Understandings of Relationships between Agriculture and Biodiversity in Kunisaki GIAHS

HAYASHI Hiroaki *

Council for the Promotion of Globally Important Agricultural Heritage System (GIAHS) in Kunisaki Usa Area, 3-1-1 Ote-machi, Oita, Oita 870-8501, Japan

1 Characteristics of Kunisaki GIAHS and aims of this research

Kunisaki GIAHS in the Kunisaki peninsula and Usa area, Oita, Japan, is a system where forestry, agricultural production, and fisheries are sustained by the strong connection between Sawtooth Oak forest, multiple interlinked irrigation ponds, and Seto Inland Sea (Vafadari 2013a; 2013b; Hayashi 2013). This area receive around 1,500 mm of annual precipitation with a characteristics of low rainfall in winter, which make the production of our main product, log wood cultivated shiitake mushrooms, difficult. From the ancient time, farmers and forest workers have made many reservoirs interlinked, for supplying water at the time of severe water deficiency.

In this research, I tried to consider the elucidation of structure which maintains the biodiversity in this connected system through discovery of the precious amphibians in the forest and harmful insects in the paddy field, respectively. As pointed by Vafadari (2013b), many animals, insects, and plants which characterized this area have been listed. I think that amphibians in this area survived with the activity of farmers and forest workers by using artificial puddles, even a small one, in case of severe water deficiency.

2 The precious amphibians in the artificial puddles

Depopulation and aging are two severe threats for the development of agricultural community in this area. Several villages were abandoned and have been covered with forests since several decades. However, the old well which was not used more than 50 years (Fig. 1A) still accumulates water and harbored numerous amounts of amphibian’s egg (Fig. 1B). Villagers including me did not notice the fact that amphibians survived in such an old man-made object. This well and this place must be an essential element for the development of village and amphibians in term of water supply.

Shiitake is a mushroom cultivated using log woods mainly in Oita prefecture in Japan. In this area, more than half of large scale Shiitake farmers are using deciduous broadleaf forests as Hoda-ba not conifer forests. The key points for cultivating good quality and high yield log wood cultivated Shiitake mushrooms lies in the usage of bright Hoda-ba and splaying water to the Hoda-ba from near puddles in winter. I visited one of the large scale Shiitake farmers and checked amphibians in the artificial puddle (Fig. 2A) which he made for water supply to the Hoda-ba (Fig. 2B and C) by himself. It is possible to observe many eggs and larvae of salamanders in the artificial puddle (Fig. 2D) at March 15, 2014. This fact clearly suggested that man-made puddle for Shiitake production played an important role for the survival of salamanders such as *Hynobius dunni* (EN) or *Hynobius naevius* (NT) which were designated as a threatened or a endan-

Fig. 1 Old well (A) with eggs of amphibians (B).