KASETSART UNIVERSITY

Sustainable Agricultural and Rural Development in Thailand
The Role of Science, Technology, and Innovation at Kasetsart University

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Prepared for communication at the Virtual Regional Consultation on Engaging with Academia and Research Institutions (ARIs) to support Family Farmers and Food System Transformation During and Post COVID-19 Pandemic in Asia. 8-9 December 2021.

Outlines

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KNOWLEDGE OF THE LAND

- About Kasetsart University
- Challenges
- Innovative curriculum development and academic activities
- Lessons learned

Bangkhen Campus

Kamphaeng Saen Campus

Sriracha Campus

Chalermphrakiat Sakon Nakhon Province Campus

About Kasetsart University

KU
KASETSART
UNIVERSITY

KNOWLEDGE
OF THE LAND

- Established in 1943 as a combination of agricultural primary school teaching center & experimental station
- Great success of coordination between research, experiment, and education

- Vision: *to provide "**Knowledge of the Land**" to promote sustainable development in order to be internationally recognized*.

- KU Motto: Knowledge of the Land: The three strands of sciences including the late King Bhumibol knowledge in *sufficiency economy, community knowledge, and international knowledge*.

- Mission: To be a university in the leading research group of the world **(Global and Frontier Research),** to carry out various international academic/research activities while reinventing the university system in the following ways

FACTS ABOUT KU, 2020

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QS World Universities Ranking in Agriculture and Forestry, 2021: 11th in Asia; 1st in Thailand

Thai programs
82 Bachelor's
203 Master's
94 Ph.D.

International programs
15 Bachelor's
13 Master's
14 Ph.D.

Total students: 68,099
60,158 Bachelor's
13 Graduate diploma
6,670 Master's
1,258 Ph.D.

Total staff: 9,870
3,530 Academic
6,340 Supporting

- And non-degree, short course, professional trainings
- All majors in agriculture, forestry, fishery, veterinary, extension, agroindustry, agricultural economics, environmental science, agricultural engineering, and related sciences plus other social sciences.

Institutional agreements with more than 600 universities and international organizations worldwide.

Source: KU Planning Division, 2020

Kasetsart University Locations

5 วิทยาเขต/โครงการจัดตั้ง
Campus/Establishment Campus Project

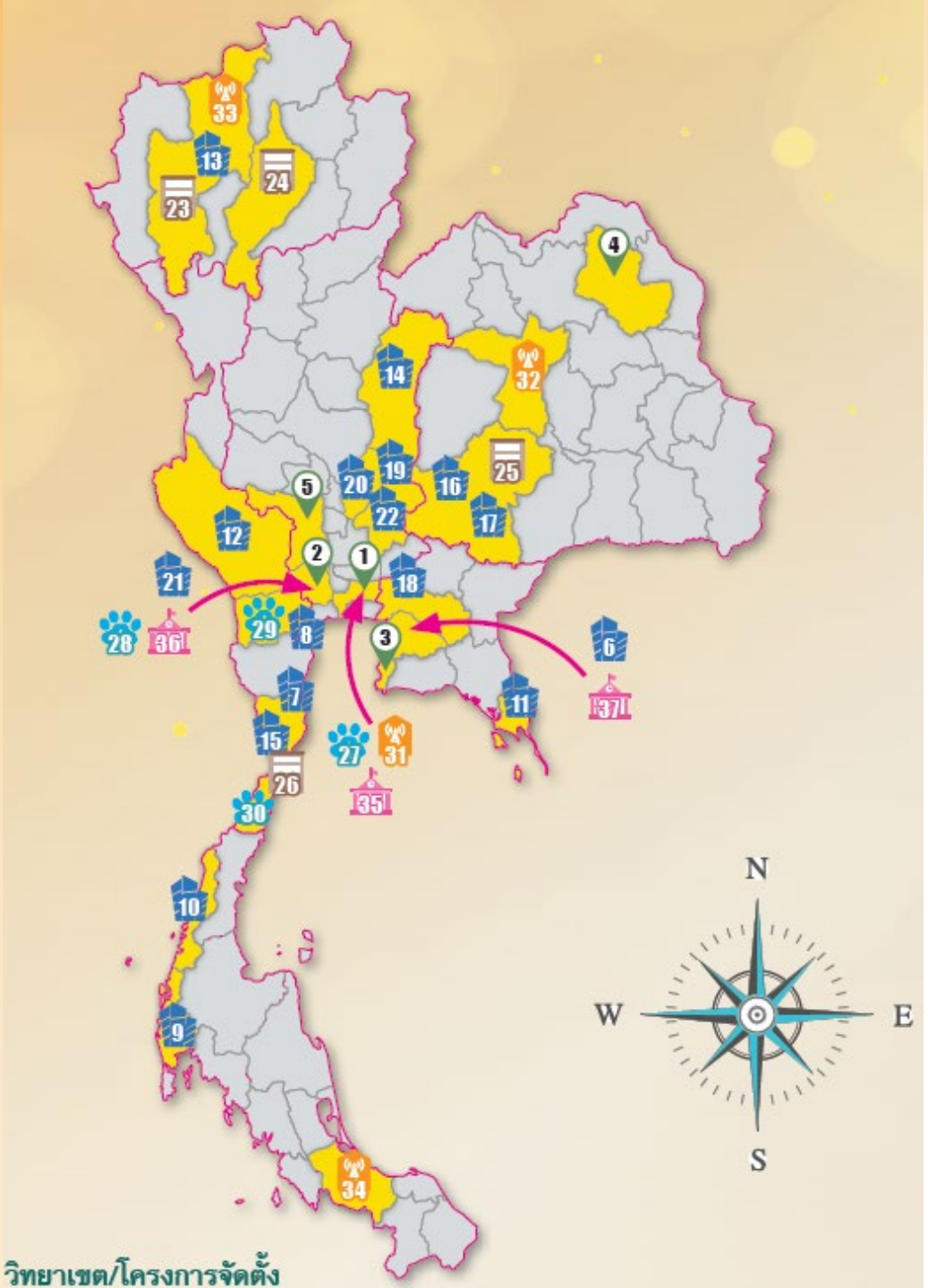
17 สถานีวิจัย/ศูนย์วิจัย
KU Research Stations, KU Experimental Stations

4 สถานีฝึกนิสิต
KU Training Station

4 โรงพยาบาลสัตว์
KU Veterinary Teaching Hospital

4 สถานีวิทยุ
KU Radio Station

3 โรงเรียนสาธิตแห่งมหาวิทยาลัยเกษตรศาสตร์
KU Laboratory School, Bangkok



Challenges

Thailand 20-year National Strategy (2018-2037), 1st national long-term strategy

- The vision of becoming "a developed country with **security, prosperity and sustainability** in accordance with the Sufficiency Economy Philosophy (SEP)" with the ultimate goal of happiness and well-being of Thai people.
- **Sufficiency Economy:** The late King Bhumibol's Philosophy of development based on three principles: *moderation, reasonableness, and self-immunity*, + 2 conditions: knowledge and integrity.

Thailand 4.0 policy, national agenda to drive the Thai economy in line with the sustainable development goals (SDGs) through innovation-driven economy.

2019 Establishment of Ministry of Higher Education, Science, Research and Innovation (MHESI)

HEIs have the main roles to **support human capital development , generate knowledge, conduct research, and generate innovation in line with national development goals to improve efficiency and competency of the nation, build national competitiveness and promote economic growth.**

Challenges

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- Declining number of interested students in agriculture
- To develop human capacity in line with national sustainable development goals
- By means of teaching, research, outreach programs
- Integrate science, technology, and innovation (STI)

Innovative Curriculum Development

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- **Challenges:**
- College students are not much interested in agriculture
- Changing population structure towards aging society
- Skills needed: Some older generations needs to **reskill, upskill**
- Need linkages from knowledge to innovation and from theory to practice
- **SDGs**
- No one single science can solve the problem

Innovative Curriculum Development

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Example: Integrated Curriculum in Knowledge of the Land for Sustainable Development

requires students to plan and design projects with the communities to develop innovations that meet community's needs.

employs a **Subjects-Integrated-Synchronization (SIS) model:** integration of **Knowledge of the Land** with active and problem-based learning experience where students' performance is evaluated from the outcome of assignments.

Objectives:

1. To be a short course, module plan that integrate many sciences and disciplines to be a complete curriculum that serve professions.
2. Promote life-long learning experience. Students at any ages can learn from 5 baskets of courses
3. Promote knowledge and skills in entrepreneurship and smart farming; emphasize on practice. Students can start start-up business or be entrepreneurial farmers
4. Promote knowledge creation and innovation
5. Promote learning experience with community and/or business companies by learning by doing

PRINCIPLES OF CURRICULUM DESIGN

SCHOOL OF INTEGRATED SCIENCE

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Drive Thailand 4.0	20-Year National Strategy	National Education Plan	The 12th National Economic and Social Development Plan	Higher Education Reform Plan
Enhancement of human value	Human potentials development and empowerment	Development for people of all ages and creation of learning society	Human potentials development and empowerment	Creating quality citizens to strengthen competitiveness
Equal Education	Disruptive education reform	Learners have fundamental skills and characteristics necessary in 21st century	Thai people of all ages have quality education that meets international standards and can continue learning on their own.	Information technology systems for education
Diverse learners of all ages	**Teaching approach consists of module with emphasis on practicality**	**Teaching approach is project-based/active learning**	**Availability of quality educational media accessible anytime and anywhere**	**Utilize information technology systems and applications in teaching and evaluation**
• Farmers/general public • University students • M.6 students	• Entrepreneurs • Communities • Source of Funds	• Innovation and learning skills • Work and life skills	• EduFarm • MOOC	• Smart Agriculture

KEY PROCESS SIS MODEL

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Adjustment of Professor's Teaching Responsibility Assignment

Course-based allocation → Combine all course contents first

Determine learning outcomes in SLO semester

Collaborate to design final integrative examination (project works) for every course

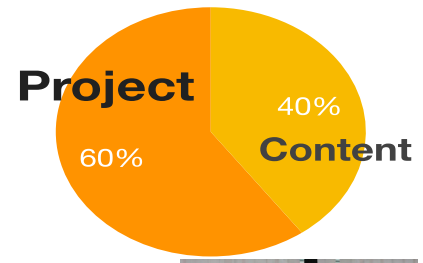
Co-create lesson plans of the semester for every course

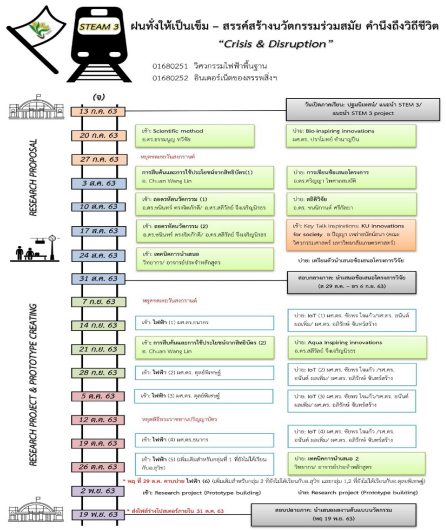
Appoint a team of instructors and lecturers for each topic and activity
(Course/Integrate/Develop skill and competence of learners)

Distribute score and evaluation methods (Each course content + SIS model project work)

All professors and lecturers participate
in team to proctor midterm and final examinations./Feedback

Lesson Learned: Innovative Curriculum Development





- Set a clear model of graduates with specific characteristics so that necessary knowledge and skills.
- The objective of curriculum development should be in line with the vision and mission of the university.
- A system analysis and holistic approach is efficient in addressing complex issues and problems such as sustainable development.
- Multidisciplinary programs are practical and increasingly gain more interests from students.

Lesson Learned: Innovative Curriculum Development

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- Inputs from graduates, employers, and potential students help in identifying knowledge and skills needed.
- Curriculum should be continually updated.
- Bring students to real world classroom: internship that trains students to conduct field research, cooperative education

Participatory and Cooperative Approach: Collaborative Program at National Corn and Sorghum Research Center

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Corn silage production with

- BAAC for access to soft loan
- Agricultural Marketing Cooperative of BAAC Customers for corn silage collection and sales
- DOAE for farmers' network
- Technology Transfer to corn seed SMEs
- Providing germplasm material: Material Transfer Agreement
- Annual cooperative public & private hybrids corn yield trials since 1987

Source: http://iicrd.ku.ac.th/

Center for Agricultural Biotechnology: Proven science to technology transfer

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A core center of research university network in agricultural sciences and biotechnology

- ➢Bring out expertise from experts from various institutes and work as a team

Equipped with state-of-the-art equipment, high quality researchers, and sizeable research budget

- ➢Able to identify problems, provide precision measurement and create appropriate technology specific to local problems.

Nutrient management and planting space for yield increase in Jasmine rice.

➢Results:

- ➢Higher yield (from 2 tons/ha to max 3.8 tons/ha)
- ➢800,000 views on youtube in a year
- ➢Increase farm revenue 200,000 THB/household

Lessons Learned: Research Centers

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- Strengthening local communities by transferring non-degree trainings with specific knowledge needed for their practice can provide good alternative to degree programs that require more time and commitment.
- Understanding the local needs and provide them with evidenced-based programs to improve farmers' observability of relative advantage and enhance triability experience will increase the adoption of innovation.
- Use efficient knowledge transfer tools/techniques for the right

Short courses/integrate research and teaching with community learning

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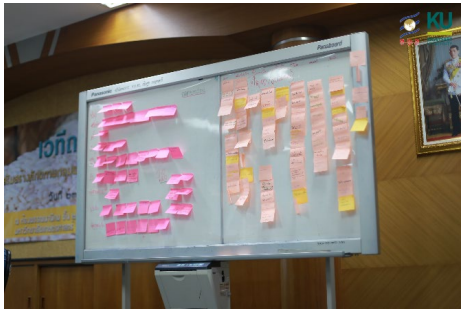
- **Glutinous rice seed production project at Sakon Nakhon campus**

PR, Open for interested farmers → Explaining the project → Creating farmers' network

Seed production ← Providing foundation seeds ← Knowledge transfer



Quality Assurance

KU Radio Plus

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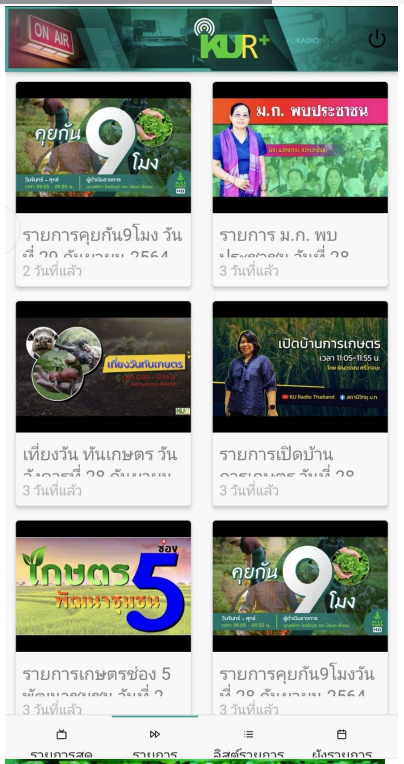
- 5 stations nationwide
- Local content/local wisdom
- On-air cooperative training courses



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Thank you

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