



Inter-University Research Institute Corporation
National Institutes for the Humanities
**Research Institute for
Humanity and Nature**

Transition of Irrigation Governance in Southern Turkey

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Hironori HAMASAKI (Nagasaki University)

Ufuk GULTEKIN (Cukurova University)



ÇUKUROVA UNIVERSITY



長崎大学
NAGASAKI UNIVERSITY

Outline

1. Introduction

- Geographical & historical background
- Setting research objective

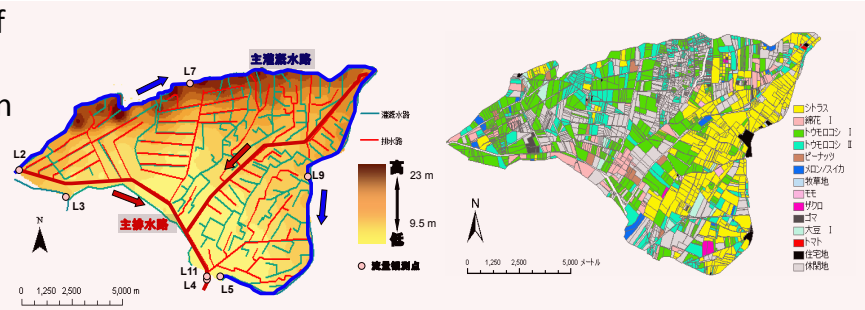
2. Method and Result of WTP survey

- Research methodology – Willingness to Pay (WTP)
- Summary of survey result

3. Conclusion

- Policy recommendation
- Future study

Integrated understanding of the impacts of institutions, technologies and outlook on natural resources of water users related to water resources management.



TURKEY

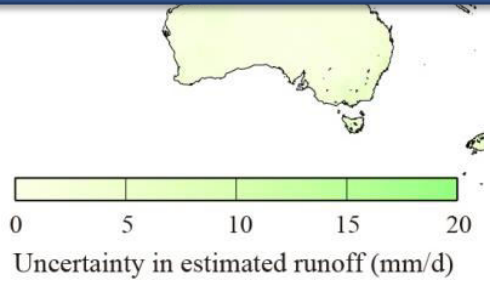
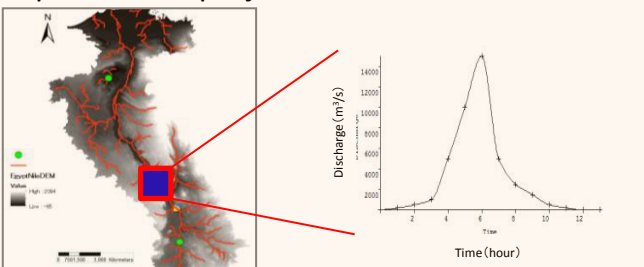
Examination of water resources management by clarifying water users' recognition of allocation and understanding water quality characteristics.



For more details about “Designing Local Framework for IWRM”, please visit their website!
http://www.chikyu.ac.jp/rihn_e/project/C-09.html

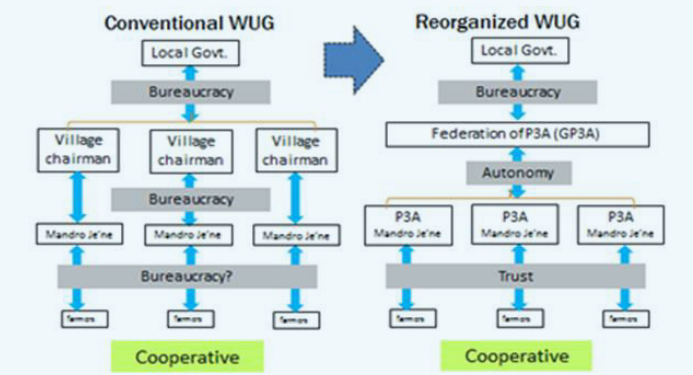
EGYPT

Historical elucidation of local water resources management based on reconstructions of stream flow and evaluation of irrigation improvement projects.



GLOBE
 Bayesian uncertainty analysis and numerical simulation linking local cases and global water resources dynamics: towards pro-humanistic assessment.

systems in humid areas and attempts to co-creation of knowledge between science and society.



Background

► Location

- Lower Seyhan Basin, south part of Turkey

► Climate

- Semi-arid region
- Average annual rainfall: 640mm
(W. Scheumann, 1997: 81)

► Lower Seyhan Irrigation Project started in 1950's

- Seyhan Dam was completed and it started operating in 1956.
- 87% storage of water for irrigation
- Arable land area: 175,000ha
(W. Scheumann, 1997: 84)

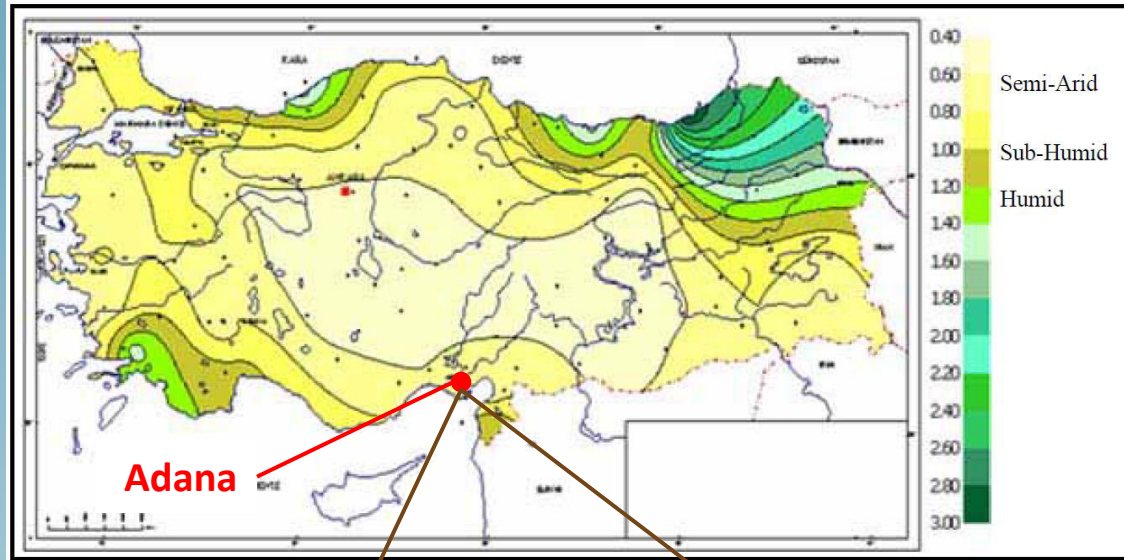
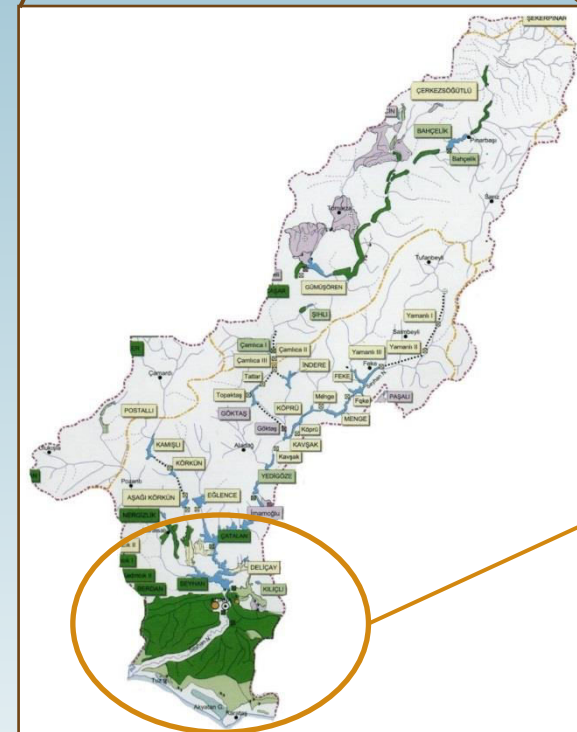


Figure 2.1 Aridity assessment of Turkey based on P/PET relation

source:
DSi (2009: 6)



Lower
Seyhan
Basin

source:
DSi (2010: 23)

Historical background: Transition of governance

Top-down management by DSI (1960's – 80's)

- Increase in the cost of O&M .
- The government tried to cut budget so that a small government has been preferable since 1980's.
- DSI couldn't provide enough service to beneficiary farmers due to budget cut

Transfer of water management to WUAs (90's – 2000's)

- WUAs have difficulties in collecting water fee.
- WUAs don't have enough budget to operate and maintain irrigation facilities by themselves.
- They can't deal with some environmental problems like salinization and erosion.

Return to top-down management by DSI (2010's –)

- Turkish government has enacted New Water Law.
- It doubled water fee and forced WUAs to secure 40% of their budget for O&M and 20% for personnel.

Setting research objective ...

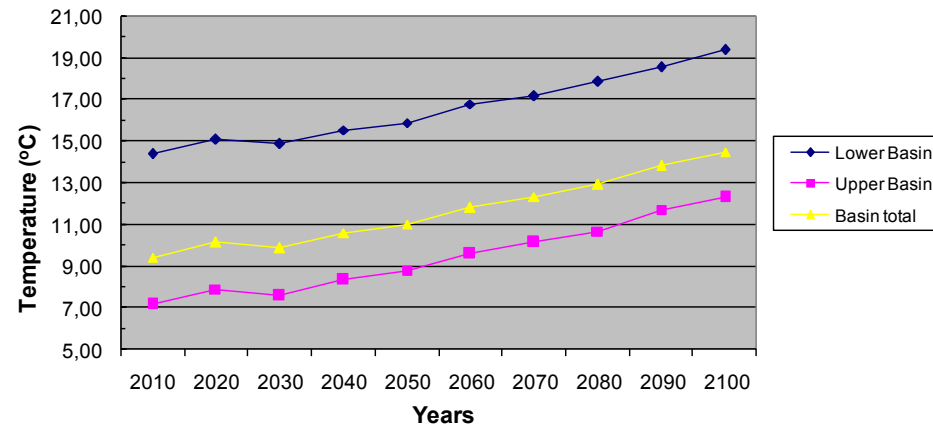
▶ Water saving is required...

- It is projected the available amount of water will decrease by about 20% in the future
- Overuse of water and fertilizer causes salinity problem.

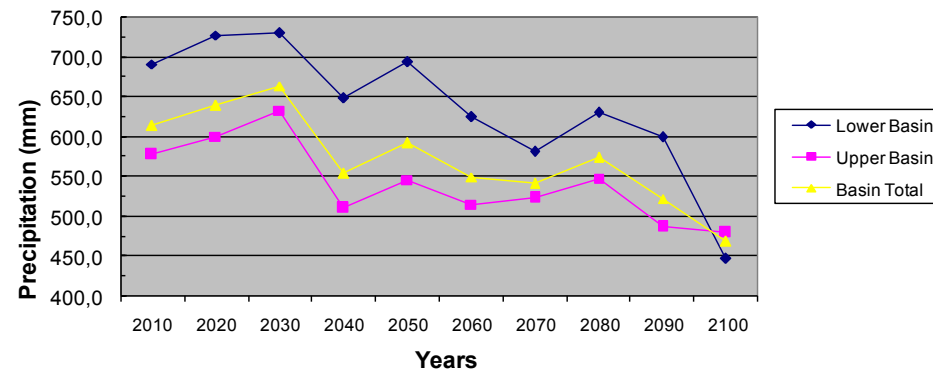
▶ Research objective

- To reveal the gap between farmers' behavior and their perception of water use
- To recommend policy proposal about irrigation governance in this region

Lower Basin, Upper Basin and Basin Total
Annual Averaged Temperature(°C)



Lower Basin, Upper Basin and Basin Total
Annual Averaged Precipitation(mm)

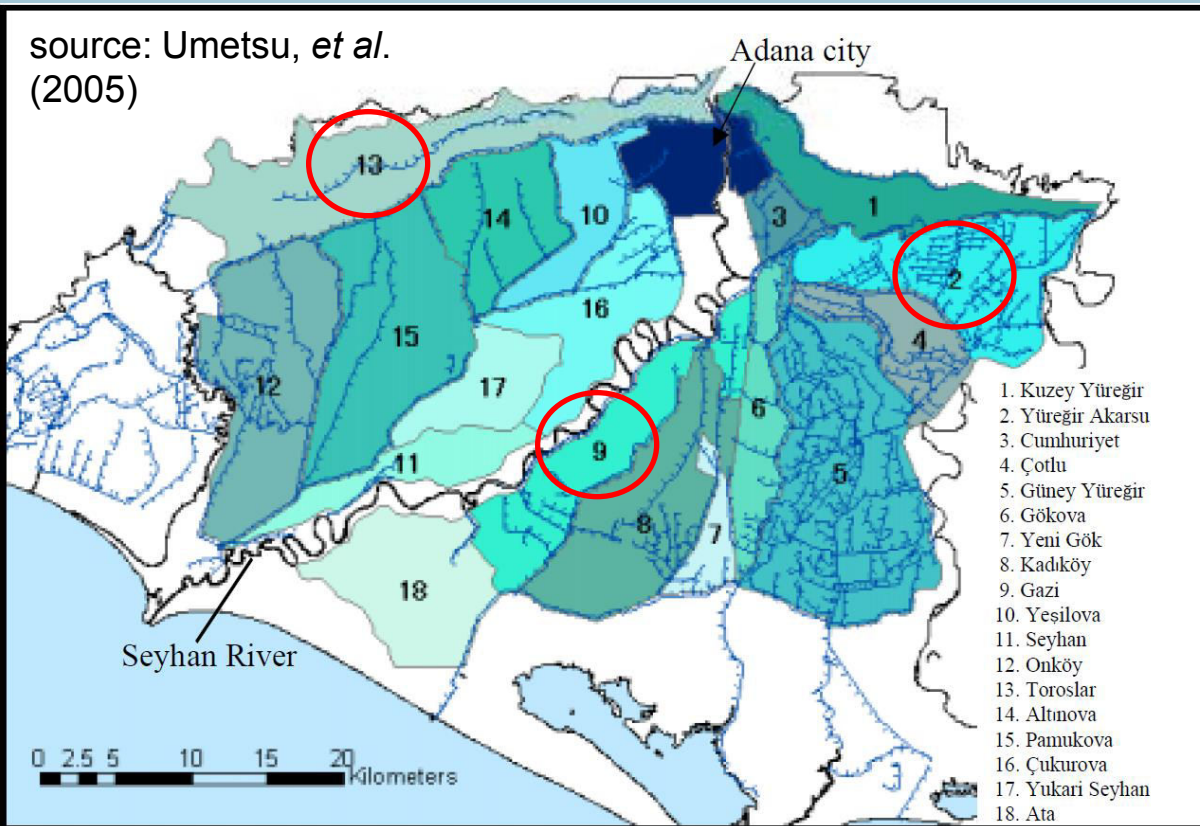


Outline of WTP survey

► Methodology of WTP questionnaire

- We have selected 3 out of 18 WUAs, based on local characteristics and collection ration of water fee (as of 2005)
 - Toroslar (Western part, collection ratio: 50%) – bad case
 - Akarsu (Eastern part, collection ratio: 64.8%) – not good case
 - Gazi (Central part, collection ratio: 84.4%) – good case

source: Umetsu, *et al.*
(2005)



- We chose 90 HHs (30 HHs in each WUA) by random sampling.
- Consider relation between the WTP and their behavior.

Methodology of WTP: MBDC

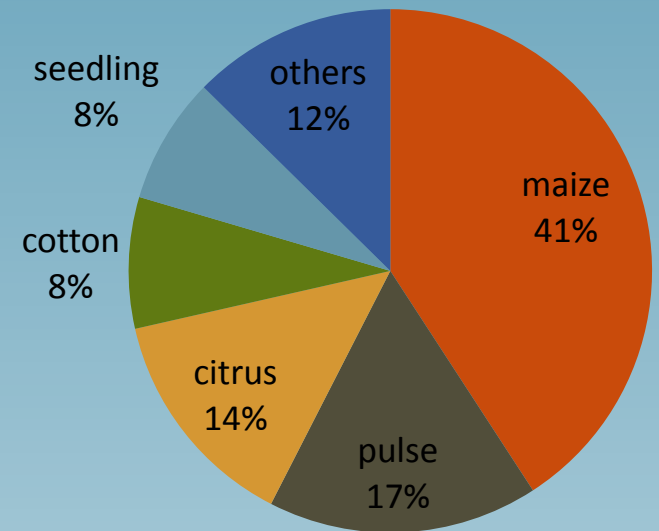
- ▶ Our methodology of WTP questionnaire in LSP
 - MBDC (Multi-bounded Discrete Choice)
 - Individual WTP depends not on the particular price but certain distribution (Wang, *et al.* 2010)
 - MBDC is one of CVM (Contingent Valuation Method)
 - How to ask questions
- “If you can get better, improved irrigation environment, how much water fee are you willing to pay in compensation for that.”

Water fee // your opinion	Very low, easily acceptable	Not high, acceptable	Barely acceptable	High, rejection	Too high, strong rejection
20 TL/da, year					
30					
40					
50					
60					

Result of WTP survey

► Multiple-bounded discrete choice card – in case of maize

- Total number of HHs: 46 (Gazi: 15, Akarsu: 17, Toroslar: 14)
- Mean current water fee: 28.1 TL/da



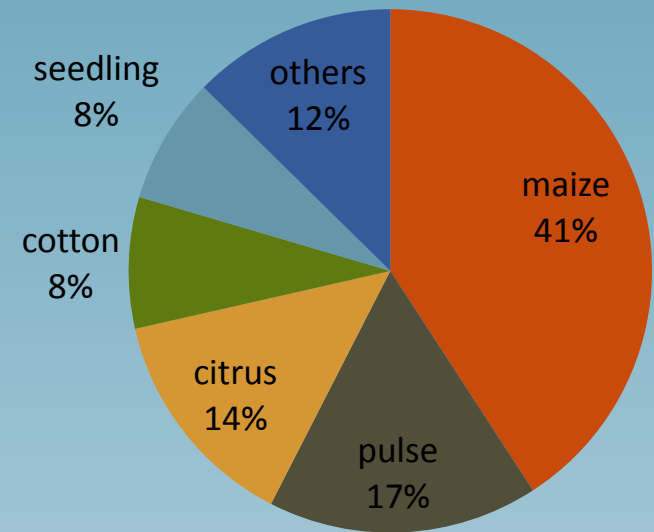
Cultivation area ratio in LSP in 2013
source: DSI (2014)

Price (TL/da)	Very low, easily acceptable (%)	Not high, acceptable (%)	Barely acceptable (%)	High, rejection (%)	Too high, strong rejection (%)	Total (%)
5	84.78	10.87	4.35	0.00	0.00	100.00
10	56.52	21.74	21.74	0.00	0.00	100.00
15	21.74	17.39	54.35	6.52	0.00	100.00
20	0.00	6.52	60.87	32.61	0.00	100.00
25	0.00	0.00	23.91	50.00	26.09	100.00
30	0.00	0.00	4.35	43.48	52.17	100.00
35	0.00	0.00	2.17	2.17	95.65	100.00
40	0.00	0.00	0.00	2.17	97.83	100.00
45	0.00	0.00	0.00	0.00	100.00	100.00
50	0.00	0.00	0.00	0.00	100.00	100.00

Result of WTP survey

► Multiple-bounded discrete choice card – in case of lemon

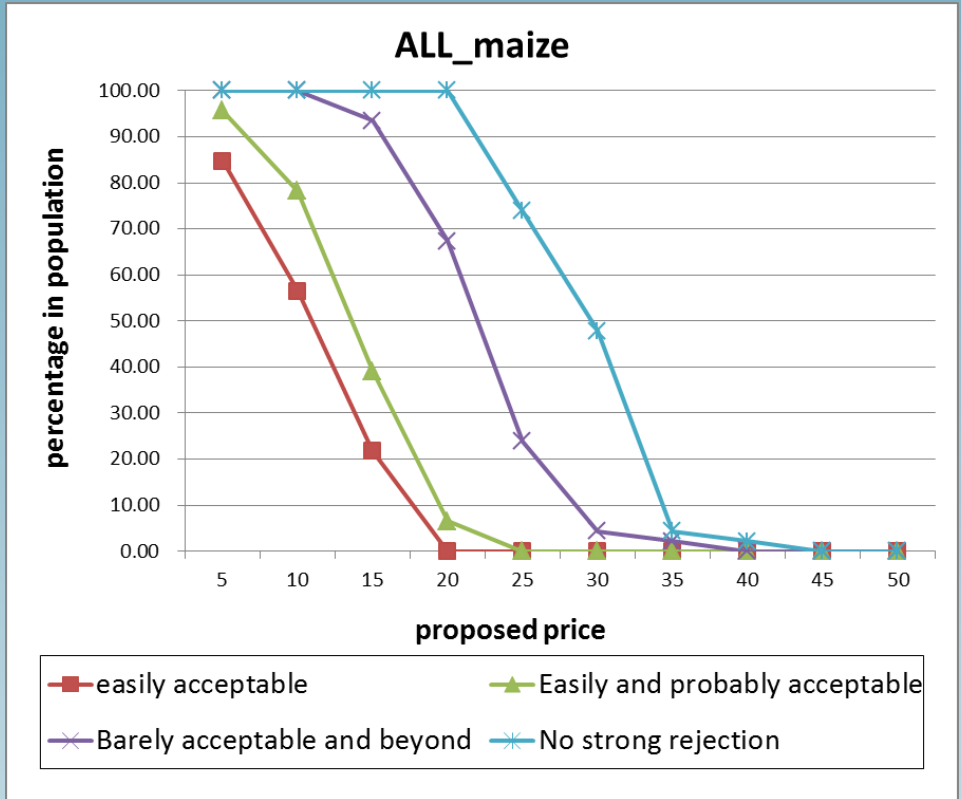
- Total number of HHs: 20 (Gazi: 6, Akarsu: 6, Toroslar: 8)
- Mean current water fee: 44.6 TL/da



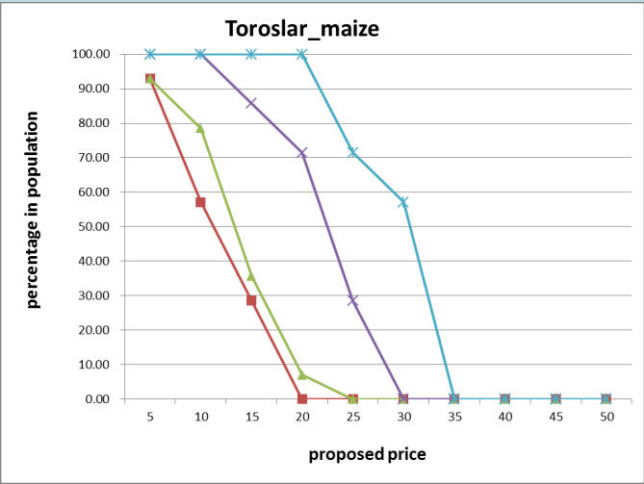
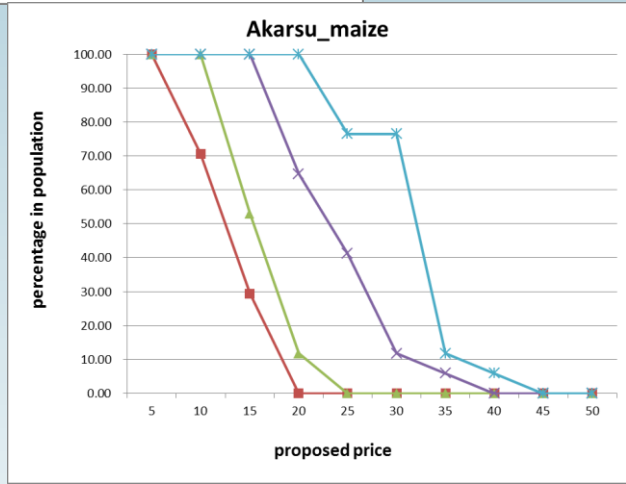
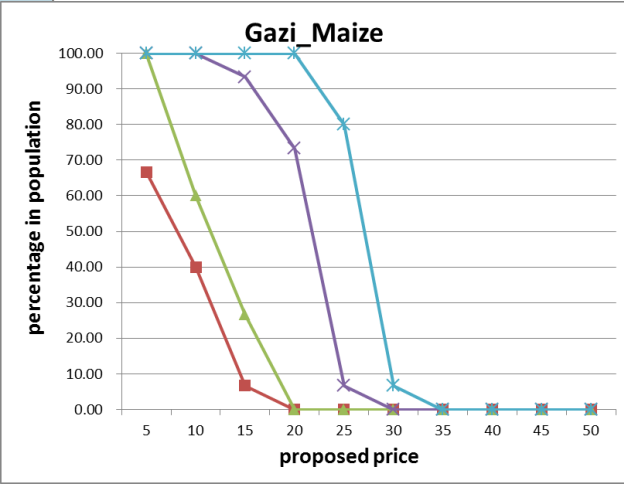
Cultivation area ration in LSP in 2013
source: DSI (2014)

Price (TL/da)	Very low, easily acceptable (%)	Not high, acceptable (%)	Barely acceptable (%)	High, rejection (%)	Too high, strong rejection (%)	Total (%)
5	85.00	10.00	5.00	0.00	0.00	100.00
10	70.00	10.00	15.00	5.00	0.00	100.00
15	50.00	20.00	20.00	10.00	0.00	100.00
20	15.00	35.00	40.00	5.00	5.00	100.00
25	0.00	5.00	85.00	0.00	10.00	100.00
30	0.00	0.00	25.00	65.00	10.00	100.00
35	0.00	0.00	10.00	30.00	60.00	100.00
40	0.00	0.00	0.00	15.00	85.00	100.00
45	0.00	0.00	0.00	5.00	95.00	100.00
50	0.00	0.00	0.00	0.00	100.00	100.00

Acceptance rate at each price in each WUA

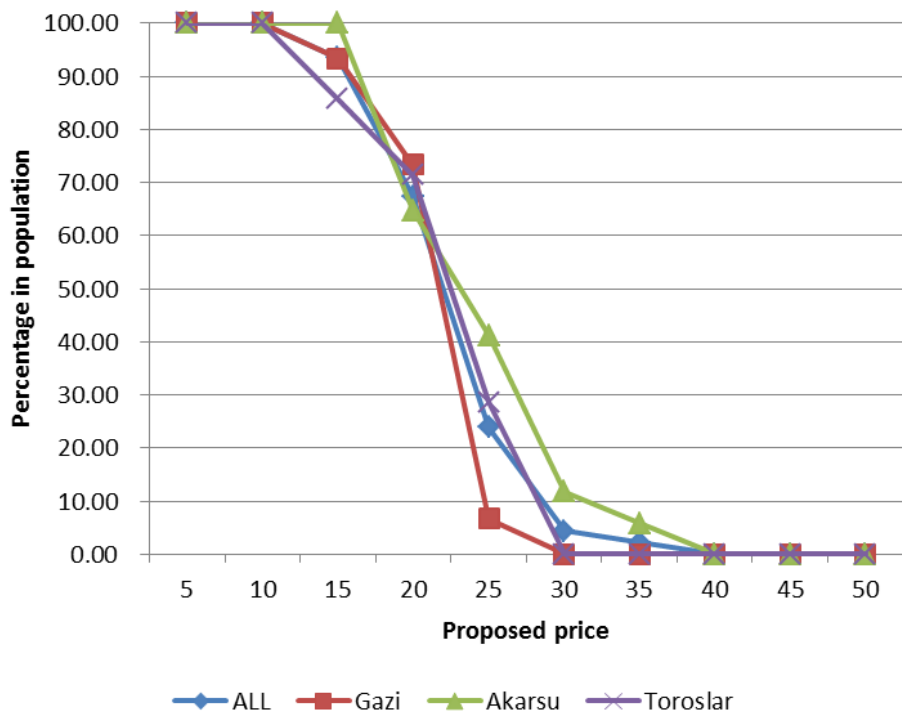


- Estimated WTP: **22.5 TL/da**
- Acceptability of 50% in households is regarded as the estimated WTP here. (Wang, H., et al. 2010)

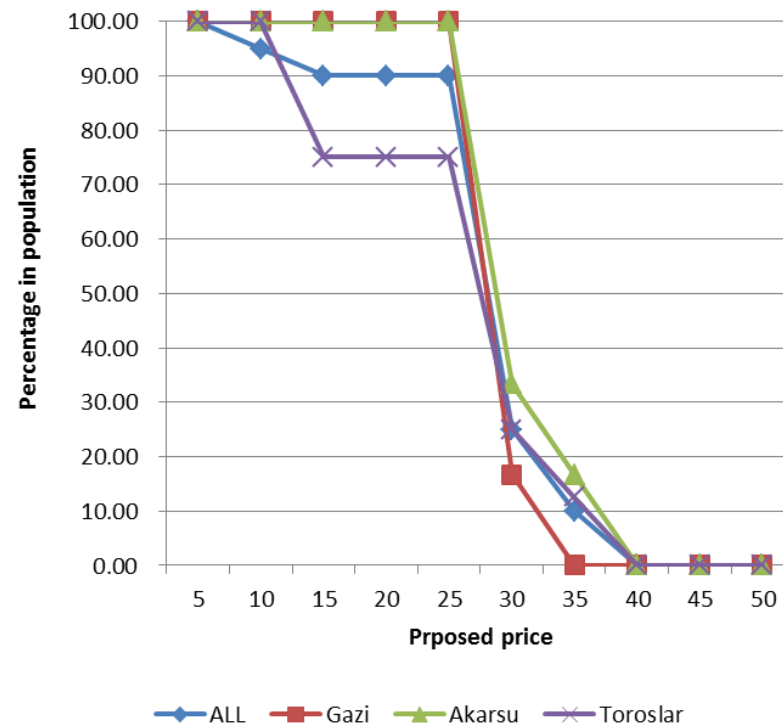


Comparison among WUAs

50% acceptability_maize



50% acceptability_Lemon



Water fee

Maize

Lemon

Current price (TL/da)

28.1

44.6

Acceptability of 50% HHs (TL/da)

22.5

27.5

Discount

No discount

22.3 (50% with drip)

Implication of WTP result I

- ▶ Estimated acceptable WTP is almost similar with the current price among different WUAs
 - Farmers' consciousness about water is almost same even among different WUAs.
 - It seems farmers think they are paying enough money for WUAs.
- ▶ Why are the collection ratios different among WUAs?
 - This depends on satisfaction with the management by WUA

There are defects in the distribution of water.

Regular maintenance and repair of channels are exist.

	Gazi	Akarsu	Toroslar
strongly agree	0.0%	10.0%	6.7%
agree	6.7%	66.7%	50.0%
disagree	60.0%	10.0%	33.3%
strongly disagree	23.3%	3.3%	6.7%
undecided	10.0%	10.0%	3.3%

	Gazi	Akarsu	Toroslar
strongly agree	3.3%	0.0%	0.0%
agree	40.0%	3.3%	36.7%
disagree	33.3%	76.7%	56.7%
strongly disagree	10.0%	20.0%	6.7%
undecided	13.3%	0.0%	0.0%

Implication of WTP result II

► Behavior of farmers

- Farmers are accepting current water price, but do not wish increase in water fee (87.9%, in average).
- They are concerned about decreasing water and fertilizer, even they can get subsidy from the government.

If the government provides subsidy for the farmers who decrease the amount of water and fertilizer, are you willing to save?

	Gazi	Akarsu	Toroslar
Yes	14.3%	12.0%	17.9%
No	85.7%	88.0%	82.1%

Policy recommendation

► Policy for saving water

- Non-monetary incentive is required

Just providing subsidy is not very effective for encouraging farmers to save water and fertilizer

Some scheme to secure farmers' yield and motivate them is required, in addition to saving water and fertilizer.

► Policy for irrigation governance

- WUAs should be autonomous

Not relying on legal force of New Water Law by the government, WUAs should collect water fee and take advantage of it for O&M.

- WUAs should be mediator between farmers and the government

WUAs should provide more opportunities for them to dialogue to build mutual understanding and confidence

Confidence in WUAs and the government may make it easier for farmers to follow their policy.

Future study

- ▶ Pilot study to reveal what kind of incentive is critical for farmers
 - Irrigation at night may be effective for saving water, especially in arid and semi-arid region.
 - The government of Australia compensates the loss of yield if this is because farmers save water and fertilizer.
- ▶ Further study of irrigation governance
 - QUANGO like WUAs may play an important role to mediate different level of stakeholders
 - Training for farmers is important, but government agencies should not only provide opportunities, but they themselves should go to the field and dialogue with farmers.

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*Thank you very much
for your kind attention!*

h-hamasaki@nagasaki-u.ac.jp

