Agricultural Research Policy in Thailand : Past, Present and Future

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Presentation topic

- **Agricultural policy research issues in the past**

- **Current agricultural policy research issues**

- **Context and future challenges in (Thai) agriculture**

- **What is the nature of future agricultural research policy ?**

- **How could researchers /think tanks influence the policy?**

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1. Agricultural policy research issues in the past

- **Main objectives are**
  - **Poverty reduction and market access**
  - **Market intervention/distortion**
  - **Export promotion and trade policy**
  - **Role of public organizations**
- **Research issues/topics on poverty/market access**
  - **Informal VS formal credit markets : high interest rate, imperfect capital market and role of rural institution (e.g., share tenancy interlocking credit-good markets)**
  - **Land settlement/land program, men and forests**
  - **R&E**
  - **Input subsidy : fertilizer /pesticide & out breaks**
  - **Rural off – farm employment**
  - **Impacts of policy bias which penalized farmers in favor of urban consumers and industrialization policy, e.g., rice premium**

1. Agricultural policy research issues in the past

- **Market intervention & distortion**
  - **Regulation of agricultural markets : slaughterhouses, seed regulation, disease control (F&M disease), tobacco and castor zoning**
  - **Price control to help urban consumers: pork**
  - **Price instability and speed of price response**
  - **Changing dietary pattern**
  - **Supply response**
- **Trade policy**
  - **Impact of export tax & industrial protection policy**
  - **Impact of Uruguay Round negotiation and free trade agreement**

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1. Agricultural policy research issues in the past

- **Institution and organizations**
  - **Cooperatives, credit unions, BAAC**
  - **Contract farming**
  - **Supermarket revolution and role of private sector**
- **Agriculture as the sunset industry**
  - **Financial liberalization & Dutch disease**
  - **Labor shortage and mechanization**

2. Current agricultural research issues

- **Main objectives**
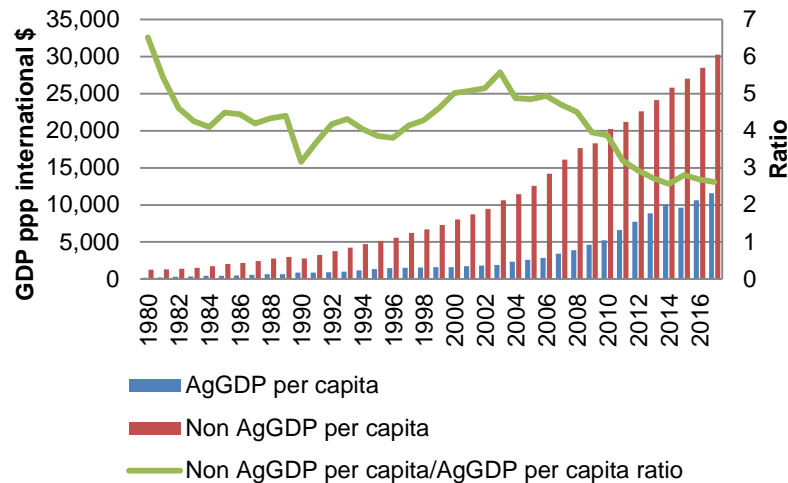 - **Reducing sectoral income disparity**
  - **More integrated approach, especially and emphasis on supply/value chain & standards**
  - **Environmental protections & climate change**
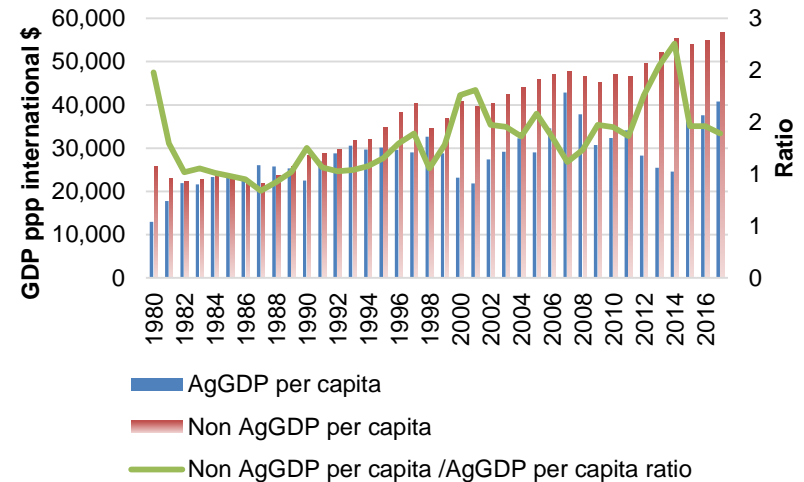- **Income disparity & productivity**
  - **Structural transformation**
  - **Aging farmers**

Per capita income gap between non-agriculture and agriculture is 1.4 times in Malaysia, 6 times in Thailand, 2.6 times in China
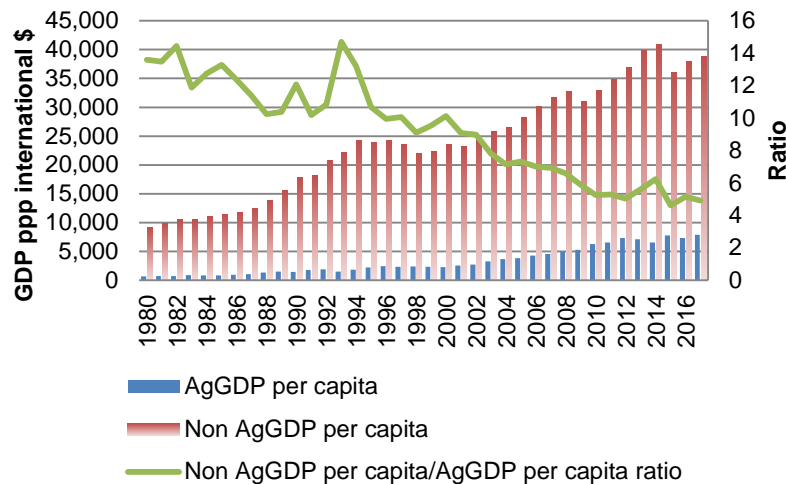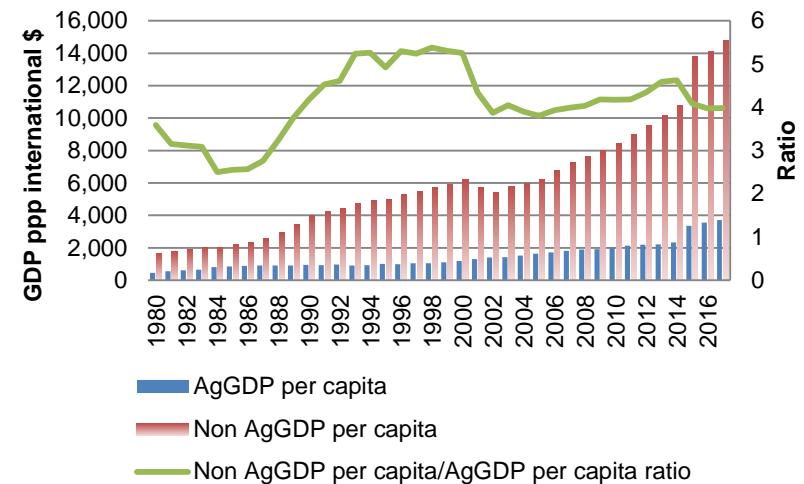

Source: The World Bank.
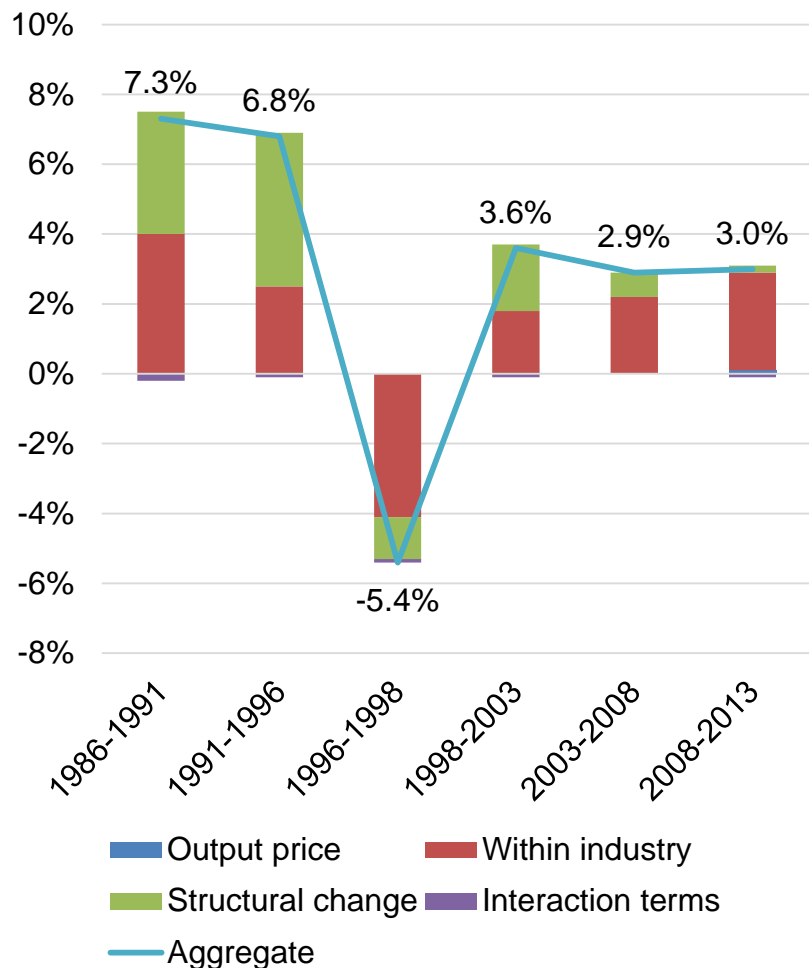
Stalled structural

All sector

Agricultural

Legend (All sector): Output price, Within industry, Structural change, Interaction terms, Aggregate

Legend (Agricultural): prices, within, between, interaction, Aggregate

Note: Diewert 2013 Method
Source: Lathapipat and Chucherd, 2015.

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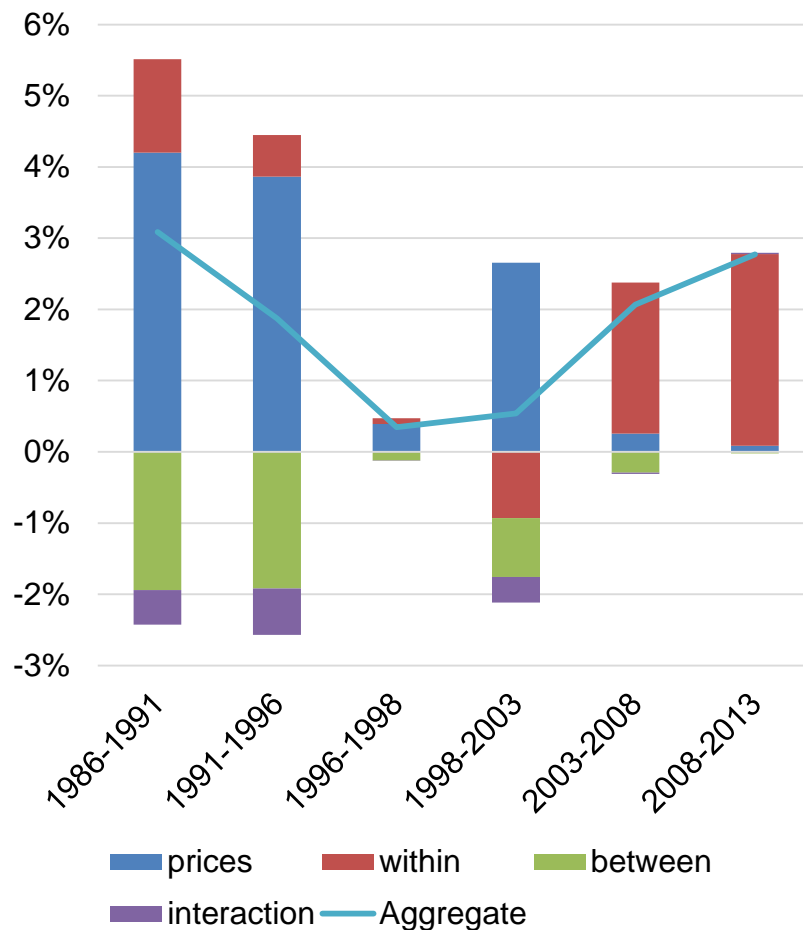
Stalled structural change after 2008 and reversed migration

Stalled structural: All sector

7.3% 6.8% -5.4% 3.6% 2.9% 3.0%

Legend:
- Output price
- Within industry
- Structural change
- Interaction terms
- Aggregate
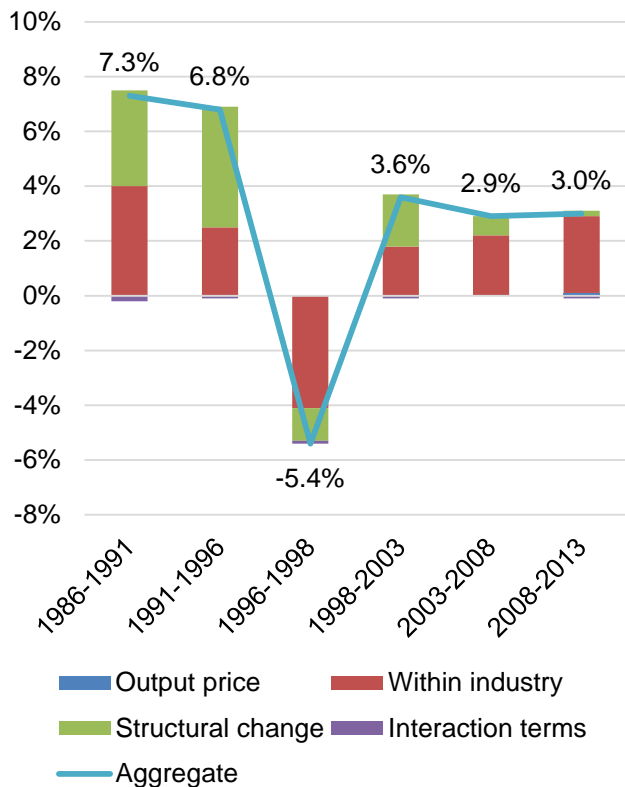
Note: Diewert 2013 Method
Source: Lathapipat and Chucherd, 2015.

Migration

crisis

Slow-down migrants

Legend:
- 15-24 Years old
- 25-34 Years old
- 35-44 Years old
- 45-54 Years old
- >54 Years old
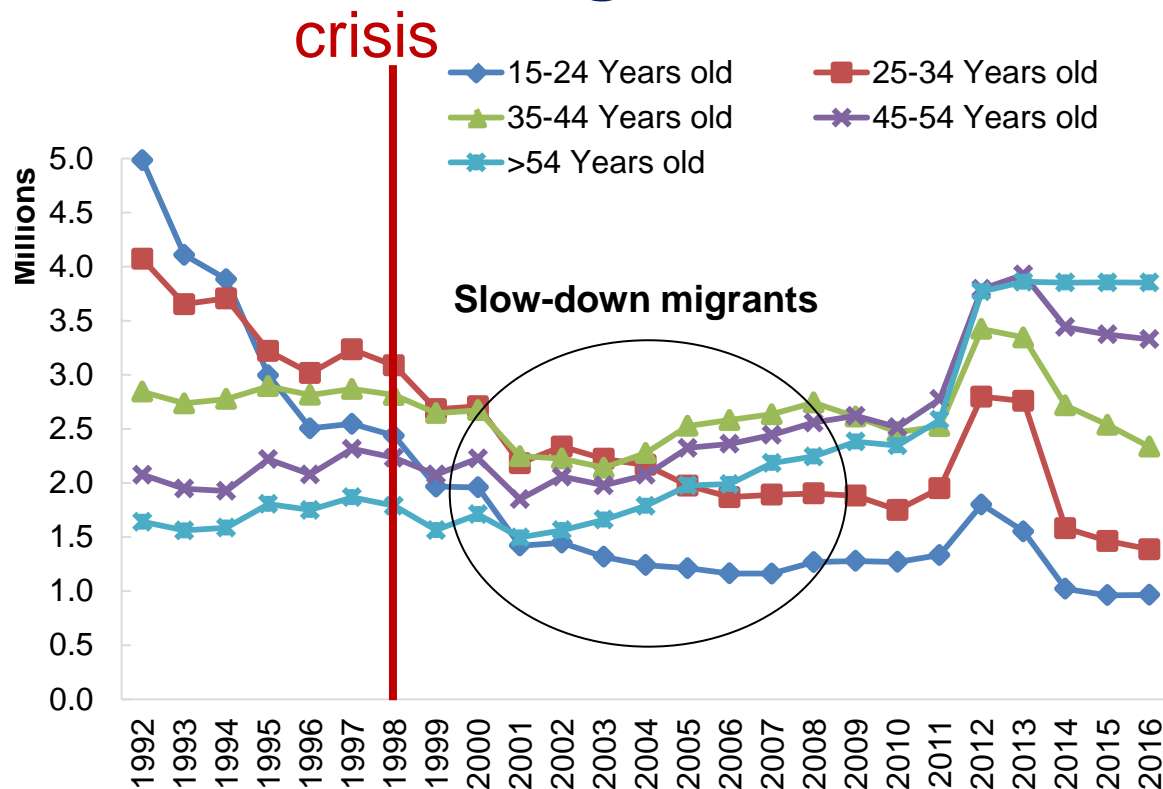
Source: LFS, NSO.

2. Current agricultural research issues (cont.)

- **Value chain development**
  - **Traceability & food safety**
  - **Access of smallholders to modern markets**
    - **Supermarket revolution**
    - **Role of farmer groups, NGOs (Fair Trade), certification**
  - **Social & environmental standards :**
    - **Eurep GAP (international private standards)**
    - **animal welfare,**
    - **IUU (Illegal, unreported and unregulated fishing)**
    - **Geographic indication**

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Environment and climate change

- **Non-physical infrastructure water management**
- **Climate adaptation and crop insurance**
- **IUU and over-fishing**
- **Heath impact of pesticide use and regulation : ban and imported tariffs**
- **Pricing of water and carbon, water footprints, carbon footprints, etc.**

3. Context and future challenges

- **Agricultural activities take place in complex, multiple, natural, and human systems**
  - The problems are intertwined with environment, ecology, education, heath, economic and social issues
  - Within agriculture, enterprises range from small farms to big plantations, different farming systems, and covered wide and dispersed areas
- **Implications**
  - **(1) Problems are usually complex and elude simple one size fits-all solutions**
  - Organizations involved in agricultural activities span a few ministries and various agencies
  - So it's not surprising that myriad policies contradict one another
  - Socialism and planning have always failed
  - **(2) Market force is the most reliable, efficient device of resource allocation**
    - Government can't increase price of export crops without using taxpayer money
    - Decentralized decisions result in the efficient production decision because farmers decide not to group if price is lower than their costs
    - Yet there are market failure

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- **Future challenges**
  - **Supply side : aging farmers, climate change**
  - **Demand side : changes in food diet due to rising middle class, health conscious, urbanization, influence of foreign food culture**
  - **Markets : rising NTMs, new myriad standards**
  - **Technological disruption : FARMING4.0 (digital and biological technology)**
    - **Thailand is not poor so no financial assistance from multi-lateral organizations and rich countries ODA**
    - **Yet it's population is too small to attract the world-class tech firms to do agri-tech business in Thailand**
    - **WE need to help ourselves**

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4. Implications for the nature of future agricultural policy research : at least 5 new approaches

- **Require a team work of economists from different fields : CGE modeling, new institutional, behavioral (experiment) trade and political economy**
- **Examples :**
  - **1) Forecast of agricultural demand for water under cc**
    - **Step 1: water requirement of crops under 2 scenarios: RCP6.5 and RCP 8.5**

$$W_{it} = \frac{(ET_i + PC_i - Rain_t)*(A_{it})}{EF_i}$$

    - **Step 2: Using supply response to predict crop area = f(relative crop prices, input prices, agric GDP)**
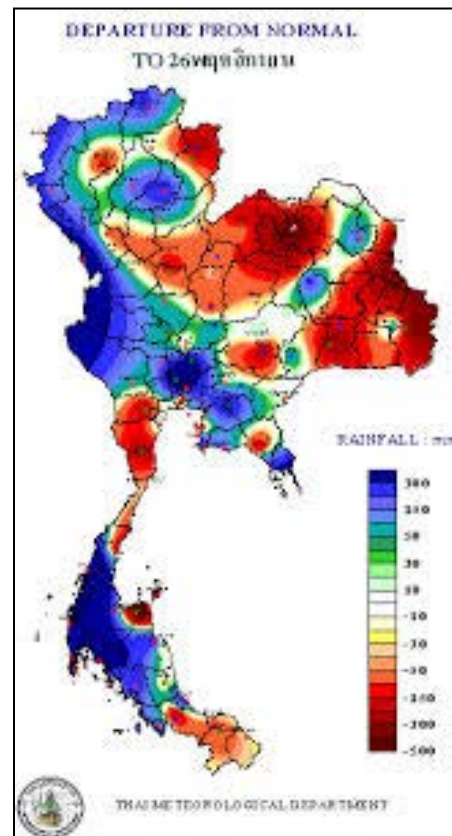
  - **2) demand management of scarce water resource – experiments with water user groups on impacts of water allocation scenarios**

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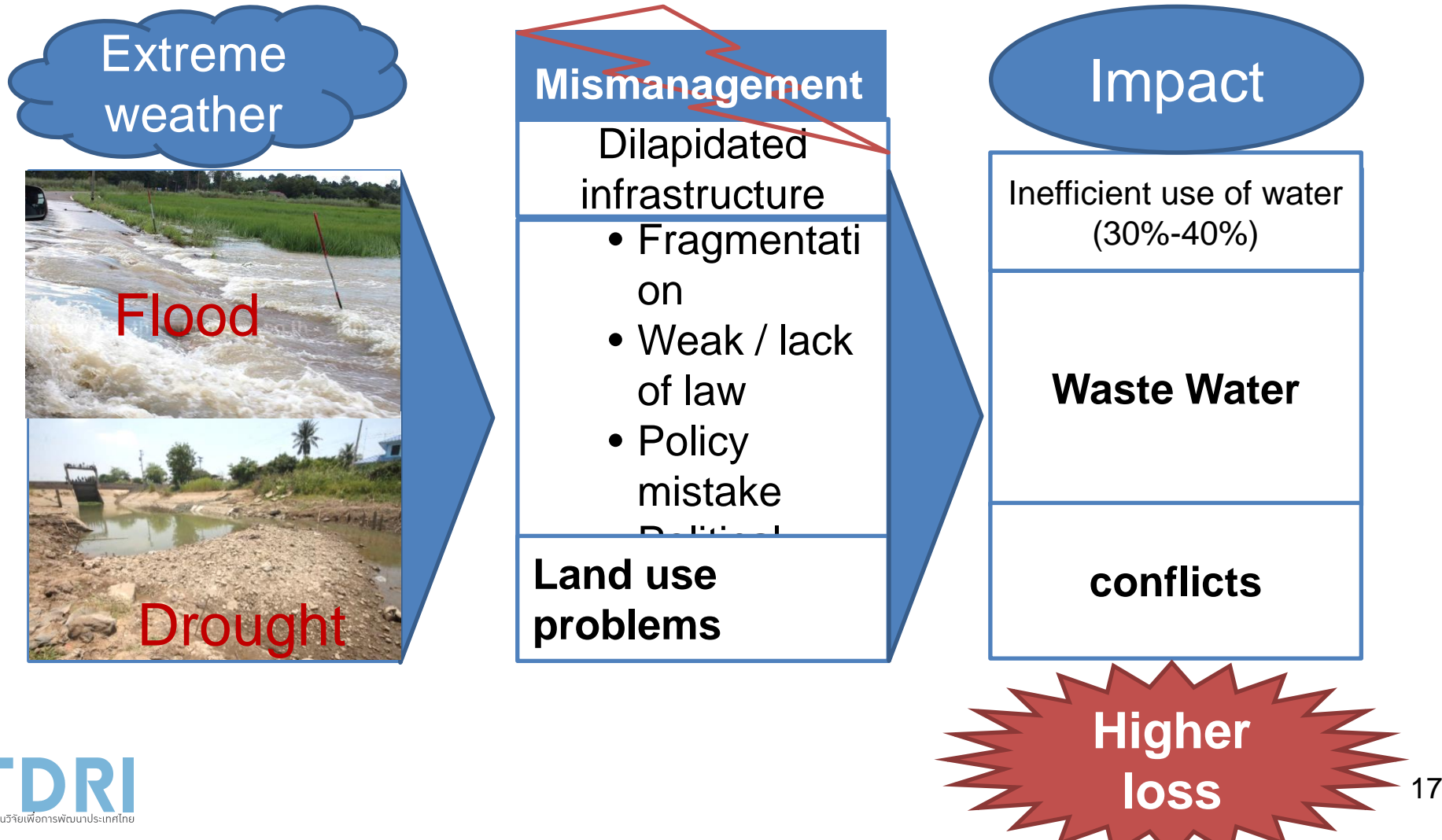# Damages and loss from extreme weather events

- **The 2011 flood caused USD 46,000 billion (13% of GDP)**

- **Agricultural output loss from the 2016 drought is USD 1,100 billion**
  - **Income loss is USD 1,890 bil (almost 5% agric GDP)**

Water mismanagement

Water crisis is not only caused by mother nature, but worsened by mismanagement

# Floods & droughts are worsened by mismanagement and land use problems

Extreme weather

Flood

Drought

Mismanagement

Dilapidated infrastructure
- Fragmentation
- Weak / lack of law
- Policy mistake

Land use problems

Impact

Inefficient use of water (30%-40%)

Waste Water

conflicts

Higher loss

occurred in 2012-14 due to mismanagement before the El Nino in 2015

①

Water in 4 major dams at the beginning of dry season

น้ำใช้การในเขื่อนใหญ่ 4 เขื่อน ณ 1 พ.ย. (ต้นฤดูแล้ง)
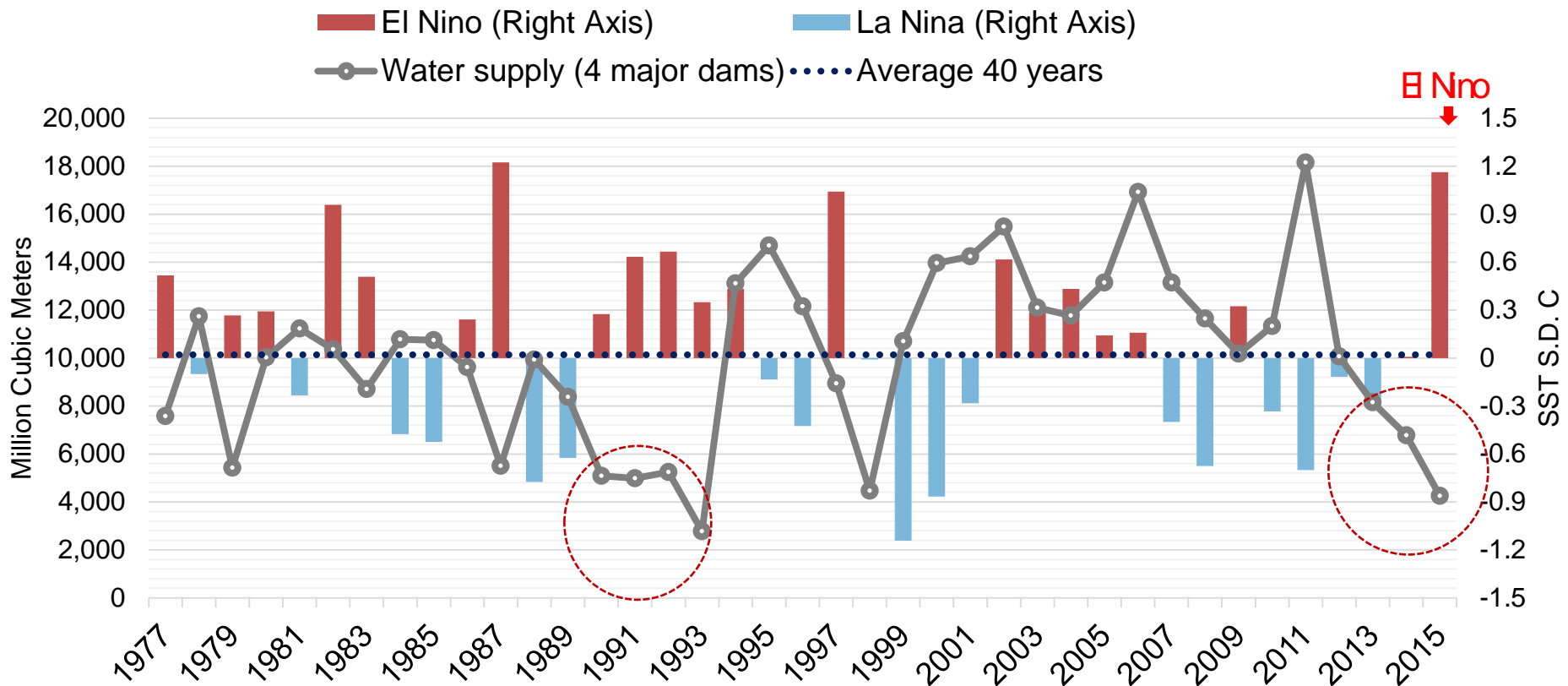
A river basin board
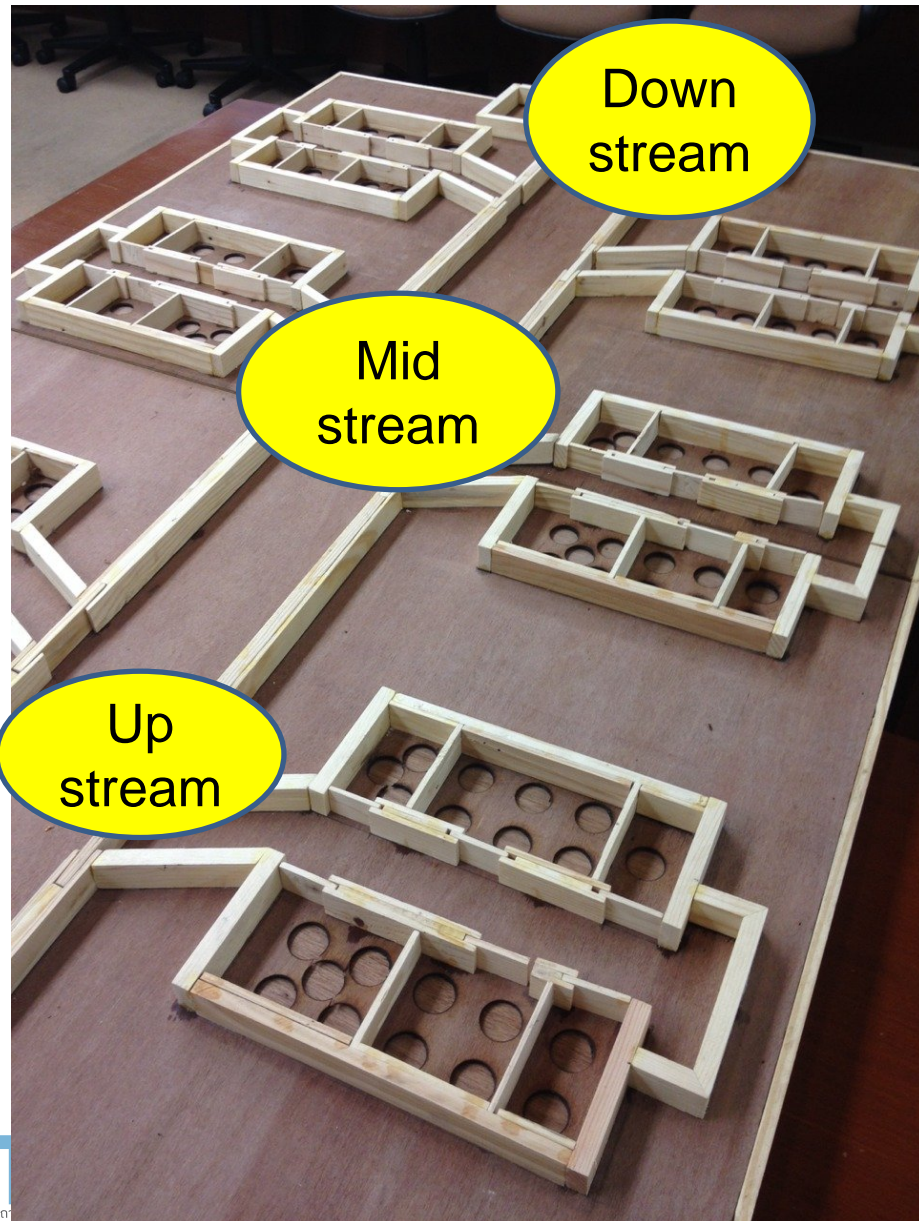
- **Three groups of farmers along the river basin: upstream, mid-stream and downstream**

- **Using glass marble as water**

Modeling the actual situation of water Allocation:
2 treatments

2) Group negotiation

1) Control group: farmers make Independent water decision

Treatment Situation

- Inviting stakeholders to assume role playing as WUGs in the upstream, mid-stream and downstream

Upstream

Mid-stream
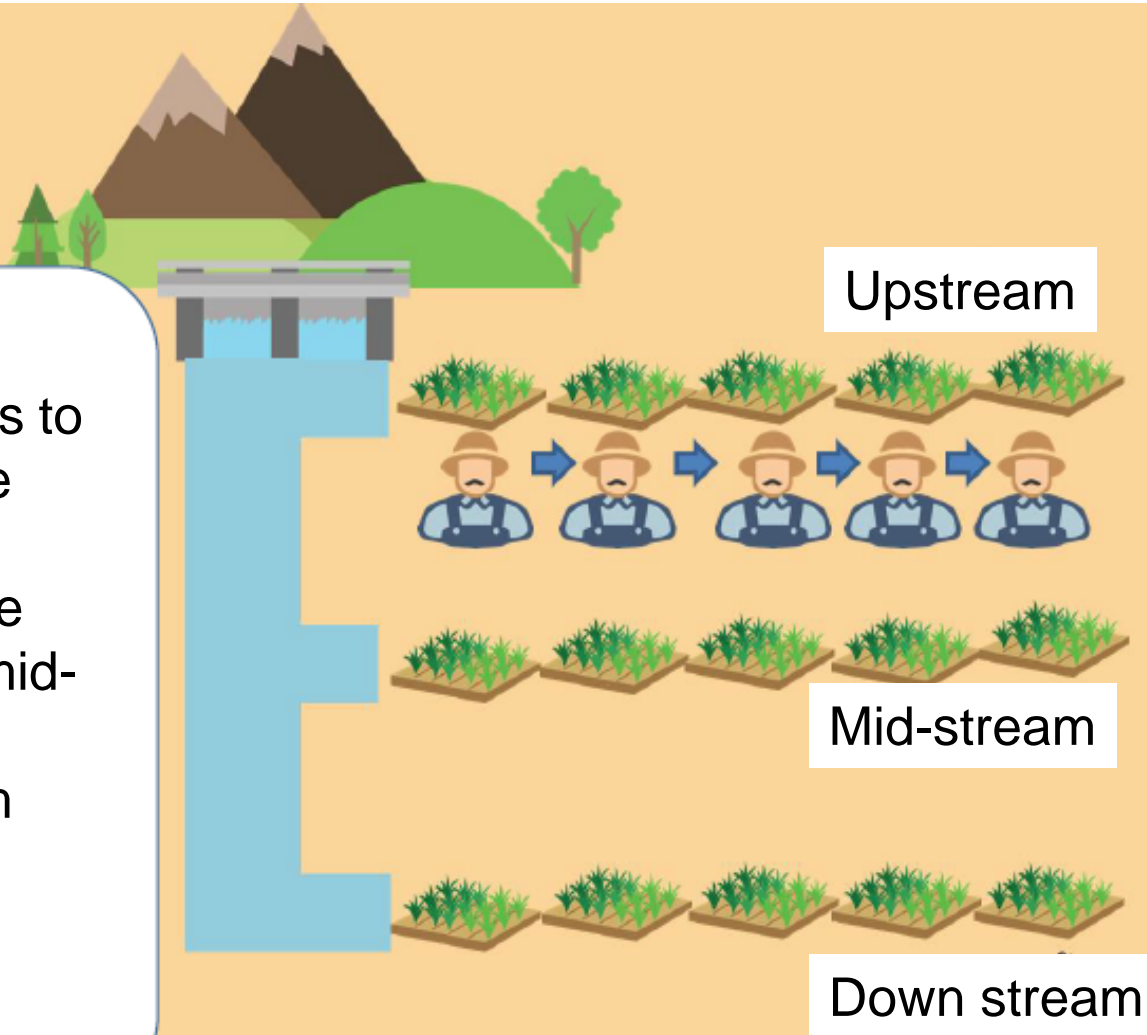
Down stream

Current situation vs treatment

Current
- Centralization of management
- Conflicts between upstream and downstream farmers

Treatment
- How farmers respond to different rules of water management, e.g., participation in management

4 experiments; 60-100 participants from various stakeholder groups in each experiment

farmers

Government officers & local government officers

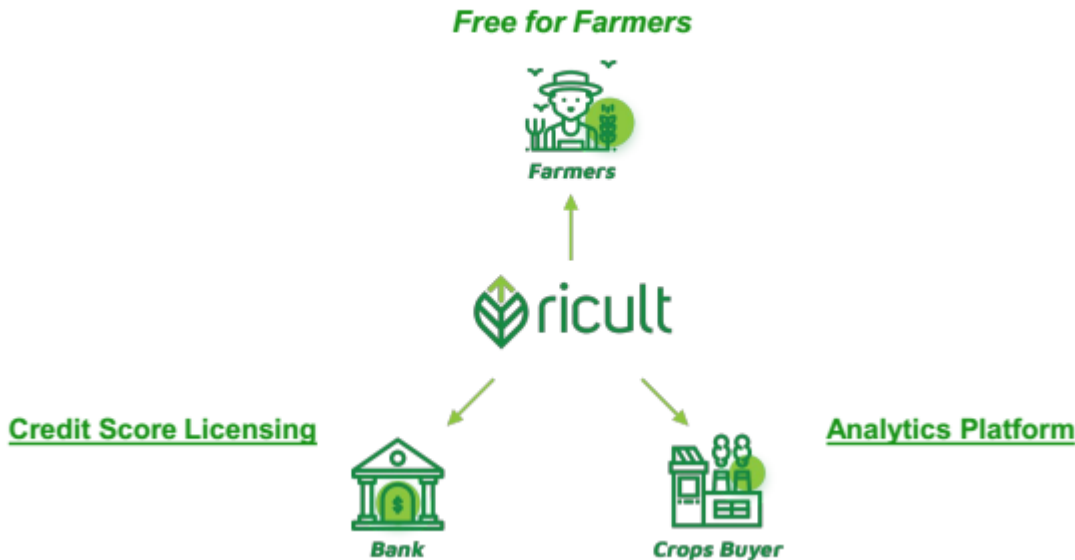**Private sector: tap water companies, industries**

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Role playing game : river basin board

4. Implications for the nature of future agricultural policy research (cont.)

- **Require a trans-disciplinary research : bio-tech, traditional plant breeders, science, engineer, sociology, digital technology**
  - **Example : climate change- forecast of agricultural water demand under climate change model and price changes (econ model)**
  - **Farming 4.0: RICULT – a social enterprise**

- **Must use new techniques and big data**
  - **Big data : GIS, GPS, drone, satellite, crowd-source, sensors**
  - **Analysis : AI, machine learning, psychometric, network analysis**
  - **Farming4.0 is now only commercially viable for big farms and high valued farms (vegetables & fruits), but still too expensive for smallholders growing low valued commodities**

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Agricultural Data Company

Free for Farmers

Farmers

ricult

Credit Score Licensing

Bank

Crops Buyer

Analytics Platform

10,000 Rai

ricult

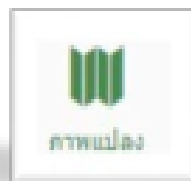**Credit Score Licensing**

Bank

Crops Buyer

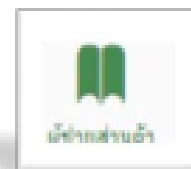# RICULT APP helps maize farmers making decision

We give farmers the information they care most about up front, so it's easy to plan field activities
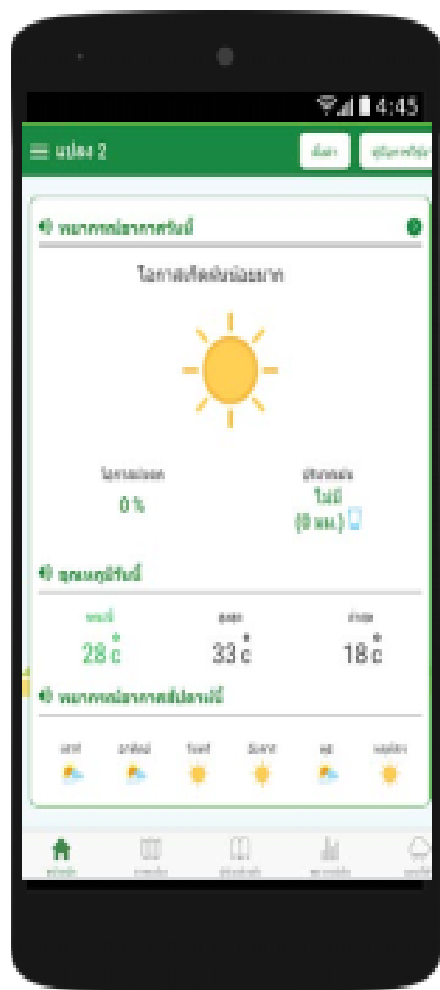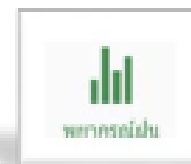

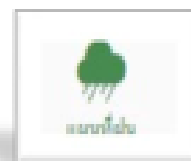- Main Page for Hyper Local Daily Rain & Weather Forecast

- Satellite Imagery for Plant Growth Detection

- Farming Advices to Improve Yield

- 9 Months Rain Forecast

- Real Time Rain Radar

Satellite imagery of individual farms and farming advice across growing stages to improve yield


Individualized Farm
Satellite Imagery

Farming Advices Across
Growing Stages to Improve Yield

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Ricult's forecasts start with a global network of weather observations

Observations come from satellites, ground stations, buoys, ships, aircraft, weather balloons, etc
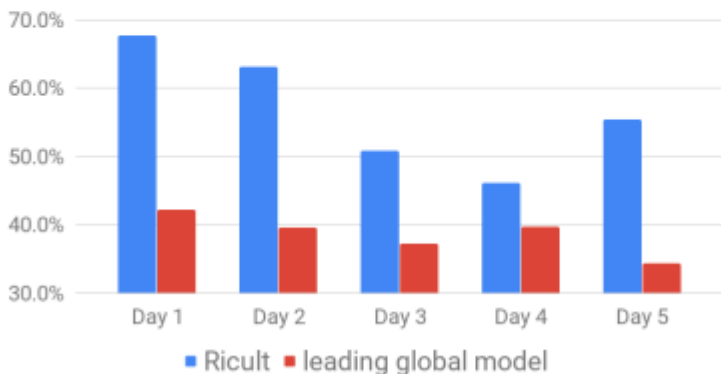

🌿 ricult

The outputs of each of the global weather models are combined using machine learning to get the forecasts we serve to farmers in the app

The resulting forecasts are more accurate than those created by any individual forecast model

Machine learning
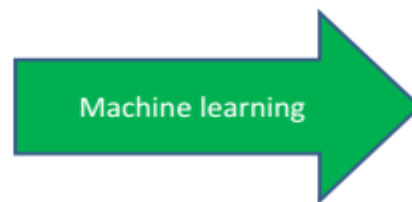
🌿 ricult

The Ricult App has the most skillful 3-day rain forecast available for farmers in Thailand

Rain forecast accuracy

Ricult ■ leading global model

RICULT App most skillful in 3-day rain forecast

🌱 ricult

Weather Data - What makes Ricult's forecasts more useful?

- Daily weather headline provided via **text, visual, and audio**
- **Designed for the farmer** with emphasis on those variables that are most likely to affect the farmer's crop
- Coming soon: Crop-specific weather alerts **recommend specific actions** for different parts of the growth cycle
- Weather headlines and extreme weather alerts are **easily portable** to other channels (IVR/SMS/USSD)
- First-of-its-kind **monthly rainfall outlook** helps farmers plan out their crop cycle in advance
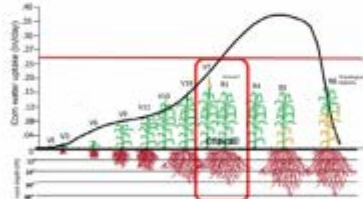
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Weather prediction is critical in key farming decisions: Crop model
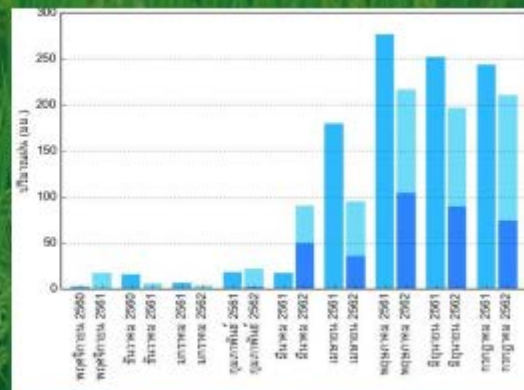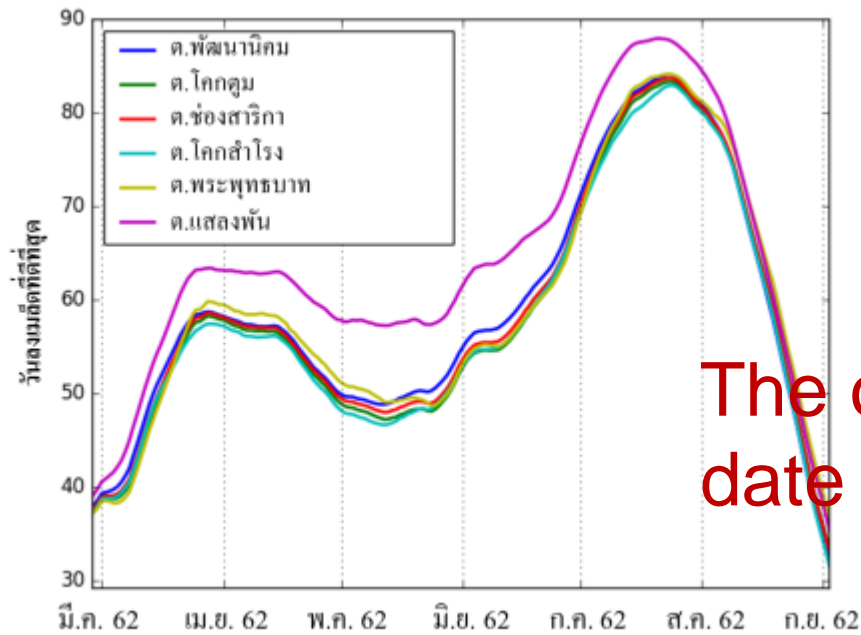
The optimum seed planting date in Lopburi is 16 July

วันลงเมล็ดที่ดีที่สุด

ความเครียดจากความร้อน

ความเครียดจากการขาดแคลนน้ำ

Value of Precise Forecast

Other Farmer's Sowing Date on 3 July
(Based on Experience)

22 Days

Ricult Farmer's Sowing Date on 16 July (Based on Data)

22 Days

Yield is higher if planted on the recommended date than on farmers' experience

Other Farmer's Sowing Date on 3 July
(Based on Experience)

Ricult Farmer's Sowing Date on 16 July (Based on Data)

เก็บเกี่ยวผลผลิต

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- **Require the location, product-specific knowledge**
  - **To improve productivity of rice under the irrigated system vis-à-vis rained system and different rice varieties**

- **Require more experiment pilot projects or option research**
  - **An experiment on water allocation/trading among water user downstream river basin**
  - **A social enter pries to provide extension services of using newt technology : RICULT**

5. How could researchers/think tanks influence policy in a more effective approach under the democratic governments ?

- **A need for knowledge management to do policy advocacy, disseminate research findings and communication with the public / policy makers.**

- **How???**

- ## How ?
  - ### Evidence-based research
    - People tend to have different policy opinions
    - Such differences can be narrowed by using evidence
  - ### More active use of social media and choosing "right time, right channel, right products" because many policy issues have their own "cycles"
    - E.g., info-graphic, video clips
    - Water policy advocacy should coincides with important day such as Songkran (Water throwing) festival or World Water Day (on 22 March every year)
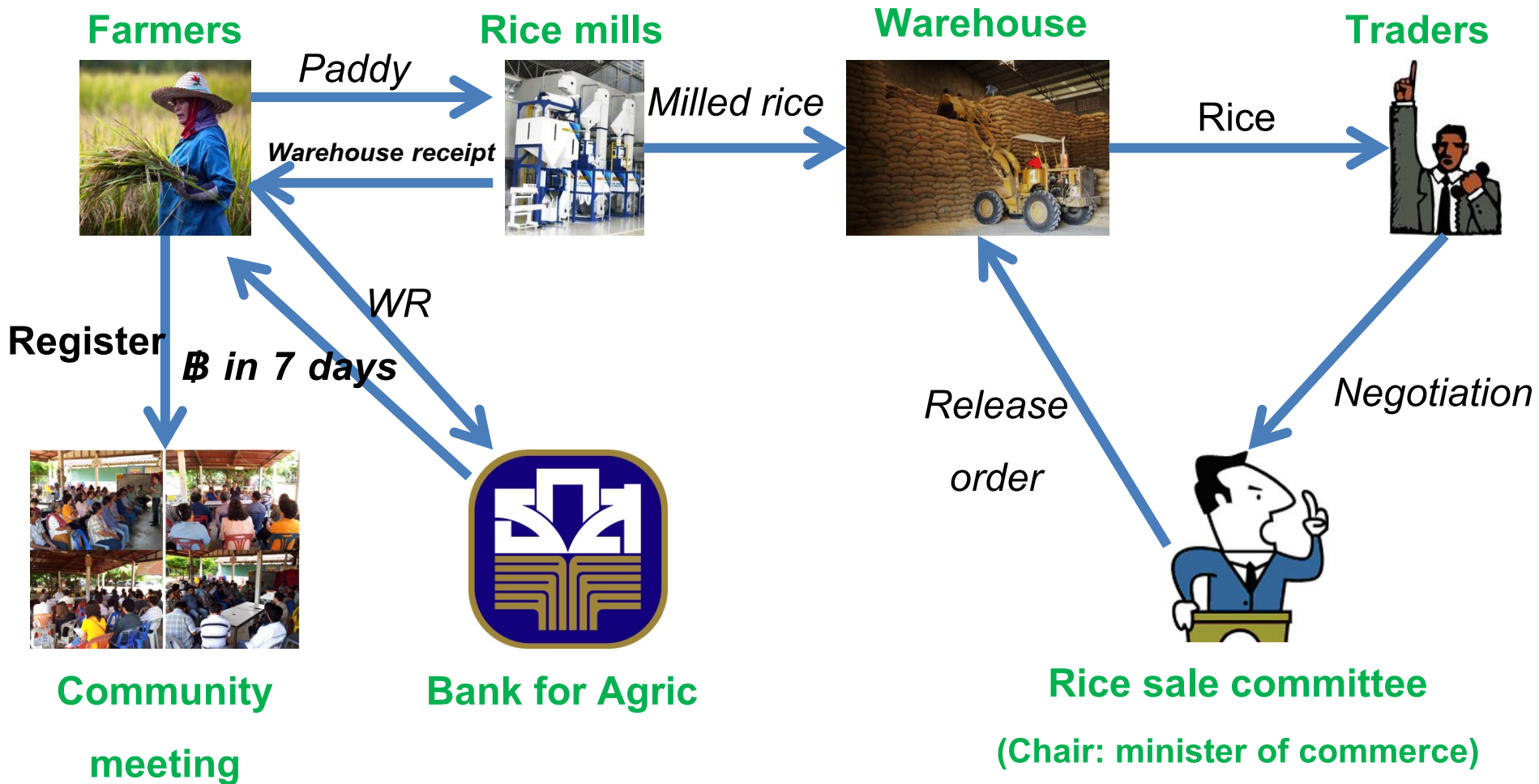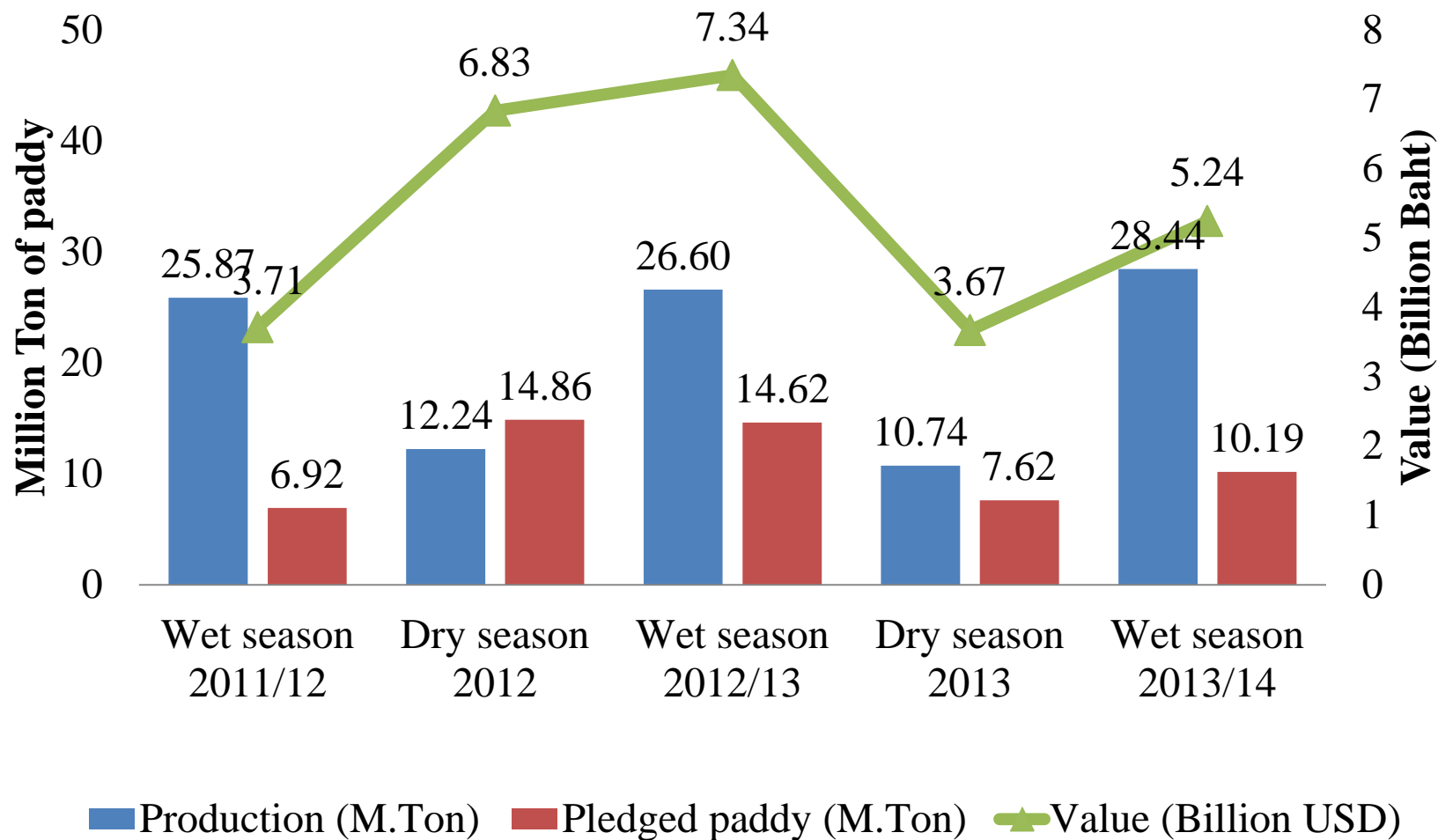
- **How ? (cont.)**
  - **Engaging with and establishing the "trusted" network/coalition with key stakeholders particularly the media**
    - Researchers will be able to obtain inside and timely information
  - **Governance of think tanks / researchers**
    - Avoiding, minimizing or declaring conflicts of interests, e.g., not being the advisors of politicians/government (but can be committee members of non-political committees)
    - Can be a consultant for the private sector under some explicit condition, such as discloser of the research finding
    - Avoid receiving research finding/grants from some lobbying groups

- **Two examples: paddy pledging policy and draft rice law.**

Example1: the paddy pledging policy: obtaining crucial information from insiders

How does the rice pledging scheme work?

Farmers — *Paddy* → **Rice mills** — *Milled rice* → **Warehouse** — *Rice* → **Traders**

Warehouse receipt (Rice mills → Farmers)

Register

WR

฿ in 7 days

Community meeting

Bank for Agric

Release order

Negotiation

Rice sale committee
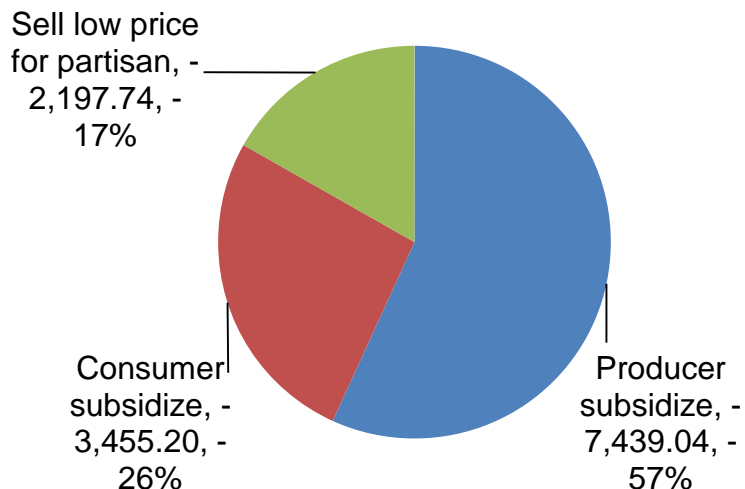(Chair: minister of commerce)

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Quantity of pledged paddy, cost of paddy purchase and production (May 2014)

Distribution of loss

1st Stage   Oct 11 - Oct 13

Sell low price for partisan, -2,197.74, -17%

Consumer subsidize, -3,455.20, -26%

Producer subsidize, -7,439.04, -57%

2nd Stage   Nov 13- Apr 14

Sell low price for partisan, -442.14, -14%

Consumer subsidize, -872.57, -28%

Producer subsidize, -1,827.56, -58%
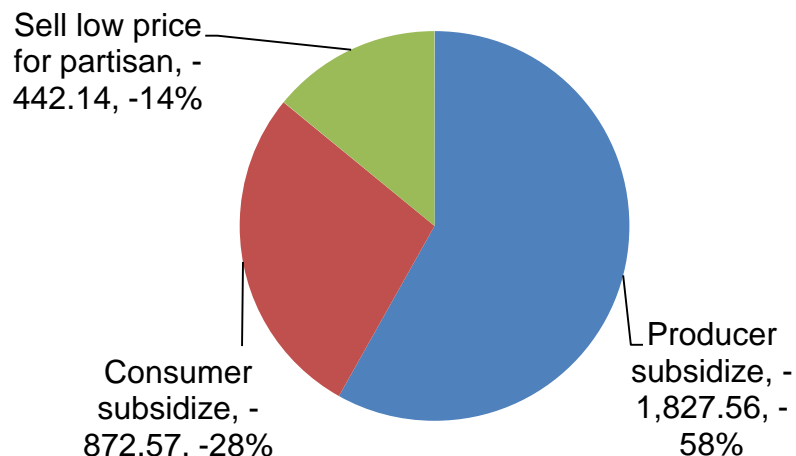
All stage Oct 11 –Apr 14

Sell low price for partisan, -2,639.88, -16%

Consumer subsidize, -4,327.76, -27%

Producer subsidize, -9,266.60, -57%
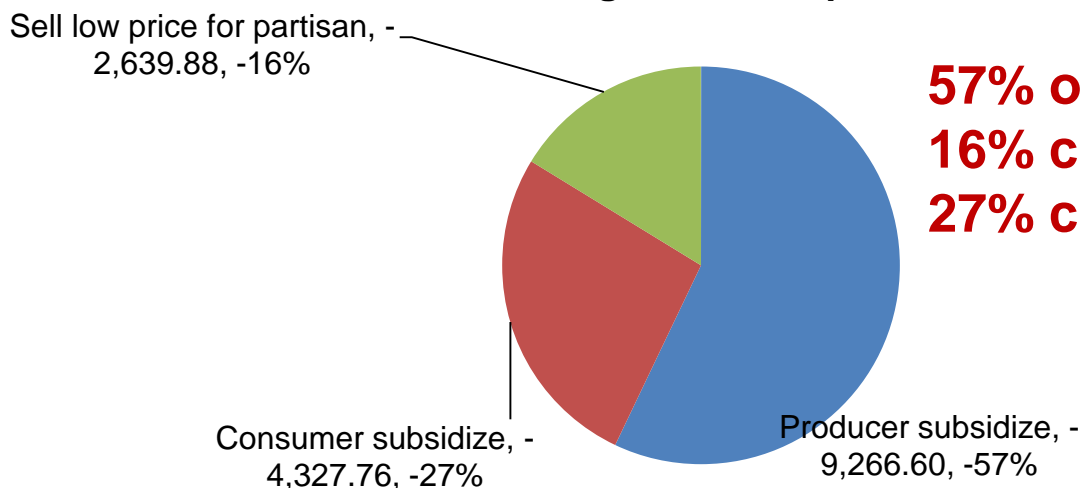
57% of loss is attributed to farm 16% corruption in rice sale, 27% consumer subsidy

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- **Examples of policy research (cont.)**
  - **Advocacy against the draft rice law**
    - **TDRI is trusted by all rice associations**
    - **Researchers need to have prior knowledge of the issues that will be regulated by the law, i.e., trade of rice seeds**
    - **They also need to have good contact and know which researchers/ stakeholders/ law makers to consult with.**
    - **Last but not least, they must have good connection with the media who can provide timely confidential information (draft law).**

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