

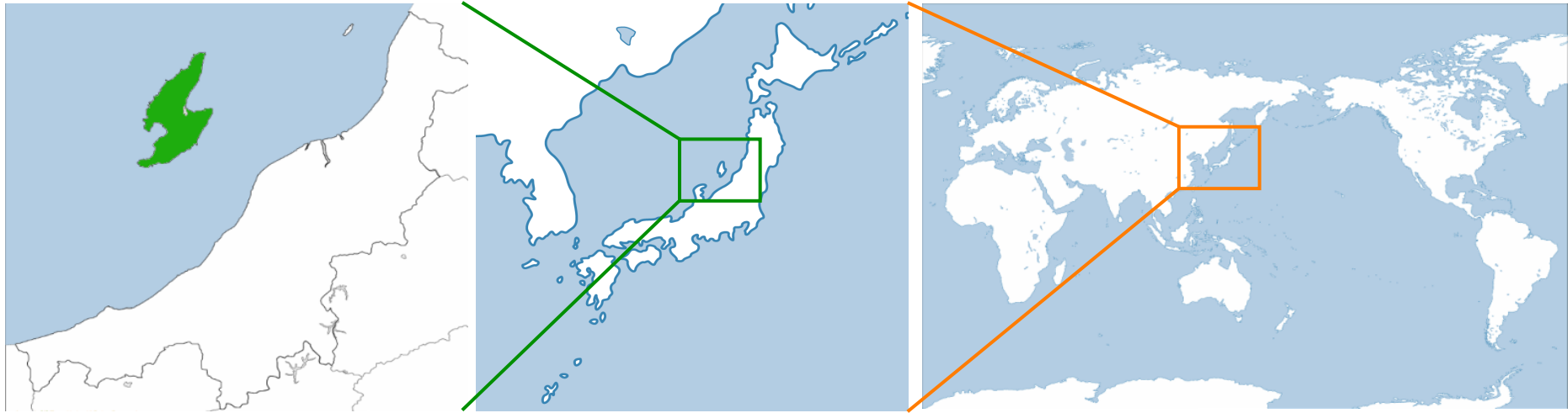
# Energy and Nature

## Investigating Sustainable Energy Sources in Island

Koichiro Takano,  
Former Mayor of Sado City  
Japan



# Outline of Sado



<b>Area</b> 面積	855km <sup>2</sup>	<b>Population</b> 人口	2003 71,000	2010 → 63,000
<b>Expanse</b> 広ぼう	East-west: 33 km North-south: 60km	<b>Population aging rate</b> 高齢化率	2003 33.8% (19.5%)	2010 → 36.8% (23.1%)
<b>Circumference</b> 周囲	280 km	<b>Total fertility rate</b> 合計特殊出生率	2003 1.67% (1.29%)	2010 → 2.01% (1.37%)
<b>Highest peak</b> 最高峰	1,172 m (Mt. Kinpoku)	<b>Gross productivity</b> 市内総生産・実額	2003 ¥245.4 bln	2010 → ¥197.2 bln

\*Brackets show the national average カッコ是全国平均

# First GIAHS Designation in Japan!

Sado's Satoyama  
in harmony with the Japanese crested ibis



Globally Important Agricultural Heritage Systems (GIAHS)



# The Abundant Biodiversity of Satoyama and Rural Culture

**A result of the gold rush** (1601~1951)

(the world's largest gold mine (at that time))

The Sado gold and silver mine (Doyu-no Wareto), tentatively listed to be a UNESCO World Heritage site

# Noh – traditional masked dance-drama

Zeami (Noh master) stayed in Sado in the Edo period and there were 200 Noh stages. The number of Noh stages is the largest now.



# Creation of Terraced Rice Fields and Satoyama





Local people and other diverse people have been involved in preserving Sado's beautiful satoyama, helping nurture the biodiversity of Japanese crested ibis and others.

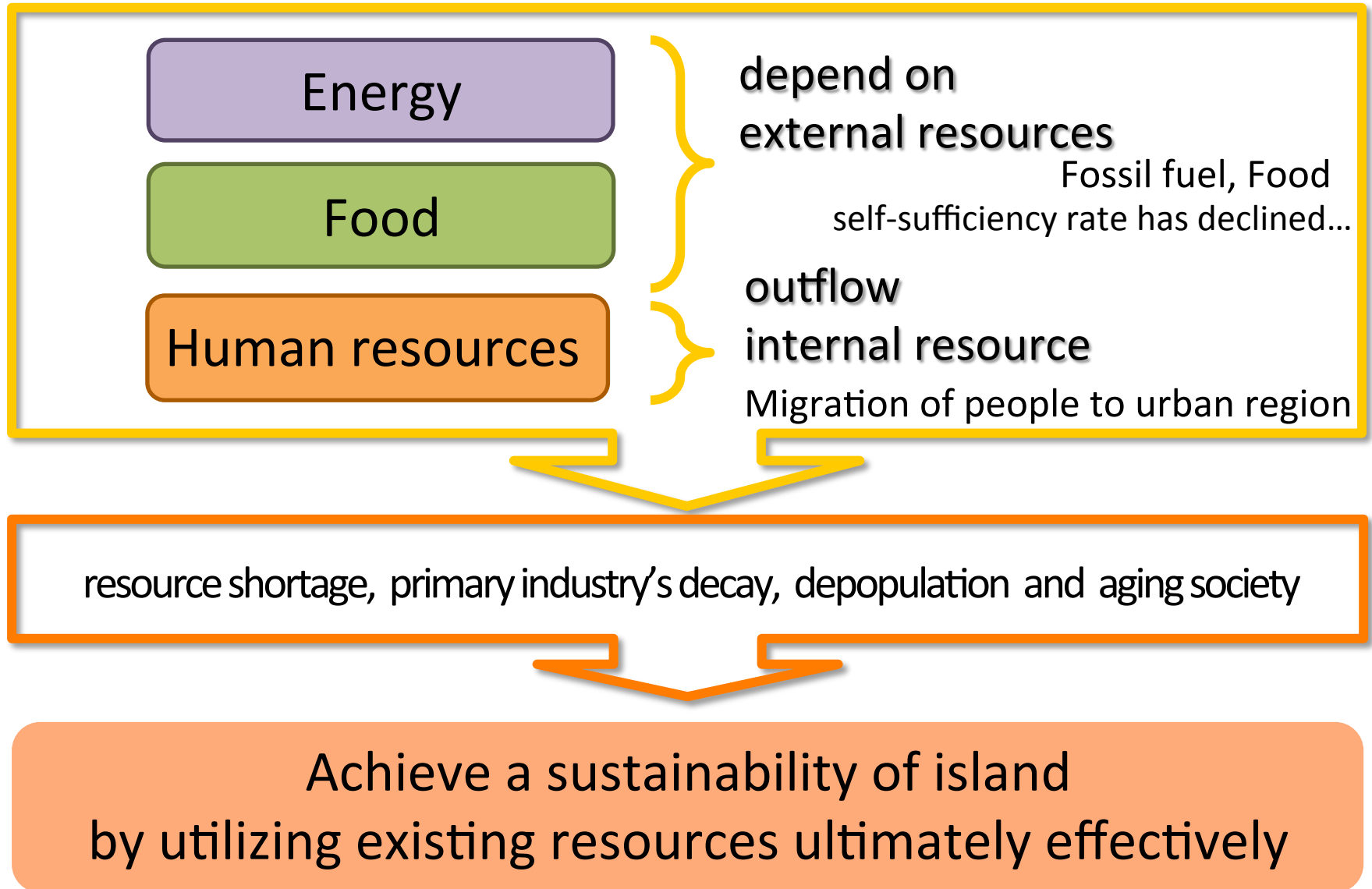


# Rice Terrace in Bali





# Problems for sustainability of Japanese islands



# Potential of Japanese islands

Energy

Food

Human resources

These already exist and available by their own potentially.

Finding various potential, developing utilization systems, and implementing it in the society  
(Social System Innovation)

# Some rural villages in Japan are self-sufficient of energy

(As of March 2012)

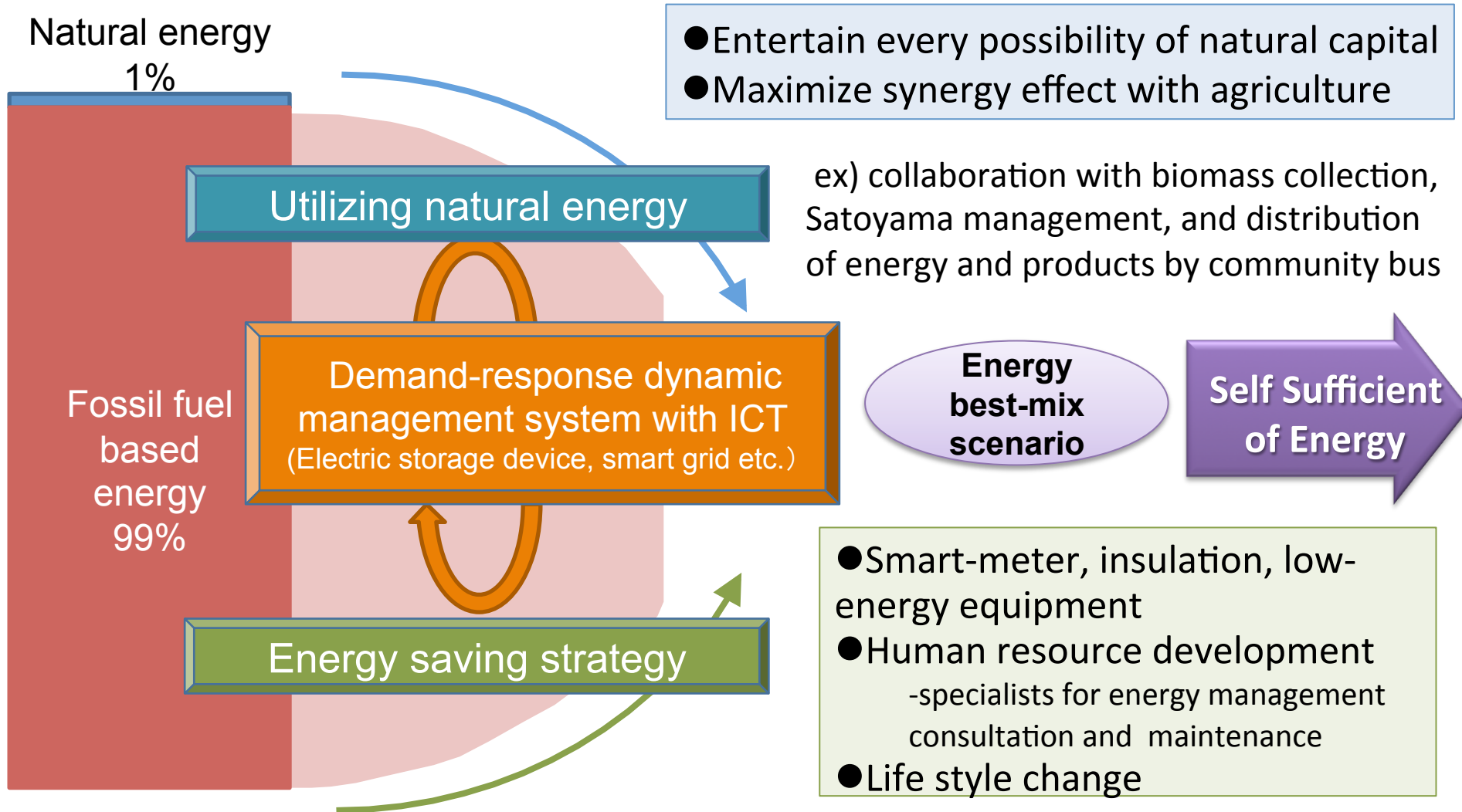
rank	prefecture	city	(%) self-sufficiency rate
1	Nagano 長野県	Hiraya 下伊那郡平谷村	1,069
2	Oita 大分県	Kokonoe 玖珠郡九重町	1,027
3	Nagano 長野県	Oshika 下伊那郡大鹿村	961
4	Fukushima 福島県	Yanatsu 河沼郡柳津町	891
5	Kumamoto 熊本県	Minakami 球磨郡水上村	753
6	Aomori 青森県	Higashidori 下北郡東通村	581
7	Kumamoto 熊本県	Itsuki 球磨郡五木村	538
8	Tokushima 徳島県	Sanakawachi 名東郡佐那河内村	534
9	Miyazaki 宮崎県	Nishimera 児湯郡西米良村	508
10	Nagano 長野県	Sakae 下水内郡栄村	425

Source: 永続地帯2013年度報告書

Self-sufficiency rate is evaluated by local energy demand and a total of solar heat, photo voltaic, biomass, wind, geothermal, and hydropower, and other natural energy resources.

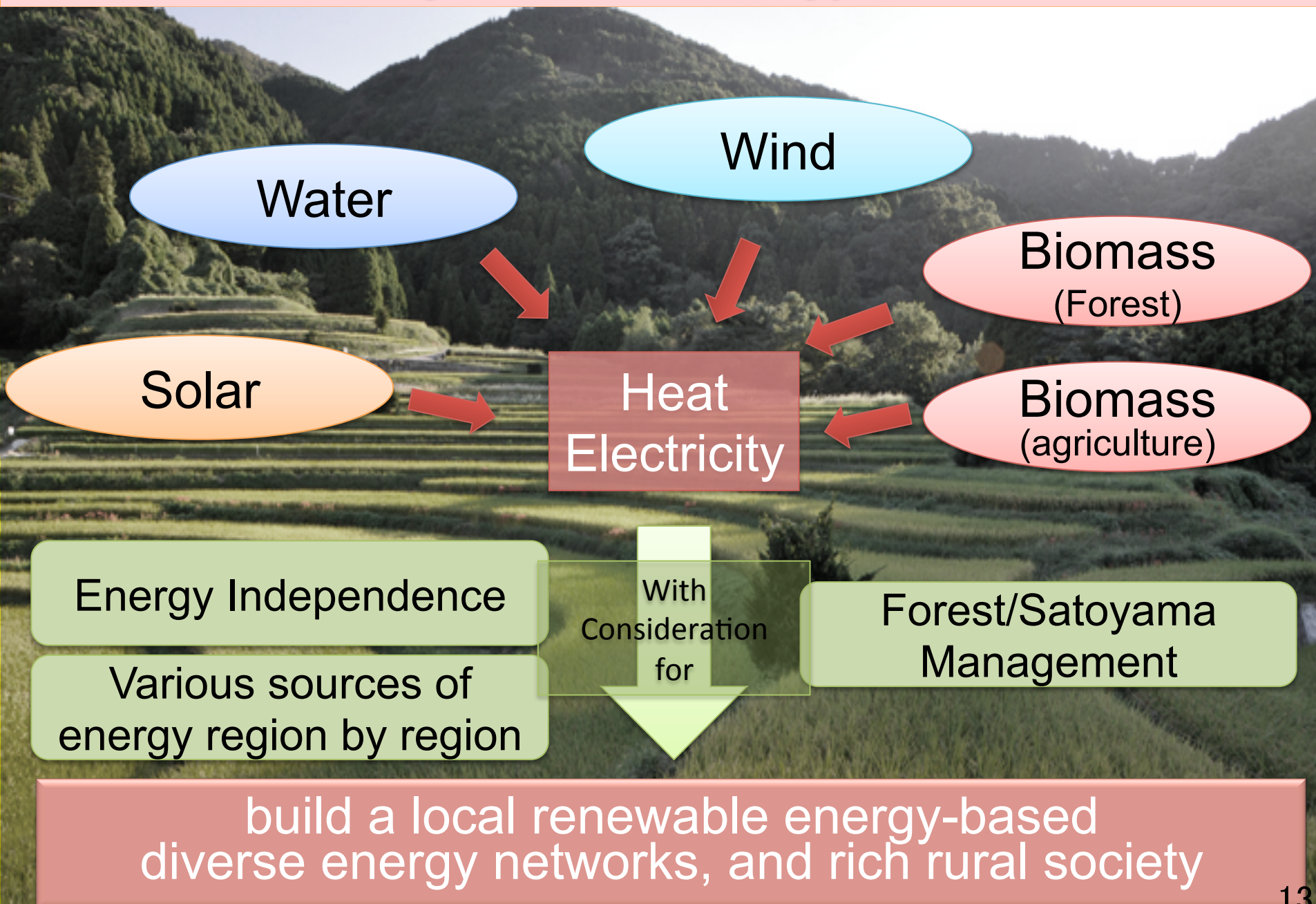
**50 Cities have over 100% self-sufficiency rate of energy.**

# Self Sufficient of Energy System at Sado



ex) utilize a campaign of 'Evaluation of Home energy use'. Specialists advice of saving energy in each house. <https://www.uchieco-shindan.go.jp/>

# Utilizing Natural Energy Sources



# Biomass: Forests and Forest Industry in Sado

## Forests

Total area of Sado City	85,534 ha
Total forest area	60,879 ha
Percentage of forest area	71.2%
National forest area	1,800 ha
Private forest area	59,079 ha
Artificial forest area	12,867 ha
Percentage of artificial forest area	21.8%

## Forest Industry

No. of forestry workers	88
No. of forestry cooperatives	4
No. of forestry entities excluding forestry cooperatives	26
Production of wood from final cutting	1,027m <sup>3</sup>
Production of wood trimmed for thinning of forests	1,724m <sup>3</sup>
Value of wood production	\200 million

Wide expanse of forest

(Natural broad-leaf trees, cover 70%)

Wide Bamboo forest (911ha)



- **value-added wood products**
- **positive use of biomass**

For sustainable forest management and biodiversity preservation

- timber market is small
  - processing capacity is inadequate
  - local wood price is high
  - high demand for imported foreign wood
- =>deficient demand for local wood

Main forest product, Dried shiitake mushroom, is also reduced.

Annual production: 21 tons

(only 9% of the peak production of 229.5 tons in 1991)

• No. of producers: 186 • Sales: 40 million yen



# Model Project to Restore Forest/Satoyama and Vitalize Rural Communities: “School Brewery” 1

A Japanese sake maker remodeled a local elementary school as a brewery, which ended its 136-year history in 2010



Citizens can learn sake brewing and the culture of Sado and the entire Japan, and have various opportunities for interaction in the school too.



Sake production conveys Japanese food culture to the world.  
=> preservation of landscapes of Satoyama where people live in harmony with Japanese crested ibises and biodiversity.

# Model Project to Restore Forest/Satoyama and Vitalize Rural Communities: “School Brewery” 2

PV in the old school pool



the School brewery with 100% renewable energy

- Introduce solar power generation to the brewery to produce sake using renewable energy.
- Use of thermal energy derived from forestry biomass (in future).



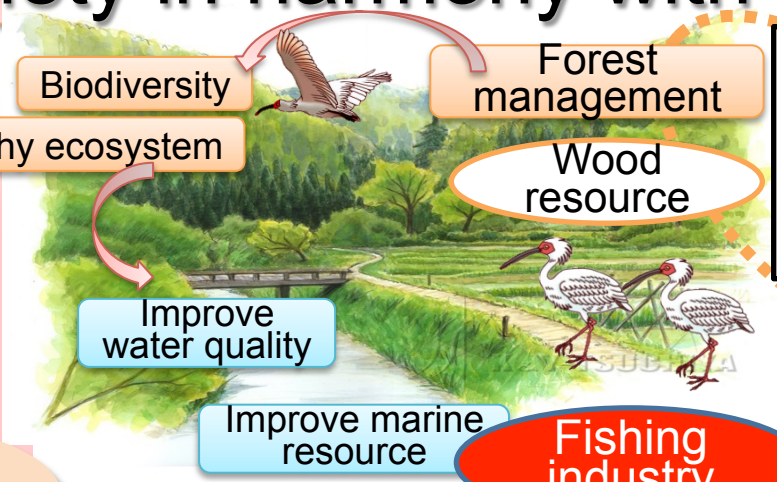
Sake is produced from rice cultivated in a biodiversity-friendly way.



Biomass for thermal from forestry (in future)



# How to vitalize forestry and agriculture for the society in harmony with nature



By revitalize forestry,  
 -Self-sufficiency and better quality of wood products  
 -Good Forest management

**Tourism**

Biodiversity  
 Healthy ecosystem

Forest management

Wood resource

Agriproducts

Highest quality

Improve water quality

Improve marine resource

**Fishing industry**

Timber

Good quality

**Food industry**

**Collaboration with Forest · Village · Sea**

Boards

Normal quality

Pulp logs and chips

**Biomass industry**

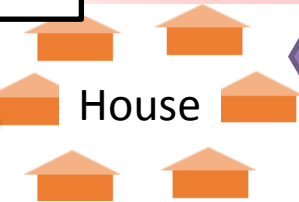
**Biomass**  
 Power/heat generation



By revitalize agriculture,  
 -Self-sufficiency and better quality of agriproducts  
 -Good agricultural lands management

**PV/ Solar Heat**

Supply



House

Heat/ Energy

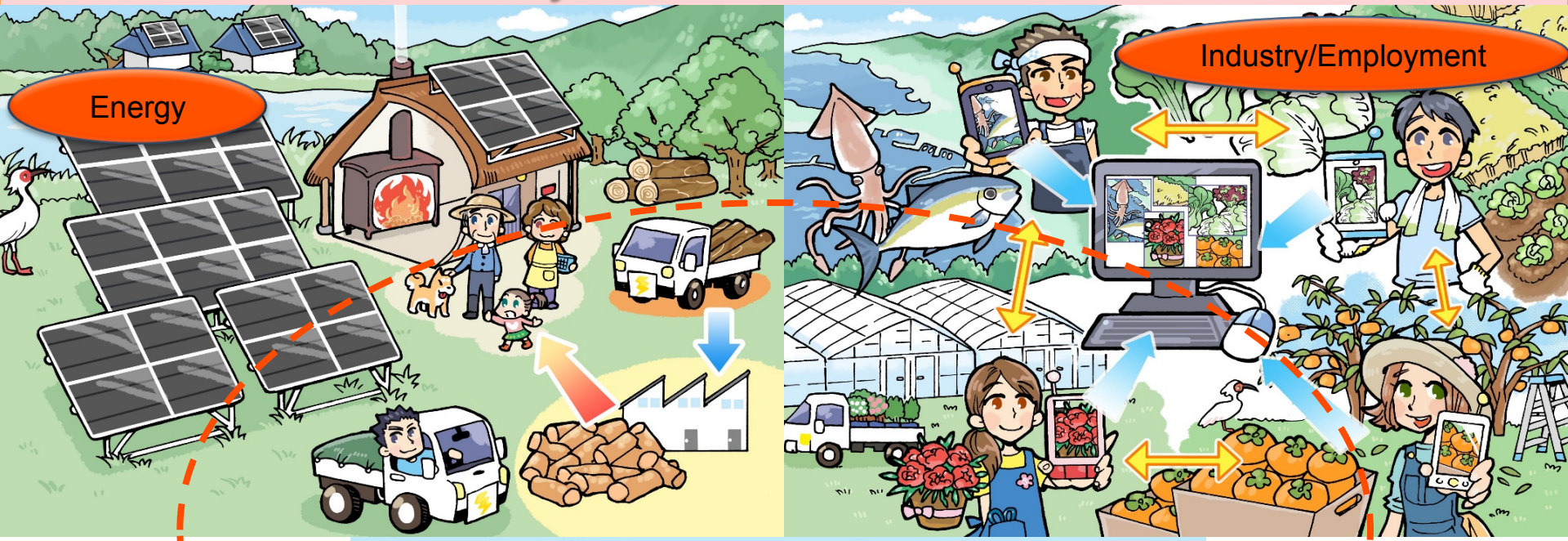
**6th industry**

- 食品工場 (Food factory)
- 施設園芸 (Facility horticulture)
- 灌漑設備 (Irrigation equipment)
- 教育・エコ・ツーリズム (Education, Eco, Tourism)

Supply

Wind, thermal, hydro etc.

# Vision of Ideal Society for Smart Eco-Island Research Initiative



Life  
in harmony  
with nature

Good Health

Collaboration with  
universities,  
businesses,  
farmers, and local  
wood producers.



=>  
**Change Sado  
to be  
Sustainable**

# Thank you for your attention!



## Koichiro Takano