Rural/Community Development - Multi-Functions and Non-Economic Values of Agriculture -

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Objectives of the session

- To understand history of alternative rural/community development in recent Japan
- To obtain information on present trial activities of alternative rural development based on multi-functionality of agriculture in Japan
Questions:
(Especially to Japanese Students)

- What does Mizuho-no-Kuni mean?
- How about Akitsu-Shima?
Task in Rural/Agricultural Development in the 21st Century

- We try to realize ‘Sustainable Agriculture’.
- Productivity / Profitability
  vs
- Environmental Conservation / Sustainability
- Food Safety / Energy Efficiency

Industrialization of Agriculture
  vs
- Special nature/characters of agriculture different from other industries
History of Japan’s Agriculture 1

- Meiji to WW II
  Land tenancy continued from Previous system
  Original: Mixed farming based on forest and paddy field
  Change: Continuous rice cultivation using organic and chemical fertilizers + Vegetables / Fruits / Livestock
  Increase in productivity ⇒ Foundation to Landed Farmer
History of Japan’s Agriculture 2

- After WW II
  - Severe Food Deficiency due to destruction of infrastructures
  - Increase in landed farmers
    1,729,000 owner-cultivators in 1945
    ⇒ to 3,822,000 in 1950
    + 1,591,000 landed / tenant

  Efforts by small scale landed farmers brought increase in production rapidly
History of Japan’s Agriculture 3

◆ 1960-
  Rapid economic growth started in late 50s brought
  ① Increase and changes in food consumption
  ② Income gap widened between agriculture and industry (9.3% GNP growth during 1960s vs 1.9% in agriculture)
  ③ Migration of young labor to urban areas
History of Japan’s Agriculture 4

- Agricultural Basic Law in 1961

Selective Expansion (=specialization):
Livestock, Fruits, Vegetables and Sugar beets

Cost reduction (=productivity):
Rice, Wheat, Rape and Soya

Reduction (=step out): Sweet potato, Silk and Barley

cf: Trade liberalization
2005 Basic Plan for Food, Agriculture and Rural Areas

- **Producer side**
  - Promotion of production more tailored to consumers’ demand by farmers with superior business acumen
  - Stronger ties between food industries and agriculture
  - Promoting efficient use of farmland by concentrating farmland use in principal farmers.
  - Collaboration between crop and livestock farming

- **Consumer side**
  - Nation-wide strategies for ‘food education’ and ‘local consumption of local produce’
  - Earning consumer confidence in domestically produced food
Origin of Rural/Community development after WW II

⇒ negative effects to environment due to heavy input from outside (e.g. energy and imported feed)

+ 

⇒ What happened to the regions where it was not possible to adopt mechanization / specialization / scaling up?
Origin of Rural/Community development after WW II

- Many less favored Areas where expansion / intensification / specialization are not possible
- Migration to urban areas and rapid ageing and depopulation

- People left in rural areas = No other choice than thinking about their own regions
- Need to integrate non-use value of agriculture
Philosophy behind rural promotion movement (Chiiki - okoshi)

- Is our place not worth staying or possible to make living out of our environment?
- Case: Sumita Town, Iwate
  Community found the local resources
  ⇒ Livestock suitable for mountain areas (Chicken)
  ⇒ Crops applicable to tiny pieces of land (Strawberry)
  ⇒ Integration of Forestry, On demand shipment of timbers with local carpenter (linkage between natural and human resources)
One Village One Product Movement

- Started in 1979 in Oita Pref.
- To encourage local people to become more motivated, to feel greater pride in their communities and to become more involved in community activities. Movement has three principles;

  - Local yet global = Think globally, act locally.
  - Self reliance and creativity = Support not subsidy
  - Human resources development = pride and action
Alternative Approach 2
Green Tourism

- Strategy:
  - Use local resources of agriculture and environment
  - Village development for community residents and tourists
- Creation of Sixth Industry
  - Agriculture (1) x Processing (2) x Service (3)
Alternative Approach 3

Linkages between Urban consumers and rural communities

- **Inconsistent Consumers** (interested, but not ready to pay) - 53%
- **Ignorant Consumers** (price is everything) - 24%
- **Positive/Affirmative Consumers** (understand values of local identity) - 6%
- **Consumers acting on individual interest** (select healthy products) - 17%
Multi-functionality of agriculture in Japan

(1) Land conservation
- Preventing floods
- Preventing soil erosion
- Preventing landslides

(2) Fostering of water resources

(3) Preservation of natural environment
- Management of organic waste
- Resolution and removal of polluted substances
- Air purification
- Maintenance of bio-diversity and preservation of wild life habitats

(4) Formation of scenic landscape / Transmitting culture

(5) Rural amenity / Maintaining and revitalizing rural community

(6) Food security
Multi-functionality of agriculture in Japan 2

- Monetary value of land conservation and water conservation = 4.6 trillion yen.
  
  vs

  Total output of rice production 3 trillion yen
  (Total amount of multi-functions = 6.9 trillion yen)

- Agriculture produces this amount of ‘good’ but consumers only pay for food value.

- Difficulty in integrating this value to economics due to its nature as ‘public good’.

- Government, at least in principle, accepts the idea to re-vitalize rural communities.
Dependence of modern agriculture on non-agriculture products

- Agriculture depending so much on materials from non-farming activities for the sake of labor-saving and increase in yield
- Separation from the uniqueness that living organisms had created, development of mutual trust among living organisms, autonomy that never allows dependence on other materials, and development of diversity.
- Fujimoto (1999)
Bio-diversity / blessing of agriculture

- A bowl of rice = three stumps of rice plant = 5093 water flea
- One dragonfly = nine cups of rice

- Abandoning agriculture means loss of this diversity
- Agricultural reform for mechanization and utilization of chemicals also broke this rural environment thus threatening human health and safety.
Organisms in paddy fields 1
(food chain)

Water Flea, Black Spotted Pond Frog, and Great Egret
(Mijinko, Tonosama-gaeru and Dai-sagi)
Photo Copyright(center and ringht):Fukuoka pref. and Kankyo-Sozo-Sha
Organisms in paddy fields 2
(indigenous and foreign)

Medaka Ricefish (killifish) and Tadpole Shrimp
(Medaka and Kabuto-ebi)

Photo Copyright: Fukuoka pref. and Kankyo-Sozo-Sha

For more information on Medaka, visit http://biol1.bio.nagoya-u.ac.jp:8000/
Changes in Environment and Changes of Bio-diversity

- Medaka Ricefish needs to move between rice fields and water streams for their reproduction
  ➔ Concrete lining made it impossible

- Tadpole Shrimp can survive during winter in the dried soil (due to its original environment in Central Asia)
  ➔ Rice fields have been drained for introduction of machinery
Economics Background

Economic-injury Level (EIL) (Stern et al., 1959)

- “The lowest population density of a pest that will cause economic damage; or the amount of pest injury which will justify the cost of control.”
- The EIL concept was developed hand-in-hand with the Integrated Pest Management (IPM) concept and was used to promote the more rational use of pesticides, to avoid pesticide resistance, reduce problems with pesticide residues on agricultural products, and reduce negative effects of pesticides on non-target organisms.
- Although the EIL concept was founded on economic considerations, it has been expanded to embrace concerns about environmental, social, and resource concerns, and sustainability (see Pedigo and Higley, 1992).
Scientific-Biological Background

Integrated Biodiversity Management in Paddy Fields: Shift of Paradigm From IPM Toward IBM  (Keiji Kiritani 2000)

- The insect fauna in paddy fields is composed of resident, migratory and aquatic species each corresponding to the continuous cropping of rice in the same field, harvesting rice as an annual crop, and originating from still water habitats in wetlands.

- A new concept, Integrated biodiversity management (IBM), is proposed under which IPM and conservation are reconciled and made compatible with each other. As an operational concept in agroecology, premises for implementing IBM are suggested.
Policy Implementation


- Improved method of direct payments to farmers.

- Previous method: payment to community/collective activities for cultivation

- New method: payment based on positive environmental impact by farming with less external input

⇒ Integration of multi-functions of agriculture as public good to rural development
Need to integrate different values of the environment in rural development

- Total Value
  - Use Value
    - Direct Use Value
    - Ecological Value
      - Crop
      - Meat
      - Materials
      - Erosion Control
      - Landscape
      - Mild climate
    - Indirect Use Value
    - Option Value
      - Use value in future
      - Intrinsic value
      - Bio-diversity
      - Landscape Knowledge
  - Non Use Value
    - Existence Value
      - Value for next generation
    - Bequest Value
      - All
Question
1. What is this photograph?
2. Where and when do you think this photograph was taken?
Answer
Slash and Burn Agriculture in Miyazaki pref.
Japan in the 21st century
In many areas in Japan, Low-external input agriculture including organic agriculture is widely being practiced as an alternative to productivity oriented agriculture.

Describe the a case (from your country / region) based on sustainable agriculture idea with scientific knowledge, and discuss the possibility of integrating multi-functionality of agriculture into rural development.