




Review

A Review of the Progress in Globally Important Agricultural Heritage Systems (GIAHS) Monitoring

Wenjun Jiao ^{1,*} , Xiao Yang ^{1,2}  and Qingwen Min ^{1,2} 

¹ Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing 100101, China

² University of Chinese Academy of Sciences, Beijing 100049, China

* Correspondence: jiaowj@igsrr.ac.cn

Abstract: In order to protect traditional agricultural systems of global importance, the Food and Agriculture Organization of the United Nations (FAO) launched an initiative for the conservation of Globally Important Agricultural Heritage Systems (GIAHS) in 2002. After nearly two decades of development, the number of GIAHS has increased from the initial 5 in 2005 to the current 65 in 22 countries around the world. Despite the remarkable increase in the number of GIAHS, many countries are now facing the difficult task of dynamic conservation and adaptive management of GIAHS. As an important element of heritage management, monitoring plays an important role in improving the level of heritage management. Scientific and effective monitoring can not only achieve the conservation of the heritage itself and the maintenance of its value, but also the sustainable development of the heritage site. However, FAO did not put forward mandatory requirements for GIAHS monitoring, nor did it issue any guiding document on GIAHS monitoring, but left it to various countries to explore their own GIAHS monitoring. In this context, the paper systematically sorts out the theoretical research and practical exploration of GIAHS monitoring conducted by different countries and research institutions, comparing and analyzing the differences between the theoretical design of monitoring GIAHS themselves and that of GIAHS action plan monitoring, as well as the differences in practical exploration of GIAHS monitoring among China, South Korea, Japan and Portugal. This paper argues that countries and research institutions face common problems in the research and application of GIAHS monitoring, which are: (1) low enthusiasm of heritage sites about participation; (2) lack of legal and financial support; and (3) lack of technical support and guidance. To further promote GIAHS monitoring globally and better promote dynamic conservation and adaptive management of GIAHS, this paper proposes that FAO should cooperate with various countries to establish a unified, scientific and efficient GIAHS monitoring system, including: (1) clarifying monitoring requirements and formulating monitoring guidelines; (2) improving the management system and establishing incentive mechanisms; (3) promoting multi-stakeholder participation and strengthening technical training.

Keywords: Globally Important Agricultural Heritage Systems (GIAHS); action plan; monitoring; evaluation; indicator system; implementation mechanism



Citation: Jiao, W.; Yang, X.; Min, Q. A Review of the Progress in Globally Important Agricultural Heritage Systems (GIAHS) Monitoring. *Sustainability* **2022**, *14*, 9958. <https://doi.org/10.3390/su14169958>

Academic Editor: Julio Berbel

Received: 29 June 2022

Accepted: 10 August 2022

Published: 11 August 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Adaptive management constitutes the cornerstone of modern environmental management [1] and is widely used in heritage management [2–4]. Monitoring is very instrumental in adaptive management, providing important feedback on how social, economic and ecological systems change and whether human activities, including management decision-making, produce effects [5]. Thus, monitoring is also deemed an important component of heritage management, representing an important guarantee for the maintenance of heritage vitality and an important foundation for heritage conservation and management. As early as 1972, the Convention Concerning the Protection of the World Cultural and Natural

Heritage clearly put forward the concept of heritage monitoring [6]. After more than 40 years of development, the world heritage monitoring has finally formed two monitoring forms, i.e., reactive monitoring and regular reporting, and established the protection status information system. These efforts have played an important role in promoting the realization of heritage conservation objectives and improving the level of the world heritage management [7]. It has been widely recognized that scientific and effective heritage monitoring cannot only conserve heritage itself and its values but also contribute to the sustainable development of the heritage site [8].

In 2002, the Food and Agriculture Organization of the United Nations (FAO) launched a global initiative on the dynamic conservation and adaptive management of Globally Important Agricultural Heritage Systems (GIAHS), aiming to establish a conservation system for GIAHS and their landscapes, biodiversity, knowledge and cultures, enable them to be recognized and conserved worldwide, and make them the basis for sustainable development [9]. In 2005, five traditional agricultural systems located in six countries, including the Qingtian rice-fish culture system in China and the Ifugao rice terraces in the Philippines, were designated by FAO as the first GIAHS conservation pilots. Then, the conservation of GIAHS has become increasingly standardized, and great progress has been made in the application, certification and publicity, thanks to the strong support of international organizations such as the Global Environment Facility (GEF) and the governments of China and Japan [10,11]. In 2015, the GIAHS initiative was endorsed as a regular program at the FAO 39th Session, ushering in a whole new stage for the conservation and management of GIAHS. Since then, both the number of countries that made applications and the number of certified GIAHS have increased year by year. As of May 2022, a total of 65 GIAHS were identified by FAO, which are distributed in 22 countries around the globe. However, as an important task in heritage management, GIAHS monitoring remains far behind other work.

GIAHS are complex in that they are multidimensional and composed of ecological subsystems and social subsystems that are inter-dependent in various ways and affect each other to some degree [12,13]. They are also described as living systems that are dynamic and adaptive, exhibiting the strategic values of multi-functionality and sustainability [14]. These strategic values of GIAHS are specifically expressed as multiple values of economy and livelihood, ecology and environment, as well as society and culture [10], which is of great significance for ensuring food safety [15,16], protecting biodiversity [17,18], coping with climate change [19,20], protecting cultural diversity [21,22] and other major problems faced by mankind. Therefore, GIAHS have been recognized as having the potential to contribute greatly to the FAO Strategic Objectives (SO), to the UN Sustainable Development Goals (SDGs), and to the Convention on Biological Diversity (CBD) Articles [9,23].

GIAHS are demonstrated as “living” systems that involve many “living” elements such as animals and plants, and they evolve as society progresses with the support of traditional knowledge and technology and the continuous participation of farmers [24]. “Closed” or “frozen” conservation is not suitable for GIAHS due to its living state; instead, dynamic conservation and adaptive management should be adopted as GIAHS change with the times [25]. Therefore, regular monitoring and evaluation are necessary for understanding and tracking the effect of these conservation and management measures and making prompt adjustments according to the changes of GIAHS and their threats [8,26]. As explicitly suggested in the *Noto Communiqué on GIAHS* released at the 4th GIAHS International Forum held in Noto Peninsula, Japan in 2013, GIAHS should be regularly monitored to ensure its vitality. Nevertheless, the FAO-GIAHS Office has neither proposed mandatory requirements for GIAHS monitoring nor issued any guidelines on GIAHS monitoring; instead, it left GIAHS monitoring to various countries to conduct on their own [8,23]. In the past few years, countries like China and South Korea and research institutions such as the Chinese Academy of Sciences (CAS) and the United Nations University (UNU) have made theoretical research and practical explorations on GIAHS monitoring. Some

achievements have been made but many challenges are still existing, all of which are of important significance for promoting GIAHS monitoring on the global level.

In such an international context, this paper systematically reviews and compares the GIAHS monitoring conducted by different countries and research institutions. It aims to find the common problems shared by the current GIAHS monitoring research and practice, and also the solutions to them. In Section 2, this paper reviews the theoretical progress in GIAHS monitoring, by focusing on the theoretical research conducted by CAS and UNU. In Section 3, it reviews the practical progress in GIAHS monitoring, by introducing the practical explorations in China, South Korea, Japan and Portugal. In Section 4, it compares different studies and different practices regarding to GIAHS monitoring, elaborates their shared problems and puts forward solutions to them. In the last section, this paper makes a short conclusion and emphasizes on the importance of a unified, scientific and efficient monitoring system for GIAHS.

2. Progress in Theoretical Research on GIAHS Monitoring

2.1. Different Understanding of GIAHS Monitoring

As defined by FAO, GIAHS are “remarkable land use systems and landscapes which are rich in globally significant biological biodiversity evolving from the co-adaptation of a community with its environment and its needs and aspirations for sustainable development” [25,27]. GIAHS are not only alive, complex and multifunctional, but also endangered and vulnerable, therefore once they are damaged, their functions and values will be inevitably lost [28]. More and more managers and researchers are coming to realize that the application and designation of GIAHS is only the beginning, while the scientific conservation and management of them is the focus of the follow-up work. As an important means of heritage management, monitoring can be used to obtain the data of GIAHS dynamic changes to assess the impact of conservation and management measures, promptly detect threats and problems faced by GIAHS and make adjustments to the conservation and management measures, thus making heritage management more scientific and effective.

Nevertheless, there are actually two kinds of understanding of GIAHS monitoring. One is the monitoring of GIAHS action plans, and the other is that of GIAHS themselves. Action plans refer to the heritage conservation strategies, measures and actions submitted by GIAHS sites [29]. The monitoring of GIAHS action plans, similar to a link in project management, refers to the monitoring of the implementation of conservation and management measures and their impact, with strong pertinence and relatively narrow boundaries. In contrast, the monitoring of GIAHS themselves, more like a “scientific observation”, involves all aspects of conservation and management (not limited to action plans) and their impact on GIAHS, with strong comprehensiveness and a relatively broad boundary scope [30]. Due to the different understanding of GIAHS monitoring, countries and research institutions differ in monitoring objectives, indicator systems, and implementation paths when conducting theoretical research and practical application of GIAHS monitoring.

2.2. Theoretical Research on the Monitoring of GIAHS Themselves

Entrusted by the Ministry of Agriculture and Rural Affairs of China (MARA), the Institute of Geographic Sciences and Natural Resources Research of the Chinese Academy of Sciences (CAS-IGSNRR) has started the theoretical research on GIAHS monitoring since 2014. The researchers believed that the monitoring of GIAHS themselves covers two aspects. On the one hand, dynamic changes in the heritage itself should be observed and recorded in light of the characteristics and values of the heritage interpreted according to the designation criteria. On the other hand, the conservation and management measures taken by the heritage site should be tracked and supervised to reveal their impact on the characteristics and values of the heritage. On this basis, the researchers proposed a GIAHS monitoring indicator system, which combines the two aspects above and consists of six first-level indicators, 24 second-level indicators, and several third-level indicators [8]. Among the first-level indicators, ecological conservation, economic development, social

maintenance, and cultural inheritance are closely correlated with the GIAHS designation criteria and also intensively reflect the impact of conservation and management measures on the characteristics and values of the heritage. By contrast, institutional and mechanism construction, publicity, demonstration and promotion cover the capacity building of GIAHS conservation and management to the largest extent. The second-level indicators further refine the first-level indicators, and the third-level indicators are the specific items to be monitored during the monitoring process (Table 1).

Table 1. The indicator system of the monitoring of GIAHS themselves proposed by CAS-IGSNRR.

First-Level Indicator	Second-Level Indicator
Ecological conservation	Farmland environment; Agro-biodiversity; Ecosystem services; Agricultural landscape
Economic development	Agri-product supply; Ecological agriculture; Sustainable tourism; Economic income
Social maintenance	Population structure; Labor employment; Women's participation; Social organizations
Cultural inheritance	Traditional knowledge; Traditional culture; Traditional villages and architectures; Cultural awareness
Institutional and mechanism construction	Management mechanism; Management capacity; Local supportive policies
Publicity, demonstration and promotion	Multi-channel publicity; University-industry cooperation; Demonstration and promotion bases; Training and exchange; Visit and investigation

As monitoring indicators differ in the speed or frequency of change and the difficulty degree of data collection, the researchers proposed to collect data by combining annual reports and survey reports. For indicators that change relatively fast or frequently and are easy to collect, such as population structure, economic income and multi-channel publicity, annual reports are used for long-term tracking and monitoring. For indicators that change relatively slow or less frequently and are relatively difficult to collect, such as agro-biodiversity, agricultural landscape and cultural awareness, survey reports are used for periodic monitoring within a period of three to five years [8]. The scientific validity and operability of GIAHS monitoring can be improved through the combination of annual reports and survey reports.

By drawing on the monitoring experience of World Heritage, the researchers also proposed an implementation framework that consists of a three-tiered monitoring network, a dynamic monitoring system, and a two-tiered inspection system (Figure 1). In this framework, national ministries, provincial competent authorities, and regulatory authorities for heritage sites are the main participants in GIAHS monitoring [8]. National ministries, like the ministry of agriculture, are responsible for formulating and issuing norms and policies, guiding GIAHS monitoring nationwide, and organizing GIAHS inspections and evaluations at the national level. The provincial competent authorities are responsible for organizing, coordinating and supervising GIAHS monitoring within their administrative divisions, inspecting and guiding GIAHS conservation and management on an irregular basis, and timely submitting annual reports, survey reports and existing problems to the ministries. Regulatory authorities for heritage sites are responsible for conducting daily GIAHS monitoring, and submitting annual reports, survey reports and other related data to provincial competent authorities and the ministries. A closed loop of monitoring data collection and evaluation feedback is therefore formed by establishing an implementation mechanism that combines active monitoring, supervision and inspection so as to make GIAHS conservation and management more scientific and systematic.

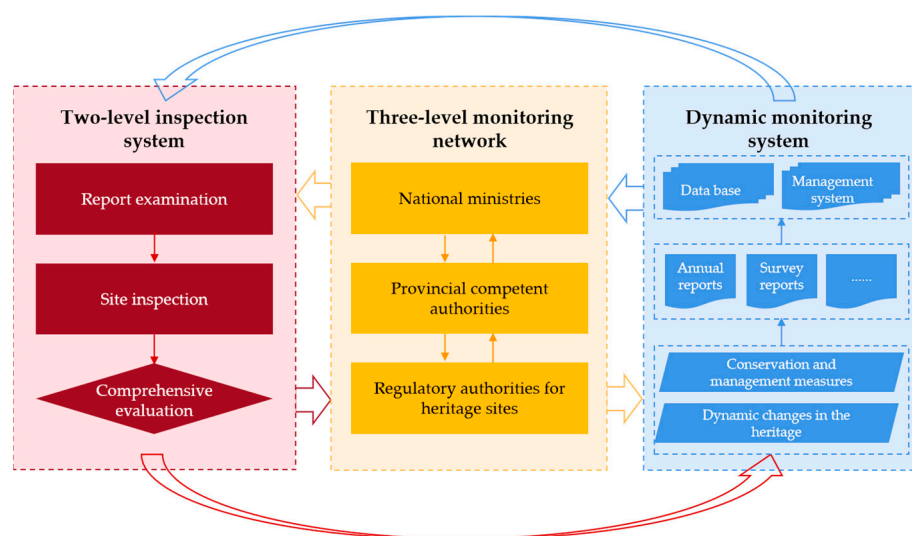


Figure 1. The implementation framework for the monitoring of GIAHS themselves proposed by CAS-IGSNRR (adapted from reference [8]).

2.3. Theoretical Research on the Monitoring of GIAHS Action Plans

The United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS) and the Rural Development Administration (RDA) of South Korea conducted two-year theoretical research on the monitoring of GIAHS action plans and released the *Manual of Globally Important Agricultural Heritage Systems (GIAHS) Monitoring and Evaluation Manual: A Technical Reference* in March 2022 [26]. The researchers proposed to monitor and evaluate the GIAHS action plans by using the Theory of Change (ToC) and establishing an analytical framework of “inputs-outputs-outcomes-impacts”. In this framework, inputs refer to conservation and management actions taken in accordance with the GIAHS action plans; outputs refer to the tangible and intangible products resulting from these actions; outcomes refer to the observation and recording of these outputs according to monitoring indicators. The outcomes are subject to constant, periodical and systematic evaluations and feedback is then formed to facilitate the adjustments to action plans, which will ensure GIAHS to be on the pathway to attain their intended impacts (or long-term goals).

The researchers believed that the five designation criteria of food and livelihood security, agro-biodiversity, local and traditional knowledge systems, cultures, value systems and social organizations, and landscape and seascape features are critical for ensuring the integrity of GIAHS, so these criteria are considered as core criteria for the monitoring of GIAHS action plans. Additionally, the researchers also proposed three enabling criteria, namely governance, capacity development and research, partnerships and outreach. Based on the eight core criteria, they further proposed 22 sub-criteria to form a criteria system for GIAHS action plan monitoring. For food and livelihood security, the sub-criteria are population statistics, agricultural income, and income from related industries; for agro-biodiversity, they are agro-biodiversity, threats to agro-biodiversity, and agro-ecology; for local and traditional knowledge systems, they are farming practices, transfer of traditional wisdom and farming techniques, and water resource management; for cultures, value systems and social organizations, they are preservation of culture, history, knowledge and values, and social organizations; for landscapes and seascapes features, they are landscapes and seascapes assessment, and maintenance; for governance, they are management and monitoring, and economic policies; for capacity development and research, they are training on agricultural skills and technology, funding, and research; and for partnerships and outreach, they are public relations and outreach, community engagement, and exchange and cooperation [26].

In order to make the monitoring indicators more feasible and monitoring data more practical, the researchers carried out surveys in the heritage sites of Japan and South Korea.

The indicators that were considered feasible by 50% of the respondents or more were used as basic indicators and those considered feasible by less than 50% of the respondents were adopted as advanced indicators. The two types of indicators are collectively referred to as key performance indicators (KPIs). In order to further improve the operability of the monitoring, the researchers divided the monitoring data collection methods into three categories, namely quantitative statistics, qualitative listing and qualitative reporting.

The researchers held that, in the monitoring and evaluation of GIAHS action plans, the organizational form and the implementation mechanism are crucial and stakeholders play different roles. Government agencies at all levels participate in and guide the implementation of GIAHS action plans; the management office is specifically responsible for the implementation of these plans; a monitoring and evaluation team needs to be set up in the management office to be responsible for the monitoring and evaluation of the plans and a working group also needs to be established to ensure the successful monitoring and evaluation; and GIAHS-related producers, consumers, community managers, and volunteers in heritage sites are extensive participants in the monitoring and evaluation of GIAHS action plans. The researchers also proposed the monitoring and evaluation process for the GIAHS action plans, which includes a. launching monitoring and evaluation; b. monitoring data collection and analysis; c. self-evaluation report; d. third-party evaluation; e. feedback and reflection; f. future scenario planning; g. developing the new action plan; h. completing monitoring and evaluation and implementing the new action plan [26].

3. Progress in GIAHS Monitoring Practices of Different Countries

3.1. GIAHS Monitoring Practice in China

China's GIAHS monitoring practice includes both monitoring of GIAHS themselves and monitoring of GIAHS action plans, which are conducted at the national and local levels, respectively. At the national level, MARA has started the annual report of GIAHS monitoring with the technical support of CAS-IGSNRR since 2014. According to the fundamental principles of comprehensiveness, scientific validity and operability, the annual report of GIAHS monitoring relates to 18 second-level indicators, 27 third-level indicators and over 150 monitoring items (Table 2). The report is designed to reflect the changes in ecological conservation, economic development, social maintenance and cultural inheritance functions of GIAHS, as well as in institutional and mechanism building, publicity, demonstration and promotion capabilities within a short term from the perspectives of counties, heritage sites and typical villages [31]. In 2015, MARA entrusted CAS-IGSNRR to develop a dynamic monitoring system for GIAHS in China, so as to perform the functions of online filling, editing and reporting of monitoring data, and generation, downloading and online viewing of annual reports. As of the end of 2020, this system has completed the online filling of monitoring reports for five years, with the number of participating GIAHS increasing from 11 to 15 and that of counties involved increasing from 23 to 30.

MARA has started to organize GIAHS inspections and evaluations at the national level since 2015. The inspection and evaluation team is composed of members of the GIAHS Expert Committee under MARA. It evaluates the conservation and development effectiveness of GIAHS every three years by combining report reviewing and site inspection. CAS-IGSNRR has designed the GIAHS Conservation and Development Evaluation Form. This form consists of five first-level indicators, 17 second-level indicators and 36 third-level indicators, which are used to measure the progress in ecological conservation, economic development, social maintenance, cultural inheritance and capacity building. The inspection and evaluation team will, according to the annual and survey reports and inspection results, rate each indicator and then obtain a comprehensive score for GIAHS conservation and development effectiveness.

At the local level, regulatory authorities of heritage sites monitor and evaluate GIAHS action plans (i.e., GIAHS conservation and development plans) on their own. Qingtian rice-fish culture system in Zhejiang province, Xuanhua traditional vineyard system in Hebei province, Xinghua Duotian agrosystem in Jiangsu province Shaoxing ancient Chinese

torreya system in Zhejiang province, among others, are GIAHS designated earlier. They have successively carried out the revision of action plans and realized the tracking and monitoring of GIAHS conservation actions. For example, in 2016 the Qingtian County evaluated the implementation effect of the *Plan for the Conservation and Development of Qingtian Rice-fish Culture System (2006–2015)*, based on which it formulated the *Plan for the Conservation and Development of Qingtian Rice-fish Culture System (2016–2025)*. In 2017, due to the adjustment of administrative divisions of Xuanhua District, a phased evaluation was conducted on the *Plan for the Conservation and Development of Xuanhua Traditional Vineyard System (2013–2022)* and the *Plan for the Conservation and Development of Xuanhua Traditional Vineyard System (2016–2015)* was formulated.

Table 2. Main contents in annual reports of China’s GIAHS monitoring.

First-Level Indicator	Second-Level Indicator	Third-Level Indicator	Items
Ecological conservation	Agro-biodiversity;	Agri-biological resources	Species name, variety name, variety number, ancient tree number, etc.
	Agricultural landscape	Land use	Land use area, heritage system area, etc.
Economic development	Agri-product supply	Production and sales of important agri-products	Product name, production area, yield, sales volume, sales value, etc.
		Processing and sales of important agri-products	Product name, producer, production time, yield, sales volume, sales value, product characteristics, etc.
	Ecological agriculture	Branding	Product name, manufacturer, brand type, certification body, effective time, identified area, identified output, etc.
	Sustainable tourism	Tourism reception capacity	The number of tourists, the annual income of tourism, the number of farmers providing heritage tourism services, the number of farmhouse entertainment, etc.
	Economic income	Economic income	The total income of rural economy, the income of GIAHS practitioners, the per capita net income of farmers, the per capita income of GIAHS management, etc.
Social maintenance	Population structure	Population statistics	Registered resident, permanent resident, migrant worker, GIAHS practitioner, etc.
	Social organizations	Agricultural business types	The name of agricultural business types, establishment time, location, business content, business area, number of participating farmers, etc.
		Social organization	Name, time of establishment, location, main functions, etc.
Cultural inheritance	Traditional culture	Development of cultural products	Product name, developer, suitable season, product features, object-oriented, etc.
		Utilization of cultural facilities	Facility name, establishment time, location, management unit, main purpose, etc.
	Traditional knowledge	Inheritance of traditional knowledge and technologies	Including technology name, technology description, application scope and number of farmers
	Cultural awareness	Spontaneous publicity	Including time, place, main content, organization unit, scale and effect, etc.
Institutional and mechanism construction	Management mechanism	Institutional construction	Organization name, establishment time, location, main functions, personnel and gender structure, time investment, fund investment, etc.
		Normative documents	Issuing time, issuing organization, document name, main content, etc.

Table 2. Cont.

First-Level Indicator	Second-Level Indicator	Third-Level Indicator	Items
Publicity, demonstration and promotion	Local supportive policies	Subsidies for important agri-product production	Subsidy content, subsidy object, subsidy scope, subsidy standard, subsidy total amount, funding source, etc.
		Conservation and development projects	Project name, starting and ending time, project location, main contents, total investment, current year investment, capital source, etc.
		Other related projects	Project name, starting and ending time, project location, main contents, etc.
	Multi-channel publicity	Cultural activities	Time, place, name, content, organizational unit, total number of participants, composition and gender structure of the heritage site, etc.
		Media publicity	Media level, media type, media name, time, title, main content, etc.
		Government propaganda	Time, place, main content, organization unit, scale and effect, etc.
	Training and exchange	Training and exchange activities	Time, place, name, content, organizational unit, total number of participants, composition and gender structure of the heritage site, etc.
	Visit and investigation	Visit and investigation activities	Time, site, name, number, content and organization of the delegation
	Demonstration and promotion bases	Demonstration base construction	Time, place, name, area, main participants, research and demonstration content, effect, etc.
	University-industry cooperation	Research activities	Research time, place, team name, number of people, research content, reception unit, etc.
		Scientific research awards	Results name, main completion unit (or individual), award name, award level, award time, content description, etc.

Source: Reference [31].

3.2. GIAHS Monitoring Practice in South Korea

The GIAHS monitoring practice in South Korea is similar to that in China, covering both GIAHS themselves and GIAHS action plans. Differently, the two kinds of monitoring actions in South Korea are organized at the national level. The central government of South Korea believes that the monitoring of GIAHS themselves is the core task of GIAHS management at the national level. It is designed to exploit heritage resources to promote rural vitalization and prevent unnecessary damage to heritage due to excessive development. In 2016, the central government of South Korea proposed an indicator system for GIAHS monitoring, which is composed of three first-level indicators, namely operating system, conservation and utilization. The first-level indicators are further divided into 10 second-level indicators including formation of management authority, management system, establishment of management planning, traditional agriculture, ecology, landscape, traditional culture, economic effect, socio-cultural effect, and environmental effect, which are further refined into 17 third-level indicators [32]. By the characteristics of each monitoring indicator, monitoring data are divided into three types, namely quantitative data, qualitative data and list data.

The monitoring of GIAHS themselves in South Korea is organized and implemented by the central government, with the joint participation of local governments, private enterprises, local residents, and other stakeholders [32]. Among them, the central government is responsible for formulating general policies, identifying heritage status, providing monitoring guidelines and, together with local governments, regulating heritage sites and their surrounding areas. Local governments are responsible for formulating and conducting specific GIAHS action plans, implementing GIAHS monitoring, and responding to feed-

back from local residents. The GIAHS management committee, composed of the local government, related experts and local residents, is responsible for the advancement of the conservation and management of GIAHS and is also one of the most important participants in GIAHS monitoring. In addition, the farmers and residents' consultative group actively collaborate on various tasks of heritage conservation and management, while farmers are also an important object subject to GIAHS monitoring. The GIAHS monitoring in South Korea has been initiated since 2018 and conducted once every two years, and the central government provides financial support worth about 40 million won every two years to each heritage site. Up to now, two phases of monitoring and evaluation of four heritage sites, which lasted four years, have been completed in South Korea.

The monitoring of GIAHS action plans in South Korea is also organized and implemented by the central government as the action plans are financially supported by the central government. Since 2013, each agricultural heritage system has received three-year financial aid worth approximately 1.5 billion won, of which 70% comes from the Ministry of Agriculture, Food and Rural Affairs (MAFRA) and the remaining 30% from the government of the heritage site; and each fishery heritage system has obtained three-year financial assistance worth approximately 700 million won, of which 70% comes from the Ministry of Oceans and Fisheries (MOF) and 30% from the government of the heritage site [32,33]. To ensure the smooth implementation of the action plans, the central government has established a strict monitoring and evaluation system. Evaluations are conducted once or twice each year during the implementation period and the final evaluation is conducted in the fourth year, i.e., the year following the ending of the implementation period. The evaluation items include financial budget execution, database building, heritage changes, residents' participation, changes in the number of tourists, education and capacity building, etc. The agricultural or fishery heritage systems that have passed the final evaluation will still be financially supported in the second stage.

3.3. GIAHS Monitoring Practice in Japan

Japan attaches great importance to the formulation and implementation of GIAHS action plans and conducts monitoring and evaluation of these plans. As required by the Ministry of Agriculture, Forestry and Fisheries of the country (MAFF), a five-year conservation and development action plan must be formulated at each GIAHS site after it is designated. To ensure the implementation effect of GIAHS action plans, since 2015, MAFF has organized the Japanese GIAHS Expert Committee to set up an evaluation team to inspect and evaluate the GIAHS action plans in the third or fourth year of the implementation period. Specifically, the following steps are followed. First, each heritage site completes a self-evaluation report and submits it to MAFF, including a summary of its previous actions, future action plan, major heritage conservation and utilization indicators, and comprehensive evaluation of conservation actions after designation. Then, experts of the evaluation team review the self-evaluation report and confirm the content of the report through online interviews and field visits, etc. Finally, a small symposium is held between the evaluation team and local representatives. At the symposium, experts announce the monitoring and evaluation results and make suggestions on the formulation and implementation of action plans [34,35]. Based on experts' suggestions, the heritage site will revise the action plan in the fifth year of the implementation period and formulate an action plan for the next five-year period.

3.4. GIAHS Monitoring Practice in Portugal

Barroso agro-sylvo-pastoral system was recognized by FAO as a GIAHS in 2018. It is the first and only GIAHS in Portugal. Although there is only one GIAHS, Portugal attaches great importance to its conservation and management and conducts monitoring and evaluation on its action plan. The monitoring and evaluation of the GIAHS action plan in Portugal, unlike in China, South Korea and Japan, is organized by the non-profit organization of the heritage site rather than by the government, with the joint participation

of competent government authorities and other stakeholders. Take the Barroso agro-sylvo-pastoral system for example. An executive committee is formed by the main public and private entities to be responsible for the conservation and management of the heritage in general. The executive committee has a monitoring and evaluation committee, which is specifically responsible for the monitoring and evaluation of the heritage, including monitoring indicator design, monitoring data collection, conservation effect evaluation and the proposing of conservation suggestions [36]. Moreover, the Barroso platform was officially established in January 2019, with the aim to promote the participation of stakeholders such as research institutions, associations, cooperatives, schools, social organizations and private enterprises in participating in heritage conservation and management. The monitoring and evaluation of the action plan are conducted by a regional development association named ADRAT. Currently, the action plan 2020–2021 of the Barroso agro-sylvo-pastoral system has been implemented and ADRAT is monitoring and evaluating the action plan for the most recent two years.

4. Discussion

4.1. Comparative Analysis of Theoretical Research

Although CAS-IGSNRR has conducted research on the monitoring of GIAHS themselves while UNU-IAS and RAD on the monitoring of GIAHS action plans, they share many similarities in the theoretical design of the monitoring system. For example, both of them have designed a three-tiered monitoring indicator system that is closely correlated with the GIAHS designation criteria; both of them have taken into account the differences in monitoring data and adopted the corresponding data collection methods; and both follow the principle of combining top-down and bottom-up methods to facilitate the organization and implementation of monitoring (Table 3).

Table 3. Comparison of the theoretical research of GIAHS monitoring between different institutions.

Institution	Monitoring Focus	Indicator System	Data Collection	Implementation Mechanism	Application of Evaluation Results
CAS-IGSNRR	GIAHS themselves	Six first-level indicators, 24 second-level indicators, and several third-level indicators	annual report and survey report	Mainly from top to bottom, emphasizing the leading role of the government	Guide the conservation and management of GIAHS
UNU-IAS and RDA	GIAHS action plans	Eight core criteria, 22 sub-criteria, and several key performance indicators	quantitative statistics, qualitative listing and qualitative reporting	Focus on bottom-up and emphasize multi-stakeholder participation	Guide the preparation of the GIAHS action plan

Certainly, due to different concerns, there are also differences in the theoretical design of the two monitoring systems. For instance, in terms of the data collection method, CAS-IGSNRR pays attention to how fast the data changes and how difficult the data is collected and proposes two forms, namely annual report and survey report. UNU-IAS and RDA focus on data attributes and adopt different collection methods for quantitative and qualitative data, respectively. In terms of the implementing mechanism, CAS-IGSNRR focuses more on the implementation of the top-down method, highlighting the leading role of the government while UNU-IAS and RDA emphasize more on the implementation of the bottom-up method, suggesting all stakeholders should extensively participate in the implementation. In terms of the application of the evaluation results, the monitoring system proposed by CAS-IGSNRR mainly serves heritage conservation and management in general but that proposed by UNU-IAS and RDA mainly serves the preparation of the next round of action plan.

4.2. Comparative Analysis of Practices in Different Countries

Globally, China and South Korea have both conducted GIAHS themselves monitoring and GIAHS action plan monitoring, while Japan, Portugal, and other countries only conducted the GIAHS action plan monitoring. China and South Korea share some similarities in terms of GIAHS themselves monitoring. For example, the monitoring is organized by the central government, a three-tiered monitoring indicator system is designed, and evaluations are made every two to three years. However, the two countries also have some differences. The monitoring in South Korea is financially supported by the central government, with more diversified participating stakeholders while the monitoring in China mainly relies on the cooperation of local governments and related experts, with financial support unavailable (Table 4).

Countries differ greatly in terms of GIAHS action plan monitoring (Table 4). The GIAHS action plan monitoring in South Korea and Japan is organized and implemented by both central governments, and explicit monitoring requirements and processes have been proposed in both countries. Differently, the action plans of South Korea are financially supported by the central and local governments in the form of projects and monitoring and evaluation have become an important part of project management, thus allowing more stakeholders to participate in the project management. Without financial assistance, the action plans in Japan rely more on the cooperation of local governments and the support of relevant experts. By contrast, the GIAHS action plan monitoring in China is not uniformly carried out at the national level, lacking clear monitoring requirements and processes, and mainly relies on the consciousness of local governments and the support of relevant experts. The GIAHS action plan monitoring in Portugal, unlike in East Asian countries, is organized and implemented by local non-profit organizations that apply for local or regional projects for funding, while the government of the country becomes one of the stakeholders involved in the monitoring. Although the action plan monitoring in Portugal has just got started, with a lack of further details for comparison, it differs greatly from East Asian countries in terms of organization and implementation methods, which deserves further attention from scholars.

Table 4. Comparison of GIAHS monitoring practices among different countries.

Country	GIAHS Themselves Monitoring					GIAHS Action Plan Monitoring				
	Organizer	Main Participants	Indicator System	Evaluation Mechanism	Financial Support	Organizer	Main Participants	Main Contents of Monitoring	Evaluation Mechanism	Financial Support
China	MARA	Local governments and experts	Six first-level indicators, 18 second-level indicators, and 27 third-level indicators	Report every year and evaluate every three years	Unavailable	Local governments	Government departments and experts	The realization of expected objectives	Evaluate after the 5-year or 10-year implementation period	Unavailable
South Korea	MAFRA, MOF	Local governments, experts, private enterprises, farmers	Three first-level indicators, 10 second-level indicators, and 17 third-level indicators	Monitor and evaluate every two years	Financial support from the central government	MAFRA, MOF	Local governments, experts, private enterprises, farmers	Financial budget execution, database building, heritage changes, residents' participation, changes in the number of tourists, education and capacity building, etc.	Once or twice evaluation each year and the final evaluation in the fourth year,	Financial support for action plans
Japan	-	-	-	-	-	MAFF	Local governments and experts	A summary of previous actions, future action plan, major heritage conservation and utilization indicators, and comprehensive evaluation of conservation actions after designation	Evaluate in the third or fourth year of the implementation period	Unavailable
Portugal	-	-	-	-	-	Local non-profit organizations	Government departments and other stakeholders	The realization of expected objectives	Evaluate for the past two years	Support from local or regional projects

4.3. Existing Problems

Although countries and research institutions differ in the theoretical research and practical application of GIAHS monitoring, they face quite similar problems during the research and application process, which are mainly reflected in the following three aspects:

(1) Low enthusiasm of heritage sites about participation

The implementation of the monitoring that depends only on the top-down mechanism is not enough or efficient, and must be combined with the bottom-up participation. Therefore, the participation of heritage sites is extremely important for GIAHS monitoring. The active participation of local stakeholders, including local governments, can not only make up for the limitations of the top-down approach, but also greatly improve the feasibility and efficiency of GIAHS monitoring. However, the enthusiasm of heritage sites to participate in GIAHS monitoring is limited. Take China for example. China has pioneered theoretical and practical work in GIAHS monitoring, such as designing annual reports of GIAHS monitoring, developing the dynamic monitoring system, and building the three-tiered monitoring network. However, not all heritage sites can submit annual reports within the specified time according to the requirements and the data quality of the annual reports submitted by heritage sites also differ largely. This has reflected the less enthusiasm of heritage sites about participating in GIAHS monitoring to some extent. Japan is also challenged by similar problems. With no financial assistance, the monitoring of GIAHS action plans in Japan can only rely on the cooperation of local governments and the support of relevant experts. Although both types of GIAHS monitoring in South Korea are financially supported by the government, they are still faced with the problems of insufficient participation of farmers and less enthusiasm of heritage sites.

(2) Lack of legal and financial support

GIAHS monitoring faces many difficulties and requires legal and financial support in particular. Since the FAO-GIAHS Office has no explicit requirements for GIAHS monitoring, all the countries are confronted with a lack of legal basis when conducting GIAHS monitoring and it is also difficult to form a reporting system of monitoring and evaluation outcomes, from heritage sites to countries and then to FAO. Although China and South Korea have mentioned GIAHS monitoring in legal documents at the national level, there is still a lack of more specific rules when it comes to the implementation at the legal level, thus having limited binding force on GIAHS monitoring. Therefore, it's difficult to warn heritage sites with poor monitoring let alone to include those with serious heritage damage due to poor conservation or management in the red list. Funding is essential to GIAHS conservation and management, including conducting monitoring and evaluation. Only South Korea has provided financial support for GIAHS themselves monitoring, and its GIAHS action plan monitoring, as an important link of project management, has also been financially supported. Some countries like Portugal apply for local or regional projects to support GIAHS monitoring. However, most others, like China and Japan, have not received relevant financial support either in GIAHS themselves monitoring or GIAHS' action plan monitoring. This had made it difficult to effectively mobilize the heritage sites and conduct the GIAHS monitoring in these countries.

(3) Lack of technical support and guidance

Besides the lack of a legal supportive system and an effective incentive mechanism, the other reason why heritage sites are less enthusiastic about participating in GIAHS monitoring is the absence of stable and sustained technical support and guidance. Firstly, FAO has not released any guiding documents concerning GIAHS monitoring and no countries have issued any detailed implementing rules in this respect. As a result, GIAHS monitoring has remained in the exploratory stage for quite a period and has been unable to form an authoritative technical system. Secondly, no stable training team or sustained training system has been formed in countries to provide the long-term technical support for GIAHS monitoring. Local participants are specific executors of GIAHS monitoring

and their capacity is directly related to the effectiveness of the monitoring, therefore it is very important to carry out training activities and strengthen their capacity building. The analyses have shown that experts have played an important role in the practical explorations on GIAHS monitoring, but the local participants have received quite limited technical training, which has explained why these countries are all confronted with the difficulty in data collection to different extents.

4.4. Main Suggestions

In response to the problems facing the GIAHS monitoring, the following three suggestions are proposed in this paper to further promote the conduction of GIAHS monitoring worldwide and better facilitate the dynamic conservation and adaptive management of GIAHS.

(1) Clarifying monitoring requirements and formulating monitoring guidelines

FAO should clarify the specific requirements for GIAHS monitoring as soon as possible, establish a unified, scientific and efficient monitoring system for GIAHS, and release authoritative monitoring guidelines to support heritage sites to conduct GIAHS monitoring. In terms of GIAHS monitoring system design, based on the results of existing theoretical research and practical applications, it is suggested that FAO combine the GIAHS themselves monitoring with the GIAHS action plan monitoring. On the one hand, suitable indicators should be selected according to the five designation criteria to monitor the conservation status of GIAHS. Given to the limited resources available, GIAHS monitoring must be implemented in a cost-effective way. Thus, a minimum set of indicators with the richest information should be formulated for GIAHS monitoring rather than a large set of indicators with low information. On the other hand, the GIAHS action plan monitoring should be conducted from the perspective of project management. This means that the monitoring emphasis should be put on whether the established actions have been effectively implemented and whether the expected objectives have been fully realized. The traditional method of using a large number of specific indicators to measure the effectiveness of action plans from several fixed aspects should be abandoned.

(2) Improving management systems and establishing incentive mechanisms

To promote the dynamic conservation and adaptive management of GIAHS, it is essential to establish a systematic process for follow-up and accountability to determine the commitment and faithfulness of heritage sites in implementing actions, monitoring changes and assessing impacts after the GIAHS designation. At the international level, FAO should immediately establish a scientific and effective GIAHS monitoring and evaluation mechanism, forming a monitoring data reporting system that starts from heritage sites to countries and then to FAO, and an evaluation result feedback system that starts from FAO to countries and then to heritage sites. At the national level, the government of each country should provide support and guarantee for GIAHS monitoring in terms of laws, talents and capital by issuing detailed implementing rules, providing supporting funds, and establishing an expert tank, for example. In addition, the government of each country should work to establish an incentive mechanism for GIAHS monitoring, not only to increase the enthusiasm of heritage sites about participation in GIAHS monitoring but also to promote the consecutive implementation of GIAHS action plans.

(3) Promoting multi-stakeholder participation and strengthening technical training

GIAHS monitoring not only requires the vigorous support and policy guidance by the central and local governments but also needs the designing and improvement of monitoring indicators and technical systems by research and technical personnel. In particular, its implementation strongly relies on the active cooperation of farmers, enterprises, industrial associations at heritage sites. Thus, more efforts should be made to promote the participation of multiple stakeholders in GIAHS monitoring. Specifically, in order to promote the better monitoring at heritage sites, stable training teams should be established

relying on universities and research institutions to provide continuous and regular GIAHS monitoring technology training for heritage sites. Additionally, cooperation mechanisms should be established between universities and research institutions and heritage sites for joint research and collection of relevant monitoring data. Last but not least, farmers are not only the objects of GIAHS monitoring, but also one of the most important participants. Farmers can contribute their knowledge and capabilities to GIAHS monitoring. For example, they can act as local data collectors following the designed indicator system. Therefore, improving their capacity through technical training will greatly increase the feasibility and effectiveness of GIAHS monitoring.

5. Conclusions

Monitoring is a basic step towards effective GIAHS conservation, and also an important way of achieving scientific GIAHS management. However, compared with the World Heritage, GIAHS is a relatively new program and mainly relies on various countries to carry out monitoring activities on their own. The theoretical research and practical exploration that have been performed by different research institutions and countries share similarities but also have differences in the concept understanding, indicator system design and implementation mechanism of GIAHS monitoring. However, all of these attempts and explorations are of great significance to the establishment of a unified, scientific and efficient GIAHS monitoring system at the global level. At the same time, these institutions and countries have also encountered difficulties in the process of research and application, many of which are common in other countries and must be solved before establishing a GIAHS monitoring system globally. It cannot be overemphasized that FAO should establish a unified, scientific and efficient GIAHS monitoring system at the global level with the support of various countries and institutions as quickly as possible.

Author Contributions: Study design, W.J. and Q.M.; data collection, W.J. and X.Y.; data analysis, W.J. and X.Y.; figures, W.J. and X.Y.; writing—original draft preparation, W.J.; writing—review and editing, Q.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Strategic Priority Research Program of the Chinese Academy of Sciences (XDA23100203) and the National Natural Science Foundation of China (41801204).

Data Availability Statement: Not applicable.

Acknowledgments: The authors would like to thank the three anonymous reviewers for their valuable comments to improve this manuscript.

Conflicts of Interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this manuscript.

References

1. Westgate, M.J.; Likens, G.E.; Lindenmayer, D.B. Adaptive management of biological systems: A review. *Biol. Conserv.* **2013**, *158*, 128–139. [CrossRef]
2. Matsuda, H.; Makino, M.; Sakurai, Y. Development of an adaptive marine ecosystem management and co-management plan at the Shiretoko World Natural Heritage Site. *Biol. Conserv.* **2009**, *142*, 1937–1942. [CrossRef]
3. Phillips, H. The capacity to adapt to climate change at heritage sites-The development of a conceptual framework. *Environ. Sci. Policy* **2015**, *47*, 118–125. [CrossRef]
4. Tu, H.M. The Attractiveness of Adaptive Heritage Reuse: A Theoretical Framework. *Sustainability* **2020**, *12*, 2372. [CrossRef]
5. Hedge, P.; Molloy, F.; Sweatman, H.; Hayes, K.R.; Dambacher, J.M.; Chandler, J.; Bax, N.; Gooch, M.; Anthony, K.; Elliot, B. An integrated monitoring framework for the Great Barrier Reef World Heritage Area. *Mar. Policy* **2017**, *77*, 90–96. [CrossRef]
6. UNESCO. Convention Concerning the Protection of the World Cultural and Natural Heritage. 1972. Available online: <http://whc.unesco.org/en/documents/170665> (accessed on 28 March 2022).
7. UNESCO World Heritage Center. Operational Guidelines for the Implementation of the World Heritage Convention. 2013. Available online: <https://unesdoc.unesco.org/ark:/48223/pf0000224675> (accessed on 28 March 2022).
8. Jiao, W.; Zhao, G.; Min, Q.; Liu, M.; Yang, L. Building a monitoring system for Globally Important Agricultural Heritage Systems (GIAHS) based on the monitoring experience of World Heritage. *Chin. J. Eco-Agric.* **2020**, *28*, 1350–1360. (In Chinese)

9. Food and Agriculture Organization. *Globally Important Agricultural Heritage Systems: Combining Agricultural Biodiversity, Resilient Ecosystems, Traditional Farming Practices and Cultural Identity*; Food and Agriculture Organization: Rome, Italy, 2018; Available online: <http://www.fao.org/3/i9187en/i9187EN.pdf> (accessed on 28 March 2022).
10. Min, Q.; Zhang, Y.; Jiao, W.; Sun, X. Responding to common questions on the conservation of agricultural heritage systems in China. *J. Geogr. Sci.* **2016**, *26*, 969–982. [\[CrossRef\]](#)
11. Min, Q.; Zhang, B. Research Progress in the Conservation and Development of China-Nationally Important Agricultural Heritage Systems (China-NIAHS). *Sustainability* **2020**, *12*, 126. [\[CrossRef\]](#)
12. Fuller, T.; Qingwen, M. Understanding agricultural heritage sites as complex adaptive systems: The challenge of complexity. *J. Resour. Sci.* **2013**, *4*, 195–201. [\[CrossRef\]](#)
13. Fuller, A.M.; Min, Q.; Jiao, W.; Bai, Y. Globally Important Agricultural Heritage Systems (GIAHS) of China: The challenge of complexity in research. *Ecosyst. Health Sustain.* **2015**, *1*, 1–10. [\[CrossRef\]](#)
14. Jiao, W.; Fuller, A.M.; Xu, S.; Min, Q.; Wu, M. Socio-ecological adaptation of agricultural heritage systems in modern China: Three cases in Qingtian County, Zhejiang Province. *Sustainability* **2016**, *8*, 1260. [\[CrossRef\]](#)
15. Xie, J.; Wu, X.; Tang, J.J.; Zhang, J.-E.; Luo, S.-M.; Xin, C. Conservation of traditional rice varieties in a globally important agricultural heritage system (GIAHS): Rice-fish co-culture. *Agric. Sci. China* **2011**, *10*, 754–761. [\[CrossRef\]](#)
16. Zhang, Y.; Min, Q.; Li, H.; He, L.; Zhang, C.; Yang, L. A conservation approach of globally important agricultural heritage systems (GIAHS): Improving traditional agricultural patterns and promoting scale-production. *Sustainability* **2017**, *9*, 295. [\[CrossRef\]](#)
17. He, X.; Sun, Y.; Gao, D.; Wei, F.; Pan, L.; Guo, C.; Mao, R.; Xie, Y.; Li, C.; Zhu, Y. Comparison of agronomic traits between rice landraces and modern varieties at different altitudes in the paddy fields of Yuanyang terrace, Yunnan province. *J. Resour. Ecol.* **2011**, *2*, 46–50.
18. Park, H.C.; Oh, C.H. Flora, life form characteristics, and plan for the promotion of biodiversity in South Korea's Globally Important Agricultural Heritage System, the traditional Gudeuljang irrigated rice terraces in Cheongsando. *J. Mt. Sci.* **2017**, *14*, 1212–1228. [\[CrossRef\]](#)
19. Sun, Y.; Zhou, H.; Zhang, L.; Min, Q.; Yin, W. Adapting to droughts in Yuanyang Terrace of SW China: Insight from disaster risk reduction. *Mitig. Adapt. Strateg. Glob. Chang.* **2013**, *18*, 759–771. [\[CrossRef\]](#)
20. Qiu, Z.; Chen, B.; Nakamura, K. Customary Management System of Irrigation ponds in Japan—a Case Study in a Globally Important Agricultural Heritage Systems (GIAHS) site of Noto Island, Ishikawa Prefecture. *J. Resour. Ecol.* **2016**, *7*, 205–210.
21. Yuan, Z.; Min, Q.; Cheng, S. The smallholder economy for the Hani rice terraces sustaining millennium. *J. China Agric. Univ.* **2013**, *30*, 133–140. (In Chinese)
22. Kajihara, H.; Zhang, S.; You, W.; Min, Q. Concerns and opportunities around cultural heritage in east Asian Globally Important Agricultural Heritage Systems (GIAHS). *Sustainability* **2018**, *10*, 1235. [\[CrossRef\]](#)
23. Reyes, S.R.C.; Miyazaki, A.; Yiu, E.; Saito, O. Enhancing sustainability in traditional agriculture: Indicators for monitoring the conservation of Globally Important Agricultural Heritage Systems (GIAHS) in Japan. *Sustainability* **2020**, *12*, 5656. [\[CrossRef\]](#)
24. Min, Q.; Sun, Y. The Concept, characteristics and conservation requirements of Agro-cultural Heritage. *Resour. Sci.* **2009**, *31*, 914–918. (In Chinese)
25. Koohafkan, P.; Delacruz, M. Conservation and adaptive management of globally important agricultural heritage systems (GIAHS). *J. Resour. Ecol.* **2011**, *2*, 12–13.
26. Yiu, E.; Jang, B.; Owada, J.; Jeong, M.; Hwang, D. Globally Important Agricultural Heritage Systems (GIAHS) Monitoring and Evaluation Manual: A Technical Reference. United Nations University Institute for the Advanced Study of Sustainability, Tokyo. Available online: https://collections.unu.edu/eserv/unu:8681/GIAHS_M_E_Manual_2022_Web.pdf (accessed on 30 May 2022).
27. Min, Q. GIAHS: A new kind of world heritage. *Resour. Sci.* **2006**, *4*, 206–208. (In Chinese)
28. Jiao, W.; Cui, W.; Min, Q.; Zhang, Y. A review of research on agricultural heritage systems and their conservation. *Resour. Sci.* **2021**, *43*, 823–837. (In Chinese)
29. FAO GIAHS Secretariat. Selection Criteria and Action Plan. Available online: <http://www.fao.org/giahs/become-a-giahs/selection-criteria-and-action-plan/en/> (accessed on 30 May 2022).
30. Jiao, W.; Min, Q. Analysis on the key issues in the monitoring of agricultural heritage systems. *Study Nat. Cult. Herit.* **2019**, *4*, 57–60. (In Chinese)
31. Jiao, W.; Wang, B.; Sun, Y.; Liu, M. Design and Application of the Annual Report of Globally Important Agricultural Heritage Systems (GIAHS) Monitoring. *J. Resour. Ecol.* **2021**, *12*, 498–512.
32. Park, Y. Monitoring and Evaluation of KIAHS in South Korea. In Proceedings of the 3rd Conference of East Asia Research Association for Agricultural Heritage Systems, Geumsan, Korea, 13–16 June 2016.
33. Yang, L.; Min, Q.; Liu, M.; Jiao, W. Experiences of the Republic of Korea's agricultural heritage conservation and development. *World Agric.* **2017**, *2*, 4–8. (In Chinese)
34. Yagi, N. GIAHS Monitoring and Evaluations in Japan. In Proceedings of the Webinar of the Monitoring and Evaluation of GIAHS: Country and GIAHS Site Experiences, Tokyo, Japan, 10 March 2022.
35. Zhang, Y.; Jiao, W.; Liu, M. Experiences of Japanese agricultural heritage conservation and development. *World Agric.* **2017**, *3*, 139–142. (In Chinese)
36. Luzio, S. Monitoring and Evaluation in GIAHS Barroso, Portugal. In Proceedings of the Webinar of the Monitoring and Evaluation of GIAHS: Country and GIAHS Site Experiences, Tokyo, Japan, 10 March 2022.