

**Proceedings of the
Second International Forum on
Globally Important Agricultural Heritage
Systems (GIAHS)**

**Theme: Cherishing our Agricultural Heritage Systems for
Climate Change Adaptation and Mitigation**

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Bundesministerium für
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und Verbraucherschutz



Enabling poor rural people
to overcome poverty

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Acronyms and abbreviations

ASM	Association pour la Sauvegarde de la Médina, Tunisia
BMELV	Federal Ministry of Food, Agriculture and Consumer Protection (Germany)
CA	Conservation Agriculture -
CAS	Chinese Academy of Sciences
CBD	Convention on Biological Diversity
CC	Climate Change
CET	Centro de Educación y Tecnología (Chile)
CONAM	Consejo Nacional del Ambiente
CSD	Commission on Sustainable Development
DENR	Department of Environment and Natural Resources (Philippines)
FAO	Food and Agriculture Organization of the United Nations
FEK	Formal ecological knowledge
FEM	Fonds pour l'environnement mondial
FPIC	Free Prior Informed Consent
GEF	Global Environmental Facility
GIAHS	Globally Important Agricultural Heritage Systems
GPA-anGR	Global Plan of Action for Animal Genetic Resources
GPIU	Global Project Implementation Unit
IDRC	International Development Research Centre, Algeria
IFAD	International Fund for Agricultural Development
IGSNRR	Institute of Geographic Sciences and Natural Resources Research
INRAA	Institut National de la Recherche Agronomique d'Algérie
INTA	Instituto Nacional de Tecnología Agropecuaria
IPHAN	Institute of Historical and Artistic National Heritage
IRT	Ifugao Rice Terraces (Philippines)

IT-PGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
LGU	Local Government Unit
MDG	Millennium Development Goals
MDGAF	Millennium Development Goals Achievement Fund
MSSRF	M.S. Swaminathan Research Foundation, India
NEMA	National Environmental Management Authority, Kenya
NMK	National Museums of Kenya
NPP	Net Primary Productivity
PFS	Peculiar Farming Systems
RAF	Resource Allocation Framework (of GEF)
SC	Steering Committee (GIAHS Project)
SD	Sustainable Development
SIPAM	Systèmes Ingénieux du Patrimoine Agricole Mondial (French)
SIPAM	Sistemas Ingeniosos de Patrimonio Agrícola Mundial (Spanish)
TEK	Traditional Ecological Knowledge
TWG	Technical Working Group
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNU	United Nations University
WFC	World Forestry Congress
WHC	World Heritage Convention
WSSD	World Summit on Sustainable Development

Foreword

The conservation and adaptive management of Globally Important Agricultural Heritage Systems (GIAHS) was conceptualized and introduced during the World Summit on Sustainable Development (WSSD) in 2002. It was registered in the Partnerships for Sustainable Development of the Commission on Sustainable Development (CSD) in 2004. The overall goal of the partnership is to identify and safeguard globally important agricultural heritage systems and their associated landscapes, agricultural biodiversity and knowledge systems through catalysing and establishing a long-term programme to support such systems and enhance global, national and local benefits derived through their dynamic conservation, sustainable management and enhanced viability.

Since it was launched in 2004, research and demonstration of dynamic conservation activities in selected GIAHS sites have been conducted to raise awareness and understanding of its values. Projects supporting the ongoing dynamic conservation of 'agricultural heritage systems' can be found in Algeria, Chile, China, India, Kenya, Morocco, Peru, The Philippines, Tanzania and Tunisia. Funding is provided by the Global Environmental Facility (GEF); Government of Germany (Federal Ministry of Food, Agriculture and Consumer Protection, BMELV); the International Fund for Agricultural Development (IFAD); Oxfam Italia, in collaboration with other United Nations agencies and international and national government institutions.

Two international forums on Globally Important Agricultural Heritage Systems (GIAHS) have taken place, the first was convened in Rome, from 24 to 26 October 2006 to evaluate the findings of project development and to guide the full-scale project piloting dynamic conservation. The second was a special side-event at the World Forestry Congress (WFC), from 21 to 23 October 2009. The objective of the GIAHS Forum at the WFC 2009 was to: (i) increase public support and understanding of the value of GIAHS; (ii) identify ways forward and opportunities to advance recognition of GIAHS at the international and national levels; and to (iii) highlight progress made to date and to adopt a harmonized GIAHS programme implementation strategy.

The Forum brought together all partner government organizations, the implementing agency and co-funding institutions, United Nations agencies, academics and other international organizations as well as biodiversity conservation advocacy groups. Pilot countries experiences were discussed during the Forum as well as the newly identified systems created to address key implementation issues of dynamic conservation related to GIAHS. The Forum provided participants clarification of the GIAHS approach, and explained the scientific aspects of agricultural heritage as well as the requirements for enabling policy instruments to support the recognition and safeguarding of GIAHS. These issues were further discussed by participants.

In the concluding section of this present document, there is a report containing the Steering Committee's recommendations for continuing implementation of each of the Project's outcomes, with a view to achieve broader goals of the GIAHS Initiative.

The Secretariat of the GIAHS Initiative would like to thank the guest speakers and national project coordinators from Algeria, Argentina, Brazil, Chile, China, India, Kenya, Peru, The Philippines, Morocco, Tunisia as well as all partner organizations from the United Nations system and other international organizations and civil society partners for their contribution to

the Forum. The Secretariat also wish to thank the WFC 2009 Secretariat for hosting the Forum, and for the kind assistance extended in its organization.

FAO looks forward to continuing the work, with partner governments and other international, national and local partners, of identifying and safeguarding Globally Important Agricultural Heritage Systems.

Parviz Koohafkan
GIAHS Global Coordinator
NR, FAO, Rome, Italy

Executive Summary

Background and objectives of the Forum

The Globally Important Agricultural Heritage Systems (GIAHS) Initiative was launched by the Food and Agriculture Organization of the United Nations (FAO) as an international partnership initiative on Sustainable Development with the Commission on Sustainable Development (CSD) in support of Agenda 21. GIAHS are defined as remarkable land-use systems and landscapes rich in globally significant biological diversity that has evolved as the result of the co-adaptation of a community with its environment and its needs and aspirations for sustainable development. The GIAHS Initiative promotes international recognition of and support to heritage agricultural systems worldwide, where the multiple goods and services provided small-scale farmers, indigenous peoples, and family farming communities are distinct in many ways.

The multiple goods and services arising from GIAHS are more evident today in the context of significantly important issues such as food security, conservation of agricultural and associated biodiversity, and climate change adaptation, mitigation and resilience. The initiative employs three distinct levels of intervention to facilitate understanding and international recognition of the importance of GIAHS, which are at the global, national and community or local levels. The GIAHS Initiative takes an integrated approach to the well-being of family farming, supports and strengthens the underlying ecological and cultural processes of heritage agricultural systems, while creating conditions for sustainable agriculture and rural development.

Since its launch, the Secretariat of the GIAHS has held international meetings or forums every other year to facilitate sharing of knowledge and experiences. The theme of the forum held at the World Forestry Congress in Buenos Aires from 21 to 23 October 2009 was *Cherishing our agricultural heritage systems for climate change adaptation and mitigation*. The Forum was attended by experts and practitioners from the national governments of Algeria, Argentina, Brazil, Chile, China, India, Kenya, Morocco, Peru, The Philippines and Tunisia, as well as representatives from United Nations agencies, international organizations, non-governmental organizations, civil society groups and donors.

The Forum was designed to: (1) increase public support and understanding of the value of GIAHS and its goods and services in this era of climate change; (2) identify ways forward and opportunities to advance recognition of GIAHS at the international and national levels; (3) address key implementation issues and assist participating countries to establish management, institutional and organizational support structures for the effective stewardship of GIAHS at various levels; and to (4) highlight the progress made and to adopt a harmonized GIAHS programme implementation strategy. The Forum served as a venue for the Third Steering Committee Meeting of the Project: *Conservation and adaptive management of GIAHS (GCP/GLO/212/GFF)*.

Summary of discussions and recommendations

In many parts of the world agricultural practices have led to landscape-scale ecosystem variation, and provided mosaics of micro-habitats that support associated plant and animal communities. These micro-habitats now depend on continued management for their viability.

In many regions, especially those where natural conditions of climate, soil, accessibility and human presence militate against intensification, agro-ecosystems and landscapes are maintained by traditional practices developed by generations of farmers and herders.

There is, however, insufficient awareness and understanding of and support for the key role that indigenous peoples and traditional farming, herding and, fishing communities have played for millennia, and continue to play, in maintaining and creating healthy ecosystems, biodiversity and landscapes. This they have done while providing the ecosystem services that, both their and other people's livelihoods and well-being, have depended upon. It is within this context that the GIAHS Initiative was conceptualized. Its approach centres on human management and knowledge systems, including their socio-organizational, economic and cultural features that underpin the conservation and adaptation processes in GIAHS without compromising resilience, sustainability and integrity.

Since the initiative was launched, two major project grants have been secured from the GEF and the Government of Germany (BMELV). The GEF provides support to six countries through a global project, and BMELV supports two countries. The national project facilitators and focal points of the Pilot Systems presented Project progress reports to the Forum. The Pilot Systems are the Ghout system in Algeria; Andean agriculture in Peru; Chiloé agriculture in Chile; the Gafsa system in Tunisia; the Ifugao rice terraces in The Philippines; rice-fish culture in China and the Maasai pastoral system in Kenya. Additional case studies were presented on the Meso-American farming system; the agricultural system of the Rio Negro in Central Amazonia; peculiar farming systems throughout the world; Sikkim Himalayan and various tribal agricultural heritage systems in India; agricultural patrimony in Argentina and the oases Tafilalet system in Morocco.

Forum participants agreed on the following objectives to address the technical aspects of the Project, and provide a way forward, to:

- encourage countries to identify, protect and promote nationally held GIAHS;
- promote GIAHS worldwide and raise international recognition and awareness of their importance;
- provide technical support to countries for identification, protection and promotion of nationally held GIAHS;
- mobilize resources to identify, protect and promote GIAHS, especially in developing countries; and to
- facilitate sharing of information, lessons learned and best practices for management of GIAHS and facilitate dialogue between stakeholders.

Regarding site or country-specific action plans, progressive recognition of GIAHS would require further studies or documentation of available agricultural systems, to demonstrate their multiple values and benefits at the local and national levels. The national project coordinators agreed to conduct national studies to identify other nationally held GIAHS, demonstrating their multiple values and national benefits, as well as to finalize national in-depth analyses of existing national policies and laws, including those pertaining to relevant international conventions.

These studies will be useful in the formulation of concrete proposals to mainstream GIAHS activities, considering their relevance within the existing national programme or budgetary allocations. Other important suggestions arose during discussions. These included the need for

the pilot (and participating) countries to include explicit activities focused on lesson learning and systematization of best practices for national and regional dissemination.

Once the best practices are available from the pilot and participating countries, the global GIAHS project management will ensure the translation and dissemination of materials on national and regional experiences to ensure their accessibility to other countries and regions. The Global Coordinators suggested that the national focal point institutions could explore and encourage the development of university courses on the GIAHS concept and practices, involving relevant academic local and national partners. This would not only ease the formation of partnerships with academics or the education sector but would facilitate awareness-raising and understanding of GIAHS.

Opening Session

Welcome Address: Dr Parviz Koohafkan, GIAHS Global Coordinator

On behalf of FAO, it is my pleasure and my honour to welcome you all to the second international forum on Globally Important Agricultural Heritage Systems on the occasion of the World Forestry Congress.

The GIAHS Initiative is a relatively recent initiative of the international community, nested in the global endeavours to achieve sustainable development and to attain the Millennium Development Goals (MDGs), which aim to identify and safeguard Globally Important Agricultural Heritage Systems and their associated landscapes, agricultural biodiversity and knowledge systems by mobilizing global and national recognition and support. The overall objective is to support such systems and to realize their considerable actual and latent potential for enhancing global, national and local benefits for increased incomes, reduced poverty, and assured food security and nutrition, which can be derived from the dynamic conservation of these agricultural heritage systems.

Why should these agricultural heritage systems be supported? Many people say that family farmers or small-scale farms are disappearing, and that they must disappear if we are to feed a growing population. I, personally do not agree with this notion even though many have migrated, the number of small-scale farmers has remained the same; we are talking about one billion people. Small-scale farmers, particularly in developing countries, not only work for their own food security and that of their region and nation, they also contribute extensively to rural development. The main problem is that these farmers have not benefited from governmental policies. Most developing countries have placed much emphasis on the urban sector and on the development of services, and they have neglected agriculture and the rural sector. Any support to agriculture has gone to high potential areas, favouring large-scale infrastructure. Rural communities, working on fragile lands in mountainous areas or drylands, have not received much attention. For this reason, the GIAHS Initiative is demonstrating examples of 'agriculture' systems to help raise people's awareness about the importance of small-scale and traditional farming.

Today the importance of small-scale farming is increasingly recognized. The shift in thinking came in 1992 when the world community recognized that the recipes for the Green Revolution were creating diverse problems, both socially and environmentally. The 30 years of Green Revolution were helpful in feeding many people during a very difficult time. At the same time, it depleted natural resources and polluted soils and water. The problem is that the mechanisms, the institutions and the policies that took advantage of Green Revolution thinking, are still dominant. Fortunately, these ideas are changing. To some extent, the financial crisis has been good for the agriculture sector. Less money is available, but there is more willingness to reflect upon the path to follow.

During the Forum's three days of work national coordinators and experts from different pilot and participating countries have convened, together with representatives of government agencies and ministries responsible for the implementation of dynamic conservation in their countries. They have a very challenging agenda, which covers the progress made to date by the different pilot countries, key implementation issues, at the managerial, institutional and organizational levels, and the two key points of increasing public support and understanding of

the value of GIAHS and, finally, of identifying ways forward and opportunities to advance recognition of GIAHS at the national and international level.

Again, I welcome everybody. I hope this three-day forum brings us a fruitful sharing of experiences and I would like to thank Prof. M.S. Swaminathan for having accepted the invitation to be with us. Prof. Swaminathan received the World Food Prize Award and is described as the Father of Economic Ecology. I am certain that his contribution to this Forum will be of the utmost importance in guiding us with this challenging initiative. Likewise, H.E. Mr Henri Djombo, Minister of Forest Economy, Republic of Congo, will share his thoughts about the role of farmers and the importance of traditional agricultural systems in sustainable development.

Welcome Remarks
Mrs. Lucrecia Santinoni, Ministry of Agriculture, Argentina

En todo el mundo han sido creados, modelados y mantenidos por innumerables generaciones de campesinos y pastores, sistemas agrícolas y ambientes específicos basados en recursos naturales diversos que usan prácticas de manejo adaptadas a las condiciones locales.

Construyendo sobre el conocimiento local y la experiencia, estos ingeniosos sistemas *agroculturales* reflejan la evolución de la humanidad, la diversidad de su conocimiento y sus profundas relaciones con la naturaleza. Estos sistemas han producido no sólo ambientes extraordinarios, el mantenimiento y la adaptación de la biodiversidad agrícola mundialmente significativa, sistemas de conocimiento nativos y ecosistemas resistentes, pero sobre todo, la provisión sostenible de múltiples bienes y servicios, alimentos y seguridad en los medios de subsistencia y en la calidad de vida.

El Forum que vamos a abrir hoy, para los próximos tres días, es el instrumento príncipe de discusión alargada entre los países participantes, especialistas de estos temas además de otras instituciones/países que miran con interés a esta iniciativa.

El concepto de los **Sistemas Ingeniosos de Patrimonio Agrícola Mundial (SIPAM)** promovido por esta iniciativa es distinto y más complejo que el de un sitio convencional del patrimonio o de un ambiente protegido. Un SIPAM es un sistema vivo, en evolución, de comunidades humanas en una intrincada relación con su territorio, ambiente cultural o agrícola o ambiente biofísico y social más amplio.

La mayoría de los sistemas agrícolas tradicionales y la biodiversidad, la diversidad cultural y los sistemas de conocimiento que contienen, están amenazados debido a fallas políticas y de mercado, pobreza y presión demográfica y estrategias de desarrollo y ambientes incentivadores inapropiados.

La iniciativa de los SIPAM podrá generar múltiples beneficios ecológicos, sociales y económicos a nivel local, nacional y global contribuyendo a reducir la pobreza y a asegurar la seguridad alimentaria y de medios de vida y el bienestar de las comunidades rurales tradicionales. A través de la conservación dinámica y el manejo adaptativo de los sistemas SIPAM iniciales en los países piloto, la iniciativa facilitará la incorporación de la conservación de la biodiversidad a las políticas y planes nacionales de biodiversidad y mejorará la capacidad de esos siete países para promover el uso sostenible de la agrobiodiversidad y de la biodiversidad silvestre y los ambientes, teniendo en consideración su contribución real y potencial a la seguridad alimentaria.

Es con vivo interés que nuestro país, a través del Ministerio que aquí represento, no solo le envía sus saludos para esta ceremonia de apertura sino también le manifiesta su interés en seguir siendo informado sobre la iniciativa SIPAM que presenta muchos rasgos próximos a nuestras preocupaciones con vista al desarrollo de la agricultura familiar, sus diversidades productivas, biodiversidades y su manifiesta capacidad de arraigo en esa linda tierra Argentina que los acoges hoy día.

Le deseo un buen trabajo a todos.

Special Remarks

**Mr Henri Djombo, Minister of Forest Economy, Republic of Congo
on behalf of Mr Francesco Bandarin, Director the United Nations Educational, Scientific
and Cultural Organization (UNESCO) World Heritage Centre**

UNESCO welcomed the Global Partnership Initiative on conservation and adaptive management of Globally Important Agricultural Heritage (GIAHS) launched by FAO in 2002. In particular in the framework of the World Heritage Convention, which has recognized cultural landscapes since 1992, the challenging conservation of agricultural heritage systems is becoming more and more important. The World Heritage Committee acknowledged that **a great variety of landscapes exist that are representative of the different cultures and regions of the world. They are combined works of nature and humankind that express a long and intimate relationship between peoples and their natural environment. The World Heritage Committee also recognized that these sites** reflect specific techniques of land use that guarantee and sustain biological diversity. Others, associated in the minds of the communities with powerful beliefs and artistic and traditional customs, embody people's exceptional spiritual relationship with nature.

A number of cultural landscapes have been inscribed on the World Heritage List to:

- reveal and sustain the great diversity of the interactions between humans and their environment;
- protect living traditional cultures; and
- preserve the traces of those that have disappeared.

In proposing properties for inclusion in the World Heritage List, States Parties are asked to consider nominating cultural and natural heritage of 'outstanding universal value'. The World Heritage List, as defined by the Convention is a select list. However the collaboration with the GIAHS project, which was demonstrated at the international level, including at the Tokyo symposium on 'Natural sacred sites and cultural landscapes' (May 2005) is crucial for assisting States Parties and other partners in the identification of potential sites, and specifically ingenious agricultural systems.

I, therefore, believe that this collaboration will enhance the identification, conservation and protection of agricultural heritage for future generations. The cultural landscapes that include cultivated terraces, pastoral systems and sacred groves all testify to the creative genius, social development and imaginative and spiritual vitality of humanity. They are part of our collective identity; they are a key to sustainable development at times of global change.

I wish you success for the Second International Forum on Globally Important Agricultural Heritage Systems (GIAHS), fruitful discussions and excellent results to share with us.

Special Remarks

Mr Dirk Gaul, GEF Resources Team, on behalf of Mrs Monique Barbut, GEF CEO

On behalf of Ms Monique Barbut, the Global Environmental Facility (GEF) CEO, it is my pleasure to be invited to this international forum on Globally Important Agricultural Heritage Systems, at the occasion of the World Forestry Congress.

The GEF unites 182 member governments, in partnership with international institutions, non-governmental organizations, and the private sector to address global environmental issues. It is an independent financial organization that provides grants to developing countries and countries with economies in transition, for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer and persistent organic pollutants. These projects benefit the global environment, linking local, national and global environmental challenges and promoting sustainable livelihoods.

FAO's conservation and adaptive management of Globally Important Agricultural Heritage Systems is a Biodiversity Focal Area project, under Strategic Objective 2, mainstreaming biodiversity conservation and sustainable use in production landscapes or seascapes and sectors. Biodiversity is one of the most important GEF focal areas of work, and requires effort to address conservation and sustainable management. While we are conserving and protecting our biodiversity, we should not forget the local population and rural peoples' livelihoods. This vision of conservation can only be promoted when livelihoods and social and cultural fundamentals are considered.

The FAO-GIAHS project approach is innovative, linking conservation with local economic development, and highlighting the key aspects, goods and services of agricultural heritage as a social agro-ecological system. Recognizing agricultural patrimony creates awareness of the fundamental role of traditional agricultural practices in conservation of natural resources. This global project with a noble objective and systematic intervention strategy targeting global, national and local levels – has the potential to be geographically upscaled and expanded. The success of ongoing activities is therefore crucial to persuading other countries to participate. There is so much knowledge and experience to learn and to share between and among us, and we can all work together to bring about positive impacts and results and to raise awareness of biodiversity conservation.

Today and for the next two days, I have other commitments during this week of World Forestry Congress, but I will try to join your sessions as much as I can, and to learn more about the work in each of the pilot countries for this important global project. Thank you very much.

Personal Message (letter)
Mr GB Mukherji, Secretary to the Government of India for Tribal Affairs

Distinguished participants promoting GIAHS, it is my privilege to convey to you all, through my friends Dr Muthoo and Dr Parviz, my personal good wishes for a very successful deliberation of the GIAHS Forum so that the potential beneficiaries all over the world, including in India, gain recognition for believing in and practicing unique agriculture heritage systems – in spite of pressures to abandon these for ‘modern’, high investment mono-cropping – thereby, in the process, sustaining biodiversity, bringing about participatory equity, and conserving and managing precious soil, land and water.

India has some 700 tribes numbering 82.3 million people according to the 2001 census listed or scheduled under the Constitution. Dwelling amidst hills, forests and deserts, these tribal people, over the centuries, have gained precious knowledge of, and vast experience in anticipating and gradually combating the effects of climate and environmental changes, in designing sustainable livelihood systems around infertile land and scarce water, and by apportioning tasks for as many of their members as practicable so that social cohesion is not disturbed. Their wisdom is reflected in their micro water-harvesting techniques, serpentine irrigation channels, bamboo or wooden water-lifting devices, multiple and multistage cropping of climate adaptable species, staggered planting for reduction of total vulnerability to pest attacks, cropping for human as well as animal needs, storage of minor forest produce and so on.

Such a treasure-house of knowledge cannot be left unrecognized and undocumented. This knowledge must be preserved lest it be totally lost in the wake of so-called modernization and passage of time. I anticipate that, in the context of global warming, the design of many development interventions, especially for those who are already marginalized, will indeed, come from such examples.

I wish the deliberators of the Forum a pioneering zeal.

Session 1: International Context of Agricultural Heritage Systems

Agricultural practices in many parts of the world have led to landscape-scale ecosystem variation, and provided mosaics of micro-habitats, that support associated plant and animal communities, which now depend on continued management for their viability. In many regions of the world, especially where natural conditions of climate, soil, accessibility and human presence militate against intensification, agro-ecosystems and landscapes that are maintained by traditional practices developed by generations of farmers and herders endure. However, still there is insufficient awareness and understanding of and support for the key role that indigenous peoples and traditional farming, herding or fishing communities have played for millennia, and continue to play, in maintaining and creating healthy ecosystems, biodiversity and landscapes, while providing the ecosystem services on which people's livelihoods and well-being depend. This is the context in which FAO initiated an international partnership initiative on conservation and adaptive management of 'Globally Important Agricultural Heritage Systems (GIAHS), which aims to provide global recognition of identified agricultural heritage systems, to ensure their dynamic conservation and sustainable management. GIAHS as an approach is centred on the human management and knowledge systems, including their socio-organizational, economic and cultural features that underpin the conservation and adaptation processes in GIAHS without compromising their resilience, sustainability and integrity.

This session was devoted to discussing the local, national and international contexts of agricultural heritage tackling the social, economic and environmental perspectives of GIAHS mitigating and adapting to climate change.

Keynote Address
Agro-Biodiversity Heritage Sites: From Hot to Happy Spots

by Professor M.S. Swaminathan
UNESCO Chair in Ecotechnology
M.S. Swaminathan Research Foundation, Chennai, India

The need for an Ever-green Revolution

A major trigger for the Green Revolution, which was a term coined by Dr William Gaud of the United States Department of Agriculture in 1968 to mark a significant increase in crop production through yield advance, was the enormous enthusiasm generated among farm families by the print media and all India Radio on the opportunity created by semi-dwarf varieties of wheat and rice to enhance yield and income substantially. The revolution resulted from a symphony approach with four major components – technology, which is the prime mover of change; services, which can take the technology to all farmers whether small or large; public policies relating to the price of inputs and output and, above all, farmers' enthusiasm.

About 80 percent of food production comes from farmers with smallholdings. For them, agriculture is the backbone of the livelihood security system. Hence, higher productivity per unit of arable land and irrigation water is essential to enhancing marketable surplus and thereby of cash income. This should however be achieved without harm to the ecological foundations essential for sustainable agriculture. The green revolution should become an Ever-green Revolution leading to enhancement of productivity in perpetuity without ecological harm (Swaminathan, 1982). Especially in this era of climate change that small-scale farmers are facing, there is an urgent need for an Ever-green Revolution.

The Ever-green Revolution relies on organic and green agricultural practices, which include: cultivation without the use of chemical inputs such as mineral fertilizers and chemical pesticides; and conservation farming with the help of integrated pest management, integrated nutrient supply, and integrated natural resource management. Dr Gaud indicated the risks associated with a global temperature increase of 2 °C, which include the following catastrophes: 4 billion people experiencing water shortages; a reduction in agricultural viability, particularly in the tropics; melting of the West Antarctic ice sheet; an increased soil carbon release; and the collapse of the Amazonian rainforest. Higher temperatures pose a significant risk to agricultural production: water scarcity and frequency of drought will increase, augmenting the threat of heat or drought stress to crops and livestock. Physiological development is accelerated, and therefore hastens maturation, reduces yields and changes the length of growing period. Increased night-time respiration can also reduce yield potentials.

Sustainable food production: early warning

Intensive cultivation of land, without conservation of soil fertility and soil structure, would lead ultimately to the creation of deserts. Irrigation without arrangements for drainage would result in soils becoming alkaline or saline. Indiscriminate use of pesticides, fungicides and herbicides could cause adverse changes in biological balance as well as lead to an increase in the incidence of cancer and other diseases, through the toxic residues present in the grains or other edible parts. Unscientific tapping of underground water would lead to the rapid exhaustion of this wonderful capital resource left to us by ages of natural farming. The rapid replacement of

numerous locally-adapted varieties with one or two high-yielding strains in large contiguous areas would result in the spread of serious diseases capable of wiping out entire crops, as happened before the Irish potato famine of 1845 and the Bengal rice famine of 1942. Therefore, the initiation of exploitative agriculture, without a proper understanding of the various consequences of every one of the changes introduced into traditional agriculture and without first building up a proper scientific and training base to sustain it may, in the long term, only lead us into an era of agricultural disaster, rather than to an era of agricultural prosperity.

Overcoming soil hunger in semi-arid areas

An approach that makes it possible for farmers to produce most of the nitrogen that crops need is to plant 'fertilizer trees' in the field – manufacturing N and cycling P and K with no cash investment. The photo-insensitive mutant of *Sesbania rostrata* fixes N in both its stem and roots. In Central and Southern Africa, *Faidherbia albida*, a tree species indigenous to many African countries, provides a pathway to sustainable maize production. Sixty years of research shows that, on each hectare, mature trees supply the equivalent of 300 kg of complete fertilizer and 250 kg of lime. This can sustain a maize yield of 4 tonnes/ha.

A conservation continuum for many indigenous plant species is also provided by community, national and global gene and seed banks. These repositories can be used to enhance the coping capacities of local communities. At the local level, gene banks, seed banks, grain banks, and water banks provide food and water security and pathways to conservation, cultivation, consumption and commerce.

Converting biodiversity hot spots into happy spots: role of agroforestry based biovalley

The goal of a biovalley is to promote bio-happiness through integrated attention to conservation, sustainable use and equitable sharing of bioresources, which leads to health, work and income security. Conservation farming will include steps for soil health enhancement, harvesting, efficient use of rainwater, and storing and using plants for saving lives and strengthening livelihoods. The Rift Valley is an example of a 'biovalley'. Biovalley is to biotechnology (BT), what Silicon Valley is to Information Technology (IT).

Agroforestry principles are being applied to sea water farming of fish. Sea water is 97 percent of the global water pool; agriculture consumes over 80 percent of fresh water. Mixed cropping of *Salicornia* and *Atriplex* mangrove varieties are used in sustainable capture fisheries. These have low external inputs and are, therefore, sustainable aquaculture practices of shrimp farming. This provides market-driven, off-farm enterprises to improve the population-supporting capacity of the ecosystem. Biodiversity is important, the loss is predominantly related to habitat destruction largely for commercial exploitation as well as for alternative uses such as roads and buildings. Invasive alien species and unsustainable development are other important causes of genetic erosion. How can we reverse the paradigm and enlist development as an effective instrument for conserving biodiversity? Prof Swaminathan cited a few examples to illustrate how biodiversity conservation and development can become mutually reinforcing.

In 1990, I visited MGR Nagar village near Pichavaram in Tamil Nadu to study the mangrove forests of that area. The families living in MGR Nagar were extremely poor and were not getting the benefits of the Government schemes since they had not been classified either as *scheduled caste (SC)* or *scheduled tribe (ST)*. The Collector mentioned that this matter was under study. The children had no opportunities for education and the fishers were catching fish

and shrimps by hand. When I asked the parents why they were not sending their children to school, the answer was that schools were far away and that they were not being admitted because of the delay in their classification as SC or ST.

I then told my colleagues, “*saving mangrove forests without saving the children for whose well-being these forest are being saved makes no sense*”. With the help of a few donors, we started a Primary School in the village and got all the children irrespective of their age to join the school. A few years later, the State Government took over the school and expanded its facilities.

Following the tsunami, the huts were replaced by brick buildings and the whole scenario of MGR Nagar changed totally. Recently, the elders of the village met me and said they would like the school to be developed into a Higher Secondary School with facilities for +2 classes. He also mentioned that they now know the value of the mangroves since they understand that mangrove tree root exudate enriches the water with nutrients and promotes sustainable fisheries. Further, during the 2004 tsunami, mangroves served as speed breakers and saved the people from the fury of the tidal waves. He said that everyone in the village now understands the symbiotic relationship between mangroves and coastal communities. Clearly hereafter mangroves in this region will be in safe hands.

Another example relates to the tribal families of Kolli Hills in Tamil Nadu. The local tribal population had been cultivating and conserving a wide range of millets and medicinal plants. However, because of the absence of markets for traditional foods, they had to shift to more remunerative crops such as tapioca and pineapple. The millet crops cultivated and consumed by them for centuries were rich in protein and micronutrients. They were also much more climate resilient, since mixed cropping of millets and legumes minimizes risks arising from unfavourable rainfall. Such risk distribution agronomy is the saviour of food security in an era of climate change.

How can we revitalize the conservation traditions of tribal families, without compromising their economic well-being? M.S. Swaminathan Research Foundation (MSSRF) scientists started a programme designed to create an economic stake in conservation, by both value addition to primary products and by finding niche markets for their traditional food grains. Commercialization thus became the trigger for conservation. Today many of the traditional millets are again being grown and consumed. They now proudly sing “biodiversity is our life”.

A third example relates to the tribal areas of the Koraput region of Orissa, which is an important centre of diversity of rice. Fifty years ago, there were over 3 500 varieties of rice in this area. Now this has been reduced to about 300. Even to save these 300 varieties, it is essential that the tribal families derive some economic benefit from the preservation of such rich genetic variability in rice. Now, they, in partnership with scientists, have developed improved varieties such as Kalinga Kalajeera, which fetches a premium price in the market.

For too long, tribal and rural families have been conserving genetic resources for public good at personal cost. It is time that we recognize the importance of promoting a genetic conservation continuum, starting with *in situ* on-farm conservation of land races by local communities, and extending up to preservation of a sample of genetic variability under permafrost conditions at locations like Svalbard near the North Pole, which is maintained by the Government of Norway or Chang La in Ladakh, where our Defence Research and Development organization has established a conservation facility under permafrost conditions.

How can we harness biodiversity for poverty alleviation? Obviously, this can be done if we can convert biodiversity into jobs and income on a sustainable basis. Several institutional mechanisms have been developed at MSSRF for this purpose such as the Biovillage and Biovalley. In Biovillages, the conservation and enhancement of natural resources such as land, water and biodiversity become priority tasks. At the same time, the Biovillage community seeks to increase the productivity and profitability of small farms and create new livelihood opportunities in the non-farm sector. Habitat conservation is vital for preventing genetic erosion. In a Biovalley, the local communities try to link the biodiversity, biotechnology and business in a mutually reinforcing manner. For example, the Herbal Biovalley under development on Koraput aims to conserve medicinal plants and local foods and convert these into value-added products based on assured and remunerative market linkages. Such sustainable and equitable use of biodiversity leads to an era of biohappiness. Tribal families in Koraput have formed a 'Biohappiness Society'.

There is a need to launch a Biodiversity Literacy Movement so that, from childhood onwards, everyone is aware of the importance of diversity for the maintenance of food, water, health and livelihood security as well as a climate-resilient food production system. The Government of India has started programmes like DNA and Genome Clubs to sensitize school children about the importance of conserving biodiversity. We see rich agrobiodiversity, i.e. diversity that is economically valuable and life sustaining. The Government of India also recognizes and rewards the contributions of rural and tribal families in the field of genetic resources conservation and their traditional knowledge systems through Genome Saviour Awards, which have been awarded to some tribes, as well as to all women from Jeypore Tract of Orissa.

Spiritual dimension of conservation

Traditional agricultural practices are embedded in the social/cultural societal framework of many indigenous peoples. Examples of this relationship can be found in the temple tree *Excoecaria agallocha* in Chidambaram, India where mangroves are associated with ancient wisdom; and Ameridian songs in Guyana “*The sky is held up by trees. If the forest disappears, the sky which is the roof of the world collapses. Nature and people then perish together*”, about the interconnectedness of ecosystems. Then there is the phrase about nature “*The forest is a peculiar organism of unlimited kindness and benevolence that makes no demands for its sustenance and extends generously the products of its life activity; it affords protection to all beings, offering shade even to the axe-man who destroys it*” (Gauthama Buddha).

Biohappiness results from the conservation, sustainable and equitable use of biodiversity and the blending of traditional knowledge with frontier technology. Therefore, we should promote **Agro-biodiversity Heritage Sites from Hot to Happy Spots.**

GIAHS, Small-scale farmers and global challenges

*Parviz Koohafkan
Director, Land and Water Division and
GIAHS Global Coordinator
FAO, Rome, Italy*

Background

Agriculture is a critical component of sustainable development and poverty alleviation particularly in developing countries. Agriculture contributes to the economic, social and environmental priorities of sustainable development and has the capacity to bring solutions to many associated problems including employment generation, environmental rehabilitation and economic growth. It is both a problem and a solution to global socio-economic and environmental problems. While there has been formidable progress in increasing food production and economic growth, severe problems of food insecurity, poverty and environmental degradation persist, and are increasing. Over the past 40 years, per capita world food production has grown by 25 percent, and food prices in real terms have fallen by 40 percent.

As a measure of this growth, average cereal yields have doubled in developing countries, while total cereal production has grown from 420 to nearly 1 200 million tonnes per year. There has been progress in increasing the average per capita consumption of food in some areas and there is enough food now and there will be enough food to feed all the population of planet in the future (FAO, 2007). However, FAO data records that there are still more than one billion people hungry, a majority of which are women and children, which is the result of considerable problems of availability and access to food owing to poverty and unavailability of food in the right place at the right time.

The battle to achieve the Millennium Development Goals, for poverty and hunger reduction and sustainable natural resources management, will be lost or won in the rural areas. This is because, despite large-scale urbanization, extreme poverty continues to be mainly a rural phenomenon. Of the world's 1.1 billion hungry, 95 percent are concentrated in developing countries, mostly in rural areas and of the world's 1.2 billion extremely poor people, 75 percent live in rural areas and depend largely on agriculture, forestry, fisheries and related activities for survival. For the rural poor, globalization and the increasing pressures of large industry, markets, and urban consumers have, on balance, been detrimental.

The challenge for future agriculture, both in developing and developed countries, is therefore, to identify win-win options whereby intensification or changes in land use, meet the demands of expanding population and economic development while reducing negative externalities of agricultural production and maintaining the goods and services provided by the environment. Balanced land access policies and programmes are needed to promote agricultural development and to protect more vulnerable groups against deepening poverty – particularly in a world where competition for access to resources and efficiency-enhancing land-use change are the main drivers of the development process. Farmers often lack incentives to consider the impacts of their decisions on environmental services. Improved information and regulations can influence farmers' decisions in ways that enhance the environment. Payments can increase the incomes of farmers who produce environmental services. Other poor households may also

benefit, for example from increased productivity of the soils they cultivate or improved quality of the water they drink.

Maximizing benefits and minimizing tradeoffs will require careful science and innovative institutions. Getting the science right is a critical first step. This requires understanding the relationships between farmers' actions and their environmental consequences, as well as understanding the socio-economic motives and constraints facing suppliers and beneficiaries of environmental services. Equally important are the institutional innovations needed to link suppliers and beneficiaries.

Conservation and adaptive management of GIAHS

In many countries specific agricultural systems and landscapes have been created, shaped and maintained by generations of farmers and herders based on diverse species and their interactions and using locally adapted, distinctive and often ingenious combinations of management practices and techniques. Building on generations of accumulated dynamic knowledge and experience, these ingenious *agri-cultural* systems reflect the evolution of humanity and its profound harmony with nature. They have resulted not only in outstanding aesthetic beauty, maintenance of globally significant agricultural biodiversity, resilient ecosystems and valuable cultural inheritance but, above all, in the sustained provision of multiple goods and services, food and livelihood security for millions of poor and small-scale farmers.

Globally Important Agricultural Heritage Systems (GIAHS) represent a unique subset of agricultural systems, which exemplify customary use of globally significant agricultural biodiversity and merit being recognized as the heritage of all people. GIAHS are defined as: remarkable land-use systems and landscapes that are rich in globally significant biological diversity evolving from the co-adaptation of a community with its environment and its needs and aspirations for sustainable development. Given this definition of GIAHS, dynamic conservation and nurturing is not only ideal for the systems, land use or landscapes and biodiversity, it advocates an integrated approach to focussing on the well-being of the community striving for sustainable development.

Types of agricultural heritage systems

GIAHS are selected based on their importance for the provision of local food security, high levels of agrobiodiversity and associated biological diversity, store of indigenous knowledge and ingenuity of management systems. The biophysical, economic and sociocultural resources have evolved under specific ecological and sociocultural constraints to create outstanding landscapes. The examples of such agricultural heritage systems are in the hundreds and are home to thousands of ethnic groups, indigenous communities and local populations with a myriad of cultures, languages and social organizations. Examples of GIAHS could fall into: (i) mountain rice terrace agro-ecosystems; (ii) multiple cropping/polyculture farming systems; (iii) nomadic and semi-nomadic pastoral systems; (iv) ancient irrigation, soil and water management systems; (v) complex multi-layered home gardens; (vi) hunting-gathering systems; and many others.

There are numerous other agricultural heritage systems around the world meriting identification, assessment and dynamic conservation. One of the main tasks of the GIAHS

partnership initiative is to identify these systems in collaboration with local communities, national governments and other national and international institutions.

FAO's GIAHS Initiative

In response to the global trends that undermine family agriculture and traditional agricultural systems, in 2002, during the WSSD, Johannesburg, South Africa, the FAO launched a Global Partnership Initiative on conservation and adaptive management of *Globally Important Agricultural Heritage Systems*.

The overall goal of the partnership is to identify, recognize and safeguard Globally Important Agricultural Heritage Systems and their associated landscapes, agricultural biodiversity and knowledge systems through catalysing and establishing a long-term programme to support such systems and enhance global, national and local benefits derived from their dynamic conservation, sustainable management and enhanced viability. A major outcome of the GIAHS initiative is the contribution to the implementation of Convention on Biological Diversity (CBD) Article 10c: “protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements”, specifically within agricultural systems; and Article 8j: “respect, preserve and maintain knowledge, innovations and practices of indigenous communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity”.

To facilitate understanding and international recognition of the importance of GIAHS, the initiative employs three distinct levels of intervention: global, national and at the community or local levels. It is an integrated idea and approach to look at the well-being of the family farming communities while aiming for sustainable agriculture and rural development. Over the years of implementation, in more than ten countries in Latin America, Southeast Asia, North Africa and in sub-Saharan Africa.

The small-scale, family farmers and indigenous communities

Small-scale farmers, family farmers and indigenous communities produce the bulk of global food. They are the largest number of stewards of the environment and its services especially biodiversity. In agriculture and forestry, particularly, the many small-scale farms and traditional agricultural systems that still dot landscapes throughout the developing world can be part of the solution. They can contribute to climate change mitigation, through carbon conservation, sequestration and substitution, and by establishing ecologically designed agricultural systems that can provide a buffer against extreme events.

The diversity of these systems, and the creativity and knowledge of family farmers and indigenous communities are assets of great value for solving the daunting problems affecting agriculture in the twenty-first century. Higher and sustainable productivity increase at their level will have a major impact on poverty reduction, economic growth and climate change mitigation and adaptation. In conclusion, while the challenges of sustainable agricultural development and poverty reduction are formidable we possess greater human capacity and ingenuity than at any time in our common history. With the right policies, investments and political will to reach into poor communities we can meet the formidable challenges of our century.

Some lessons learned and key success factors in the implementation of dynamic conservation of GIAHS

Although in most 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. The dynamic conservation of such sites and their cultures forms the basis of a strategy of territorial development with cultural identity. It is recognized that to overcome poverty it is not necessary to rely on the cultural richness existing in the territory.

On the contrary, regional development should be founded upon the existing natural and agrobiodiversity and the socio-cultural context that nurtures it. Inherent to the concept of GIAHS is an acknowledgement that indigenous knowledge has intrinsic merit and holds development potential. Case studies reveal that there is a diversity of local and traditional practices to manage the ecosystem, including systems of biodiversity management and soil and water conservation. Many academicians and scientists talk about rural populations as being inventively self-reliant, and that resource-poor farmers continuously experiment, adapt and innovate.

It could boldly be premised that rural peoples in GIAHS hold many of the potential answers to the production and natural resource conservation challenges affecting today's rural landscapes. Based on experience and lesson learned, there is a common understanding and stakeholders of GIAHS acknowledge that there are real possibilities for building on local traditions and indigenous environmental knowledge to solve hunger and poverty in rural areas, instead of relying on often inappropriate technologies from outside. Some of the lessons learned and success factors identified are, as follows:

- Preservation (protection) and transmission of valued traditions and agricultural practices (i.e. rice-fish related cultural activities) to new generations plays an essential role in the long-term conservation of traditional farming system.
- Scientific research and studies showing ecological advantages, resiliency, socio-cultural factors, etc.) and technical extension can reinvigorate and infuse new vitality into traditional agricultural practices by influencing local and national governments.
- Informal certification and labelling provides higher market values, which influence the motivation of local farmers, local governments and other stakeholders in the conservation of GIAHS.
- Inclusion and involvement of communities and all relevant stakeholders (community-based interactive participation) emphasizing the sharing of responsibility between and among them to support conservation of GIAHS goods and services.

Unusual Farming Systems in the World Ecology and Society in Traditional Agriculture

Eric Mollard

Research Institute for Development, France

Photo1_Mollard

The concept of unusual/Peculiar Farming Systems

Human beings have always adapted to even the most inhospitable environments. The severity of physical constraints has led to innovative farming practices that use diverse and creative technical solutions. This indigenous technical knowledge is embedded in the social and cultural societal framework, and is passed down through generations. These unusual/peculiar farming systems (PFS) are ingenious not only for the innovative solutions practised within them, but also for the ability of farmers and leaders to adapt them. This leads to improved flexibility and thus, greater opportunity. PFS technology would have been improbable for development had it not given farmers a way to 'artificialize' the ecological environment. These practices also provided a way to be highly competitive with the reclaimed environment.

Markets are crucial for many agricultural systems, both for family income, and for maintaining a steady workforce faced with other labour options. Local social cohesion and lack of migration networks also aid in sustaining an active labour force. Availability of markets and connection to the external world facilitate the use of modern inputs, such as increased tourism. However, better transportation can bring competition with local production. This is true for the Floating Gardens system in Myanmar where there is a strong tourism component, but transportation of vegetables to the market relies on reed rafts in valleys.

It is important to identify the market-bound stakes, but also the two major agricultural classifications: labour saving and labour intensive. In labour saving, mechanization is an option and a local workforce is not necessary, therefore, to sustain this system many farmers must seek employment outside the farm. Labour intensive systems do not allow for outside employment. They rely on maintaining a specific ecology, such as the case of the Delta Poldered Raised Beds in Thailand. This system produces fruits and vegetables on raised beds that alternate with ditches where water stagnates permanently. For other situations, a specific set of factors needs to be thoroughly analysed.

The following Peculiar Farming Systems can be included in the labour intensive category: Pearl River Delta, Mulberry Dyke-Fish Pond; Hortillonnages (France), Raised Beds (unpoldered) and vegetables; Poldered Raised Beds in Delta (Thailand) and vegetables and fruit for export; Dogon Area (Mali) and onion for national market; Entarquiamiento (Mexico) and potatoes for national markets and strawberries for the United States market; Floating Gardens (Myanmar) and vegetables for the local market; Shifting Dug Wells (Ghana) and vegetables for the local market; Cultivated Coastal Sand Bar (Tunisia) and vegetables, corn and trees (home garden and market); and the Canary Islands and Vineyard (Market). Floating Rice (Thailand) and Corn farming/fish ponds in Dombes (France) are to be included in the labour saving category. The following PFS on the contrary, are poorly articulated to the market and went from labour intensive to labour saving: Camellones (Latin America); Easter Islands Home

Gardens; Hoyas and Qochas (Peru), Cost and high plateau areas; Chilac Gold (Silt diversion) (Mexico), maize; Pacific Island, Taro cultivation.

[Photo2_3_4_5_Mollard](#)

Vulnerabilities

Some PFS are burgeoning, some are maintaining their existence, and yet others are disappearing or have completely disappeared. Vulnerabilities are numerous and must be classified according to a defined methodology. The market and local society, with its social cohesion or organization and perception of the world, play a major role in determining the weaknesses and opportunities associated with agricultural goods and labour. Local ecology and information sharing also determine a system's vulnerability.

GIAHS Conservation and Biodiversity Management

P.S. Ramakrishnan

Jawaharlal Nehru University, New Delhi, India

Photo1_Ramakrishnan

GIAHS conservation and biodiversity management

The relationship between traditional societies and the environment has been misunderstood; the net result is the interpretation that ‘primitive’ practices are the culprits of land degradation and should be converted to ‘modern’ ways of living, but this can lead to the loss of GIAHS sites. There are three commonly referenced myths:

- population and poverty are responsible for deforestation, natural resource depletion, and land degradation;
- traditional ‘primitive’ agricultural systems, should be replaced with energy-intensive modern farming practices; and
- sedentary grazing regimes are superior to traditional rotational grazing practices, and the former should replace the ‘primitive’ latter.

The concept of biodiversity is more complex than the number of different species in a given geographic region. It goes beyond subspecific species identification to include the linkage of functional groups, ecosystems and landscapes. Marginalized sectors of society seek basic amenities such as land, water and air for sustainability of their way of life. Commodities and eco-processes are linked to biodiversity; commodities, such as fodder, fuelwood, timber, agriculture and animal husbandry are crucial for food security. Eco-processes, such as sustainable soil, water and air quality are associated with economic wellbeing. Conservation of natural and cultural landscapes is also an important amenity for intangible religious and artistic values. Socially-valued ecological keystone species are the basis for fallow land management plans for sustainable production systems.

GIAHS have a strong socio-cultural connotation; intangible benefits are an important consideration for declaring a site as GIAHS. These elements are strongly connected to ‘place’ as in the Demojong landscape of the Tibetan Buddhists of Sikkim. The area below Mount Khangchendzonga in West Sikkim, referred to as Demojong, is the core of the sacred land of Sikkim. The air, soil and water are all sacred to the people because of the interconnections that they perceive to exist. Any human-induced perturbation is considered by Sikkimese Buddhists to spell disaster for the whole region, because of the disturbance caused to the ruling deities and the treasures placed in the landscape.

The region has a number of sacred lakes, which are said to have presiding deities, representing both good and evil. Propitiating these deities through various religious ceremonies is considered important for the welfare of the Sikkimese people. Offerings are made to the protective deities, but no meaningful performance of Buddhist rituals is possible if this land and

water is desecrated (Ramakrishnan, 2002). Attention is paid to the human-nature interactions in this area to evaluate the intangible in more tangible terms.

Photo2_3_Ramakrishnan

Agricultural knowledge systems can be classified into two types: formal and traditional. Formal knowledge systems (FEK) are hypothetical and deductive; their process is de-linked from the human element. Traditional ecological knowledge systems (TEK) have a strong human element. Linking the two for cultural diversity, associated with biological diversity leads to 'hybrid' technologies. GIAHS-relevant TEK has been linked with anthropocentric secondary forested landscapes. In India, secondary forests with discrete and discontinuous old growth and savannahs have been documented (before the eighteenth century) with a population density of less than 35 people/km² (Guah, 1999). In South America, extensive terraced farming systems relying on plant cultivars from at least 1000 BC (IUBS, 1994) have been identified.

Biodiversity-linked knowledge systems are the key to addressing landscape sustainability concerns. Understanding the mutually supportive dynamics existing between cultural diversity and biodiversity has implications for community-centered sustainable development pathways. Conserving or restoring the value-system-based natural and cultural landscape is essential for GIAHS. Traditional forest dwellers have always strived to conserve the cultural landscape to which they are attached. Even urban societies are now seeking to get close to nature through reconstructed urban cultural landscapes. This is true even in highly industrialized nations (United States) (Shutkin, 2000).

TEK can be a trigger for land-use change; it can lead to improved water balance and soil fertility, which leads to altered nutrient-cycling properties and increased biodiversity, which subsequently leads to agro-ecosystem redevelopment and ecosystem rehabilitation, leading eventually to sustainable livelihoods or development and human security.

Water is an additional trigger, along with TEK, for land-use development. Sustainable water management leads to biodiversity change, which leads to species regeneration, leading to improved livelihoods, soil fertility, subsoil recharge, agro-ecosystem redevelopment, increased biodiversity, phosphorous, and improved community participation, all of which eventually lead to sustainable livelihoods/development.

Photo4_Ramakrishnan

Sustainable landscape management

The concept of sustainable development and the effective management of natural resources and indeed, the rehabilitation of degraded ecosystems, are all closely interlinked. Ecological issues

are linked with social, economic, anthropological and cultural dimensions, since the guiding principles of sustainable development cut across these very disciplinary realms, with obvious trade-offs.

Sustainable landscape management means agricultural and natural ecosystem sustainability must be linked. There are three pathways for this to happen:

1. Incremental pathway:
 - shifting agricultural landscape in northeast India;
 - building on TEK step-by-step, with minimal FEK as appropriate;
 - involving 1 200 villages – a successful developmental initiative for more than 100 years.
2. Contour pathway:
 - bring about appropriate balanced dosage of TEK and FEK;
 - traditional sedentary agriculture and degraded forest landscapes.
3. Buffering ill-effects arising from excessive use of fertilizer technologies with minimal TEK inputs:
 - tea plantation landscape in the West.

GIAHS could also be interpreted as an integrative metaparadigm (Ramakrishnan, 1992; Costanza, 2003), aiming at ecologically, socio-culturally, and economically sustainable production systems in a cultural landscape context.

Session 2: GIAHS as Development Assets and Resources

The need to strengthen the resilience of rural peoples and to help them cope with the threat of climate change to food security is more evident than ever. This requires that strategies to promote climate change adaptation and mitigation measures are fully integrated into development approaches, especially in the agricultural sector. These approaches will need to be innovative in order to involve and encourage different actors to devise solutions together. In recent years, traditional agricultural practices have increasingly attracted the attention of scientists, journalists, policy-makers, and civil society as a means to promote environmental sustainability and achieve community development. The roles played by traditional farming communities, indigenous agricultural practices, food systems and adaptation strategies provide a critical resource for addressing climate adaptation and the ongoing challenge of sustainable development. In other words *Globally Important Agricultural Heritage Systems* are a heritage for the future. They deserve further support and their stories must be told.

This session was devoted to the presentation of the important characteristics, experiences and lessons learned from different regions of the world about the evolving, living agricultural heritage systems.

Chile: Chiloé Agriculture

*Carlos Venegas
Centro de Educación y Tecnología (CET)
Chiloé, Chile*

Photo1_Chile Ingenious Systems

The Archipelago of Chiloé, in the south of Chile, is one of the centres of origin for potatoes and is an extraordinary biodiversity reserve; its temperate rainforests hold a wide range of endangered plant and animal species. The Chilotes – Huilliche indigenous populations and Mestizo – still cultivate about 200 varieties of native potatoes, following ancestral practices transmitted orally by generations of farmers, mostly women. However, new income-generating activities, such as intensive fish farming in the island lakes, are leading to the dramatic out-migration of male labour from the agricultural sector, which is, consequently, overburdening women with additional social and labour responsibilities. These changes seriously jeopardize biodiversity conservation activities that are beneficial not only to Chilotes, but also to global genetic biodiversity. The GIAHS project will help to design policies for the recognition and conservation of these resources in which rural and indigenous communities play an active role and are recognized as the main custodians of this treasure of humanity.

The largest island is 9 000 km² and there are 40 smaller islands, which are mostly inhabited, by around 150 000 inhabitants. Agriculture is based on potatoes, wheat, oats, rye, vegetables, cattle, pigs and sheep. Non-agricultural activities include crafts, wood, fibre, leather, wool, in addition to tourism, agro-tourism, fishery, harvesting of salmon, mussels and seaweed.

Progress of GIAHS implementation

The targets of the GIAHS initiative are the: domestication, maintenance and adaptation of globally important agricultural biodiversity such as potatoes, goose, strawberries, etc.; integration of the different levels of agricultural biodiversity: genetic resources, species, ecosystems and landscapes; integration of biodiversity with the traditional knowledge systems; principles and lessons for the *in situ* conservation of biodiversity and sustainable agricultural development; achievement of food security and the participatory improvement of animals and vegetables directed to coping with the effects of climate change.

Outcome 1: Institutional arrangements for the collaborative conservation and adaptive management of the Chiloé GIAHS

The target is: public and private institutional policies, programmes and plans aligned to the GIAHS concept and the active collaboration of interested parties.

Outcome 2: Sustainable management of globally important agro-biodiversity realized in Chiloé by three communities (indigenous peoples and hill farmers) participating in the project.

The target is to achieve a delicate equilibrium between tradition and change promoting generation of income and food security.

Milestones and related activities for the next four years of the Project

The first activity considers the strengthening of institutions that promote the project, the unification of criteria and the addition of human and economic resources. Subsequently, the activities will be framed within three areas: 1) direct work with communities (educational workshops on culture and native biodiversity, transference of production technologies and traditions associated with them, and the training of teachers and high-school students); 2) research and development of productive systems; 3) reinforcement of CET as a research and development centre that systematizes and archives information related to the genetic cultural, agronomic and commercial information, providing technical support to farmers.

The promotion and creation of policies related to biodiversity conservation is essential through the organization of seminars and conferences to promote native varieties at the national level while sensitizing and informing the community, with the purpose of generating the interest of the authorities in creating a political framework that protects the cultural legacy and the existing biodiversity in the Archipelago.

Photo2_Chile Ingenious Systems

Peru: Andean Agriculture

Mario Tapia, Peru

Photo1_Andean Agricultura

From Machupicchu to Lake Titicaca

The Central Andes are a primary centre of origin for potatoes. Hundreds of varieties have been domesticated by generations of Aymara and Quechua in the valleys of Cusco and Puno, not far from the famous Macchu Pichu. Many cultural and agriculture treasures from the Inca civilization have been carefully preserved or conserved that have evolved over centuries to guarantee living conditions over 4 000 m above sea level (masl).

One of the most amazing features of this heritage is the terracing system, which is used to control land degradation. Terraces allow cultivation on steep slopes and at different altitudes. Three main agricultural systems can be found ranging from 2 800 to 4 500 m. Maize is cultivated in the lower areas (2 500–3 500 masl); potato mainly at medium altitudes (3 500–3 900 masl). Above 4 000 m the areas are mostly used as rangeland, but can also be cultivated with high altitude crops. On the high plateau, around Lake Titicaca, farmers dig trenches (called *sukakollos*) around their fields. These trenches are filled with water, which is warmed by sunlight. When temperatures drop at night, the water gives off warm steam that serves as frost protection for several varieties of potato and other native crops, such as quinoa.

Photo2_Andean Agricultura

Agricultural biodiversity:

This area is the primary centre of origin for potatoes, quinoa, kañiwa, chilis, chinchona trees, coca shrubs, oca, olluco, mashwa, amaranth, leguminous plants, such as beans and lupins, and roots, such as arracacha, yacón, mace and chagos. Moreover, extraordinarily polymorphic groups of soft corn have been identified and llamas, alpacas and guinea pigs have been domesticated.

The following varieties can be found;

Carmen: Potatoes (105 var.), Oca (25 var.) Olluco (14 var.), Mashua (20 var.), Maize (34), Quinoa, Kañiwa, Lupins, Llamas, Alpacas, wild relatives

Lares: Potatoes (177 var.), Oca (20 var.), Olluco (11 var.), Mashua (17 var.), Maize (23), Quinoa, Kañiwa, Lupins, Llamas, Alpacas, wild relatives

Caritamaya: Potatoes (28 varieties). Bitter potatoes (13 var.) Quinoa (43 var.), Kañiwa (8 var.), Oca, Olluco, Llamas, Alpacas (all 24 colours, 3 main breeds)

San José: Potatoes (80 var.), Mashua (14 var.), Olluco (18 var.), Kañiwa (12 var.) Oca (20 var.) Llamas, Alpacas

Photo3_4_Andean Agricultura

Main milestones and related activities

Objectives

1. Preserve dynamic agrobiodiversity through the *in situ* conservation of native crops and livestock.
2. Re-evaluate traditional technology concerning soils, water and environmental management.
3. Strengthening of the local authority systems.
4. Promotion of sustainable agricultural systems.

The GIAHS project, in coordination with the Peruvian *Ministerio del Ambiente (MINAM)* and the participation of local institutions, will help value these centuries old ingenious agricultural technologies to maintain this unique, culturally and biologically rich environment for future generations. An important activity to be implemented will be the production of high quality seeds from main native crops. This will be carried out in coordination with local people in the selected sites and local institutions. Communal fairs will be held to facilitate an equity market.

The threats to the successful completion of the project are: water contamination; replacement of native varieties; migration and cultural erosion (opportunity costs of labour); problems with storage and distribution of seeds of native varieties; insecure land tenure and fragmentation of the collective property systems, which have been closely associated with the collective management of agricultural biodiversity; and erosion of gender-specific roles and knowledge regarding biodiversity management resulting from a shift in responsibilities because of male out-migration (opportunity cost of labour).

Photo5_Andean Agriculture

The MILPA (cornfields) of the twenty-first century recovery of the Meso-American farming system

Ian Cherrett
FAO Representative a.i. in Ecuador

Photo1_Milpa System

The Meso-American farming system is an agroforestry system generated through collaboration between local and technical knowledge systems, which combines grain production (maize, beans and sorghum) with a series of agricultural technologies that ensure soil and water management together with agroforestry practices.

Characteristics of the system

The system features fields with 200 to 300 dispersed trees per hectare, under natural restoration, an open multi-cropping system, based on local varieties that maximize the use of the ecosystem resource base, resulting in a high level of system resilience. This system provides various environmental services and increases resistance to climate instability. It protects and recovers natural biodiversity, at the same time allowing for the incorporation of animals. It is a sustainable soil management system that includes three layers of ground cover: mulch and stover, crops, bushes and trees, with a production system for the dry forest region of the tropics between 140–800 m above sea level.

The system includes the following technologies: no burning, direct sowing, zero tillage, management of stover, natural regeneration, tree pruning and biomass management, crop diversification, multi-cropping, dispersed trees, cover crops, live barriers, crops with trees and use of diverse tree varieties, including fruit trees.

Impacts of the XXI Century Cornfields

Photo2_Milpa System

In two years 4 000 families have increased their hillside maize yields by 25 percent and leading farmers doubled their maize production (from 1.5 to 3 tonnes of maize/ha, (El Conte, El Progreso y San Francisco, El Bran, Jutiapa). The rates of return from maize production increased from 35 to 50 percent and within four years of validation by leading farmers, 87 percent of the families have adopted the new system for their grain production. Abandoning burning techniques and incorporating stover has increased the rate of return on investment to US\$2 for every US\$1 invested and in Lempira (southern Honduras), the average production after 6 years is 4 tonnes/ha when it used to be 1.5.

Variations of the system are practised by 40 million Meso-American small-scale hillside farmers, who are mainly indigenous people. This system is a reservoir of crop varieties, especially maize, and of the knowledge of their ecological relationship and usefulness. Small-scale farmers are able to sustainably recover degraded landscapes and manage watersheds and the system provides an alternative to slash and burn agriculture worldwide, especially where maize is an important crop. This system also helps militate against the threats of climate change and hillside degradation.

Problems and Challenges

- decision-makers often do not recognize the value of small-scale farmers' production potential;
- lack of farmer organizations and the lack of necessary autonomy where they do exist
- predominance of client based political systems;
- the paternalistic attitude of the developed world;
- lack of extension system;
- donors' focus on cut-backs; and
- sense of inferiority, causing external initiatives to have greater acceptance.

Photo3_Milpa System

Brazil: The agricultural system of the Rio Negro region in Central Amazonia

*Laure Emperaire and
Anna Gita de Oliveira,
Pacta Researchers
Brazil and France*

Photo1_Brazil

Brazilian context of intangible heritage

Brazilian cultural heritage is safeguarded by the Institute of Historical and Artistic National Heritage (IPHAN) and by the local Culture Department (Decree 3551/2000).

The Rio Negro Region is populated by 23 different ethnic groups and the indigenous areas cover 10 000 km². Slash and burn farming and subsistence agriculture are functional elements of local farming practices. The entire area is rich in forests and regional urban centres and the social system is characterized by linguistic or clanic exogamy, virilocality and patrilinearity.

Outstanding features

- high diversity of cultivated plants;
- material culture;
- food system based on cassava (characterized by genetic diversity);
- over 100 food plants;
- chilli peppers, peach palms, açai, yams, dashes, sweet potatoes, fish;
- personal network: for one agriculturist, 42 providers, 154 species or varieties;
- cassava varieties circulation characterized by intergenerational transmission;
- circulation of therapeutic plants;
- circulation of fruit trees characterized by horizontal transmission;
- global network between urban centres and forest communities; and
- the horizontal, polycentric and participatory diffusion patterns of innovation.

Photo2_3_Brazil

Geographic origin: Santa Isabel, Espirito Santo, Tapereira.

Identity of the cassava variety:

Photo4_Brazil

Recognition criteria are the following: morphology, epigeal and hypogeal parts of the plant, structure, form, colour of the leaves, stems and tubers.

Properties are agronomic, productive, for use, organoleptic and nutritional and the attributes are name, history, mythology, social links and circulation.

Methodological aspects

- Geographical origin: spatial organization of the agro-ecosystem.
- Social origin: social network and life story, cultivated plants and associated values.
- Social links: biological, social and spatial basis of agrobiodiversity.

Study areas for 2008–2013:

- Indigenous: Rio Negro (AM), Yekuana (RR), Wayana/Aparai (PA), Sateré-Mawé (AM), Apinajé (TO), Krahó (TO), Kuikuro (MS)
- Traditional: Juruá (AC), Agricultores (PE), Quilombolas (SP), Faxinalenses (PR)

New trends and challenges

- complex structure of the agricultural systems;
- local status of the variety: shared goods, individual goods;
- forms of innovation: many stakeholders, multispatial and social network;
- main values embedded: identity and heritage, economic;
- local systems of experimentation and innovation; and
- environmental and genetic services.

Session 3: Learning and measuring progress of the dynamic conservation of GIAHS

This session presented the agricultural heritage systems from the pilot and participating countries. The participants engaged in an interactive exchange of experiences, perspectives, opportunities, as well as obstacles and success stories in implementing the GIAHS Initiative. The presentations and discussions *aimed to identify synergy, local actions and effective implementation mechanism in the dynamic conservation of GIAHS.*

The **Philippines: Ifugao rice terraces agricultural heritage systems**

Cristina Regunay

***Department of Environment and Natural Resources (DENR),
The Philippines***

Photo1_Ifugao System

Ifugao Province, Northern Cordillera Mountains

The ancient Ifugao Rice Terraces (IRT) of the Northern Cordillera Mountains, covering approximately 20 000 ha, have remained viable for the past 2 000 years. This is a direct result of indigenous technical knowledge of organic rice paddy agriculture being passed down by generations of Ifugao peoples. Inheritance is the mode of ownership and land is not partitioned into smaller sizes. Use of natural resources and Ifugao rice production are based on aboriginal customs and beliefs, which prevent over-exploitation of land resources and promotes biodiversity conservation. These unique areas are under threat as a result of increased urbanization, particularly along the main roads near the *Banaue poblacion* (town center).

In 1995, the IRT were designated as an UNESCO World Heritage site because of their outstanding and evolving organic cultural landscape. Traditional silvicultural and agroforestry practices, as well as native *mumbaki* rice rituals, which are conducted throughout the growth cycle, ensure agricultural productivity. The IRT landscape consists of a series of *payoh* (terraces) and *muyong* (private forests) with patches of *uma* (slash and burn *swidden* farming). The *muyong* is a family forest located above the *payoh* varying in size from 0.5–2.5 ha. It is a natural forest, with as many as 264 plant species that supply many family needs. Irrigation water comes from the forested subwatersheds and is conveyed through *ala* (irrigation canals) to the *payoh*. This system allows for adequate water levels to be maintained year round.

Figure1_Ifugao System

Progress of GIAHS Implementation

The goal of the GIAHS initiative is to “protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements” [cf. CBD: Article10(c)], specifically within agricultural systems. Four outcomes have been prescribed to reach the project objective of “promoting conservation and adaptive management of globally significant agricultural biodiversity harboured in GIAHS”.

Outcome 1: An internationally accepted system for recognition of GIAHS is in place.

- Target: by project end, identified institutions have issued appropriate resolutions/ordinances.
- Accomplishments:
 - establishment of a functional inter-agency technical working group (TWG) at the national and regional/local levels; and
 - tourism awareness and skills training conducted for local government units (LGUs) and communities.

Outcome 2: *Mainstreaming of GIAHS in sector and national plans and policies in pilot countries.*

- Target: policies and plans explicit to GIAHS are formulated, issued and implemented.
- Accomplishments:
 - the project is already mainstreamed at the Office of the Global Environmental Facility (GEF), which is the Focal Operational Point for The Philippines – counterpart funds Php500 000 were appropriated for 2009 by the Department of Environment and Natural Resources (DENR)/Government;
 - both regional and provincial agency and LGU, respectively, have provided counterpart contributions in cash and in-kind (i.e. personnel, communication facilities, technical assistance, etc); and
 - criteria for the selection of GIAHS sites (future expansion sites) and criteria for the prioritization of the activities on the pilot site were formulated together with the LGUs, communities and the Project.

Outcome 3: *Globally significant agricultural biodiversity in pilot GIAHS is effectively managed.*

- Target: habitat surrounding traditional farms remains stable or has increased compared to baseline level.
- Accomplishments:
 - initiated the preparation of:
 - community land-use plan;
 - inventory of flora and fauna (Protected Areas and Wildlife Bureau);
 - inventory of damaged rice terraces;
 - studies of giant worms; and
 - policy reviews including Mountain Provinces.

Outcome 4: *Lessons learned and best practices of promoting effective management of pilot GIAHS are widely disseminated.*

- Target: functional website, best management practices and GIAHS initiatives published and disseminated.
- Accomplishments:
 - preparation of the database management proposal and information materials, i.e. brochures
 - initiating sourcing of funds from other donors through project proposals to GIAHS pilot areas using other resources e.g. Millennium Development Goals Achievement Fund (MDGF).

Photo2_3_Ifugao System

China: traditional rice-fish System The Achievement and Prospect of GIAHS Implementation

*Dr. Qingwen Min.,
Institute of Geographic Sciences and Natural Resources Research (IGSNRR),
China*

Photo1_Rice Fish System

Qingtian agriculture

Among the biodiversity features in Qingtian County, there are twenty native rice varieties, six native breeds of carp, four species of Azolla, vegetables, fruits, medicinal plants and forests. The agricultural practices are based on rich knowledge and skills that integrate rice, fish and other components to achieve integrated and multiple benefits, such as balanced diets, pest control and the recycling of nutrients.

Progress of GIAHS implementation

Outcome 1: Establishment of an internationally accepted system for the recognition of GIAHS

Delivered outputs

- the publication of academic articles (in English or in Chinese with English abstract) and six books (one in English and five in Chinese);
- two special articles were published in an academic journal;
- more than ten national and international workshops and/or forums;
- special theme and cover story in three public magazines; and
- several seminars on agricultural heritage systems were held, raising the awareness of the community, local government and local farmers' about agricultural heritage.

Photo2_3_Rice Fish System

Accomplishments

- Mingbao Weekly and Wenhui Daily in Hong Kong reported Qingtian's rice-fish culture in 2007 and 2008.
- HK Cable TV produced and broadcast a special programme in November 2007: *Rice-fish means good harvest*, which showed rice-fish practices in Qingtian, Longji terrace in Guangxi and Congjiang in Guizhou.
- Prof. Li Wenhua was interviewed by CCTV-9 (international channel) in June 2005.
- Mr Parviz Koochafkan was interviewed by CCTV-news in 2007.
- The BBC and CCTV co-produced a Chinese natural and cultural series in 2008 entitled *Wild China*, featuring Qingtian's rice-fish culture.
- Prof. Min Qingwen was invited to join the forum held in Sikkim, India, in 2007, the conference held in Vienna, Austria, in May 2008, and the forum held in Taipei, China in October 2008, where the Professor gave a presentation on China's GIAHS.

Outcome 2: The conservation and adaptive management of globally significant agricultural biodiversity harboured in GIAHS was mainstreamed in sectoral and inter-sectoral plans and policies.

Accomplishments

- Qingtian's medium- and long-term development plan focussed on the rice-fish agricultural production and culture conservation. The local government issued temporary legislation to promote rice-fish conservation and development.
- Qingtian Bureau of Agriculture, Culture and Tourism encouraged and promoted local farmers to join the conservation. They provided related techniques, prepared standards, supported the demonstration households, developed the Shiboletth Basakah and *Yujiale* (Happy Fishing) in Longxian and enlarged the rice and fish market.

Outcome 3: Globally significant agricultural biodiversity in pilot GIAHS are being managed and sustainably used by empowering local communities, by harnessing evolving economic, social, and policy processes and by the adaptation of appropriate new technologies that allow interaction between ecological and cultural processes.

Targets

- To place a GIAHS label on rice and fish products with the objective of enhancing their market value.
- To develop the Shiboletth Basakah and *Yujiale* (Happy Fishing) in Longxian to increase local farmers' income.
- To combine traditional knowledge with modern science and techniques such as fry breeding, rational planting density and appropriate field management to increase rice and fish yields.
- To support related – national or provincial – cultural activities as heritage, to increase local farmers' awareness. For instance, Qingtian's Fish-Lantern Dance was listed as a National Intangible Cultural Heritage in 2008.

Photo4_Rice Fish System

Outcome 4: Lessons learned and best practices for promoting effective management of the pilot GIAHS are being widely disseminated to support the expansion and upscaling in other areas or countries and the creation of a GIAHS network.

Accomplishments

- The acknowledgement that Government support and policy perfection are a strong guarantee for GIAHS conservation.
- Community-based interactive participation is the foundation for the sharing of responsibility and benefits of GIAHS conservation.
- The recognition that the preservation and transmission of traditions and culture to new generations plays an essential role in the long-term conservation of GIAHS.
- The understanding that scientific research and technical extension infuse new vitality into traditional agricultural practices.

- Adequate certification and labelling is essential for agricultural products to obtain higher market values, which in turn influences the motivation of local farmers and the conservation of GIAHS.

Main milestones and related activities for the next four years of the Project

- There are currently three committees: the National Agricultural Heritage System Conservation Committee, the National Scientific Committee for Agro-cultural Heritage Systems Conservation and the Local Agricultural Heritage System Conservation Committee.
- The workshops and training courses for local governors and farmers are being held twice a year: the first in June (China's National Cultural Heritage Day, on the second Saturday of June) and the second in November or December.

China's GIAHS candidate system

There are currently three candidate systems in China: the Congjiang rice-fish-duck system in Guizhou province, the Wannian rice-culture system in Jiangxi province and the Hani rice terrace system in Yunnan Province.

- Other potential candidates include: the dyke-pond system, dry land agricultural system, Karez, check dam system, traditional nomad and fishery systems.

Future activities:

- China's AHS Series will be produced gradually. The first part, which includes four systems is currently being produced and will be broadcasted in CCTV-7 (Agricultural Channel) in June (2010).
- Other media reports will be emphasized, especially during China's National Cultural Heritage Day.
- Scientific research will be increased, especially the creation of legislation at different levels, product certification systems, cultural conservation, adaptation and development, a comparative study between different regions with different economic levels and different minorities, as well as multi-stakeholder and participatory mechanisms.
- China's agro-cultural heritage series will be published continuously.
- The demonstration and extension of rice-fish culture will be an important occupation for future years.

Problems/opportunities in Project implementation

Problems

- Officials at the Ministry of Agriculture (MOA) and the Central Government have not been paying much attention to agricultural heritage systems as compared to modern agricultural development.
- Scientific research has not been given sufficient emphasis because GIAHS is a new field with inter-disciplinary characteristics. It has been very difficult to apply for research projects from the MOA, the Ministry of Science and Technology, and the National Scientific Foundation;

- Certification or labelling has lagged behind, therefore, many agricultural products cannot get higher market values, which influences the realization of potential values existing in the GIAHS and the approval of local farmers.

-
-Opportunities

- Central governments are promoting Ecological Civilization, New Countryside Socialism and Cultural Industrial Development, all of which positively influence GIAHS Project implementation.
- Many local governors and farmers value their indigenous knowledge systems and agricultural species.
- Many local governors and farmers have expressed their strong interest in the GIAHS project and have expressed their hope that FAO will include their traditional agricultural systems in the GIAHS pilot systems.

Maasai pastoralist system
Supporting food security and reducing poverty in Kenya and the United Republic of Tanzania through dynamic conservation of GIAHS

Kiprop Lagat
Nation Coordinator, NMK, Kenya

Photo1_Maasai

Maasai pastoralist system

The Maasai pastoralist system has been practised in the savannah rangelands of Eastern Africa for several hundred years. Herds consist of cattle, sheep, goats and recently camels. Livestock is central to sustaining Massai livelihoods; many households are provided food, materials and income. The system provides meat, milk, wool, hides, forage, water, manure, and forest-based products (edible fruits, seeds, medicines, honey, poles). In addition, the Massai form of pastoralism, has generated traditional indigenous knowledge over the years for managing natural resources. The most important forms of knowledge acquired by the Maasai are:

- selecting disease-resistant, young stock;
- ensuring water and forage availability before livestock movement;
- moving livestock in relation to mineral (salt licks), forage, and shade needs;
- ensuring human and livestock health through intra- and inter-annual movements avoiding disease-prevalent areas:
 - over-grazed areas with tick and Tsetse fly disease vectors such as Leishmaniasis;
 - swampy areas with insect and snail vectors of disease like Fascioliasis and Malaria;
- living in proximity to markets;
- rotational movement patterns to avoid overgrazing and predators;
- closely monitoring animal movement and environmental changes; and
- saving forage through delayed entry during the dry season.

Associated biodiversity includes diverse wildlife species, especially herbivores and carnivores, as well as abundant birdlife. In addition, the forests, wooded grasslands, and shrub lands support varied species of plant life – some rare – that are culturally significant and used for ethno-medicinal, veterinary and ceremonial purposes.

This system displays a high diversity of habitats and biodiversity, which all play a critical role in the sustainable functioning of the whole, and continue to support food-security and culture of their custodians. The common property tenure practised in Oldonyonyokie-Olkeri Group Ranches and its associated cultural institutions have ensured the viability of the Maasai.

Progress in GIAHS implementation

The goal of the GIAHS initiative is to “protect and encourage customary use of biological resources according to traditional cultural practices that are compatible with conservation or sustainable use requirements” [cf. CBD: Article10(c)], specifically within agricultural systems. Four outcomes have been prescribed to reach the project objective of “promoting conservation

and adaptive management of globally significant agricultural biodiversity harboured in GIAHS”.

Outcome 1: *An internationally accepted system for recognition of GIAHS is in place.*

Discussions have been held with a Kenyan member of the World Heritage Convention (WHC) Committee on the importance of GIAHS under the WHC.

Outcome 2: *Mainstreaming of GIAHS in sector and national plans and policies in pilot countries.*

The importance of recognizing and supporting GIAHS through policy interventions has been explored with Kenyan stakeholders. It has been agreed that the project sites, as well as other agricultural heritage systems identified by the project, will be designated as a national heritage. Thereafter, the most significant ones will be included in the *Kenyan World Heritage Tentative List*. A national policy workshop is planned in the next quarter emphasising the importance of mainstreaming GIAHS into national plans and strategies. This will focus on the implementation of relevant international agreements with the CBD, [International Treaty on Plant Genetic Resources for Food and Agriculture \(IT-PGRFA\)](#), [United Nations Convention to Combat Desertification \(UNCCD\)](#), Ramsar, Global Plan of Action for Animal Genetic Resources (GPA-AnGR), etc. under applicable sectors, especially the Ministries of Livestock and Agriculture (ML/MA), and the National Environmental Management Authority (NEMA).

Outcome 3: *Globally significant agricultural biodiversity in pilot GIAHS is effectively managed.*

The assessment of dynamic land-use patterns at landscape-scale accounting for linkages with other communities and land uses has been undertaken. This has resulted in the selection of Oldonyonyokie and Olkeri Group Ranches in the Kajiado District; an area covering a total area of 93 418 ha. Upon selection, free prior informed consent (FPIC) meetings with the local community were held. Further consultations with the community will be held throughout the project period. Kenya is now at the stage of developing a site-specific community-based land-use zoning and management plan for productive and sustainable use of GIAHS sites.

Outcome 4: *Lessons learned and best practices for promoting effective management of pilot GIAHS are widely disseminated.*

Although the Maasai Pastoral System GIAHS project is still in its formative stage, we have come to appreciate the importance of cross-sectoral collaboration with different stakeholders as a means to promoting its understanding. Dissemination strategies at country-level will be formulated.

Milestones and related activities expected for the next two years

Land-use planning/management and tenure (access to NR):

- assessment of dynamic land-use patterns at landscape-scale, accounting for linkages with other communities and land uses;
- developing a site-specific community-based land-use zoning and management plan for productive and sustainable use of GIAHS sites; and
- securing access to critical resources identified in the assessment and plan for community members, using existing tenure law negotiation with other land users (access under law and training in participatory and negotiated territorial planning, and use of national and local legislation), and trans-boundary cooperation between Kenya and Tanzania.

Improved agricultural and rangeland management practices:

- as appropriate, use of CA-SARD practices for home gardening and fodder production in pastoral sites;
- in selected sites, improving rangeland productivity by setting aside areas for recovery (to be reflected in the site-specific plan); and
- promoting alternative livelihood activities to combat/regulate charcoal burning.

Promotion of heritage agricultural practices and knowledge systems

- assessment of knowledge systems and local technologies available and practised on site;
- strengthening knowledge transmission to future generations (training of young land-users by selected elders (farmers/pastoralists), education in local schools, strengthening traditional institutions for such transmission); and
- promotion of these practices at national level (other communities, extension services, national government).

Policy (at National level)

- recognition of GIAHS sites in national heritage law (designation of sites and awareness raising);
- mainstreaming of GIAHS in national plans and strategies for the implementation of relevant international agreements (CBD, WHC, IT-PGRFA, UNCCD, Ramsar, GPA-AnGR, etc.); and
- improved practices for land-use planning that consider dynamic patterns of land-use at landscape-scale, including appropriate tenure arrangements (training for policy makers).

Problems and opportunities

No major problems have been met so far; however, the threat of change in land-tenure from group ranch to individual tenure might jeopardize the principles under which the GIAHS projects operate. Discussions with a majority of ranch members indicated their desire to continue operating as a group ranch.

Second, water plans have been created in dry season grazing reserves thus, encouraging permanent settlement. There is a willingness to relocate from these areas if the project can offer alternative water sources away from these dry-season grazing reserves.

Institutional arrangements

The National Museums of Kenya (NMK) is the National Focal Point Institution (NFPI) for the implementation of the GIAHS project in Kenya, providing the Project National Coordinator. The NMK is a multi-disciplinary institution under the Ministry of Heritage and Culture and has a wide mandate for the protection and management of Kenya's cultural, natural, and mixed heritage. This includes collections, heritage sites, (agricultural) biodiversity and traditional knowledge. It is also the Focal Point for several environmental conventions, including relevant elements of the CBD, as well as for the WHC. An Assistant National Coordinator is from the

Ministry of Livestock, the other Focal Point Institution whose mandates cover animal genetic resources, rangeland management, and livestock production.

Other relevant government agencies, including the Ministry of Agriculture, NEMA, and the Kenya Wildlife Service have each appointed individuals to act as focal points for the project and will support the project through the Project Facilitating Committee. It is envisioned that other national agencies may be contracted to implement different components of the project if the NFPIs do not have the relevant competencies.

Photo4_Maasai

Tunisian National Pilot System: Historic Oasis of Gafsa Globally Important Agricultural Heritage Systems (GIAHS)

Atef Dhahri
Association pour la Sauvegarde de la Médina de Gafsa
Tunisia

Photo1_Gafsa System

Introduction

Tunisia is one of the six pilot countries chosen for the GIAHS project. The historic oasis of Gafsa, with its specific agro-biodiversity, has been selected as a pilot system to develop the methodology of *dynamic conservation* for Agricultural Heritage Systems.

The preparatory phase of the project was facilitated and coordinated by Bioversity International (former International Plant Genetic Resources Institute) in the Maghreb Region (Tunisia, Morocco and Algeria) and coordinated at the national level by the *Association pour la Sauvegarde de la Médina de Gafsa* (ASM Gafsa) with its local, national and international partners who were actively involved during this phase (2005-2007) to implement activities. The main results were the:

- preparation of the action plan's five-year project (2008-2013) (available at: http://www.fao.org/fileadmin/templates/giahs/PDF/Oases_of_the_Maghreb.pdf);
- increased awareness and involvement of national and local partners (meetings, training and field activities with farmers' oases); and the
- dissemination of information on GIAHS historic oasis of Gafsa (posters, leaflets, radio broadcasts).

The project implementation phase was coordinated in partnership with the GIAHS Project Secretariat at FAO Rome, the FAO Sub-Regional Office for North Africa, the Tunisian Ministry of Environment and Sustainable Development and the *Association pour la Sauvegarde de la Médina de Gafsa* (ASM Gafsa), the local implementing agency of the project.

Presentation of the Historic Oasis of Gafsa

The oasis of Kasba covers approximately 700 ha. Its creation dates back to earliest times. It owes its existence to many natural springs that gushed from the deep aquifer waters of Gafsa. Many cropping cultures are practised and several animal species are raised.

Cropping is conducted at three levels:

- forage crops and vegetables;
- fruit trees, including olives, figs, apricots, pomegranates and other fruit trees; and
- palm trees.

The oasis, created in a desert environment, was the result of the great ingenuity of the oasis population. It is mainly characterized by the mastery of channelling and distribution of water, use of work tools adapted to soil (i.e. *Mesha*, *Marchem*, etc.), diversification of crop varieties so that the oasis can satisfy food needs and develop several products for domestic needs (i.e. housing, furniture, etc.).

Temperatures are generally mild in winter and high during the rest of the year. The average minimum temperatures falls below 7 °C from December to February; 4.6 °C in December; 3.6 °C in January and 4.8 °C in February with risk of frost. The average temperature is 18.8 °C.

Very dry and cold winds in the western sector, southwest and northwest from November to April, are often accompanied by sandstorms. These winds can cause erosion and silt. The sirocco causes a net increase of temperature (10 to 15 °C for one to two hours) and a drop in relative air humidity (relative humidity of less than 10 percent). Other weather events are rare but marked by the damage they can cause. For example there are about 8 days per year of hail and about 22 days per year. Rainfall data for the region of Gafsa are: an annual rainfall of 164 mm with a maximum of 501 mm events in 1990 and a minimum of 27 mm in 1911.

Modern socio-economic development has caused a shift in cropping systems. In the past few years, the historic oasis of Gafsa has experienced profound changes caused by the rapid development of modern agriculture based on export and industrial processing. These systems are becoming more specialized and cultivated species are reduced to those that are competitive on domestic and external markets. Moreover, and because of subsequent divisions of property, farms are becoming increasingly fragmented and scattered, resulting in abandonment of plots and genetic erosion mainly in condominium parcels.

Photo2_Gafsa system

Description of GIAHS - Historic Oasis of Gafsa: project results

The overall project goal is “to protect biological resources and encourage use of traditional cultural practices according to the requirements of sustainable conservation.”

Expected results - GIAHS historic oasis of Gafsa

The GIAHS Project values FAO’s methodology and its achievements (Department of Natural Resources and Environmental Management) in defining policies and strategies that assure people sustainable livelihoods. The first workshop for the GIAHS-Maghreb oasis was organized in Gafsa, Tunisia in November 2005. Four outputs of the GIAHS oasis project were identified:

- the historic oasis of Gafsa’s biodiversity is preserved and promoted in a sustainable manner for the well-being of oasis’ local populations and humanity;
- water and land are managed in a fair, rational and sustainable way in the oasis;
- community and supporting institutions for oasis systems are operational, efficient and effective to ensure the oasis’ well-being; and the
- preservation, dynamic conservation and valorisation of knowledge, traditional knowledge and specific cultural heritage of the oasis.

Progression of GIAHS Project in the historic oasis of Gafsa

An internationally accepted system for recognition of GIAHS (Global)

Improve awareness of the advantages of international organizations as to the role of globally important agricultural systems to ensure the sustainable use of agro-biodiversity and food security of indigenous peoples.

- Presentation on the historic oasis of Gafsa – GIAHS project at the international meeting “The oasis: a heritage to preserve and enhance” – Gabes, Tunisia, 28-29 November 2008.
- Presentation on the historic oasis of Gafsa – GIAHS project at the side event during the Third Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture, 3 June 2009.

-Conservation and adaptive management of globally significant agricultural biodiversity harboured in GIAHS is mainstreamed in sectoral and inter-sectoral plans and policies in pilot countries (National).

- Appointment of monitoring and evaluation committee for the historic oasis of Gafsa – GIAHS project, grouping 20 representatives from local institutions, national development institutions, researchers, representatives of professional support structures, civil society and representatives of mass media.
- Organization of a preparatory meeting with members of the monitoring and evaluation committee in April 2009 under the auspices of the Governor of Gafsa to politically support the project and define each partner’s form of contribution according to guidelines and the focus of the project.
- Organization of a national inception workshop on 2 July 2009 in partnership with FAO, the Tunisian Ministry of Environment and Sustainable Development and national and local partners.
- Presentation of the guidelines of the historic oasis of Gafsa – GIAHS project and discussion of the contribution of the Ministry of Environment and Sustainable Development following the visit of H.E. Minister of Environment for Sustainable Development in Gafsa, 11 July 2009.

Globally significant agrobiodiversity in GIAHS pilot systems is being sustainably managed and used through the empowerment of local communities and the harnessing of evolving economic, social, and policy processes and by appropriate adaptation of new technologies that allow interaction between ecological and cultural processes (Local).

- Launching an initiative in partnership with the Global Greengrants Fund and PAN Africa for the alternative fight against the pest *Virachola (Deudorix) livia* Klug on local varieties of pomegranate in the historic oasis of Gafsa with the aim of building a culture of alternative control of pesticides for preserving genetic resources.
- Implementation of a project co-financed by the Finnish Embassy in Tunisia entitled “Support to artisans in economic difficulties by creating a workshop for capacity building in weaving”. This project aims to increase the income of craftswomen, heads of families and to improve their living standards through the employment of these artisans. All are from families having a socio-economic status that can allow to them to be integrated into the economic network.

Lessons learned and best practices from promoting effective management of pilot GIAHS are widely disseminated to support expansion and upscaling of the GIAHS in other areas or countries and creation of the GIAHS network (Global, National, and Local).

Publishing a book entitled *Gafsa and neighbouring oasis villages: about communal life (from the beginning of the seventeenth century to 1881)* to present the process of adaptation of local populations in the oasis of Gafsa with the natural environment, local know-how and social mechanisms. This book is an initiative to promote a better understanding of the oasis communities of Gafsa in modern times. FAO has purchased 300 copies of this book through the GIAHS Project for distribution to institutions and international agencies, national and local stakeholders involved in the project.

GIAHS Historic Oasis of Gafsa : Workplan, 2009-2013

After approval of the project by the Tunisian Ministry of Environment and Sustainable Development, the focal point of GEF projects in Tunisia, ASM Gafsa began the preparation and implementation of a five-year action plan in cooperation with FAO, the Monitoring and Evaluation Committee and local and national partners (http://www.fao.org/fileadmin/templates/giahs/PDF/Oases_of_the_Maghreb.pdf).

To optimize the use of financial resources allocated for this project (GEF/Resource Allocation Framework, RAF), it was agreed to continue with the implementation of priority activities to achieve specific objectives and overall goals of the project. The following preparatory activities have been selected by the Project Monitoring and Evaluation Committee:

- conducting a survey-inventory in the historic oasis of Gafsa;
- enrichment of organic waste into livestock feed;
- rationalization of water use for irrigation;
- promotion of ecotourism and agrotourism in the historic oasis of Gafsa; and
- awareness-raising and communication.

Once completed, a meeting with the Monitoring and Evaluation Committee will be organized to evaluate these activities and proceed with the preparation of the second workplan in synergy with the five-year project workplan, prepared in 2008. Recommendations of the International Steering Committee and GIAHS Secretariat in FAO Rome will be taken into account.

Constraints encountered in the implementation of the project are:

- institutional embedding of local and national partners of the project;
- terms of technical and financial management of the project;
- enabling role of Monitoring and Evaluation Committee members; and the
- definition of priority activities of the project.

Workplan for addressing the problems encountered:

The measures taken to solve these problems are summarized below:

- strengthening advocacy and training for a wide audience through good planning;
- working in consultation with the Monitoring and Evaluation Committee;

- selection of partners with the incentive to ensure the project's success;
- strengthening the activities of economic recovery of oasis products; and
- carrying out realistic activities that have a long-term field impact.

Ghouts Systems – Algeria

Ms Salhi Amal

*Institut National de la Recherche Agronomique d'Algérie (INRAA),
Algeria*

Photo1_El Oued

The Souf region

Photo2_El Oued

The Souf is a group of Oases of the Oriental Erg, characterized by the cultivation of date palm, potato, herbs and fruit: apricots, figs, grapes, olives. This arid desert region covers 44 586.80 km², which is equivalent to an area one and a half times that of Belgium. The *chotts* Melghir and Merouane border the region to the north, the extension of the Oriental Erg to the south, Oued-Righ to the west and the Tunisian border to the east (El Oued Souf's capital is located only 80 km from Tunisia). The population represents 2 percent of the national population and is spread across 18 municipalities.

The climate is arid with winter rains averaging 60 mm/yr with high evaporation. The Souf region is famous for its hydro-agricultural tradition spanning some 9 500 Ghouta. The water used for irrigation comes from the upper continental formations deposited in the late Quaternary. The depth of the water varies between 2 and 60 m and its salinity between 2 and 6 g/litre depending on the area. The average annual temperature is 22 °C, with a minimum of 11 °C in January and a maximum of 45 °C in August. Rainfall is both weak and episodic, rarely exceeding 35 mm/yr, between 19 mm in summer and 160 mm/yr in winter.

The project aims to safeguard and preserve the agricultural, cultural and historical heritage of *Ghouta* within the SIPAM, a group of oases with a diversified agricultural system based on date palm and associated fruit trees cultivation, gardening, fodder and the raising of small animals. This project meets the GEF strategy on biodiversity and will encourage the preservation of the genetic diversity of a wider range of species and varieties, to ensure the sustainability and well-being of oases farming communities. The project is co-financed by the GEF and the Ministry of Agriculture and Rural Development. The GEF allocated a budget of US\$100 000 and US\$200 000 was allocated by the Department. The project is supervised by the FAO in Rome and the FAO regional office in Algiers. INRA is the institution responsible for setting up the project in collaboration with the DSA of El Oued.

The preparatory phase

During the preparatory phase of the project, several workshops were organized at national and regional level (Maghreb) between project stakeholders (local elected officials, farmers of Ghouta, associations, researchers, etc.) to allow them to work on the project together, and to vote the action plan. A workshop launched the project in January 2009.

First Workshop, Gafsa, Tunisia, 28-30 November 2005: development of the Action Plan

In addition to presenting GIAHS, the objective of this first workshop was to identify an action plan for the safeguarding of oasis systems within GIAHS oasis sites. Four panels developed an action plan with four outcomes;

- establishment of the Action Plan to safeguard oasis systems;
- establishment of an alliance of stakeholders in the preparatory phase PDF-B and for the operational phase of the project GIAHS-OASIS;
- uniting the Project Team for further work;
- production of the type of oasis and proposal of representative sites; and
- reviewing potential and constraints to biodiversity, water and earth, institutions, traditional knowledge and cultural heritage of each country.

Second Workshop, El-Oued, Algeria, 4-7 June 2006: apprenticeship in multi-stakeholder approach and preparatory actions per site.

During this workshop, various activities were implemented with the following results:

- participants were informed about the latest developments of the project SIPAM, especially about the oasis site;
- participants approved the intervention approach;
- participants increased their conceptual framework on group learning and organizational learning;
- participants learned to analyse participatory and integrated stakeholders involved in the sites (stakeholder analysis);
- participants identified a framework for monitoring and evaluation that allows key stakeholders to monitor project results;
- key activities were outlined for each site in the oasis community, which were considered necessary for project success; and
- structured participatory information was designed for a site in the Maghreb and the conclusions and actions taken thereafter have been selected and adopted by different actors.

Third workshop for the launch of the project, 28 January 2009: Adoption of the Action Plan by project stakeholders.

Objectives

- presentation of the Project Action Plan for the five years of implementation;
- establishment of a debate on the actions presented;
- adoption of the Action Plan by participants and Project stakeholders. The plan was prepared in advance by the INRA in Biskra and FAO (see action plan in Appendix 4 p. 64); and to
- raise awareness of target populations.

Implementation of the Action Plan

The established Action Plan has been validated by various project partners, such as FAO, GEF, NGOs, various associations, technical-administrative structures, training and religious organizations (INRA DSA; ITDAS; CFPA) local media (local radio, local newspapers) and traders. The components of the Project at its launch in January 2009 were:

- Plant Genetic Resources of the date palm;
- Water and soil;
- Institutional support;

- Knowledge and skills.

Expected outcomes:

- preservation and promotion of biodiversity oases systems in a sustainable manner for the well-being of people;
- management of water and land in a fair, rational and sustainable way in the oases;
- community institutions and support institutions of the oasis systems should be operational, efficient and effective for the well-being of populations of the oasis;
- preservation, conservation and dynamic development of traditional knowledge and cultural heritage of the unique oasis ecosystems.

A calendar of activities and Project reports will track the progress of project activities. The workshops focussed on awareness-raising of project stakeholders (local elected officials, farmers of Ghouta, associations, researchers, etc.). Several posters and leaflets were prepared according to the needs of participants.

Progress of the Ghouta El Oued Oasis System

Actions taken between 2006 to 2009

- Identification of farmers and agricultural services in El Oued to safeguard agricultural dynamics within Ghouta. These actions have benefitted from the special the support of the Ministry of Agriculture and Rural Development. The programme of agricultural support is currently being amended.
- Participation of the Ghouta Association in the International Tourism Fair of El Oued, with an exhibition to raise the awareness of farming communities.
- Supervision by students of the International Development Research Centre (IDRC) Master, Paris in rural economy of the Sahara region regarding the case of the oasis system of the Ghouta date palm in Algeria.
- Presentation of project posters during the national day of popularization, inaugurated by the Minister of Agriculture and Sustainable Development.
- Publications, newspaper articles and radio interviews to publicize the project; and raise the awareness of the indigenous populations regarding the preservation and conservation of Ghouta.
- Certain project activities have been offered to various University Departments, i.e. the agricultural universities of Biskra and Ouargla and they will be conducting them within the framework of *Engineering and Masters Thesis*.

Photo3_El Oued

Constraints encountered during Project implementation

- arrangements for the financial management of the project;

- reluctance of some partners, despite being very motivated during the preparatory phase of the project, as a result of the slow implementation of the Action Plan;
- the project team was not officially designated;
- lack of representation in El Oued of INRAA, the department in charge of the project; and the
- need for the Project team's permanent presence to ensure better management of the Action Plan.

Proposed solutions

Meetings were held between members of the Biskra team, unofficially in charge of the project and the Project Management of Agricultural Services of El Oued; and with the Directorate General of INRA to allow for better management during project implementation to:

- review financial management of the project to allow for greater autonomy in carrying out the activities of the Action Plan (proposal already submitted to the FAO representation in Algeria);
- carry out immediate activities to involve SOE partners in the project (these activities will be identified in participation with farmers and agricultural services in El Oued); and
- official designation of the project team is imperative.

Tafilalet, Morocco: Management of agro systems of Oases

Lhoussaine El-Rhaffari
Faculty of Sciences and Techniques
University of Errachidia, Morocco

Photo1_Morocco

Oases of Tafilalet, Morocco

These oases are located in southeastern Morocco between latitudes 29°30' and 32°30'N, spanning 60 000 km² (8.44 percent) of the country's land surface. They are part of the more than 7 million ha area of the *Oasis du sud Marocain*, which was designated an UNESCO World Network of Biosphere Reserves site in 2000 for the critical role it plays in buffering the advance of the Sahara desert.

Oases are created around a water source (well, river, *khettara* [subsurface irrigation channels], and *séguia* [surface irrigation channels]). Houses and stables for intensive livestock breeding are situated on infertile soils. Crops are planted on the fertile soils nearest to the water source and livestock are grazed in the uncultivated areas around the palm groves. All these uses combine to make the oasis a full agro-ecosystem.

Photo2_Morocco

There are three types of oases from north to south that cover the Tafilalet: mountain zone oases; intermediate zone oases and plain zone oases. The structures of traditional oases in the first two zones are similar. Water and land resources are available, but erosion and soil salinity are a problem, respectively. Both rely on divided land plots and terracing of flora cultures. These cultures are separated into three levels, further assisting in the diversification of agricultural production. Mixed farming technique ensures optimal use of resources (land and water).

The ecosystem on the plane is semi-arid, therefore cropping is limited. There are fewer water resources in these areas and salinity is a major issue for both soil and water quality. Production systems are based on extensive livestock breeding and limited farming. Management of resources is held privately and, on rare occasions, by the community. Various products are supplied to the market to raise income and there is a highly developed tourist trade. However, the ecosystem is very fragile and cannot sustain further shocks.

The modern palm grove structure is different from that of the traditional oases. Development and mobilization of water resources happened quickly, but technical supervision is lacking and sustainable management of technology has not yet been mastered by local farmers. Traditional irrigation systems of *khettara* and *séguia* are better utilized and, therefore, allow a more sustainable use of the resource.

During the past centuries, traditional land management techniques relied on crop rotation, use of organic fertilizers and mixed farming. These techniques are based on inter- and intra-tribal agreements; one such agreement is that of the *Agdal*. In this system, a tribe identifies land for biodiversity preservation and reconstruction of plantings. This concept has been scientifically identified as an ingenious conservation and biodiversity preservation system.

Goods and services

Many goods and services are derived from the oases; these provide an economic base for the population. In the uncultivated pastoral and forestland zones, wood is collected and sold. Medicinal and aromatic herbs and arboriculture (almonds, apples, and walnuts) products are harvested in the mountain zone. Extensive food-producing agriculture of date palms, cereals, meat and forage crops are used for subsistence and are also sold.

Other services provided by the oases system are:

- Regulation services
 - regulation of climate, disease, and water
 - palm grove microclimates
 - cultivation of traditional medicinal remedies
 - irrigation
- Cultural services
 - spiritual and religious, inspiration, cultural heritage, education
 - important site for Islam, Judaism and Christianity
 - ecotourism, scenic beauty, and geography
 - mountains, forests, palm groves, savannahs, and desert;
 - location between Sahara and Mediterranean Sea.

Threats and challenges

The Oases of Tafilalet have experienced extensive and intensive palm plantation on collective soils. Increased tourism activity, combined with climate change and desertification pose a danger to this agro-ecosystem. These new forms of exploitation of natural resources increase the severity of environmental problems and contribute to water and soil salinization and pollution. Any new intervention or large-scale project must establish an ecosystem balance.

Development and investment projects have targeted the oases as a unique, ingenious system worth protecting. The Regional Development Programme Sustainable Oasis Tafilalet (MATEE, ADS, United Nations Development Programme (UNDP), Fonds pour l'environnement mondial [FEM], Monaco), the Rural Development Project in the Mountain Zones of Errachidia Province (IFAD), the Millennium Challenge Account, and Morocco's Green Plan have come together to fight desertification and valorise the oasis.

Local and global importance

These systems provide food and livelihood security to 2 percent of Morocco's population and protect agricultural biodiversity based on traditions that have been adapted over a long time. The laws, charters, and pragmatic action plans that govern the social, economic and environmental management of these territories have benefitted the Moroccan population. The indigenous technical knowledge of local peoples ensures services that meet local, national and global needs.

These systems deserve to be integrated into the GIAHS initiative for the following reasons:

- They are models of creation and management
 - creation of functional balanced ecosystems;
 - adequate community management and scientifically verified use of soils;
 - mixed farming techniques that facilitate the preservation of biodiversity;
 - effective and sustainable management of water, cultivated and natural vegetative resources.
- They have unique systems of production
 - traditional system of production based on agro-ecological principles;
 - production of food and services for local and non-local populations;
 - provide local products for a global market.
- They provide a lesson for effective management of oases systems
 - pragmatic traditional model that can be built upon by other systems;
 - unique, ingenious systems that should be valued and protected.

Photo4_5_Morocco

India: Tribal Agricultural Heritage Systems

*Dr. D. K. Giri,
Director of, Schumacher Centre*

Photo1_India

Introduction

Approximately 8 percent of India's population belongs to one of the 700 Scheduled Tribes as outlined in Article 342 of the Constitution of India. These traditional, cohesive communities of tribal peoples are associated with unique lifestyles that are location-specific (forests, hills, remote areas). They live in areas of immense diversity of flora and fauna; the genetic repository of the region and indigenous technical knowledge of agriculture are of great significance in the global context.

The objectives of the Schumacher Centre in alleviating rural poverty in these tribal areas are:

- taking inventory of the potential GIAHS sites in tribal areas;
- documenting the existing practices of these systems;
- suggesting measures for dynamic conservation of the sites; and
- adding value to current agricultural practices.

With a population of 200 000, the Jungle Doctors of Bilaspur cultivate 300–400 medicinal plants. These plants are processed into 100–150 different herbal remedies packaged in capsule and sachet form to be sold at Sanjeevani Kendras (outlets for traditional medicine).

The Machauras of Orissa are a unique cultural group whose fishing traditions predate the settlement of agriculture. Fishing is the profession of a single caste, unlike the agrarian multi-caste structure. This system leads to more autonomy and self-governance and the networks are highly organized and internally controlled. The Machauras fishers act as a single tribe operating on a sharing system.

The system is under threat as increased numbers of fishers vie for limited natural resources, creating problems of overfishing. The challenge is to reduce or control the occurrence of destructive fishing practices while achieving social justice. Legitimate and integrated governance that makes use of existing institutions is needed.

Photo2_India

Tribal peoples occupy the corridor between the Singalia National Park and the Senchal Wildlife Sanctuary in Darjeeling. These tribes amount to 100 000 people and they are known for their distinctive hill-farming practices. They cultivate maize, cabbage, potatoes, squash, coriander

and chillies. These areas have been affected by the arrival of global climate change, which has been viewed as a mixed blessing as it has allowed the growth of new crop varieties.

The Apatani of Arunchal practice rice-based fish farming. Paddy fields retain water creating a unique aquatic agro-ecosystem that is stocked with fish. The rice fields carry 500 kg of fish per hectare of paddy. These ecosystems are self-sustaining as the rice and fish have a symbiotic relationship.

Traditional agricultural practices can benefit from indigenous solutions, such as drip irrigation. This method relies on local bamboo to transport water to betel nut groves and it requires a minimum supply of water that is collected during the monsoon season. This adaptive mechanism allows major livelihood activities, such as agriculture, to be sustained during dry periods.

Photo3_India

The Argentina experience: The Juella Community (SIPAM)

Abdo Guadalupe

Instituto Nacional de Tecnología Agropecuaria (INTA)

Argentina

The study of traditional agriculture in the Andean systems is not a new subject, anthropologists have been studying indigenous societies and their agricultural systems across various geographic regions for more than a century. In recent years, numerous detailed descriptions of different models of traditional subsistence farming communities have emerged (Rappaport, 1968; Brokenshaw *et al.*, 1980). Several important questions have arisen regarding the social relations of production, the interactions between humans and their environment, and the interactions between certain peoples and the rest of the world.

The goal of some anthropologists was to convince planners and development workers to take into account accumulated knowledge, traditional skills and indigenous technologies. Many resource managers trained in Western countries have ended up counselling and sometimes even managing agricultural resources of other lands and cultures. Much damage could be avoided if these people understood the cultural, historical and ecological background of the systems where they work. It is very difficult to separate the study of agricultural systems from the study of the culture that nourishes them. It is therefore important to study the complexity of the production system as a whole and the sophisticated knowledge of the people involved in its management.

In particular, Quebrada de Humahuaca is presented as one of the most interesting, and yet little studied situations involving actors and processes of a complex agricultural reality, especially that connected with peasantry.

Quebrada de Humahuaca is located in the Jujuy Province in Argentina. This semi-arid region is particularly rich in biological diversity as it is the centre of origin and of diversification of important Andean crops such as corn, potatoes and beans.

Features of the SIPAM of the community of Juella

Agro-pastoral production systems feature Andean characteristics. The Andean conception of the world and life implies respect and a sense of identification with nature and its deities. Villagers have ancient traditions and their activities are associated with subsistence farming and irrigation. Production systems have different cultures and use different environments for production and reproduction strategies, not only biological but also social and cultural, which imply certain conceptions of the world, a relationship with nature and between human beings. (Bazalote and Radovich 1992; Guevara, 1988).

The town of Juella is 15 km from the town of Tilcara, located in a ravine across Quebrada de Humahuaca, in the Jujuy province, Argentina. For several years we have been working with farmers on food security and sovereignty, with a holistic view of the community that relates each plant to people, animals and deities based on a concept of reciprocity which is an expression of the Andean worldview.

The production systems are agro-pastoralist systems in which the community takes advantage of the different environments of Quebrada de Juella. With crops placed in lowlands near the river and upland areas of the hills for the animals, small organic gardens coexist in this agro-ecosystem with peach plantations and breeding of goats and sheep.

The way the community relates to plant resources involves a system of meanings and beliefs expressed through daily activities. Knowledge of their rituals and beliefs can serve for different uses (fodder, medicine, fuel, food, dyes, rituals and emotional). As for farmed species, farmers in this locality produce different kinds of Andean corn, which comprise the basis of world germplasm. Some of these varieties of maize have been maintained thanks to consumption and to an exchange process between communities. This process has not only allowed corn biodiversity to be maintained, but also the cultivation of potatoes and their associated knowledge. The cultivation of quinoa ceased approximately 50 years ago, according to sources: interviews with key informants throughout the Humahuaca Valley.

The following components will be part of the Pro Huerta: organic gardening for self-sufficiency (only in cases of water scarcity), home chicken-rearing, production of jam and preserves, fruit-tree pruning and grafting, production of bread and other pastries. Moreover, recently work has begun on recovering ancient Andean corn seeds and the knowledge that accompanies them.

Common to all activities is the rescue of local knowledge, recovery of species and uses hidden in the memory of the elders of the community. Memory is undoubtedly an important reservoir of knowledge pertaining to the use of life resources.

We believe that strengthening this small-scale farming system and local culture for the conservation of species and varieties of native crops is a way of ensuring food security and self-sufficiency of the farmers of Juella. This is because it is not possible to preserve the diversity and variability of Andean crops without the culture that sustains them.

Specific objectives for Andean family systems are to:

- promote recovery and evaluation of local use spaces within the framework of a food security strategy;
- develop strategies to secure availability and accessibility of species that complement those provided by the Pro Huerta Project through in-site preservation and local multiplication; and to
- promote public policies that enhance valorisation, recovery and protection of local species as social patrimony.

General Objectives at the country level:

- promote and develop community production of fresh food;
- accompany and promote processes working with sovereign communities and food security: self-sufficient production of seeds, rights and access to water and land;
- encourage production of food in gardens and family farms, schools and communities;
- recover, defend and transfer appropriate technologies for food production on small-scale farms for self-sufficient consumption and surplus sale;
- enhance family and community participation in solving food issues; and
- promote productive enterprises to generate income.

Production of local seeds

This activity takes place in cooperation with IPAF NOA, using a great number of multiplied species, i.e. beans, corn, quinoa, kiwuicha and chia. Moreover, several fairs have been organized to encourage seed exchange between Campesino communities.

Quinoa

- construction and reconstruction of knowledge concerning quinoa cultivation;
- trial of 15 varieties of quinoa in association with IPAF NOA and the Provincial Government at the Experimental Station of Hornillos; and
- delivery to families in Pro Huerta of two varieties of Quinoa: Sika Hornillos and Real Salteña, already adapted to the area and multiplied at the Experimental Station in Hornillos.

Andean maize

- analysis of varieties of Andean maize;
- development of an Andean maize catalogue as preliminary work for starting to manage the development of public policies that encourage payment for an environmental service (payment of a differential income to *Campesinos* for maintaining biodiversity within farmhouses).

Threats and challenges

One of the main threats is the continuing migration of young people towards urban centres, abandoning their native lands. The designation of Quebrada de Humahuaca as an UNESCO World Heritage site has led to the sale of land because of the increase in its value and to the proliferation of hotels at the expense of agriculture. This does not take into account the fact that agricultural systems are also part of the World Heritage Patrimony.

Currently, the process of modernization of agricultural production and its market orientation is turning these agropastoral production systems into vegetable production systems driven by market and not by family food needs. Some farms are engaged in horticulture and floriculture and therefore unprofitably connected to the economic system, that has not improved the quality of life of farmers. This form of production is accompanied by a technology package, where ecological principles are continually dismissed, generating unstable systems that result in recurrent pest flare-ups, loss of biodiversity as well as salinization, soil erosion and water pollution.

The loss of the genetic diversity of native varieties grown by local farmers is not only connected to the potential loss of knowledge management but also with the use of these varieties in production and food security. In the case of Juella, however, it is local farmers, men and women, who retain genetic diversity, maintaining the varieties and landraces of traditional Andean crops according to food security, autonomy and food sovereignty, belonging to a cultural context that is different from the modern conception of agriculture.

Moreover, the implementation of a uranium mine in the Juella community will not only cause contamination but also consume water that is already scarce for agricultural systems.

Sikkim Himalayan Traditional Agricultural System Globally Important Agricultural Heritage Systems (GIAHS)

*Shimako Takahashi,
United Nations University (UNU)
Japan*

Photo1_Sikkim

Location

Photo2_Sikkim

Biodiversity significance

India is one of the world's ten Critical Centres for Biodiversity and Endemism, and serves as meeting ground for Indo-Malayan and Indo-Chinese bio-geographical realms and the Himalayan and Peninsular Indian Elements.

Sikkim Himalaya encompasses globally important biodiversity 'hotspots'. In fact, 26 percent of the total plant wealth of the Indian subcontinent can be found here. It is a genetic treasure that serves as a home to plants, animals and micro-organisms, called bio-resources. This area is also the centre of evolution of many new gene pools and is listed among the 12 mega-biodiversity rich zones of the world. Its abundant gene pools contain valuable components and many applications for the species diversity in the region. Large quantities of cardamom, ethnically fermented food, edible wild plants and their fruits, and wild honey, which provide food security, can be found in Sikkim. Medicinal herbs, orchids, ornamental and wild flowering plants, ginger and oranges are its main 'cash-generators'.

Diversity of ecosystems

The region's ecosystems range from alluvial grasslands and subtropical broadleaf forests to alpine meadows.

Traditional farming system in Sikkim Himalaya

The Valley of Rice (Dhan Kheti)

- trans-Himalayan agropastoralism can be found from: 4 000–6 500 m;
- high-altitude subsistence agriculture or mixed-agropastoralism: 2 500–4 000 m;
- hill-farming and agroforestry systems: 300–2 500 m; and
- upland rice cultivation in the terraces or valleys: 300–1 700 m.

Threats and challenges

Socio-economic

Development activities: hydro-electronic power plants, poverty migration and demographic change.

Environmental

Climate change and global warming, the emerging of factory industries.

Ecological

Traditional practices (TEK), genetic resources and social institutions, land degradation or conversion, invasive species, diseases and pests.

Policy

Lack of policy support and access, ban on resource-use assessment and other grazing bans.

Recommendations

- creation of referenced documents providing available knowledge;
- compilation, evaluation and validation of indigenous knowledge (TEK), as well as publication of existing knowledge and policies;
- creation of a database on lesser-known or unknown elements of TEK adaptation to CC techniques, sustainable use of NR and socio-cultural capital that favours environmental sustainability and community solidarity;
- disseminate messages from Sikkim to identify the indicators of sustainability, to develop and improve the systems and to cater for change and guide adaptation to climate change through further discussions and the sharing of ideas;
- facilitate the flow of information through networking from the local, national and regional levels to the global level;
- establish partnerships in the region between communities and the Government of Sikkim plus other governments, in order to take a participatory approach; and
- gain the support of scientists and governments.

The Sikkim initiative will provide a showcase policy recommendation and develop a strategy based on TEK and the use of community resources to pursue sustainability towards COP10 Nagoya (Japan) in 2010.

Photo3_Sikkim

Session 4 and 5: Steering Committee Meeting and Concluding Session

This session convened the members of the Steering Committee. It aimed to seek recommendations of the Steering Committee on the further implementation of each of the Project's outcomes, with a view to achieving broader goals of the GIAHS Initiative.

Members of the Steering Committee include: donors, designated representatives of participating countries, relevant international organizations and substantive partners, including civil society organizations. Other participants of the Forum were encouraged to contribute to the Steering Committee meeting as observers.

The GIAHS-Secretariat and designated speaker provided and introduced the agenda items, including draft recommendations for consideration by the Steering Committee.

THE REPORT OF THE STEERING COMMITTEE (SC)

INTRODUCTION

The Third Steering Committee of the GEF-Project *Conservation and Adaptive Management of Globally Important Agricultural Heritage Systems (GIAHS)* convened in Buenos Aires, 22-23 October 2009, on the occasion of the Second International Forum on Globally Important Agricultural Heritage Systems (GIAHS). The meeting comprised the first Steering Committee of the Full-scale GEF Project, following Steering Committee meetings on the project's PDF-A and PDF-B stages.

The GEF-Project is one of the main vehicles of FAO's Globally Important Agricultural Heritage Systems (GIAHS) Initiative and aims to establish the foundation for a long term international programme to provide for global recognition, protection and promotion of GIAHS worldwide. At its third session, the Steering Committee considered progress and the way forward in the implementation of the full-scale project.

Each agenda item was introduced by the Global Project Implementation Unit (GPIU) and accompanied by a decision document outlining specific questions and drafting recommendations on the way forward for each of the project's Outcomes. On its first day, the Committee considered the agenda in a plenary session. On the second day the Committee formed three groups to facilitate discussions in different languages (English, French and Spanish), addressing the full agenda. Each group reported back on its discussions and recommendations in a final plenary session.

OUTCOME 1(A): OPTIONS FOR ESTABLISHING AN *INTERNATIONAL SYSTEM* FOR THE RECOGNITION OF GIAHS

Recalling Outcome 1 as contained in the Project Document, the Steering Committee considered a number of key issues requiring clarification in order to successfully implement Outcome 1. The Committee noted the document prepared by the GPIU and thanked Prof. Stuart Harrop and the GPIU for their introduction of the agenda item, including their analysis of the linkages of GIAHS to existing international instruments. The following recommendations were made on the guiding questions and proposals put forward by the GPIU.

Scope of the international system

The Steering Committee:

- Acknowledged the need to clarify the scope of the international system for recognition, protection and promotion of GIAHS (*international system*) and considered other aspects of the definition of GIAHS to further clarify which agricultural systems and areas should be covered.
- Noted that a more detailed definition of GIAHS will help in further defining the content and form of the *international system* and the steps required to establish it, as well as clarify its

linkages to existing international instruments, including the Convention on Biological Diversity (CBD), the World Heritage Convention (WHC) and FAO's instruments on genetic resources for food and agriculture.

- Considered the relative value of biodiversity as a defining feature of GIAHS, noting that all systems that fall within the definition of GIAHS display significant biodiversity, particularly biodiversity that is closely linked to and dependant on cultural practices. It further noted that this biodiversity is critical to the functioning of such systems.
- Recommended that biodiversity should remain a prime criterion for the definition and selection of GIAHS at all levels, from genetic resources to ecosystems.
- Further recommended that biodiversity should not, in all cases, override other characteristics of agricultural heritage systems that may be warranted recognition under the *international system*, and pointed out that such other characteristics may include ingenious land and water-management practices and other features captured by the selection criteria.
- Considered the usefulness of a distinction between agricultural heritage systems and areas of *Global Importance* and of *National Importance* under the *international system*, as well as under the current Initiative.
- Suggested that, candidate areas should be first identified as *nationally important* by the relevant authorities, before they are proposed for inclusion in the GIAHS framework.
- Stressed the key role of endorsement of the concept of GIAHS at national level, and the importance of prioritizing national and local benefits derived from the protection and promotion of GIAHS areas.
- Stressed that agricultural heritage systems or areas considered of national or local importance by countries or custodian communities all display dimensions of global importance, and recommended that they be considered *globally important* under the *international system*, on the condition that such areas conform to the GIAHS selection criteria.
- Recommended that, under the global GIAHS framework, the development of any distinction between areas as either *globally important* or *nationally important* would not be meaningful and that *Global Importance* remain a broad concept.
- Considered the usefulness of the definitions of *Global Importance* under the World Heritage Convention (*Outstanding Universal Value*) and the Global Environment Facility (*Globally Important Biodiversity*) and recommended that these concepts and their accompanying criteria would be unnecessarily restrictive to the definition and coverage of the *international system*.
- Recommended that *global importance* be defined within the international system through its own selection criteria.

Working objectives for the international system

The Steering Committee:

- Noted that the formulation of a working set of objectives for the *international system* would constitute an important input to the process required for its establishment and clarify its relations with the existing international instruments.
- Stressed that the international system's primary function would be to encourage and assist countries and communities to protect and promote GIAHS areas according to their own priorities.
- Reviewed the proposed working objectives for the international system, put forward by the GPIU.
- Recommended the following reviewed set of working objectives. To:
 - encourage countries to identify, protect and promote nationally held GIAHS;
 - protect and promote GIAHS worldwide and raise international recognition and awareness of their importance;
 - provide technical support to countries for identification, protection and promotion of nationally held GIAHS;
 - mobilize resources for identification, protection and promotion of GIAHS, especially in developing countries; and
 - facilitate sharing of information, lessons learned and best practices on the management of GIAHS and facilitate dialogue between stakeholders.

Strategic options for advancing the international system

The Steering Committee:

- Considered the analysis of the mutual relevance of GIAHS considerations and existing international instruments presented by the GPIU and Prof. Harrop.
- Noted the compatibility and mutual relevance of GIAHS with existing international instruments, in particular the World Heritage Convention (e.g. its subcategories of *Mixed Natural and Cultural Heritage* and *Cultural Landscapes*) and the CBD (e.g. Articles 10(c) and 8(j)), as well as the relevant provision of FAO's International Treaty on Plant Genetic Resources for Food and Agriculture and its Global Plan of Action on Animal Genetic Resources.
- Further considered the Strategic Options presented by the GPIU outlining the potential institutional modalities for the establishment of the *international system* and its potential relations with existing international instruments.
- Recommended the establishment of a separate international framework for GIAHS, given the diverging priorities and limitations of the existing regime in comprehensively addressing specific considerations of GIAHS.
- Noted that, although the importance of GIAHS considerations for global environmental and development challenges could ensure the development of a specific international convention, this option does not appear to be politically and practically attainable.

- Recommended that the *international system* be established as a long-term statutory technical programme at FAO, with a decision taken by the relevant governing body.
- Noting the capacity of WHC to raise global visibility, further recommended that the GIAHS Initiative continue to develop its collaboration with the WHC, and to encourage participating countries to propose selected GIAHS areas for inclusion in the World Heritage List, as appropriate.
- Recommended that the GPIU develop the preferred institutional options in detail, to be addressed by the next Steering Committee.
- Recommended that the GPIU continue to explore options for the establishment of the *international system* and develop linkages with relevant instruments.
- Suggested that a ministerial conference of countries participating in the GIAHS Initiative may provide a strong political message to support the establishment of the *international system*.
- Recommended that National Coordinators/National Focal Persons in pilot and participating GIAHS Countries contact focal points of relevant conventions (e.g. CBD, IT-PGRFA, WHC, etc.) with a view to mainstreaming GIAHS efforts into national policies, plans and strategies for the implementation of such conventions, as well as be included in national reports to such conventions.
- Stressed the importance of continued efforts to develop national laws and policies for the recognition, protection and promotion of GIAHS at national level; and
- Noted that the current GIAHS Initiative already provides a significant framework for the recognition, protection and promotion of agricultural heritage systems and recommended that FAO continue its function until the *international system* is established.

OUTCOME 1(B): WORKING CRITERIA FOR GIAHS

The GPIU reintroduced a document containing the set of selection criteria developed during the conceptualization stage for identifying GIAHS. The aim is to further develop the concept of GIAHS in more detail and to agree on a standard set of criteria for the GIAHS framework. The GPIU noted that a standard set of criteria, once agreed, would provide a valuable input for the establishment of the *international system*.

The Steering Committee:

- considered the criteria provided by the GPIU;
- noted the need to build consensus on a set of minimum criteria;
- recommended a number of amendments, contained in the reports of the three subgroups (compiled in annex 1);
- recommended that the criteria be finalized at a special expert-meeting, to be organized by the GPIU before the next Steering Committee;

- recommended that the GPIU prepare an improved set of criteria as an input to the expert-meeting, taking into consideration the amendments and suggestions provided by the three subgroups of the Steering Committee; and
- recommended that the GPIU consult experts on the draft prior to the expert meeting.

OUTCOME 2: NATIONAL POLICIES FOR GIAHS

Recalling Outcome 2 as contained in the Project Document and taking into consideration the introductory document presented by the GPIU, the Steering Committee:

- stressed the critical importance of successfully implementing Outcome 2 for the sustainability of the project's efforts;
- recommended that national project coordinators implement activities to raise awareness of national benefits derived from nationally held GIAHS and their safeguarding and promotion;
- noted the desirability of identifying country champions to support and encourage mainstreaming of GIAHS at the national level;
- recommended that national studies be conducted in pilot countries, identifying other nationally held GIAHS, demonstrating their multiple values and national benefits;
- further noted that national policies of multiple sectors, including agriculture, rural development, environment and heritage, are relevant to the implementation of Outcome 2;
- recommended that pilot countries conduct or finalize national in-depth analyses of existing national policies and law, including those pertaining to relevant international conventions, identifying entry points for Outcome 2; and
- recommended that countries formulate concrete proposals for mainstreaming GIAHS activities, taking into consideration their relevance within the existing national programme/budgetary allocations through national policy workshops.

OUTCOME 3: SITE SPECIFIC ACTION PLANS

Recalling Outcome 3 as contained in the Project Document and taking into consideration the introductory document presented by the GPIU, the Steering Committee:

- Reiterated the importance and complementarity of achieving Outcome 2, in order to achieve sustainability of efforts under Outcome 3.
- Recommended that pilot countries develop long-term management plans for their project sites, to take effect at the end of the project cycle, addressing institutional and financial sustainability.
- Pointed out the need for land-use planning in GIAHS areas taking into account their dynamic land-use patterns and multiple values for the community.
- Noted the potential benefits of Farmer Field Schools to mobilize GIAHS communities, and to transfer and share information, practices and technologies.

- Stressed the need to recognize and reinforce the custodianship of local communities, taking into account their internal diversity and gender roles in all efforts to implement Outcome 3.
- Stressed the need to clarify and reinforce the rights of GIAHS custodian communities over natural resources, including land, water and biological resources, as well as cultural resources, including indigenous or local knowledge.
- Recommended that efforts to achieve Outcome 3 recognize and reinforce the role of customary institutions and practices for the sustainable management of landscapes and natural resources.
- Reiterated the need to respect the rights of communities to Free Prior Informed Consent before the implementation of GIAHS activities in their areas.
- Recommend that the GPIU further develop technical standards and principles for the management of selected GIAHS; and
- Recommended that Outcome 3 is seen as part of the GIAHS monitoring process.

OUTCOME 4: LEARNING

Recalling Outcome 4 as in the Project Document and taking into consideration the introductory document presented by the GPIU, the Steering Committee:

- Recommended that all national GIAHS pilot projects include explicit activities focused on lesson learning and systematization of best practices for their national and regional dissemination.
- Recommended that the GPIU prioritizes the monitoring of this targeted outcome with the task of generating a set of global lessons.
- Recommended that the GPIU ensure the translation and dissemination of materials on national and regional experiences to ensure their accessibility to other countries and regions of the world.
- Recommended that the GPIU and national focal point institutions explore and encourage the development of University Courses on GIAHS issues and practices, with relevant academic partners; and
- Stressed the need to acknowledge and respect custodians' rights over their local or indigenous knowledge, including Farmers' Rights.

INSTITUTIONAL FRAMEWORK

Owing to time constraints, the Steering Committee and its subgroups did not address this agenda item. The Steering Committee:

- Recommended that the agenda item would reappear on the agenda of its next session.

GENERAL

The Steering Committee made several general recommendations to the GPIU:

- Thanked the chairs and rapporteurs of the subgroups for their reports.
- Requested that the GPIU make available all presentations and documents pertaining to the current meeting to all participants on CD-ROM.
- Requested that the GPIU circulate a list of participants, containing all contact details.
- Requested that the GPIU make available all films and other materials on GIAHS, in the regional languages.
- Recommended that the GPIU revise all translations of the term 'GIAHS' to make it consistent in all relevant languages.
- Recommended that the GPIU develop a glossary of GIAHS related terms in all relevant languages.
- Requested that the GPIU make available in all relevant languages the materials for the fourth Steering Committee, prior to the meeting.

Annex 1. Agenda of the Forum

Tuesday 20 October 2009

- Arrival of participants at **Hotel 725 Continental** and registration
- Informal meeting between Project Management and the Steering Committee Members (18:00 – 19:00; meeting room of Hotel 725 Continental)

Wednesday 21 October 2009

9:00 – 10:30 **Opening of the Forum**

9:00 - 9:30

Welcome Address by:
Dr Parviz Koochafkan, FAO
The host country, Argentina
The World Forestry Congress Committee/Secretariat

9:30-10:30

Keynote Address by:
Prof. M.S. Swaminathan, Member of Indian Parliament (Rajya Sabha);
World Food Prize Awardee and described by UNEP as Father of
Economic Ecology; Millennium Development Goals (MDG2) Task Force
Coordinator
“Agrobiodiversity heritage sites, from hotspots to happy spots”

Special remarks by:

- H.E. Mr Henri Djombo, Minister of Forest Economy, Republic of Congo on behalf of Mr Francesco Bandarin, Director UNESCO World Heritage Centre
- Mr Dirk Gaul, GEF Resources Team on behalf of Ms Monique Barbut CEO and Chairperson of Global Environmental Facility

10:30 – 11:00

Coffee/tea Break

11:00 - 13:00 / Session 1: International Context of Agricultural Heritage Systems

Chair: Prof. M.S. Swaminathan
Rapporteur: Dr Mary Jane dela Cruz

Agricultural practices in many parts of the world have led to landscape-scale ecosystem variation, and provided mosaics of micro-habitats, that support associated plant and animal communities, which now depend largely on continued management of their viability. In many

regions of the world, especially where natural conditions of climate, soil, accessibility and human presence militate against intensification, agro-ecosystems and landscapes that are maintained by traditional practices developed by generations of farmers and herders still persist.

However, there is still insufficient awareness and understanding of and support for the key role that indigenous peoples and traditional farming, herding and fishing communities have played for millennia, and continue to play, in maintaining and creating healthy ecosystems, biodiversity and landscapes, while providing the ecosystem services that people's livelihoods and well-being depend on.

This is the context in which FAO initiated an international partnership initiative on conservation and adaptive management of 'Globally Important Agricultural Heritage Systems (GIAHS), which aims at providing global recognition to identified agricultural heritage systems, to ensure dynamic conservation and sustainable management of such systems. GIAHS as an approach is centred on the human management and knowledge systems, including their socio-organizational, economic and cultural features that underpin the conservation and adaptation processes in GIAHS without compromising their resilience, sustainability and integrity.

This session will be devoted to discussing local, national and international context of agricultural heritage tackling the social, economic and environmental perspectives of GIAHS adapting to and mitigating climate change.

11:00 – 11:20	Small Farmers and Global Challenges Dr Parviz Koochafkan, Global Coordinator; Director, Land and Water Division, NR, FAO, Rome, Italy
11:20 – 11:40	Peculiar Farming Systems in the World: Ecology and Society in Traditional Agricultures Dr Eric Mollard, IRD, France
11:40-12:00	GIAHS and Agro-ecosystem Management in the Contemporary Context Prof. P.S. Ramakrishnan, Jawaharlal Nehru University, New Delhi, India
12:00 – 13:00	Summary and Conclusions
13:00 – 14:30	Lunch Break

14:30 – 18:00 / Session 2: GIAHS as development assets and resources

Chair: Prof. Miguel Altieri
Rapporteur: Mr David Boerma

14:30 – 14:45	Chiloe Agriculture: Ingenious Systems for Global Agricultural Heritage Mr Carlos Venegas, Chile
14:45 – 15:00	Andean Agriculture Heritage Systems Mr Mario Tapia, Peru
15:00 – 15:15	The MILPA (cornfields) of the Twenty-first Century: Recovery of the Meso-American Farming System Mr Ian Cherrett, FAO Representative a.i. in Ecuador
15:15 – 16:15	Brazil: The Agricultural System of the Rio Negro region in Central Amazonia Dr Laure Empeaire DR-IRD
16:15 – 16:45	tea/coffee break
16:45 – 17:45	Discussions

18:30 – 20:30 Dinner

Thursday 22 October 2009

9:00 – 12:30 Session 3: Learning and measuring progress in dynamic conservation of GIAHS

Chair: Dr Eric Mollard

Rapporteur: Dr Shimako Takahashi

This session will present the agricultural heritage systems from the pilot and participating countries. The participants will have interactive exchange of experiences, their perspectives, opportunities, as well as obstacles and success stories in implementing the GIAHS Initiative. The presentations and discussions will *aim at identifying synergy, local actions and effective implementation mechanism in dynamic conservation of GIAHS.*

9:00 – 9:15	Philippines: Ifugao Rice Terraces Agricultural Heritage Systems Ms Cristina Regunay, DENR, Philippines
9:15 – 9:30	China: Traditional Rice-fish System Prof Qingwen Min. IGSNRR, CAS, China

9:45 – 10:00	Maasai Pastoral Systems –Kenya Mr Kiprop Lagat Asst Director, Museum Sites & Monuments, Kenya
10:00 – 10:15	Tunisian National Pilot System – Historic Oasis of Gafsa Mr Atef Dhahri, ASM, Tunisia
10:15 – 10:30	Algerian National Pilot System – Ghouts Systems Ms Salhi Amal, INRAA, Algeria
10:30– 10:45	tea/coffee break
10: 45 – 11:00	Tafilalet, Morocco: Management of agro systems of Oases Prof. El Rhaffari, Science and Technology Faculty, Errachidia University, Morocco
11:00 – 11:15	India: Tribal Agricultural Heritage Systems Dr D.K. Giri, Director, Schumacher Development Centre, India
11:15 – 11:30	Agricultural Patrimony – The Argentina Experience Ms Guadalupe Abdo, INTA
11:30 – 11:45	Sikkim Himalayan Traditional Agricultural System Mr Shimako Takahashi
11:45 – 13:00	Discussions and Summary

14:30 – 18:00 / Session 4: Steering Committee (SC) Meeting - 1

Chair: Mr Maharaj Muthoo

Rapporteur: Dr Paolo Groppo

GIAHS Initiative aims to establish the basis for national and international recognition of “Globally Important Agricultural Heritage Systems” and raise awareness at the international and national levels of the intrinsic value of GIAHS and the need to promote their long-term sustainability. To address this, FAO aims to promote three outcomes, consistent with three distinct levels of intervention:

1. At the global level, to facilitate international recognition of GIAHS in collaboration with multilateral instruments and governing bodies such as the FAO Commission on Genetic Resources for Food and Agriculture, the International Treaty on Plant Genetic Resources for Food and Agriculture, the UNESCO Man and Biosphere Reserve Programme and World Heritage Convention, the Convention on Biological Diversity and others;

2. At the national level in pilot countries, to ensure mainstreaming of the GIAHS concept in national sectoral and inter-sectoral plans and policies including national designation of National Agricultural Heritage systems; and
3. At the local level, to address conservation and adaptive management of agro-ecosystems by empowering communities and developing payment schemes for environmental services derived from dynamic conservation and sustainable management of GIAHS.

The GIAHS Initiative is currently being implemented through two projects: *Conservation and adaptive management of GIAHS* funded by GEF and “Supporting Food security and reducing poverty in Kenya and Tanzania through the dynamic conservation of GIAHS”, funded by the Government of Germany. The substantive outcomes of the GEF-Project reflect the outcomes mentioned above, whereas the German funded project reflects outcomes (2) and (3). Both projects aim to establish the current GIAHS Initiative as a long-term programme for the dynamic conservation and sustainable development of GIAHS worldwide.

This session convenes the members of the Steering Committee. It will aim to seek recommendations of the Steering Committee on the further implementation of each of the Project’s outcomes, to achieve broader goals of the GIAHS Initiative.

Members of the Steering Committee include: donors, designated representatives of participating countries, relevant international organizations and substantive partners, including civil society organizations. Other participants of the Forum are encouraged to contribute to the Steering Committee meeting as observers.

The GIAHS-Secretariat and invited speaker will provide and introduce the agenda item, including draft recommendations for consideration by the Steering Committee. The SC will address the following agenda:

Project Outcome 1: Options/next steps to establish a long term GIAHS programme (NIAHS/GIAHS), and Technical standards for identifying/selecting NIAHS/GIAHS (update)

Project Outcome 2: National policy (current and prospective activities to make progress)

Friday 23 October 2009

9:00 – 11:00 / Session 5 – Steering Committee Meeting-2

Chair: Ms Ximena George-Nascimento/Mr Jose Antonio Gonzalez Norris

Rapporteur: Mr Ian Cherrett / Ms Cristina Regunay

This session is a continuation of the previous session and the Steering Committee will address the following agenda items:

Project Outcome 3: The content and implementation of Action Plans for the dynamic conservation of GIAHS:

- a) Conservation and adaptation measures
- b) Economic development measures
- c) Coordination and integration

Institutional aspects of project implementation

- a) At Global level, Steering Committee: Composition and Terms of References of the Steering Committee
- b) At National level, Steering Committee: Composition and Terms of References of the Steering Committee
- c) In-country institutional implementation arrangements
- c) Networking and Partnerships

Adoption of the Steering Committee's recommendations

11:00 – 13:00 Concluding Session on the Way Forward – Cherishing our Agricultural Heritage Systems

Chair: Dr Parviz Koohafkan

Rapporteur: Dr Shimako Takahashi / Mr Reza Najib

- **Report of the Chairpersons presented by Rapporteurs**
- **General Discussions**
- **Recommendations of the Forum**
- **Wrap up of the Forum and Closing Remarks**

14:30 Participation to the Closing Ceremony of the WFC 2009 (Optional)

Note:

Time allocation for each session/presentation will be adjusted, if necessary.
No provision of language interpretation.

Extra Activities - Promotion and awareness raising campaign

During the Congress, on the designated FAO booth, information materials about GIAHS will be displayed.

Expected Outcomes/outputs of the Forum

1. Recommendations by the GIAHS Forum on technical aspects of GIAHS
2. Recommendations by the Steering Committee on the ways forward of the Project on the implementation of its substantive outcomes
3. Proceedings of GIAHS Forum including Inception Report (GCP/GLO/212/GFF Project)
4. Steering Committee Report

Participants

- Members of the Steering Committee (donors, designated representatives of participating countries, relevant international organizations and substantive partners, including civil society organizations)
- International Organizations and interested stakeholders
- Participating Countries
- Scientists and experts
- Observers

Annex 2. List of Participants

Name (Last Name, Given Name)	Organization/Country	Email address
Koohafkan, Parviz	FAO	parviz.koohafkan@fao.org
Amal, Salhi	INRAA, Algeria	salhiamelle@yahoo.fr
Dhahri, Atef	ASM, Tunisia	asm.gafsa@plante.tn
Echirk, Djamel	GEF OFP, Algeria	djamelechirk@msn.com
El Rhaffari, Lhoussaine	Univ of Errachidia, Morocco	elrhaffari@yahoo.fr
Emperaire, Laure	IRD, Brazil	laure.emperaire@gmail.com
George-Nascimento, Ximena	GEF OFP, Chile	nascimento@conama.cl
Giri, DK	SDC, India	dr.dkgiri@gmail.com
Gonzalez Norris, Jose Antonio	GEF OFP, Peru	agonzalez@minam.gob.pe
Harrop, Stuart	Univ of Kent, UK	S.R.Harrop@kent.ac.uk
Lagat, Kiprop	NMK, Kenya	klagat@museums.or.ke
Liang, Luohui	UNU, Japan	liang@unu.edu
Methamem, Zouhour	Min. of Environment vice GEF OFP, Tunisia	zouhourenv@yahoo.fr
Min, Quingwen	IGSNRR, China	minqw@igsnr.ac.cn
Mollard, Eric	IRD, France	eric.mollard@ird.fr
Muthoo, Maharaj	HEADS, India	romanforum1@virgilio.it
Ramakrishnan, PS	India	psr@mail.jnu.ac.in
Regunay, Cristina	DENR, Philippines	regunay@yahoo.com
Swaminathan, MS	MSRRF, India	swami@mssrf.res.in
Takahashi, Shimako	UNU, Japan	stakahashi@unu.edu
Tapia, Mario	Peru	
Guadalupe, Abdo	INTA, Argentina	guadalupeabdo@yahoo.com.ar
Santonini, Lucesia	Min. of Agr., Argentina	
de la Rocha, Jorge	FAO, Argentina	
Gaul, Dirk	GEF Resources Team	d.gaul@thegef.org
Bevillaqua, Francisco	Argentina	
Giusti, Federico	Argentina	
Djombo, Henri	Min. of Forest Economy, Congo Republic	
Paul, Helena	ECONEXUS	h.paul@econexus.info
Cherret, Ian	FAO	ian.cherrett@fao.org
Venegas, Carlos	Chile	cetchiloe@gmail.com
Najib, Reza	FAO	reza.najib@fao.org
Grosso, Paolo	FAO	paolo.grosso@fao.org
Boerma, David	FAO	david.boerma@fao.org

Dela Cruz, Mary Jane	FAO	maryjane.delacruz@fao.org
Coosje, Hoodgedorn	INBAR	
Yofre, Francisco	FAO, Argentina	
Mihanovich, Sebastian	WFC, Argentina	
Castelli, Cecilia	FAO, Argentina	

Annex 3. The GIAHS Criteria

Introduction

The objective of the GIAHS selection criteria is to assist governments, international organizations and donors in identifying traditional or historic agricultural systems (Agricultural Heritage System), represented by a particular site, of Global (or National) Importance. The Global Importance of a system or site is a composite value of five subsequent criteria, which help to establish the value of the individual characteristics (the parts) of a site and its functioning and relevance as an agricultural system (the whole). Due to the multi-dimensional nature of the selection criteria, the various scores will be carefully weighed to establish the Global Importance of the system/site.

Defining sites

The delineation of the site is of critical importance for site selection and for any measures to support its sustainable management. The boundaries of the site should encompass an integral spatial/ecosystemic unit and the integral social group associated with it. The relationship of the social group (community) with the spatial unit (place) constitutes the place as a 'territory'. A territory is a unit of interdependence between a community and its environment, where social and spatial boundaries ideally coincide. A territory typically embodies all the necessary environmental and socio-cultural elements and processes to constitute it as an integral unit for site selection and for ensuring its dynamic conservation. The concepts of territory and integrity thus guide site delineation.

However, territories do not exist in isolation. A territory is often embedded in the territories of larger social groups, such as those of clans and tribes or municipalities, provinces and nations. Additionally, boundaries between neighbouring territories are permeable and often fluid. There may be significant ecosystemic, natural resource and socio-economic interdependences with the territories of neighbouring communities or larger communities. Territories of different communities might even overlap. These trans-boundary and scalar relations between territories are part of the dynamics of each agricultural heritage system. Therefore, site delineation and selection, as well as interventions that might follow should take this into consideration.

Practical considerations

Qualification of sites under the GIAHS Initiative will consider a number of additional practical parameters. These include the accessibility of the site, the complementarity of the project to existing initiatives in the area, the expected impact of GIAHS measures and resources on pertinent problems of the community and in relation to the priorities of national institutions, and the willingness and prior informed consent of the local community, the local or national authorities and other relevant stakeholders.

The criteria

Preamble

It is a sum of criteria that makes a system ‘globally outstanding’. This can only happen after it has been identified as ‘outstanding’. The distinguishing features of GIAHS are the landscapes, which have been constructed by human beings through the development of livelihoods systems, and that are sustainable by means of maximizing, even enhancing, the original systems. The components of the capital of GIAHS are the following: human, nature, economic, infrastructure and society.

The expression ‘National importance’ is used to describe the features of a traditional and historic agricultural system, represented by a particular site, as a heritage of human kind (or a country). National Public Good value is determined by the description of the five subsequent criteria and by weighing the global importance of the individual characteristics of the site or system, by its intrinsic resilience and capacity to strike a social-environmental balance, by its historic and contemporary relevance for human development, the site’s integrity and by whether the site is a unique or outstanding example of the agricultural system it represents. ‘Global importance’ of ingenious systems means that they are unique at local level but with a global dimension. Ingenuity of systems occurs when landscapes and heritage are indivisible.

- Integrity

‘Integrity’ is defined by whether all the human and natural resources, critical for the sustainable functioning and continued regeneration of the system, are present in the proposed site and/or are accessible to its custodian community.

1. Outstanding biodiversity, landscape and socio-cultural characteristics

Each site representing an agricultural heritage system is endowed with specific biophysical features and socio-cultural features, which may be of a tangible or intangible nature. For instance, the site may be endowed with globally significant genetic resources and biodiversity, a particularly ingenious system of managing scarce resources such as water or organic matter, or with valuable local knowledge. Each of these characteristics may represent a heritage of global importance in its own right, adding to the Global Importance of the agricultural system or site as a whole, in which’ context it has evolved and continues to be maintained.

2. Outstanding biodiversity and landscape characteristics

The following tangible or intangible characteristics will be considered under this criterion.

- Biodiversity: agricultural biodiversity and genetic resources (species, varieties and breeds), as well as associated biodiversity, including wild relatives, pollinators and wildlife associated to the agricultural landscape (tangibles).
- Land, water and other landscape characteristics: landscape features resulting from human management, that provide particularly ingenious or intelligent solutions to environmental or social constraints, such as irrigation or water management systems, terraces, particular soils or overall ecosystem architecture, which might provide for resource conservation/efficiency or provide habitats for valued biodiversity (tangibles).

- Other relevant buildings/structures: these tangibles might have particular social or ecological functions in the management of the site. They might include environmentally sustainable and resource-efficient housing, architecture of ceremonial or social significance to the management of the agricultural system or have particular functions such as seed storage, stables or otherwise (tangibles).
- Sacred/ceremonial sites. (tangible/intangible)

Nationally important social and cultural characteristics pertinent to management of the agricultural system

- Local and farming knowledge systems: Such knowledge might pertain to crop and livestock breeding, production and conservation, to grassland and forest conservation and use, to the various properties and uses of biological diversity (including ethno-veterinary, nutritional and medicinal uses), to balancing and optimizing ecological processes, to climatology, soil and water-management and other relevant areas. These knowledge systems may include encyclopedic knowledge, management practices, crafts and skills and they are often underpinned by particular cosmologies/epistemologies. (intangibles).
- Tools and technologies. (material culture – tangible)
- Social/cultural institutions related to the management of the agricultural system. Local institutions play a critical role in balancing environmental and social objectives, in creating resilience and in the reproduction of all elements and processes critical to the functioning of the agricultural system. Some may ensure conservation of and promote equity in the use of natural resources; some transmit local knowledge and critical values that promote custodianship of biodiversity, land and water; some facilitate planning, cooperation and innovation/adaptation. Such institutions may include forms of governance, leadership, decision-making and cooperation; of customary law and conflict resolution, including on resource tenure; of ceremonial and religious beliefs and practices, including taboos, ceremonies and festivities; of kinship, marriage and inheritance systems; of oral and written traditions; of forms of education and instruction; of division of roles and distribution of labour, including gender roles and specialized functions; etc. (intangibles).

3. Sustainability: social-environmental balance and resilience

The ‘parts’ described above interact in a web of human-environmental relationships at various scales, from the genetic to the landscape level, from the individual to the community. Whether these relationships are mutually supportive provides a positive measure of the overall functioning and sustainability of the system, in which both social objectives (e.g. food security, human-well-being, social cohesion, opportunity, peace, equity and the preservation of cultural wealth) and environmental objectives (e.g. conservation of biological diversity, sustainable NRM, climate adaptation) are obtained. The degree to which and how this ‘social-environmental’ or ‘agri-cultural’ balance is achieved in the system or site is at the heart of this criterion. It also includes the resilience of the system to cope with, adapt to and recover from socio-economic and environmental challenges and shocks, both in the past and the present.

In certain cases a system or site may be presently off-kilter owing to outside pressures, which can potentially be remediated through targeted measures. In those cases one needs to assess

whether the intrinsic design of the agricultural system or site is such that it historically was and will be capable again of striking a socio-environmental balance, as well as conforming to the other criteria.

4. Historic values

The contribution of the agricultural system or site to the domestication and development of agricultural biodiversity, the creation of valuable landscapes, the development of agricultural knowledge and technologies, and to human, social and cultural development in general, constitutes its historic relevance. Additionally, the historic relevance is determined by whether the system or site has remained sustainable and has shown its resilience in the face of environmental and socio-economic changes over time.

- Representative or unique nature

The site should be a unique example of a particular agricultural system, which might be reasonably widespread. Examples of such typical agricultural systems are rice terraces, oasis, nomadic pastoralism and others. The site should represent its maximum expression according to these selection criteria. Alternatively, a site might represent a totally unique agricultural system, which is not or only rarely found elsewhere.

5. Contemporary relevance

The systems' or sites' contemporary relevance 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 criterion therefore relates to the relevance of an agricultural system or site to global or national policy and development challenges, most prominently achieving food security, human well-being and environmental goals, such as climate adaptation, carbon sequestration, water, land and biodiversity conservation. Under this criterion one should highlight particular lessons learned or principles that can be derived from the system site, which might be applied elsewhere.