Current status of Agricultural Engineering Research and Agricultural Machinery strategy in Korea

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UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

CSAM

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Market opening

FTA agreement (52 countries, at 2017. 2.)

Land area 109th
(except DPRK)

Economic land 3th
(FTA market GDP scale/world GDP)

Threat

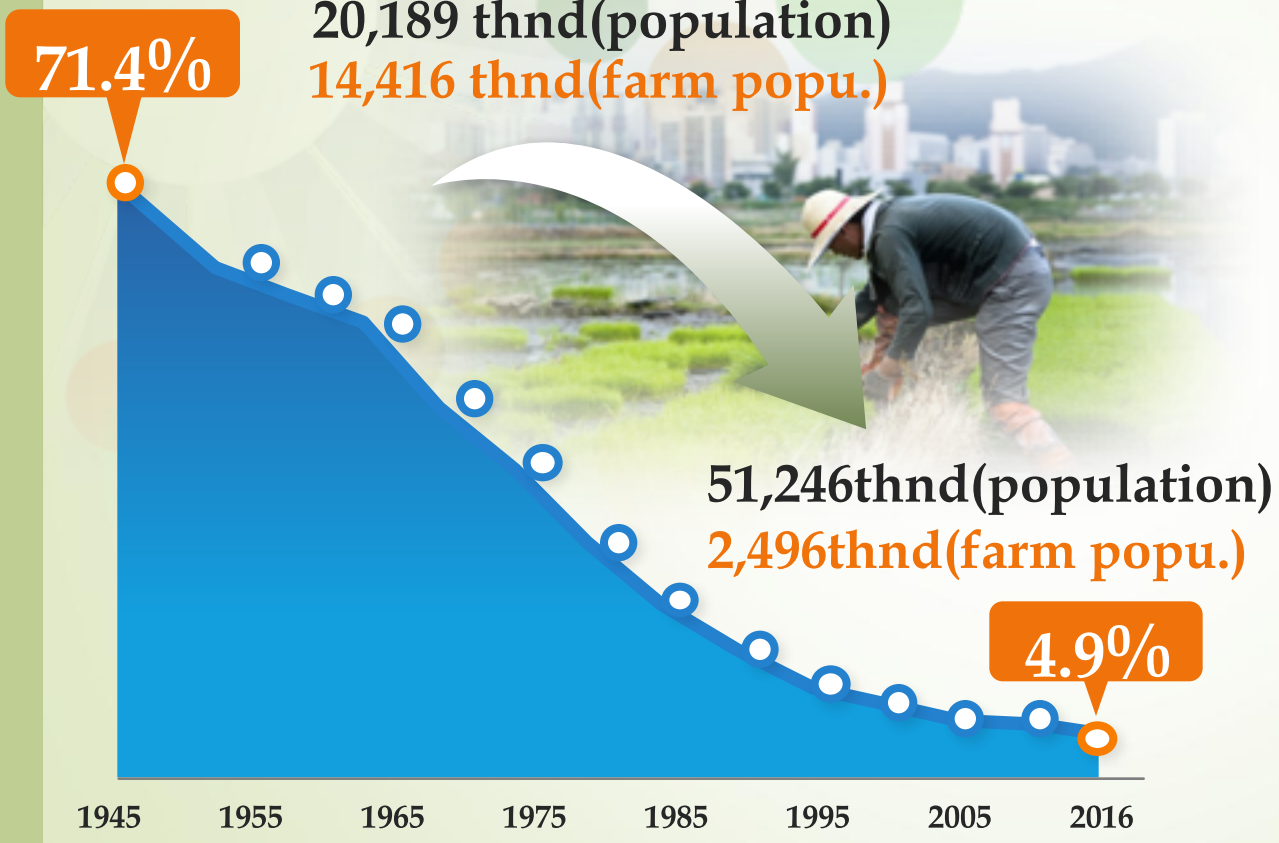
…gricultural products
Weakening agricultural competitiveness of upland

Opportunity

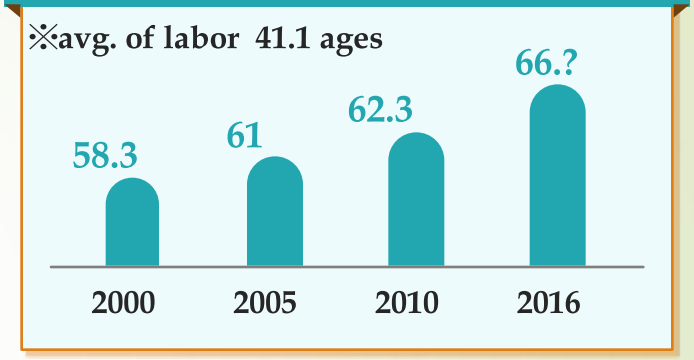
Increased market access opportunities

Decrease farm population and aging

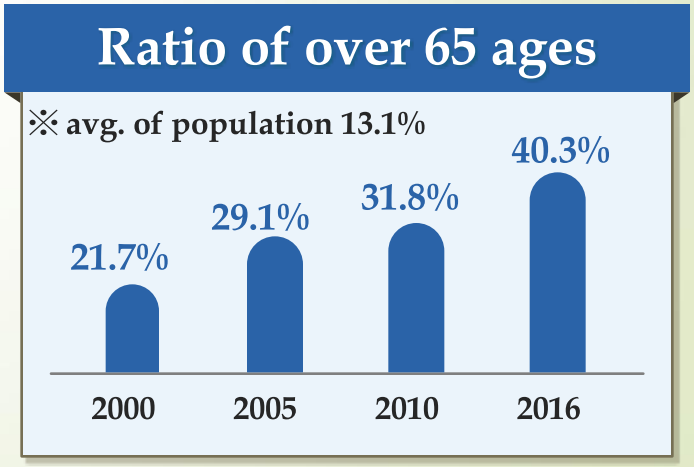
Ratio of farm population(%)



Avg. age of farmer

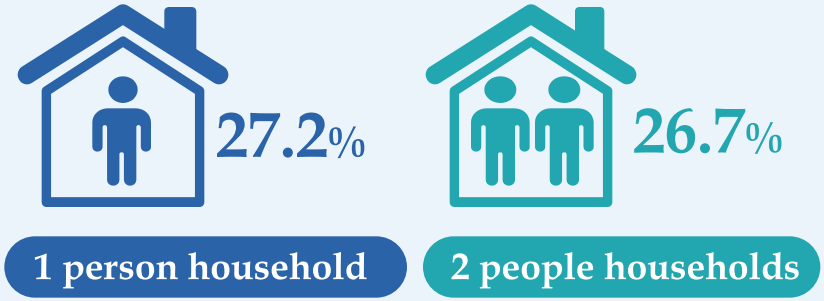


Ratio of over 65 ages

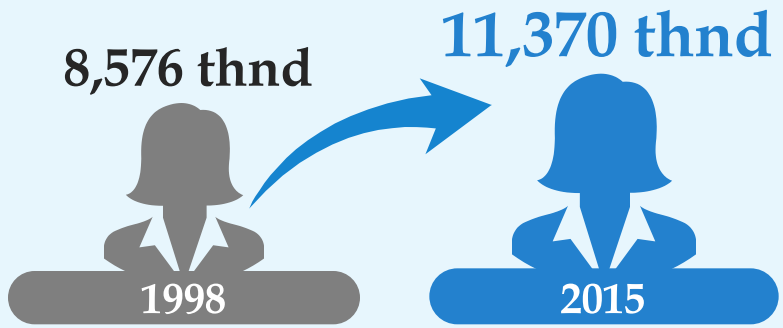


Change of trends

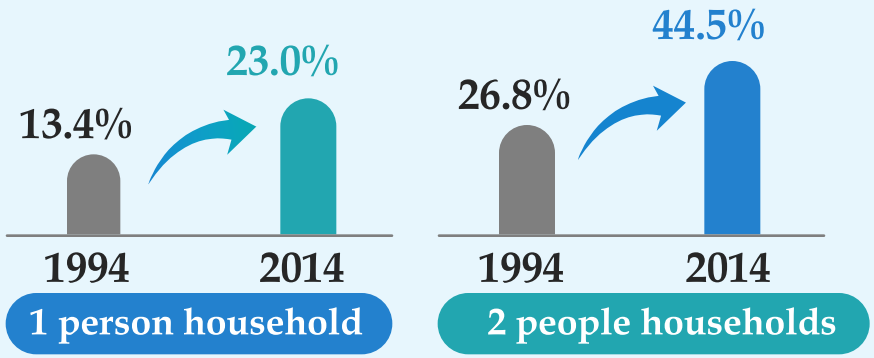
Increase of 1~2 households ('16)



Woman economic activity : 51.8% ('16)



Increase old man 1 household

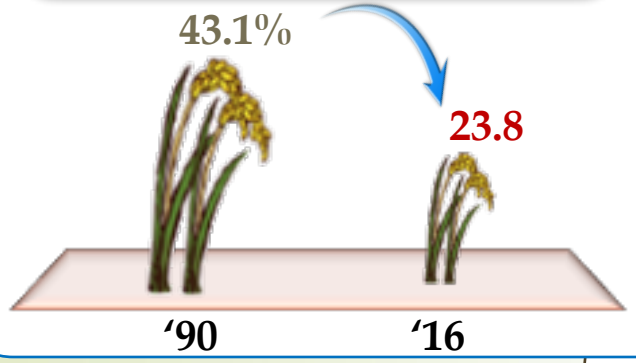


Increase of simple meal

- Instant rice, cup rice, side dish etc.
- Over 1 time at 1 week (84%)

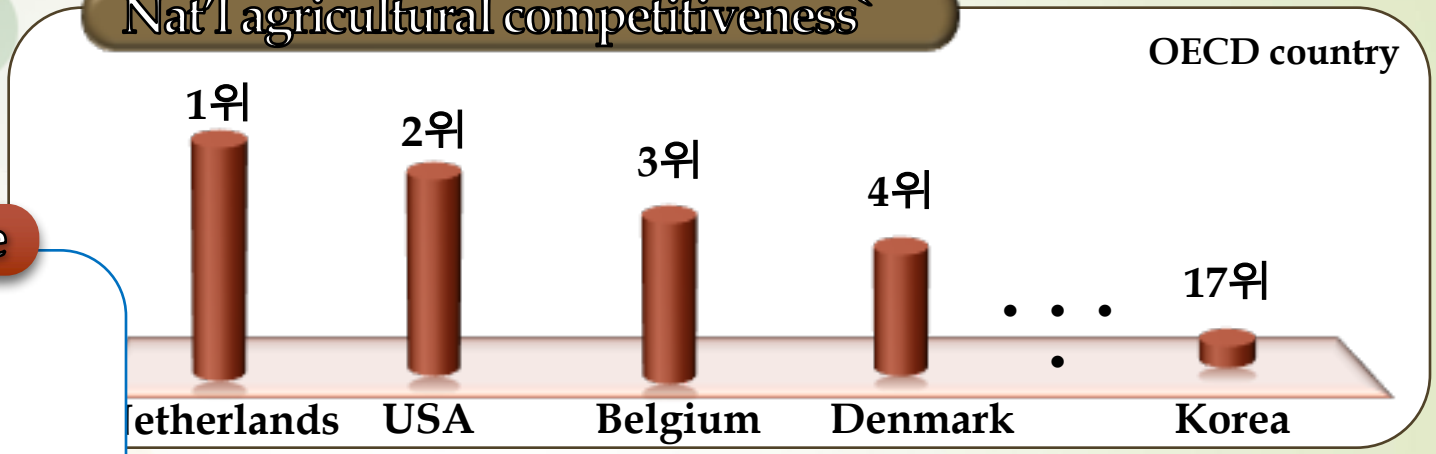
Overall status

Self sufficiency decrease

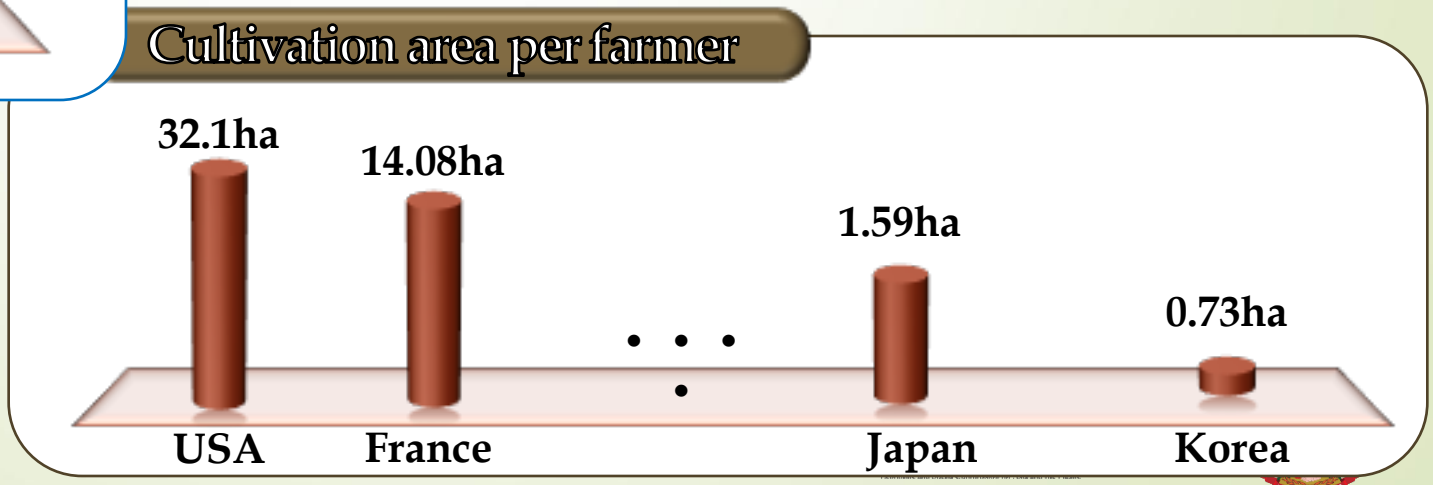


Due to market opening, self sufficiency decrease

Nat'l agricultural competitiveness`



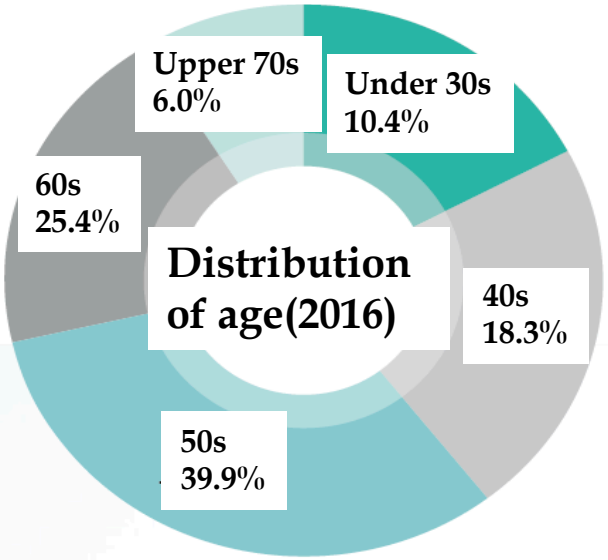
Cultivation area per farmer

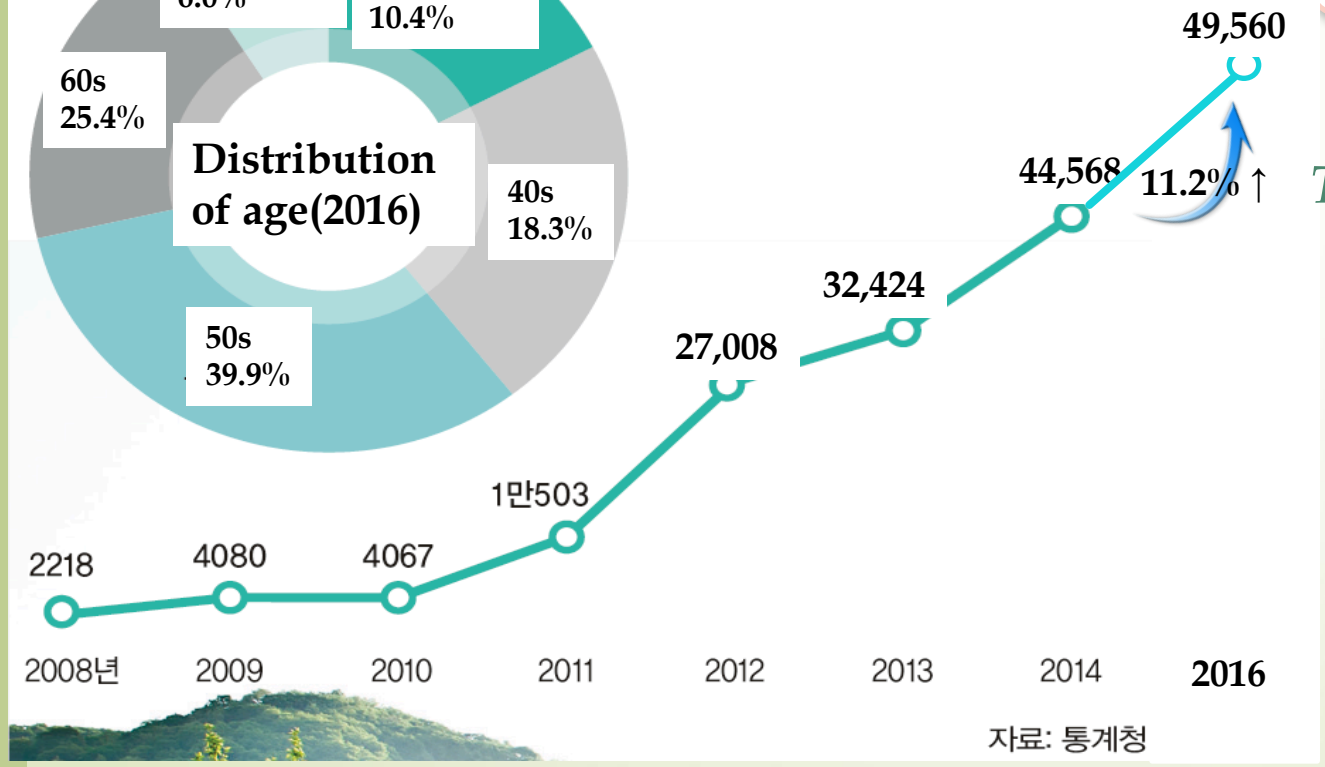


Threat, but new opportunity

Increasing return farm and/or rural

Unit : household





The world's largest high-speed Internet penetration rate

The world's No. 1 smart phone penetration rate

The new paradigm shift needed at agriculture and rural

New leap forward required by the ICT convergence of Agriculture Rural

UNITED NATIONS ESCAP Economic and Social Commission for Asia and the Pacific CSAM

Detail statistics (1/7)

Farm households

	unit	’13	’14	’15	’16
□ total households	thousands	18,206	18,457	19,561	19,285
□ farm	〃	1,142	1,121	1,089	1,068
(compare to total households)	(%)	(6.3)	(6.1)	(5.7)	(5.5)
◦farmer age					
-under 49 years	〃	9.3	8.2	9.0	7.5
-50~59 years old	〃	23.4	22.5	22.7	21.4
-over 60 years	〃	67.3	69.2	68.3	71.1
-over 65 years	〃	53.5	55.7	53.5	55.5
* years of average	years	65.4	66.5	65.6	-

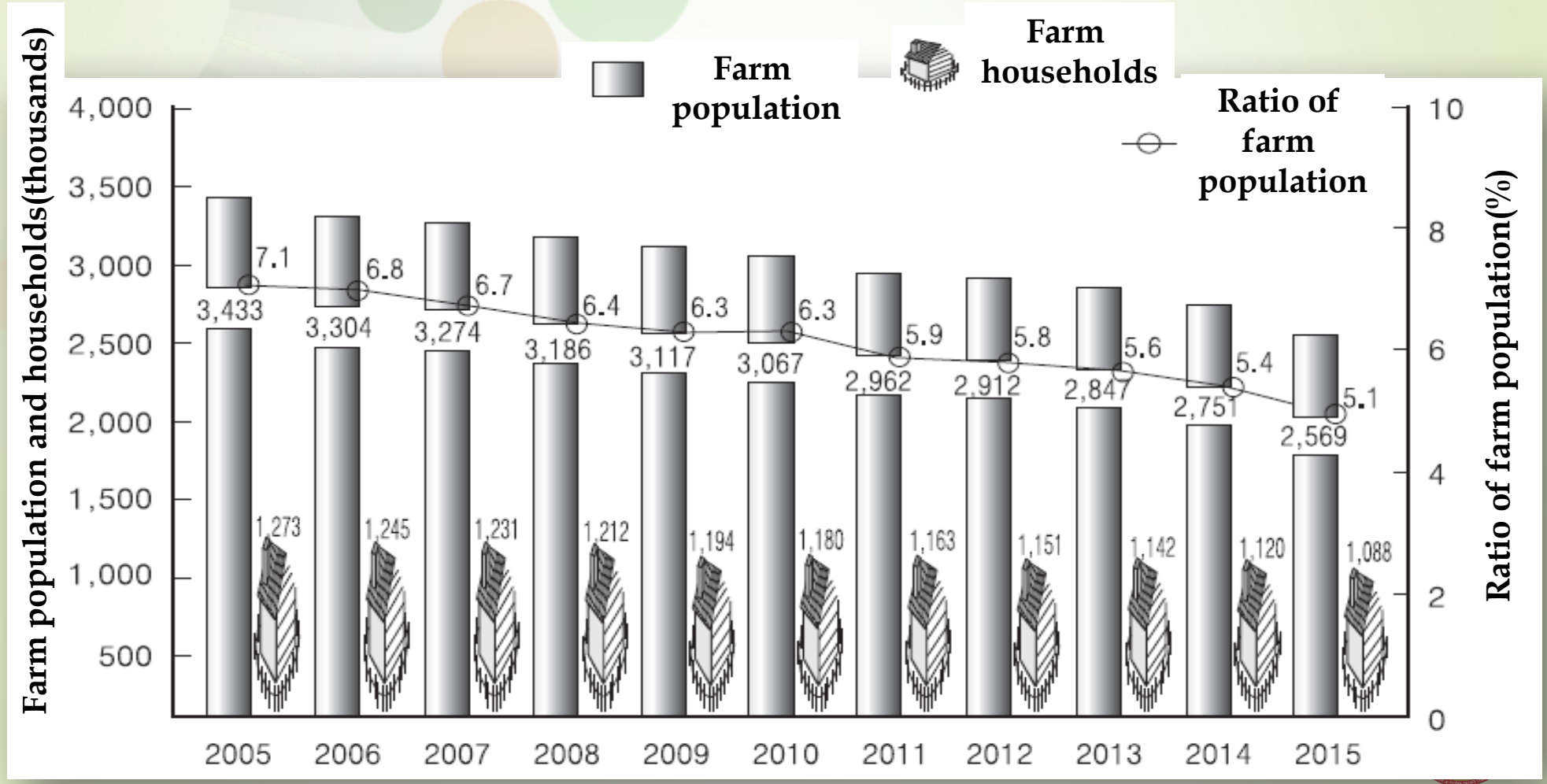
Detail statistics (2/7)

Farm population of Rep. of Korea.

	unit	'13	'14	'15	'16
□country population	thousands	50,220	50,424	51,069	51,246
- over 60 years	(%)	17.1	17.7	18.5	22.9
- over 65 years	〃	12.3	12.7	13.0	17.1
* average years	years	39.3	39.8	40.4	-
□farm population	thousands	2,847	2,752	2,569	2,496
(compare to total households)	(%)	(5.7)	(5.5)	(5.0)	(4.9)
-over 60 years	〃	47.8	49.7	50.3	53.1
-over 65 years	〃	37.3	39.1	38.4	40.3
*farm population per household	person	2.5	2.5	2.4	2.3
◦woman farm population	thousands	1,461	1,412	1,305	1,275
(compare to farm population)	(%)	(51.3)	(51.3)	(50.8)	(51.1)

Detail statistics (3/7)

Farm households, farm population



Detail statistics (4/7)

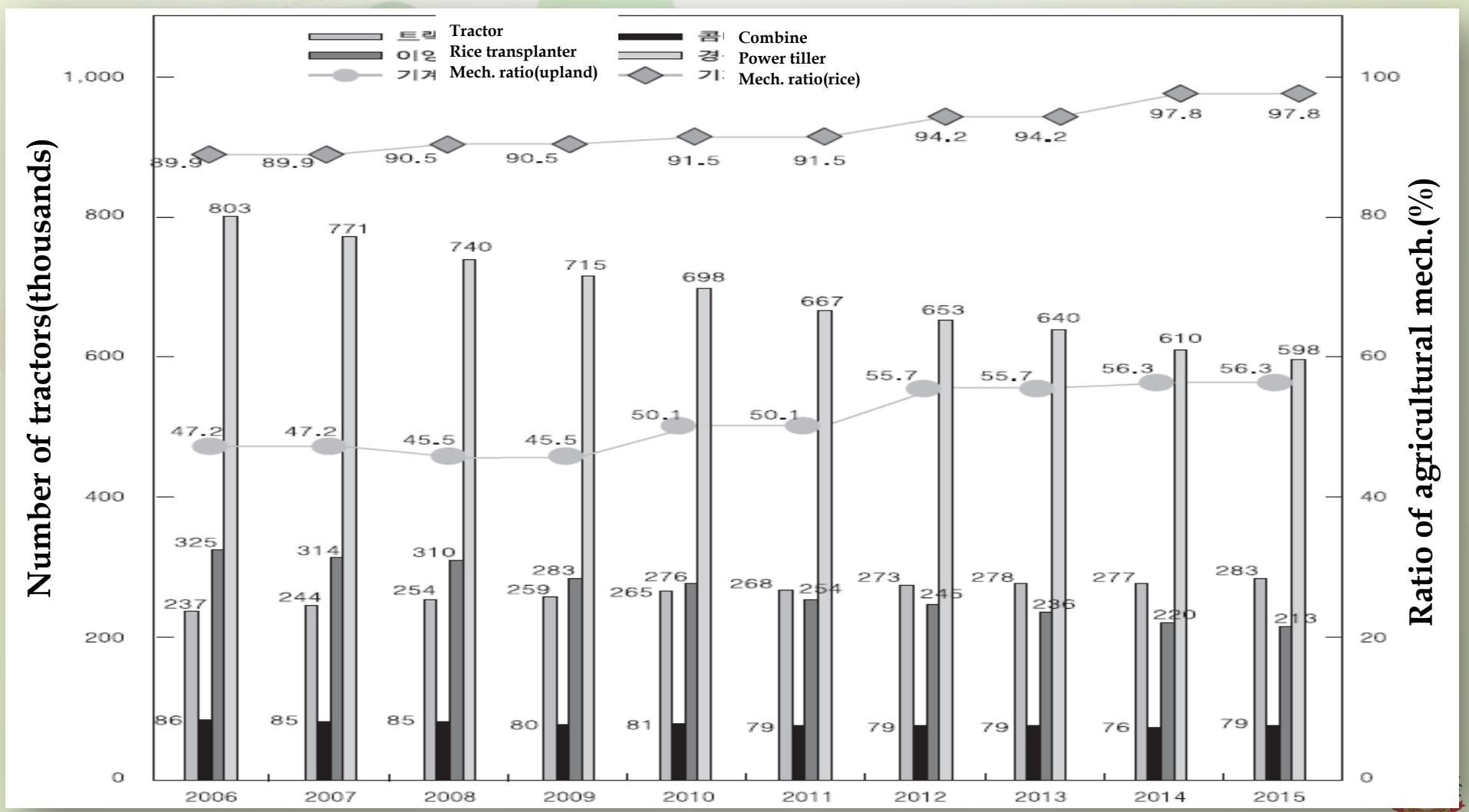
Self-sufficiency of Food crops

단위 : % Unit : %

항목 Item / 연도 Year	계 Total	쌀 Rice	보리쌀 Barley	밀 Wheat	옥수수 Maize	두 류* Pulses	서 류 Potatoes	기 타 Others
				전체양곡 자급도(곡물자급도)				
2000	29.7	102.9	46.9	0.1	0.9	6.4	99.3	5.2
2007	27.7	95.8	48.3	0.2	0.7	11.1	98.4	9.8
2008	26.2	94.4	36.1	0.4	0.9	7.1	98.5	7.7
2009	26.7	98.0	41.1	0.5	1.0	8.4	98.5	7.6
2010	27.6	104.5	24.7	0.9	0.9	10.1	98.7	10.0
2011	24.3	83.2	22.3	1.0	0.9	7.9	96.9	9.1
2012	22.8	86.6	16.9	0.7	0.9	9.7	95.7	10.0
2013	23.1	89.2	19.9	0.5	1.0	9.7	96.2	8.4
2014	24.0	95.7	-	-	-	-	-	-

Detail statistics (5/7)

Number of selected agricultural machinery and ratio of agricultural mechanization



Detail statistics (6/7)

Ratio of mechanization for rice farming

가. 수도작 작업별 기계화율 Ratio of Mechanization for Rice Farming

단위 : % Unit : %

항목 Item / 연도 및 시도 Year and Province	평 균 Average	경운, 정지 Tillage	이 앙 Transplant	수 확 Harvesting	방 제 Spray	건 조 Drying
2002	88.9	98.8	98.4	99.1	99.6	48.6
2004	89.9	99.1	98.4	99.4	99.5	53.2
2006	89.9	99.1	98.4	99.4	99.5	53.2
2008	90.7	99.0	99.2	99.5	99.4	55.6
2010	91.5	99.9	99.8	100.0	99.3	58.5
2012	94.1	99.9	99.8	99.9	99.7	71.6
2014	97.8	99.9	100.0	99.9	99.0	90.1

벼 영농규모별 승용기계화율 Ratio of Riding Mechanization for Cultivating Area

0.3 ha 미만	~0.3 ha	55.1	81.3	61.8	94.6	11.3	26.4
0.3~0.5 ha	0.3~0.5 ha	65.4	87.5	81.6	99.5	14.3	43.9
0.5~1.0 ha	0.5~1.0 ha	64.5	88.1	70.1	98.4	10.9	55.2
1.0~2.0 ha	1.0~2.0 ha	69.0	91.5	67.3	99.5	10.1	76.5
2.0~5.0 ha	2.0~5.0 ha	75.5	98.8	83.2	97.8	9.3	88.6
5.0 ha 이상	5.0 ha~	84.0	100.0	99.3	99.4	23.3	97.9

Detail statistics (7/7)

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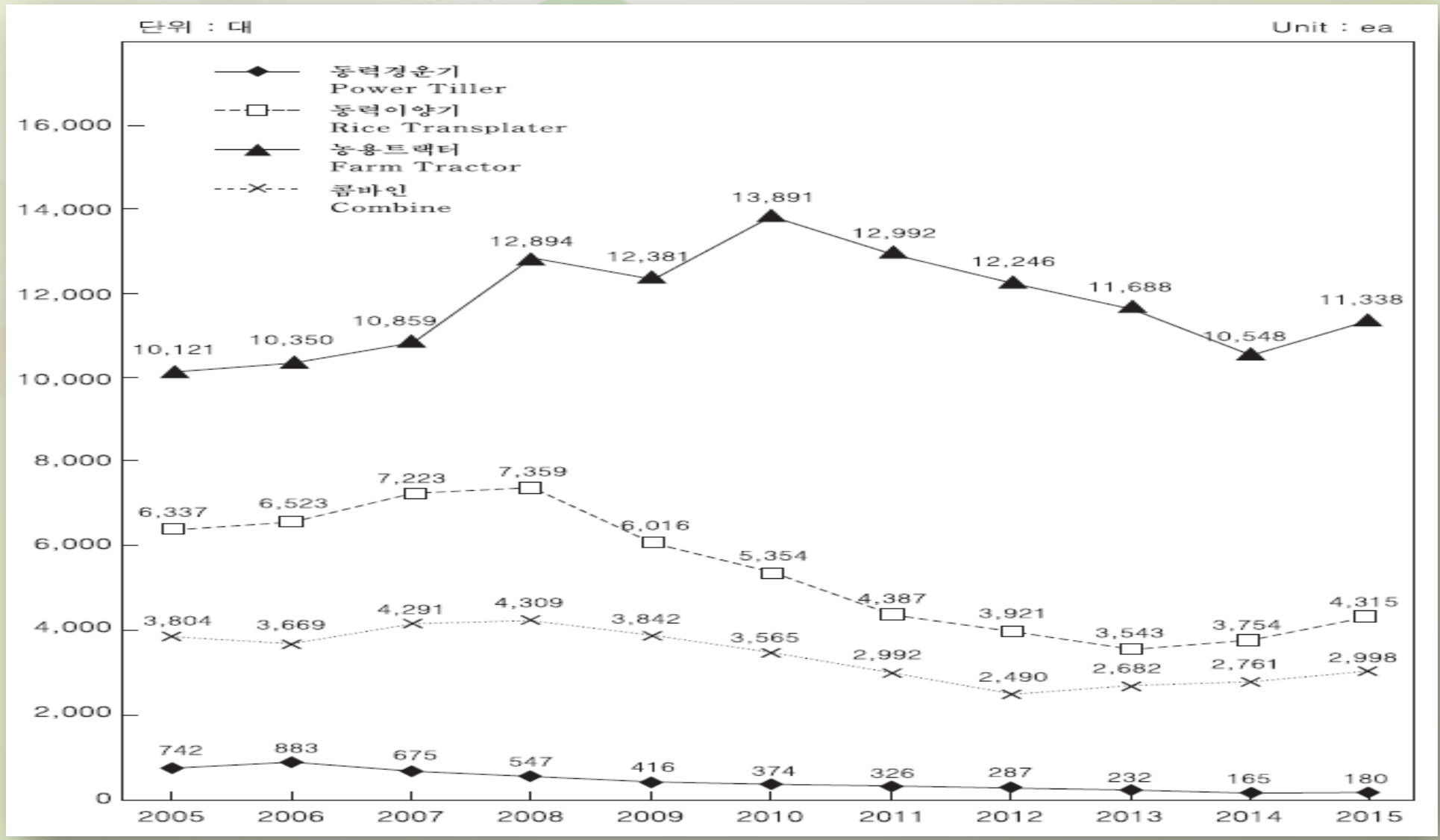
Annual supply of selected agricultural machinery



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Research of Korean agricultural engineering

Basic research

- mainly carried out by the University and the RDA
- published in the Journal of Biosystems Engineering
- title of the journal was changed from “Journal of Korean Society of Agricultural Engineering” to "Journal of Agricultural and Biosystems Engineering" (English manuscripts) at 2012
- KSAM has totally 5 working groups such as field system engineering, environmental engineering and energy, post harvest engineering, bio-engineering, and information processing.

Research of Korean agricultural engineering

Basic research

- In 2016, about 33.2% of KSAE published papers were on the field system engineering while 25.3% and 18.1%, respectively for environmental engineering/energy and information processing.

Long-term plan : The 4IR and Precision Agriculture

- The key phrase used at the World Economic Forum in 2016 was the 4IR
- In the era of the 4IR, new technologies and new businesses that cannot be defined by existing laws and systems will be developed.
- In order for the 4IR to be rooted in agriculture, it is necessary to promote the safety of agricultural work and rural life, and to create a convenient environment for cyber technology and cloud infrastructures.

4IR technology and agricultural R&D convergence model

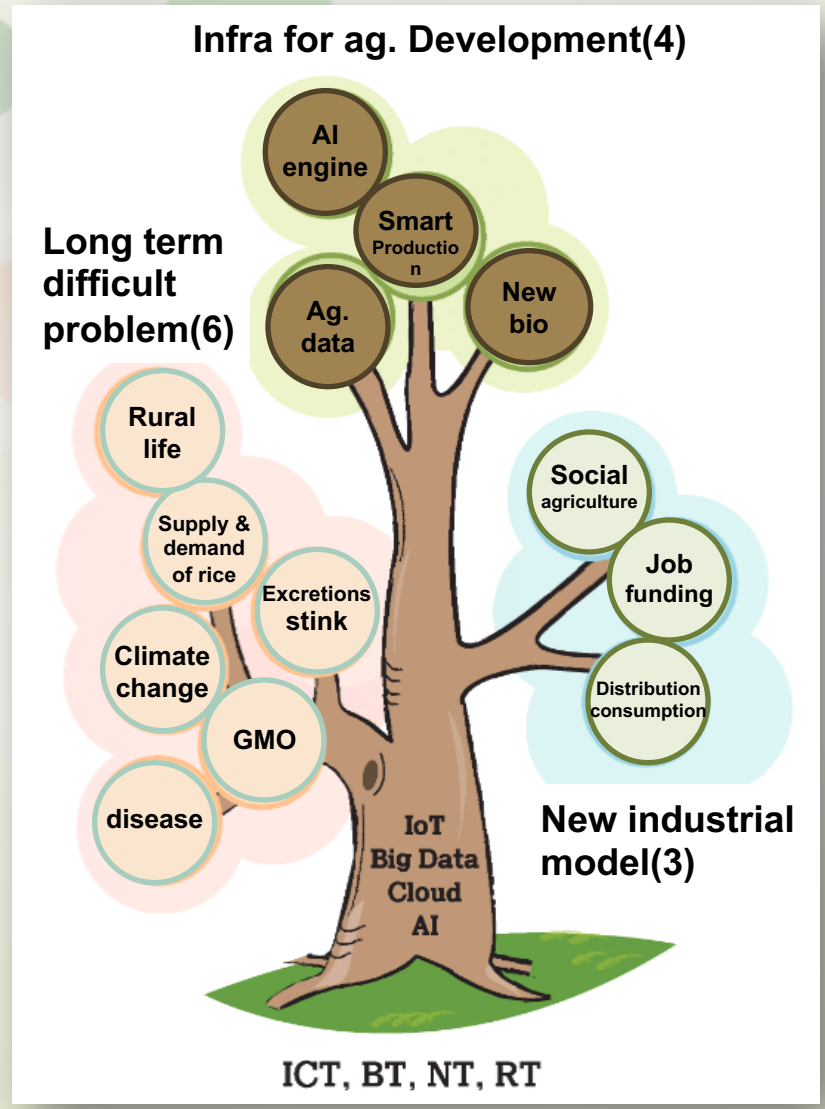
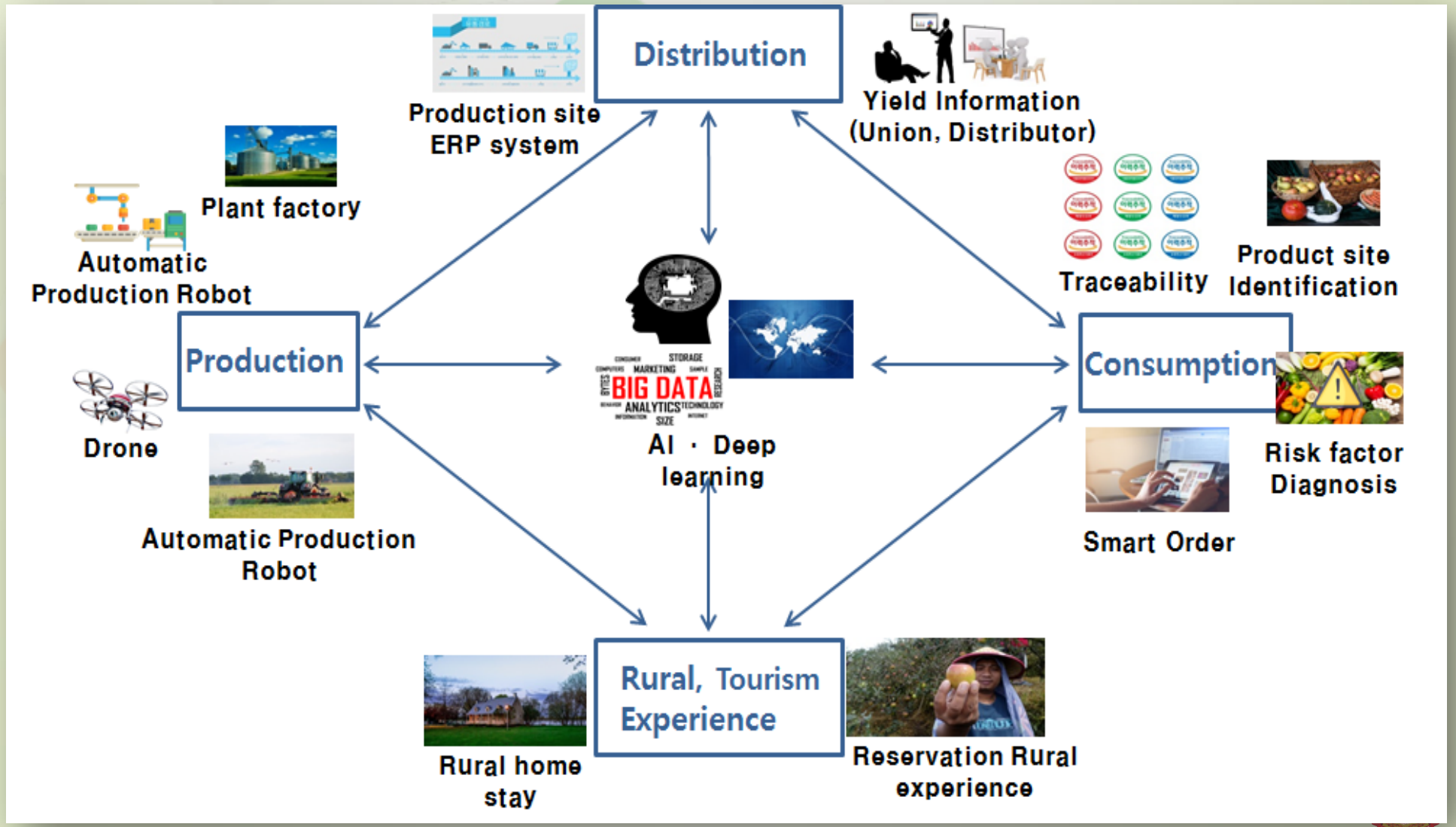


Illustration of the future agriculture with the 4IR



The 4th Industrial Revolution and Changes in Agricultural Production (1/2)

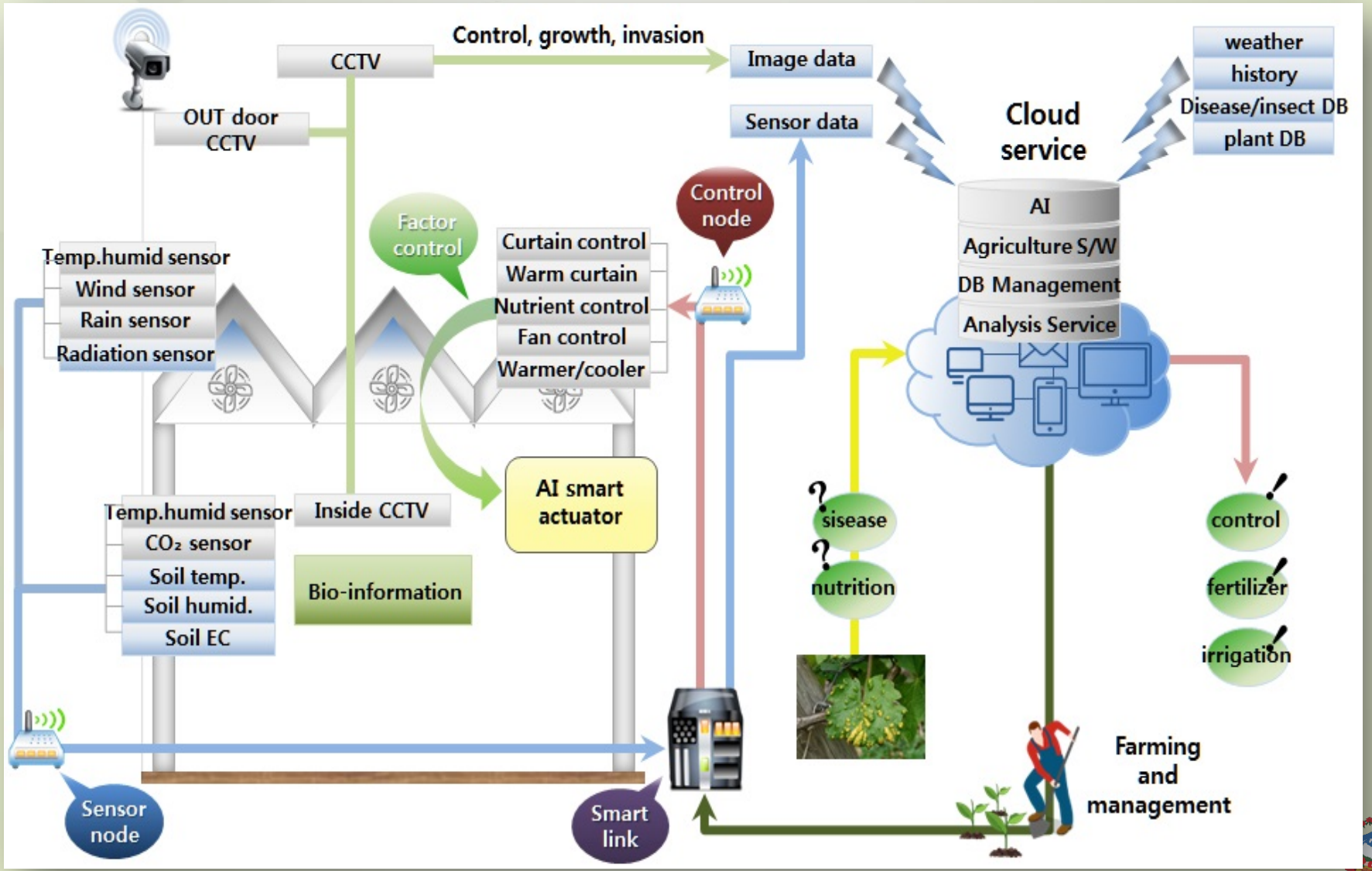
스마트 센싱 & 모니터링
(Smart sensing & monitoring)

빅데이터/
인공지능 기반 클라우딩
(Cloud-based event and data management)

스마트 제어
(Smart control)

스마트 분석 및 기획
(Smart analysis & planning)

The 4th Industrial Revolution and Changes in Agricultural Production (2/2)



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Straw management

- 생볏짚 원형곤포 사일리지 및 기계화작업 간편화로 볏짚 수거 이용률 매년 증가 추세
- 볏짚 생산량은 증가하고 있으나 볏짚을 대부분 조사료로(72.4%) 이용하고 논에 돌려주는 양 (21.7%)은 매우 적음

* 볏짚 생산량 : ('10) 5,337천톤 → ('11) 5,760 → ('12) 5,871

Thank you for your interest

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