Restoring Rice Paddy Field Habitats to Reintroduce the Oriental White Stork in Toyooka City

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Short title: Reintroduction of Oriental White Stork through PES for habitat restoration, Japan.

Key Message: Reintroduction of the white stork in Japanese rice paddies have contributed to creating a biodiversity-friendly economy.

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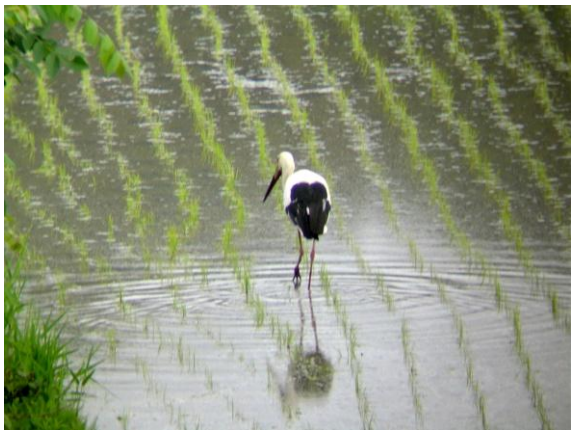

Photo 1: Oriental white stork in paddy field
Provided by Toyooka City

Photo 2: Rice"flying Oriental White Stork"
Provided by Toyooka City

What is the problem?

Toyooka City, located along the Japan Sea coastline, was the last area inhabited by wild Oriental white storks, classified as Endangered on the IUCN Red List, before they became extinct in Japan in 1971. The main reasons for their extinction lay in the degradation of their habitat provoked by the modernization of rice farming which involved rice paddies holding water for a shorter period of time than traditional methods (from several days prior to planting through several succeeding weeks, after which they are drained), concrete irrigation and drainage systems and the use of pesticides and chemical fertilizers. Because the oriental white stork is carnivorous and sits at the top of the ecosystem pyramid, restoring its foraging habitat was the key to it reintroduction[1].

Based on Toyooka City (2007), the history of the reintroduction of Oriental white stork could be summarized as follows: After 25 years of breeding in captivity by introducing several white storks from abroad, the first baby was born in 1989 and a pilot release program was

[1] The historical background surrounding Oriental White Stork was summarized based on Toyooka City (2007) , site visit in July 2010 and personal communication with Toyooka City, etc.

launched in 2005. In September 2005, after 40 years of captive breeding efforts, storks raised in captivity, once again started to fly freely in the sky for the first time since the extinction in the wild in Japan.

Which ecosystem services were examined? And how?

The targets of the projects are to create Oriental White Stork habitat. Traditional concept but modern agriculture method for rice production has been introduced for the conservation of Oriental White Stork habitat (Toyooka City, 2007).

According to Hyogo prefecture Tajima Region Toyooka Agriculture Extension Centre (2008) and Toyooka City (2007), the agriculture method for conservation of Oriental white stork is summarized as follows: Since 2003, in order to improve the habitat quality of the paddy field, rice farmers have to reduce either 75% or 100% pesticides, to flood their paddies deeper, to retain the water in the paddies for a longer period of time compared with conventional methods, and to keep a diary of living creatures (which would serve as indices of biodiversity) found in their paddies as obligatory requirements. In addition to that, winter-flooded rice paddies and fish water way development, etc. are encouraged to introduce for this paddy field as reasonable efforts.

According to Toyooka City[2], from 2003 through 2007, when the prefecture shared half of the costs with Toyooka City, participating farmers were paid 40,000 JYen[3] per 1,000m^2 of rice paddies to compensate for increased labor and reduced income (Expert Committee on Sustainable Land Management, 2006 and Toyooka City[4]). And they are currently granted 7,000 JYen per 1,000m^2 by Toyooka City (Inter-Ministerial Committee on the National Biodiversity Strategy of Japan, 2008 and Toyooka City [5]). As a result of such habitat restoration, the wild population of oriental white storks has now increased to 44[6].

The acreage of rice grown organically in a way that helps restore the habitat for the Oriental White Stork has increased from 0.7 ha in 2003 to 212.3 ha (in terms of fields fulfilling only obligatory requirements) (Toyooka City, 2009a) .

Onuma and Yamamoto(2009) presented study results as follows: The reintroduction of the Oriental White Stork has raised municipal income by 1.4 percent, which amounts to about 8 billion JYen. They also report that, although this agricultural method for the conservation of the Oriental White Stork reduces rice production by 25% compared to conventional methods, the product can be sold under the local brand, “Konotori no Mai (meaning “flying Oriental White Stork”) which sells for a premium price – 23 % higher than rice grown by conventional methods for reduced pesticide use, and 54 % more, for organic farming – therefore promising increased revenue.

According to the Toyooka City, other Oriental White Stork brand products have been produced, such as Japanese Sake and vegetables. In order to acquire Toyooka city certification for agricultural products, producers must first be issued the “Hyogo Prefecture Security Certificate,” which proves that the amount of pesticide residue is less than 10 percent of that compared with national standards (Toyooka City, 2009a). Then, other mandatory growing method-related requirements such as pesticide usage, etc. must be fulfilled to be eligible for the Toyooka certificate.

[2] The information was provided from Toyooka City at TEEB-D2 workshop in Tokyo in Feb. 2010.
[3] Exchange rate was as of 2 Sep 2010; 1US$=84.1874JPY
[4] The information was provided from Toyooka City at TEEB-D2 workshop in Tokyo in Feb. 2010.
[5] The information was provided from Toyooka City at TEEB-D2 workshop in Tokyo in Feb. 2010.
[6] The information was provided from Toyooka City by e-mail communication in July 2010.

A part of the municipal income rise by 8 billion JYen stated above is contributed by eco-tourism related to Oriental White Stork. The economic impact of reintroducing the oriental white stork in terms of tourism is estimated to be approximately 1 billion JYen annually (Onuma and Yamamoto,2009). Visitors to Toyooka include school children, students from China and Russia, farmers and researchers from Korea. The growing number of visitors to the municipal museum beyond 2004, which peaks in 2006, implies that more people are coming to see the oriental white stork[7].

What policy uptake resulted from examining the ecosystem services?

This is one of the good examples to integrate biodiversity consideration into local economic development. Toyooka city has successfully established a biodiversity local brand starting from rice and expanded to other agricultural products, such as vegetable, Japanese sake as well as eco-tourism. They are also linking the brand development with environmental education and outreach activities to develop biodiversity friendly consumer market. This comprehensive approach can contribute to build biodiversity friendly local economy.

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Toyooka City (2009b) *Toyooka City Environmental Report: The Environment of Toyooka, Coexisting with the Oriental White Stork*

[7] The information was provided by personal communication with Toyooka City in July 2010.

Apology and errata on "PES for habitat restoration to reintroduce Oriental White Stork, Japan-TEEB"

The authors would like to express sincere apologies for Professor Onuma and Yamamoto(2009)[8] by incorrect quotations from their paper in the TEEB case Version 1.1 Last update: September/2010 of "TEEBcase by K. Hayashi and H. Nishimiya (2010) PES for habitat restoration to reintroduce Oriental White Stork, Japan, available at: TEEBweb.org". Also the authors would like to apologize for the readers of this TEEB-case deeply for this inconvenience. The authors have already made the updated Version 1.2 Last update: October/2010 in the same TEEB-case in the middle of October 2010. The Verson 1.2 has included several other minor revisions. The authors would like to ask the readers to read the updated version if the readers have the old Version 1.1.
Sincerely,

K. Hayashi and H. Nishimiya
December 2010

8 Onuma, A and M. Yamamoto(2009), Economic Analysis of Reintroduction of Oriental White Stork in Toyooka, Hyyogo. Mita Journal of Economics, Vol102, No.2.