



Behavioral insights and a new design to enhance new technology adoption among Thai farmers

Phumsith Mahasuweerachai
Steffen Andersen
Siwaporn Fongtong
Uri Gneezy
Katharina Laske
Julie Marx

Prepared for in-house seminar at School of Economics, Khon Kaen University
March 23, 2017



Beginning of Story: Rural Development



**Nong Leng Puiey,
Kalasin**



Royal Initiative Discovery Foundation



- Rural development project
- Create water supply storage: 7 million cubic meter of water
- Build small irrigation system



Enough water supply for agriculture during dry season
But not for rice

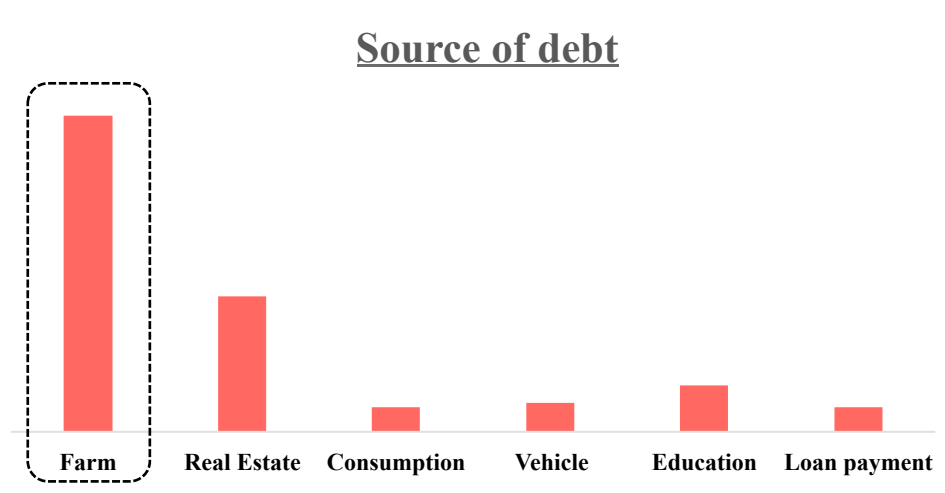
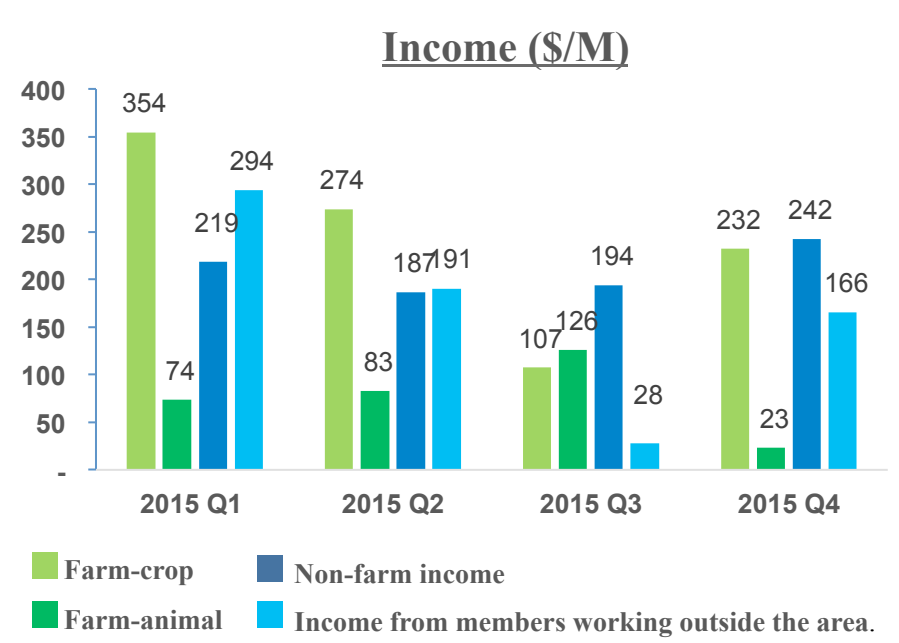
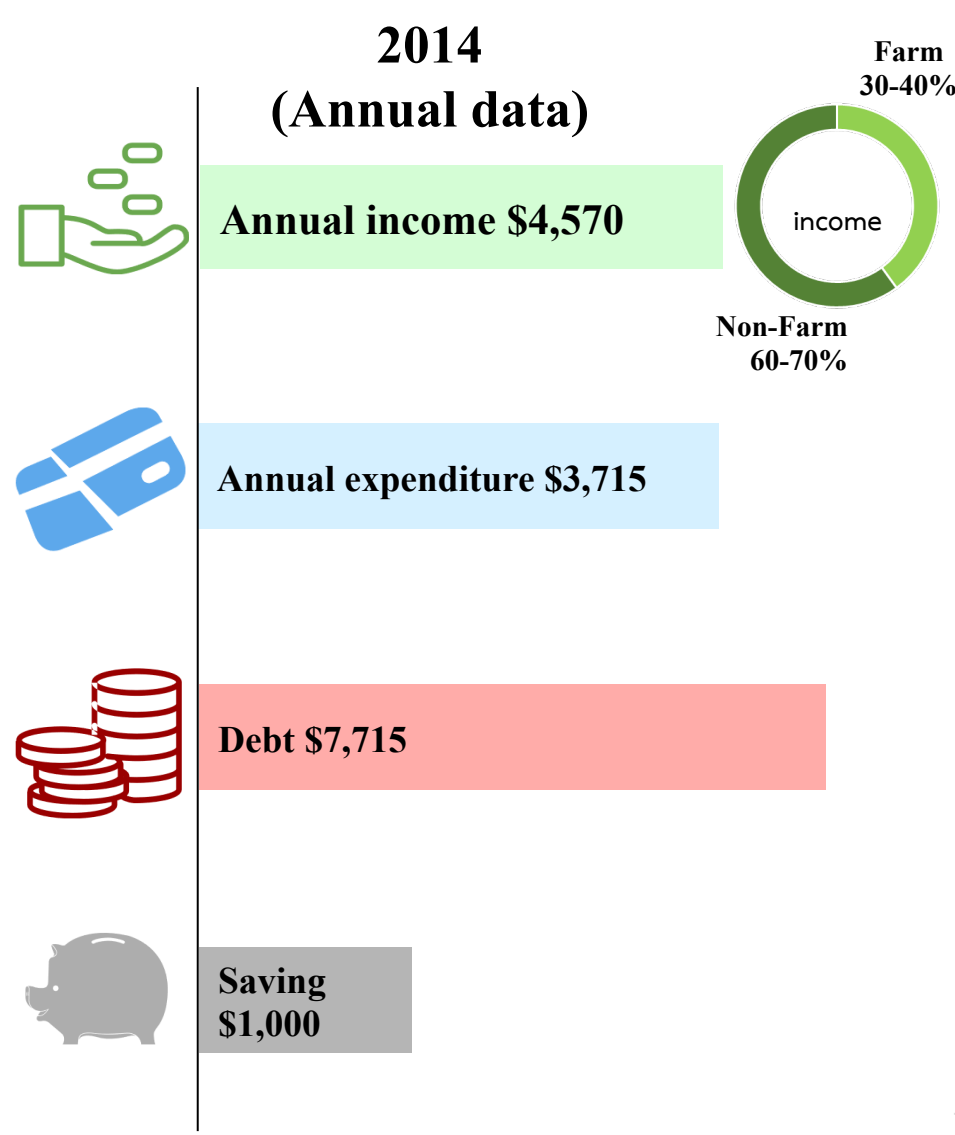
Involvement in the 1st Year



- Household data collection
 - Population: About 4,500 households from 52 villages
 - Randomly select 505 households from those villages
 - 2014 is the baseline data
 - Since 2015, we collect quarterly data from sample households
- The survey contains four main parts
 - Happiness
 - Household economic status
 - Environmental related issues
 - Social capital



Example of the data and what we learn from it.



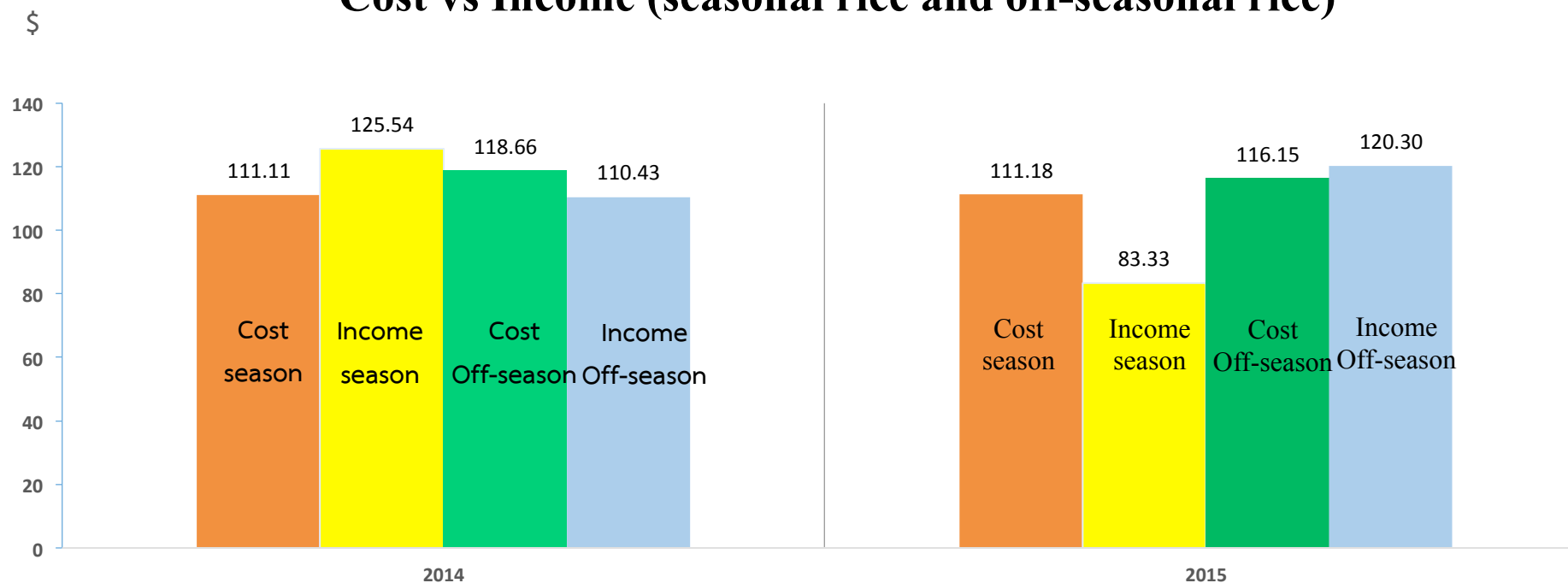
Example of Rice Production Data



High debt, low saving, and main crop does not provide any profit.

70% of debt comes from agricultural investment?

Cost vs Income (seasonal rice and off-season rice)



Our View to Help the Poor



Farmers have no burden to access to credit. Lack of appropriated skills and technology would be the more important issue. So, rather than focusing on providing them cheap loan, giving them choices of appropriated skills and technology as well as opportunity to try them would improve their livelihood.

Extension Programs by the Foundation



To improve villagers economic status

- Develop combination of new crops
 - Provide higher profits
 - Available markets
 - Use less water

**Classical problem arrives:
Very low rate of adoption for the new crops**

Problem: Too risk averse?

How to solve it in efficient way?

Too Risk Averse?



“New crops are good but I have never grow them before. I fear I will do something stupid and will not be able to get any profits.”

“I have debt to pay if I lose from new crops I will not be able to pay back debt and I may lose my land.”

“Even thought, off-seasonal rice provides lower profit, I am sure I could make some profit from it. However, I am not sure to make any profit as shown in the paper from the new crops.”

“My kids are still studying. I want to make sure I have consistent income to support them. Rice and working outside agricultural sector could provide this steaming of income, but I am not sure for the new crops.”

The Main Barriers



- Inexperience
- Uncertainty of HH Economy
- Fear of loss

Loss aversion

Risk aversion

Low rate of adopting the new crops

The Main Barriers



Inexperience
Fear of loss



Can be managed
in the short-run.

Uncertainty of
HH economy



Cannot be managed
in the short-run.

Short-run main purpose: To increase rate of adopting new crops

Program to Convince Farmers



1. Pay farmers a monthly of 5,000 Baht (\$143) if they participate in the new crops adoption program introduced by the foundation.
 - This payment will last for 4 months; off-seasoning farming period.
 - This payment will be guaranteed as long as the farmers put in enough effort.
2. The foundation will introduce combination of new crops that could make profits at least 20,000 Baht (\$570) to cover guaranteed income.



Program to Convince Farmers



3. The foundation will provide inputs to farmers, i.e. seeds, fertilizer.
4. The foundation will provide experts and field experts
 - As supervisor for growing new crops (prevent inexperience problem)
 - As enforcer to prevent moral hazard (whether farmers put enough effort)
5. The foundation will buy all product from farmers with guaranteed price.
6. After harvesting the crops, the revenue will go back to the foundation to cover all costs including monthly payments. Any revenue above all costs will go back to the farmers.
 - If losses occur, farmers do not need to pay back the losses, and can have monthly payment.

Implementation: Risk Transfer



- 38 from 52 villages are eligible for the program.
- Participants were recruited in village level during November to the first week of December 2016 .
- The number of households participated in the program was limited to 10 households per village.
- Same recruiting process was used in every village (except process of selecting participated households if there are more than 10 households registered; the second experiment).
- Farmers have three day to make decision to join the program. They also allow to submit the application right after the meeting.

Implementation: Risk Transfer



Before and After Comparison

- Before
 - Villagers themselves before the program is implemented.
 - No risk transfer mechanism
 - The number of applicant before introduction of risk transfer program
- After
 - Implement risk transfer mechanism

Outcome: The number of applicant after the risk transfer program is implemented.

Implementation: Hard to Get Message

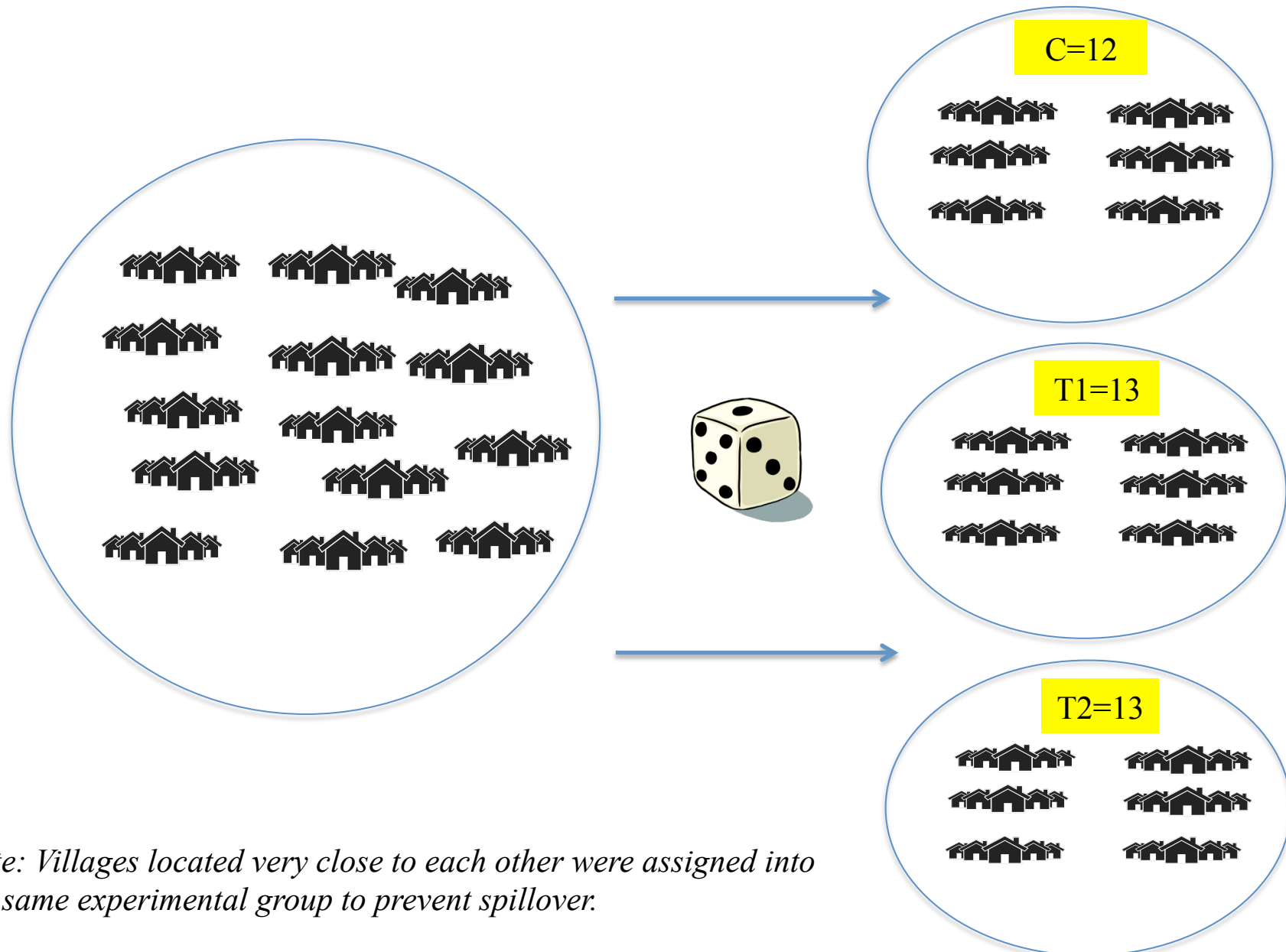


- Limited resources message would impact the number of applicant?
- High expectation would impact the number of applicant?

Randomization at village level

- **Control group (C)**
 - Not tell villagers in the meeting there are limited number of farmers join the program in the first year
- **Treatment group 1 (T1)**
 - Telling them in the meeting we can have at most 10 villagers in the village to participate in the program
 - If more than 10 farmers registered lottery is used to select 10 participants
- **Treatment group 2 (T2)**
 - Telling them in the meeting we can have at most 10 villagers in the village to participate in the program (the same as treatment group 1)
 - If more than 10 farmers registered a monk and headman will choose 10 participants

Randomization at Village Level: Hard to Get Message



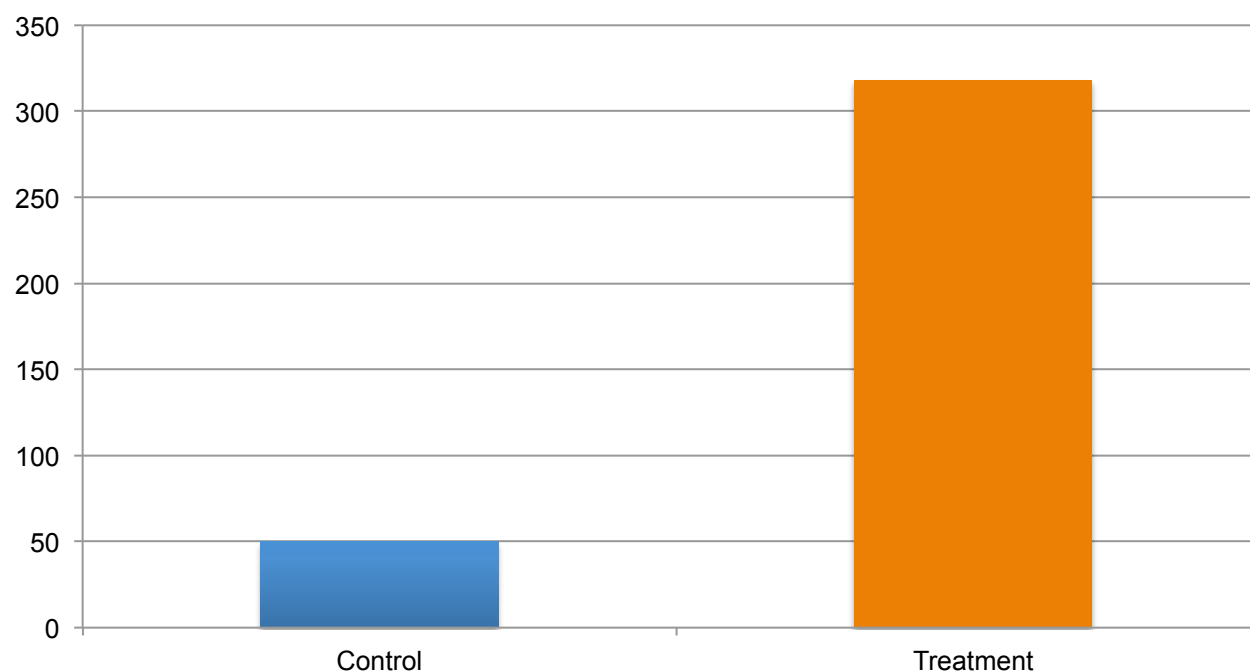
Note: Villages located very close to each other were assigned into the same experimental group to prevent spillover.

The Impacts of the Program: Risk Transfer



- Short-run
 - Transfer risk from farmers to foundation seems to work
 - Solve fear of loss (loss aversion)

318 households applied for the program



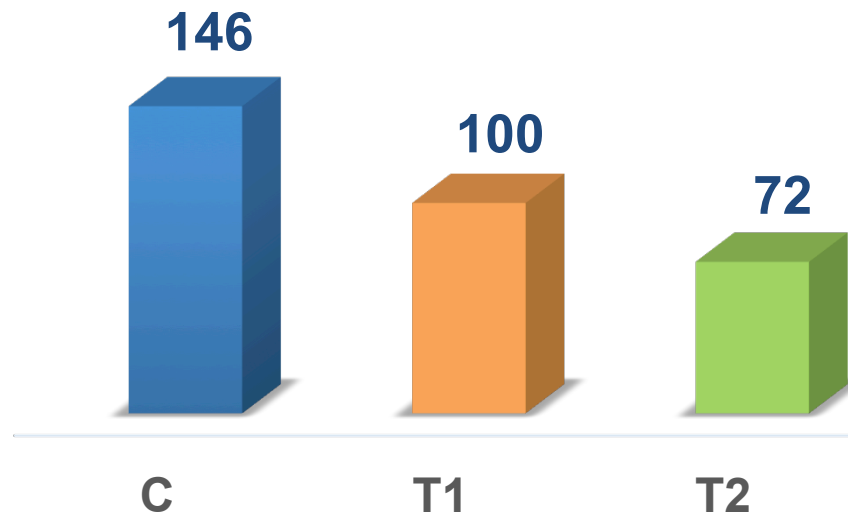
Note: No farmer applied for similar program with no risk transfer

The Impacts of the Program: Hard to Get Message



- Hard to get message
 - Seems to have impact on number of applicant.
 - Risk and high expectation seem to reduce number of applicant.

Numbers of applicant in each group

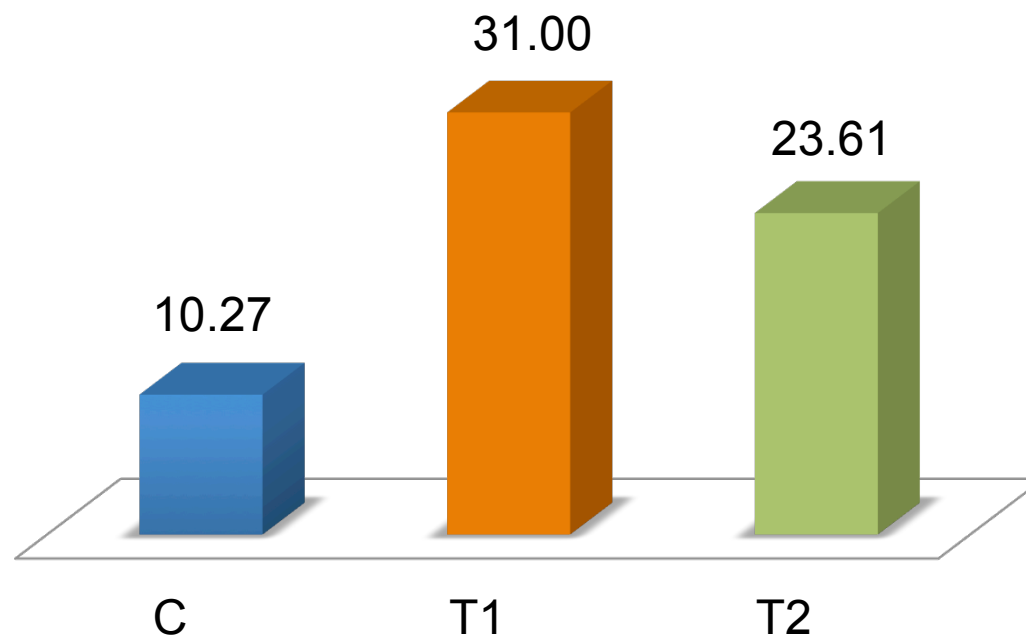


The Impacts of the Program: Hard to Get



- Hard to get message
 - Limited resource message and lottery seem to spur applicant to quickly apply to the program.
 - Similar situation occurs for the limited resource and high expectation.

Proportion of applicant who applied to the program instantly after the meeting

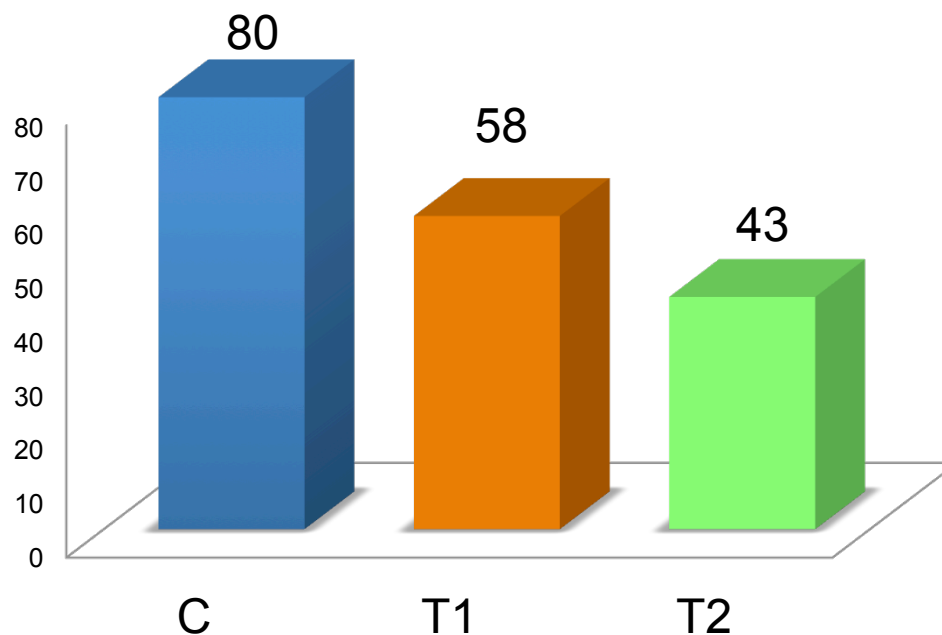


The Impacts of the Program



- Short-run
 - Access to water supply and enough labor
 - Lottery

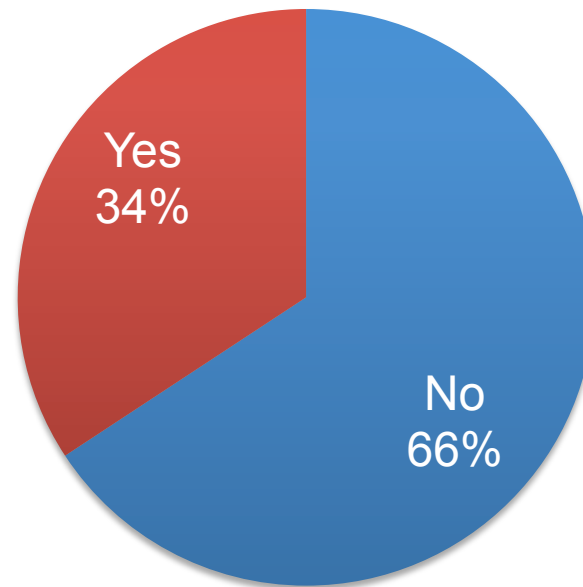
181 households join the program



The Impacts of the Program



- Short-run
 - Program seem to attract targeted farmers.
 - Those who have never tried the new crops before.



Conclusion (but not the last)



- Data both quantitative and qualitative could provide insight information of people's mind.
- Loss aversion that leads to risk aversion could be managed.
- Appropriate transfer risk mechanism could increase rate of new technology adoption for the poor.
- Limited resource message seems to have an impact at least for persuading some to make decision quickly.

What will be focused next?



- Success of farmers in each experimental group.
- Social network on imitation.
- What type(s) of farmer could create significant imitation (i.e. high social network farmer or respected farmer)?
- Whether limited resource message really impacts rate of new technology adoption.
- Clear goal (reference point) and success rate.



Thank you!

ศูนย์วิจัยธุรกิจและเศรษฐกิจอีสาน
E-SAAN CENTER BUSINESS AND ECONOMIC RESEARCH



คณะเศรษฐศาสตร์ มหาวิทยาลัยขอนแก่น
FACULTY OF ECONOMICS, KHON HAEN UNIVERSITY

