



Towards a Knowledge-based Economy:
*Case Studies of the Use of ICT in Enhancing
Agricultural Value Chain in Thailand*

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Outline of the Presentation

1. The Thai Agricultural Sector in a Nutshell
2. Case Studies
3. Findings
4. Recommendations

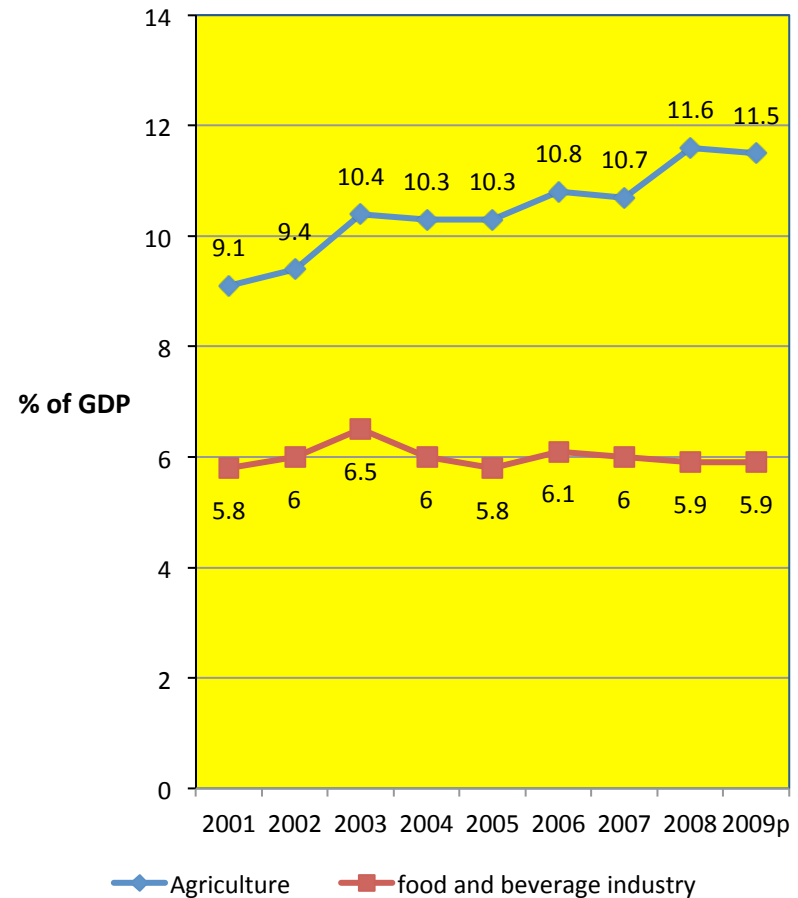


1. The Thai Agricultural Sector

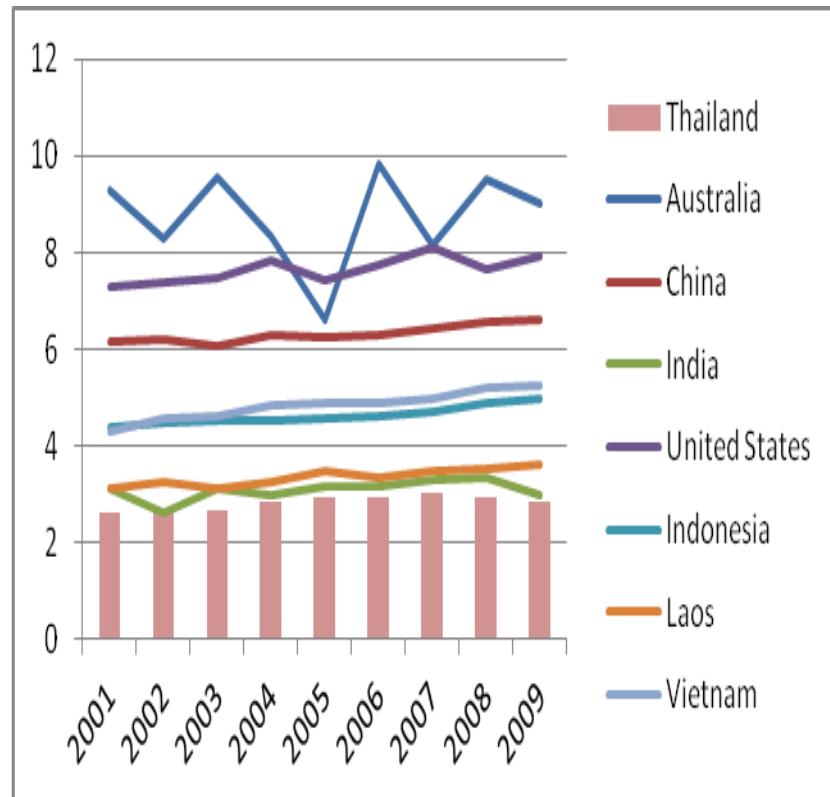


1. The Thai Agricultural Sector (1)

- Agriculture sector contributes to rising GDP share during the last decade due to rise in global commodity prices.



1. The Thai Agricultural Sector (2)



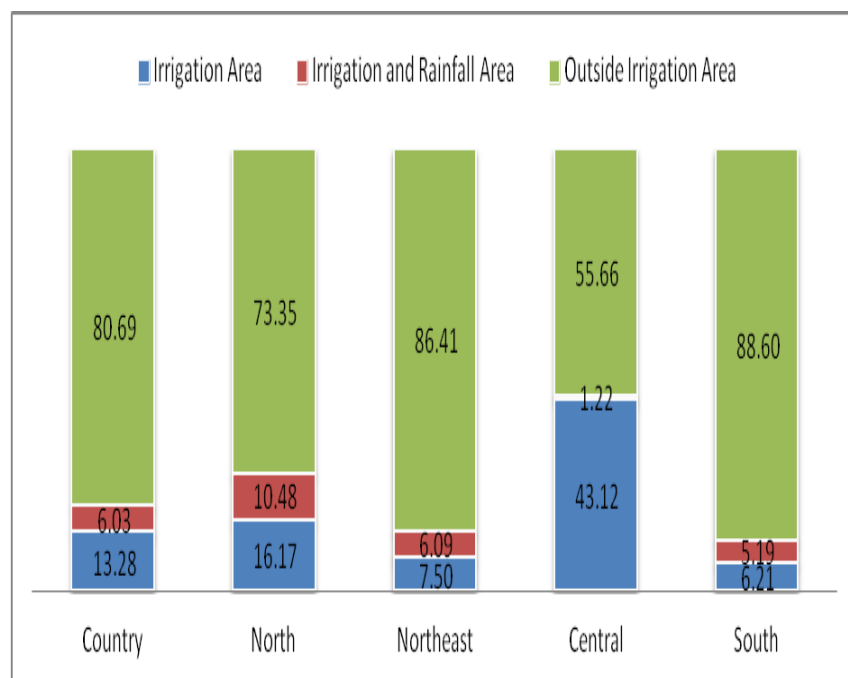
Productivity has been stagnant, however.

This can be attributed to

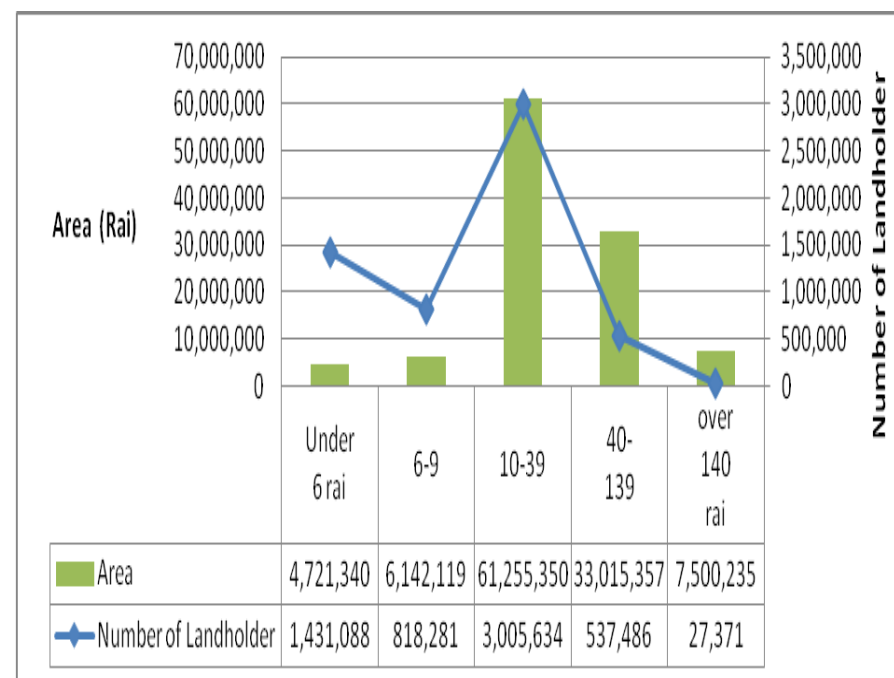
- (1) inadequate water supply*
- (2) excessive use of fertilizer and*
- (3) suboptimal farm size and*
- (4) lack of proper cultivation technology and knowledge*



1. The Thai Agricultural Sector (3)



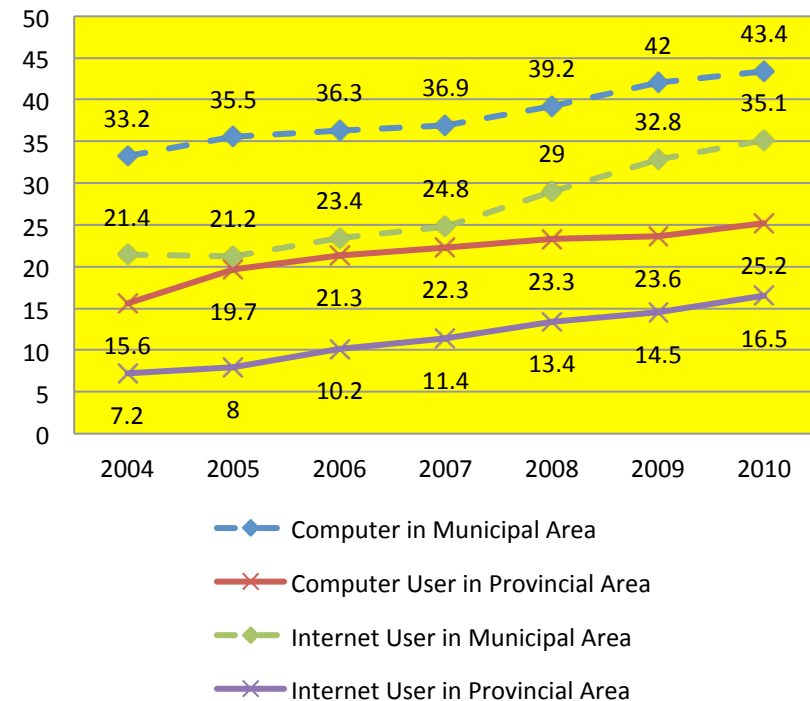
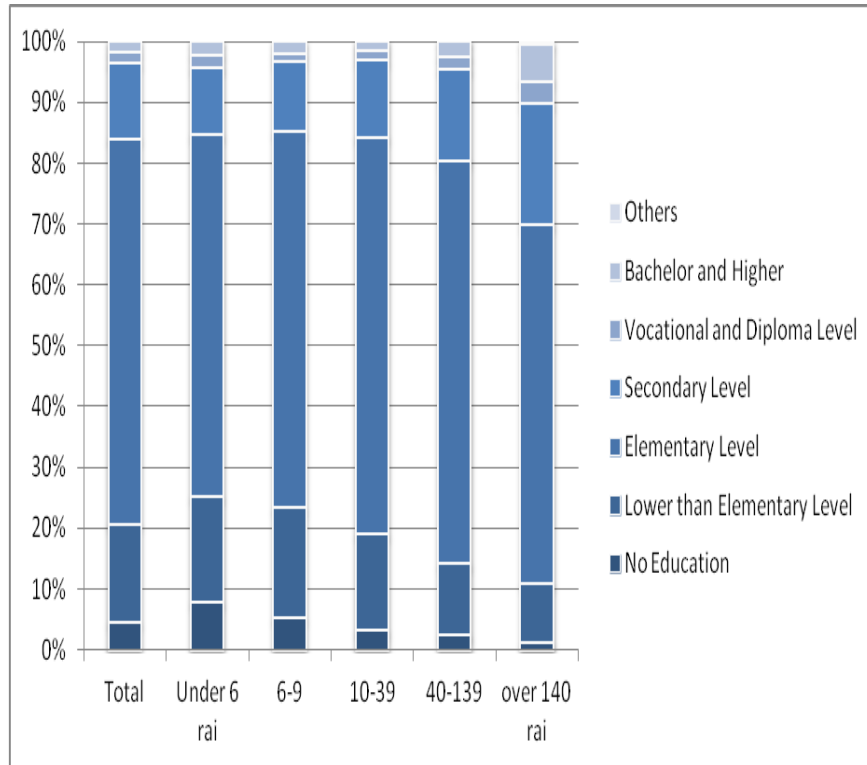
Percentage of irrigated land outside the central area is very limited



Most farms are small: 1.6 – 6.4 hectares.



1. The Thai Agricultural Sector (4)



Most farmers only complete elementary level of education

Computer and internet usage in the provincial area is still very much limited. But mobile penetration in the province is higher (57%).



2. Case Studies



1. ICT for traceability:
rice/tangerine



2. ICT for dissemination of information:
Longan

3. ICT to facilitate the use of customized fertilizer



4. ICT to facilitate efficient distribution of irrigated water



2.1 Traceability

Problem: EU requires traceability of all imported agricultural produce. Sourcing from “pooled” supply from small farms became a problem for manufacturers/exporters

Solution: Establishment of systematic data recording and information sharing among participants of the rice supply chain with following steps:

- (1) identification of the working procedures and actions of each participant*
- (2) Farmers record and store information on cultivation (seeding source, fertilizer usage, harvesting method, packaging technique, etc.*
- (3) Middlemen record slot of rice purchased from each supplier with unique electronic product code (EPC)*
- (4) Customers can access traceability on-line at www.thairicetrace.com*



2.1 Traceability

Use of ICT:

- On-line entries of traceability information that can be shared among various participants along the supply chain.
- Farmers without access to computer can ask “central bar code issuer” to send bar codes and approach “e-marketplace: to help with on-line marketing

Result: The website (maintained by the Department of Science of Khun Kaen University) was not very informative and is now discontinued.



2.2 Off-season Longan

Problem: In-season longan fetches extremely low price. Off-season longan can fetch higher price but requires more complex cultivation technique that will provide high and timely yields.

Solution: Use of ICT to provide on-line access to

- (1) compile individual farmers production data record in order to synthesize optimal cultivation technique based on statistics.
- (2) Disseminate cultivation techniques: type of fertilizer and application techniques (timing and location) as well as pruning, harvesting and packaging techniques.
- (2) Provide monthly market supply and demand forecast (based on data of each individual farms nationwide)



2.2 Off-season Longan

Use of ICT: On-line data entries and information dissemination. Farmers without computers may approach Subdistrict Administrative Organization (SAO) help desk and information (fertilizer application and price data) can be provided via SMS.

Result: Approximately 70 farms joined the program with the incentive of obtaining price and supply forecasts as well as cultivation techniques in exchange for submission of own cultivation data (farm size and location, type of fertilizer used and method of application, etc.) The website is still available with updated information.



2.3 Customized Fertilizer

Problem: Most farmers use chemical fertilizer excessively, leading to deterioration of soil quality.

Solution: Allow farmers to design own fertilizer mix according to soil type and chemical composition according to the “soil test toolkit”.

ICT Use : Farmers may enter soil information on-line or via SMS in order to obtain information about soil and type and then, optimal fertilizer mix (N-P-K).

Result: The pilot project has become very popular as cost saving has been remarkable. The “soil test kit” is now commercially sold. In March 2011 the government has provided 3.5 billion baht funding to expand and extend this project.



2.4 Water Management

Problem: Uncoordinated water request and dispense system lead to excessive electricity cost for pumping water and inefficient supply of water.

Solution: Centralized the water dispensing in order to better coordinate the request for water supply of farms. Requested volume and time of water of each farm is aggregated into “groups” of users and is then recorded at the each pumping station and fed into the centralized system.

A “Decision Support System” was created to facilitate integrated water management operated jointly by Sub-district Administration and users. The system consists of 1) water management system 2) information management system and 3) reporting system.



2.4 Water Management



ICT use: On-line data and information about request for water allocation, the actual dispense of pumped water and the cost of electricity associated therewith promoted a transparent communal water management system.

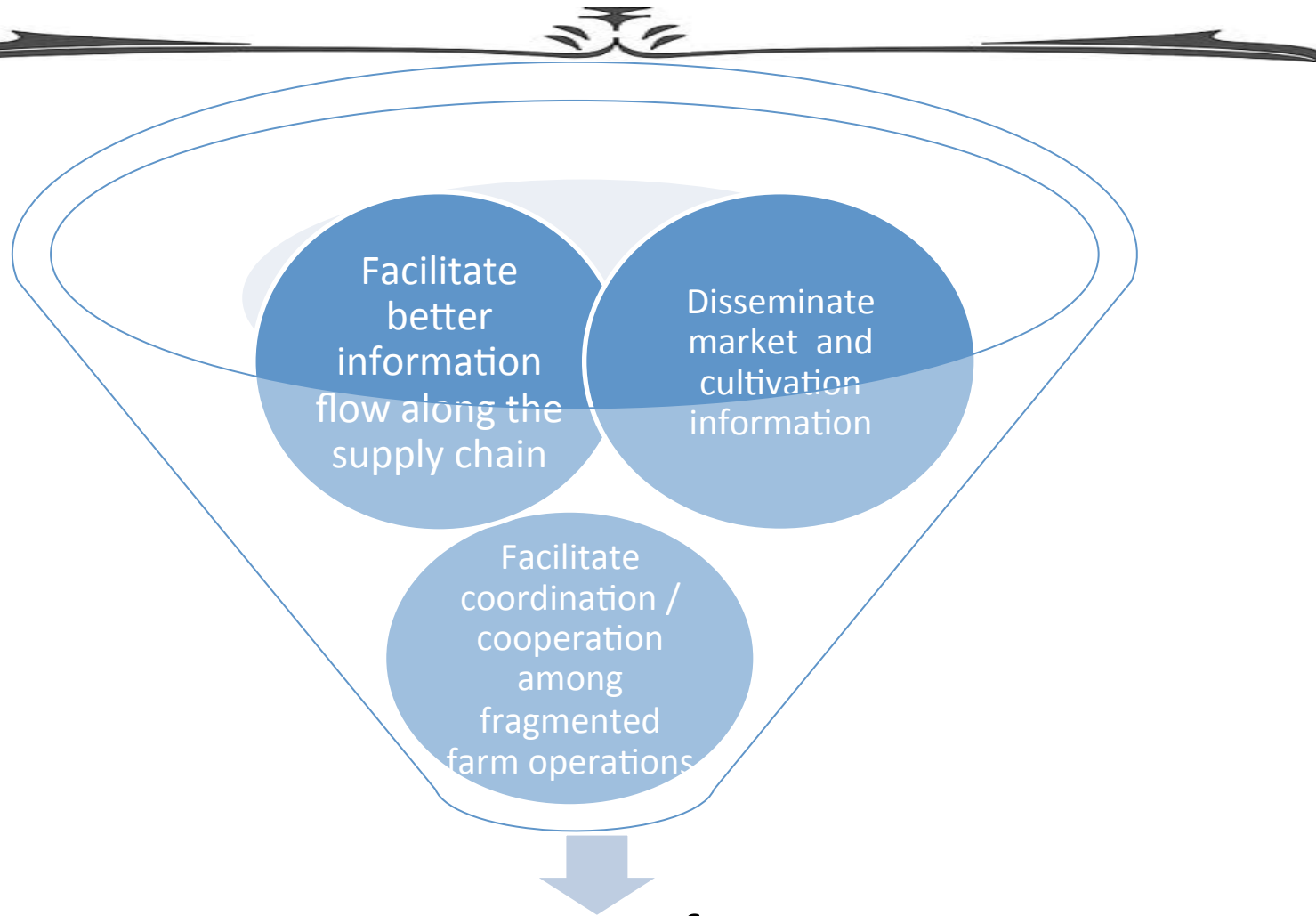
Results: The pilot project proved successful such that it is being implemented in numerous subdistricts. It allows the community to manage their own water resources, including mobilizing supplementary funding for the development of canals network built in the electricity charges.



3. Findings



How did the ICT help with KBE ?



What are the “enabling factors”?



Information flows

- Willingness and ability to collect, compile and share data
- Well designed and user-friendly communication system

Information Dissemination

- Availability of back-up access for those without internet access
- Incentives for farmers to share information

Coordination Cooperation

- Communal participation
- Incentive to establish management of communal resources



4. Recommendations



Farmers

- need to bind together in order to initiate a KBE at the community level
- establish links with academics and local administration to implement schemes
- learn how to make “informed decisions” by nurturing the culture of data and statistics.
- participants along the supply chain need to appreciate the “non-zero sum” game in information sharing.



4. Recommendations (2)



The State

- Provide limited funding for pilot projects initiated by academics with cooperation from farmers and local administration.
- Facilitate maximum participation from targeted beneficiaries by various means (technology, training “leaders” etc.)
- Assess the practical results
- Expand project that proved successful with greater financial contribution from beneficiaries (farmers)

