ENVIRONMENT FRIENDLY AGRICULTURE AND ORGANIC AGRICULTURE IN VIETNAM

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INTRODUCTION

- **Vietnam: a tropical monsoon climate**
- **The main agricultural products: rice, coffee, cocoa bean, vegetable, tea, silk ...**
- **Agricultural systems: Enviroment friendly including: improved food security, conserve biodiversity, integrated Pest Management with increase yield sustainable.**
- **Biodiversity: human health, sustainable development natural resources.**

Present Status of Biodiversity in Vietnam

1. **One of 16 countries having most biodiversity: More than 13,200 flora, 275 animal, 828 bird, 258 reptile, 82 amphibian, 3109 fish, 5500 insect species**

The tropical marine: more than 20 typical ecosystems

2. **Biodiversity lost: 365 fauna, 400 flora species are endangered due to:**

- High demand for foods, fibers and recreation

- Industrialization and urbanization process

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Conservation Measures

1. Development of a diverse agriculture
2. Integrated Pest Management
3. System of Rice Intensification (SRI)
4. Bio-diversity Use and Conservation
5. Pesticide Risk Reduction
6. Genetic Resource Conservation

1. Development of Diverse Agriculture

- **Crop and livestock:** **Use local, indigenous breeds varieties to tolerate adverse conditions (drought, cold, hot, humid, pests and diseases) - All food, industrial, medical crops, annual and perennial - Low and high water demand crops**
- **Aquaculture:**

– Fresh, blackish and marine aquaculture (shrimp, catfish, tilapia), open sea cage culture,

– Integrated coastal aquaculture

- **Forestry:**

– Identifying and managing protected areas: 28 national parks ,18 nature reserves, 39 protected landscapes,

– Afforestration (0.5 million ha (1990) to 3.1 million ha (2010).

– Sustaining local livelihood by wildlife rearing and conserving (50 fauna, 1000 flora species)

Cropping Systems

- **The greatest crop diversification: northern upland and lowland (>8 crops/ household**
- **The central highlands: a region of highly diversified cropping systems with perennial crops, fruit and forest trees.**
- **The index for the south and Mekong River Delta is 2.6 crops/household**
- **There are 15 strategic food crops in Vietnam**

Characteristics of cropping systems

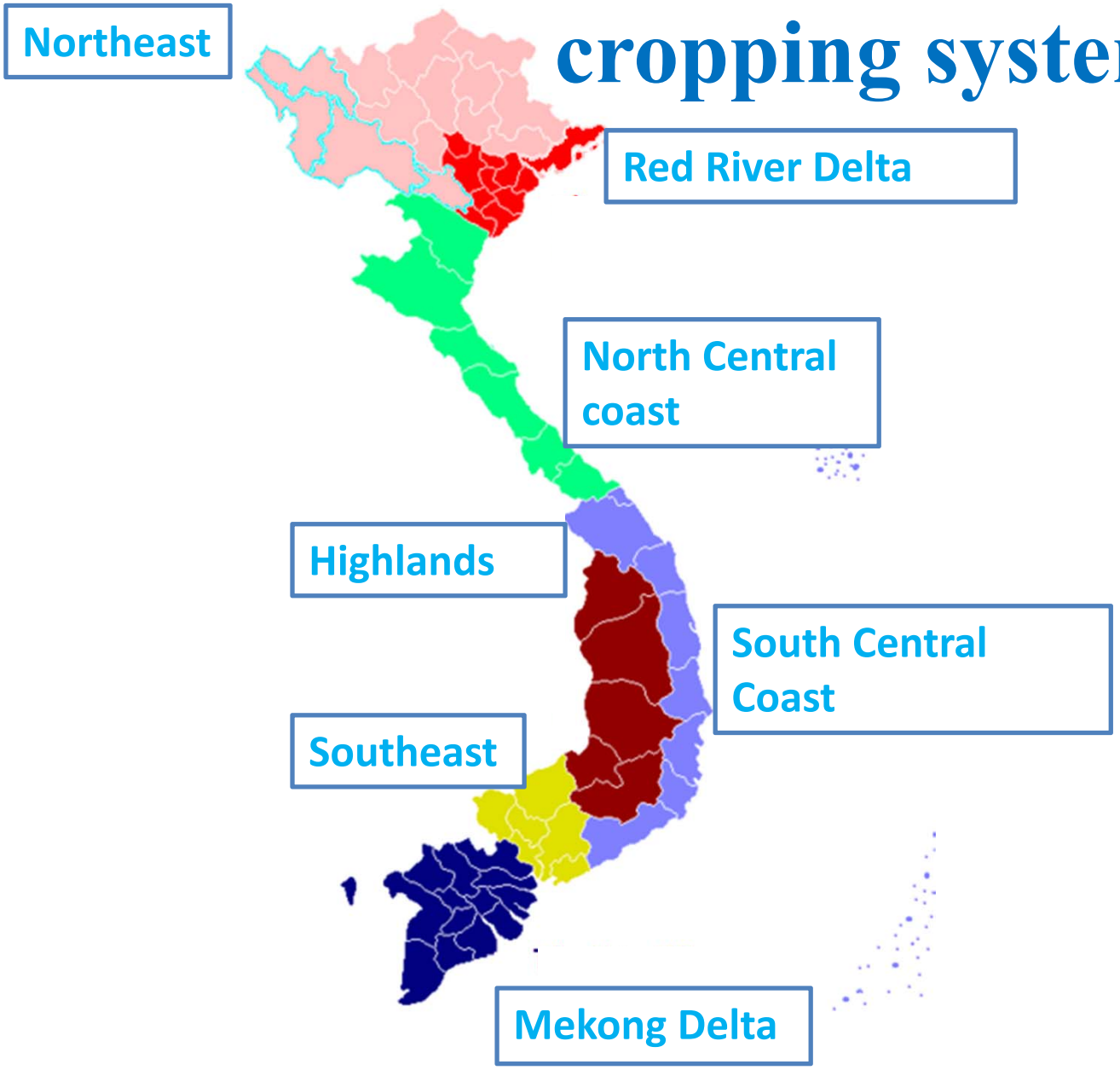


Table 1 Cultivated Area and Productivity of Major Crops in Vietnam

Crop	Area (1000 ha)	Productivity (100 kg/ha)	Crop	Area (1000 ha)	Productivity (100 kg/ha)
Rice	7899.4	55.8	Coconut	136.7	Na
Corn	1172.6	44.3	Sweet potato	135.9	100.4
Coffee	584.6	2.21	Soybean	117.8	14.3
Rubber	545.6	1.74	Tea	114.1	8.1
Cassava	544.3	179.0	Pepper	51.1	2.4
Sugarcane	309.3	647.3	Sesame	42.9	7.7
Cashew	301.3	0.76	Tobacco	26.3	19.3
Peanut	216.3	22.8			

Source: Government of Vietnam (2014).

Table 2 Number of Popular Crop Plant Species in Vietnam

No.	Plant group	Number of species	No.	Plant group	Number of species
1	Main food crops	41	9	Oil plants	45
2	Minor food crops	95	10	Plants for fragrances	20
3	Tree fruit	105	11	Soil improvement	28
4	Vegetables	55	12	Medicinal plants	181
5	Spices	46	13	Ornamental plants	62
6	Juice	14	14	Shade trees	7
7	Fibre	16	15	Industrial crops	24
8	Foodstuffs	14	16	Timber	49

Table 3 Land use types (LUTs) and cropping patern in paddy field of RRD& MRD

No	Delta region	LUTs	Cropping patterns/ year
1	Red river delta(RRD)	2 crops/ year	Spring rice- Summer rice
			Winter upland crop- Summer rice
		3 crops/year	Spring rice- Summer rice- Winter crops*
			2 Upland crops**- Summer rice
		Mixing land use	Rice- Fish
		1 crop/year	Winter- Spring rice
		Specialized crops	Specialized vegetable or Fruits garden
2	Mekong river delta(MRD)	2 crops/ year	Summer rice- Autumn rice
			Summer rice- Upland crop
			Spring rice- Summer rice
			Spring rice- Autumn rice
		3 crops/year	Spring winter rice- Spring summer rice- Autumn rice
			2 Upland crops- Autumn summer rice
			Spring winter rice- Spring summer upland crop- Autumn summer rice
		Mixing land use	Rice- Fish
		1 crop/year	1 Summer inbreed rice
		Specialized crops	Specialized vegetable or Fruits garden

2. IPM Programme

- **Application of IPM is very useful for farmers. Reduce production costs and increase income, IMP also helps protect the environment and the health of farmers.**

⇒IPM to Vietnam since 1992 to resolve problems of pests and overuse of pesticides caused by lack of farmers knowledge on crop and ecological management

IPM Results (2012):

- **FFS covered 95% of rice producing communes, 10% of total farmers trained in IPM, 70% IPM participants are women**
- **TOT: 2,691 technician- trainers, 5,855 Farmer- trainers**
- **3,000 IPM clubs formed and operated**
- **IPM Impacts: Saved seed, pesticide and labor costs, higher profits and safer environment**
- **Educating IPM in primary schools**

Results in Training

Training of Trainers (TOT)	
Crop	Crop Trainers
Rice	1,661
Vegetables	570
Cotton	168
Maize	40
Sweet Potatoes	12
Tea	53
Orange, Citrus	10
Bio-diversity	120
Nutri. magment	45
Total	2,691

Training of Farmer Trainers	
Crop	Farmers trained
Rice	5,425
Vegetables	343
Cotton	42
Nutri.Management	45
Total	5,855

(Do Kim Chung & Kim Thi Dung, 2013)

3. System of Rice Intensification (SRI)

Some of SRI benefts on Environmental

Better soil quality: greater abundance, activity and diversity of soil organisms

Prevention of water pollution: reduces adverse effects on water quality from rice farming.

Natural resources: to saving water. Moreover, the production of chemical fertilizers relies on oil and other natural resources, in contrast to organic fertilizers promoted by SRI.

- **Climate change mitigation: SRI plots are likely to have lower methanegas emissions than conventional plots.**
- **Agro-Biodiversity: SRI directly contributes to a diversity of soil biota and to a diversity of animals and plants in and around the paddy feld, mainly due to lower use of agrochemical inputs.**
- **Because SRI works with all varieties of rice, it can contribute to maintaining a diversity of rice varieties.**

SRI VS. Conventional Rice Production

Criteria System of Rice	System of Rice Intensification	Conventional Rice Production
Age of seedling Seeding rate	Transplanted at 8-12 days 5-7 kg/ ha	At 21-40 days old 50-75 kg/ha
Number of seedlings	1-2 seedlings/ hill, transplanted with shallow depth (1-2cm), not flooded	3-4 seedlings / hill are clumped and pressed deep into flooded soil
Spacing plant	Wider spacing with hills 20-30 apart,	Close spacing with hills 10-15 cm apart
Water management	Non flooded aerobic soil condition with intermittent irrigation	Continuous flooding of paddy fields with 5-15 cm deep
Soil fertilization	Organic matter preferred, synthetic fertilizers	Inogranic fertlizers
Weed and pest control	Manual weeders	Flooding, herbicide application

SRI Results (2011)

- **Covered:** 26/ 63 province
- **Areas:** 85,422 ha
- **Involved:** 264,000 farmers
- **Saved cost:** Seed: 70 - 90%
  Nitrogen Fertilizer 20 - 25%
  Water: 33% Pesticides: 60-80%
  Cost: 342 - 520 đ/kg of paddy
- **Increased:** Yield: 9 - 15% Profit: 30-40%
  Capacity to resist to pests

Do Kim Chung & Kim Thi Dung, 2013

The application of SRI expanded to 1.3 million ha in 2012 (Gujja and Uphoff 2013).

The model of rice cultivation ‘’3 reductions 3 increases”

- The model was created in 2005.
- Reduction:the use of seed sowing, fertilizer and pesticide.
- Increases: productivity, quality and efficiency

Successfully applied model ’3 reductions 3 increases

***Reduce their insecticide use by 33%- 50% (Huan *et al*., 2008, Nguyen Ho Lam , 2012)**

***Reduce use Seed and nitrogen rates by 7% and 10%, respectively,**

Many provinces: Long An, Quang Binh, Can Tho, Vinh Phuc etc… Vinh Phuc has reduced sowing of seeds from 94.5kg / ha down to 67.5kg / ha (down 28%); Binh Dinh Province, Can Tho City, Vinh Phuc has decreased 20-46% of the nitrogen fertilizer

The model of rice cultivation ‘’ One must do, five reductions

- **The Vietnamese Ministry of Agriculture and Rural Development (MARD) together with IRRI proclaimed the Mekong Delta**
- **The one “must do” refers to using certifed rice seeds;**
- **The five reductions concern efforts to reduce the amount of seeds, pesticides, fertilizers, water, and post-harvest losses (IRRI, 2012).**

Ecological engineering

- **In 2009 ecological engineering approaches were introduced into Vietnam to prevent planthopper outbreaks**
- **Growing of nectar flowers on in between the paddy fields.**
- **Ecological engineering is to use insecticide only when absolutely necessary and as the last resort.**

Successfully applied Ecological engineering

- **Farmers were very impressed by Growing of nectar flowers**
- **Covered: 24/ 63 province**
- **Reduce the use of significantly pesticide**
- **Encouraging insect predators,pararitoids**
- **Planting flowers alongnside vegetables 20% reduction in pesticide sprayed on vegetables**

Flowers to provide resource for natural enemies

4. Pesticide Risk Reduction (PRR)

- **Objectives: reduce health and environmental risk through capacity building for the sustainable management of agricultural and industrial chemicals**
- **Activities: 1) Advocacy; 2) Continue to adopt IPM and PRR; 3) Policy improvement**
- **Implementing agencies: FAO, Regional NGOs (PANAP, The Field Alliance, in partnership with local government)**

PRR results

- **Covered: 30/63 provinces,**
- **Better behaviors: Read label: +40%; keep safe place: +11-46%, better container management: 100%.**
- **Better knowledge: VietGAP: +66-98%, safe vegetable standard: +21-61%, container color system: +72-78%, safety symbol: +31-86%, knew label: +23-27%, Pesticide list:+49-77%, Internal regulation: +91-98%.**

- **Hazard Reduction: Pesticide types: (-35-39%), Class III and IV: +(18-22%), spray times:- (54-66.7%), Pesticide amount: -(17.5-67%), wrong application reduced at 16-54%.**
- **Exposure Reduction: Always used protective equip: +(54-57%); Right PHI: +(15-46.3%)**
- **Risks reduced: Farmer EIQ –(14-88%), Consumer EIQ: -(24-86%), Ecology EI: -(21-74%). EIQ value reduced 20-78%**

5. Genetic Resource Conservation

5. 1 Institutions

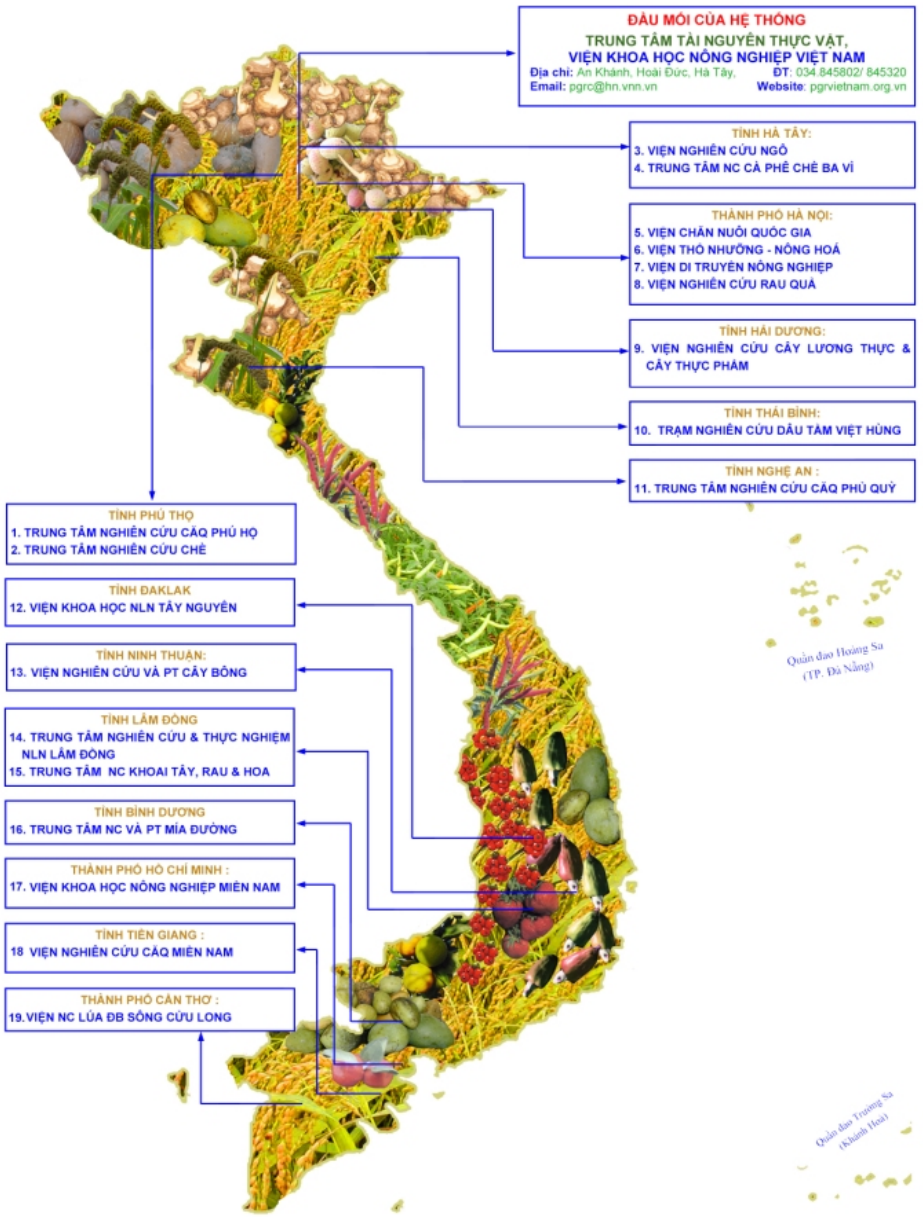
- **Considered as a National task since late 1980s.**
- **Organizations involved**

- Ministry of Natural Resources and environment is mainly responsible for bio-diversity conservation work

- Ministries of Agriculture and Rural development, Science and Technology: conserving wildlife genetic resources

- **National network of Plant genetic resources (PGR) conservation with 21 member institutions to conserve plants, animals and aquatic resources**
- **Plants Resources Center (PRC) established (1996) and have had the mandate to coordinate all the activities relating to plant genetic resources (PGR) throughout the country.**

HỆ THỐNG BẢO TỒN TÀI NGUYÊN DI TRUYỀN THỰC VẬT PHỤC VỤ MỤC TIÊU LƯƠNG THỰC VÀ NÔNG NGHIỆP QUỐC GIA



Phòng Quản lý dữ liệu và Thông tin Tài nguyên di truyền thực vật.
Trung tâm Tài nguyên thực vật

5.2 Conservation strategies

- **A strategy for bio-diversity conservation: 2013-2020 and vision for 2030 will be approved and enacted by June 2013**
- **Means of Conservation of genetic resources:**

- Ex-situ (conserve wildlife in the man-made conditions (net house, cold storage, botanic gardens)

- In-situ (conserve wildlife naturally where they were born and live);

5.2.1. Ex-situ Conservation

- **Genetic Surveys: 50 teams were sent to 50% communes of 63 provinces, collected 500 PGF accessions per year**
- **Collection and maintaining by national genetic bank: About 18,300 germplasm accessions (50% rice) of 150 plant species maintained in seed, field and in vitro collections**
- **Evaluation and documentation: 17,000 accessions were characterized in 30-60 haracters; over 7,000 accessions assessed in resistance/tolerance to more than one pests/diseases**

- **Information dissemination: A website**

(http://www.pgrvietnam.org.vn) PGR maps, Books

- **Utilization: Yearly, 1,000 times of germplasm and information are provided for breeding, research, training, Some varieties selected from the collections of National plant gene bank have been released for production**

Table 4. The amount of plant germplasm being conserved

No.	Plant varieties	Number of varieties
1	Rice	2,404 (Cold store)
2	Maize	616 (Cold store)
3	Fruit	1,141
4	Coffee,	306
5	sugarcane	546
6	flower	230
7	tea	179
8	others	1,545

Sourse: (Ronnie Vernooy, 2015)

5.2.2 In-situ Conservation

- **Promoting wildlife rearing instead of hunting and collecting, catching**
- **Fully fulfill CITIES commitment**
- **Recommending suitable rearing practices / standards for specific species at particular place/ region**
- **Promoting extension on wildlife conservation (seed, breed, feeds, rearing techniques)**
- **Certification of wildlife farms that meets required standards**

In-situ Conservation..

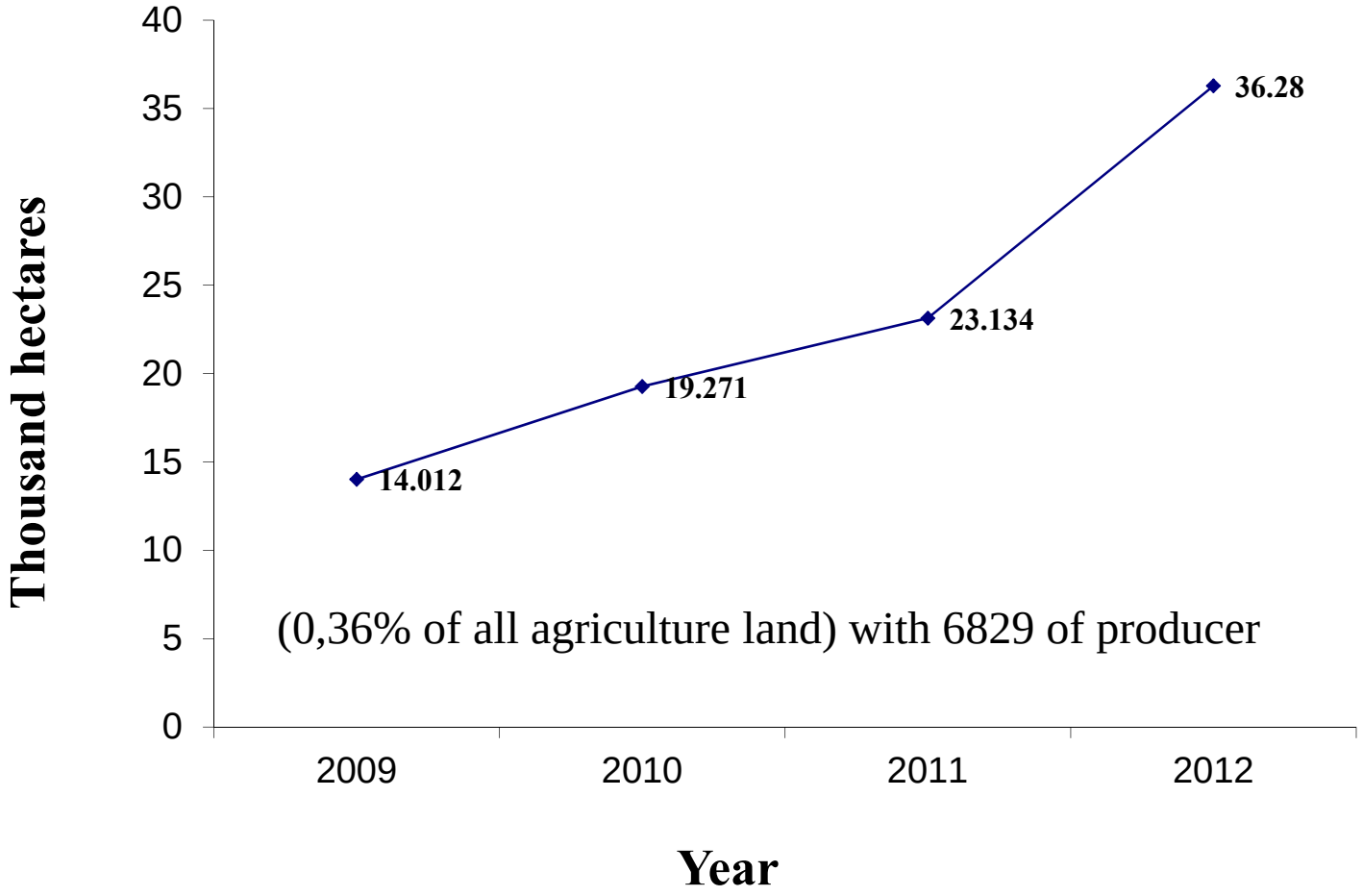
- **Conservation of Wildlife in the Protected Areas: 126 national parks, 18 nature reserves (1,283,209 ha), 39 protected landscapes or seascapes (215,287 ha)**
- **Number of Fauna species reared: 12 Amphibian, 6 bird species, 18 mamals species**
- **Flora species: Non-timber products: 30 (Bamboo), 14 (rattan), 300 (Food plants- leaves, roots, flowers, seeds), 34 medical plant species**
- **On-farm/in-situ Management and Improvement of PGR: some sites have been established (Pomelo in Day River bank, Longan in Hung Yen Province, Home garden in Hoabinh, Ninhbinh and Namdinh provinces)**

What is organic production?

- **Organic arable production aims to produce healthy, good quality food in an ecologically responsible way, for which the grower gets a fair return.**
- **The organic approach is designed to deliver positive health throughout soils, plants and crops, avoiding the need for agrochemicals and contributing positively to the environment and wildlife.**

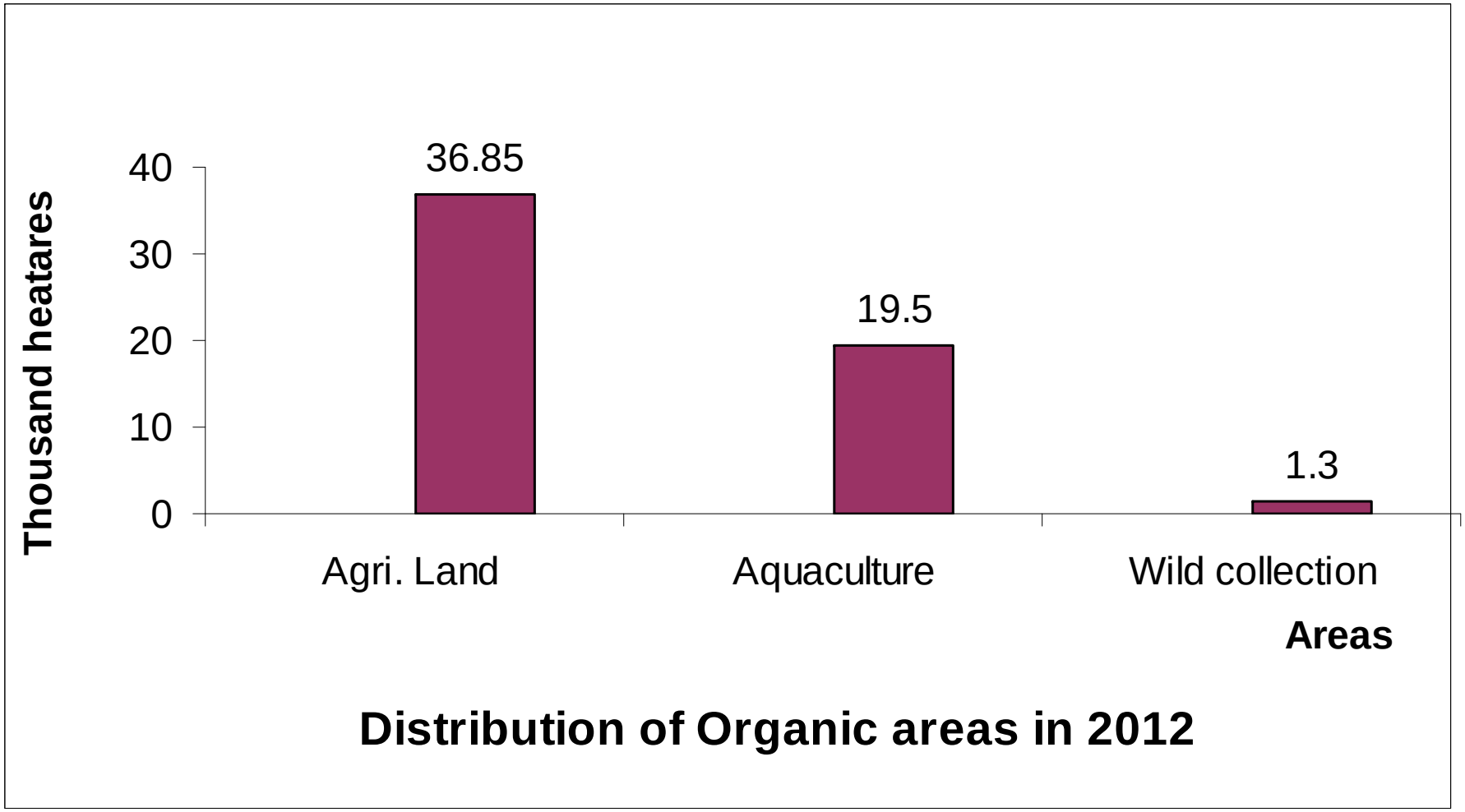
Foundational Principles & Practices

- **Biodiversity**
- **Diversification & Integration of enterprises**
- **Sustainability**
- **Natural Pest Management**
- **Integrated Management**



Viet Nam of the organic Agriculture Land 1999- 2012

FiBL-IFOAM (2014) The word of organic agriculture 2014 Frickand Bonn


Thousand heatares
40
30
20
10
0
36.85
19.5
1.3
Agri. Land
Aquaculture
Wild collection
Areas
Distribution of Organic areas in 2012

CURRENT STATUS OF ORGANIC PRODUCTION

- **Organic farming is quite new to Vietnam.**
- **The certified organic area: in Vietnam was some 21.000 hectares only 0.07 percent of the total agricultural area of Vietnam, equivalent to 0.2% of the total cropped area of which 7000 ha was for aquaculture (mainly shrimp).**
- **The total export value of the organic products was some 12-14 million US$. Vietnam also has some 44 ha of natural forest for wild harvesting.**

Organic Certification and Standars

- **National standards are being developed.**
- **Foreign certifiers certify organic products for export (SKAL, ICEA/ACT, IMO, …)**
- **ADDA-VNFU organic project collaborates with MARD to support development of national organic standards and certification.**
- **Plan to set up national organic association and to issue organic "market" label. ADDA-VNFU organic project is one main partner to facilitate this plan**

- **Participatory Guarantee Systems (PGS) was certificated by IFOAM**
- **VietGap and GlobalGap standard for certificate organic products**

Dự án Phát triển Nông nghiệp Hữu cơ ADDA - VNFU

Hệ thống Đảm bảo Cùng tham gia

PGS HỮU CƠ ORGANIC CERTIFICATE

ADDA - VNFU Organic Agriculture Development Project

Participatory Guarantee System

CHỨNG NHẬN HỮU CƠ PGS

PGS Organic Certificate

Cấp cho: **Nhóm Đầm Đa 1**

Awarded to: ***Mã số/ Code: 2011/G026***

Địa chỉ/ *Address:* **Xóm Đầm Đa 1 - Xã Liên Sơn - Huyện Lương Sơn - Tỉnh Hòa Bình**

Địa điểm sản xuất/ *Production place:* **Cánh đồng Cổ Duối - Xóm Đầm Đa 1 - Xã Liên Sơn**

Tên sản phẩm/ *Product name:* **Rau các loại**/ *Vegetables*

Chứng chỉ này xác nhận nhóm Nông dân tuân theo các tiêu chuẩn hữu cơ của PGS được thực hiện trong Dự án Phát triển Nông nghiệp Hữu cơ của Tổ chức ADDA Đan Mạch và Hội Nông dân Việt Nam.

This certificate confirms that this farmer group complies with the organic standards of the PGS implemented under the Organic Development Project of ADDA Denmark and Vietnamese Farmers' Union.

Hà Nội, ngày 05 tháng 01 năm 2012

Head of PGS Coordination Committee

Trưởng Ban Điều phối PGS

Có giá trị đến/ *Valid until:* **Ngày 05/01/2013**

Số/ *Number:* **75 GCN/ PGS - CC. Cấp lần 1**

Koen den Braber

MAJOR ORGANIC ACTIVITIES IN VIETNAM

1. ADDA-VNFU Project on Organic Farming http://sites.google.com/site/pgsvietnam/
2. The ECOMART Company for Organic Tea and Vegetable www.ecomart.vn
3. Organik Dalat for organic vegetables http://www.organikvn.com
4. The Vien Phu Green Farm for Organic Rice http://vienphugreenfarm.com
5. The ecological shrimp model in Ca Mau province

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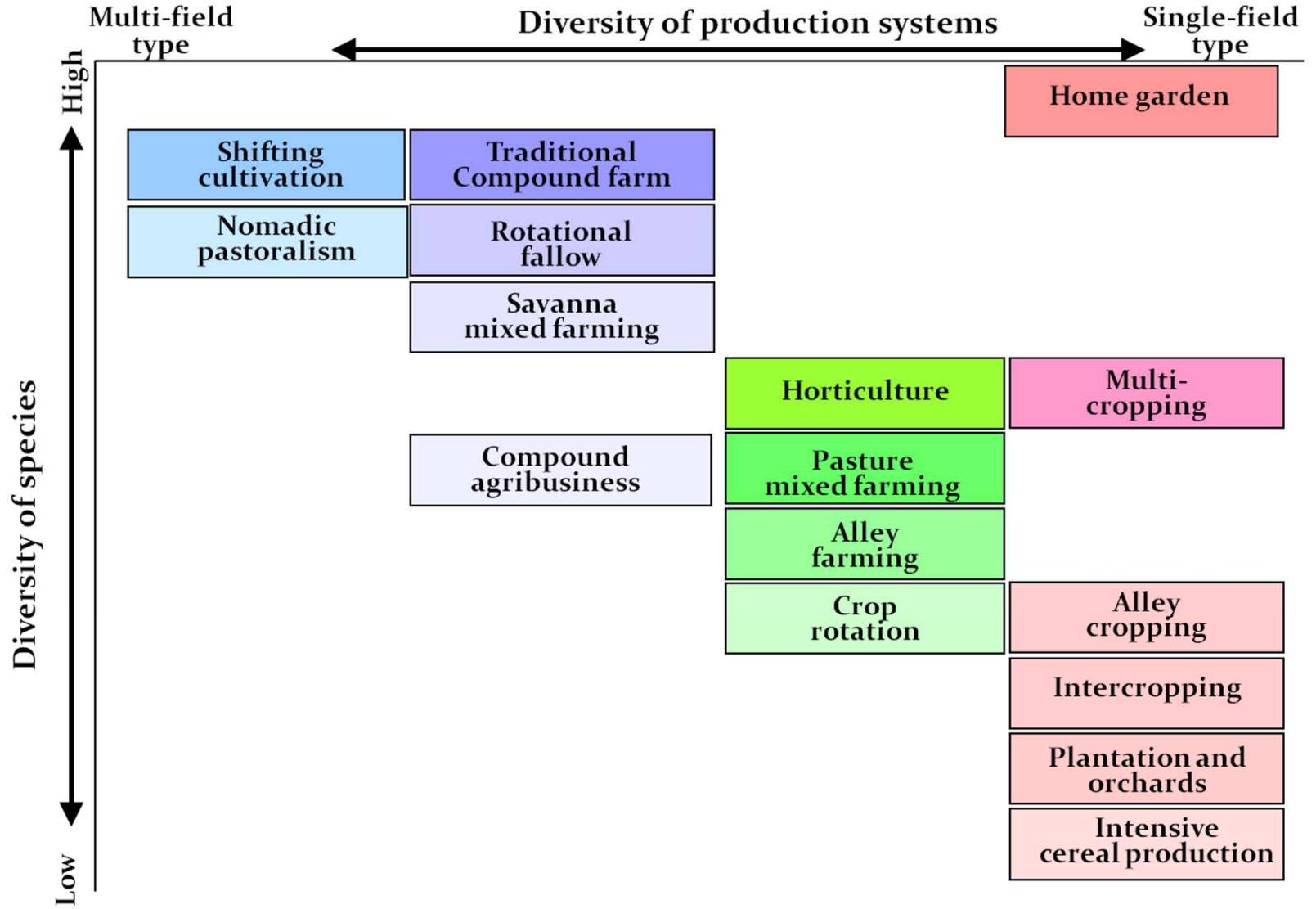
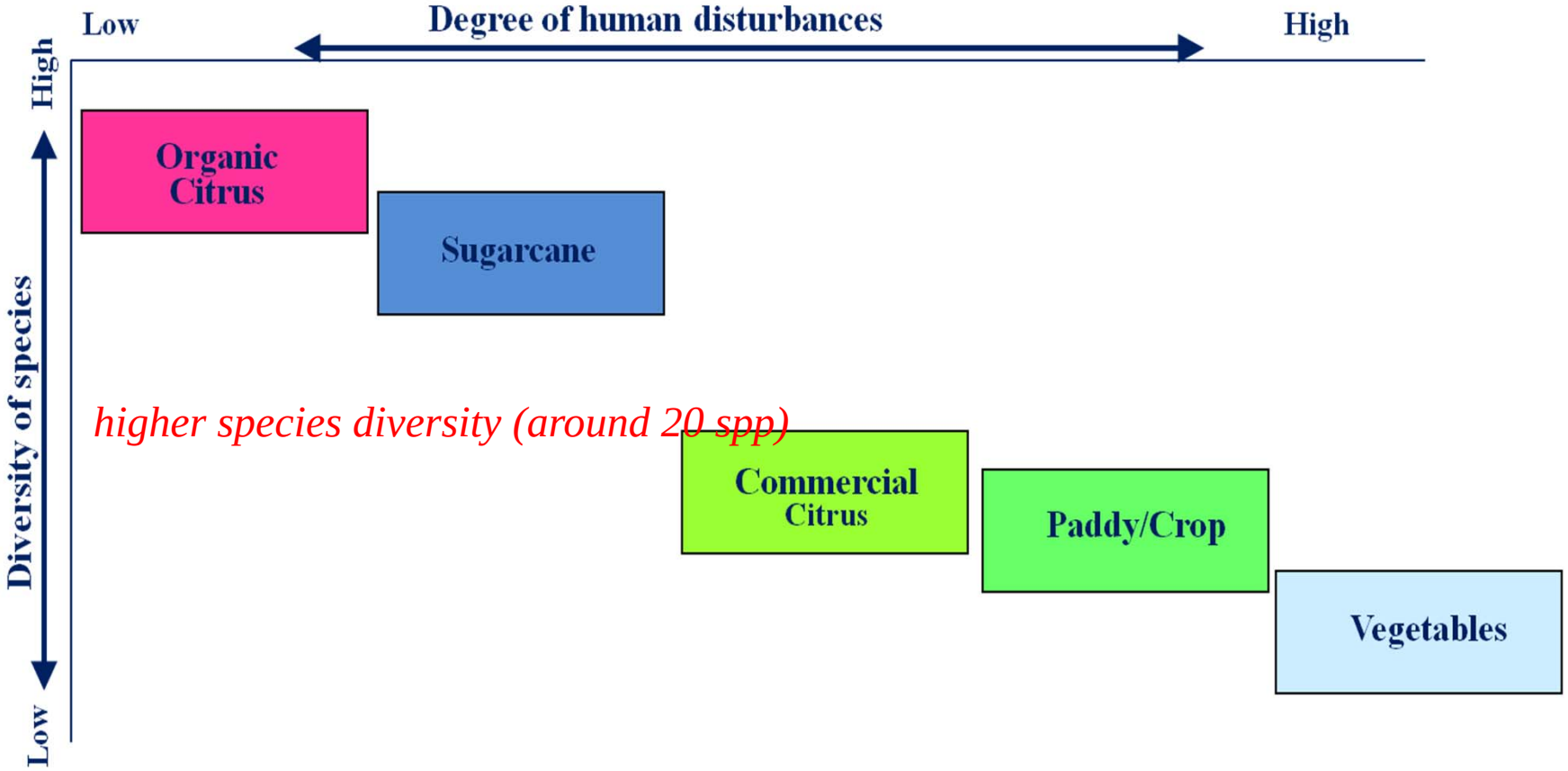
Organik Dalat for organic vegetables



A classification of agricultural systems on the basis of their biological diversity and complexity (Swift et al. 1996).



higher species diversity (around 20 spp)

Lower species diversity (less than 10 spp.) for ant

A classification of agricultural systems on the basic of their species diversity and human disturbance in Vietnam.

Le Ngoc Anh *et al*. (2010)

CONCLUSIONS

- **Vietnamese farmer need more training workshops on organic farming techniques**
- **Ecological engineering has the potential to complement IPM programs**
- **The major organic commodities include vegetables, tea, shrimp though efforts have been expanded to other products such as rice, oranges, litchi, longan, cinnamon, ginger, bassa fish…**

- **There is still a lack of specific Government policies to support the development of organic agriculture.**
- **The Government in setting up long term programming for organic production areas in different agro-ecological regions and localities**

FUTURE WORK

Combine with Food Safe Program;Food Security Program; Environment program

- **Continuing to disseminate field programmes to help farmers adopt IPM, SRI, ecological engineering and PRR**
- **Research, extension on organic farming techniques, wildlife conservation, rearing and procedure of wildlife farm certification, trade control**
- **Concern to agrotism Bio-organic fertilizer, Bio-pesticide**

A group of farmers being trained in making organic compost

Rice- Fish

Rice and upland crops

THANK YOU FOR YOUR ATTENTION!