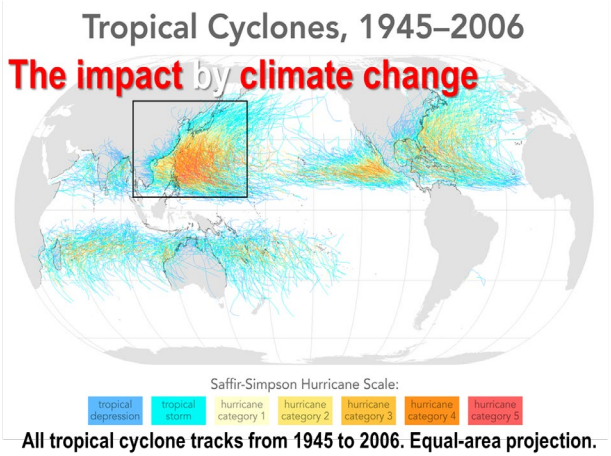
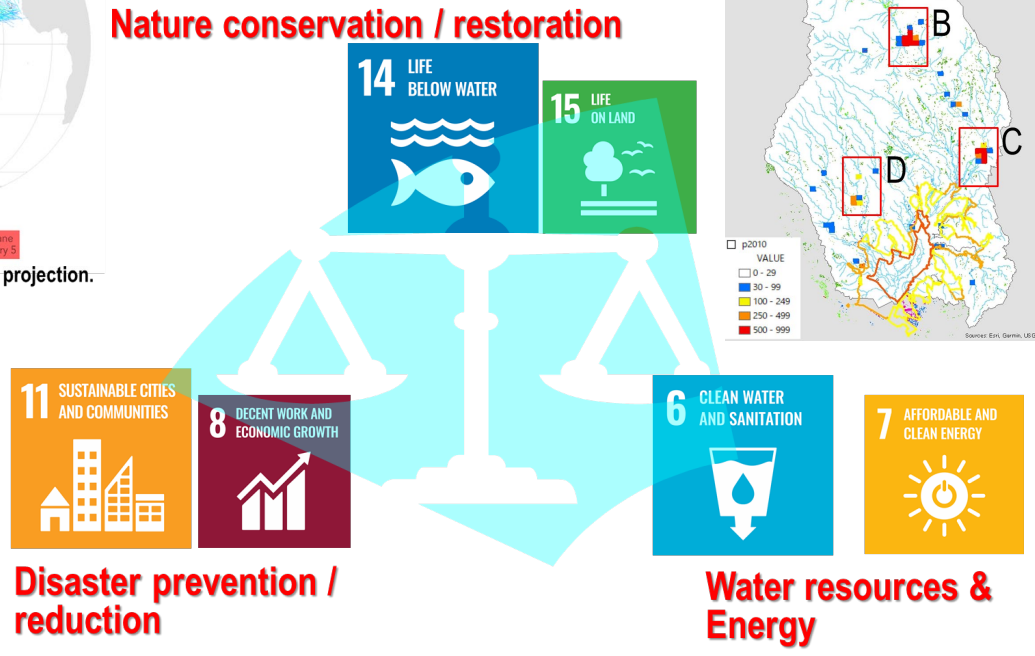
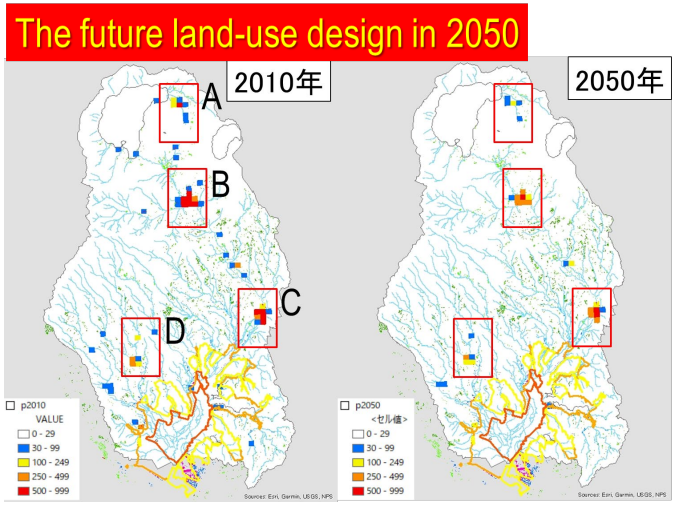
Future Design of the Regional Circular and Ecological Sphere

adapting to Climate Change and Depopulation by utilizing Unused Farmland in Japan



All tropical cyclone tracks from 1945 to 2006. Equal-area projection.





Kyoto University, C-PIER
(Research Professor)

Center for Environmental Biology and Ecosystem
National Institute for Environmental Studies
(Senior Researcher) Satoshi KAMEYAMA

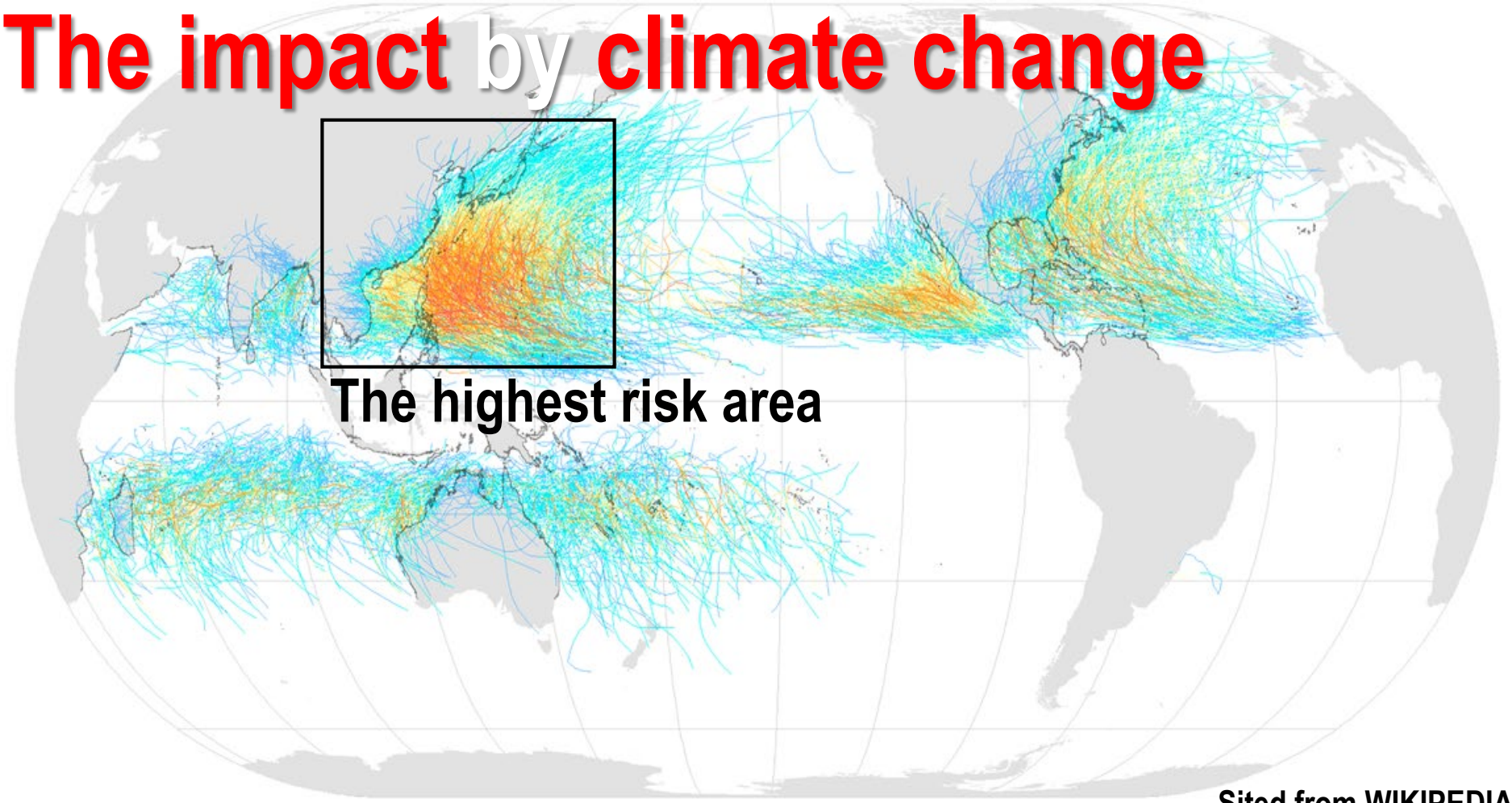
Synergetic Strategies

Sustainable Development Goals on Climate Change and Protecting Healthy Ecosystems

??? Beyond Win-Win ???

Tropical Cyclones, 1945–2006

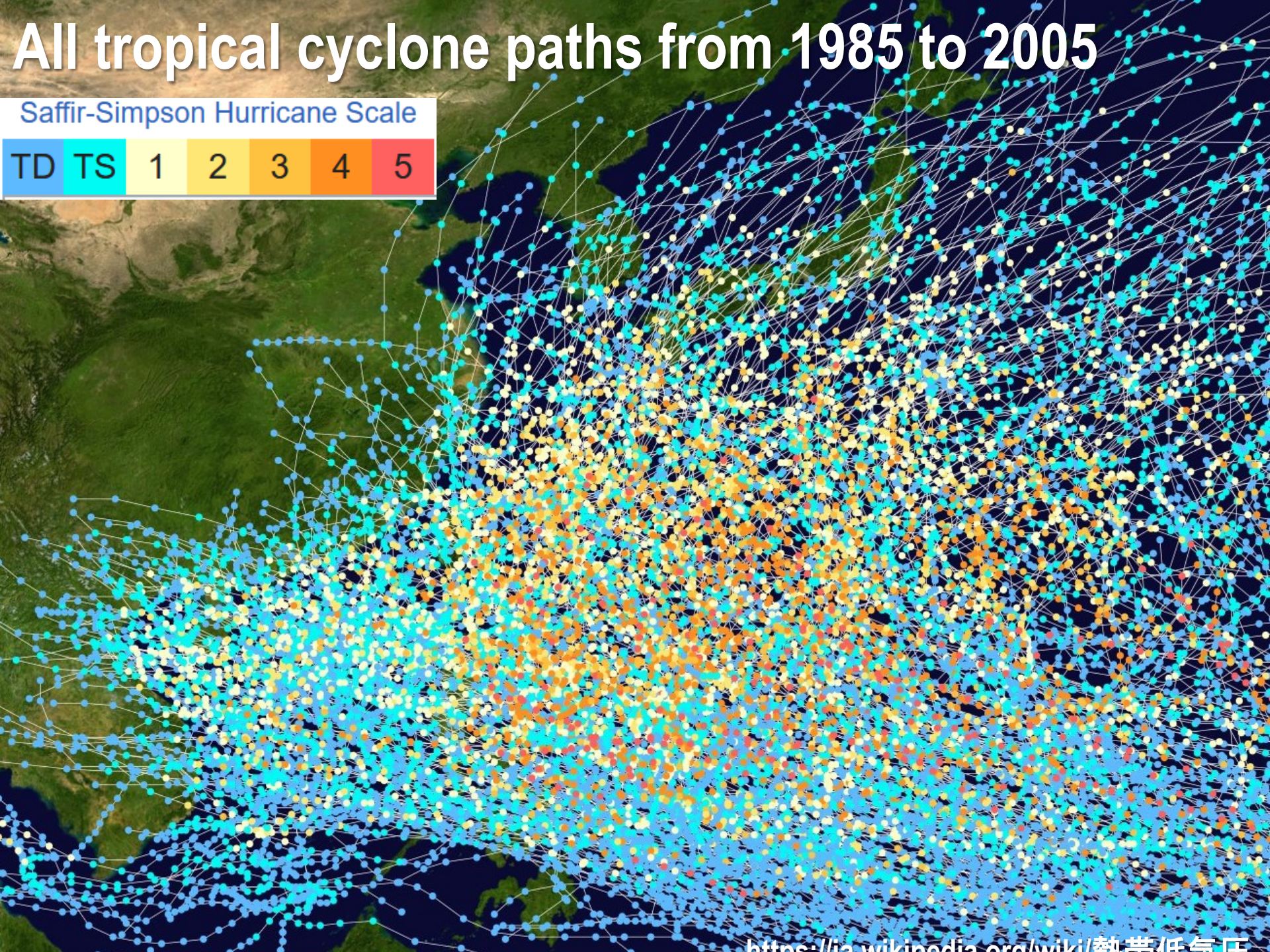
The impact by climate change



Sited from WIKIPEDIA
(Tropical cyclone)

All tropical cyclone tracks from 1945 to 2006. Equal-area projection.

All tropical cyclone paths from 1985 to 2005



https://ja.wikipedia.org/wiki/熱帯低気圧

Climate change and “extreme” weather

14日(月)3時
暴風警戒域
13日(日)3時
12日(土)3時
強風域
11日(金)3時
10日(木)15時
暴風域
10日(木)3時現在

台風 19 号 (10日3時現在)

Size / strength	Large/Violent
Direction / Speed	北 10km/h
Central pressure	915hPa
Max. wind speed	55m/s
Max. instantaneous wind speed	75m/s

=270km/h

The path of the typhoon (19) in 10 Oct. 2019.

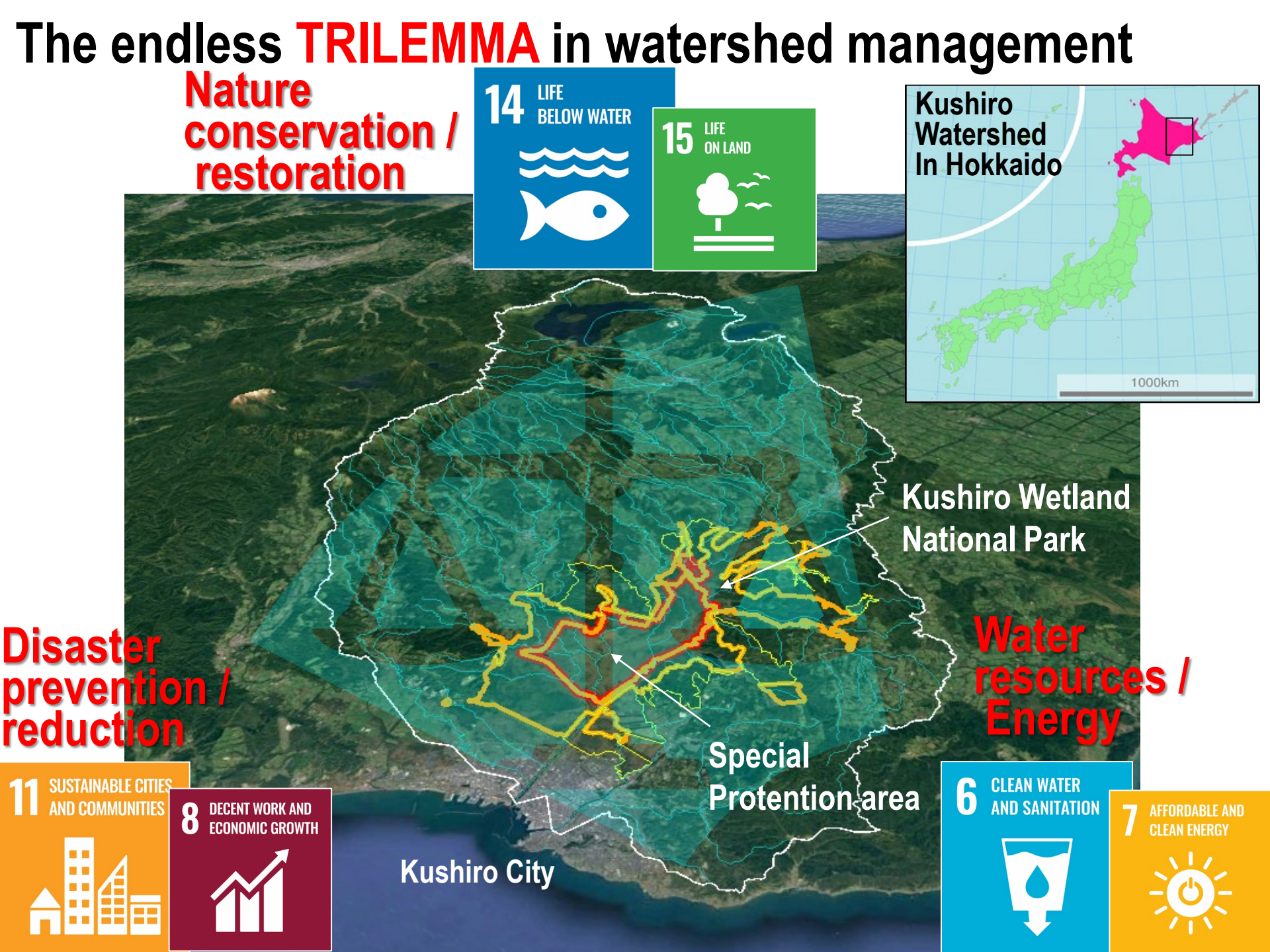
Sited from weather news H.P.

Japan is the county of “DISASTER”

The bank break of the Chikuma River flowing through Nagano Prefecture. Flooding damage occurred extensively in the basin

Image from BBC NEWS JAPAN 2019/10/22

The endless TRILEMMA in watershed management



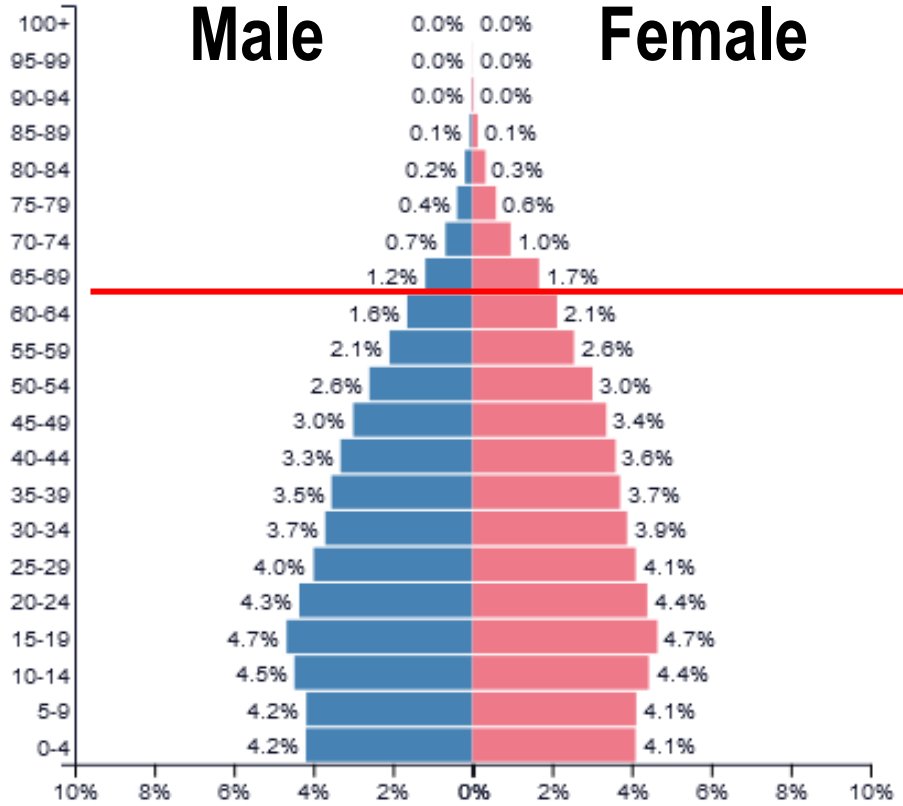
The change of population

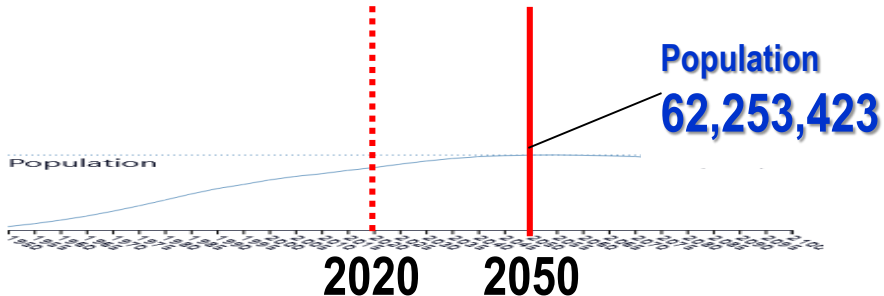
PopulationPyramid.net Population Pyramids of the World from 1950 to 2100

Myanmar

2020

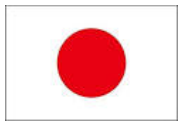
Population 54,409,794



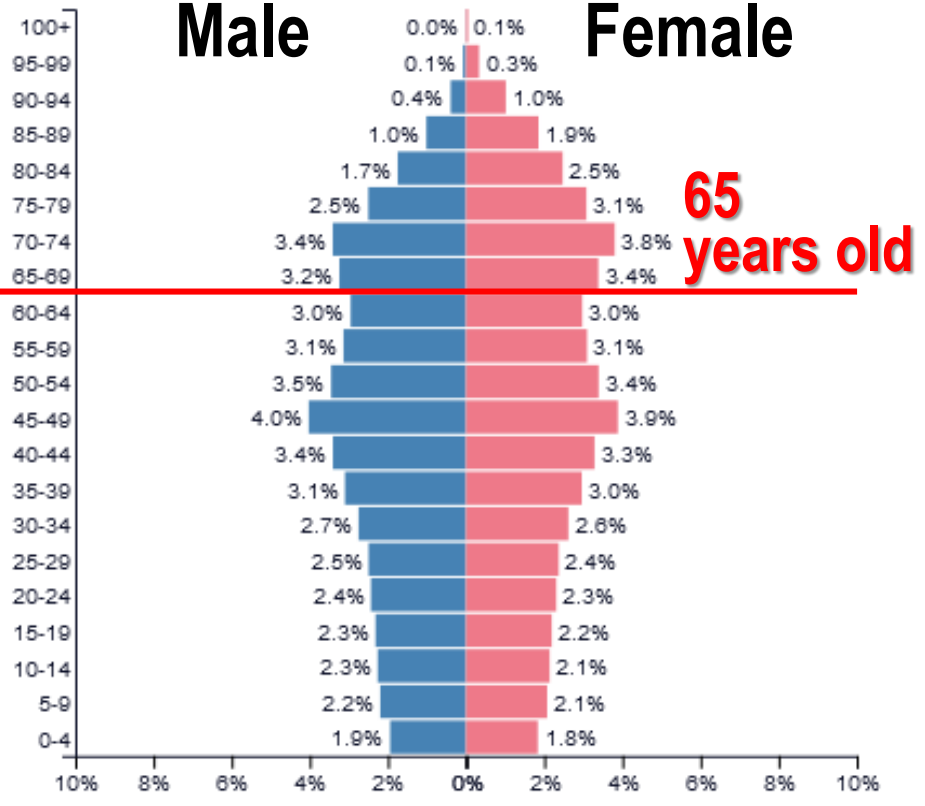


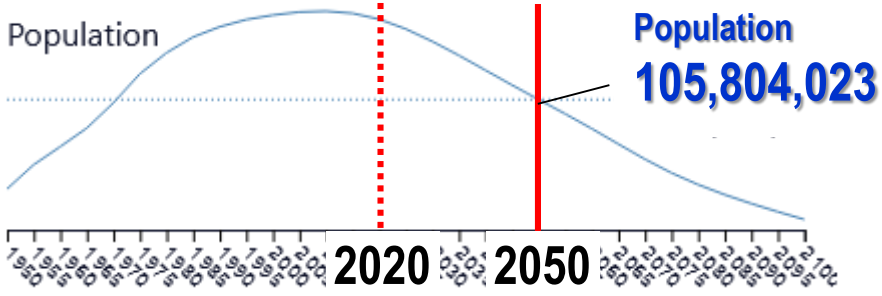
Japan

2020



Population 126,476,458



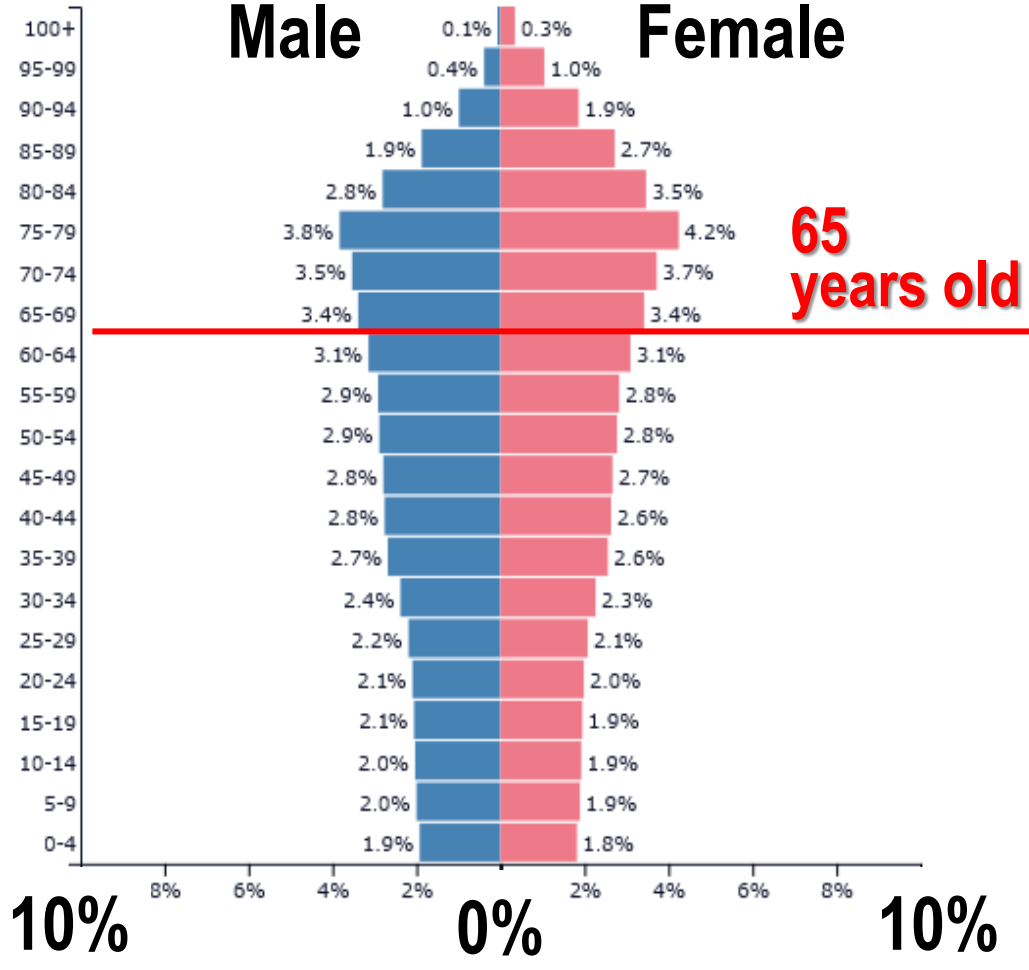


The current local area is the future of Japan

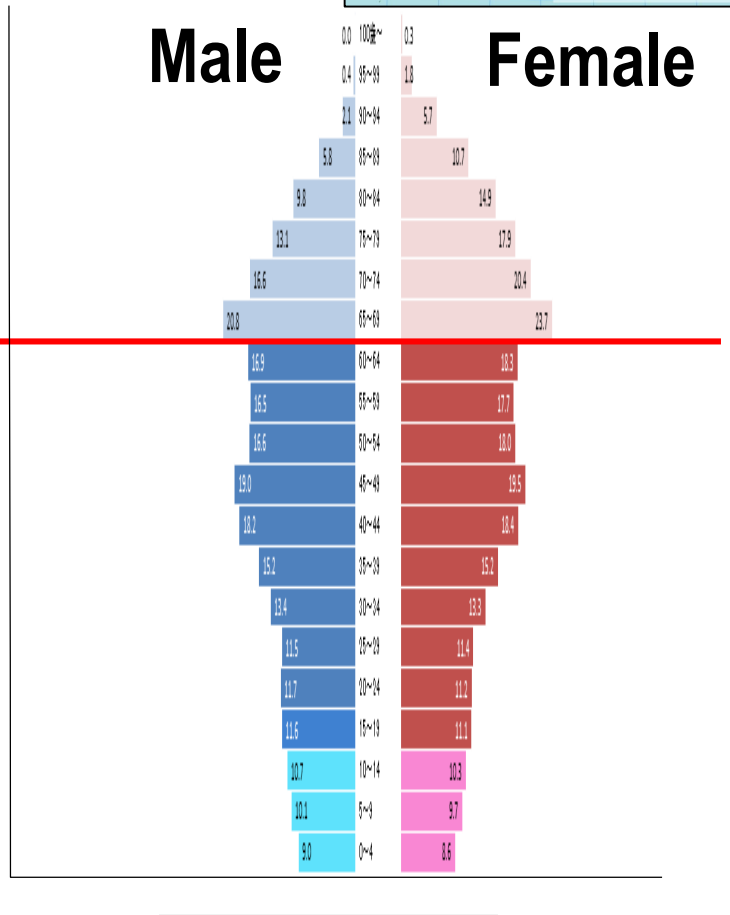
Japan 2050

Population 105,804,022

Hokkaido 2019



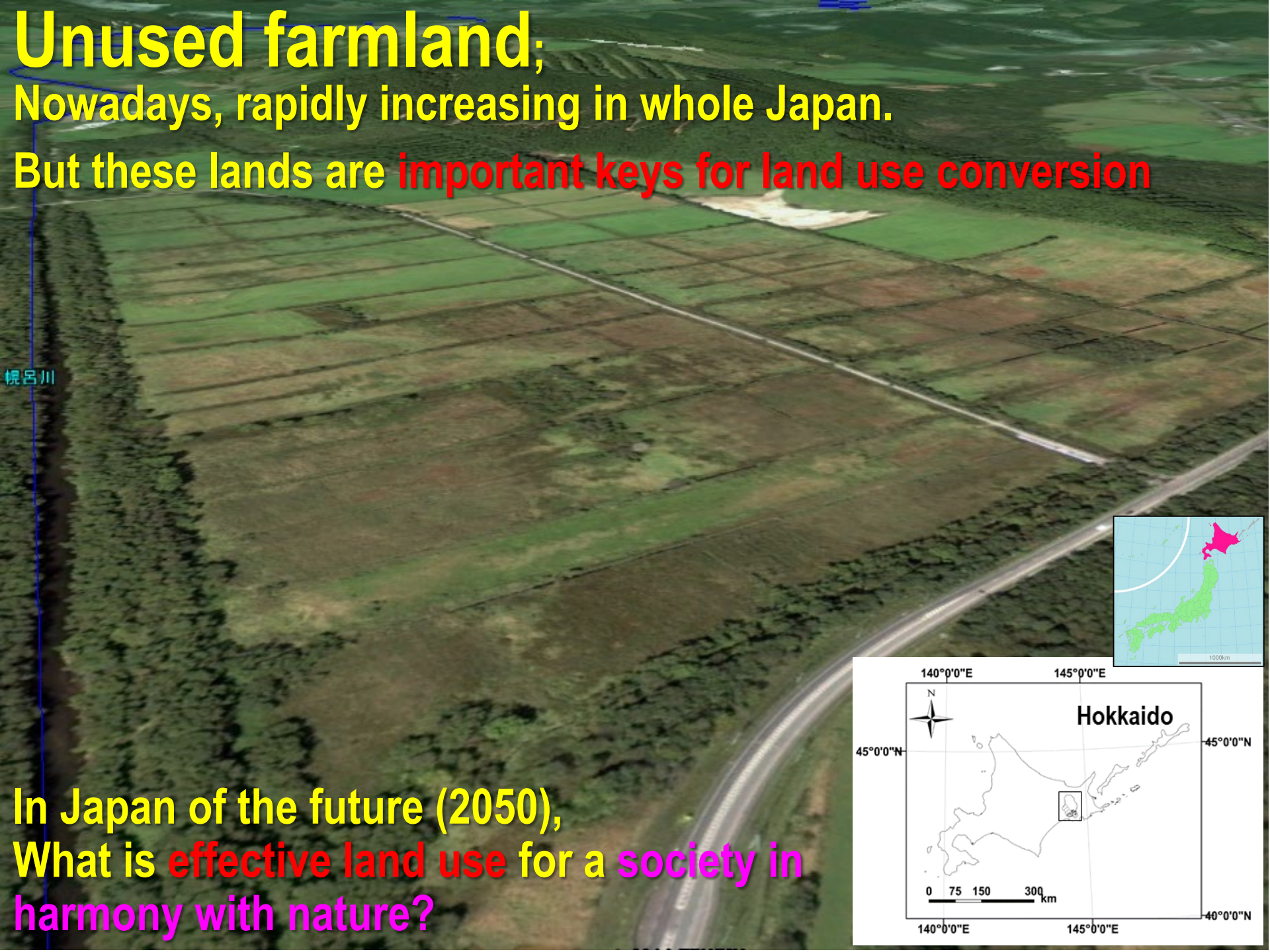
65 years old



Unused farmland;

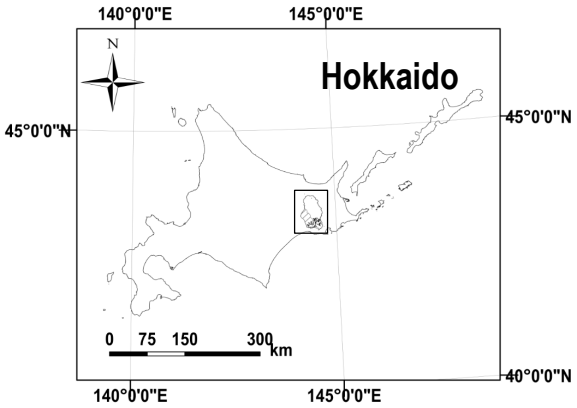
Nowadays, rapidly increasing in whole Japan.

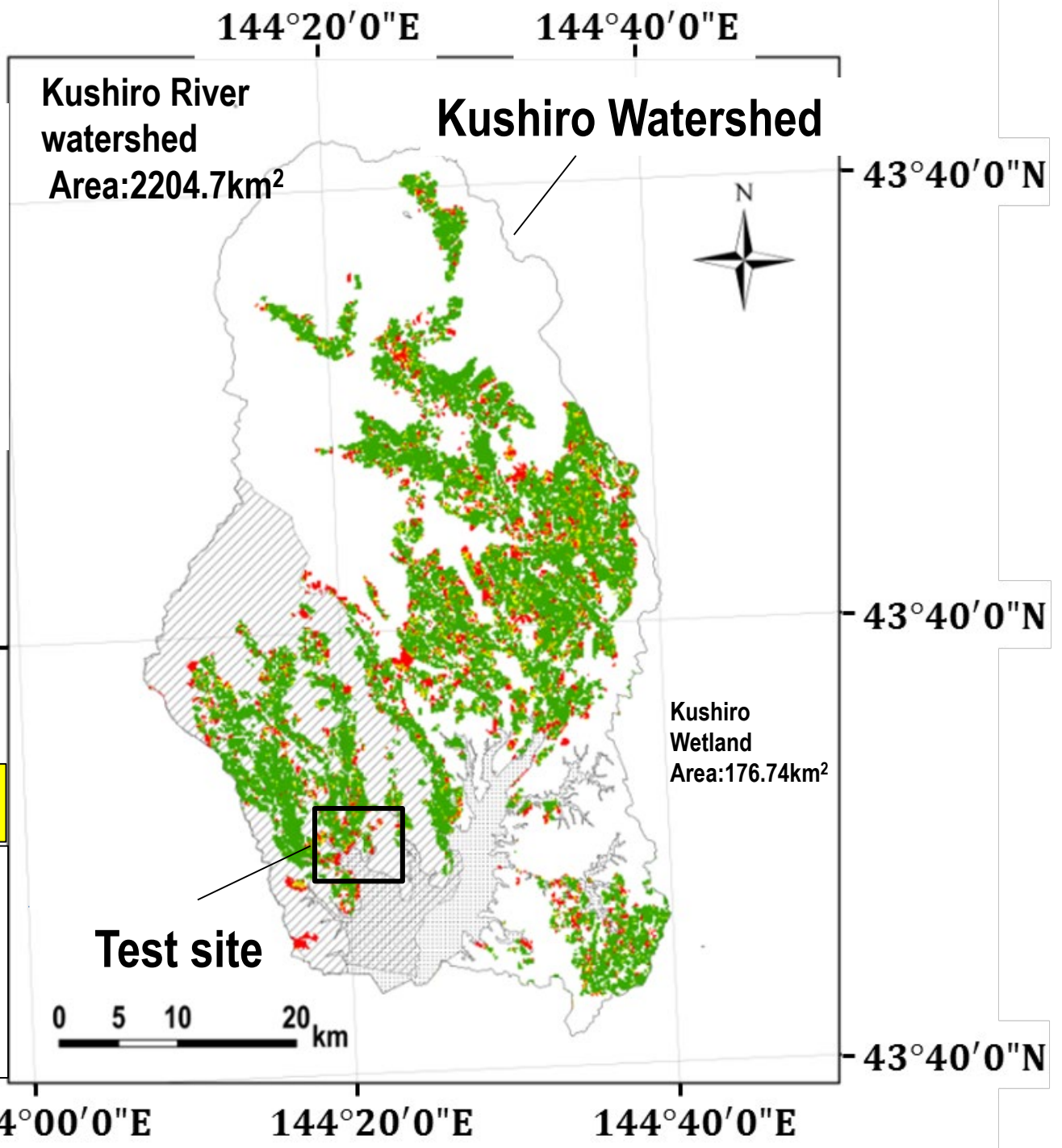
But these lands are important keys for land use conversion



In Japan of the future (2050),
What is effective land use for a society in harmony with nature?

【Study area】





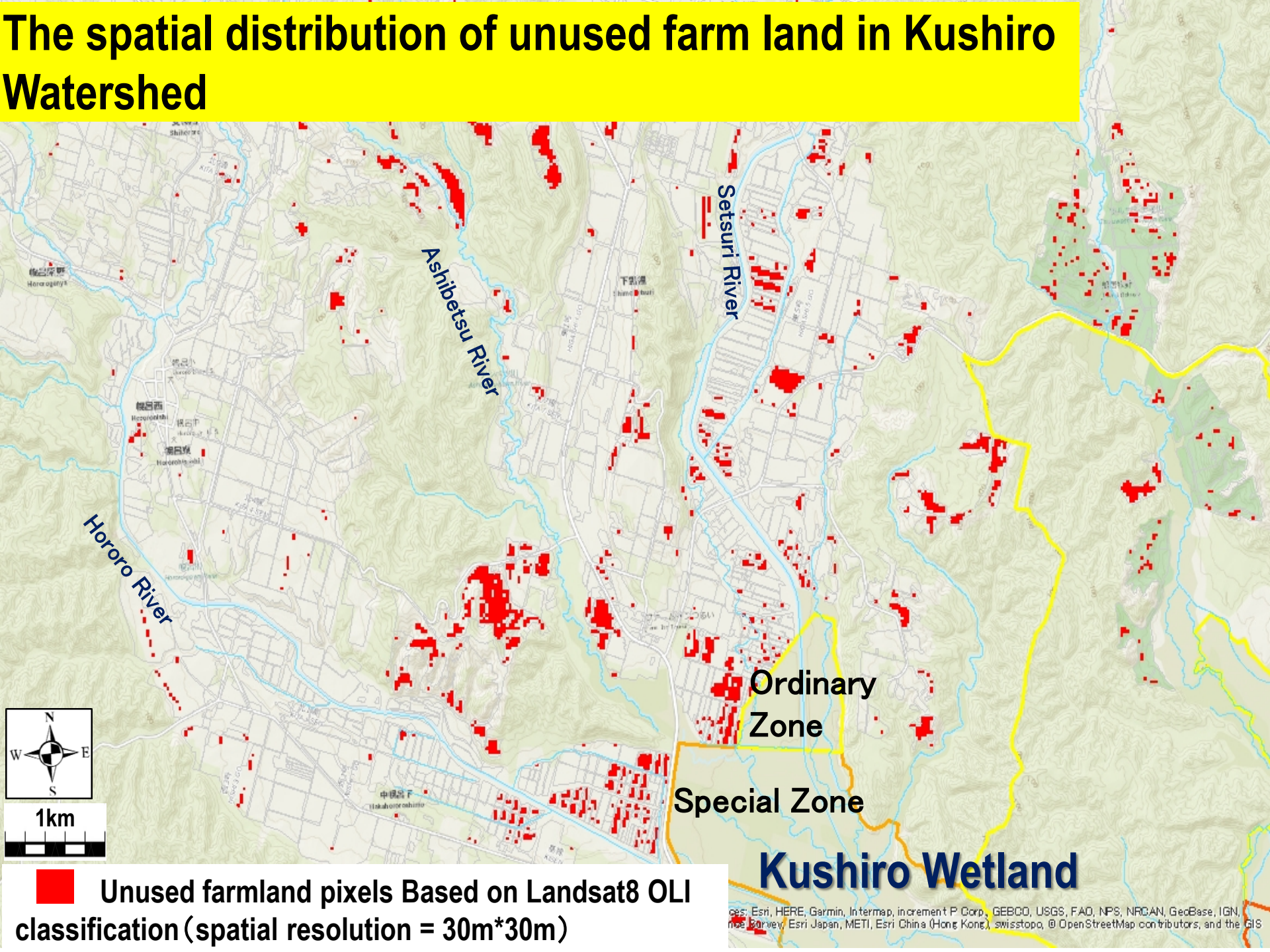
2014-2015年

The ratio of unused area in the field (%)

0 50 100

Sakuma et al. 2017
Japan journal of Remote Sensing

The spatial distribution of unused farm land in Kushiro Watershed



Land-use design support system

The future land-use=The future of current land-use

The land-use categories in the watershed(2015)




Grassland

Farmland

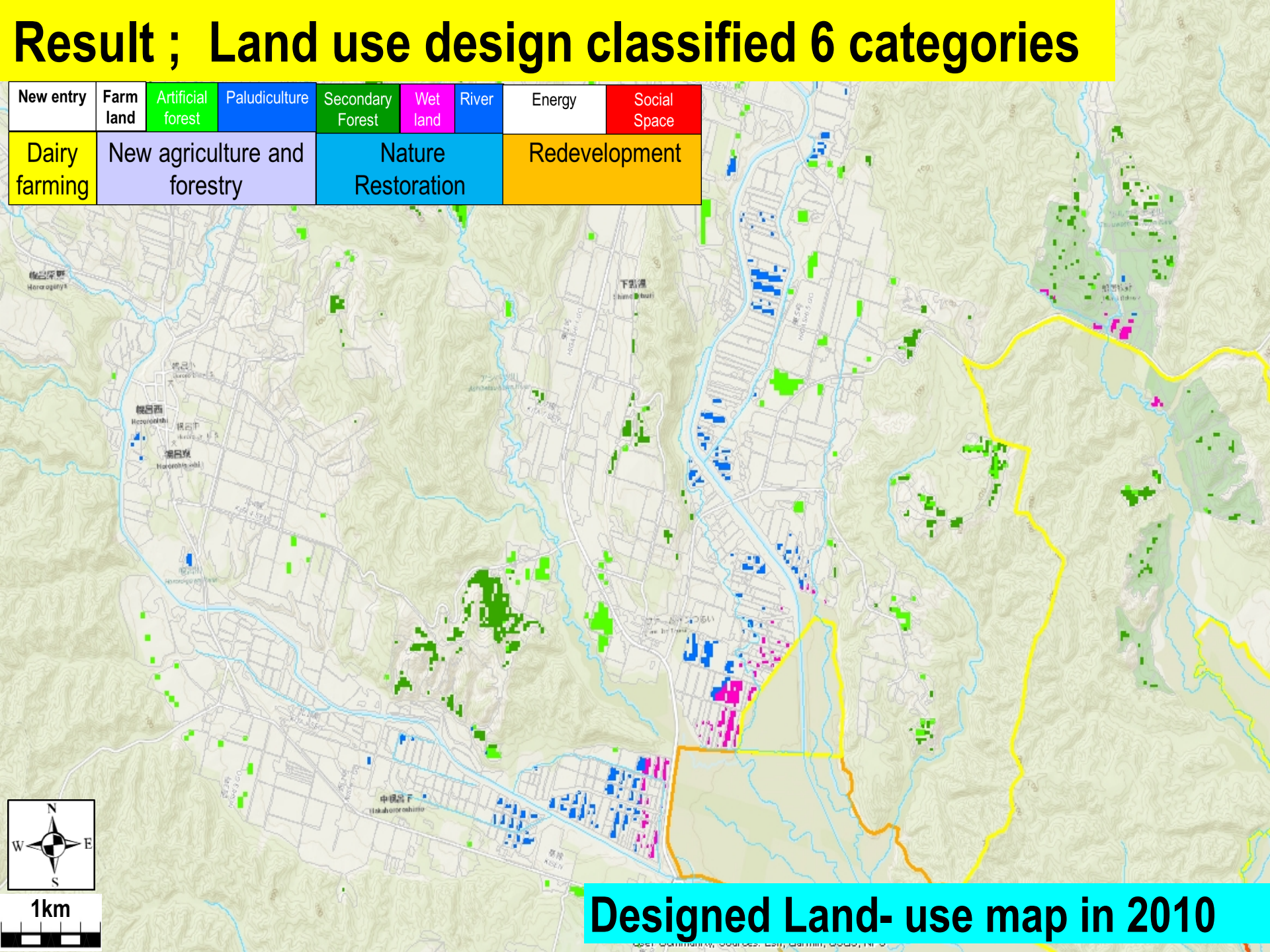
Forest

Unused farmland

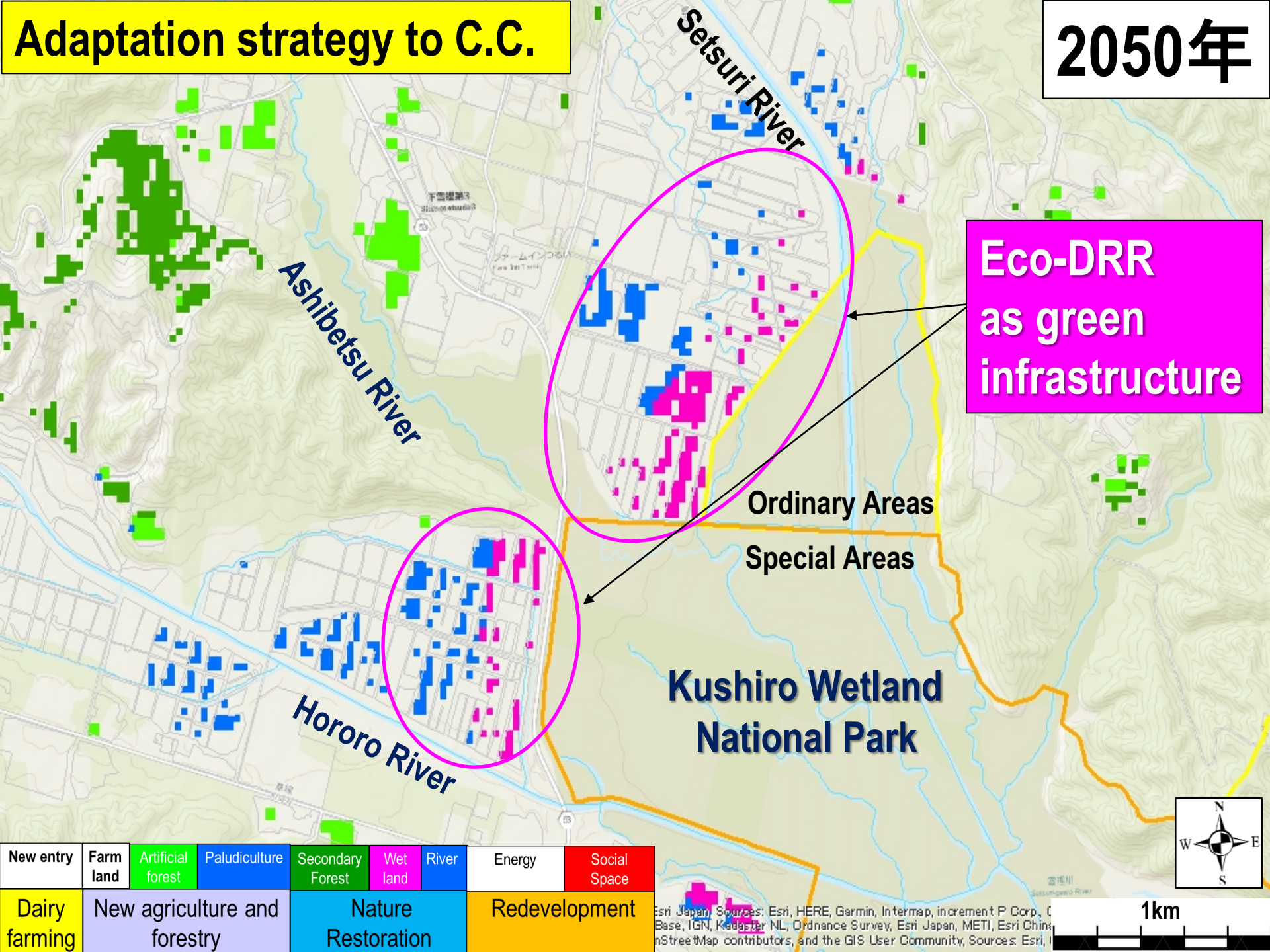
Conti nue	New entry	Farm land	Planted forest	Paludiculture	Secondary Forest	Wet land	River	Energy	Social Space
Dairy farming			New agriculture and forestry		Nature Restoration			Redevelopment	

Result ; Land use design classified 6 categories

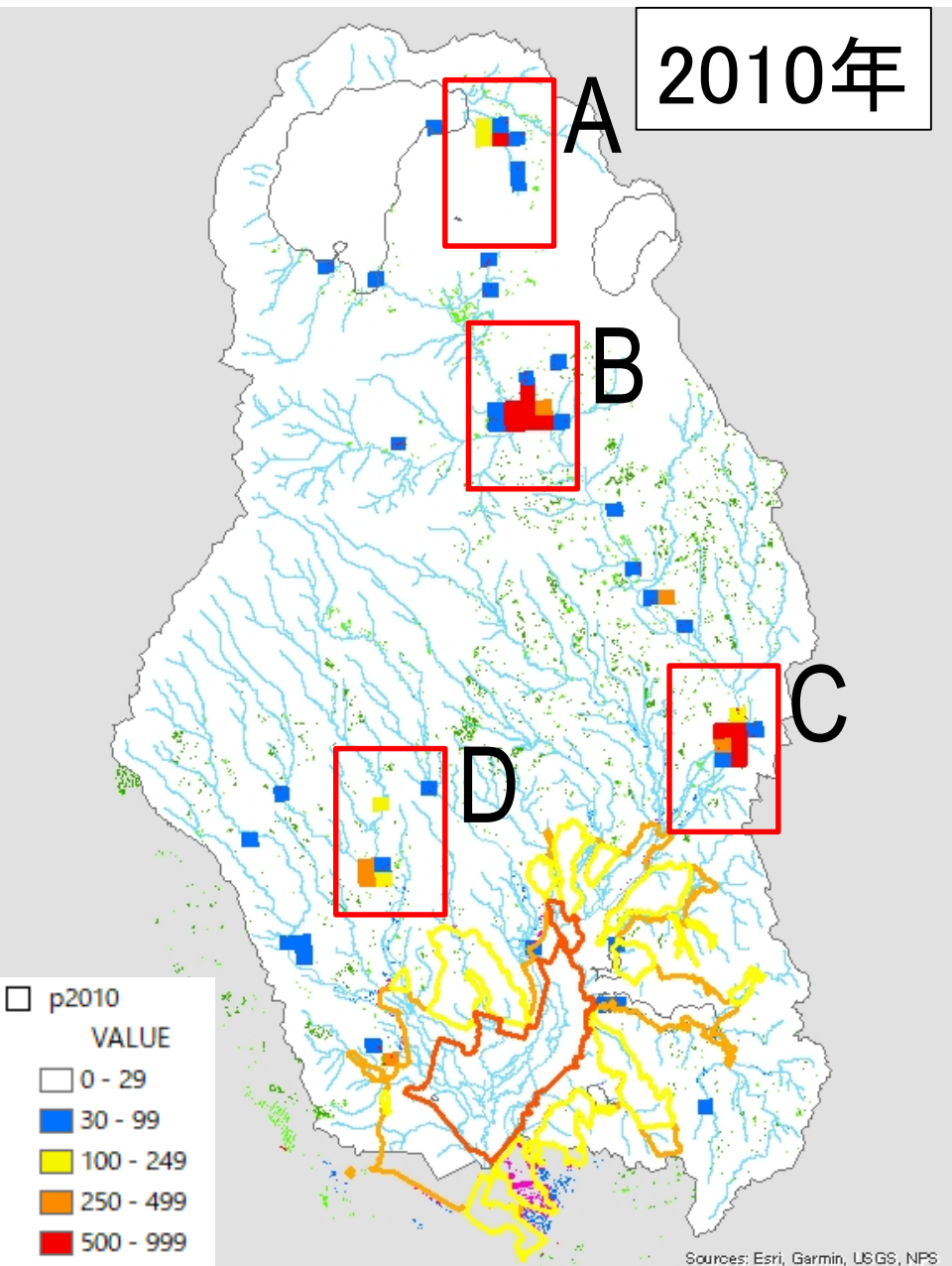
New entry	Farm land	Artificial forest	Paludiculture	Secondary Forest	Wet land	River	Energy	Social Space
Dairy farming	New agriculture and forestry			Nature Restoration			Redevelopment	

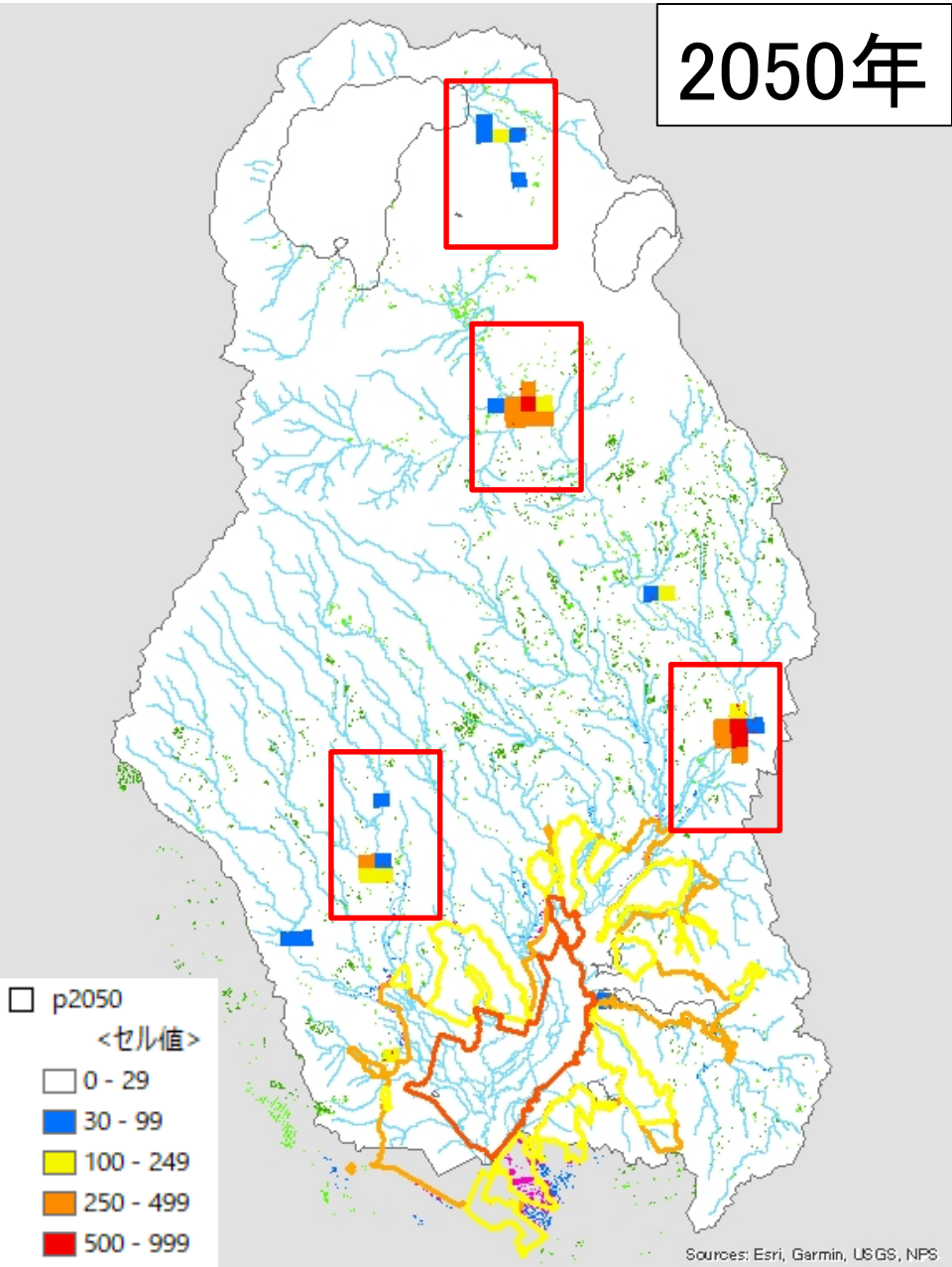


Designed Land- use map in 2010


Adaptation strategy to C.C.
2050年
Setsuri River
Ashibetsu River
Hororo River
Eco-DRR
as green
infrastructure
Ordinary Areas
Special Areas
Kushiro Wetland
National Park
New entry
Farm land
Artificial forest
Paludiculture
Secondary Forest
Wet land
River
Energy
Social Space
Dairy farming
New agriculture and forestry
Nature Restoration
Redevelopment
N
W
E
S
1km

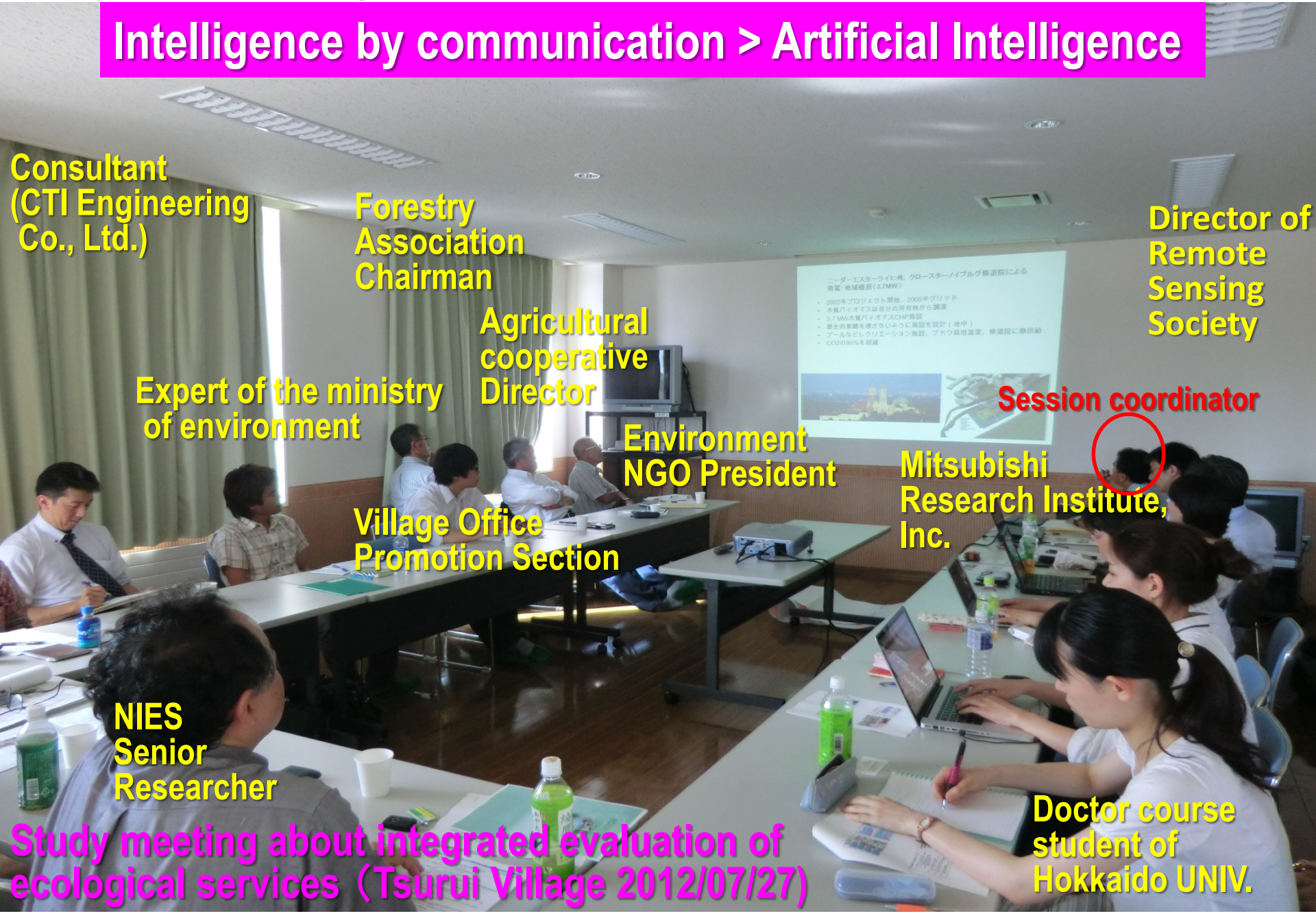
The future land-use design and population density in 2050





Our future design created from peoples communication

Intelligence by communication > Artificial Intelligence



Study meeting about integrated evaluation of ecological services（Tsurui Village 2012/07/27)

【Summary】

Picture of Local Museum in Shibecha Town

Rice planting in Kushiro watershed (Kuchoro Area) in 1928 June.

Regional sustainability is the ability of the region and the community to respond to temporal change.