Workshop on
"Agriculture Extension and Farm Advisory Services in Myanmar"
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Linkages between Education, Research and Extension Services

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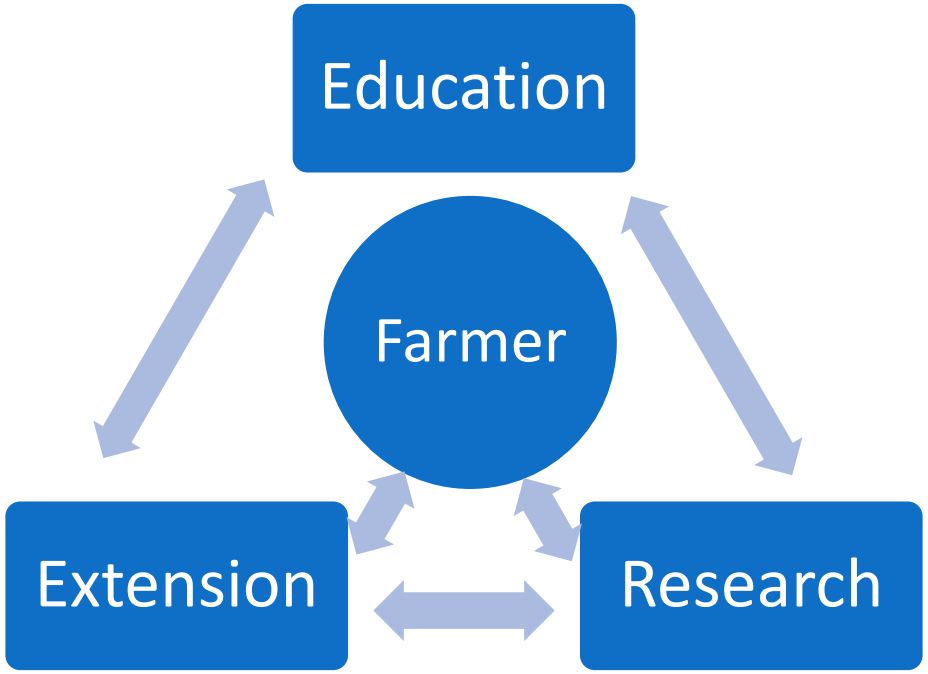
Linkages Between Education, Research and Extension Services

- **Linkage implies the communication and working relationship established between two or more organizations pursuing commonly shared objectives** in order to have regular contact and improved productivity (Agbamu, 2000; Sadighi, 2005).



Adapted from Anandajayasekeram et al. (2008), and Eneyew (2013)

Objectives

- To explore the curricula of agriculture education institutions with emphasize on agriculture extension, and the graduate researches done at YAU
- To examine the linkage of education in agriculture with research and extension

Methodology

- Personal interviews
- Literature review
- Observations and personal experience gained while working at the YAU

Agricultural Education Institutions

- **Education is central to the building of capacity** for the production, dissemination, and utilization of knowledge.
- **2 Agricultural higher education institutions** in Myanmar,
  - **State Agriculture Institute** (**SAI**) – 3 years, offers diploma
  - **Yezin Agricultural University** (**YAU**)– 5 years, offers degree
- **The education systems was reformed** during democratic government **in 2011-2012** academic year
- Bridge Education System for SAI students to YAU – at 1966

SAI - First Year Subjects

Sr	Dept.	First semester	Second semester
1	English	Comprehension, Vocabulary, Morphology	Grammar and Composition
2	Mathematics	Algebra and Calculus	Coordinate Geometry and Trigonometry
3	Physics	Mechanics, statistics, Heat and light	Electricity, Electromagnetism, Modern Physics
4	Agri-Chemistry	Inorganic and physical chemistry	Organic and Introductory Biochemistry
5	Agri-Botany	Plant Morphology	Plant Histology and Anatomy
6	Agronomy	Principles of Crop Production	Cereal Crop Production
7	Horticulture	Basic Principles of Horticulture	Perennials, Rainy and Cool season and Improved Vegetables
8	Animal Husbandry	Principles of Animal Husbandry	Poultry Production

SAI - Second Year Subjects

Sr	Dept.	First semester	Second semester
1	English	Grammar and Composition	Communication English
2	Agri-Chemistry	Principles of Soil Science I	Principles of Soil Science 2
3	Agri-Botany	Plant Physiology and Classification	Genetics, Breeding, Ecoogy, Evolution
4	Agronomy	Oil Crops and Industry Crops	Pulses and Food Crops
5	Horticulture	Flowers and Fruit Trees Growing	Spices, Condiments, Stimulant, Medicinal and edible underground plants
6	Animal Husbandry	Cattle Production	Fish and swine
7	Plant Protection	Fundamental Plant Protection I	Fundamental Plant Protection 2
8	Farm Mechanics	Farm Shop Mechanics	Principles of Engines and Transmission of Power

SAI - Third Year Subjects

Sr	Dept.	First semester	Second semester
1	Agri-Chemistry	Fertilizers and Fertilizer Application	Soil Conservation and Sustainable Agriculture
2	Agronomy	Agricultural Research and Experiments	Post-Harvest technology and Mulberry Production
3	Horticulture	Ornamental Plants and Landscape Garden	Tissue Culture, Fruits and Vegetable Preservation and Post Harvest Handling
4	Animal Husbandry	Livestock diseases, parasites, Prevention and Treatments	Livestock Farm Management and Nutrition
5	Plant Protection	Crop Pests and Diseases	Pests and Diseases of Flowers, Vegetables, Fruits and IPM
6	Farm Mechanics	Farm Machinery Operation, Maintaining and Farm Surveying	Water Management and Farm Electrification
7	Agri-Extension	Extension Approaches and Teaching Aids	Methods for Educating Farmers
8	Farm Management and Accounting	Farm Management (1) and Accounting (1)	Farm Management (2) and Accounting (2)

YAU - First Year Subjects

		First Year	
Sr	Department	1st Semester	2nd Semester
1	Agronomy	Principle of Agronomy	Field Crops Production (1)
2	Plant Breeding, Physiology and Ecology	Plant Taxonomy and Anatomy	Plant Physiology Level (I)
3	Soil and Water Science	Inorganic Chemistry and Physical Chemistry	Organic and Biochemistry
4	Entomology and Zoology	General Zoology	Fundamental Entomology and Classification of Insects
5	English	Straight Forward Level 1 A	Straight Forward Level 1 B
6	Myanmar	Myanmar	Myanmar
7	Mathematics	Mathematics	Mathematics
8	Physics	Physics	Physics

YAU - Second Year Subjects

		Second Year	
Sr	Department	1st Semester	2nd Semester
1	Agronomy	Field Crops Production (2)	Crop Planning and Management
2	Plant Breeding, Physiology and Ecology	Plant Physiology Level (II)	Cytology
3	Soil and Water Science	Introduction to soil science	Soil Physics and Soil Genesis
4	Entomology and Zoology	Industrial Entomology	Rice Pests and Their Control
5	English	Straight Forward Level 2 A	Straight Forward Level 2 B
6	Horticulture and Agricultural Biotechnology	Introduction to Horticulture	Plant Propagation
7	Plant Pathology	Introduction to Plant Pathology and Principles of Mycology	Plant Nematology, Bacteriology and Virology
8	Animal Science	Animal Nutrition, Genetics, Reproduction and Breeding of Farm Animals	
9	Information Technology	Principles of Basic Computer Science and Technology	
10	Agricultural Engineering		Agriculture Machinary, Farm Structure
11	Agricultural Economics		Introductory Economics and Principles of Agricultural Economics

YAU - Third Year Subjects

		Third year	
Sr	Department	1st Semester	2nd Semester
1	Agronomy	Biometrics	**Agriculture Extension and Rural Sociology**
2	Plant Breeding, Physiology and Ecology	Seed Biology	Genetics
3	Soil and Water Science	Soil Chemistry	Mineral Nutrition in Plants
4	Entomology and Zoology	Crop Insect Pests and Control	Crop pests in their Control
5	Horticulture and Agricultural Biotechnology	Vegetables Science and Fundamental of Fruit Science	Floriculture
6	Plant Pathology	Crop Diseases and Control (1)	Crop Diseases and Control (2)
7	Agricultural Economics	**Farm Management**	**Marketing and Accounting**

YAU - Specialization for Fourth Year

Sr.	Dept. of Agronomy	Dept. of Plant Breeding, Physiology and Ecology	Dept. of Soil and Water Science	Dept. of Plant Pathology
1	(A-1) Farming Systems Specialization	(B-1) Plant Breeding Specialization	(C-1) Soil Science Specialization	(D-1) Plant Pathology Specialization
2	(A-2) Field Crop Production Specialization	(B-2) Plant Physiology Specialization	(C-2) Water Management Specialization	(D-2) Agricultural Microbiological Specialization
3	(A-3) Seed Science and Technology Specialization		(C-3) Plant Nutrition Specialization	(D-3) Plant Protection Specialization
4	(A-4) Postharvest Technology of Field Crops Specialization			
5	**(A-5) Agricultural Extension Specialization**			

YAU - Specialization for Fourth Year

Sr.	Dept. of Entomology and Zoology	Dept. of Horticulture and Agricultural Biotechnology	Dept. of Agricultural Economics
1	(E-1) Integrated Pest Management Specialization	(H-1) Vegetables Science Specialization	**(Ec-1) Agricultural Trade and Marketing Extension Specialization**
2	(E-2) Integrated Pest Management Specialization	(H-2) Fruit Science Specialization	**(Ec-2) Farm Management Specialization**
3	(E-3) Insect Toxicology Specialization	(H-3) Floriculture Specialization	(Ec-2) Natural Resource Management and Environmental Economics Specialization
4	(E-4) Storage Pests and Their Control Specialization	(H-4) Agricultural Biotechnology Specialization	(Ec-4) Agricultural Production Economics Specialization
5		(H-5) Postharvest Technology of Horticultural Crops Specialization	(Ec-5) Agricultural Economics Development Specialization

Specialization in Department of Agronomy (e.g.)

Sr	Year	Code No	Subject
1	(A-1) Farming Systems	AGY-4101	Farming System Management
	Specialization	AGY-4104	Post-harvest Technology of Field Crops
		AGY-4106	Research Techniques in Agriculture
		PBP-4101	Principles of Plant Breeding
		ENT-4103	Integrated Pest Management
		ASC-	
		AGE-4101	Farm Machinery and Farm Surveying
2	(A-2) Farming Systems Specialization	AGY-4102	**Farming System Management**
		AGY-4104	Post-harvest Technology of Field Crops
		AGY-4106	Research Techniques in Agriculture
		AGY-4107	Principles of Seed Technology
		ENT-4103	Integrated Pest Management
		ASC-	
		AGE-4101	Farm Machinery and Farm Surveying
3	(A-3) Crop Physiology Specialization	AGY-4103	**Crop Physiology**
		AGY-4104	Post-harvest Technology of Field Crops
		AGY-4106	Research Techniques in Agriculture
		PBP-4101	Principles of Plant Breeding
		ENT-4103	Integrated Pest Management
		ASC-	
		AGE-4101	Farm Machinery and Farm Surveying
4	(A-4) Postharvest Technology of Field Crops Specialization	AGY-4104	Post-harvest Technology of Field Crops
		AGY-4106	Research Techniques in Agriculture
		AGY-4107	Principles of Seed Technology
		ENT-4103	Integrated Pest Management
		ASC-	
		AGE-4101	Farm Machinery and Farm Surveying
5	(A-5) Agricultural Extension Specialization	AGY-4105	**Agricultural Extension Approaches and Methods**
		AGY-4108	**Community Organization and Leadership**
		AGY-4109	Research Techniques in Biological and Social Science
		AEC-4101	**Agriculture Trade and Marketing Extension I**
		ASC-	
		AGE-4101	Farm Machinery and Farm Surveying

Academic Researches

- M.Agr.Sc program started in 1977-78 (to 1982-83)
- Ph.D program initiated in 2001 (to 2006)

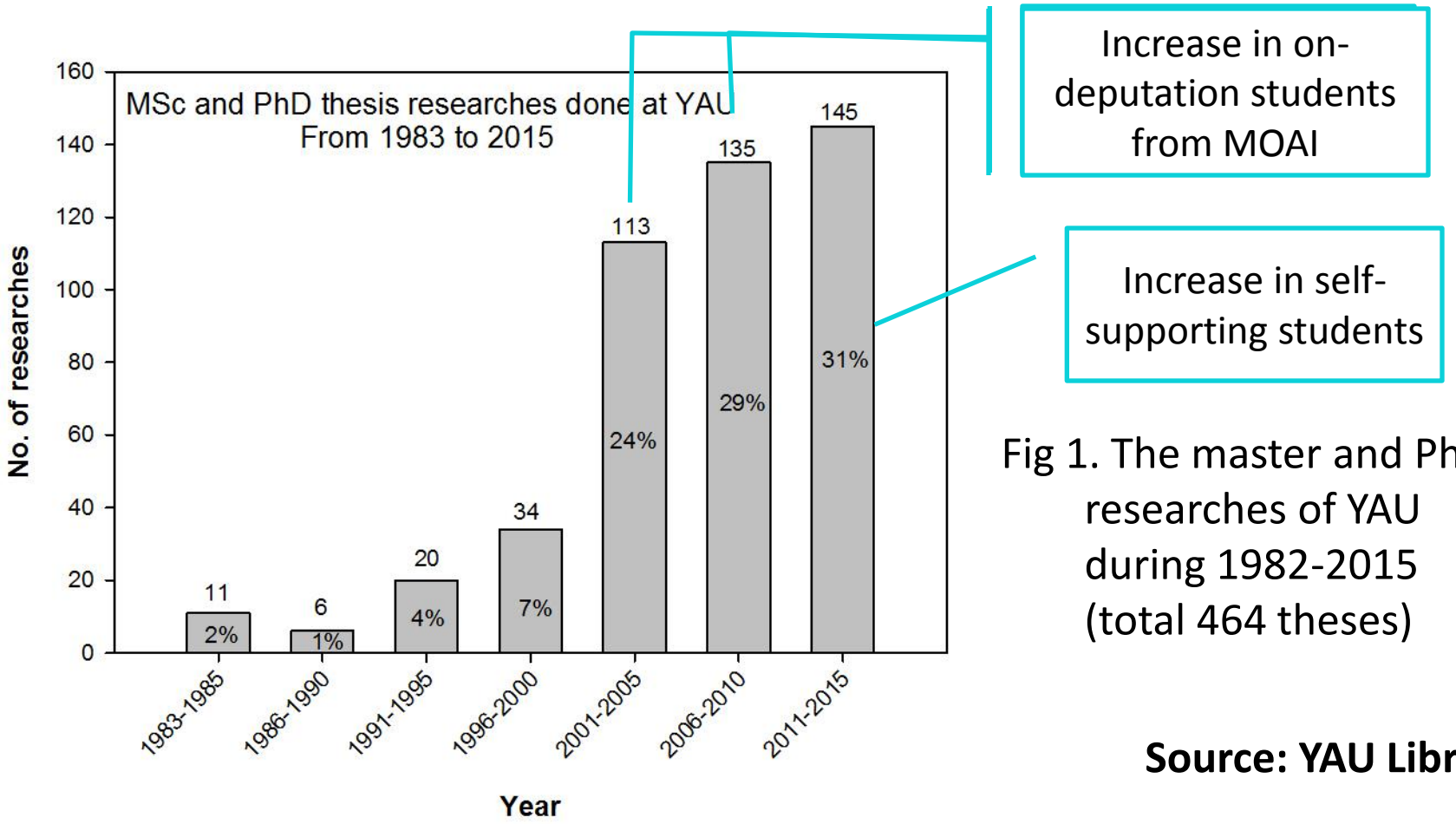


Fig 1. The master and Ph.D researches of YAU during 1982-2015 (total 464 theses)

Source: YAU Library

- The production of **pulses and oilseed crops are the second most important target** of MOAI **after rice** production

  (Cho and Boland, 2003).

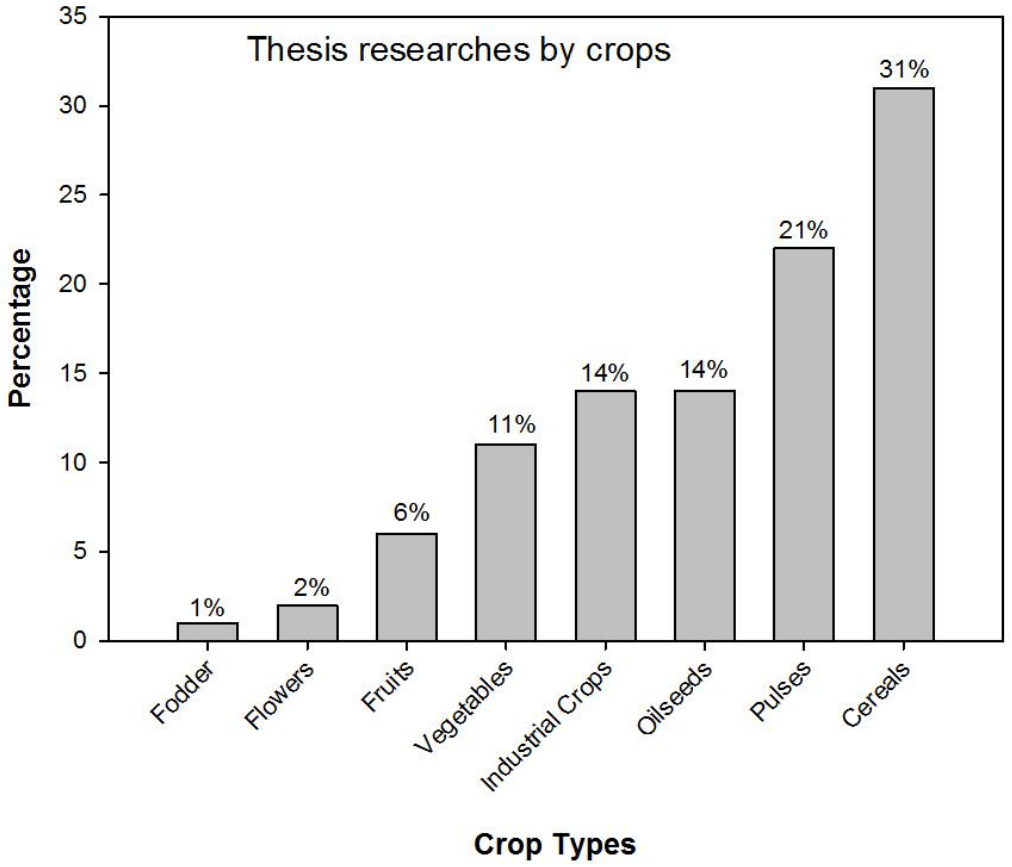
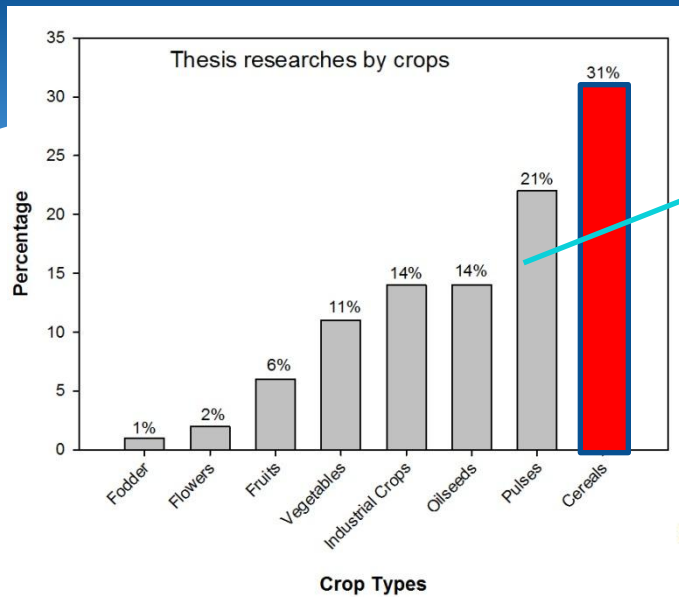


Fig 2. Master and Ph.D researches categorized by crop types



No. of pulses researches (96)

No. of rice researches (103)

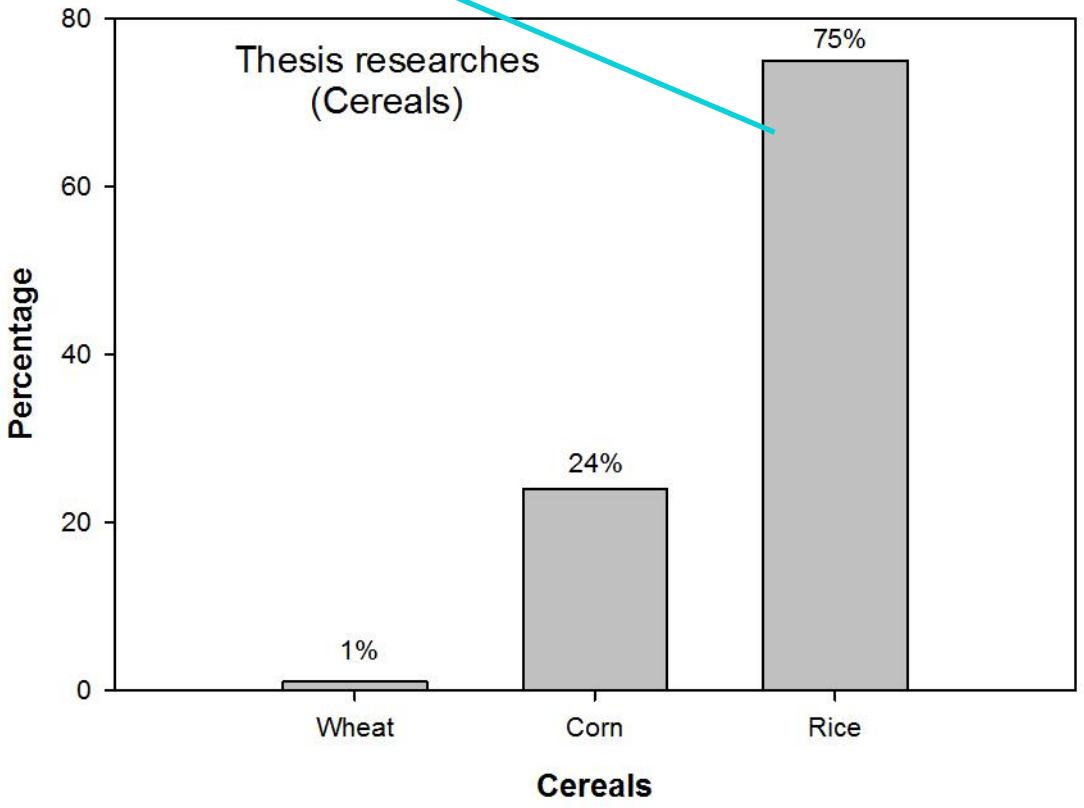
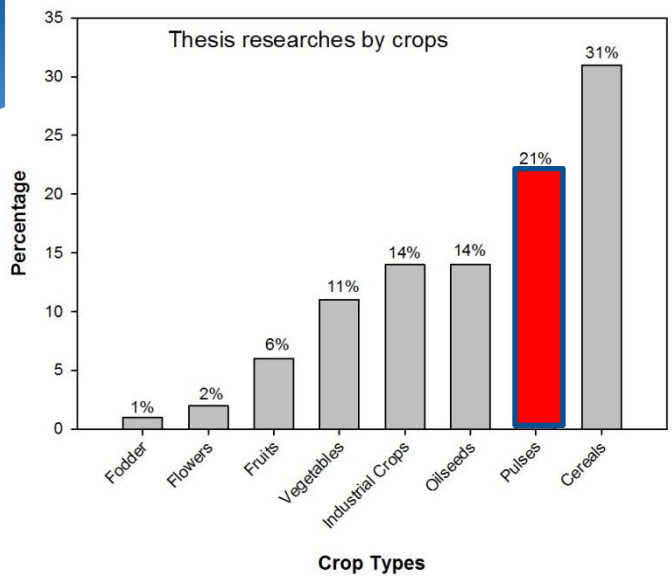


Fig 3. Cereals researches in master and Ph.D. theses



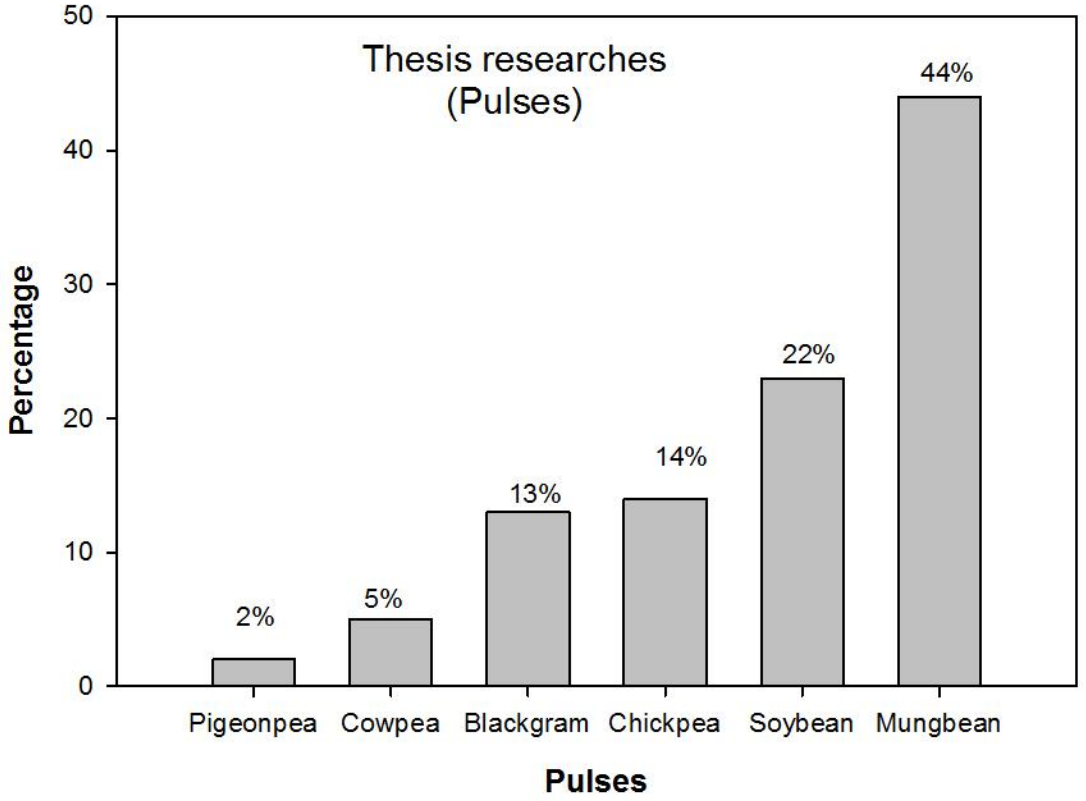


Fig 4. Pulses researches in master and Ph.D. theses

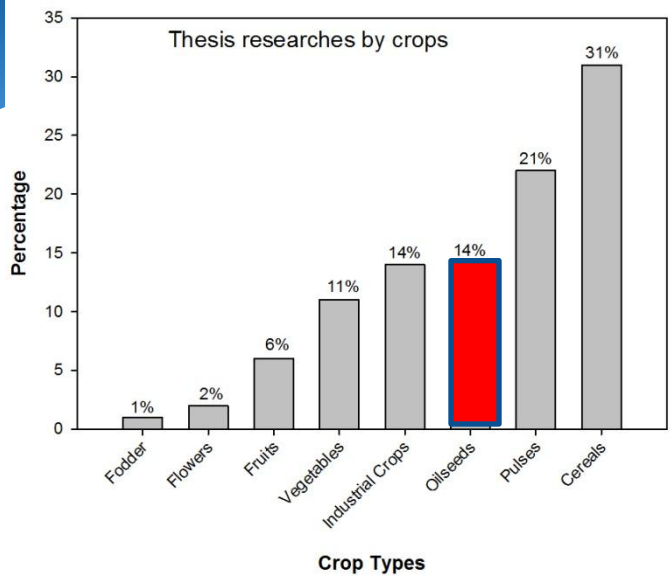
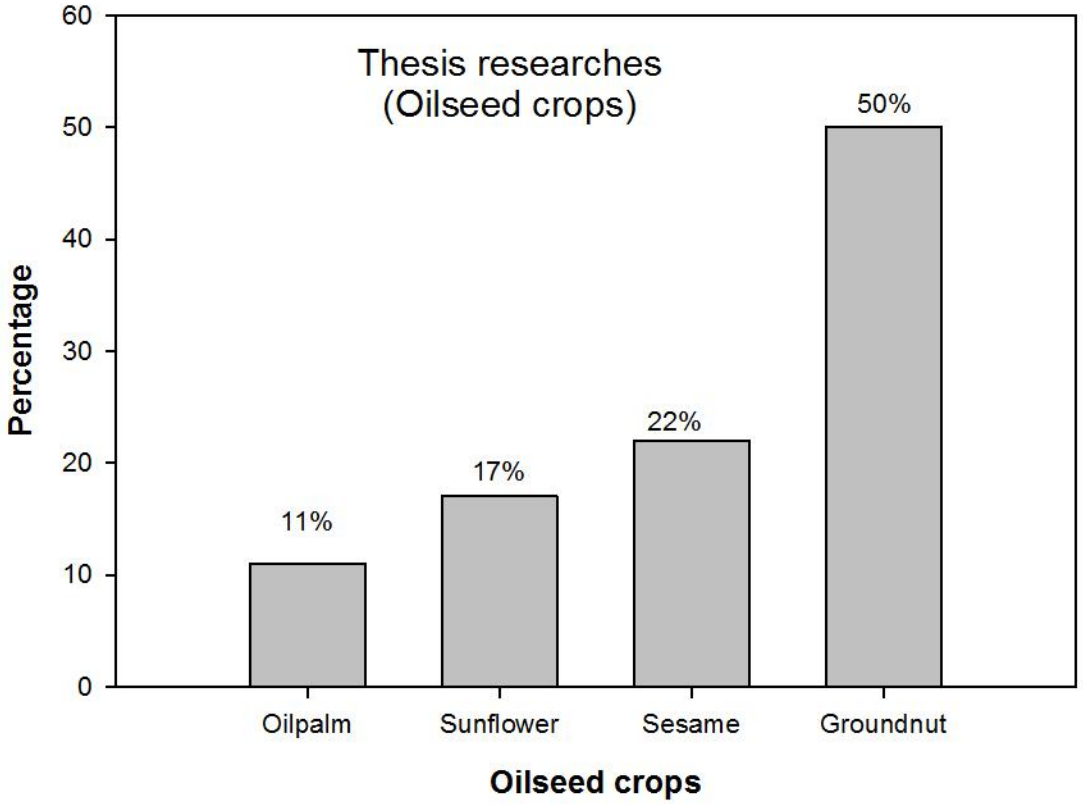
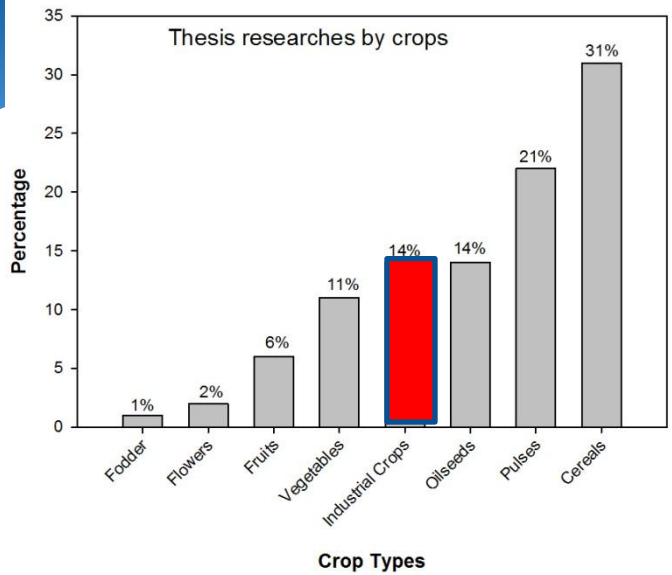


Fig 5. Oilseeds researches in master and Ph.D. theses





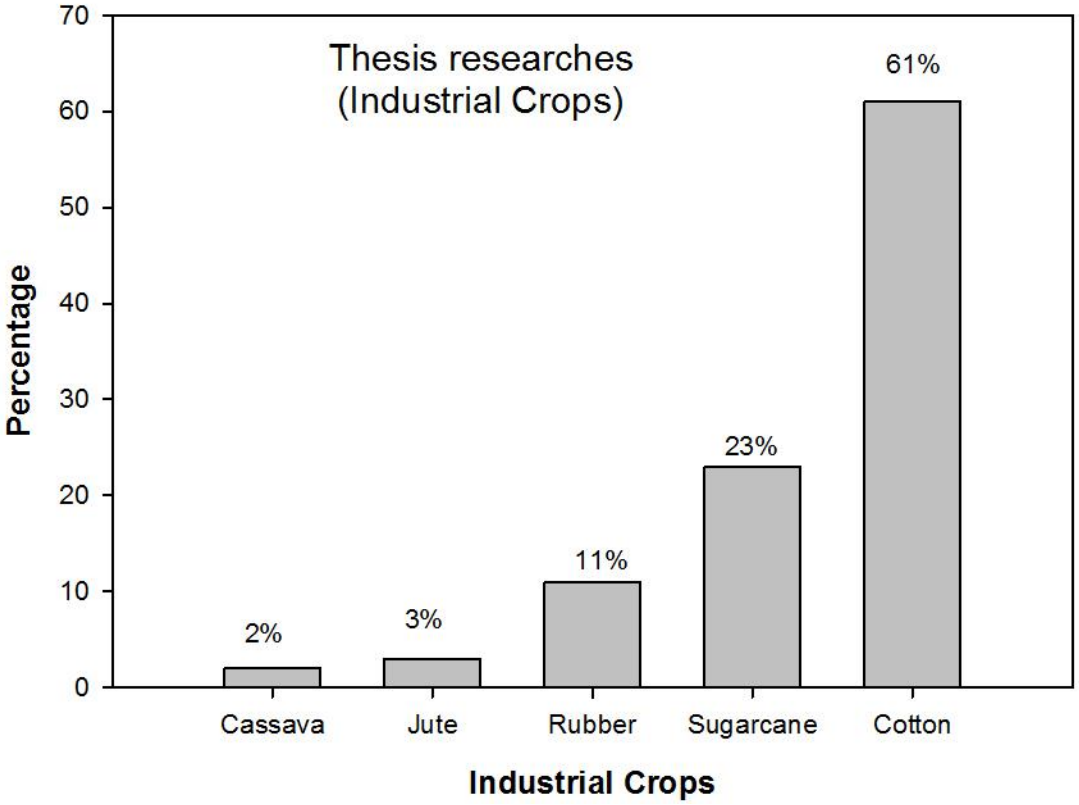


Fig 6. Industrial crops researches in master and Ph.D. theses

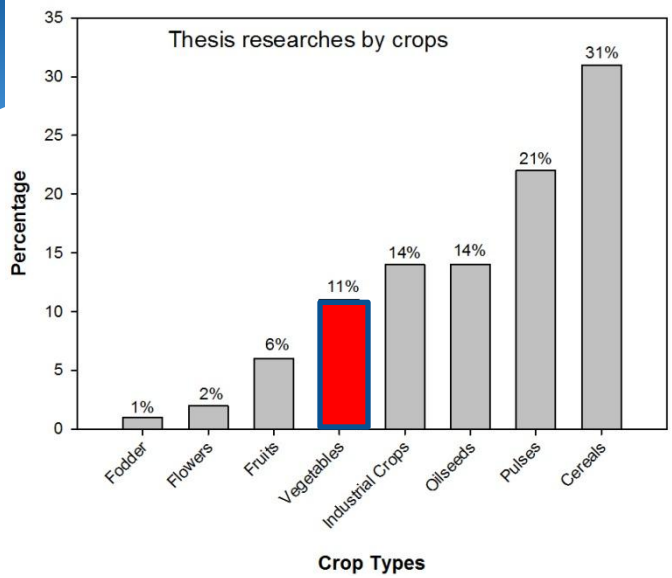
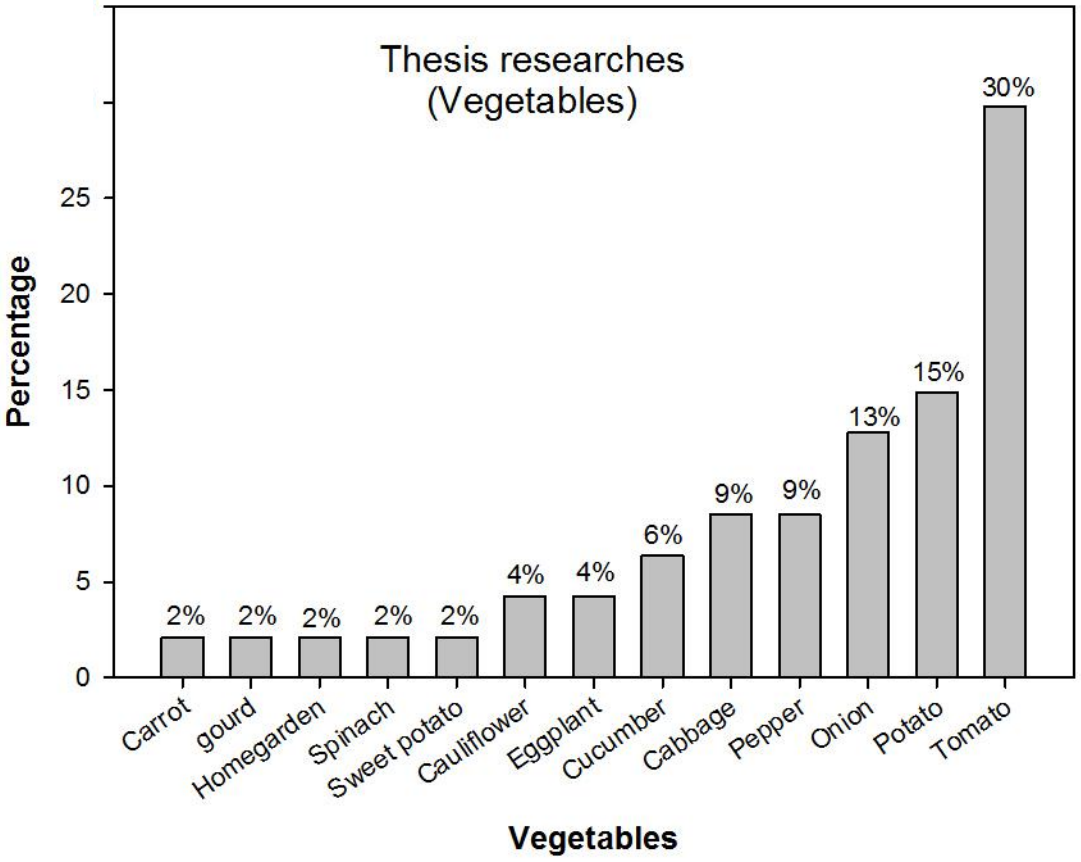


Fig 7. Vegetables researches in master and Ph.D. theses



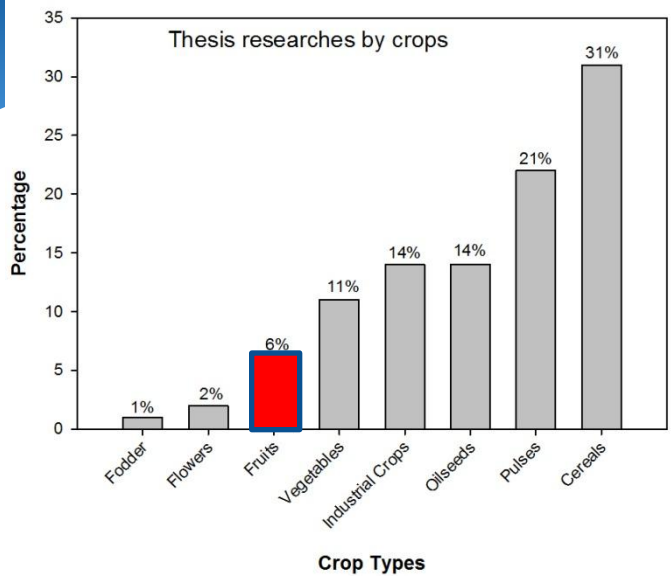
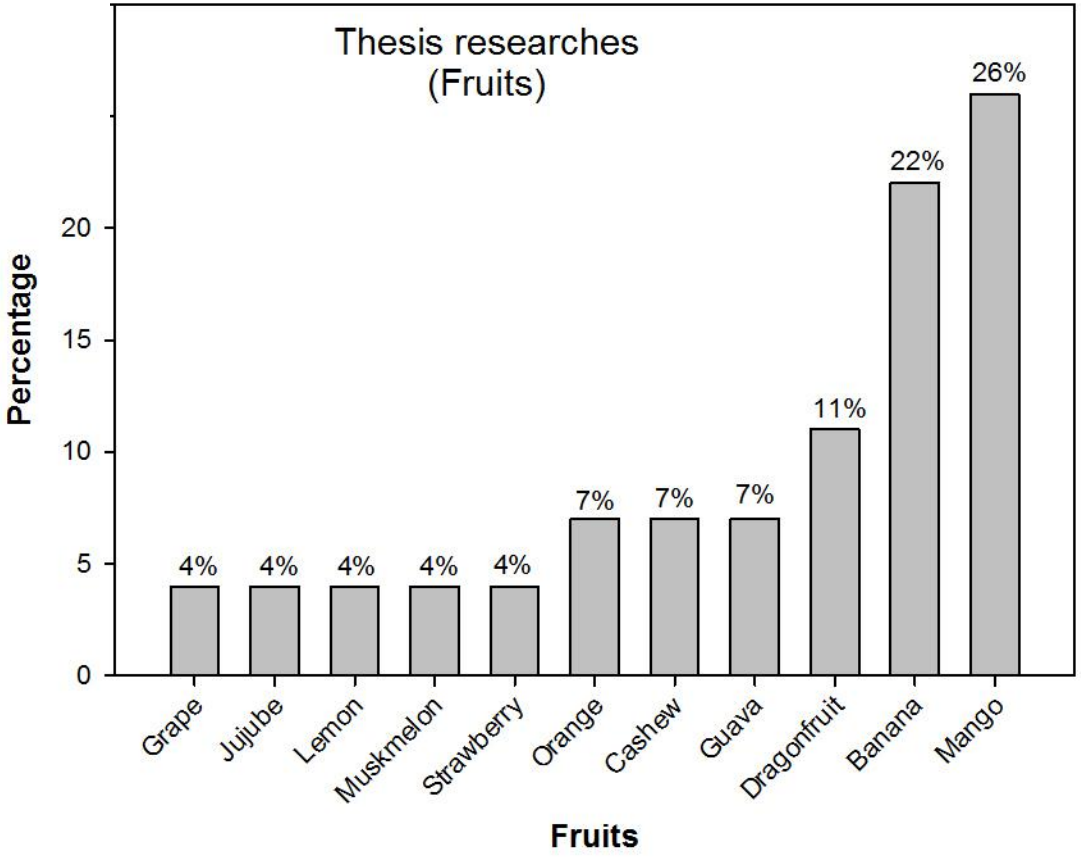
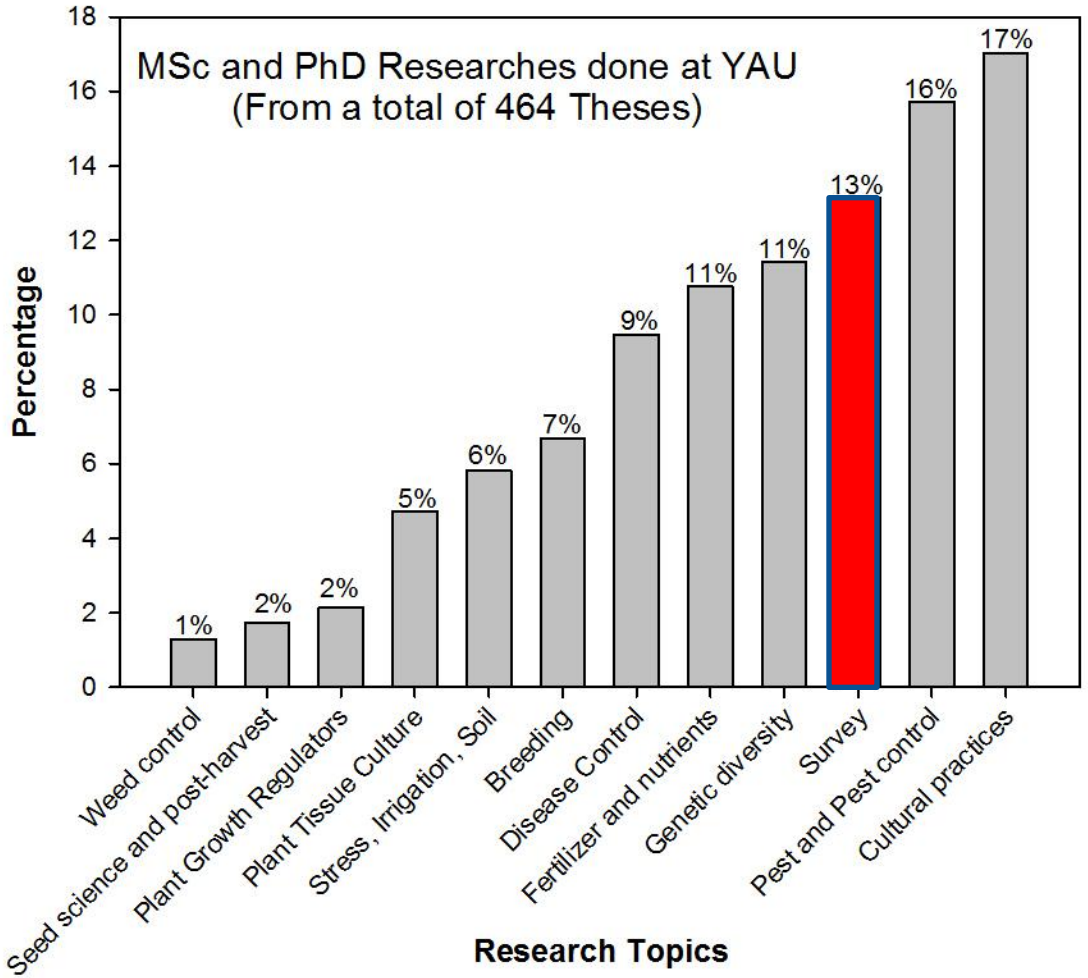


Fig 8. Fruit researches in master and Ph.D. theses





Survey researches on agriculture extension and agriculture economics and farm management occupy 13% of total.

Significant attention has been paid to crop related researches

Fig 9. Master and Ph.D researches categorized by research topics

Extension

- The very meaning of extension is **extending university education in a non formal way to the surrounding community or to the rural sector to improve the lives of farmers** (Davis, 2009)
- Research focuses on the technical aspects for generating useful technologies, while **extension focuses on the acceptance and adoption of those technologies by users** (Agbamu, 2000; FAO, 2005).
- **Until recently, extension was the weak link at the university because of a lack of appreciation of the extension role** of education institutions (**1st** priority is **education and training, 2nd** is **research,** and **3rd** is **extension**).
- The **lack of skilled and well-trained personnel in agricultural extension is the main problem** of current agricultural extension services in Myanmar (Cho and Boland, 2003). That also implies a low link between education and extension.

Linkages Between Education, Research and Extension

- Research, extension, education and farmers are the main supports of agricultural knowledge systems and their **effectiveness depends on strong linkage among each other**.
- **The existing education-research-extension linkage is very poor or not effective** (One factor is that most staffs have been involved in different activities which are extra-curriculum or not related to their normal duties).
- **The lack of strong linkage causes disruption in technology flow and low adoption rates, reduced efficiency in the use of resources, and increased cost of agricultural research and extension activities** (Ashraf et al., 2007).
- **Linkages are facilitated when** research, extension and education **institutions see the value of shared or complementary information**.

Conclusion

- **Agriculture diploma and degree holders have the knowledge of Agricultural Extension and Farm Management** as of other subject matters (All taught-subjects have the same credit).
- Previously, agricultural extension subjects were taught during final year of study (Cho and Boland, 2003). **Currently, curricula are updated including some specializations on agricultural education and extension at a five-year study period**.
- **Academic institution and departmental researches are more or less closely related** because crop selection for most M.Sc. and Ph.D. researches were based on institutional interest.
- **However, the effective application of research findings in the field is questionable** (It depends on individual capacity, institutional limitations as practicing top-down administration etc.)
- **Few evidence was found the linkage between academic education and extension** except for growing demonstration plots.

Suggestions

- Education institutions
  - Should include **with emphasis on other agricultural related social sciences** and effective agricultural policy research (NAAS, 2005)(**already included in new syllabus???**).
  - Should redefine so as **to equip students not only with taught-subjects competency, but also with self motivation, positive attitude, and communication skills** (NAAS, 2005).
  - Should **enhance the effort to extend scientific findings, technologies, and practices to farmers** through field visits, demonstration centers, and farmers' training centers beyond workshops (Eneyew, 2013)
- To do this, the **education institutions should have complete autonomy** coupled with accountability to ensure academic excellence (NAAS, 2005)
- Team of representatives from each institution (education, research and extension) should **draw a framework that leads effective linkage** such as **joint problem diagnosis, joint priority setting and review meetings in order to minimize misunderstanding and have shared vision** (Eneyew, 2013).

Thank You