



# Globally Important Agricultural Heritage Systems (GIAHS) in Japan: Sado Island Agriculture in Harmony with Endangered Japanese Crested Ibis

## Introduction

The Globally Important Agricultural Heritage Systems (GIAHS) programme, launched as an initiative of the United Nations Food and Agriculture Organization (FAO) in 2002, provides international recognition to important traditional agricultural systems (including forestry and fisheries) which conserve agrobiodiversity, indigenous knowledge, culture heritage and agricultural landscapes.

The GIAHS programme advocates for dynamic conservation of all agricultural heritage systems and safeguards the provision of their multitude of goods and services (social, cultural, economic and environmental) to family farmers, smallholders, indigenous peoples and local communities for their food and livelihood security now and for future generations, through an integrated approach combining sustainable agriculture and rural development.

GIAHS are ingenious agri-cultural systems of historical significance and contemporary relevance as a heritage of humankind, designated based on the following criteria which reflect their multifunctional roles:

1. Food and livelihood security
2. Agro-biodiversity
3. Local and Traditional Knowledge systems
4. Cultures, Value systems and Social Organisations
5. Landscapes and Seascapes Features



Figure 1. The Iwakubi rice terrace. Some resting paddy field are filled with water throughout the year to serve as biotopes

### GIAHS in Japan (Total of 8 sites as of Aug 2017)

- 2011: Sado (Niigata Prefecture) , Noto (Ishikawa Prefecture)
- 2013: Aso (Kumamoto Prefecture), Shizuoka (Shizuoka Prefecture), Kunisaki (Oita Prefecture)
- Nagara River (Gifu Prefecture), Minabe-Tanabe (Wakayama Prefecture), Takachihogo-Shiibayama (Miyazaki Prefecture)

Today (as of August 2017), there are 38 GIAHS sites worldwide, each conducting its own local initiatives to conserve GIAHS by promoting sustainable agriculture. The concepts of GIAHS initially targeted developing countries, and researchers in Japan sought to deepen understanding through work with the United Nations University. In the process, the value of applying GIAHS concepts to enhance resilience of Japan's own agriculture and rural communities was realized. In 2011, Sado Island (Niigata Prefecture) and the Noto Peninsula (Ishikawa Prefecture) of Japan were the first GIAHS sites designated in a developed country.

In addition to the FAO GIAHS criteria, Japan also has adopted the following approaches to the sustainable conservation of GIAHS:

- 1. Enhance Resiliency (Ecological):** Maintain resilient ecosystem functions and services, integrate traditional and scientific knowledge, and create Green Economy to secure livelihoods



- 2. Establish New Commons (Cultural/Social):** Inherit and revitalize traditional culture practices, and bring together multi-stakeholders from rural and urban areas to participate in conservation of GIAHS
- 3. Create New Business Models (Economic):** Branding of local products by adding value to agriculture through a regional multi-sectorial approach and promoting agri-tourism and multiple livelihoods options

## Description of the Agroecology system

One agroecology-based GIAHS is “Sado’s Satoyama in Harmony with the Japanese Crested Ibis” located in Sado City, Niigata Prefecture, Japan. An island city of 855 km<sup>2</sup> populated with 56,831 people (Aug 2017), out of which 4,377 farmers operate over a total farming area of 7942 hectares (Agriculture Census, 2015), Sado was designated by the FAO as one of Japan’s first GIAHS in June 2011. Its traditional rice cultivation system harnesses the agroecosystem and biodiversity of its satoyama landscape - a dynamic mosaic of various socio-ecological systems comprising secondary woodlands, plantations, grasslands, paddy fields, wetlands, irrigation ponds and canals- that provides nurturing habitats for the endangered Japanese crested ibis.

The development of Sado and its agriculture is closely related to the history of gold mining, where rice cultivation expansion resulted in the creation of terraced rice paddies in the hilly and mountainous areas of the island to meet a population boom of 100,000 people at its peak during the height of gold mining in the Edo period. This rice cultivation system of Sado not only provided food and habitats for surrounding biodiversity, but also created various cultural customs such as Noh theatrical performance and shrine rituals related to agriculture which continue to be central to the spirituality of its people today. Apart from rice, vegetables, fruits, flowers and husbandry products are produced in small quantities yet wide varieties, including famous local products such as the “Okesa Persimmon” and “Sado Beef”.



Figure 2. Japanese crested ibis feeding in the paddy fields of Sado

Among the rich biodiversity of animals and birds living on Sado, the most representative is the Japanese crested ibis (Scientific name: *Nipponia nippon*, or “toki” in Japanese). Once flourishing on Sado, the Japanese crested ibis became extinct in 2003 due to overhunting and habitat loss. The Sado Japanese Crested Ibis Conservation Center continues to breed Japanese crested ibis from the offspring of a Chinese pair, Yuuyuu and Yangyang, presented as gifts from the Chinese government in 1997, and supports a national campaign launched in 2004 by the Japanese Ministry of Environment that initially targeted the return of 60 birds back to the wild by 2015. However, to ensure the successful survival of the ibises in a natural environment, their feeding grounds of paddy fields, upland fields and the surrounding ecosystems must be restored. With this in mind, an agroecological-based way of traditional agriculture has begun to be re-examined.

### Main Activities

In 2008, ten Japanese crested ibises bred in the Conservation Center were released into the wild for the first time in 27 years. In order to promote ibis-friendly agriculture, Sado City in collaboration with the Sado Agricultural Cooperative (JA Sado) introduced the “*Toki-to-kurasu-sato*” (Villages coexisting with the crested ibis) rice certification initiative in 2010 to certify rice production that has met the above-mentioned 5 conditions to secure feeding grounds for the Japanese crested ibis. The Japanese crested ibis feeds on small living creatures, such as fishes, loaches and worms that live in and around the rice paddies. Based on indigenous knowledge regarding the ibis, Sado City has adopted several traditional strategies to restore the agroecological environment to nurture feeding habitats for the



Japanese crested ibises. As a prerequisite for the rice certifications, farmers must reduce of agricultural chemicals, pesticides and chemical fertilizer by 50 percent to sustain living creatures in the rice paddies that will serve as food for the Japanese crested ibis, and also fulfill more than one of the following requirements:

1. Create swales (or “e” in Japanese) of 20-30 cm to be dug around the paddy fields to provide safe havens for aquatic organisms when the fields are drained for a week in summer to improve rice quality (a traditional rice farming technique known as “*nakaboshi*”) and to serve as feeding grounds for the Japanese crested ibis
2. Create fish ways to connect paddy fields with the drainage ditches to facilitate migration of fish and other aquatic organisms
3. Create biotopes of water ponds around the paddy fields to provide habitats for aquatic organisms all year round
4. Irrigate paddy fields in winter with agricultural water to create habitats for aquatic creatures to survive and secure feeding grounds for the Japanese crested ibis through winter

Additional requirements for this certification also stipulate that farmers should conduct surveys of living creatures in the paddy fields twice a year, first in June and then in August. Since 2017, no chemical weeding is allowed on ridges between the rice fields. To help farmers attain this eco-farming certification, Sado City encourages and supports farmers taking up the eco-farming certification by working with JA Sado to sell the Toki-branded koshihikari certified rice at higher prices than regular Sado grown koshihikari rice.



Figure 3. Farmers conducting annual survey of living creatures in the paddy fields with local residents

## Outcomes of the practices

### Economic

Before the introduction of ibis-friendly farming and the rice certification scheme, sales of rice in Sado were in crisis. 5,000 tons of rice, or 21% of annual sales, remained unsold every year from 2005 through 2007 due to a national decrease in rice consumption and a drop in rice quality brought about by natural disasters such as typhoons<sup>1</sup>. With the introduction of the rice certification system in 2010 and national publicity, Sado gained the GIAHS designation in 2011. The certified rice has gained steady following of consumers through online retail and major rice vendors in Tokyo and has sold out every year.

Farmers' incomes have also improved. Compared to the conventionally grown koshihikari rice of Niigata prefecture which sells for about 1,600 yen per five kg, the Toki-branded koshihikari rice from Sado could fetch nearly double the price at 3,000 to 3,500 yen. Starting only with 256 certified farmers cultivating rice over 427 hectares in 2008, the well-received certification scheme has expanded to 524 farmers and a total of 1,278 hectares. This increase in participation not only testifies to the economic success of this eco-farming scheme, but also reflects an expansion of feeding grounds to support the wild Japanese crested ibis population. Indeed, this effort has inspired many others to play a part in conserving their agroecological environment to support the Japanese crested ibis. For instance, a local consumer cooperative, CO-OP Niigata, initiated the “Sado Toki-Supporting Rice Project” in which 1 yen from every 1 kg of Sado-produced koshihikari rice sold is donated to a fund to improve habitats for the birds. This project to promote a collective effort, bringing together producers, retailers and consumers, for conservation of the Japanese crested ibis raised 15 million yen from 2010 to 2016.

<sup>1</sup> <https://www.biodic.go.jp/biodiversity/shiraberu/policy/pes/en/satotisatoyama/satotisatoyama03.html>



## Ecological

Since the first ten ibis bred in captivity were released into the wild in 2008, gradual releases have taken place every year. On April 23, 2012, it was confirmed that three crested ibis chicks had hatched in the wild on Sado Island, the first time in 36 years and a milestone for wild Japanese crested ibis restoration in Japan. Thanks to the relentless efforts of Sado farmers in creating suitable feeding grounds and adopting eco-friendly farming to provide food, 281 Japanese crested Ibis live in natural environment of Sado today, out of which 142 birds were born in the wild (as of July 2017). 139 birds out of a total of 270 birds released back to the wild since 2008 (survival rate of 51.5%), and 142 out of 176 birds (survival rate of 81%) born in the wild since 2013 are currently alive (The average life span of the wild Japanese crested ibis is estimated to be about 10 to 15 years). The Conservation Center continues to breed around 200 birds today. This steady revival of the wild Japanese crested ibis population has become one of the greatest motivations for the eco-farming of Sado farmers and residents as they pride themselves on their love for nature through conservation of the Japanese crested ibis.

## Social

The eco-farming has not only raised farmers' awareness and solicited their support for biodiversity conservation, but also residents have deepened their understanding of agroecology related to rice farming as they participate in the farmers' annual surveys of living creatures in rice fields. Moreover, to showcase their GIAHS and promote exchange amongst GIAHS sites, a series of activities such as guided tours of rice terraces, high school student exchanges between Noto GIAHS and Sado GIAHS, dispatch of farmers to Ifugao GIAHS in the Philippines, and hosting of the East Asia Research Association for Agricultural Heritage Systems, etc. have been organized. These national and international exchanges have greatly boosted the confidence of Sado and its people; and as they regain pride for their traditional cultural values and natural landscapes, Sado is preparing to apply as a UNESCO Global Geopark and World Heritage Site with the aim of recognition by 2019.



Figure 4. Packaging of the “Toki-to-kurasu-sato” certified rice

Thus, as seen in the case of Sado GIAHS, it is evident that agroecological approaches in enhancing the circular economy, biodiversity conservation and social cohesion can play a crucial role in the successful and long-term conservation of GIAHS. At the same time, GIAHS' comprehensive framework of promoting a holistic “system approach” to enhance food and livelihood security; conserve agro-biodiversity; utilize local and traditional knowledge systems; preserve cultures, value systems and social organizations; and maintain landscapes and seascapes features of agricultural communities can also contribute to dynamic conservation and promote understanding of agroecology.

## Message from farmer to farmers

*“To promote understanding of GIAHS, it is necessary to create a mechanism linking agricultural technology and environment and biodiversity with the economy, not only out of economic motivation; but such efforts of agricultural activities should bring about spiritual wealth with objectives based in the heart”.*

— Message from Shinichiro Saito, Sado Farmer

## Acknowledgement

Data and statistics on “Toki rice certification” and Sado GIAHS are based on information provided by Sado City and Japanese crested ibis-related sources are from Japanese Ministry of Environment affiliated websites.