Transformation of agricultural value chains and collective action in irrigated areas

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Content

Institutional Change in Land-Labpr Relations in Irrigated Areas of Central Asia (AGRICHANGE)

• More into the project motivation
• Project profile
  – Objectives, research clusters, work packages
• Supply chain development
• Farmers’ cooperation in water use
Reinterpreting ‘Malthusian Trap’
Business as usual

Minimum income required to sustain modernization, \( D \)

Income generation, \( Y(X) \)

Stable equilibria may be inefficient and costly to leave

Degree of modernization (\( X \))

Transition

Growth

Potential growth

Point of collapse

Malthusian trap

\( Y, D \)
Reinterpreting ‘Malthusian Trap’
Degradation of resources

Minimum income required to sustain modernization, $D$

Income generation, $Y(X)$

Growth

Degree of modernization ($X$)

Point of collapse

Malthusian trap

$Y, D$

$X^0$

$X^*$

$X^*$
Reinterpreting ‘Malthusian Trap’
The Innovation enters!

- Escaping trap via large investments (subsidies)
- Change underlying parameters of the income generation function
Modernization environment

- Technical innovation (change)
- Institutional innovation (change)
- Costly physical infrastr.
- Costly Institutional env.

Path dependent environment
Evolutionary approach to institutional change

Institutions $t$ → Institutions $t+1$

Institutional divergence

- New farm organizations
- New forms of individual farms
- Innovations & modernization
- Trade and exports

Critical juncture

- Reinvention of informal institutions
- Lack of farm cooperation
- Slow innovation adoption
- Slow supply chain development
AGRICHANGE research objectives

1. **Analyse institutional change** in Central Asian agriculture, based on a comparison of two irrigation-dependent farming regions in Kazakhstan and Uzbekistan

2. Understanding the institutional change by **promoting theory development**, fertilised by multidisciplinary empirical insight

3. **Integrate local universities** into international academic networks
Institutions as innovations

Institutional change in:

<table>
<thead>
<tr>
<th>Type of interaction</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer – Processor</td>
<td>Contracts in supply chains</td>
</tr>
<tr>
<td>Farmer – Farmer</td>
<td>Water use cooperation</td>
</tr>
<tr>
<td>Farm manager – Farm worker</td>
<td>Labor effort incentives</td>
</tr>
</tbody>
</table>
Transformation of agricultural value chains

Key research questions:

• How has the organization of value chains evolved and how can these changes be explained?

• What is the impact of contract farming on farm income and performance?

• What are the determinants of collective action among farmers in supply chains?
How has the organization of value chains evolved and how can these changes be explained?

Example: Cotton supply chain in Kazakhstan

Prior to 2007

Producer

Gin

Bank

International trader

Input suppliers

Contract services

Textile Mill

Post 2007

Producer

Gin

KazAgroGaran

Traders

Bank

International trader

Input suppliers

Contract services

Textile Mill

Source: Oshakbayev et al. (2016) based on Sadler (2006)
Effect of the 2007 law

Source: Oshakbayev et al. (2016)
What is the impact of contract farming on farm income and performance?

• Emergence of contract farming played a prominent role in the development of supply chains in both regions

Examples:
- cotton producers and gins/traders in South Kazakhstan
- vegetable/fruit producers and processors in Uzbekistan

Although contract farming is often linked to productivity increases, technological transfer etc., establishing a definitive causal relationship is challenging (Dries and Swinnen, 2004; Gow and Swinnen, 2001).
What are the determinants of collective action?

Through the lens of transaction economics

<table>
<thead>
<tr>
<th>Intensity &amp; Mechanisms of Control:</th>
<th>Price</th>
<th>Minimal Equity</th>
<th>Medium Equity</th>
<th>High Equity</th>
<th>Hierarchy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Specificity</strong></td>
<td>Very Low (1)</td>
<td>Low (2)</td>
<td>Intermediate (3)</td>
<td>High (4)</td>
<td>Very High (5)</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>Very Low (1)</td>
<td>Low (2)</td>
<td>Intermediate (3)</td>
<td>High (4)</td>
<td>Very High (5)</td>
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<tr>
<td><strong>Uncertainty</strong></td>
<td>Very Low (1)</td>
<td>Low (2)</td>
<td>Intermediate (3)</td>
<td>High (4)</td>
<td>Very High (5)</td>
</tr>
<tr>
<td><strong>Externalities</strong></td>
<td>Very Low (1)</td>
<td>Low (2)</td>
<td>Intermediate (3)</td>
<td>High (4)</td>
<td>Very High (5)</td>
</tr>
</tbody>
</table>
Rural cooperation & collective action

Key research questions:

• What are the determinants of cooperative behaviour among Central Asian farmers?

• What institutional setting enables better cooperative result? And how does it happen?

• What synergy of institutions could lead the current decentralized irrigation water management of the region into cooperative solution?
## Simplified overview of Central Asian irrigation water governance path

<table>
<thead>
<tr>
<th>Irrigation management</th>
<th>Governance structure</th>
<th>How did it function?</th>
<th>How coordination was approached</th>
</tr>
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<tbody>
<tr>
<td>7-19 centuries (Traditional settings)</td>
<td>Market-community-state-synergy</td>
<td>- <strong>Election-sanctioning</strong> by the water users; -Reliance on water users’ free labor (hashar) -<strong>Federation of water management</strong> -Supportive legal env.</td>
<td>Institutional <strong>complementarity</strong>- successfully and continuously handled the coordination</td>
</tr>
<tr>
<td>19 century (Tsarist intervention)</td>
<td>State community-synergy</td>
<td>-Irrigation staff – civil servant -Reliance on water users’ free labor (annual hashar)</td>
<td>Institutional <strong>crowding out</strong> leading to weak community-failed to handle the coordination</td>
</tr>
</tbody>
</table>
## Simplified overview of Central Asian irrigation water governance path

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</table>
| **20th century** (Soviet and early post-soviet years) | State (and created communities – kolkhozes) | - Irrigation staff - civil servant (fixed wage)  
- Water user – worker with fixed wage | **Coercive coordination of cooperation** |
| Present time | Market-community-state-synergy | - Irrigation staff/WUA – civil servant (fixed wage);  
- Reliance on water users’ contribution (hashar) and payment  
- Legal supportive environment | ????
Project structure

WP A: Database

WP B: Transformation of agricultural value chains

WP C: Organization of rural labor

WP D: Rural cooperation & collective action

WP E: Synthesis & follow-up

WP F: Capacity building

Scientific Reflection Board
Multidisciplinary & international

IAMO Germany

KazNAU Kazakhstan

SamAI Uzbekistan
PhD studies

- Land market development and its influence on agricultural land use in Kazakhstan
- Transformation of agricultural value chains
- Organization and management of farm labor
- Access to agricultural services and impact on farm productivity in Samarkand
- Modernization of public administration in of agrisector in Kazakhstan
- Options for promoting farm cooperation in water use in Samarkand
- Rural cooperation and collective action in irrigated areas of Central Asia
Cross regional & longitudinal data base

- Literature review
- Historical analysis
- Longitudinal data from official statistics
- Cross-sectional farm surveys
- Qualitative interviews with key stakeholders
- Innovative methods such as experiments, participant observation, group discussions
Thank you!

www.iamo.de/agrichange