watershed area.

- Poverty alleviation—especially in developing countries where the rural poor tend to rely heavily on natural resources—should include a strategy that involves full participation by stakeholders, equitable government power, and policies which encourage the market to value ecosystem services.

- Usually the ecosystem services are beyond the administrative boundary, and each administration agency. A platform of trans-boundary and inter-sector cooperation needs to be set up. A systematic and comprehensive ecosystem management plan is very necessary. A more market based eco-compensation system is expected and needed.