



Martin Petrick

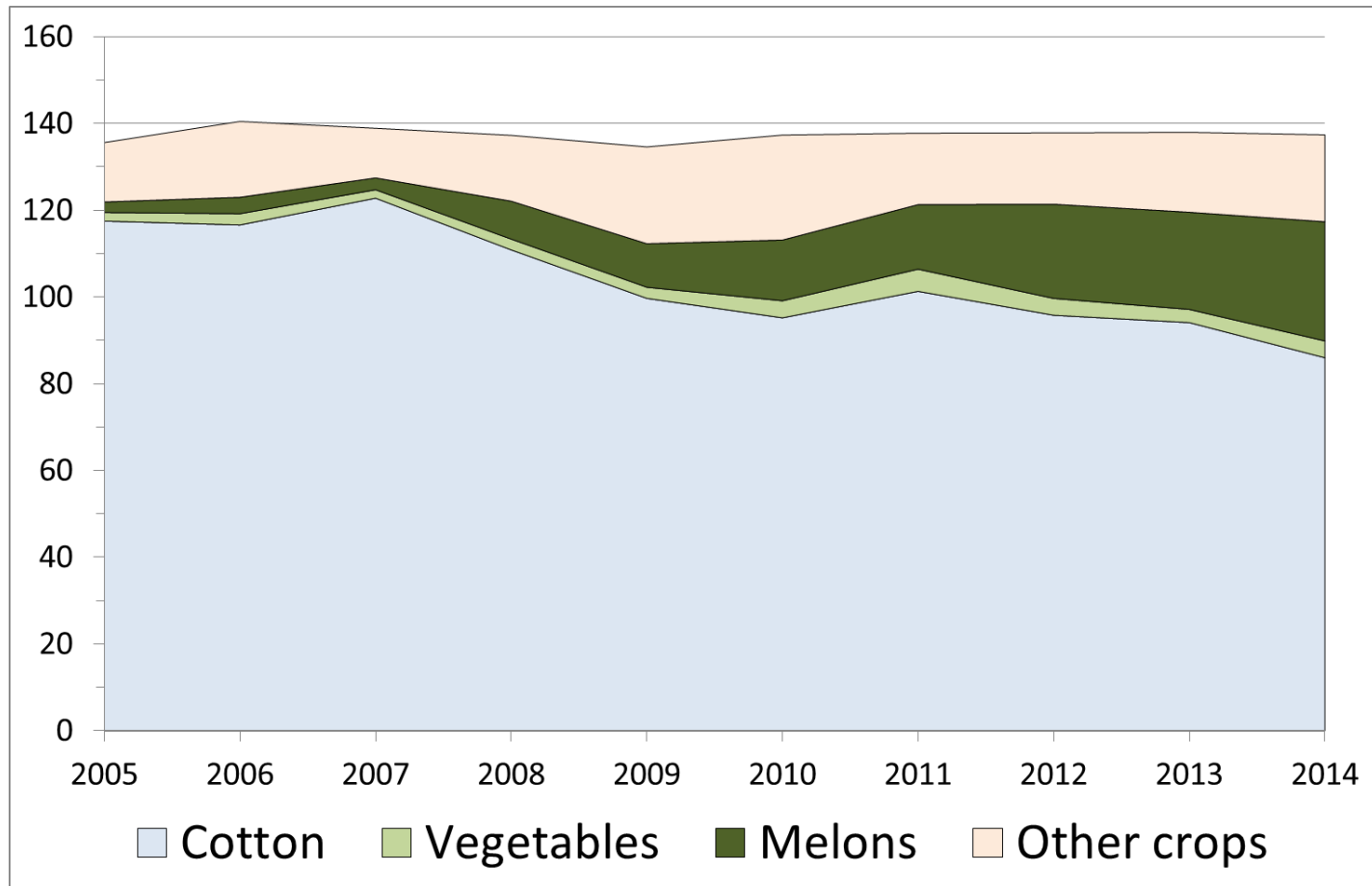
The use of social science for agricultural development policy

The use of social science for agricultural development policy

- Measuring social reality
- Isolating social laws of human behaviour
- Informing institutional & policy change
- Contributing to public discourse

Inspired by Streeck 2009.

Sown area in Maktaaral district, Kazakhstan



Source: Kazakhstan Statistical Agency.

Introducing social laws of human behaviour

- **Social interaction:** A situation involving more than one person/party, where one's actions affect both their own and other people's outcomes.
- **Strategic interaction:** A social interaction where people are aware of the ways that their actions affect others.
- **Strategy:** Action(s) that people can take when engaging in a social interaction.

For details visit <http://core-econ.org/>

If social interaction was a game

- **Players** – who is involved in the interaction
- **Feasible strategies** – actions each player can take
- **Information** – what each player knows when choosing their action
- **Payoffs** – outcomes for every possible combination of actions

Simplifying assumptions

- No other people involved or affected
- No other decision to take than which crop to grow
- Aida & Boris interact only once
- They decide simultaneously, without knowing what the other does

The crop choice game

	Boris	
Aida	Cotton	Melons
Cotton		
Melons		

The crop choice game

	Boris	
Aida	Cotton	Melons
Cotton	<p>Lots of cotton produced Low cotton price Shortage of melons Aida does not produce melons at which she is good</p>	<p>Balanced supply of crops High prices for both crops Both produce crops at which they are not so good</p>
Melons	<p>Balanced supply of crops High prices for both crops Both produce crops at which they are good</p>	<p>Lots of melons produced Low melons price Shortage of cotton Boris does not produce cotton at which he is good</p>

The crop choice game

	Boris	
Aida	Cotton	Melons
Cotton	<p style="text-align: right;">3</p> <p>1</p>	<p style="text-align: right;">2</p> <p>2</p>
Melons	<p style="text-align: right;">4</p> <p>4</p>	<p style="text-align: right;">1</p> <p>3</p>

What is their best response?

	Boris	
Aida	Cotton	Melons
Cotton	<p style="text-align: center;">3</p> <p>1</p>	<p style="text-align: center;">2</p> <p>2</p>
Melons	<p style="text-align: center;">4</p> <p>4</p>	<p style="text-align: center;">1</p> <p>3</p>

What is their best response?

	Boris	
Aida	Cotton	Melons
Cotton	1 3	2 2
Melons	4 4	3 1

A dominant equilibrium

	Boris	
Aida	Cotton	Melons
Cotton	1 3	2 2
Melons	4 4	3 1

Crop choice as an “invisible hand game”

Both Aida & Boris simply pursuing their self-interest yielded:

- the best of four possible outcomes for each player
- the largest payoffs for both Aida & Boris combined
- the outcome they would have chosen if they had coordinated their action beforehand

Are people entirely selfish?

- “Homo economicus” (economic man) = selfish & calculating character of economic textbooks
- Experience & experiments show that people display altruism, reciprocity & aversion to inequality
- Behavioural assumptions should be made dependent on context

The pest control game

- “Terminator” chemical: inexpensive, kills every insect, leaks into the groundwater
- “Integrated pest control”: introduces beneficial insects which eat the pest insects

If both farmers use Terminator, water contamination requires buying a filtering system

The pest control game

	Boris	
Aida	IPC	Terminator
IPC	Beneficial insects spread over both fields, eliminating the pest No water contamination	Boris' chemicals spread to Aida's field & kill the beneficial insects Limited water contamination
Terminator	Aida's chemicals spread to Boris' field & kill the beneficial insects Limited water contamination	Eliminates all pests Heavy water contamination Requires costly filtration system

The pest control game

	Boris	
Aida	IPC	Terminator
IPC	3 3	4 1
Terminator	1 4	2 2

What is their best strategy?

	Boris	
Aida	IPC	Terminator
IPC	3 3	4 1
Terminator	1 4	2 2

Pest control as a “prisoners’ dilemma”

- Both Aida & Boris pursuing their self-interest yielded an unfavourable outcome for both of them
- Their joint IPC use always threatened by “free-riding”
- Both have an interest in alternative outcome

Can selfishness lead to the common good?

- Markets can harness self-interest to improve the workings of the economy (“invisible hand”)
- Sometimes unregulated markets fail & lock players in self-harm (“social dilemma”)

Why Aida & Boris could not reach their best outcome

- No value placed on the outcome for the other person, costs of the other not “internalised”
- None of them was held accountable for the harm caused by the insecticide
- Inability to reach an agreement beforehand (= absence of regulation)

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Informing policy change using field experiments

- Incentives & rules common to all subjects, while field setting preserves cultural context
- Control of confounding factors
- Subjects have financial stakes, so decisions have consequences (other than in survey questions)
- Replication possible

Elinor Ostrom
1933 – 2012



© Holger Motzkau (2010)

An example: Free riding among farmers in Central Asia

- Field experiments involving 235 farmers in 12 villages in Samarkand & Maktaaral in 2016 (conducted by Iroda Amirova)
- Framed as **contribution to an irrigation infrastructure public fund** with subsequent water withdrawal
- Repeated interaction by constant group of farmers within sessions
- Two types of “treatment”:
“communication” (= self-governance) & “punishment”

Farmer field experiments in Central Asia

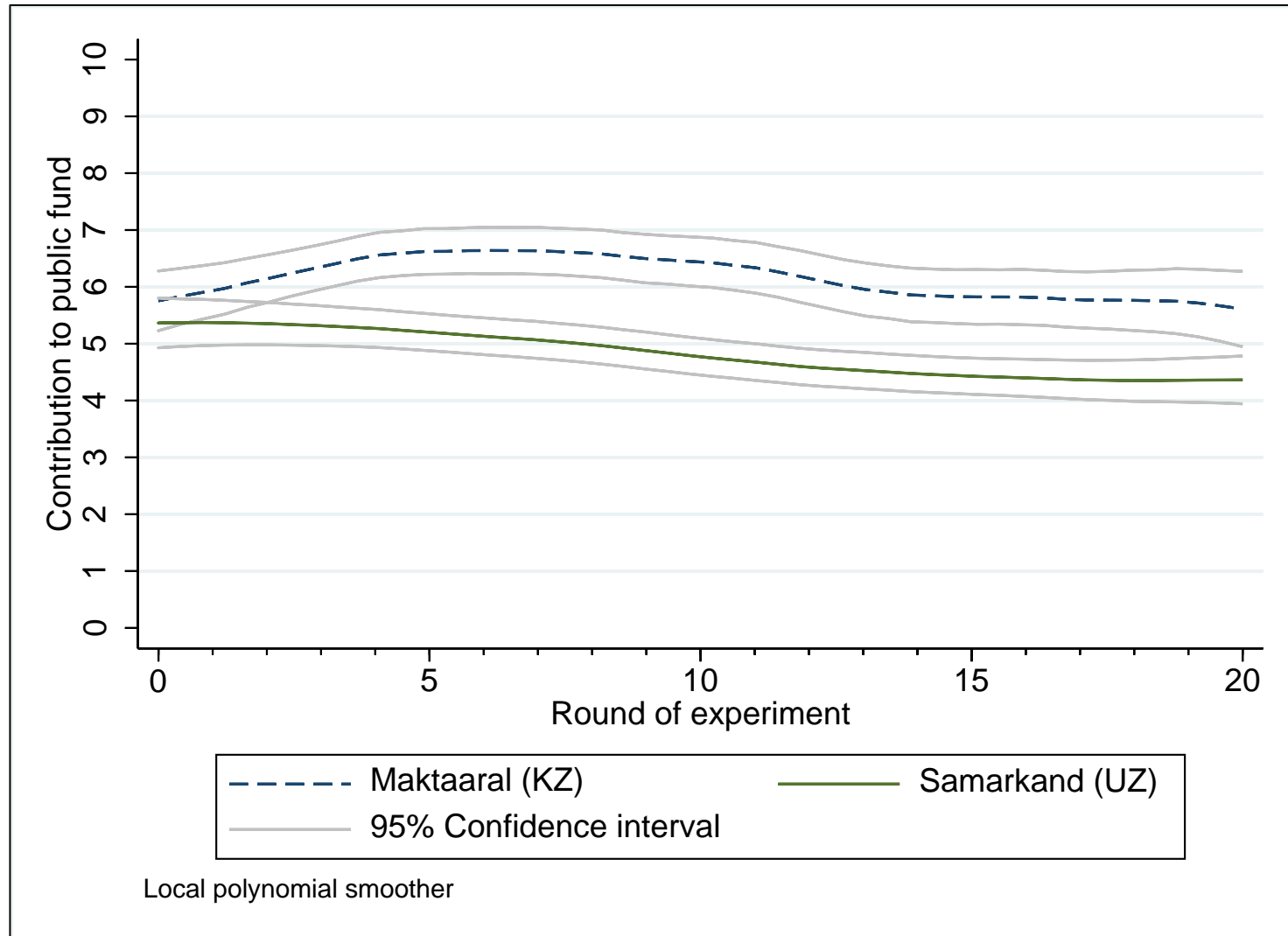


Photos by Iroda Amirova.

Hypotheses

- Purely selfish players contribute nothing
- Contributions in Samarkand are higher than in Maktaaral
- Communication & punishment increase contributions

Findings: contributions by country (baseline)



Treatment effects on contribution to public fund

Treatments	Maktaaral (Kazakhstan)	Samarkand (Uzbekistan)
Communication	8.1 ***	11.8 ***
Low penalty	0.1	0.5
High penalty	- 4.8 **	-1.0

*** (**): significant at 1% (5%) level. Partial results of a larger regression model of public fund contributions in % of individual endowment.

Source: Amirova / Petrick /Djanibekov 2019, Long- and short-term determinants of water user cooperation: Experimental evidence from Central Asia, World Development 113.

<https://doi.org/10.1016/j.worlddev.2018.08.014>

Farmers contributed more if

- Others contribute more in preceding round
- Farm size deviate less from group average
- Game position at water source was more upstream
- Their formal education was higher

Implications of field experiments in Central Asia

- Positive communication effect on contribution:
self-governance should be possible
- No desirable penalty effects (even crowding out):
reconsider command & control policies
- Kazakhstani farmers contribute more than
Uzbekistani:
No long-term effects of historical water cooperation

The power of ideas

“The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood.... I am sure that the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas.... soon or late, it is ideas, not vested interests, which are dangerous for good or evil.”

John Maynard Keynes
1883 – 1946

Contributing to public discourse

- Any political practice, even the most pragmatic, must begin with certain assumptions (theories) about the functioning of the world
- Much depends on whether these theories are indeed correct
- Knowing whether they are requires rigorous criticism & thorough discussion

Academia is the place to pursue this form of enlightenment.

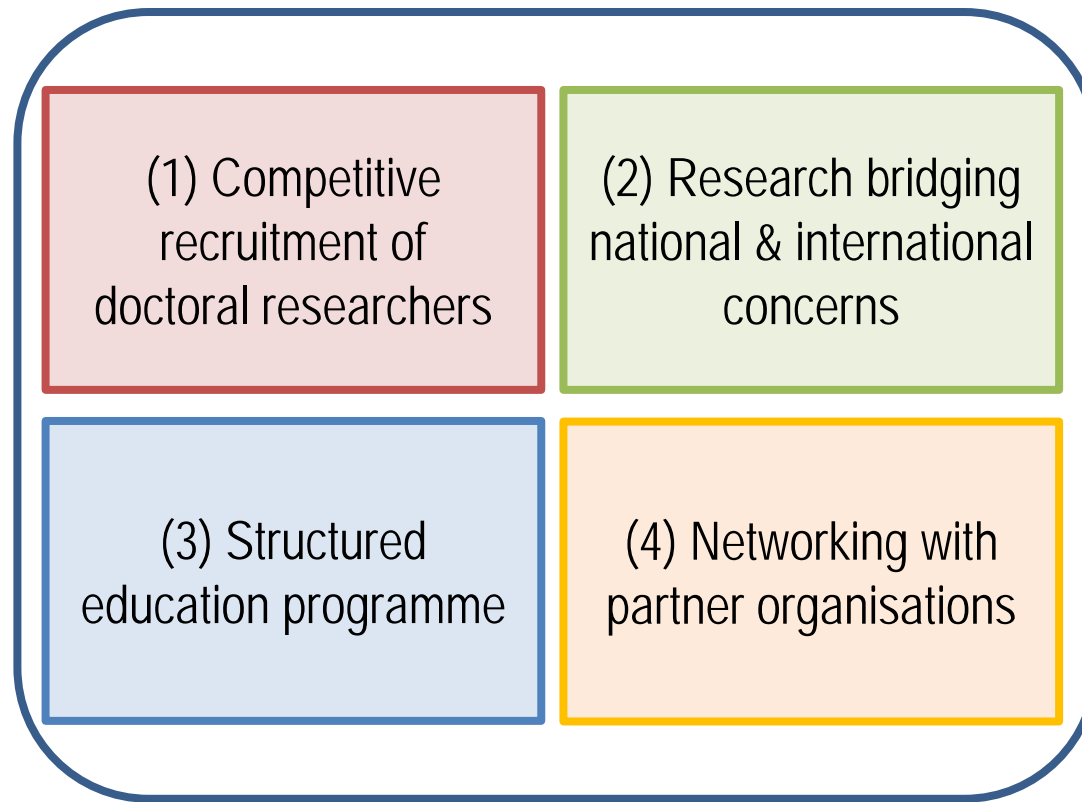
There is little more practical than the disciplined examination of the theoretical premises of political activity.

Our vision for Uzbekistan

- Creating a challenging, collaborative research environment for **doctoral researchers**
- Based at TIAME
- Established & maintained jointly with German & international partners
- Financially supported by Volkswagen Foundation & Government of Uzbekistan



Guiding Principles of the Graduate School



SUSADICA – Structured doctoral programme on Sustainable Agricultural Development in Central Asia

- Financial support by Volkswagen Foundation, Germany
- Government of Uzbekistan provides stipends, outreach support, travel grants for lecturers
- Kick-off workshop for 10 PhD positions in Halle (Germany) in March 2019
- May – October students stay in TIAME / fieldwork in Central Asia



Future SUSADICA activities to engage in

- Weekly **Agricultural Development Seminar** in English Language starting soon
- **Training Module** “Economic Development of post – Soviet Central Asia”, 17-21 June 2019 held by Richard Pomfret, University of Adelaide **open for external applicants**

Check it out on <https://www.facebook.com/susadica/>

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