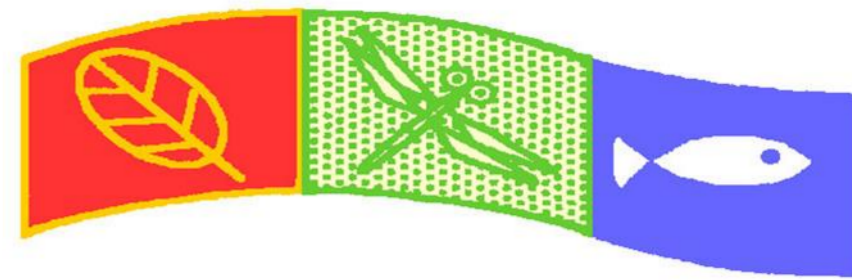


STRATEGY FOR FLOODPLAIN RESTORATION IN AN INDUSTRIALIZED AND POPULATED DRAINAGE AREA OF CENTRAL JAPAN



Toshiya Yamamoto (Toyota Yahagi River Institute, Japan, toshiya5094@gmail.com), Alexander Zinke (Zinke Environment Consulting for CEE, Austria)

Introduction

Floodplains in Japan are home to diverse special biota like in other countries. However, most floodplain environments were more destroyed than in European countries owing to Japan's higher population density and economy-focused policies. Even though nowadays the values of floodplains are recognized, there is no financial assistance such as in the EU nor such strong regulatory systems like the EU WFD to support river restoration. Still, there are possibilities to introduce a strategy aimed at steady steps towards pioneer floodplain restoration.

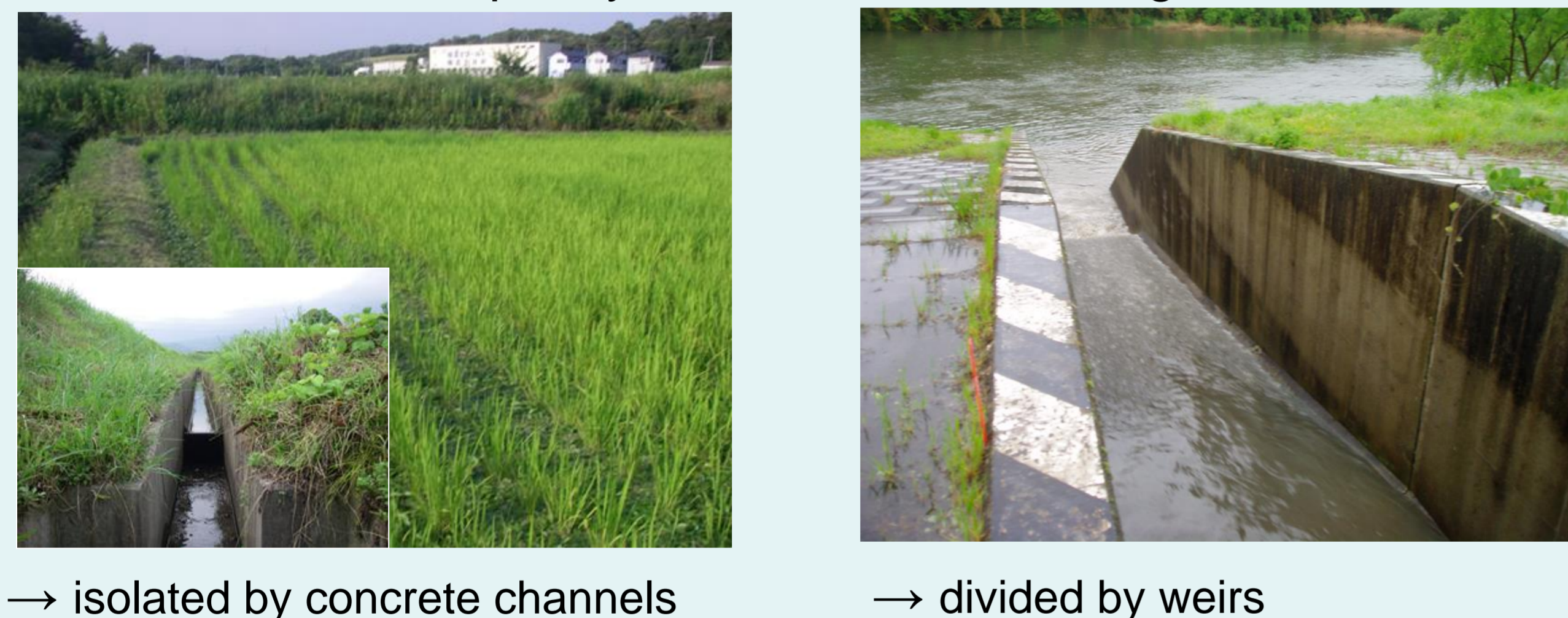


Fig.1 Location of the Yahagi River basin

Macro scale: Two of the former floodplain areas changed into...



Micro scale: The paddy fields and their drainage channels were



Starting point

1 Visualization of fish community collapse by interviews

Fish are key food of storks but local fish records are weak. To assess changes in the fish fauna, we interviewed three local persons who have been collecting and investigating local fishes over 40-60 years in the middle reaches of the Yahagi River. All fish species, where all interviewees confirmed decreased populations, were assigned as "decreased species".

2 Experience on advanced floodplain conservation and restoration in central Europe (study visit in Vienna from June to November, 2014)

3 Perspective 1: Proposal of reintroducing the oriental stork (*Ciconia boyciana*) as a symbol of floodplain biodiversity

Oriental stork, extinct in the wild areas of Japan in the 1970's, started to revive after successful reintroduction in Toyooka City, Hyogo Prefecture. As a next step, it is expected that some local governments announce to reintroduce the largest bird in Japan. To realize that, it is necessary to restore the feeding and nesting environments, such as natural floodplains and paddy fields with numerous aquatic animals.

4 Perspective 2: Fundraising to sustain floodplain restoration

A large budget is inevitably needed to restore the floodplain, especially in Japan, where all land is heavily exploited. Receiving funds from the rigid and inflexible public administrations is rather difficult (the Government's Efficiency is ranked 42th among 60 countries, according to IMD* survey). So, the needed initial funds have to come from another source.

*IMD: International Institute for Management Development in Switzerland

Conclusion

- 1 Decreasing trends in biodiversity in the Yahagi River basin can be changed by establishing a policy to reintroduce oriental stork
- 2 To promote the restoration, donation systems and sustaining management should be created, referring to the preceding cases in Europe
- 3 If the reintroduction policy is initiated, Toyota Yahagi River Institute, a unique municipal organization, will support the restoration not only in scientific researches but also in managing the whole restoration framework

Results and Perspectives

1 Visualization of fish community collapse by interviews

Among 42 indigenous fish species, 20 species (48%) were judged as "decreased" by all three interviewees. Ten of these 20 species (50%) are spending at least a period of their life in floodplains (Fig.2)

Fig. 3 shows that this value corresponded to 83% of all the floodplain fishes (12 species). **Floodplain fishes are assumed to be most damaged fishes.** Some endangered fishes are being kept in a biotope of Toyota City.

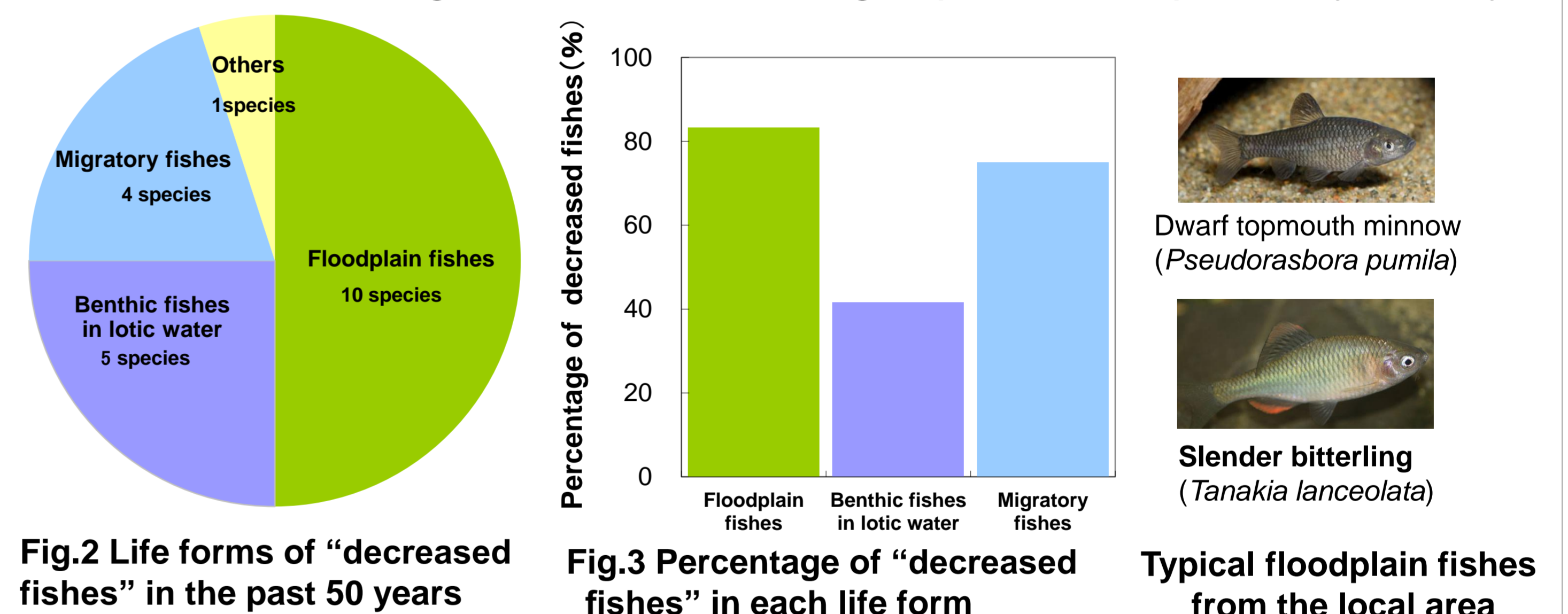


Fig.2 Life forms of "decreased fishes" in the past 50 years

Fig.3 Percentage of "decreased fishes" in each life form

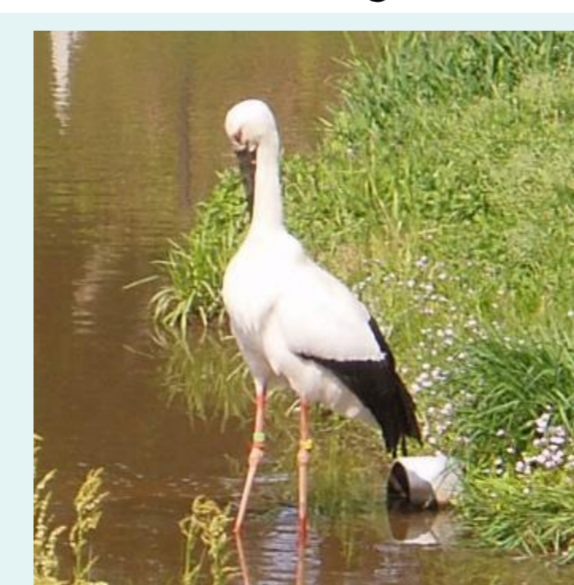
Typical floodplain fishes from the local area



2 Learning about modern floodplain conservation and restoration in central Europe

- 1) Ecology: functions and values of floodplains in European rivers
- 2) Hydromorphology: methodologies for restoring floodplains
concept of floodplains as flood retention space
- 3) Socio-economics: policies and organizations to sustain restoration

3 Perspective 1: Proposal of reintroducing the oriental stork (*Ciconia boyciana*) as a symbol of floodplain biodiversity



Oriental stork (*Ciconia boyciana*)

Population size: 1000~2500 (76 in Japan)
Distribution: Russia, China, Korea, Japan and Taiwan
IUCN Red List: Endangered
The entire population is still decreasing.

First phase: present a few storks in a local park

Objective: Raise interest on floodplains, especially among citizens with little interest in aquatic lives or floodplains

4 Perspective 2: Fundraising to sustain floodplain restoration

We would like to create a donation system to promote and start restoration. Yahagi River basin is home to the headquarter of Toyota Motor Company, by far the largest company in Japan in terms of market capitalization. In our district the size of human population is predicted to increase - quite unusual for Japan. Attracting sponsoring from local companies and donations from citizens for river restoration is expected to trigger support from public administrations in the future.

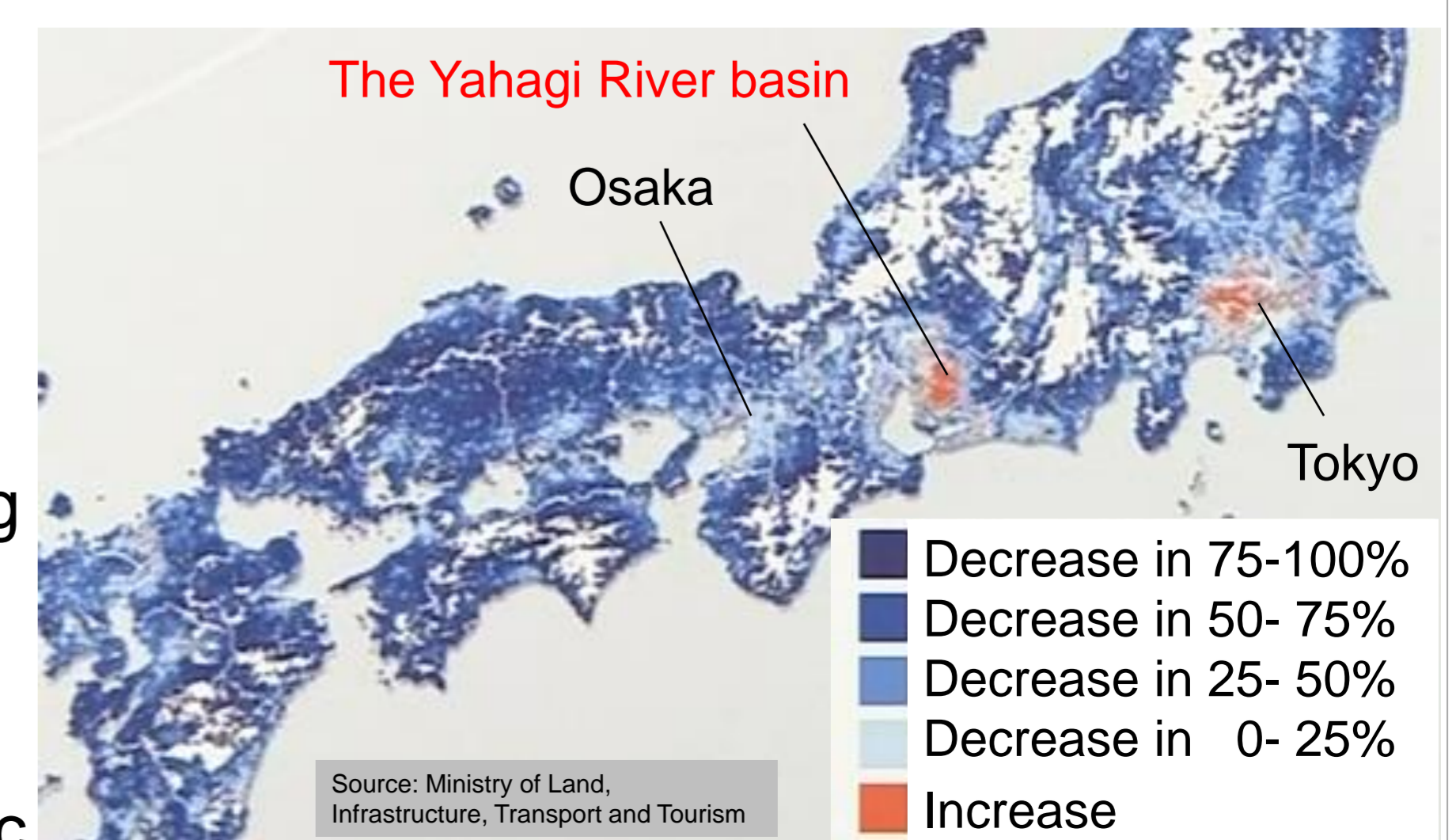


Fig.4 Prediction of population change in 2050