Income generation-oriented marginal land management practices

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1. Challenges of Chinese farmers

Some basic information of agriculture in China

- Total cropland: 128 million ha
  - Govt baseline: > 120 million ha
- Population: 1 413 million
  - Per capita cropland: 900 m²
- Cropland composition
  - Cropland in flat topography: 31%
  - Cropland in sloping topography: 69%
    - Sloping cropland: 33.4%
    - Land prone to wind erosion: 5.3%
  - Irrigation: 54%

Challenges of Chinese farmers

- Small landholding
  - Small farm: Average size: 0.27 ha
  - Land allotted to each household, can be contracted only
  - Basic cropland for grain production only
  - Emerging professional farmers: farm size 100-150ha
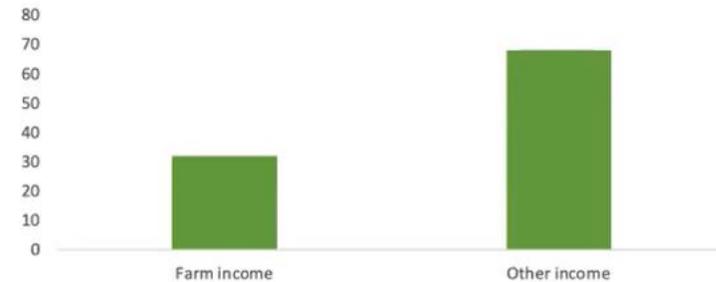   - Machinery and drone assisted farming

Challenges of Chinese farmers

- Labor shortage
  - Labor force characterized by > 60 years old
  - Most young population in cities
- Low share of farming in household income: 10-42%, average 30%
  - Increasing costs: seeds, agro-chemicals, use of machinery, labor
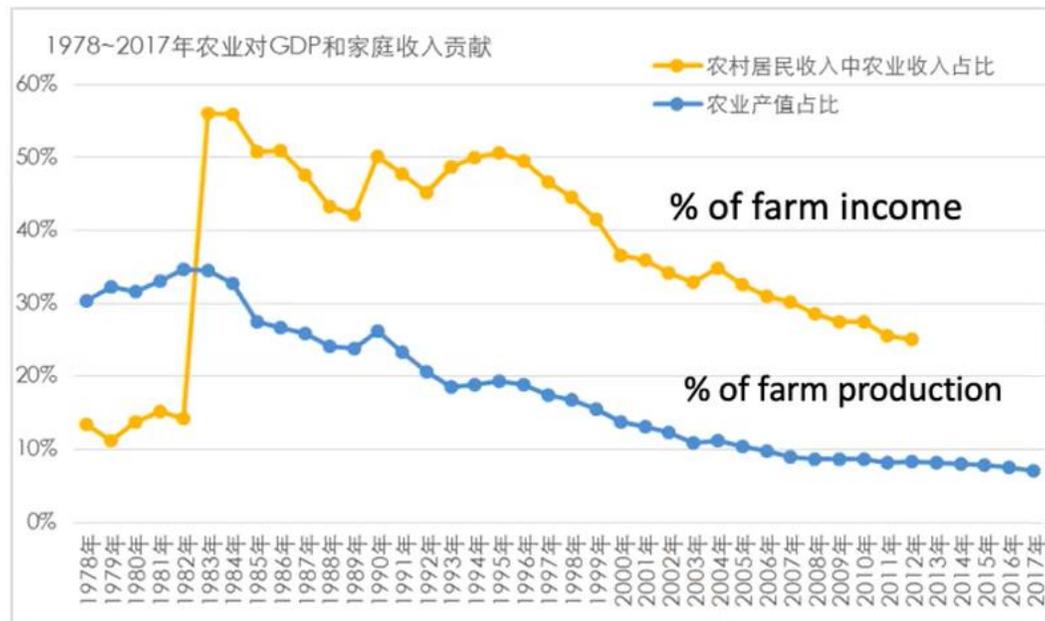 - Small farm → Low household total yield, though high per unit land productivity

Present shares of household income

2. Management practices for income generatio

- Land riser-based systems
  - Mulberry - sericulture
  - Fruit trees
- Woods-based
  - Medicinal plants
- Cropland rotation based
  - Mushrooms
  - Vegetables
- Area-based
  - Rural tourism

1978~2017年农业对GDP和家庭收入贡献

农村居民收入中农业收入占比
农业产值占比

% of farm income

% of farm production

2.1 Land riser-based systems (Land riser economy)

- Sericulture

Ningnan County

- Area: 1670 km^2
- Pop: 202 548, in 52518 households; <4/household
- Cropland: 23 953 ha; per capita: 0.12 ha; 90% sloping land
- Annual cocoon yield: 14, 700 t, 2490 t raw silk (highest 1510 t of Thailand in 2001)
- Income from cocoon: US$ 4,300/household

- Fruit Trees – pears
- Hanyuan County
  - Area: 2382 km^2
  - Pop: 330 000
  - Cropland: 28 533, per capita: 0.086 ha, sloping land: 83%
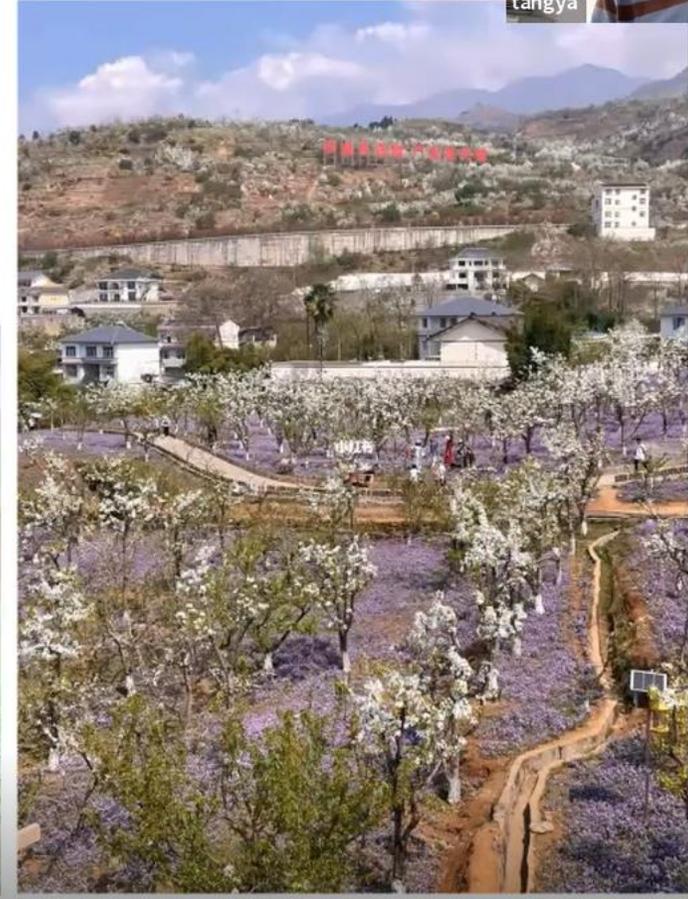 - Area under pears:

Hanyuan: income

- One pear tree: $120/year
- Tourism: $30 000/household
- Garlic (flower stem and tuber): $3000
- Rice: $500
- Other fruits

2.2 Woods-based systems

- Medicinal plants
  - Large scale cultivation of 200 species out of 600 ones used in large quantity
  - 3 million ha
  - Land used
    - Cropland
    - Marginal land

Birds: chicken, wild pheasant

- Higher price
- Attraction to local tourists

2.3 Rotation

- Rice + mushrooms

- Fruits + vegetables
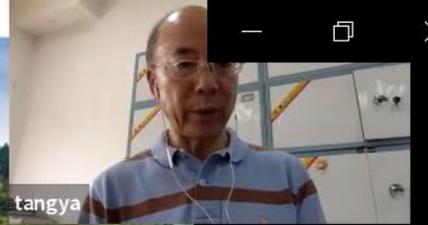
Bird watching in Mount Gaoligong

- Farmers identify and manage a locality with many birds
- Provide all service to birders
  - Guide
  - Lodging
  - boarding
- 2018: Annual income: up to over $2 million for a village
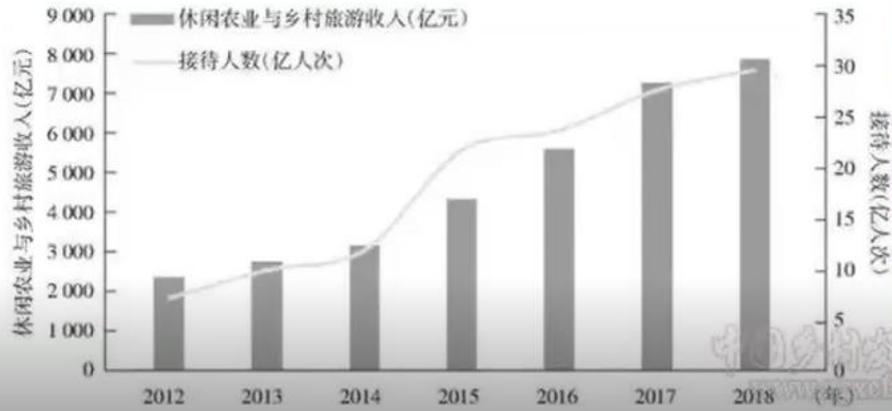
Many places in SW and SE China

2.4 Rural tourism

- Daily stay: weekend
- Monthly stay
  - Summer season
  - Winter season
  - Lodging and boarding
- $500 million in 2021 in Hanyuan

- Fruits-based
  - Pears, plums, apples
- Natural forests-based
  - Red, yellow leaves
- Local foods-based
  - Farmhouse cuisine
- Nature education based

3. Policy and institutional support

3.1 Policy

- Recent national policy to improve farmers' life
  - Agriculture, rural areas and farmers have been the annual No 1 national policy since 1982
  - Rural rural vitalization. A national agency is established: **National Administration for Rural Revitalization.**
    - Income generation is the key component

3.2 Institutional

- Regionalization
  - National
  - Provincial
- County level
  - Most important planning on what to development
  - Recommendation from professional scientists and technicians on prioritization of development based on local biophysical and socio-economic background
  - Setup of local support system
    - solve any problems from farmers
    - Update new development
    - Training

- Research institutions and universities
  - Crop selection
  - Technique
  - Management
- Extension institutions at provincial, prefecture and county levels
  - Specific: mulberry, medicinal plants, mushrooms, economic crops/plants
- Financial support
  - Government
  - Industries/business
    - Corporate + production bases

- Economic factors
  - Sufficient scale
  - Reliable markets
    - Medicinal plants
    - Fruits
    - Vegetables
    - Rural tourism: close to cities
  - Diversities/avoiding copying and repeating
  - Accessibility
    - Good areas for mass production
    - Poor areas high value, low volume, like Dendrobium

4. Future directions

- Who will farm?
  - Declining rural population

- Farm size to support a family with similar living stardands

- Professional farmers