

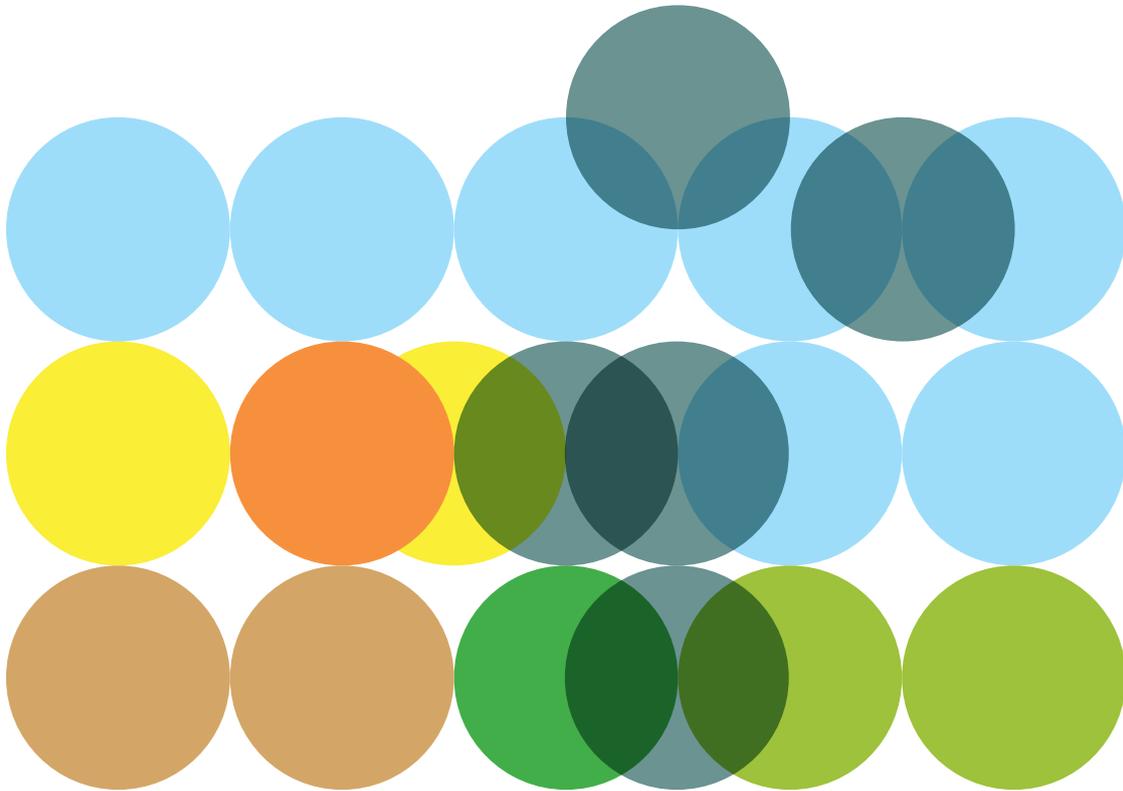


Food and Agriculture Organization
of the United Nations



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organizzazione internazionale italo-latino americana



Proceedings from the

FAO-IILA

OPEN HOUSE

on Climate Change

CHALLENGES IN AGRICULTURE IN **LATIN AMERICA**

Organizzazione internazionale italo-latino americana (IILA)

13-14 February 2018 - Rome, Italy

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Challenges in Agriculture in **Latin America**

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Organizzazione internazionale italo-latino americana (IILA)
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Acronyms

CBD	Climate, Biodiversity, Land and Water Department
CNR	Consiglio Nazionale delle Ricerche
CREA	Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria
CSA / CSF	Climate Smart Agriculture / Climate Smart Forestry
DIBAF	Department of Innovation in Biology, Agri-food and Forest systems
ENEA	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile
FAO	Food and Agriculture Organization of the United Nations
GGW	Great Green Wall
GHG	Greenhouse gas
GIAHS	Globally Important Agricultural Heritage Systems
GSP	Global Soil Partnership
ICOS	Integrated Carbon Observation System
IILA	Istituto Italo Latino Americano
MoU	Memorandum of Understanding
NIAHS	Nationally Important Agricultural Heritage Systems
SDG	Sustainable Development Goals
SIPAM	Sistemas Importantes del Patrimonio Agrícola Mundial (Spanish translation of GIAHS)
SO	Strategic Objective (FAO)
SP	Strategic Programme (FAO)
TWW	Treated Wastewater
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNES	University of El Salvador
UniTuscia	University of Tuscia
WASAG	The Global Framework on Water Scarcity in Agriculture

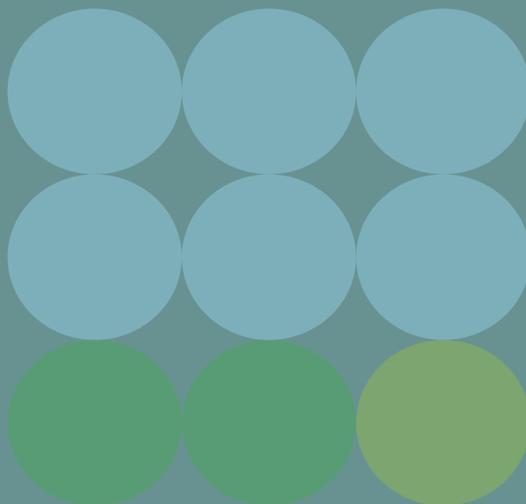
Executive Summary

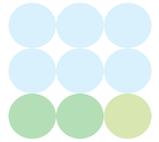
Climate change poses a serious threat to the achievement of global food security and sustainable development. Under this pretext, The Food and Agriculture Organization of the United Nations (FAO) and the Istituto Italo Latino Americano (IILA) joined efforts to co-organize an “Open House” day at the IILA Head Office in Rome on 13-14 February 2018. The event invited Latin American and Italian research institutions to review the state of research on climate change in agriculture and forestry and concurrently consider opportunities to develop research proposals on scientific and technical themes included in the FAO’s mandate and UN SDGs.

The “Open House” event was professionally facilitated and structured in an interactive and inclusive way, enabling a dialogue between Latin American and Italian institutions to exchange information and knowledge and find common areas of collaboration, in order to develop project ideas to support FAO in fighting hunger by overcoming the new challenges caused by climate change. Moreover, this event provided an opportunity to explore the approach of FAO’s Globally Important Agricultural Heritage Systems (GIAHS) programme, as well as the experiences and the possibilities it offers in this context. The event consisted of a one-day meeting and a field trip at the campus of the University of Tuscia, in Viterbo, on the second day.

The workshop was attended by 51 participants, including representatives from four Italian universities (Roma La Sapienza, Roma Tre, La Tuscia of Viterbo and the University of Florence), six Latin American Institutes (Argentina, Chile, Ecuador, Mexico, Panama and El Salvador), Italian governmental sectors and research institutions (CNR, CREA and ENEA) and FAO’s technical departments, including the Forestry Department and the Climate, Biodiversity, Land and Water Department. Opening remarks for the workshop were provided by Ms. Maria Florencia Paoloni (Scientific Secretary, IILA), Mr René Castro-Salazar (Assistant Director-General, Climate, Biodiversity, Land and Water Department) and Mr. Davide Bradanini (First Secretary, Permanent Representation of the Republic of Italy to FAO).

The two-day workshop generated numerous outcomes such as deepening the data and scientific evidence for GIAHS and expanding the global “Fluxnet” network measuring carbon emission (CO₂) fluxes for land use in Latin America, concurrently reinforcing collaboration in the water sector, specifically in groundwater management policies. These and many other results are captured in the workshop report, which also includes a [workshop video](#).





1. Introduction

BACKGROUND AND OBJECTIVES OF WORKSHOP¹

Climate change poses a serious threat to the achievement of global food security and sustainable development. Greenhouse gas (GHG) emissions from human activities, livestock and deforestation are significant drivers of climate change. The Food and Agriculture Organization of the United Nations (FAO) is supporting countries to both mitigate and adapt to the effects of climate change through a wide range of research based and practical programmes and projects, as an integral part of the 2030 Agenda and to achieve the Sustainable Development Goals (SDGs).

Academia and research institutions are primary partners of FAO as they generate knowledge and technologies to be shared and contextualized within member countries, with the objective of addressing climate change challenges. In this framework, FAO and the *Istituto Italo Latino Americano* (IILA) joined efforts to co-organize an “Open House” day at the IILA Head Office in Rome on 13-14 February 2018, inviting Latin American and Italian research institutions to review the state of research on climate change in agriculture and forestry, and concurrently consider opportunities to develop research proposals on scientific and technical themes included in the FAO’s mandate and UN SDGs.

The “Open House” event was facilitated and structured in an interactive and inclusive way by applying bottom-up capacity enhancement techniques² that fostered joint-ownership, joint-commitment and mutual accountability for the envisioned results. It enabled a dialogue between Latin American and Italian institutions to exchange information and knowledge and find common areas of collaboration, in order to develop project ideas to support FAO in fighting hunger by overcoming the new challenges caused by climate change. In particular, this event provided a chance to explore the approach of FAO’s GIAHS programme and the experiences and possibilities it offers in this context. The event consisted of a one-day meeting and a field trip at the University of Tuscia, in Viterbo, on the second day.

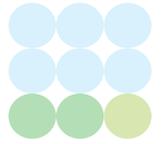
The Open House was organized in three sessions: the first session show-cased various advanced research projects internationally developed by Italy, the second session focused on proposals on climate change in agriculture for funding in Latin American countries. Finally, the third session discussed the presented project ideas to set the framework of cooperation among the participating institutions under the overall umbrella of FAO and IILA.

The report presents the workshop proceedings and the identified areas of collaboration and joint-actions.

1 Resource persons for the event were Maria Florencia Paoloni (IILA), Umberto Ciniglio (FAO), Alberto DellLungo (FAO) and Patrick P. Kalas (FAO).

2 See FAO’s Corporate Strategy on Capacity Development <http://www.fao.org/capacity-development/en/>





2. Participants and welcome

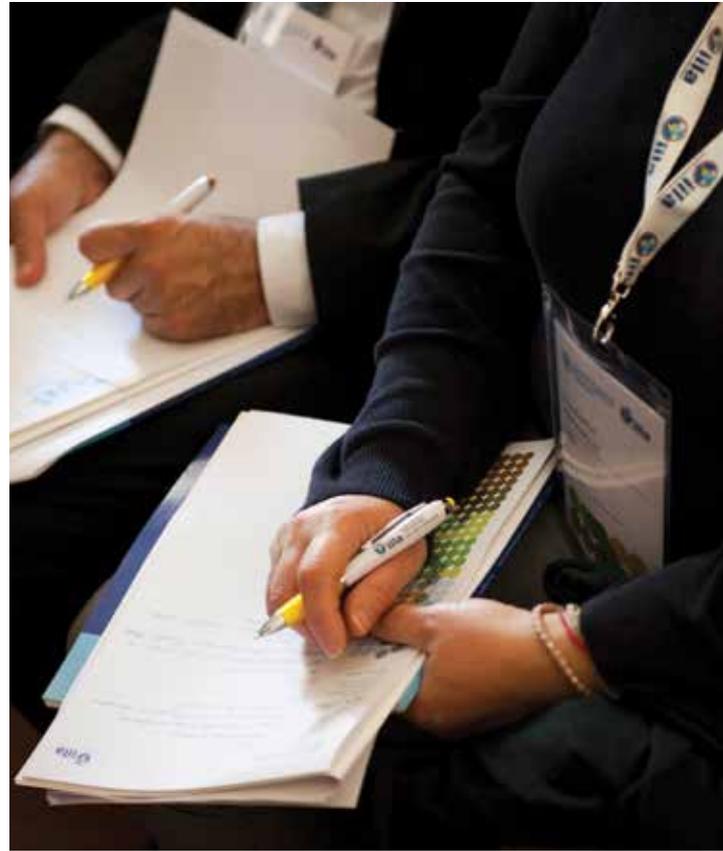
The event was attended by 51 participants, including representatives from four Italian Universities (Roma La Sapienza, Roma Tre, La Tuscia of Viterbo and the University of Florence), six Latin American Institutions (from Argentina, Chile, Ecuador, Mexico, Panama and El Salvador), Italian governmental sectors and research institutions (CNR, CREA and ENEA) and FAO's technical departments, including the Forestry Department and the Climate, Biodiversity, Land and Water Department.

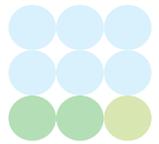
Opening remarks for the workshop were provided by Ms. Maria Florencia Paoloni (Scientific Secretary, IILA), Mr René Castro-Salazar (Assistant Director-General, Climate, Biodiversity, Land and Water Department) and Mr. Davide Bradanini (First Secretary, Permanent Representation of the Republic of Italy to FAO).

Ms. Maria Florencia Paoloni acknowledged the support of the Italian Permanent Representation, with particular attention to the contribution provided by Ambassador Pierfrancesco Sacco. Agriculture is necessary, particularly in Latin America as 2030 is a milestone for sustainable agriculture and an inspiration for the IILA. In fact, the Institute has a long tradition in supporting environmental and agricultural projects in Latin America and is particularly interested in promoting new activities in these areas for the young generations. IILA welcomes this event as it is open and happy to cooperate with everybody.

Mr. René Castro Salazar highlighted that we need to support development of agriculture stakeholders. The Paris agreement on climate change imposes the reduction of temperature of 1.5 degrees as a challenge and, in addition, increasing food production by 50 **percent** in the next 50 years is crucial. GIAHS is therefore a critical area and more GIAHS sites are necessary to improve good practices for sustainable agriculture. Water use and water management also require improvement. In this regard, the Master course in Florence (supported by the Italian Government) is particularly relevant, to improve the knowledge of GIAHS in young generations. The Open House at IILA is an interesting initiative to link Italian and Latin American scientific institutions to common objectives to reduce the impacts of climate changes.

Mr. Davide Bradanini mentioned that this is the first result of the MoU between IILA – FAO that was signed at the presence of the Italian Minister of Foreign Affairs. Sustainability is fundamental in order to solve problems in agriculture. Yet, agriculture is also a key priority issue for climate change mitigation and reduction. IILA is a key institution in this meeting as it encompasses both countries and country institutions. **The whole speech of Mr Bradanini is available in Annex 6.**





3. Summary of day reports

SESSION 1 "ADVANCED RESEARCH IN AGRICULTURE AND FORESTRY IN ITALY"

Mr. Patrick Kalas, Capacity and Institutional Development Officer, FAO and event facilitator, introduced the key -day technical event as an opportunity to discuss innovative, "out-of-the-box" ideas to help address the daunting challenge across the nexus of climate change and food security, with focus on Latin America. He invited participants to fully join and contribute to this dialogue to help connect the dots between the knowledge and expertise available in the room.

Mr. Mark Davis, Senior Natural Resources Officer, Climate and Environment Division, FAO, introduced FAO's climate change work from the viewpoint of an ecologist, illustrating how complex things are connected and how ecology helps understand the linkages between agriculture and climate change. He pointed out that FAO's strategy on climate change represented a participatory work involving colleagues from all the regions, governing bodies and country representatives.

The work is based on a theory of change and concludes that a key thrust is to enhance the capacity of countries to ensure food security, to eliminate poverty and to guarantee the sustainability of natural resources. Climate change is a threat to all these issues and agriculture (i.e. crops, fishery, forestry, livestock and aquaculture) will be seriously impacted by climate change. This includes the growing connection between climate change and migration. In addition, besides supporting countries through capacity and institutional development, FAO needs to have the capacity to develop tools and support countries. One focus of FAO's work on climate change is to support farmers and evaluate impacts through models which will facilitate forecasting what will happen in the future. Key entry points are the Nationally Determined Contributions (NDCs) and how to incorporate agriculture into the formula to achieve the NDC commitments.

Mr. Olcay Ünver, Deputy Director, Land and Water Division, FAO, introduced linkages between land and water management to strengthen climate change resilience. He explained that in land and soils there are a number of climate change mitigation effects. The water and land programme addresses various priorities of FAO's mandate. In water resources there are three areas: data information and maintenance (for which Aquastat provides the most available set of data at country level),



water scarcity (a programme focusing on water scarcity in agriculture that was introduced in 2006 by the FAO Director General with WASAG) and irrigation schemes, which encompass a strong area of work on irrigation management including the rehabilitation of irrigation infrastructures, water and rural poor, drought risk management and groundwater governance, world agriculture watch and territorial development, global soil partnership. FAO priorities for the Land and Water Division, include: Governance of soil and water resources, Sustainable land and water management, Global initiatives (GSP WASG and data information Aquastat) and Communication and outreach.

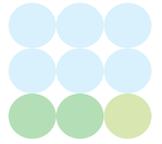
Mr. Giuseppe Scarascia Mugnozza, Head of Department of Innovation in Biology, Agri-food and Forest systems (DIBAF), University of Tuscia, Viterbo highlighted the work on *Monitoring climate change effects on forestry and agroforestry ecosystems*. He pointed out that, owing to the phenomena of Anthropocene, conservation is not a manageable solution. Forest and agriculture are part of the solution to address climate change, but they are also simultaneously impacted by climate change. For instance, forestry ecosystems are pumping CO₂ in growing seasons. Forests absorb approximately 50 **percent** of the CO₂ that we emit. Forest ecosystems contribute for approximately EUR 2 billion to carbon sequestration. Encouragingly, forests in the realm of climate change are receiving increased media attention.



Moreover, the role of forests in mountains is critical for soil protection, as well as to improve the quality of water and tourism. There are 100 carbon stations in Europe, half of which are forests. The ICOS network present at the hub at UniTuscia coordinates the ecosystem data collection and management. Forests act directly on biophysical aspects. Removing forests would increase temperatures of 18 degrees Celsius. In conclusion, "Green Dreams" such as the Great Green Wall (GGW) and the use of TWW in northern African countries (FAO Project "Forest restoration in Algeria, Egypt, Morocco and Tunisia using treated wastewater to sustain smallholders' and farmers' livelihoods", <http://www.fao.org/forestry/tww/>) are crucial. The University of Tuscia considers international cooperation as a priority.



Mr. Guido Giordano, Associate Professor, Department of Science, University of Roma Tre, provided an overview on *Water cycle and water management for agriculture*. He explained the relationship between agriculture and the groundwater system, stating that stress factors such as water shortages are expanding in concurrence with the increasing numbers of wells, causing a rapid and unsustainable water extraction. Water management in agriculture is key as 70 **percent** of fresh water globally is consumed by agriculture. For instance, kiwis necessitate more water than vineyards (e.g. in southern Lazio). This will have implications for GIAHS. Hence, it is crucial to consider the multidimensional purpose of water. Groundwater management is relevant and GIAHS is useful to develop good practices regarding water utilization.



Ms. Kakoli Ghosh, Coordinator, Partnerships and South-South Cooperation Division, FAO, illustrated a presentation regarding Partnerships with academia and students to strengthen sustainable agriculture. Key messages included the central importance that food and agriculture have in relation with the 17 SDGs, the need of interdisciplinary thinking, innovations, the increased importance of FAO on partnerships including civil society and inclusiveness (no one is left behind approach).

The concept of sustainability is heavily used, but what does it mean and how best to adopt it at the farm level in the face of rapid climate change? A systems approach is needed which incorporates the five key principles for sustainable food and agriculture: improving resource use efficiency, concrete actions to conserve, protect and enhance natural resources, enhancement of resilience, protection of livelihoods of people and effective governance mechanisms. Partnerships for an integrated approach, combined with knowledge generation and innovations, are essential for developing a sustainable future for agriculture and food systems.

Mr. Yoshihide Endo, Coordinator GIAHS, FAO, presented *The FAO GIAHS (Globally Important Agricultural Heritage Systems) approach: experiences from Asia and Latin America*. GIAHS is important as it enables dynamic conservation in harmony with socioeconomic and sustainable development, thus addressing the challenges of climate change. GIAHS are living, evolving systems of human communities in an intricate relationship with their territory, cultural or agricultural landscape or biophysical and wider social environment. The resilience of many GIAHS sites has been developed and adapted to cope with climatic variability and change, natural hazards, new technologies and changing social and political situations, so as to ensure food and livelihood security and alleviate risk.

Mr. Endo pointed out that the overall goal of the GIAHS programme is to achieve dynamic conservation of the agricultural systems. This concept means conservation and adaptive management of the GIAHS site to agricultural, social and economic development through various available measures implemented by major stakeholders as have been formulated in Action Plans, maintaining the balance between conservation and development. In fact, to halt the rapid degradation of GIAHS, their dynamic nature must be recognized first. Their resilience depends on their ability to adapt to new challenges without losing their biological and cultural wealth and their productive capacity. This requires continuous agroecological and social innovation combined with careful transfer of accumulated knowledge and experience across the generations. Trying to conserve GIAHS by freezing them in time would surely lead to their degradation and condemn their communities to poverty.

The GIAHS Coordinator concluded with some examples of outstanding GIAHS sites, which are able to maintain a huge biodiversity, are resilient to changes, and continuously provide livelihoods to the local



communities. These include the Andean agriculture system in Peru, the Chiloé Island in Chile, the agroforestry system in the slopes of Mount Kilimanjaro, Shimbwe Juu village near Arusha, Tanzania. These examples of sustainable agricultural practices have shown their capability in adapting to numerous changes and, compared to other production systems, have demonstrated to be resilient over time. Not without reason, these systems that are located in remote areas, with difficult geographic and climatic conditions, have adapted and survived until our days, providing food and livelihood security to rural communities around the world.

Mr. Mauro Agnoletti, Associate Professor, Department of Agriculture, Food and Forestry Systems, University of Florence gave a detailed overview on *GIAHS in support of sustainable agriculture: a concrete option and good practice to deal with climate change*. He pointed out that a national register of historical rural landscapes exists. Landscapes originate from the simultaneous evolution of humans and nature. The national register exists to classify abandoned sites resulting from agricultural industrialization.

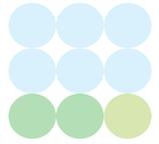


Moreover, the monitoring of GIAHS requires also detailed remote sensing. Findings include that modern agricultural systems require more energy and leave larger carbon foot prints. Olive trees have similar roles in carbon absorption as the Mediterranean maquis. Terraces have strong effects on the preservation of water, similarly to the bordering areas of Florence which absorb water and prevent flooding as humidity is stored in terrace systems. He mentioned some successful experiences restoring terraces, now they are making comparative studies between Italy, Cuba and Morocco all with very different landscapes: but they all have in common the complexity of the landscape mosaic.



Mr. Xu Yubo, First Secretary, Permanent Representation of the People's Republic of China to FAO, elaborated in the relationship of GIAHS and climate change from a Chinese perspective. He pointed out that China considers GIAHS of key relevance to achieve SDGs and is proud to support FAO. GIAHS possesses significant potential as a solution to address climate change. For instance, production systems include rice-fish culture system which can help reduce CO₂ emissions by **22 percent**. This has been replicated across continents including Africa by South-South cooperation.

Other examples include rice cultivation terraces for the sustainable management of water, eco-landscape forest village terrace river, traditional rice cultivation, rice-fish duck system, tea agrosystems in Pu'er traditional tea agrosystem and Aohan dryland farming systems. China also supports NIAHS and considers strategic support necessary to upscale GIAHS. China has provided the FAO-GIAHS programme with USD 2 **million**. In addition, China is supporting the training of students and participated in a workshop in Brazil focusing on GIAHS in Latin America. **The whole speech of Mr Xu Yubo is available in Annex 6.**



SESSION 2 “FUNDING PROPOSALS FOR PROJECTS ON CLIMATE CHANGE IN AGRICULTURE IN LATIN AMERICAN COUNTRIES”

Patrick Kalas, FAO, introduced the session aimed at presenting and discussing funding proposals regarding NIAHS and GIAHS, to enhance climate change adaptation and mitigation through conservation and sustainable use of agrobiodiversity. The proposals were subsequently presented by Latin American country representatives.

Argentina



Mr. **Esteban Borodowski**,
Director, Forest Production Division,
Ministry of Agroindustry.

The presentation focused in two potential GIAHS in the country: “Sistemas Productivos con algarrobo” and “Sistemas ancestrales de la Puna y el pre-andino”.

The area dedicated to *Sistemas Productivos con algarrobo* in the *Región del Parque chaqueño* covers a total of 21 million ha and suffers a yearly deforestation rate of 0.8 **percent**, resulting in a loss of 200 000 ha/year as well as the simultaneous introduction of new varieties. The traditional production system managed by local communities is based on the use of Algarrobo (*Prosopis* sp.), a tree that is also part of the Montreal process, the Working Group on criteria and indicators for the conservation and sustainable management of forests in the temperate and boreal region. The importance of conserving this local species is connected to the conservation of biodiversity and the prevention of deforestation, as well as the reduction of soil degradation. Current efforts are being carried out to restore this species in degraded areas, in order to also restore the related ecosystem. Indeed, Algarrobo trees are associated to a very peculiar ecosystem typical of drylands which actually creates a microclimate.

Algarrobo is also an important species for rural development and provides important socioeconomic and environmental alternatives to smallholders in the provinces of Chaco and Formosa. Planting Algarrobo in these provinces would restore degraded landscapes and strengthen agriculture. However, this would require transfer of knowledge in order to improve cultivation and silviculture in support of production.

Algarrobo can enable integrated production systems and increase the livelihoods of local communities. It is a relevant species that grows in drylands, taking advantage of its ability to catch deep water in soils. The species is also a nitrogen fixator that enables

the increase of natural soil fertilization. It is a typical species of agroforestry systems as it successfully mixes with horticulture, livestock and agriculture (cows, goats and sheep). Moreover, its ecologic characteristics allows the restoration of degraded lands with agriculture and ensures the production of a number of services to increase rural livelihoods. Fruits from Algarrobo are edible and suitable for human consumption and for celiacs. In addition, Algarrobo wood is highly valuable and can be utilized for furniture, handicraft and construction and it also represents an energy source. Algarrobo can trigger local production chains allowing people to work in their own areas.

The principal risk brought about by this system consists in subjecting the areas where this species grows to progressive deforestation and soil degradation, implying social risks such as increasing migration from rural to urban areas and the continuous draining of tree genetic resources.

This system presents a number of challenges, such as:

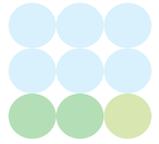
- promoting identification, recovery and dynamic conservation of this variety;
- increasing knowledge of researchers focused on wood and non-wood products;
- strengthening the relationship between humans and forests (linked with development);
- recovering degraded lands which were abandoned by traditional farmers;
- developing and increasing the value of benefits and advantages of mixed and integrated production systems: agroforestry, sylvopastoral, silvo-apiculture, etc.

Nonetheless, a number of opportunities also arise. In fact, a formal inter-institutional collaboration has already been established under the National Program for Algarrobo (2013). Various universities including the University of Formosa, the University of Santiago del Estero and the University of Salta are already committed to work on Algarrobo. Particularly, the University of Salta is testing new methodologies related to geothermal energy, in order to allow the harvesting of native crops, principally concentrated in summer, all over the year. However, there is the need to coordinate these efforts under an overall program in support of Algarrobo. In this regard, the designation of a GIAHS for the region of Algarrobo would provide an additional, important improvement to value knowledge of local communities and promote livelihood opportunities (for commercial purposes) and production.

Also, international research cooperation would be necessary. Argentina would, in fact, appreciate the support of Italian universities on different thematic areas of work, including the conservation of genetic resources of *Prosopis alba*, identification of conservation sites, the involvement of local communities and local universities and the genetic improvement of the identified trees.

Possible work on GIAHS and potential sites:

1. Algarrobo agro-silvo-pastoral system: GIAHS designation represents a big opportunity to invert the trend of deforestation and introduction of new varieties that is currently affecting the area. Protecting these areas under such a program would also protect the cultural and agricultural system that depends on Algarrobo trees and



that is developed by communities around the tree system. Deforestation and land degradation harms ancestral productive systems of autochthonous communities, therefore conserving this variety would mean biodiversity conservation and at the same time would be a deterrent to land degradation, land use changes. As many other traditional systems this is an integrated system and can be considered an Agro-sylvo-pastoral system, supporting livelihoods of local communities and providing numerous environmental services. Threats to this system are: loss of this variety and associated genetic resources, migration of local communities and abandonment of the area;

2. Ancestral systems of Puna and pre-andean zone: this system is based on native crops that are influenced by climate conditions. In fact they can be harvested only in summer season. Work is needed to improve efficiency and allow traditional farmers to find alternative incomes during winter. GIAHS could support commercial opportunities for these products and promote traditional knowledge of communities, by giving visibility to the wider public.

The sustainability objectives include organic production, sustainable agriculture plans and GIAHS. GIAHS is an important tool for differentiating production systems and related activities as it recognizes farmers' strategies as an alternative of differentiation. In addition, it adds value to farmers' production systems which revolve around traditional methods of land utilization and management, thus depicting cultural identity. Moreover, GIAHS rescues and increases the value of local and traditional varieties and breeds, which contribute towards adaptation to global changes (including climate change). Finally, it enables the move towards sustainable, competitive and inclusive agriculture.

Chile



Ms. Margarita Vigneaux Roa,
Advisor, Embassy of Chile in Italy,
Ministry of Foreign Affairs,

pointed out that the strategy of the Ministry of Agriculture is based on two main pillars: the reduction of inequalities and sustainable and healthy diets.

In Chile, the Government has been focusing its efforts in GIAHS and NIAHS strategies (one and two sites respectively). The first GIAHS site, in Chiloe Island, was greatly supported by the Government and this approach enables local communities to feel empowered via the support to their cultural identity. Currently there is a NIAHS Network: it is a NIAHS project of USD 3.5M encompassing 4 components. Lessons learned and results include:

- governance at three levels: global, national and regional/local;
- GIAHS Branding: SIPAM Chiloe;
- empowerment of local communities;
- dissemination of experience via participation in international meetings, national and local agricultural fairs;
- contribution to family farming.

Ecuador



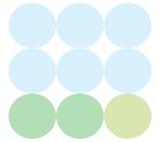
Ms. Érika Zárate Baca,
National Director, Livestock, Aquaculture
and Fisheries Division, Ministry of Agriculture
and Livestock.

Ecuador has adopted GIAHS for its domestic agricultural and food systems. Between 2013 and 2015, a total of eight potential sites were identified. Presently, local management models for dynamic conservation are being considered.

The strategy in Ecuador began with the identification of NIAHS and the second phase consisted in the presentation of GIAHS sites. Eight NIAHS were identified based on the five GIAHS criteria and their vulnerability (6th criterion for Ecuador's methodology). Subsequently, two GIAHS potential sites were identified from the eight NIAHS, Chacra andina and Chacra amazónica (an agroforestry system based on cacao production). Both systems are very important for the conservation of the Amazon as they simultaneously confront two opposite threats: drought and excessive rain.

The vulnerabilities brought about by climate change include the increase of temperatures, variations in rain patterns and the infrastructure of response to risk. The consequences of climate change comprise the increase of prices (up to 130 percent), the increase of production costs and the reduction of food quality. Opportunities for joint research and regional exchanges (encompassing Colombia, Peru and Ecuador) have been identified with regards to mitigation, adaptation and resilience.

Ecuador welcomes the proposal of the University of Florence as being quite relevant for GIAHS. However, there is a need of stronger policy support to GIAHS. In particular, capacity development in identification, awareness and monitoring of the systems, as well as capacity development in developing networks to capitalize on the accumulated experiences. It is deemed important to collaborate with Universities in order to develop sustainable agriculture and conservation systems.



El Salvador



Mr. Balmore Martínez Sierra,
Professor, Department of Plant Breeding,
University of El Salvador (UNES).

El Salvador tops the list of countries with a climate risk index. The country needs to direct national agricultural policies towards promoting soil conservation, agroforestry and sustainable systems.

El Salvador also lacks policies confronting environmental and forest conservation and forest management. A total of 42 percent of the country is affected by landslides caused by deforestation and 67 percent of river margins are damaged. However, the systems developed in El Salvador for the production of salt and the production of shrimps are potentially eligible for GIAHS but require further efforts to reduce production costs (by shifting to agro-ecology systems for example).

UNES (Unidad Ecológica Salvadoreña) has already signed a partnership agreement with the University of Palermo (Italy) and has developed a plan to sign a partnership agreement with the University of Tuscia. The potential areas of collaboration in which El Salvador would need support include:

Monitoring Climate **Change effects**: adopting a method for the measurement of GHG and carbon emissions using six strategic axes, in order to contribute to climate change adaptation in different land uses (it has been proposed to conduct these studies with the support of UniTuscia);

1. **Water Management**: presentation of a proposal to collaborate with University Roma 3 forestry, fisheries and aquatic sectors: strengthening of capacities, innovation and Water Division could also support);
2. **GIAHS**: request for transferring knowhow, inter-institutional cooperation, institutional strengthening, communication and participation in the Master's course on GIAHS offered by the University of Florence. Two potential sites have been identified (coffee cultivation and horticulture in the area of Pinares) which exemplify sustainable water management, indigenous knowledge and citizen participation;
3. **Other challenges**: tackling deforestation caused by land tenure issues, in order to raise awareness and prevent uncontrolled deforestation.

Mexico



Ms. **María de los Ángeles Gómez Aguilar**,
Second Secretary, Permanent Mission
of Mexico to the Rome-based
United Nation Agencies in Rome,

explained that Chinampas, an ancestral
system from the Aztec period, has been
recognized as a GIAHS for its high
cultural and traditional value.

Chinampas is characterized by an elevated biodiversity and, should its potential contribution to food security be fulfilled, by the capacity of providing sufficient sustenance to Mexico City for over 2000 years. The Mexican Government considers GIAHS as a crosscutting topic which focuses on biodiversity conservation, livelihoods and climate change.

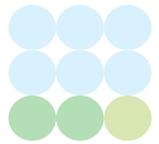
Panama



Ing. **Eldis Barnes Molinar**, **Dean**,
Department of Agrolivestock Science,
University of Panama.

The economy stemming from the Panama Canal
is not developing agriculture. In fact, every
ministerial institution was established after
the creation of the Canal with the objective
of expanding the Canal's economy rather
than to enhance agriculture.

From an academic point of view, Panama has one faculty of agriculture, 40 faculties of law and various faculties of economy and tourism. From a total of 65 000 students in Panama, only 15 percent studies scientific disciplines and only few of them are agronomists. The country currently has no agricultural policy, although approximately 30 percent of the population depends on agriculture. Panama faces significant challenges in the management of fresh water (resulting from the absence of a national management policy) and does not systematically recycle wastewater. In addition, Panama is still utilizing dangerous chemical fertilizers. Numerous islands face the risk of disappearing over the next 25 years as a result of climate change. Panama was the last country to emerge in the LA continent and will probably be the first to disappear owing to climate change.



Sustainable agriculture in Panama is a current theme together with sustainable water utilization. Possible areas of collaboration include:

- water harvesting projects to reduce obstacles for farmers during the dry season;
- managing the reduction of chemical inputs (thus improving soil quality);
- as the Guna Islands are being submerged by water, there is an urgent need of support to identify alternative livelihoods.

Cuba



Ms. Yadira Trujillo,
Commercial and economical attaché,
Embassy of Cuba in Italy

Cuba reported that the Government is trying to improve the resilience of local people to climate change via a project concerning the sustainable management of the environment.

In this framework, GIAHS are considered as an important instrument to support the Government's work and could be linked to "Proyecto Vida", initiated in 2011.

Republica Dominicana



Ms. Julia Vicioso,
Permanent Mission of the Dominican
Republic to the UN Agencies in Rome.

The enhancement of resilience is crucial in order to reduce the calamities generated by climate change.

Small island countries such as the Dominican Republic are particularly threatened by climate change compared to other countries.

SESSION 3 DISCUSSION ON SYNERGIES AND POSSIBILITIES FOR COOPERATION BETWEEN LATIN AMERICA AND ITALIAN RESEARCH INSTITUTIONS

The session started with Alberto Del Lungo, Senior Forestry Expert, summarizing key areas of the collaboration already voiced during the discussion. GIAHS provides opportunities to increase rural resilience to climate change. Countries are benefitting of the exchange of knowledge and technologies through South-South cooperation. The Italian Universities involved showed to be advanced in research on monitoring carbon emissions, managing water in agriculture and strengthening good practices in agriculture. They are ready to transfer knowledge and work together with Latin American countries to develop projects in support of GIAHS. China, who is the most advanced country on GIAHS and NIAHS, should also support establishment of agriculture heritages in Latin America

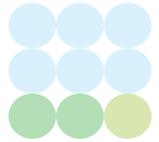
Interventions:

Nicaragua - Panama Costa Rica, Guatemala, Nicaragua and Central America are vulnerable to natural catastrophes induced by volcanoes, earthquakes, flooding and draughts. These countries need both South-South and North-South cooperation involving transfer of knowledge, capacity building and funding as they usually find the implementation of policies and programmes developed by their governments problematic owing to the lack of resources.

El Salvador - The country has linkages to the University of Palermo and, in addition, the University of Tuscia has already developed an agreement with El Salvador for the monitoring of carbon emissions. El Salvador would be interested in cooperating with the University of Roma Tre on water-related projects and with the University of Florence on GIAHS.

Mr. Patrick Kalas, FAO - Switching from facilitator to a technical expert in human and institutional capacity development, Mr. Kalas posed the question regarding what it would really take for the current GIAHS 1.0 to be up-scaled to GIAHS 2.0. Assuming the existence of a current knowledge gap, further research was recommended to determine which system-wide capacities require enhancement in order to enable a GIAHS 2.0 transformation at greater pace and scale. This research would need to identify which conducive policies, laws and incentive systems (e.g. including alignment of production, trade and conservation policies, smart subsidies etc.) should be in place at national and subnational levels, determine which organizations and institutions should be strengthened (e.g. including institutional coordination mechanisms, institutional political economy etc.), establish the role of multi-stakeholder/multi-actor platforms to suitably manage the sites and, finally, ascertain what sort of individual knowledge and competencies the people involved require. In conclusion, FAO's capacity development approach and strategy – if contextualized for GIAHS- could provide methodological insights if currently applied across various thematic areas across climate change and natural resource management.

Mr. Guido Giordano - Mr. Giordano stated that GIAHS could be of interest to focus on the conservation of a site, as GIAHS allows qualitative work over quantitative work. SIPAN methods could also develop quantitative methodologies but forest benefits could also be calculated in terms of CO₂ absorption. The work of GIAHS for the mitigation of climate change should be included both in international and national agendas and should focus on sharing the knowledge through Master programmes (in the Universities



of Florence and Viterbo, for example). With regards to dimension, the definition of a scale to identify SIPAN was deemed necessary in order to address this deficiency. Finally, the example of Chile utilizing the revenues of COP in order to fund study abroad scholarships for its students was provided.

The way forward, strategies to achieve collaboration between Italy and LAC Countries - One significant outcome of the event was to enable knowledge sharing between a diverse groups of actors. The ambitious agenda included rich presentations which will require a period for absorption. The maintenance of a continuous dialogue among the various participants was strongly recommended, and FAO and IILA were encouraged to facilitate this process. In addition, numerous areas for collaboration were proposed in the individual presentations. The key areas included:

- **Climate Change and AFOLU sector - Fluxnet:**

Expand and strengthen fluxnet to measure CO² fluxes for land use to Latin America (in close collaboration with Latin American universities)

Exchange of equipment and know-how for Fluxnet: Offer from University of Viterbo to provide measuring spare equipment (at the cost of approximately EUR 30 000) to interested universities for one year initially. Moreover, providing coaching on how to use the equipment.

- **Water** - Policies for groundwater management:

Collaboration between FAO CBL and University of Roma Tre with Latin American universities and governments (such as Panama) with the objective of elaborating good practices (see intervention)

Development and implementation of good practices and training on sustainable management of water resources.

- **Globally Important Agricultural Heritage sites (GIAHS)**

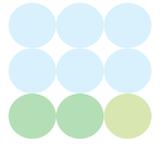
Data and scientific evidence for GIAHS: Collaboration between Latin American universities, China and the University of Florence with the objective of expanding knowledge, scientific basis and evidence regarding socioeconomic impacts (e.g. linkages to livelihood diversification), in order to complement or deepen the presently available biophysical impact assessment data

Enhance the understanding and potential of "Biocultural Diversity" and capturing and sharing traditional practices: GIAHS represents an interesting model of the co-evolution between men and nature. It may also present an interesting model to address the failure of the market system to internalize environmental externalities. One of the challenges is to capture the mostly orally transmitted, tacit knowledge of traditional practices, documenting them systematically and making them available

Generate good practices on policies, laws, incentive schemes (i.e. subsidies, investments) and institutional coordination mechanisms for GIAHS and NIAHS:

Develop, capture and systematically share good practices between FAO, Latin American universities and China, to provide guidance to countries regarding the establishment of GIAHS and NIAHS sites in terms of a favourable policy environment and institutional setting.





4. Closing remarks

Mr. **Patrick Kalas**, FAO, Capacity and Institutional Development Officer and event facilitator, thanked the organizers for this opportunity, the preparation team for their support and the participants for the trust. This event represents an important, initial contribution to address one of the most daunting challenges to humanity and the planet – the nexus between climate change and food security. This multi-actor event particularly focused on Latin America with the intention of creating a space for dialogue to facilitate the exchange of innovative ideas, minds and expertise. This event embodies the beginning of a collaborative journey, as various concrete steps and pathways for intended collaborations were identified in order to expand, scale-up and scale-over innovative approaches. The next step will translate intention into concrete, tangible action.

Ms. **Maria Florencia Paoloni**, Secretary for Scientific and Technological Affairs, IILA, stated that numerous, relevant topics were covered during this intensive technical discussion. Among these, climate change, agriculture and water management, as well as ancestral knowledge. Moreover, the event affirmed the importance of not leaving anyone behind (women and children especially) and emphasized the importance of working and researching in an interdisciplinary way and with a holistic view. During the presentations, various Latin American countries and Italy shared experiences on GIAHS whilst others also expressed their interest in submitting a proposal to create a GIAHS. The organization of a follow up meeting would be very functional to facilitate the transfer of know-how. A number of fellowships in these areas are also available for students of Latin American countries through IILA.

Mr. **René Castro-Salazar**, Assistant Director-General, Climate, Biodiversity, Land and Water Department, FAO, thanked the organizers and participants for their active engagement. Particular appreciation was extended to the knowledge shared by the Italian universities and country participants with their subsequent presentations. Further exchanges would be welcome including between foreign students to build a new generation of environmental pioneers. Mr. Castro also reiterated the concept of “dynamic conservation” as put forth and applied by the GIAHS programme. Above all, the meeting clearly established synergies and generated tangible action items to make progress.

Ambassador **Pierfrancesco Sacco**, Permanent Representation of the Republic of Italy to FAO, expressed appreciation for the results achieved between IILA and FAO in the framework of the MoU in less than one year. Italy acknowledged both IILA and FAO for their great work on facilitating the cooperation between Italian and Latin American research institutions. This event should be considered as a first and very important step taken in the framework of the MoU to facilitate the establishment of synergies between several research institutions, including not only the three universities invited to speak but also CNR, CREA ENEA and University La Sapienza.



ANNEX 1

Final agenda

DAY 1
13 FEB 2018

CLIMATE CHANGE CHALLENGES IN AGRICULTURE IN LATIN AMERICA

08.45 - 09.30

Registration

09.30 - 10.00

Opening remarks

Ms Maria Florencia Paoloni
Secretary for Scientific and Technological Affairs, IILA

Mr René Castro-Salazar
Assistant Director-General, Climate, Biodiversity, Land and Water Department, FAO

Mr Davide Bradanini
First Secretary, Permanent Representation of the Republic of Italy to FAO

SESSION 1

Advanced research in agriculture and forestry in Italy

Facilitator: Mr Patrick Kalas (Climate, Biodiversity, Land and Water Department, FAO)

10.00 - 10.20

Climate change and the work of FAO
Mr Mark Davis (Senior Natural Resources Officer, Climate and Environment Division, FAO)

10.20 - 10.40

Land and water management to strengthen climate change resilience
Mr Olcay Ünver (Deputy Director, Land and Water Division, FAO)

10.40 - 11.00

Monitoring climate change effects on forestry and agroforestry ecosystems
Mr Giuseppe Scarascia Mugnozza (Head, Department of Innovation in Biology, Agri-food and Forest systems, DIBAF, University of Tuscia, Viterbo)

11.00 - 11.30

Coffee break

11.30 - 11.50

Water cycle and water management for agriculture
Mr Guido Giordano (Associate Professor, Department of Science, University of Roma Tre)

11.50 - 12.10

Partnerships with academia and students to strengthen sustainable agriculture
Ms Kakoli Ghosh (Coordinator, Partnerships and South-South Cooperation Division, FAO)

12.10 - 12.30

The FAO GIAHS (Globally Important Agricultural Heritage Systems) approach: experiences from Asia and Latin America
Mr Yoshihide Endo (Coordinator GIAHS, FAO)

12.30 - 12.50

GIAHS in support of sustainable agriculture: a concrete option and good practice to deal with climate change
Mr Mauro Agnoletti (Associate Professor, Department of Agriculture, Food and Forestry Systems, University of Florence)

12.50 - 13.10

.....
Mr Xu Yubo (First Secretary Permanent Representation of the People's Republic of China to FAO)

13.10 - 14.00

Lunch

SESSION 2**“Funding proposals for projects on climate change in agriculture in Latin American countries”**

Facilitator: Mr Patrick Kalas (Climate, Biodiversity, Land and Water Department, FAO)

Research funding proposals, regarding NIAHS and GIAHS, to enhance climate change adaptation and mitigation through conservation and sustainable use of agrobiodiversity. The proposals will be presented by Latin American country representatives.

14.00 - 14.15

Argentina

Mr Esteban Borodowski (Director, Forest Production Division, Ministry of Agroindustry)

14.15 - 14.30

Chile

Ms Margarita Vigneaux Roa (Advisor, Embassy of Chile in Italy, Ministry of Foreign Affairs)

14.30 - 14.45

Ecuador

Ms Érika Zárate Baca (National Director, Livestock, Aquaculture and Fisheries Division, Ministry of Agriculture and Livestock)

14.45 - 15.00

El Salvador

Mr Balmore Martínez Sierra (Professor, Department of Plant Breeding, University of El Salvador)

15.00 - 15.15

Mexico

Ms María de los Ángeles Gómez Aguilar (Second Secretary, Permanent Mission of Mexico to the Rome-based United Nation Agencies in Rome)

15.15 - 15.30

Panama

Ing. Eldis Barnes Molinar (Dean, Department of Agrolivestock Science, University of Panama)

15.30 - 16.00

Coffee break**SESSION 3****Discussion and conclusions**

Facilitator: Mr Patrick Kalas (Climate, Biodiversity, Land and Water Department, FAO)

16.00 - 17.30

Identifying synergies and possibilities for cooperation between Latin American and Italian research institutions

17.30 - 18.00

Closing remarks

Ms Maria Florencia Paoloni

Secretary for Scientific and Technological Affairs, IILA

Mr René Castro-Salazar

Assistant Director-General, Climate, Biodiversity, Land and Water Department, FAO

H.E. Ambassador Pierfrancesco Sacco

Permanent Representation of the Republic of Italy to FAO

DAY 2
14 FEB 2018

FIELD VISIT TO THE MONITORING OF ENVIRONMENTAL ECOSYSTEMS CENTER AT THE UNIVERSITY OF TUSCIA, VITERBO

09:00

Meeting outside IILA Head Office

10:30

Arrival in Viterbo and transfer to the University of Tuscia

13:00

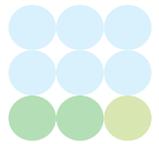
Lunch and visit to Viterbo

16:00

Departure from Viterbo

17:30

Arrival in Rome



ANNEX 2

List of participants

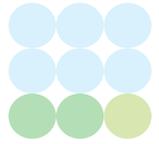
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ANNEX 3

Speeches

(in order of delivery)

IILA – FAO OPEN HOUSE DAY CLIMATE CHANGE CHALLENGES IN AGRICULTURE IN LATIN AMERICA



Mr. Davide Bradanini

First Secretary,

Permanent Representation
of the Republic of Italy to FAO

Excellencies,
Ladies and Gentlemen,

It is a pleasure for me to welcome all of you to this special event – the first Open House Day on Climate change challenges in agriculture in Latin America, jointly organized by FAO and IILA. Also on behalf of Ambassador Sacco, I would like to warmly thank all those involved in its coorganization.

This is the first follow up of the Memorandum of Understanding between FAO and IILA, signed last May at the Ministry of Foreign Affairs. The presence at the signature ceremony of the Italian Minister of Foreign Affairs by itself is a sign of the strong political priority that Italy attaches to the consolidation of this cooperation between FAO, at the core of the third UN global hub, and IILA, a bridge between Italy and Latin America.

We are also glad that this first event focuses on the challenges of climate change, as the urgency of this challenge cannot really be overstated: demographic pressure, uncontrollable processes of urbanization, changing diets, unbalanced socio-economic development, rising levels of hunger, all seem to be climaxing toward an organic crisis of humans' relations with our planet and with each other. If we then add to the equation the consequences of conflicts generated by climate change pressures, the macroscopic nature of the impasse is evident for all of us to see. The solution is also slowly finding its way among researchers, practitioners and in the corridors of International Organizations, and the name of this solution is: sustainability.

John Maynard Keynes famously stated that “practical men, who believe themselves to be quite exempt from any intellectual influences, are usually slaves of some defunct

economist". Expanding this reasoning to the issue at hand, one may appreciate how research on climate change and sustainable practices – once largely obscure issues to public opinion – is now at the heart of the political debate at national and international levels. The role of research and academia is crucial precisely in this sense: it anticipates future societal debates and political decisions.

This brings me to the issue under discussion today: as you well know, agriculture is included in a large number of Nationally Determined Contributions as a key, priority, sector for climate change adaptation and mitigation.

The solutions exist; our efforts should concentrate on how to sharpen, implement and share them at regional and international levels, as we are doing today. Some of these tools and methods at hand, with a special focus on Globally Important Agricultural Heritage Systems, will be showcased today by Italian and Latin American Universities. I hope that during the follow-up discussion, we will explore how these solutions can coalesce into a framework of cooperation among FAO, Italian and Latin American Universities. This is the spirit of this initiative.

Thank you very much.

IILA – FAO OPEN HOUSE DAY THE RELATIONSHIP OF GIAHS AND CLIMATE CHANGE FROM CHINESE PERSPECTIVE

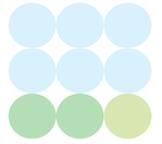


Mr. Yubo XU

First Secretary,
Permanent Representation of the People
Republic of China to FAO

Excellencies,
distinguished guests,
ladies and gentlemen,

Good afternoon. I am Yubo Xu, first secretary of Chinese Permanent Representation to UN agencies for food and agriculture. It is my pleasure and my great honor to be here to make a presentation on the relationship of GIAHS and Climate Change from the Chinese perspective. Before my presentation, I would like to thank the host organizations, FAO and IILA, for your kind invitation and arrangement. As we all know, climate change is one of the institutional strategies for FAO and it is also the biennium themes of FAO governing bodies. Chinese government attaches great importance on climate change and commit itself to contribute to the adaptation and mitigation of climate change in agricultural areas.



The Belt and Road international Cooperation, South-South Cooperation and GIAHS are three effective approaches for China to contribute to the 2030 Agenda to achieve the 17 sustainable development goals. GIAHS is a pretty new theme in FAO and originally it was a project funded by FAO and Global Environment Facility (GEF). Actually, up to now, the work for GIAHS in FAO has been carried out for no more than 20 years under FAO framework. We need to bear this in mind when we compare GIAHS with other Heritage Systems. I am proud to say that China has been actively participating in the GIAHS work since the launch of GIAHS and trying the best to advocate GIAHS at global, regional and local level. China's position on supporting the work of GIAHS in FAO is consistent and strong. And China strongly supports GIAHS work as a pioneer in many FAO governing bodies such as Conference, Council, Finance Committee, and Committee of Agriculture. Sometimes we argued with other members to persuade them to adopt the resolution to support GIAHS as a prioritized area for FAO.

It is my great honor to be here to make a presentation for the GIAHS supporters from Italy and Latin American countries. I am very glad to show and share Chinese experience in relation to the GIAHS work. Since 2005, 15 Chinese GIAHS sites, out of over 100 NIAHS, have been designated by FAO, based on the scientific evidence and consultation with the SAG, Scientific Advisory Group. When we look at these Chinese GIAHS sites, we may find the potential solutions for addressing the climate change challenges. For example, the first GIAHS site in China is Zhejiang Qintian Rice-Fish System, which can be traced back to 1200 years ago. Rice-Fish System contributes to the adaptation of climate change as follows. Firstly, this system has great capabilities in adaptation. The area of Rice-Fish System in China amounted to 1 million ha, from South China to North China, from Sichuan to Jiangsu, from Yunnan to Jilin. You may find Rice-Fish System almost in every province. According to the historian, China is the first country to have rice-fish system in the world. A model of rice-fish system was found in the tomb 2000 years ago.

Mr. Cao Cao, a famous hero in the Three Kingdoms period, mentioned the rice-fish system in the book of "Four Season Food System". Considering the benefits of Rice-Fish System to the environment and farmers, China regarded this Rice-Fish System as an effective approach to end hunger and poverty, both domestically and internationally. In 2014, Chinese experts helped Myanmar to implement a pilot project on the standardization of rice-fish system in Myanmar. In 2015, Chinese experts helped Brunei to include rice-fish system in the national plan of agricultural development. Chinese experiences on Rice-Fish System are also extended to Nigeria, Sierra Leone, and Mali through the South-South Cooperation led by FAO, funded by Chinese government. From the perspective of climate change mitigation, there are many studies on the contribution of Rice-Fish System. In 2011, Professor Min Qinwen found that Rice-Fish System model can reduce methane emissions because the fish foraging activities stir the soil and enhance soil aeration. In the meantime, Rice-Fish System weakens weeds and plankton respiration and increases the dissolved oxygen content in water, which could help oxidize the methane produced by the soil.

The application of Rice-Fish System can reduce the methane emissions by 20% per unit area. Yue Dongdong, in 2013, found that Chinese Rice-Fish System has reduced the carbon dioxide emissions by 1.22 million tones. All of these experiences come just from one GIAHS site in China. Actually, you may find many different kinds of experiences in different GIAHS sites. Take Honghe Hani Rice Terraces System as another example, which is the second GIAHS site in China and adopted by FAO in 2010, 5 years after the first GIAHS site on Rice-Fish System. Honghe Hani Rice Terraces System has a history of 1300

years. It is a good agro-ecology circulation system which includes River, Terrace, Village and Forest. Professor Min Qinwen found that the genetic diversity of rice in Ha Ni Terrace-Rice system helps to reduce and control the rice diseases such as rice blast (caused by a fungus-*Magnaporthe oryzae*).

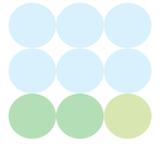
The average incidence of rice blast for the mix planting of tradition and modern hybrid varieties of rice decreased by 42%, compared with the net planting of modern hybrid rice varieties. Secondly, generally speaking, modern rice varieties will be degraded after 3 to 5 years planting. However, the traditional varieties such as Hani Red Rice have very stable genetic trait which can adapt to the climate change and natural disasters. In 2013, Sun Faming made a study on the mechanism of adaptation to extreme drought of Hani Terrace. It is found that a complete ecosystem, efficient use and management of water resources and effective conservation and use of forest resources are the key elements in the adaptation of terraces to extreme droughts.

In 2015, Yang Jingbiao made a study on the adaptation of the agroecosystem of Hani Terrace to the natural environment. It was found that the adaptive management of natural resources in the compound ecosystem of Hani Terrace maximized the self-regulation of the natural environment. This was considered as a mechanism of emergency mitigation for extreme weather events such as droughts and floods. I would also like to highlight other GIAHS sites for their conservation of biodiversity, but I don't have enough time. So I will be brief. The 3rd GIAHS site in China is Wannian Traditional Rice Culture, which was adopted by FAO in 2010. In 1995, a Sino-U.S. Agricultural Joint Archeology Team found the remains of paddy rice from 12,000 years ago in Wannian County, Jiangxi Province.

This makes Wannian County one of the origins of rice in the world. Scientists found that Wannian rice is rich in pest and disease resistance genes and extremely cold-tolerant genes. These genes are of great significance for studying the response to climate change. The 4th GIAHS site in China is Dong's Rice Fish Duck System, with a history of 1200 years, adopted by FAO in 2011. This Rice-Fish-Duck System has a rich diversity which includes 45 traditional varieties of rice, more than 20 species of aquatic organisms such as Carp, grass carp, carp, eel, shrimp, and crab. This ecosystem could reduce the methane emissions by more than 30%. I would not give examples one by one due to the time limit. To sum up the contribution of GIAHS in China to the adaptation and mitigation for climate change consists of four parts.

First, GIAHS in China are the living agroecology models, showcasing the sustainable agricultural development especially in the trend of growing globalization and urbanization. They have a long history with more than 1000 years. These ecosystems are threatened if we do not take immediate action to conserve and use them in a sustainable way. Second, GIAHS in China bear the richest biodiversity in agricultural genetics. There are so many wild species and traditional varieties. These constitute a natural gene pool of germplasm resources. Third, GIAHS in China reduce the emission of greenhouse gas through the cycling model of the typical Rice-Fish System and Rice-Fish-Duck System, and also the Mulberry-Dyke and Fish-Pond System. Last but not least, driven by the GIAHS work led by FAO, Chinese government launched the NIAHS (Nationally Important Agricultural Heritage Systems) projects in 2012.

From then on, China attached more and more emphasis on agricultural heritage, contributing to the development of eco-agriculture. Up to now, China has 91 NIAHS all



over the country. I must say, the number of GIAHS in China is still limited. We should work collectively and closely to promote the extension of GIAHS all over the world. Ladies and Gentlemen, at its seventieth birthday, FAO has achieved ten great achievements. On the way to the 2030 agenda or 2050 agenda, I sincerely hope FAO, cooperate with member countries and other international organizations especially ILLA, to try our best to make the GIAHS work more visible, more concrete, and most importantly, increase the number of GIAHS sites at global, regional and national level.

This is also the requirement of the resolution of 40th session of FAO Conference. To achieve this goal, we need to work together, cooperate closely, and think strategically to scale up the GIAHS work. We hope FAO and member countries could increase the efficiency and effectiveness to make GIAHS as the next great achievement of FAO before 2030. Your Excellencies, in 2015, the South-South and Triangular Cooperation (SSC) initiated the project of "Strengthening the Implementation of GIAHS Initiative through Capacity Development".

Chinese government provided 2 million US dollars to support the project. The main purpose of this project is to 1)strengthen GIAHS governance and Secretariat function by establishing a structural and operational framework of the program; 2)further strengthen the capacity development of FAO member countries through building regional partnerships, networking and twinning programme of GIAHS sites; 3)enhance knowledge platform to share and disseminate knowledge and experiences of GIAHS and promote policy dialogues among FAO member countries and 4) scale up/expand GIAHS coverage, enhance their international recognition, visibility and promote the dynamic conservation of GIAHS sites. Many colleagues participated the training course of GIAHS and made fruitful visits to China GIAHS sites.

Funded by this project, 38 participants from 24 countries received 2 weeks training course to enhance their capabilities of drafting the proposals for their own countries GIAHS sites last September in 2017. And another outcome of this project is that the GIAHS Secretariat participated in the 6th Latin American Congress on Agro-ecology, held in September 2017 in Brazil. I believe that these outcomes and results of this project contribute to the promotion of GIAHS in Latin American. To conclude, in my opinion, GIAHS is a crosscutting theme just like the climate change and I believe if we strengthen GIAHS work by scaling up the coverage of GIAHS, GIAHS will be an effective approach and make more contribution to address the issues related to climate change. Thank you for your attention.

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