With the technical support of the Food and Agriculture Organization of the United Nations (FAO)

Summer school

Agrobiodiversity in a changing climate

Sustainable production, fragile ecosystems, resilience to global changes

One of the world's greatest challenges is to secure access for all to adequate supplies of food that is healthy, safe, and of high quality, and to do so in an environmentally sustainable manner. To achieve the necessary improvements, a sustainable management of natural capital must be at the forefront of the major goals of food production systems. Resilient environments, sustainable production practices and the protection of agrobiodiversity can serve as avenues to improve dietary diversity and quality and, in turn, generating income for sustainable small holder farmers, at the same time as aiding in the restoration and preservation of ecosystem.

Simplification of agricultural production has allowed increased farm yields in the second half of last century. However, the reduced variety of crops on which commercial farming is based upon implies a reduced capacity for agriculture to adapt to environmental changes and stresses. The loss or lack of adaptive capacity in modern, commercial agriculture is a cause for concern in relation to the expected impacts of climate change.

This topic is particularly relevant to mountain areas. Mountain farmers are preserving many of the rarest varieties of cultivars in functioning biodiverse agro-ecosystems, while the harshness of the environment as well as the effects of climate change increasingly pressures the mountain communities to modify their traditional approaches to agriculture.

Taking into account agrobiodiversity in food systems means bringing together various sectors of science, agriculture and economy to propose new strategies of food production that can be implemented in a changing environment, proposing diversified crops and practices as a resource and increased variety as a strength in agro-ecosystems. In addition to agricultural and genetic aspects, the agrobiodiversity discussion focuses on economic and social issues such as identifying markets for biological products, developing adequate value chains and marketing strategies, and preserving local crops.

The impact of investments in the agricultural sector depends significantly on the kind of interventions carried out and on the type of food system that is promoted. It is essential to enable community-driven food systems that provide the best possible outcomes for producers and consumers. In this model consumers and producers are connected through short, transparent, direct value chains, with a double impact on the income of citizens. Producers are incentivized to develop or conserve quality based production models that are then rewarded with a price premium by consumers. Conversely, consumers are able to access culturally adequate, safe, nutritious food at affordable prices.

Objectives, participants and venue:

The course will focus on the importance of biodiversity in agriculture, with particular attention to its role in enhancing resilience and adaptability of cropping and farming systems to climate change.

The lectures will illustrate principles and practices for gathering agro-biodiversity data through either participatory diagnostic and empirical approaches, and for their utilization to develop management approaches that improve resilience and adaptability.

The course will also analyse the economic value of agricultural biodiversity in food systems as an incentive to conservation. The most critical management aspects along the agricultural value chain will be investigated, ranging from production to marketing and consumption.

A set of tools and methodologies for improving market access of neglected and underutilized foods and the role of gastronomic heritage as a driver for rural development will be presented.

The aim of the course is to equip the participants with the necessary tools, knowledge and understanding to enhance productivity and improve marketing strategies in sustainable and resilient agricultural systems.

The training will include joint lectures by speakers from various national and international organizations and two field trips to nearby farms, which will provide hands-on experience on relevant practices.

Organizers: Sapienza University of Rome, Department of Environmental Biology; Bioversity International; Mountain Partnership Secretariat. With the technical support from the Food and Agriculture Organization of the United Nations (FAO).

Scientific Directors:

- **Fabio Attorre –** Department of Environmental Biology, Sapienza University of Rome, Rome, Italy
- **Devra Jarvis –** Agrobiodiversity and Ecosystem Services**,** Bioversity International, Maccarese, Italy

Official course language: English

When: 24 September – 05 October 2018

Fees: 600 Euro

Location: FAO Headquarters, Via delle Terme di Caracalla, Rome

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UNIVERSITÀ DEGLI STUDI DI TORINO
ALMA UNIVERSITAS TAURINENSIS

Summer school

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Sustainable production, fragile ecosystems, resilience to global changes

24 September – 05 October 2018
FAO Headquarters

WEEK 1
FAO, ETHIOPIA ROOM (C285)

Date	Content	Lecturers
DAY 1	**Monday, 24 September**	
08:45 – 09:00	**Welcome and introductions**	All participants
09:00-10:00	**Crop genetic diversity, Domestication and Traditional Varieties**	
	Introduction to traditional varieties The origins of Agriculture and Crops Centres of Crop diversity and Centres of Origin Nature, Biodiversity and Genetic Resources	D Jarvis / T Hodgkin (Bioversity)
10:00-11:15	**Measuring Diversity in Crops**	
	The Nature of Diversity Crops, Varieties, and Populations Population Genetic Structure	T Hodgkin D Jarvis (Bioversity)
11:00-11:15	**Coffee break**	
11:15 – 13:00	Evolution in Crop Varieties and Populations Reproductive Biology Crops and Crop Varieties in Production Systems Gathering data using participatory approaches	
13:00-14:00	**LUNCH BREAK and Diversity Survey in local market**	
14:00-15:00	Practicum: Calculating On farm Diversity Indices: Richness, Evenness, Divergence	D Jarvis
15:00-15:15	**Coffee break**	
15:15- 17:00	**Abiotic and Biotic Components of Agricultural Ecosystems**	
	Abiotic components of Agroecosystems Biotic Components of Agricultural Ecosystems Farmer Characterization and Classification of Abiotic and Biotic Components Reducing the Dimensionality of Complex Data Sets	M Reverberi/ V Scala/ F Attorre/ (Sapienza)
	Ecosystem Diversity and Function	D Jarvis (Bioversity)
17:00 - 18:00	**Presentations of participants**	

DAY 2	Tuesday, 25 September	
09:00 - 10:00	**Measuring Diversity in Crops** Exploring the Extent and Distribution of Diversity (agronomic, biochemical, molecular) Gathering data using participatory approaches Designing and Investigation	P Colangelo/ D Jarvis
10:00 – 11:30	**Diversity in, and Adaptation to, Adverse Environments On-farm** Evolution of Crop Varieties in Stress Prone Environments Abiotic Stress and Crop Genetic Diversity Biotic Stress and Crop Genetic Diversity Farmer Management of Crop Genetic Diversity to Cope with Environmental Stress Identifying Where Diversity is Used to Cope with Environmental Stress Genetic Diversity, Damage, and Genetic Vulnerability	D Jarvis / P Colangelo/ D Jarvis (Bioversity)
11:30-11:45	**Coffee break**	
11:45 – 13:00	**Who Are the Managers of Diversity? Characterizing the Social, Cultural, and Economic Environments** Farmers' Roles and the Management of Crop Diversity Social Relationships and the Distribution of Diversity Social Capital, Collective Action and Property Rights Tool and Methods for Documenting and Relating Farmer Characteristics to Crop Genetic diversity	R. Nanyka (Bioversity)
13:00-14:00	**LUNCH BREAK**	
14:00 – 15:00	**Practicum – Who are the Managers of Diversity?**	D Gauchan
15:00 - 15:15	**Coffee break**	
15:15-17:00	**Measuring the Values of On-Farm Diversity** Public and Private Values of Diversity Varietal Choice and Diversity Maintenance Econometric Models and Value Chain Actors Measuring Non-Market Values of Diversity	
17:00 - 18:00	**Presentations of participants**	

DAY 3	Wednesday, 26 September	
09:00 - 11:00	**Policy and Genetic Diversity On-Farm** The Development and Evolution of National Programs on Plant Genetic Resources The Origins of an International Commitments to Plant Genetic Resources Conservation Policy Debates on Conservation- ABS	I.L. Noreiga (Bioversity)
11:00-11:15	**Coffee break**	
	The Use of Genetic Resources for Plant Breeding Policies and Legal Frameworks that Have a Negative Impact on Farmers' Capacities to Use Diversity On-Farm	

	Policy Processes: Overview on Concepts and Methods	
	Developing Policies that Support Farmers' Role as Generators, Managers, and Conservers of Crop Diversity	
13:00 - 14:00	**LUNCH BREAK**	
14:00-15:30	**Genetic Diversity and Selection Pressures at Different Social, Spatial, and Temporal Scales**	D Jarvis/ P Colangelo (Bioversity)
	The Crop Cycle	
	Use of Harvested Materials and Diversity of Traditional Varieties	
	Selection During Crop Production and Seed Management	
	Patterns of Seed Supply: The "Seed Systems"	
	Social, Spatial and Temporal Dimensions of Traditional Varieties	
15:30 - 15:45	**Coffee break**	
15:45 - 16:30	**Strategies for Collaboration and Intervention**	P De Santis (Bioversity)
	Institutional and Partner Diversity	
	Building Trust and Equitable Collaboration	
	Actions that Incorporate Genetic, Ecological, Social and Economic Concerns in Support of On-farm Management of Crop Genetic Diversity	
	Farmers Benefit from the Use and Conservation of Materials	
16:30-17:00	**Traditional Varieties and Agricultural Productivity**	D Jarvis/ R Nankya/ D Gauchan (Bioversity)
	Socioeconomic, Policy, Environmental, Biological and Genetic Dimensions	
	The Future Value of Traditional Varieties	
	Approaches to Maintenance of Traditional Varieties	
17:00 - 18:00	**Presentations of participants**	
DAY 4	**Thursday, 27 September**	
09:00 - 11:00	**Climate Change and Agriculture**	
	Opening	
	Climate Change, its Impacts on Agriculture, Need and Options for Climate Change Adaptation and Mitigation (CCAM)	J Skoet (FAO ESA)
	Tools and Methods for Evidence-based Decision Making I (overview)	J Schnetzer (FAO CBC)
	Modelling the shifting patterns of agricultural production in response to climate change	F Attorre (Sapienza)
11:00 - 11:15	**Coffee break**	
	Challenges and Options for Implementation of CCAM at the National Scale – A Policy Maker's Perspective	A Ignaciuk (FAO ESA)
	Challenges and Options for Implementation of CCAM at the Field Scale – A Farmer's Perspective	S Ramasamy (FAO CBC)
	Discussion	All presenters (if available)
13:00 - 14:00	**LUNCH BREAK**	
14:00 - 17:00	**Climate-Smart Agriculture (CSA)**	

	The CSA Approach	F Matteoli (FAO CBC)
	Practices and production systems for CSA	J Schnetzer (FAO CBC)
	Presenting a map of tools for extension services across CSA	S Sala (FAO DPS)
15:30 - 15:45	**Coffee break**	
	Tools and Methods for Evidence-based Decision Making II (demonstration) - Modelling System for Agricultural Impacts of Climate Change (MOSAICC) - Ex-Ante Carbon Assessment Tool (EXACT)	R Vuolo (FAO CBC) L-S Schiettecatte (FAO ESA)
DAY 5	**Friday, 28 September**	
09:00 - 13:00	**Agroecology** The principles of Agroecology Agroecology as a Science, Practice, and Social Movement	A Bicksler (FAO AGPM)
11:00 - 11:15	**Coffee break**	
11:15 - 13:00	Agroecology for Resilience and Climate Change Adaptation	
13:00 - 14:00	**LUNCH BREAK**	
14:00 – 17:00	**Agriculture and the Sustainable Development Goals // Hands-on Exercises**	
	Transforming Sustainable Food and Agriculture to achieve SDGs	K. Ghosh, (FAO DPSP)
15:00 - 15:15	**Coffee break**	
	Hands-on exercise: Agriculture sector vulnerability and adaptation assessment, planning and implementation	J Schnetzer (FAO CBC)
DAY 6	**Saturday, 29 September**	
10:00 - 17:00	**FIELD TRIP to Vallepietra Village** Visit to the Slow Food presidium of Vallepietra, where a small consortium of farmers is starting to revive a traditional legume from the Simbrivio Valley, the "Ciavattone" bean.	

WEEK 2
FAO, AUSTRIA ROOM (C237)

Date	Content	Lecturers
DAY 7	**Monday, 1 October**	
09:00 - 10:30	**Mountain partnership: mountain products' value chains** The Mountain Products initiative	G Grussu (FAO MP)
10:30 – 10:45	**Coffee break**	
10:45- 13:00	Farming in environments under pressure	N Giuggioli (Università di Torino)
13:00-14:00	**LUNCH BREAK**	
14:00 – 15:30	**Slow Food** Agrobiodiversity as driver for rural development and the preservation of healthy ecosystems Externalities, ecosystem services and common goods	F Mattei (Slowfood)
15:30 - 15:45	**Coffee break**	
15:45 – 17:00	Promoting market access and generating sustainable demand paradigms Education and awareness raising	
17:00 - 17:30	**Open discussion**	
DAY 8	**Tuesday, 2 October**	
09:00 - 13:00	**Slow Food** Slow Food Methodologies and Tools (From the Ark of Taste to Slow Villages) Slow Food Travel - an innovative model	F Mattei (Slowfood)
11:00 – 11:15	**Coffee break**	
11:15 - 13:00	Examples from the field - from theory to impact Education and awareness raising	
13:00-14:00	**LUNCH BREAK**	
14:00 – 15:30	**NaturaSi** Organic products in Italy and in the world: growing market, more responsible consumers Effective and equitable farming techniques and distribution processes with low environmental impact Economic and social wellbeing of producers and their communities	F Brescacin/ C Murer (NaturaSi)
15:30 - 15:45	**Coffee break**	
15:45 - 17:00	How to build long lasting relationships of trust between producers, retailers and consumers	
17:00 - 17:30	**Open discussion** Marketing and distribution strategies for small mountain producers Organic farming: new approaches and research	

DAY 9	**Wednesday, 3 October**	
8:00 - 19:00	**FIELD TRIP** Visit to Fattoria di Vaira, the largest organic farm of Molise and lead research centre of NaturaSi During the travel the participants will present their action plan for the future	P Santi (NaturaSi)
DAY 10	**Thursday, 4 October**	
09:00 - 13:00	**IFOAM** Fundamental principles and definitions: Organic Agriculture Organic Agriculture and its relation and contribution to other Sustainable Agriculture initiatives	K Hauptfleisch (IFOAM)
11:00 - 11:15	**Coffee break**	
11:15- 13:00	Organic 3.0: Towards truly sustainable food and farming systems The Organic Movement and its Support Systems - Organic and SDGs	
13:00-14:00	**LUNCH BREAK**	
14:00 – 15:30	**PGS (IFOAM)** An overview/summary of current organic guarantee systems Locally appropriate and smallholder-friendly alternatives - and overview	K Hauptfleisch (IFOAM)
15:30 - 15:45	**Coffee break**	
15:45 – 17:00	Participatory Guarantee Systems - principles and practice	
17:00 - 17:30	**Open discussion**	
DAY 11	**Friday, 5 October**	
09:00 - 13:00	**GIAHS** Introduction to GIAHS concept, approach, difference with other recognition schemes, alignment with international initiatives and concepts	Y Endo (GIHAS)
11:00 - 11:15	**Coffee break**	
	Presentation of concrete success cases in countries where the GIAHS approach was implemented and its concrete impacts Presentation by experts on the impact of this approach on the climatic resilience of the agrosystems, with specific examples	D Bazile R Moussadek M Xu
13:00-14:00	**LUNCH BREAK**	
14:00 - 15:30	**Closing remarks**	