



Food and Agriculture
Organization of the
United Nations

Globally Important
**AGRICULTURAL
HERITAGE**
Systems



GLOBALLY IMPORTANT AGRICULTURAL HERITAGE SYSTEMS

Combining agricultural biodiversity,
resilient ecosystems, traditional
farming practices and cultural identity

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GIAHS AND GLOBAL ISSUES

**THE GIAHS
PROGRAMME
RECOGNIZES THE
PROUDEST
TRADITIONS
OF HUMAN
INGENUITY IN
HARNESSING
PRECIOUS
RESOURCES TO
PROVIDE FOOD
AND LIVELIHOODS
AND PROTECT
UNIQUE
ECOSYSTEMS.**



MOROCCO

Oases System in
Atlas Mountains.
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INTRODUCTION

**GLOBALLY
IMPORTANT
AGRICULTURAL
HERITAGE
SYSTEMS (GIAHS)
PROVIDE FOOD
AND LIVELIHOOD
SECURITY FOR
MILLIONS OF
THE WORLD'S
POOR AND
SMALL-SCALE
FARMERS.**

GIAHS sites are
testament to the intricate
relationships human
beings have with
their unique territory,
cultural and agricultural
landscapes and their
wider social environment.

THE PHILIPPINES

Ifugao rice terraces.
©FAO/Lena Gubler

For centuries, farmers, herders, fishers and foresters have developed diverse and locally adapted agricultural systems managed with time-tested, ingenious techniques. These practices have resulted in a vital combination of social, cultural, ecological and economic services to humankind. “Globally Important Agricultural Heritage Systems” (GIAHS) are outstanding landscapes of aesthetic beauty that combine agricultural biodiversity, resilient ecosystems and a valuable cultural heritage. Located in specific sites around the

world, they sustainably provide multiple goods and services, food and livelihood security for millions of small-scale farmers.

Through a remarkable process of coevolution of humankind and nature, such sites have emerged over centuries of cultural and biological interactions and synergies, representing the accumulated experiences of rural people. Unfortunately, these agricultural systems are threatened by many factors including climate change and increased competition for natural resources. They are





also dealing with migration due to low economic viability, which has resulted in traditional farming practices being abandoned and endemic species and breeds being lost.

In recognition of these global threats to family farming and traditional agricultural systems, 16 years ago FAO launched the GIAHS Programme. Aiming to strike a balance between conservation, sustainable adaptation and socioeconomic development, the GIAHS Programme helps identify ways

to mitigate the threats faced from farmers as well as enhance the benefits derived by these systems. Through multi-stakeholder support, this approach aims to: provide technical assistance; boost understanding of the value of keeping alive sustainable agricultural knowledge; and promote agricultural products, agro-tourism and other incentive mechanisms and market opportunities.

There are currently 50 GIAHS-designated sites in 20 countries around the world, with

potentially many more to follow. GIAHS sites are testimony to the inventiveness and ingenuity of people in their management of resources, biodiversity and ecosystem dynamics, and use of landscapes, codified in traditional but evolving knowledge, practices and technologies. These ancestral agricultural systems constitute the foundation for contemporary and future agricultural innovations and technologies. Their cultural, ecological and agricultural diversity is still evident in many parts of the world, maintained as unique systems of agriculture.

KEY MESSAGES

Traditional agricultural systems are extremely important for sustaining livelihoods, maintaining rural communities, preserving knowledge, and protecting fragile landscapes and agrobiodiversity.

► For centuries, traditional agricultural systems provided food for many family farmers living in rural areas around the world. Today, they are also being increasingly recognized for sustaining livelihoods and maintaining local agrobiodiversity, fragile landscapes, traditional knowledge, and farmers' identity and culture.

► Thanks to years of experience and knowledge, farmers in GIAHS sites have developed





CHINA

Zhejiang Huzhou
Mulberry-dyke &
fish-pond system.
©Jianyi Dai

sustainable agricultural practices to manage and use natural resources effectively. This knowledge offers examples of high resilience and precious agroecological techniques that can help agriculture adapt to ever-changing social, environmental and economic conditions.

► The unique legacy and heritage that GIAHS sites have to offer is an example of harmony between humans and their unique ecosystems in the context of sustainable development.

► Peoples' know-how and the richness of biodiversity come together in GIAHS to achieve the sustainable management and efficient use of natural resources and ecosystems.

► GIAHS sites bring together the economic, social and environmental dimensions at the heart of the 2030 Agenda for Sustainable Development.

► Small-scale and family farmers are the backbone of many GIAHS sites and can offer real solutions for achieving food security and ending poverty by maintaining rural communities, preserving knowledge, and protecting fragile landscapes and agrobiodiversity.

**FACTORS
THREATENING
TRADITIONAL
AGRICULTURAL
SYSTEMS
INCLUDE
UNSUSTAINABLE
MODELS OF
AGRICULTURE,
DRAMATIC LOSS
OF LOCAL
VARIETIES AND
BREEDS, LAND
ACCESS PRESSURE
AND CLIMATE
CHANGE.**

A BRIEF HISTORY OF GIAHS

OVER THE LAST DECADE, THE NUMBER OF DESIGNATED GIAHS SITES HAS INCREASED TO 50.

Since its inception in 2002, the GIAHS Programme has built a strong local and international reputation in the fields of agricultural heritage and agricultural development.

ORIGINS OF GIAHS

In response to global trends undermining family agriculture and traditional agricultural systems, in 2002, during the World Summit on Sustainable Development in Johannesburg, South Africa, FAO launched a Global Partnership Initiative on the conservation and adaptive management of GIAHS.

EXPANSION OF GIAHS

Since 2002, many global or country projects have been

implemented with partners and in consultation with local communities and relevant stakeholders to assist member countries in identifying and conserving GIAHS sites. Projects carried out in 2008–14 resulted in the designation of the first eight GIAHS sites in six pilot countries: Algeria, Chile, China, Peru, the Philippines and Tunisia, with other proposals from the same period resulting in subsequent designations.

UNITED ARAB EMIRATES

Al Ain and Liwa Historical Date Palm Oases.

©George Steinmetz



To enhance the capacity of countries and to raise awareness of the GIAHS concept, international, regional and national conferences, seminars, and training courses were organized, including an International GIAHS Forum in Rome, Italy (2006); Buenos Aires, Argentina (2009); Beijing, China (2011); and Noto, Japan (2013).

As a result, the number of designated GIAHS sites increased, bringing added recognition to both the sites and the programme.

At the national level, GIAHS has contributed to the adoption of policies that integrate agricultural heritage into agricultural development programmes. In this way, it has been influential in promoting the sustainable use of biodiversity and genetic resources for food and agriculture, the protection of traditional knowledge systems, culture and, more importantly, creating a bridge to a sustainable future.

In recent years, the GIAHS Programme has gained traction globally. It has been specifically referenced at high-level conferences where food security and agriculture have been discussed, such as the G20 Agriculture Ministers' meetings and the UN General Assembly in 2016.*

*[G20 Agriculture Ministers Meeting Communiqué 3 June 2016; Fourth APEC Ministerial Meeting on Food security, 27 September 2016; G20 Ag Ministers Action Plan 2017; UNGA Resolution 72/238, 20 December 2017]

MAIN FEATURES OF GIAHS SITES

ONE OF THE MAIN GIAHS CRITERIA IS TO ENSURE FOOD SECURITY FOR LOCAL POPULATIONS IN TRADITIONAL AGRICULTURAL SYSTEMS.

From food and livelihood security to landscape and seascape features, there are five major criteria which must be addressed in every GIAHS proposal.

In developing the GIAHS Programme, several important aspects were taken into account to help profile the sites, such as natural, topographic and climate conditions. The main features consist of “Historical and contemporary relevance” and five selection criteria detailed below.

● Historical relevance

Every GIAHS site has its own unique story of development. Historical relevance can demonstrate how the site has adapted to the surrounding environment over time and how farmers have developed specific knowledge and techniques to form the current landscapes and systems.

● Contemporary relevance

The contemporary relevance of a site is established by its present and future capacity to provide food and livelihood security, to

contribute to human well-being and quality of life and to generate other local, national and global economic and environmental goods and services to its community and wider society. This relates to the relevance of an agricultural system/site to global or national policy and to sustainable development challenges, most prominently achieving food security, human well-being and environmental goals, such as climate adaptation, carbon sequestration, and water, land and biodiversity conservation.

CHILE

Chiloé Agriculture.
©FAO/Liana John





SELECTION CRITERIA

Five features determine the “Global Importance” of a site and are used as selection criteria when assessing the suitability for the designation of a GIAHS site.

1 Agricultural systems that contribute to food and livelihood security

The farmers in GIAHS sites have gradually developed and established productive, efficient, resilient and sustainable production systems through skilful resource management, diversified crop

production, and optimization of the mutual benefits of ecological functions of crops and animals to overcome disadvantageous conditions. As a result of these long-term efforts, unique local agriculture still maintains its significance in the rural community, as it provides livelihoods and contributes to food security by ensuring stable food supply.

2 Rich and unique agrobiodiversity

GIAHS sites often reflect rich and globally unique agricultural

biodiversity displayed at field and landscape levels in the form of rotations, polycultures and/or agroforestry patterns. Indeed, agrobiodiversity is the result of a long domestication process from endemic and wild species together with a selection process of the most adapted and resistant varieties. This is the result of attempts by farmers over time to minimize the risk of crop failure by conserving and growing several species and varieties of crops to stabilize yields, promote dietary and nutritional diversity and ►

MAIN FEATURES OF GIAHS SITES

maximize outputs and ecosystem services with limited resources. This strategy of promoting genetic diversity provides security to farmers against diseases, pests, droughts and other stresses.

3 Traditional knowledge and technologies

Indigenous peoples and family farmers living in GIAHS sites often possess a broad knowledge base underlying the intricacies of local and complex ecological systems. This knowledge of plants, animals, soils and the general environment has been accumulated through a long series of observations transmitted from generation to generation. Farmers are aware that biological diversity is a crucial factor in generating ecological services and in conserving the resource base and foods on which they depend. In many cases women are the main holders of traditional knowledge and thus play a critical role in the sustainable conservation and utilization of biodiversity.

4 Strong cultural values and collective forms of social organizations and value systems for resource management and knowledge transmission

As specific types of agricultural

systems developed over time, so did the social organizations, value systems and cultural practices that became part of the resource management practices and food production technologies used in the agricultural systems. This has led to the close association of social organizations and cultural values with the entire management of agricultural resources and the operation of agricultural systems. These social organizations embedded in rural communities have also contributed to the transfer of traditional knowledge to the next generation. Thus, cultural identity and sense of place are ingrained in the agricultural sites.

5 Remarkable landscapes and seascapes stemming from ingenious systems and technologies of land and water management

Many generations of farmers have worked on the natural environment to produce agricultural products. For this purpose, they have converted hills, mountains, forests, wetlands, and natural water flows into excellent food production systems such as rice terraces, orchard terraces, irrigation networks, grasslands and mixed cropping systems. These long-

term human interactions have led to rich cultural and landscape diversity, as well as sustainable land and water management systems.

NATIONAL SYSTEMS TO SUPPORT GIAHS

Some countries (Chile, China, Ecuador, Japan, the Republic of Korea) have established national systems to support GIAHS activities, for example Nationally Important Agricultural Heritage Systems (NIAHS) or similar national systems such as a traditional agricultural landscapes registry (Italy). In some cases, countries have also established a National GIAHS Committee, composed of relevant ministries to promote collaboration on national GIAHS activities.

MULTIFACETED NATURE OF GIAHS AND RELEVANCE TO OTHER FAO PROGRAMMES AND ACTIVITIES

The GIAHS Initiative was endorsed as an FAO corporate programme at the 39th FAO Conference in 2015. The programme contributes directly to FAO's Strategic Framework, especially to make agriculture, forestry and fisheries more productive and sustainable, and supports many FAO programmes and activities.

DYNAMIC CONSERVATION

**ACTION PLANS
ARE IMPORTANT
BECAUSE THEY
OUTLINE HOW
PROponents OF
A NEW GIAHS
SITE INTEND TO
ENSURE
DYNAMIC
CONSERVATION
GOING
FORWARD.**

Dynamic conservation relies on the active participation of all core stakeholder groups, in particular local communities in the traditional agricultural systems.

IMPORTANCE OF DYNAMIC CONSERVATION

Traditional agricultural systems are threatened by a range of challenges including urbanization, social and economic changes, neglect, inappropriate policy and lack of incentives. Through the recognition of an official GIAHS designation, the programme aims to enhance awareness of the values and associated benefits of such agricultural systems and to promote all necessary actions to achieve dynamic conservation.

Dynamic conservation involves not only conservation, but also the adaptive management and sustainable development of GIAHS sites with the participation of all major stakeholders, availing of a wide range of policy tools implemented by government, private and voluntary sectors, and academia.

AN ACTION PLAN FOR DYNAMIC CONSERVATION

An Action Plan for Dynamic Conservation needs to be

submitted to FAO with the proposal document during the evaluation process for a GIAHS site.

The responsibility of implementing an action plan lies with all stakeholders, including GIAHS site communities, local and national governments, relevant NGOs and researchers.

The recommended items in the action plan should be based on an analysis of threats and challenges and include detailed descriptions of the policies, strategies, actions and outcomes which are already under implementation and/or will be newly implemented with the following information:

- identification and analysis of threats and challenges, including socioeconomic pressures and environmental changes to the continuity of the existence, sustainability and viability of the system;
- proposed policies, strategies and actions and how they will respond to the threats as described;

DYNAMIC CONSERVATION



INDIA

Koraput Traditional Agriculture.
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- how the policies, strategies and actions will contribute to the dynamic conservation of the proposed GIAHS site;
- how multi-stakeholders (including local communities) are involved in and support the implementation of the action plan at local, national and international levels;
- how policies, strategies and actions can be used to leverage funding and/or mobilize resources at the local, national and/or international level; and
- how monitoring and evaluation of the progress and the effect of the implementation of the action plan will be undertaken.

MAIN COMPONENTS OF A GIAHS ACTION PLAN

- Dissemination of GIAHS concepts and awareness-raising of the value of GIAHS sites
- Establishing and/or strengthening the framework to implement the Action Plan
- Better resource management and improved agricultural practices
- Regulations to manage development in and near the site
- Management of agrobiodiversity, biodiversity conservation and sustainable use
- Marketing and promotion of agricultural products from the sites
- Promotion of agro-tourism, eco-tourism, cultural activities and local cuisine
- Involvement of local farmers in decision making process
- Empowerment of women in the rural community

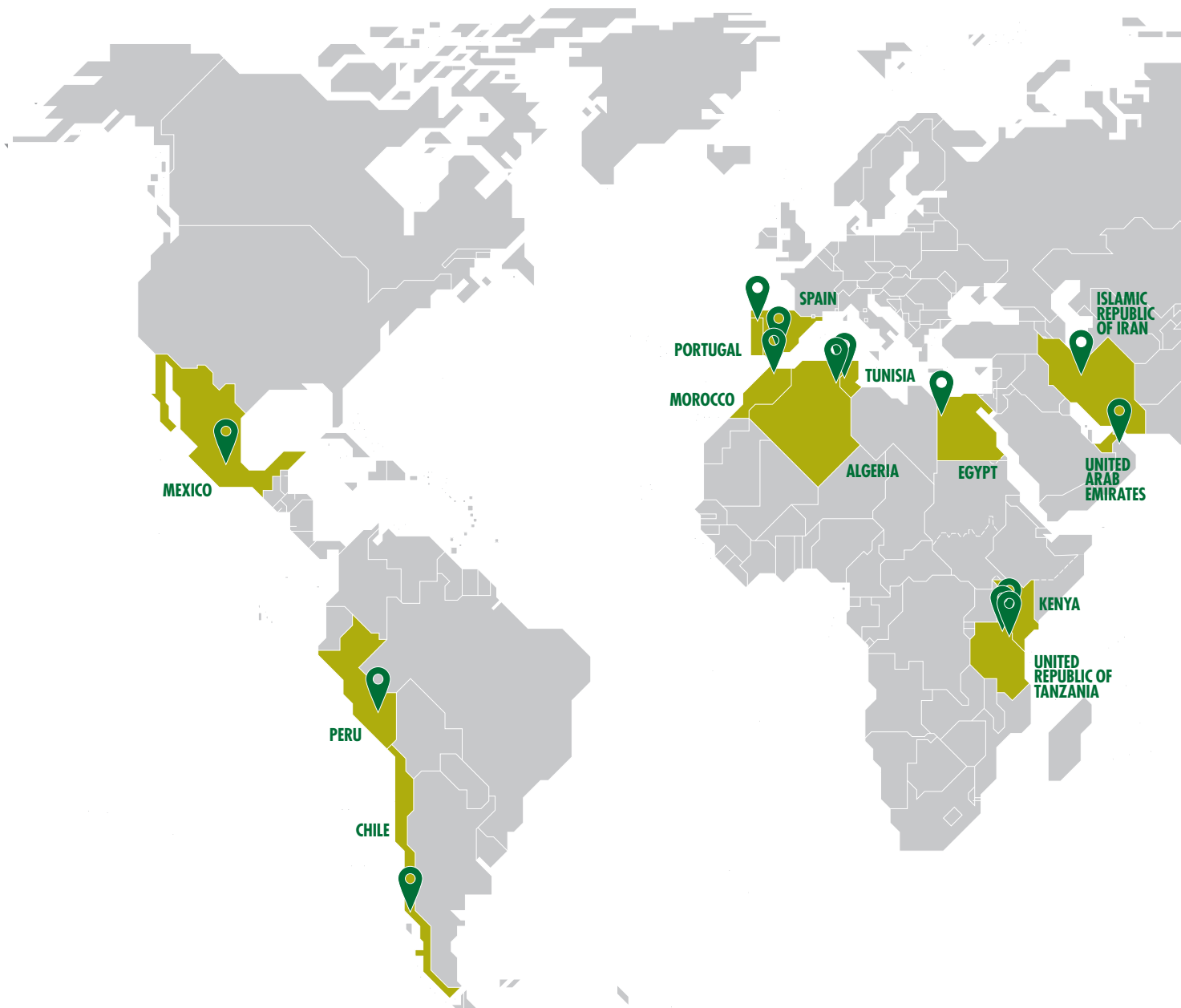


GIAHS AROUND THE WORLD

As of the beginning of April 2018 there are 50 GIAHS sites in 20 countries. Six GIAHS sites are also UNESCO World Heritage sites. These sites are listed below with their years of official designation by GIAHS and UNESCO:

- **CHINA** – Hani Rice Terraces (2010)/Cultural Landscape of Honghe Hani Rice Terraces (2013)
- **IRAN (ISLAMIC REPUBLIC OF)** – Qanat Irrigated Agricultural Heritage Systems of Kashan, Isfahan Province (2014)/The Persian Qanat (2016)
- **PHILIPPINES** – Ifugao Rice Terraces (2011)/Rice Terraces of the Philippine Cordilleras (1995)
- **REPUBLIC OF KOREA** – Jeju Batdam Agricultural System (2014)/Jeju Volcanic Island and Lava Tubes (2007)
- **UNITED ARAB EMIRATES** – Al Ain and Liwa Historical Date Palm Oases (2015)/Cultural Sites of Al Ain (Hafit, Hili, Bidaa Bint Saud and Oases Areas) (2011)
- **UNITED REPUBLIC OF TANZANIA** – Engaresero Maasai Pastoralist Heritage Area (2011)/Ngorongoro Conservation Area (1979)

LOCATION OF GIAHS SITES WORLDWIDE





COUNTRY	GIAHS SITE	YEAR
ALGERIA	Ghout System (Oases of the Maghreb)	2011
BANGLADESH	Floating Garden Agricultural Practices	2015
CHILE	Chiloé Agriculture	2011
	Rice Fish Culture	2005
	Wannian Traditional Rice Culture	2010
	Hani Rice Terraces	2010
	Dong's Rice Fish Duck System	2011
	Pu'er Traditional Tea Agrosystem	2012
	Aohan Dryland Farming System	2012
	Kuajishan Ancient Chinese Torreya	2013
CHINA	Urban Agricultural Heritage — Xuanhua Grape Garden	2013
	Jiaxian Traditional Chinese Date Gardens	2014
	Xinghua Duotian Agrosystem	2014
	Fuzhou Jasmine and Tea Culture System	2014
	Diebu Zhagana Agriculture-Forestry-Animal Husbandry Composite System	2017
	Zhejiang Huzhou Mulberry-dyke & Fish-pond System	2017
	Traditional Mulberry System in Xiajin's Ancient Yellow River Course	2018
	Rice Terraces in Southern Mountainous and Hilly Areas	2018
EGYPT	Dates production System in Siwa Oasis	2016
	Saffron Heritage of Kashmir	2011
INDIA	Koraput Traditional Agriculture	2012
	Kuttanad Below Sea Level Farming System	2013
IRAN (Islamic Republic of)	Qanat Irrigated Agricultural Heritage Systems, Kashan	2014
	Noto's Satoyama and Satoumi	2011
	Sado's Satoyama in Harmony with Japanese Crested Ibis	2011
	Managing Aso Grasslands for Sustainable Agriculture	2013
	Traditional Tea-grass Integrated System in Shizuoka	2013
	Kunisaki Peninsula Usa Integrated Forestry, Agriculture and Fisheries System	2013
JAPAN	Ayu of the Nagara River System	2015
	Minabe-Tanabe Ume System	2015
	Takachi-higo-Shiibayama Mountainous Agriculture and Forestry System	2015
	Osaki Kodo's traditional water management system for sustainable paddy	2017
	Nishi-Awa Steep Slope Land Agriculture System	2018
	Traditional WASABI Cultivation in Shizuoka	2018
KENYA	Oldonyonokie/Olkeri Maasai Pastoralist Heritage	2011
MEXICO	Chinampas Agricultural System in Mexico City	2017
MOROCCO	Oases System in Atlas Mountains (Oases of the Maghreb)	2011
PERU	Andean Agriculture	2011
PHILIPPINES	Ifugao Rice Terraces	2011
PORTUGAL	Barroso Agro-Sylvo-Pastoral System	2018
	Traditional Gudeuljang Irrigated Rice Terraces in Cheongsando	2014
REPUBLIC OF KOREA	Jeju Batdam Agricultural System	2014
	Traditional Hadong Tea Agrosystem in Hwagae-myeon	2017
	Malaga Raisin Production System in Axarquía	2017
SPAIN	Salt production system of Añana	2017
SRI LANKA	The Cascaded Tank-Village System in the Dry Zone of Sri Lanka	2017
TUNISIA	Gafsa Oases (Oases of the Maghreb)	2011
UNITED ARAB EMIRATES	Al Ain and Liwa Historical Date Palm Oases	2015
UNITED REPUBLIC OF TANZANIA	Engaresero Maasai Pastoralist Heritage Area	2011
	Shimbue Juu Kihamba Agroforestry Heritage Site	2011

GHOUT SYSTEM

The farmers from El Oued Souf have developed a non-irrigated oasis system called Ghout, adapted since the fifteenth century to face violent winds and scarce water resources in a region off the Trans-Saharan roads.

A ghout is effectively a crater dug into the sand using the speed and the force of desert winds. Through the installation of fences made of poles of dry palm leaves organized in circular lines along the edge of the crater to be dug, strong wind provokes a phenomenon of turbulence to shape the ghout naturally. The bottom ground of a ghout is always located on the top of a water reserve. Thus, the objective of shaping a profound crater is to plant palms on the top of a water table, avoiding any kind of irrigation and drastically reducing evaporation.

The other main function of the ghout is to shelter the trees from the violent Saharan winds. Indeed, one of the main issues in the desert is sand silting, which can be reduced thanks to the traditional knowledge of the Remmala – “wind engineers” – who know how to detect water tables and protect the ghout. The presence of such shelters in the desert represents a precious eco-habitat for wild species in the region.

Overall, the ghout system gathers up to 26 different local varieties of palms, highly adapted to the Saharan context and offering long conservation of their fruits. Indeed, for more than two centuries the local varieties of dates produced by this system have enjoyed particular fame for their taste and visual quality.

In short, this sustainable and non-irrigated oasis system is mostly independent and self-sufficient, relying only on traditional knowledge. It has an adapted and local agrobiodiversity based on oasis life culture and food habits. The knowledge and techniques used here could also be a precious resource in the management of sand silting, which occurs in many other regions in the world. This system has allowed the farmers to respond to the needs of local people and safeguard the rich local biodiversity that is threatened with disappearance.







HANI RICE TERRACES

Hani Rice Terraces are located in the Honghe Hani and Yi Autonomous Prefecture, which is in the southeast part of China's Yunnan Province. People from various minorities – Hani being the main minority group – have built these spectacular agricultural and natural wonders and lived in this remarkable landscape for over 1 300 years. One of the best examples of farmers' wisdom in China, the terraces are mainly distributed along the south part of the Honghe Ailao mountain and spread over four counties covering an area of about 70 000 hectares. The Hani villages are built on the mountainsides: above the villages are flourishing forests and just below are the terraces themselves.

It is amazing that in the Hani Rice Terraces there are no reservoirs, yet water supply is abundant. The forest, village, terrace and river compose the typical ecological landscape of the Hani Rice Terraces. The Hani utilize and manage local water resources in a unique, simple, economical and efficient manner that has provided a guarantee for the sustainable operation of the system.

The Hani people, their indigenous agricultural technologies, their selection of the settlement site and their traditional customs for environmental protection and conservation, all show a harmonious relationship between humans themselves and between humans and nature.



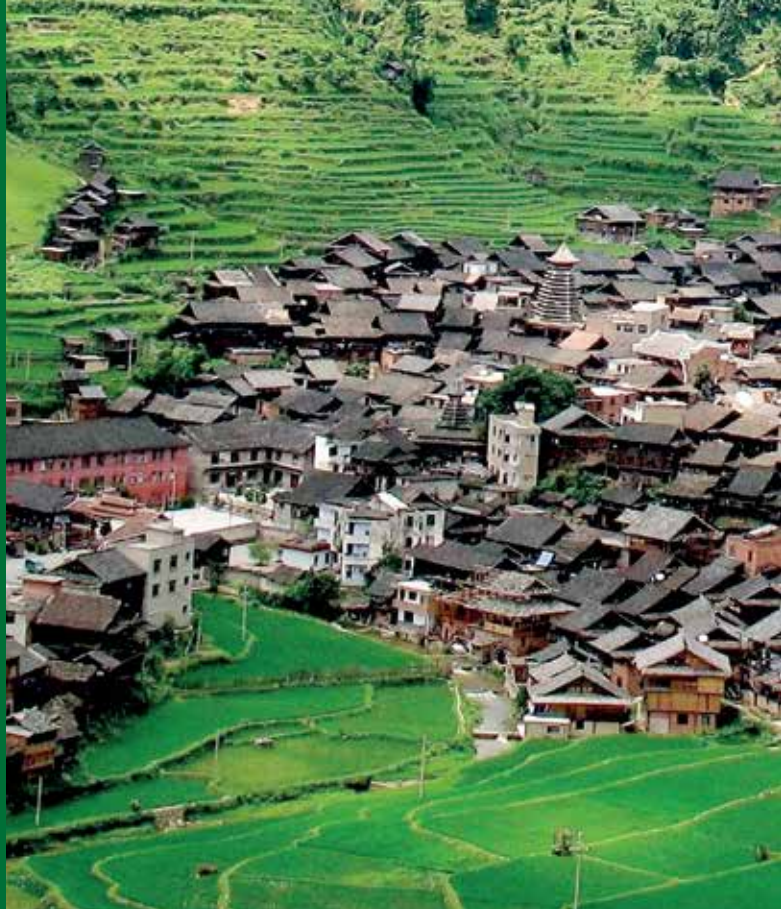
©FAO/Min Qingwen

DONG'S RICE-FISH-DUCK SYSTEM

Congjiang county is located in Qiangdongnan Miao and Dong Autonomous Prefecture, Guizhou, China, in vast mountain areas. The county has several ethnic minorities, including Miao, Dong, Yao, Zhuang and Shui.

The Rice-Fish-Duck system has a long history with strong local characteristics in Congjiang county. It is a unique mode of production and land use by Dong people based on long-term exploration under limited natural conditions. Growing rice and rearing fish and ducks at the same time in paddies creates an excellent ecosystem that is beneficial for human-managed sustainable development. It is also an economic system combined within a virtuous eco-cycle, in which many traditional methods of farming and folk customs are harboured.

This approach effectively saves land resources and achieves a natural three-dimensional agriculture by relieving the tension between humankind and nature, providing multiple goods and services. Thus, despite the influence of modern economic and societal change, where traditional values can fade away, this excellent traditional agricultural system can help in confronting many contemporary threats and challenges.





QANAT IRRIGATED AGRICULTURAL HERITAGE SYSTEMS

The Qanat Irrigated Agricultural Heritage Systems are uniquely designed, demonstrating a close relationship between nature, culture, and the surrounding environment, as well as underlying sustainability and productivity principles.

These underground tunnels following aquifers in surrounding mountain areas have facilitated the collecting of water from different layers of earth to grow food, plants and trees. The local population has been socially and culturally depending on Qanat uses since early 800 BCE so that the Qanat has come to be considered a living member of the community.

This system has contributed to the enrichment of the landscape in the Kashan region, saving it from becoming a desert. Indeed, Qanat irrigation has created and maintained the most beautiful farms and gardens, which could otherwise be threatened by over-pumping in the deep aquifers.



©George Steinmetz







MINABE-TANABE UME SYSTEM

As both food and medicine, ume (*Prunus mume*) have been a highly valued crop in Japan for about 1 300 years. Pickled ume, called “umeboshi”, keep well and have excellent medicinal effects including food-poisoning prevention and recovery from fatigue – they are consumed on a daily basis as a Japanese side dish.

The Minabe-Tanabe ume system is a unique system that has sustainably produced high-quality ume by making use of slopes with rudaceous soil, which is poor in nutrients. The system is responsible for more than half of Japan’s total ume production and its yield per unit area is almost twice that of Japan’s other ume-producing districts. Further, the system also has outstanding ume varieties as a result of the continuous effort of the local people to improve varieties over the centuries.

To make a living with soils that are not suitable for usual kinds of agriculture, about 400 years ago local people started cultivating ume, which can be produced even under these conditions. They have also maintained mixed forests as coppice forests near ume orchards and along the ridges of steep slopes. In this way, people in the region have endowed the system with functions including watershed conservation, nutrient replenishment, and slope collapse prevention, thereby sustaining ume production.

In the coppice forests, honeybees help pollinate the ume trees, and the ume aid honeybee propagation in the early spring – when few flowers are blooming – by providing them with valuable nectar. The coppice forests provide not only habitat for honeybees but also wood for a prime grade of charcoal that is produced in the area and highly appreciated in Japan. The coppice forests are managed by a selective-cutting method of coppice forest management that is not found in other places and can regenerate the trees quickly.

Sustainable agriculture and livelihoods are considered important in the world, and this GIAHS site is a model that embodies them.

TRADITIONAL WASABI CULTIVATION IN SHIZUOKA

Wasabi (*Eutrema japonicum*) is a native Japanese plant of the Brassicaceae family that has been highly prized in Japan since ancient times for the sharp flavour produced when its stems are grated. The Shizuoka region is the origin of worldwide wasabi cultivation, which is believed to have begun approximately 400 years ago, during the Keicho era (1596-1615) in the Aoi district of Shizuoka City.

The traditional cultivation method results in the production of large stems, little crop damage from disease, and little danger of nutrient depletion from repeated cultivation that is so often seen in agriculture. Thus, it is a cultivation system with an extremely high degree of suitability for wasabi production. Further, wasabi fields in steep mountainous areas currently possess a structure that is resilient to natural disasters because these fields have high water-holding capacity, and they also function to protect downstream areas from flooding disasters.



©Shizuoka WASABI Association for Important Agricultural Heritage Systems Promotion





OLDONYONOKIE/ OLKERI AND ENGARESERO MAASAI PASTORALIST HERITAGE AREA

In southern Kenya, Maasai have developed an agropastoral system over the centuries to adapt to scarce water supply and lack of grazing land availability. Maasai have succeeded in adapting the system to the surrounding environment and wildlife to satisfy both their own needs and the evolving needs of the cities nearby – instead of competing for resources they are functioning in synergy.

Their agropastoral system simultaneously integrates animals such as buffaloes, goats and sheep with endemic species and food plants such as maize and beans. Further, as the Maasai community is highly organized, they split core tasks such as grazing land research, water management, livestock movements, etc. To manage the needs of the animals and the community requires an important knowledge and understanding of nature and the climate in the region.

In this fragile environment, Maasai have skillfully shaped and maintained the landscapes through the ages in a way that is sustainable and respectful to wildlife. Thus, their agropastoral system must be preserved both to maintain the magnificence of the landscape linked to their unique identity and to keep their incredible knowledge about nature.



©FAO/David Boerma







CHINAMPA AGRICULTURE

The chinampas agricultural system is an articulated set of floating artificial islands built in a traditional way based on the oral transmission of the chinampera culture prevailing since Aztec times. The system has seen farmers turn non-cultivable lands into highly productive arable lands for growing plants and breeding cattle.

The knowledge and experience developed by the farmers through the centuries are at the heart of the agricultural productivity and ecological balance of the system. The chinampas are surrounded by canals, ditches and rows of "ahuejotes" (*Salix Bonplandiana*) – native willow species – that perform several functions, such as serving as fences for wind and insects, providing habitats for birds, and keeping the soil in the plots. The willow roots also protect the edges of the chinampas from erosion.

Faced with climatic contingencies such as frost or variation in rainfall, chinampera agriculture offers an example where agroecological intensification can co-exist with urban development and the revitalization of heritage through linking social networks to develop technological strategies and promote solidarity and a sense of community. The chinampas are a symbol of Mexican identity and a source of pride for farmers who benefit from the system to supply the city.



©GIAHS Secretariat, FAO

ANDEAN AGRICULTURE

Andean agriculture is one of the best examples of the adaptation and knowledge of farmers to their environment over the last 5 000 years or more. Actual presence of indigenous agricultural knowledge includes terraces, ridge fields, local irrigation systems and traditional agricultural tools, crops and livestock spread at different altitudes.

Multi-millennial experiences and selection have led to the domestication of a lot of endemic species such as potatoes and quinoa. Added to that, local knowledge has led to the development of three main agricultural systems, each one related to altitude: the maize area (2 800–3 300 metres), the potato area (3 300–3 800 metres) and the livestock area with high altitude crops such as quinoa and cañihua (3 800–4 500 metres). At each altitude band, native selected crops are cultivated.

Indigenous communities also form a strong social organization with their own norms and cultural rituals – such as the tribute to the Pachamama (mother earth) – leading both to sustainable practices and solidarity. Indeed, a strengthening sense of identity is probably one of the main goals to be achieved through agriculture here.

As these areas maintain most of the ancient traditional agricultural technologies, they should not be taken for granted – particularly in the current context where migration of younger people to the forest or towns may lead to a severe loss of knowledge and biodiversity.



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TRADITIONAL GUDEULJANG IRRIGATED RICE TERRACES

Between the sixteenth and the mid-twentieth centuries, unique rice paddies were constructed in Cheongsando Island combining soil and water management by re-engineering the natural environment in areas with disadvantageous conditions. The residents of the island not only constructed but have also maintained and managed Gudeuljangnon and the irrigation systems as a means of livelihood.

Gudeuljangnon are culverts constructed by stacking stones used as aqueducts in underground irrigation and drainage systems. This maximizes the usable area of the land by constructing the paddies above stacked rocks of various sizes, red mud and arable soil. By employing this technique, the farmers can adapt their water management to face droughts, converting paddies into dry lands.

Ultimately, this unique way of life is part of a very rich culture including typical cuisine, religions and songs related to agriculture. And despite fewer youths practising agriculture and urbanization of the island, the Gudeuljang system must be preserved to keep this unique water network alive.







THE AGRICULTURAL SYSTEM OF VALLE SALADO DE AÑANA

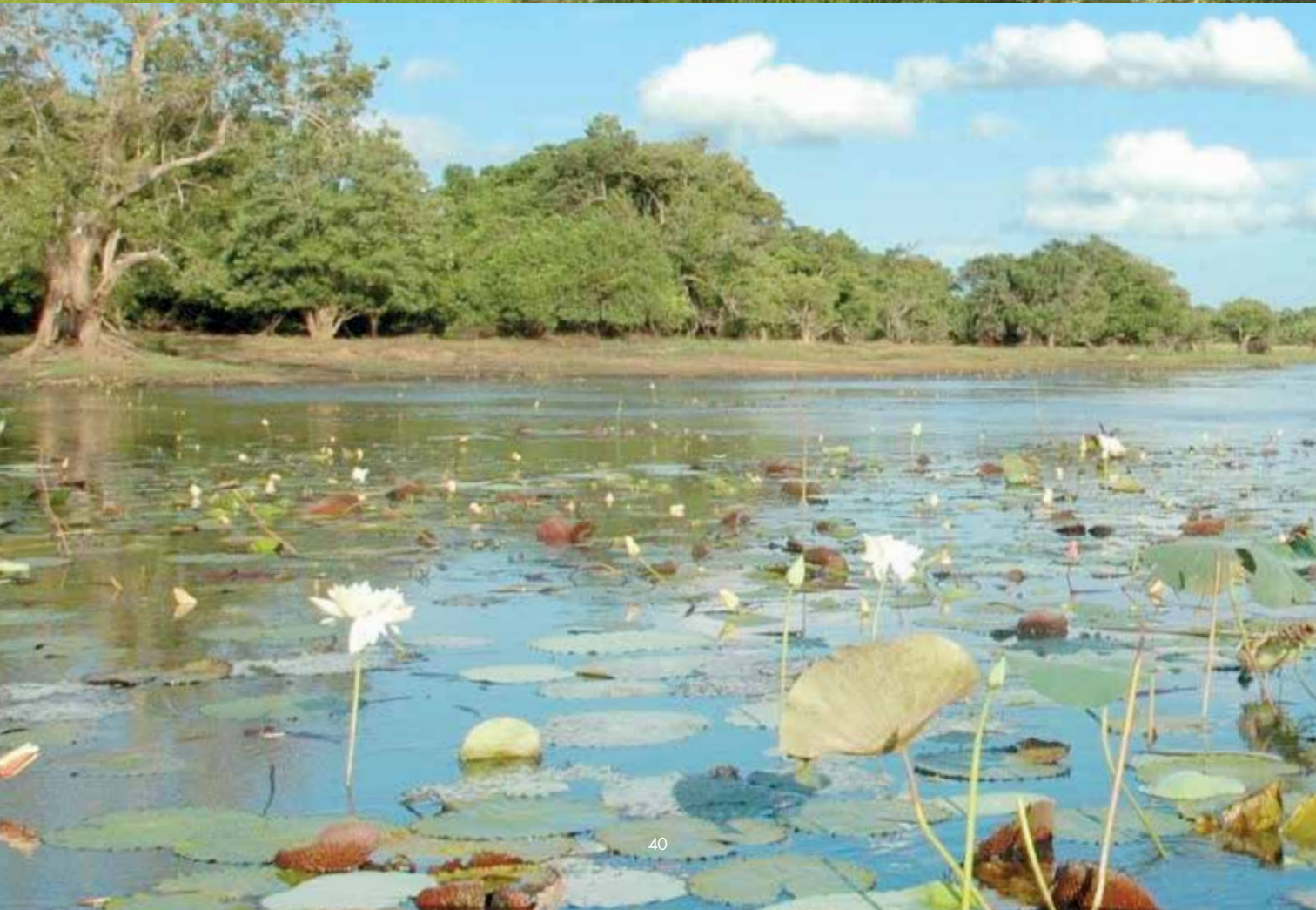
Valle Salado is located in the town of Salinas de Añana (Alava, Basque Country), in northern Spain. It is crossed by two small rivers which join at the centre of the valley and sits on a giant salt bubble originating from a sea that disappeared millions of years ago.

Thanks to the existence of a geological phenomenon called a "diapir" and to the injection of fresh water into a reserve of old salt trapped in the soil, a number of salt water springs emerge at the highest part of the valley. This salt water is channeled by means of an ingenious gravity-driven system of canals to the wells and salt pans, where it evaporates to form salt.

The ancient cultivation techniques have been carefully preserved alongside the gradual introduction of changes required to preserve the livelihood of the local community, which nonetheless respect the basic conditions that experience has shown are the key to the system.

©The Añana Salt Valley Foundation





THE CASCADED TANK-VILLAGE SYSTEM IN THE DRY ZONE OF SRI LANKA

The Cascaded Tank-Village System (CTVS) is described as a connected series of tanks organized within a micro-catchment of the dry zone landscape, storing, conveying and utilizing water from a sporadic rivulet.

It is an ancient, widely used and unique traditional agriculture system mainly found in the dry zone of Sri Lanka. The system has evolved over a period of nearly two millennia. It provides water for irrigation, domestic purposes, animals and ecosystems.

The CTVS predominates over all other systems due to its expansive coverage, unique technology, sustainability, and resilience to natural disasters (such as droughts, epidemics, floods, cyclones, and external invasions), high biodiversity and many other beneficial characteristics. Indeed, this system has helped rural people in the dry zone of Sri Lanka to survive in isolation for several centuries of negligence due to unstable socio-political situations.



SHIMBWE JUU KIHAMBA AGROFORESTRY HERITAGE SITE

The Northern Upland Agroforestry system is characterized by a structural diversity, adopted by farmers to achieve higher efficiency of resource use by harvesting solar energy and using soil nutrients and moisture. It also helps to exploit the space, both temporally and spatially in order to meet the many demands of food, fodder, fuel, timber, organic mulch, and medicinal plants.

Growing a high diversity of crops and trees but also animals, the agroforestry system is highly integrated into its environment. It also participate in maintaining the soil fertility but mainly in regulating the water flow from Mount Kilimanjaro as a water tower for the region.

Satisfying the needs of local communities from the northern region of the United Republic of Tanzania, this system is nowadays threatened mainly due to land scarcity, population growth and migration of younger generations. Beyond its feeding role, this system is an example of synergy between humans, plants and animals in contributing towards keeping a sustainable environment.

GIAHS AND GLOBAL ISSUES

GIAHS is globally recognized as being an important contributor to the UN Sustainable Development Goals and the Convention on Biological Diversity.

GIAHS AND SDGs

The 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (SDGs) were adopted in September 2015 by the United Nations member states. Food and agriculture are key to achieving the entire set of SDGs. Rural development and investment in agriculture - crops, livestock, forestry, fisheries and aquaculture – are powerful tools to end poverty and hunger, and bring about sustainable development.

The GIAHS sites, with their integrated approach and explicit recognition of multiple issues and roles associated with agriculture, are already contributing to achieving a wide variety of SDGs:

- After ten years of the designation of the Rice and Fish Culture System in China in 2005, the price of the rice produced in that area has doubled and the tourism income in Qingtian county also increased, as well contributing to achieving zero hunger (SDG 2) and eliminating poverty (SDG 1).
- Various GIAHS sites in China have embraced new technologies and work with the private sector to promote their agricultural heritage products,

generating employment opportunities and achieving SDG 8. Innovation and tradition have merged, allowing youth to return to rural areas to work with local farmers opening their own agricultural heritage product online shops.

- GIAHS in the United Republic of Tanzania was instrumental in giving a voice to women and including them in the decision-making processes of the village, achieving gender equality (SDG 5). There is a special group in the United Republic of Tanzania called Mapendo (love), linked to the GIAHS site that promotes women's access to financial services and small loans used to support their families and invest in other agricultural activities diversifying their livelihoods.
- Many GIAHS countries have established cooperatives and local associations to promote the community-based dynamic conservation of GIAHS sites. For instance, in Algeria four local associations were created with the objective of preserving local knowledge and culture related to the Ghout system, by documenting and raising awareness at various levels.
- The Engaresero Maasai Pastoralist site in the United Republic of Tanzania established a Community Based Organization to sustainably manage natural resources and livestock development in the village, promote tourism activities, and preserve and develop the indigenous knowledge and customary law of the Maasai community in the area.

The concept of agricultural heritage sites so far is being embraced and even mainstreamed at the policy level in several countries around the world. National GIAHS committees have been formed to encourage the agricultural heritage concept to become the norm in national sustainable agricultural development policy agendas in China, Japan, the Republic of Korea, Tunisia, Madagascar and Mauritania. In Tunisia, a law was passed to conserve the genetic heritage of the date palm and oasis ecosystems that became a GIAHS site in 2010. A charter of the oases to recognize oasis agriculture as a cultural, social and economic heritage was also established.

Acknowledgment of the valuable cultural treasure troves these sites harbour is also recognized in Kenya and the United Republic of Tanzania, where pastoral heritage museums were established for exhibition and transmission of traditional knowledge.

Each GIAHS possesses features that serve as selection criteria that could have the potential to contribute to relevant SDGs, as follows.



EGYPT

Dates Production System
in Siwa Oasis.
©West Siwa Development Project

GIAHS AND AGROECOLOGY

According to the High Level Panel of Experts on Food Security and Nutrition (HLPE)¹, “from a scientific and technical perspective, agroecology applies ecological concepts and principles to food and farming systems, focusing on the interactions between microorganisms, plants, animals, humans and the environment, to foster sustainable agriculture development in order to ensure food security and nutrition for all, now and in the future.

Today’s more transformative visions of agroecology integrate transdisciplinary knowledge, farmers’ practices and social movements while recognizing their mutual interdependence”.

GIAHS sites are living examples of the ecological concepts and principles, such as diversity, context-specific knowledge, culture and food traditions, that have been applied over centuries and form the basis of agroecology. One of the main pillars of GIAHS sites is their agricultural biodiversity. Biodiversity for food and agriculture harnesses the delivery of ecosystem services such as pollination, soil-based ecosystem services and pest control. There are many ways

¹ See <http://www.fao.org/cfs/cfs-hlpe/en>

GIAHS Criterion 1:

FOOD & LIVELIHOOD SECURITY

- Sustainable agricultural systems for food production and relevant economic activities for rural livelihood and associated decent work [SDG 1, SDG 2, SDG 8]
- Use of biomass energy and reduced use of chemical fertilizers, thereby reducing energy footprint [SDG 7]
- Encouragement of sustainable consumption and production of food in the GIAHS [SDG 12]

GIAHS Criterion 2:

AGROBIODIVERSITY

- Rich agrobiodiversity could lead to: alleviation of hunger, resilience to climate change, biodiversity conservation of its surrounding terrestrial and aquatic ecosystems: [SDG 2, SDG 3, SDG 13, SDG 14, SDG 15]

GIAHS Criterion 3:

LOCAL & TRADITIONAL KNOWLEDGE SYSTEMS

- The sustainable use of natural resources through traditional knowledge and practices

promotes the conservation of terrestrial and aquatic environments, combating climate change

[SDG 13, SDG 14, SDG 15]

GIAHS Criterion 4:

CULTURE, VALUE SYSTEMS

& SOCIAL ORGANIZATIONS

- Recognized role of women in preservation of culture and social values could promote equity in the use and access to natural resources [SDG 5, SDG 10]
- Integrated approach for dynamic conservation through innovation which encourages partnerships between rural and local communities [SDG 9, SDG 10, SDG 17]

GIAHS Criterion 5:

LANDSCAPE & SEASCAPE FEATURES

- The ecological resilience of GIAHS ensures the provision of clean water and protects habitats for terrestrial and aquatic life [SDG 6, SDG 13, SDG 14, SDG 15]

GIAHS AND GLOBAL ISSUES

in which increasing the diversity of the biological components within production systems can contribute to sustainable production.

Agricultural biodiversity is the outcome of the interactions among ecosystems, varieties, breeds, genetic resources of crops, livestock, trees or fish and the traditional knowledge and practices accumulated through centuries. In these systems, farmers' cultures and social involvement are important factors for the continuity of traditions embedded in the systems. These traditional and unique agricultural systems have resulted in well-balanced agroecological systems, the variety of which reflect the diversity of agroecological approaches according to natural, socioeconomic and territorial contexts. Examples include:

- Sea-forest-agriculture in Chiloé Island, Chile;
- Integrated aquaculture with silk worms and mulberry production system, China;
- Shimbwe Juu Kihamba traditional agroforestry in the United Republic of Tanzania; and
- Chinampas agricultural system in Mexico City, Mexico.

GIAHS AND CLIMATE CHANGE

Many GIAHS sites have withstood climate variability for centuries showing a remarkable ability to cope with the adverse impacts of climate change. They have been

able to minimize crop failure and increase resilience through diversifying varieties, increasing use of drought-tolerant varieties, improving water management techniques, and adopting mixed cropping, agroforestry and other effective traditional adopting techniques. In addition, many indigenous management practices that reduce the impacts of climate variation also incorporate wild and local varieties into the agricultural system and increase the temporal and spatial diversity of crops both at the field and landscape level. In some areas where flooded water covers farmland for many months, farmers have created artificial floating farming beds from organic materials on which vegetables are grown and harvested. Farmers have realized that agroforestry systems have functions to create a microclimate to protect crops inside the system from the outside heat and strong sun. Some GIAHS sites have also adopted good soil management practices, as well as various types of agricultural techniques that could lead to higher carbon sequestration, thus contributing to greenhouse gas reduction.

The ability of some GIAHS sites to adapt to climate fluctuations and even mitigate climate change underlines the need to re-evaluate

indigenous technology as a key source of information on adaptive capacity for climate change.

A number of concrete examples of how the GIAHS sites adapt to climate change constitute repositories of valuable resources for climate change adaptation.

1. The floating gardens in Bangladesh are a good example of farmers developing solutions to face recurrent flooding, using invasive aquatic plants that are cut and used for building floating fields.
2. The Kihamba agroforestry system practised on Mount Kilimanjaro in the United Republic of Tanzania relies on multi-layered crops (coffee, bananas, taro, maize, etc.) cultivated under endemic forest timbers which protect crops from heat and strong sunshine outside. This system also adopts traditional mulching practices to maintain good soil conditions.
3. The Chinampas system in Mexico and the Xinghua Duotian system in China are arable lands built thanks to traditional knowledge in wetlands and flooded areas. Both systems are very interesting examples of turning non-cultivable lands into arable or pasturelands. People move from one field to another in boats and practise fisheries activities in between.
4. Oasis systems in North Africa and the Near East are used as a tool to combat desertification and scarcity of water resource in arid regions. The three-layered, multi-crop systems' resilience is based on the cultivation of palm dates. The palm date cover mitigates climatic parameters such as temperature in the oasis, evapo-transpiration, maintenance of a water reserve, reduction of soil salinity, etc.

5. Hani rice terraces in China highlight GIAHS sites' resilience in the field. Between 2011 and 2013 a severe drought occurred in this region devastating all the surrounding mono-crops and modern agricultural production. The Hani rice terraces system, nonetheless, emerged from the drought with little damage thanks to the traditional way of cultivating. Relying on hilltop forests and traditional water management, the rice paddy fields have survived.
6. As mentioned going through the criteria, all of our sites can be considered as open genetic reserves of endemic, local and adapted varieties, species and breeds. This agrobiodiversity will be critically important when genetic adaptation cannot follow as fast as climatic changes do, often accompanied by pests and diseases.

GIAHS AND AGROBIODIVERSITY

Agrobiodiversity – and genetic resources conservation – is one of the main pillars of the GIAHS Programme. It is increasingly recognized as being critically important for the development of farming systems that are climate resilient and pest resistant, while also ensuring a great variety of food diets. For official designation, the GIAHS programme therefore expects candidate sites to organize multi-stakeholder dynamic conservation plans for conserving, renewing and guaranteeing the on-going evolution of genetic resources against different environmental stresses.

THE WAY FORWARD – KNOWLEDGE MANAGEMENT

Looking to the future, the GIAHS Programme should continue to disseminate the great benefits arising from GIAHS sites and strengthen knowledge management in the following ways:

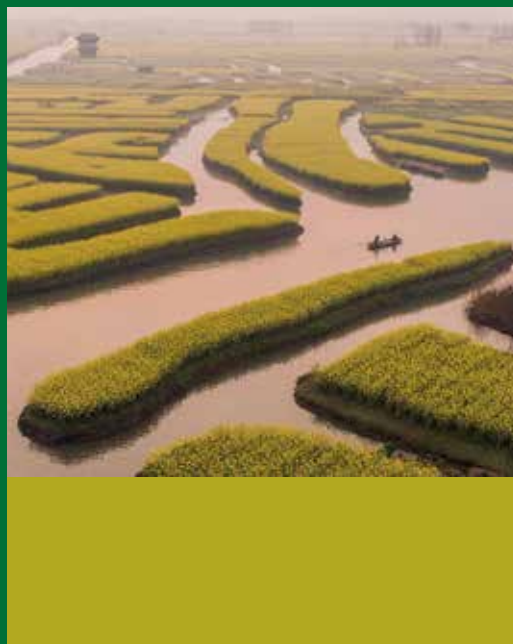
1. Provide support to member countries on how to craft a well-coordinated action plan and develop technical guidance to implement it. This should include advice on actions and policies required for effective resource management, traditional knowledge management, conservation of valuable agrobiodiversity and development of markets for local agricultural products. The sharing of experiences and knowledge between GIAHS sites and experts in the field will be key.
2. Facilitate the monitoring of the implementation of GIAHS action plans, including evaluation of outcomes and proposals for corrective actions where necessary.
3. Collect scientific evidence and objective data that support traditional knowledge and good agricultural practices in GIAHS sites. This will help in evaluating the current state of the sites and in spreading awareness of useful technologies to other agricultural production areas.
4. Develop a mapping system of GIAHS sites to monitor land use changes.

Examples of dynamic conservation in action include: farmers in Chiloé Island in Chile and in Peru carrying out activities to conserve endemic species of potatoes; local traditions being used to conserve valuable varieties of dates in the Oasis GIAHS sites in Tunisia, Morocco, Algeria and the United Arab Emirates; and local farmers maintaining endemic rice varieties resilient to drought in Hani rice terrace sites in China.

With the increasing penetration of the market economy into traditional farming communities previously reliant on subsistent agriculture, there is a threat that only high-demand agricultural products will be cultivated, with less-requested varieties abandoned. In this sense, GIAHS has the potential to become a model for protecting and sustaining endemic varieties and species through dynamic conservation activities.

GLOBALLY IMPORTANT AGRICULTURAL HERITAGE SYSTEMS

Combining agricultural biodiversity,
resilient ecosystems, traditional
farming practices and cultural identity



The “Globally Important Agricultural Heritage Systems” (GIAHS) Programme was developed by FAO to help in the conservation and adaptive management of outstanding traditional farming systems.

These systems rely on centuries-old farming practices and accumulated knowledge to adapt to the unique features of local landscapes and create ecosystems that are rich in biodiversity, resilience and character.

Originally, eight GIAHS sites were designated in six pilot countries (Algeria, Chile, China, Peru, the Philippines and Tunisia), but over the last decade the number has quickly risen to an impressive 50 GIAHS sites in 20 countries worldwide. The sites are awarded GIAHS designation not only for their historical

significance and incredible heritage; they must also prove that they are able to sustainably provide food, protect livelihoods, and preserve and manage precious landscapes going forward.

With a general introduction to and brief history of the GIAHS Programme, this publication outlines the two core features of GIAHS sites, as well as the five main selection criteria used when assessing suitability for GIAHS designation. It also introduces the concept of ‘dynamic conservation’ and presents examples of some of the magnificent GIAHS sites around the world. Finally, it outlines how the GIAHS Programme itself fits in with global issues such as the UN Sustainable Development Goals, agroecology and agrobiodiversity.