Heritage for the Future

Traditional systems of agriculture constitute a cumulative legacy of humankind initiated since the Neolithic of fundamental importance. Modern agriculture constantly threatens the sustainability of this inheritance. Because of their ecological and cultural significance and the wealth and breadth of accumulated knowledge and experience in the management and use of resources that these systems represent, it is imperative that they be considered globally significant resources to be protected and conserved, as well as allowed to evolve. Policy support and actions at international, national and local levels are needed to allow GIAHS to evolve while providing continued goods and services in their totality and integrity.

Inherent to the concept of GIAHS is an acknowledgement that indigenous knowledge has intrinsic merit, and holds development potentials. Fortunately in many parts of the developing world, there still exists a diversity of local and traditional practices of ecosystem management, including systems of biodiversity management, and soil and water conservation. Many rural peoples, who are resource-poor farmers, are inventively self-

reliant, and continuously experiment, adapt and innovate. The rural communities living in traditional agricultural landscapes and GIAHS sites may hold many of the potential answers to the challenges of agricultural production and natural resources management in an era of climate change. The GIAHS framework acknowledges that there are real opportunities for building on ecosystem and livelihood diversity and investing in local communities and their resources, indigenous knowledge and institutions, to solve hunger and poverty in rural areas, rather than relying on excessive external inputs and often inappropriate and unsustainable technologies from outside.

To sustain and capitalize GIAHS it is necessary to improve understanding of threats that they face and identify ways to mitigate risks of land degradation, and the perverse impacts of globalization and global change. In this sense, to prevent further degradation of GIAHS, their dynamic nature must first be recognized. Their resilience depends on capacity to adapt to new challenges without losing their biological and cultural wealth, and productive capacity. Trying to conserve GIAHS by "freezing them in time" would surely lead to their degradation and condemn their communities to poverty. The initiative emphasizes that *"GIAHS is not about the past but it is about the future"*, referring to the approach centred on people, human management and knowledge systems. This encompasses their socio-organization, economic and cultural features that underpin the conservation and adaptation processes of agricultural heritage, providing support without compromising their resilience, sustainability and integrity.

Globally Important Agricultural Heritage Systems (GIAHS)

GIAHS pilot systems around the world

The GIAHS initiative has selected pilot systems located in several countries of the developing world. The values of such systems not only reside in the fact that they offer outstanding aesthetic beauty, are key in the maintenance of globally significant agricultural biodiversity, and include resilient ecosystems that harbour valuable cultural inheritance, but also have sustainably provisioned multiple goods and services, food and livelihood security for millions of poor and small farmers, local community members and indigenous peoples, well beyond their borders.

Despite the fact that in most parts of the world, modernity has been characterized by a process of cultural and economic homogenization, in many rural areas specific cultural groups remain linked to a given geographical and social context in which particular forms of traditional agriculture and gastronomic traditions thrive. It is precisely this persistence that makes for the selection of these areas and their rural communities a GIAHS site.

The dynamic conservation of such sites and their cultural identity is the basis a strategy for territorial development and socio-cultural revival. Overcoming poverty is not equivalent to resignation to loss of the cultural richness of rural communities.

On the contrary, the foundation of regional development should be the existing natural and agricultural biodiversity and the socio-cultural context that nurtures it.

CHILOE AGRICULTURE SYSTEM
Chiloé island, Chile

The Archipelago of Chiloé, a group of islands in southern Chile, is a land rich in mythology with native forms of agriculture practiced for hundreds of years based on the cultivation of numerous local varieties of potatoes. Traditionally the indigenous communities and farmers of Chiloé cultivated about 800-1,000 native varieties of potatoes. The varieties that still exist at present are the result of a long domestication through, selection and conservation processes of ancient Chilotes.

The conservation of such rich genetic diversity provides a major social and economic service to the Chilotan people by improving nutrition, welfare and resiliency, as many varieties are resistant to introduced pathogens and droughts which are increasingly affecting the region. Native varieties are highly adapted to the range of ecological conditions found in the region and are of key importance for subsistence production. With more than 60% of the population still living in rural areas, Chilotan

small farmers located in inland as well as coastal valleys are cultivating native and exotic potatoes, giant garlic, wheat, barley and rye. Old apple varieties in small orchards with native vegetation are utilized to feed local races of sheep. In addition many farmers preserve native forest areas from which they derive wood and non-timber products. Others gather from the wild or grow a variety of medicinal plants. Most harvest for subsistence family use but surplus is sold in local markets in nearby towns or cities. Potatoes, sheep meat and marine resources are the backbone of the food security of the Chilotan population. Rural women have traditionally carried out agrobiodiversity conservation activities in small plots on family vegetable gardens, comprising a key source of knowledge about on-farm seed conservation, cultivation and potato-based gastronomy in their respective communities.

ANDEAN AGRICULTURE SYSTEM

The Cuzco-Puno corridor, Peru

The Andes are a range of mountains including the Puna and Páramos valleys. They are considered among the most heterogeneous environments on the planet. Andean people have domesticated a suite of crops and animals. Of particular importance are the numerous tubers, of which the potato is the most prominent. Generations of Aymara and Quechua have domesticated several hundred varieties by in the valleys of Cusco and Puno, of which more than 400 varieties are still grown today. The maintenance of this wide genetic base is adaptive since it reduces the threat of crop loss due to pests and pathogens specific to particular strains of the crop. Other tubers grown include oca, mashua, ullucu, arracacha, maca, achira and yacón. Farmers also grow some fruit trees, corn and chenopods.

Ascending the Andes mountain range, different climates, plant types and human shaped landscapes composed of patchworks of terraces, irrigation works, crop fields and settlements are found. The impact of the complex Andean environment on human economy has resulted in vertically integrated spatial arrangements of settlements and agricultural systems. The pattern of verticality derives from climatic and biotic differences related to altitude, geographical location and human influence. The evolution of agrarian technology in the Central Andes has produced extensive knowledge about using the environment sustainably. This knowledge affected the division of the Andean environment into agroclimatic belts by altitude, each characterized by specific field and crop rotation practices, terraces and irrigation systems, and the selection of animals, and crop varieties.

The most important cultural adaptation to these environmental constraints has been the development of farming systems and technologies designed to yield an adequate diet with local resources while avoiding soil erosion. The highlands of Peru contain more than 600,000 hectares of terraces, mostly constructed during prehistoric times. These staircase farms, built up steep mountain slopes with stonewalls, contributed vast amounts of food to the Incas. The farms provided tillable land, controlled erosion and protected crops from frost and freezing. Many were irrigated with water carried at long distances through stone canals. Today, as in the distant past, the major crops grown on these terraces are native tubers such as potatoes, oca and ulluco.

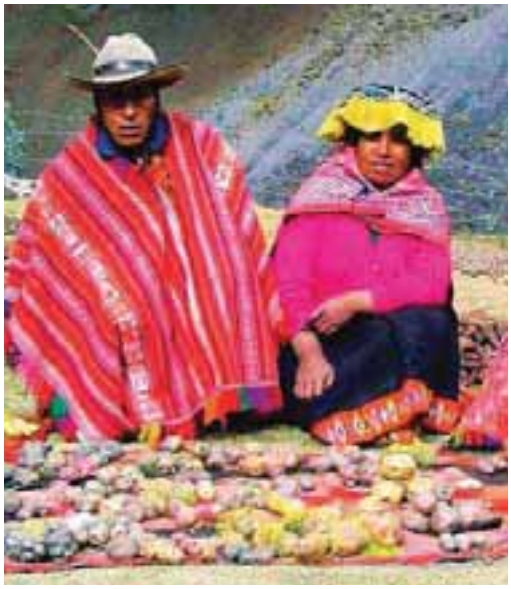
The 350 kilometre transect of the GIAHS pilot site captures environmental heterogeneity notably determined by the mountainous topography. This extends from the southern area of the Peruvian Andes including the sacred city of the Incas, **Machu Picchu** (1900 meters) and the whole Vilcanota River Watershed (4300 meters), crossing to northern part of the Peruvian high plateau and eventually reaching **Lake Titicaca** (3800 meters). In this transect more than 300 native communities maintain most of their ancient traditional agricultural technologies in spite of strong external economic and other influences. Many cultural and agricultural treasures from the Inca civilization can be found in this GIAHS transect, which has been carefully conserved and improved over the centuries in order to live in high altitudes (from 1000 to 4000 meters above sea level).

One of the most amazing features of this agriculture heritage is the terracing system used to control land degradation. Terraces allow cultivation on steep slopes and at different altitudes. Andean peasants manage a diversity of crops and crop varieties which have been adapted to different altitudes and are grown in plots in up to different ecological zones to spread risk across the

mountain environment. A plot is seldom dominated by a single crop and even a potato field has up to 10 different varieties. Crops are combined for different purposes. Mashua and potato are grown together as protection against certain diseases. To prevent cattle damage, tarhui (lupine) is planted on the edge of maize fields. Maize, beans and pumpkin complement each other in maintaining soil fertility and maximising use of growing space.

In the high plateaus around Lake Titicaca, farmers used to dig trenches (called "sukakollos" or "waru-waru") around their raised fields. These trenches were filled with water, modifying or regulating the microclimate and allowing for crop production in the midst of frosts. These ingenious platforms of soil surrounded by ditches filled with water are able to produce bumper crops, despite floods, droughts and the killing frost common at altitudes of nearly 4000 meters. This ingenious system of raised fields emerged on the high plains of the Peruvian Andes about 3,000 years ago.

The combination of raised fields and canals has proven to have important temperature moderation effects, extending the growing season and leading to higher productivity on the Waru-Warus compared to chemically fertilized pampa soils. In the Huatta district, reconstructed raised fields produce an impressive harvest with sustained potato yield of 8 to 14 tons per hectare per year. In Camjata, with the waru-waru system, potato yields can reach up to 13 tons per hectare per year.



IFUGAO RICE TERRACES

Philippines

The ancient Ifugao Rice Terraces (IRT) are the country's only highland mountain rice ecosystem (about 68,000 hectares) featuring the Ifugao ingenuities, which has created a remarkable agricultural organic paddy farming system that has retained its viability over 2000 years. The continued existence and viability of the rice terraces is a demonstration of strong connections between culture and nature, marvellous engineering systems, indigenous technological innovation and flexibility, and the determined spirit of local communities to maximize use of mountainous and steep lands for food production. In 1995, five terrace clusters in the Ifugao province were declared UNESCO World Heritage Sites honouring these spectacular landscapes reflecting the harmony between rural society and the environment.

The rice terraces are managed based on indigenous knowledge. The Muyong, a private forest that cap each terrace cluster, is sustained through collective effort and under traditional local practices. The communally managed forestry areas at the apex of the terraces contain about 264 indigenous plant species, mostly endemic to the region. The terraces form unique clusters of micro-watersheds and have become an integral part of the whole mountain ecology. They serve as a rainwater filtration system and are saturated with irrigation water all year round. The technology, in which cultural activities are harmonized with the rhythm of climate and hydrology management, has enabled farmers to grow rice at over 1000 meters.

IRT paddy farming favours planting traditional rice varieties of high quality for food and rice wine production. Varieties of mudfish, snails, shrimps and frogs - many of them endemic - are associated with the rice paddies. The Muyong associated with the rice terrace paddies serve as biodiversity reservoirs (171 tree species, 10 varieties of climbing rattan, 45 medicinal plant species, and 20 plant species used as ethno-pesticides; about 41 bird species, 6 indigenous mammal species, including beneficial species of rats, and 2 endemic species of reptiles) and are fundamental to the agro-ecosystem.

RICE-FISH CULTURE
Qingtian county, China

In Asia fish farming in wet rice fields has a long history. Over time an ecological symbiosis has emerged in these traditional rice-fish agricultural systems. Fish provide fertilizer to rice, regulate micro-climatic conditions, soften the soil, displace water and eat larvae and weeds in the flooded fields; rice provides shade and food for fish. Furthermore, multiple products and ecological services from the rice ecosystems benefit local farmers and the environment.

Fish and rice provide high quality nutrients and an enhanced living standard for farmers. The rice-fish association reduces cost and labor, increases productive efficiency and reduces use of chemical fertilizers, pesticides and herbicides for insect and weed control through agro-biological conservation and on field environmental protection. In Longxian village of Zhejiang Province, this system demonstrates an ingenious approach to generating ecological, economic and social benefits through integrated systems that perform essential ecological functions.

About 20 native rice varieties - many threatened - grow in the rice paddies, interwoven into the landscape with home gardens, livestock, poultry, trees, field hedges, small plots featuring numerous native vegetables and fruits including lotus root, beans, taro, eggplant, Chinese plum (*Prunus simoni*) and mulberry, 6 native breeds of carp, five other species of fish, several amphibians and snails can also be found in the paddies. Seven species of wild vegetables are commonly collected along field borders where 62 forest species thrive with 21 species used as food as well as 53 species for medicinal and herbal purposes.

HANI RICE TERRACES
China

Hani Rice Terraces are located in the south-east part of the Yunnan Province. The Hani are the main minority local group and have lived in the region for over 1300 years. Their rice terraces are distributed along the south slopes of the Ailao Mountains covering an area of about 70,000 hectares. Hani villages are usually located on the mountainsides in a landscape with flourishing forests above and the Honghe River below. Hani Rice Terraces are rich in agricultural biodiversity and associated biodiversity. Rice planted in Hani terraced fields is extremely diverse even though it has been subjected to genetic erosion. Of the original 195 local rice varieties, today there are still about 48 varieties. Local varieties of rice include Hongjiaogu, Shuihongjiaogu, Dabaigu, Maxiangu, Mazhagu, Pizagu, Changmaogu, Shangu, Xianggu, Shuihuangnuo, Damaonuo, etc. To conserve rice diversity, Hani people are exchanging seed varieties with surrounding villages. In addition to the diversity of rice in Hani terraced fields, other common types of plants and animals include a large variety of local aquatic flora and fauna such as fish, snail, eel, loach, shrimp, stone mussels and crab as well as duckweed, lotus and other aquatic plants. Wild herbs like water celery, plantain and Houttuynia are grown on the ridges of terraced fields. Hani communities also raise ducks and culture a variety of fishes including common carp, silver carp, crucian carp and other fish species within the rice terraces and also plant soybeans on the ridges between fields.

The vertical distribution along the mountain slopes of the Forest - Village - Terrace - River landscapes constitutes a unique system of energy and material flows. Part of surface rainfall runoff percolates into the underground water system, while the balance of the runoff and springs flow through the forests, villages and terraces. The flowing water carries nutrients from the forest litter, village sewage and waste, and soil into the layers of horizontal terraced fields. These nutrients and sediment are trapped and filtered in the fields, hence improving soil fertility of the terrace fields. The spatial distribution of the different components of the Hani terrace system performs multiple ecological functions, including soil and water conservation, control of soil erosion, maintenance of system stability and water-purification.

The Hani people also invented two traditional methods of “fertilization of rice fields with hydropower”. The first fertilization method

requires each village to dig a communal manure pond, in which livestock manure is gathered. During spring ploughing, water is released from the large pond and nutrient-rich water washes into the terraced fields. Nutrients are ploughed into the subsoil to provide long-lasting basic fertility.

The second type of fertilization method uses June and July rains, which wash dung and humus from the mountain into ditches and diverts them into terraced fields to fertilize the flowering rice. These traditional methods of soil fertilization not only save energy and labour in the fertilization process but also make full use of the organic "garbage" in the village and the nutrients carried by water runoff and natural soil erosion. Management of ditches plays a very important role in terraced field irrigation. Water coming down the hills has to go through ditches to reach the whole terrace. The purpose of digging, cleaning and maintaining ditches is to catch flows from mountain forests and spring water seeping from mountains to irrigate terraces. In addition, the ditches also

In the absence of a dedicated global support structure, many of these heritage systems and associated communities are threatened with virtual extinction. With rapid advances in globalization, liberalization of trade and commerce, technological change and revolution in communications, these traditional systems are increasingly being challenged by factors such as: (a) agricultural transformation and loss of traditional agricultural know-how and techniques, (b) lack of payment for non-market goods and services, (c) out migration of farmers due to local economic pressures or opportunities elsewhere, (d) loss of biodiversity and (e) cultural erosion.

The disappearance of cultures, habitats and human-created ecosystems is a serious and immediate threat. There is need to protect and safeguard the unique characteristics of agricultural heritage systems: their importance for human resilience; the value of the conservation of biodiversity, cultural, spiritual and agro-ecological assets in the light of the goods and services provided by traditional systems in diverse local contexts. GIAHS main goal is to design policy strategies conceived in a global context to meet the threats that undermine the sustainability and agro-ecology of traditional agricultural landscapes.

deposit sediments before entering the terrace to avoid continuously elevating the terrace surface due to sediment deposition resulting in declining water-retention capacity. To enable every household reasonable access to water, the Hani invented a unique water allocation method with "water dividing wood", "water dividing stone" and "watershed distribution". A wood or stone bar is placed at the junction of water diversion to lower ditches. The wood or stone is carved with different sizes of water outlets to divide and allocate a specific volume of water flow to lower ditches. The size of the water outlet for each lower ditch is decided according to the irrigation area of the ditch, the water flow in the upper ditch, and the historical order of irrigation priority. This water distribution method not only conserves water, but also ensures irrigation of lower hill paddy, and has set a precedent for irrigation of mountainous regions.

Table 1. The extent of traditional agriculture in the developing world.

REGION	NUMBER OF FARMERS	AREA (HECTARES OR %)	CONTRIBUTION TO FOOD SECURITY
Latin America.	a. 160 million peasants. b. 50 million indigenous people.	38% of total land devoted to agriculture, about 60.5 million hectares.	41% of food consumed domestically.
Africa	a. 60-80% labor force involved in agriculture. a. 70% of population living in rural areas (about 375 million of Sub-Saharan Africa.	100-150 million hectares	80% cereals 95% meat
Asia	200 million small scale rice farmers.	a. 7.3 million hectares of upland rice. a. 20.5 million hectares of rainfed rice.	200 million people supported by upland shifting cultivation.

Source: Organic agriculture, environment and food security (FAO 2002).

Small farms and family farming have been and will remain a key component of our efforts to reduce global food insecurity, alleviating poverty and achieving the Millennium Development Goals (MDGs). In the context of increased global urgency for economically viable, socially responsible and environmentally sound solutions, GIAHS can serve as benchmark systems for international and national strategies for sustainable agriculture and rural development. They address the increasing food and livelihood needs of the poor and the sustainability of natural resources in an era of climate change.

WANNIAN TRADITIONAL RICE CULTURE

China

Wannian County is located in the north-east of the Jiangxi Province and the lower reaches of the Lean River. It is under the jurisdiction of Shangrao City in Jiangxi. The Wannian has a long history, a splendid ancient civilization and is believed to be at the origin of rice cultivation. Its wild rice ancestor is found in neighbouring Dongxiang County.

Wannian traditional rice was formerly called "Wuyuanzao" and is now commonly known as "Manggu", cultivated in Heqiao Village since the North and South Dynasty. Wannian varieties are unique traditional rice varieties as they only thrive in Heqiao Village. The varieties require cold spring water and special soil conditions and climate found in in this village. This traditional rice is of high nutritional value as it contains more protein than ordinary hybrid rice and is rich in micronutrients and vitamins. Rice culture is intimately related to local people's daily life, expressed in the cultural diversity of their customs, food and language. As ancient but dynamic tradition, Wannian people have developed a set of experiences in rice seedling preparation and transplanting, field management, harvesting, storage and processing. Traditional rice is resistant to insects and adapted to poor soils, hence farmers do not need to use chemical fertilizers and pesticides. This contributes to environmental quality and biodiversity conservation.

OASES OF THE MAGHREB

El Oued, Algeria and Gafsa, Tunisia

The oases of the Maghreb region are green islands flourishing in a constraining and harsh environment. They are home to a diversified and highly intensive and productive system, which has been developed over millennia. Sophisticated irrigation infrastructure constitute a crucial element of the oasis systems, supported through traditional local resource-management institutions which ensure a fair water distribution.

Dominated by the date palm, intertwined with trees and crops, these long-standing systems produce a surprising variety of fruits (pomegranates, figs, olives, apricots, peaches, apples, grapes, citrus) and vegetables, cereals, forages, medicinal and aromatic plants. In Algeria there are about 100 date varieties while 50 varieties can be found in Gafsa, Tunisia. The palm groves offer shade and lower the ambient temperature, making it the best place to live in the Sahara and an important place for recreation.

Agricultural products from the oasis provide an important source of nutrition and income for its inhabitants and for many it is their primary or secondary source of livelihood. The systems of production and irrigation and the culture of the oases vary between the different locations in relation to their environment. There are oases in inland plain and mountainous, as well as in littoral, areas. With their rich diversity these oases systems constitute an agricultural and cultural heritage.

In Algeria, social institutions such as the Aoumma represent the local community and are charged with the oversight, control, and

maintenance of oasis resource systems. The Aoumma derives its legitimacy and authority from customary law and is dependent upon the council of local religious dignitaries - the Halqa of Azzabas - which is also the focus of social life and local norms. Agricultural products from the oasis provide an important source of nutrition and income for its inhabitants and for many it is their source of livelihood. Most of the agricultural products derived from the oasis are for family consumption and guarantee food security that is high in quality and quantity.

In Tunisia, oasis dwellers are descendents of indigenous Berbers and people from numerous civilizations that have invaded, migrated to and assimilated into the population over millennia. Since the beginning of the extraction of phosphate (at the end of the 19th century) there has been a significant influx of workers and families looking for work in phosphate mines from Libya and Algeria. The backbone of oasis livelihood is the irrigated date palm culture with integration of other crops and livestock. In recent times other economic activities such as tourism and remittances from community emigrants have provided for other sources of income and investment.

The traditional water management system has been largely replaced by: an association of farmers for water management ("Groupement d'Intéret Collectif (GIC)" for water), a co-operative of agricultural services, Omda (responsible for the smallest administrative unit), agricultural engineering services and local farmer unions. As there is no integrated collaborative community approach towards water management, access to the principal natural water sources and disputes between water users are beginning to be a problem. Also, due to the increased demand for drinking water of the city of Gafsa, the irrigation systems are under increased stress.

THE MAASAI PASTORAL SYSTEM
Kenya and Tanzania

Maasai pastoral system in Tanzania occupies northern areas bordering Kenya (from Loliondo to West Kilimanjaro) and extends southward as far as parts of Manyara (Kiteto to Simanjiro) along the Great Rift Valley on semi-arid and arid lands including parts of the Ngorongoro National park and Serengeti Plains. The Maasai live in extended households and manage livestock herds to increase herd size (sheep and goats for market slaughter, and camels and cattle for weddings, rituals and insurance), produce milk (for young children), for wool (sheep) and for hides (goats). It is a pastoral system and culture over 1000 years old and it continues to strike a social and environmental balance in a fragile environment. The Maasai are trying to maintain their unique identity through the maintenance of socio-cultural institutions, which are critical in regulating natural resource uses, maintaining grazing cycles and promoting conservation values. Maasai practices of rotational grazing and other natural resource management practices have contributed to creating the typical East African rangeland landscapes that provide such critical habitat for wildlife. In areas where traditional Maasai pastoralism is practiced, the synergies between their natural resource management practices and the prevalence of wildlife continues. However, this traditional pastoral system is under pressure, threatened by several factors including recent policy reforms, increase in human and livestock population, socio-economic changes, and climatic changes. The livestock pasture and water resources are diminishing due to shrinkage of grazing areas, successive years of droughts, prolonged dry seasons and increasing stocks. The Engaresero village on the Western shores of Lake Natron has been chosen by the government of Tanzania to exemplify the Maasai pastoral system given its singularity, integrity, high diversity of habitats and biodiversity. The site also has major additional significance because of the presence of Lake Natron and the volcano Oldonyo L'Engai, which have immense ecological, geological and cultural value. The community has demonstrated strong resilience in facing threats to their systems and has maintained associated social and cultural institutions, which ensure its sustainability under prevailing environmental conditions.

Rewarding traditional farmers as providers of ecological and cultural services

Many traditional farmers provide environmental services such as watershed conservation, biodiversity protection and carbon storage. These strongly benefit external stakeholders. GIAHS intends to build momentum and public interest in rewards for environmental services and to develop ways to offer incentives to poor farmers who protect ecosystems of local and global significance. Farmers' and Non-Governmental Organizations, working with external financial support, could play an important role in developing and maintaining programmes to utilize and conserve agricultural biodiversity, e.g. bridging between farmers who provide and beneficiaries who pay for environmental services, or facilitating the production of 'added value' products that comes from GIAHS farming systems that utilize and conserve unique agricultural biodiversity. In addition, stakeholders outside the agriculture sector - e.g. ecotourists - may be induced to pay for conservation measures that offset the loss of biodiversity in agricultural landscapes to increase farmers' income and livelihood security. As GIAHS sites constitute heritage landscapes of global significance, recognition and rewards for environmental services from beneficiaries within countries and from outside can generate financial and other incentives for environmental service providers to maintain biodiversity-rich agricultural landscapes.

The resiliency of agricultural heritage systems depends on their capacity to adapt to new challenges without losing their biological and cultural wealth, and productive capacity. It does require continuous agro-ecological and social innovation combined with careful transfer of accumulated knowledge and experience across generations. The GIAHS Initiative will not "freeze" agricultural systems in time but instead stimulate "dynamic conservation", emphasizing a balance between conservation, adaptation and socio-economic development. It aims to empower smallholder family farming communities, traditional rural communities, and indigenous peoples and minority or tribal groups to continue to conserve their traditional agricultural systems and create an economic value for the conservation of biodiversity so that nature and people can prosper together.

Opportunities for promoting dynamic conservation of Globally Important Agricultural Heritage Systems

It is imperative that the common world agricultural patrimony is recognized at the national and international level and the values of agricultural heritage systems as cultural, social, environmental and economic assets be assessed properly. Agricultural Heritage Systems satisfy the expectations and demands for food, energy, health, culture and recreation of millions of people at the national level but also provide shared global benefits. Such recognition can open new opportunities for generation of employment and income through what may be called the "cultural economy" (ecotourism, cultural identity products, local gastronomy, and other products pertaining to richness of local cultures and resources).

In many GIAHS sites the eco-cultural patrimony is associated with "poor people". Public recognition of their knowledge and skills can help in enhancing the rural poor's identity, self esteem and sense of belonging to the global community. Their cultural resources may also be calculated as economic resources. The challenge is to search for new ways of valuing such assets in order to develop strategies of territorial development based on investments in all rural livelihood assets as well as products and services of specific cultural identity. By obtaining economic benefits from their "products with cultural identity", local farmers can sustain their traditions without abandoning rural areas and continue their role as stewards of biodiversity and the environment. Identifying and promoting food diversity, local varieties and other products with cultural identity at GIAHS sites can contribute to the creation of market processes tailored to informed local and other consumers that prefer products identified by origin, cultural identity and quality. In the case of GIAHS sites located in biodiverse areas of global importance, linking cultural capital with natural resources can provide the foundation for territorial development directly involving the small farmers, indigenous peoples and the overall local population rooted in their evolving knowledge systems.

Farmers at GIAHS sites maintain *in situ* crop and animal genetic diversity and are actually net subsidizers of modern agriculture and food consumers worldwide. These custodians of genetic portfolios are not compensated for the potential global benefits that they provide. Certainly, rewarding such ecological and social service providers to continue agrobiodiversity conservation is a major goal of the GIAHS initiative.

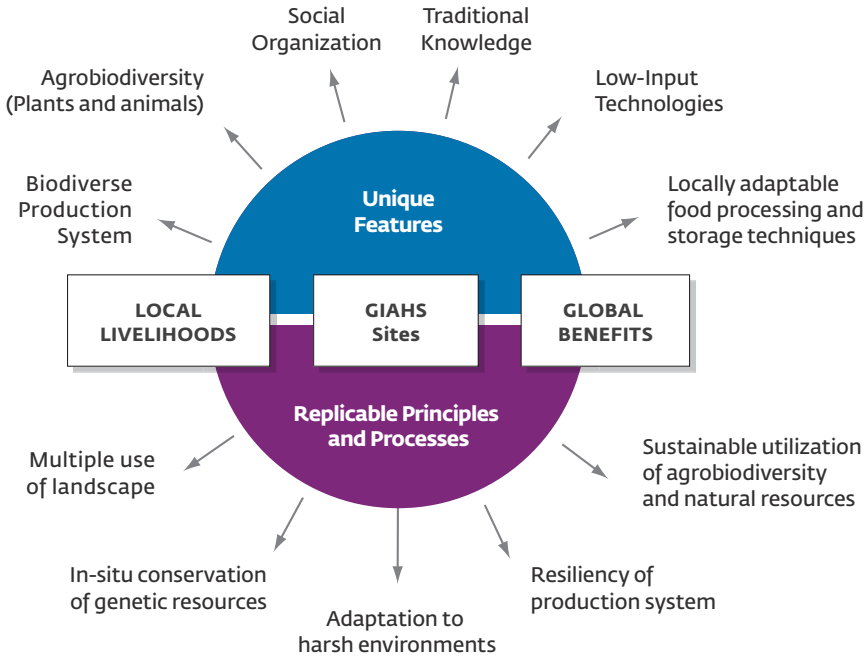
In many countries, conservation of the eco-cultural patrimony is still threatened by the

low value attributed to traditional products and skills. Markets need to be developed and improved, although other non-market mechanisms may be available and preferable to enhance income and well-being. Likewise, the tourist industry must aim at creating more awareness of the significance of this patrimony, and support it by consuming local foods, promoting ecotourism of natural areas and traditional agricultural landscapes, donating to local projects that support community projects, and other initiatives. When ecotourism is managed by local people or local businesses committed to the GIAHS concept, projected results should include reduction of poverty, greater conservation of biodiversity and generation of socio-economic benefits for local populations.

Major drivers of traditional agricultural biodiversity loss include land use changes, introduction of new crop varieties, over exploitation of wild resources, over fishing, highly consumptive food practices with considerable waste, and perverse effects of trade liberalization and agricultural subsidies. The consequences of these losses disrupt the lifestyles of the poor farmers who depend upon local ecosystems for their livelihoods especially in terms of food security. Therefore, policies are needed to support dynamic conservation of GIAHS and safeguard it from negative external drivers of change. It is also important to protect the natural and cultural assets of GIAHS sites from industrial development, which often extract labor and cause market distortion as well. Special attention should be given when introducing modern agricultural varieties and inputs to avoid upsetting the balance of traditional agro-ecosystems.

In addition to conserving local production systems and compensating farmers for their services, one of the goals of the GIAHS initiative is to engage in a process of scaling up agroecologically-based innovations, which incorporate elements of both traditional knowledge and modern agricultural science. The analysis of hundreds of farmer-centred projects around the developing world shows convincingly that under agroecological approaches, crop yields of most poor farmers can be increased several-fold. This is achieved based on internal inputs through reliance on their own labor and know-how and not on external inputs such as the purchase of expensive inputs. GIAHS sites capitalize on processes of diversification and synergies amongst activities. Scaling up such approaches can have a positive impact on the livelihoods of small farming communities in many countries. Success will depend on the use of a variety of agroecological improvements that, in addition to farm diversification, favor better use of local resources, emphasize enhancement of human capital and empower communities through training and consultative, participatory methods. Finally, there has to be greater access to equitable markets, credit and income generating activities with the support of enabling policies local farmers and rural areas.

Figure 3. Unique features and principles of GIAHS derived from such sites that may be replicated in other farming systems to achieve sustainability and resiliency.



GIAHS systems represent a continuation of historic traditions and knowledge that have evolved over the centuries. These cultures, settlements, landscapes and habitats have suffered dramatically in the wake of industrial and agricultural revolutions and advances of science, technology, commerce and communications in the 19th and 20th centuries.

The few that still survive as flag bearers of the earlier tradition are worth safeguarding as a part of the protection of the world cultural and natural heritage. Agricultural heritage landscapes are not only important landmarks of historical value but also depend on living and dynamically evolving agricultural communities. These communities are the custodians of an institutional, ecological and cultural heritage which provides a variety of benefits and services at the local, national and global levels.

Conclusions and Way Forward for Sustainable Agriculture and Rural Development

Globally Important Agricultural Heritage Systems are living, evolving system of human communities in an intricate relationship with their territory, cultural or agricultural landscapes or biophysical and wider social environment. The humans and their way of life have continually adapted to the potentials and constraints of the social-ecological environments, and shaped the landscapes into remarkable and aesthetic beauty, accumulated wealth of knowledge systems and culture, and in the perpetuation of the biological diversity of global significance.

Many GIAHS and their unique elements are under threats and facing disappearance due to the penetration of global commodity driven markets that often creates situations in which local producers or communities in GIAHS have to compete with agricultural produce from intensive and often subsidized agriculture in other areas of the world. All of these threats and issues pose the risk of loss of unique and globally significant agricultural biodiversity and associated knowledge, aesthetic beauty, human culture, and thereby threatening the livelihood security and food sovereignty of many rural, traditional and family farming communities. Moreover, what is not being realized, once these GIAHS unique key elements is lost, the agricultural legacy and associated social-ecological and cultural, local and global benefits will also be lost forever. Therefore, policies are needed to support dynamic conservation of agricultural heritage and safeguard it from the negative external drivers of change. It is likewise important to protect the natural and cultural assets of GIAHS sites from industrial development, which often extract labor and causing market distortion as well. Special attention should be given when introducing modern agricultural varieties and inputs to avoid upsetting the balance of traditional agro-ecosystems.

Success in sustainable agriculture development will depend on the use of a variety of agroecological improvements that in addition to farm diversification, favoring better use of local resources; emphasizing human capital enhancement; empowerment of rural communities and family farmers through training and participatory methods; as well as higher access to equitable markets, credit and income generating activities, and all should be supported by conducive policies.

"A Heritage for the Future"

The Earth is dotted with a myriad of home-grown agricultural systems that are humanity's common heritage. These systems provided essential ecosystem goods and services and food security for millions of local community members and indigenous peoples, well beyond their borders.

Food and Agriculture Organization of the United Nations
www.fao.org

Globally Important Agricultural Heritage Systems (GIAHS)
www.fao.org/nr/giahs/en

I1979E/1/12.10