Issues Related to Confirmation of Irrigation Water Rights to Farmers in China

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1. Introduction

- Water shortage is serious in China. Since 2011, Chinese Government implemented the stringent water resources management to achieve sustainable development.
1. Introduction

- Measures: decompose red line index and step targets, put strict caps on water consumption and strengthen source management.
- Finished the breakdown of the total water consumption control at top 4 levels.
1. Introduction

- In China, agriculture is the largest water user. Irrigation water saving is important.
  - Irrigation water use remains around 340 billion m³ per year in past 40 years.
  - Irrigation water use generally zero increasing was required by central government.
  - Step-by-step decomposition and confirmation of irrigation water rights was required to promote irrigation water saving.
2. Challenges

- The confirmation of irrigation water rights to farmers is an important task and a huge project.
  - In 2018, China had 790 million farmers. Arable land per farmer was only about 0.17 hectares (34% of average value worldwide), and geographically scattered.
  - Irrigation water is related to the rights and interests of hundreds millions of farmers.

Planting structure map of Gaochang district
2018, Turpan, Xinjiang
2. Challenges

- Under county level, the quantity of water supply is not match to water demand.
  - Water consumption control index in county level from top to down is an average value.
  - Water supply and demand of each stakeholder (township, village and farmer) are different.
How to confirm irrigation water rights to farmers?
3. Method

Through summarizing practices and experiences all around China

“Five-step” method

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3rd World Irrigation Forum & 70th IEC Meeting
1-7 September 2019, Bali, Indonesia
3. Method

Step 1: Decompose the control index of total water consumption from top to bottom. —County level

- Based on: actual water supply and consumption over years
- According to 3 principles for water consumption: priority to domestic, reasonably increasing ecological, and strictly controlling irrigation
- To decompose: from county-level to township and village levels
- To subdivide: domestic, ecological, industrial, agriculture(irrigation)

Step 2: Calculate irrigation water demand from bottom to top. —Village levels

- Investigation: irrigation water supply construction, irrigation water supply structure and other basic information
- Based on: development planning of township and village
- To determine irrigation water supply(value B1) in different years
- To calculate irrigation water demand(value B2): based on crop irrigation quota, irrigation area, and agricultural planting structure
- To compare value B1 and value B2, take a small value(value B)
3. Method

Step 3: Integrate up and low levels to verify the irrigation water index.
• In order to meet the reasonable demand of all water users and not to surpass the carrying capacity of local water resources.
• To comprehensively compare value A and value B of the above two steps.
• Take a small value (value C) as the final control index of total irrigation water consumption at village level.
• To Determine control index of irrigation water consumption per hectare or per capita.
3. Method

Step 4: Register irrigation water rights to farmers.
- Based on the control index of irrigation water consumption per hectare or per capita.
- Comprehensive considering land contracted area, irrigation area per capita, population and so forth.
- To issue irrigation water right certificates to farmers by county water resources management bureau.

Step 5: Push forward irrigation water rights trade.
- To establish online and offline water right trade platform.
- To establish the system for government repurchase of water rights.
4. Case study

- Location: Zhongba Village, Luliang County, Yunnan Province
- Irrigation area: 530.67 ha
- Population: 2245 in 2016

Water use Indicators

Qujing City
Luliang County 310 million m³
Xiaobaihu Town 45 million m³
Zhongba Village 3.5 million m³
the Pilot Area 2.68 million m³

Quota

Provincial water quota
Agree by Zhongba Limin Cooperative of Rural Water Users
Luliang County Bureau of Quality and Technical Supervision

Water Certificate

Luliang County Government
Authorize
Water Authority of County
Entrust
Water certificate for Zhongba Limin Cooperative of Rural Water Users
Water certificate for farmers
4. Case study

- This method has been applied in the study area successfully.
- In 2016, the National Irrigation Reform Site Conference was held at the study site.
- The conference advocated the promotion and application of this method throughout the country.
5. Conclusions

• “Five-step” method solved the problem of how to match the relationship between supply and demand of users at different levels under county, and could confirm water rights to farmers reasonably.

• After the confirmation of irrigation water rights to stakeholders, the new task facing China is how to manage irrigation water rights and promote irrigation water rights trading, and stimulate the driving forces of farmers to save water.
Thank you!