Changes in Biological and Cultural Diversity over Time

In **regions** across the world dramatic and rapid changes occur:
- new species domesticated, introduced, and used
- Cultural practices change rapidly to incorporate new practices and demographic changes, migrations
- Agrarian communities innovate, adopt, and endogenise new biological and cultural practices a brief historical period

**Globally**, cultures are threatened by:
- loss of local languages and traditional knowledge,
- demographic changes, poverty, and marginalisation
- loss of access to traditional resources, territories, and landscapes
- Biodiversity in food systems, agricultural systems, and landscapes is diminishing, (land use conversion, intensification, and homogenisation)
Human potential to maintain and innovate through bio-cultural diversity

- Occurs in places where communities have resided and managed resources for livelihood security for generations

- Where mosaic landscapes result from application of the unique cosmovision of the community to the land and its products

- Where communities access and use wild and cultivated biodiversity to maintain their systems and increase flow between the cultivated and the wild.

- Where food cultures and local food systems provide the potential for food sovereignty

- Where local institutions and knowledge systems exist to embed, govern, and transmit the value and potential of their agricultural biodiversity and biocultural landscapes to young people and allies in conservation and development.
Social Ecological Systems and Bio-cultural Landscapes most apt for Crop Domestication and Evolution.

- Association with protected areas/ecotones
- Traditional ecological and biodiversity knowledge embedded and transmitted through cultural values, beliefs, and practices
- Maintenance and distribution of local seeds and germplasm
- Geneflow from wild to cultivated patches-home gardens, swiddens, abandoned or resting fields and orchards (Lorocco, Eggplant, Manioc, Yams, Taros, Pepper, Fruit trees) and back
- Distinctive food cultures, dietary diversity, local notions of health & nutrition
- Local management of mosaic landscapes for resilience and ecosystem services in soils, water, niche differentiation pollinaters, pest and disease management.
Europe and the Caucasus: PAs containing wild relatives of cereals, pulses, fruits, nuts and forestry species, such as wheat, faba bean, pea, plum, almond, pistachio, walnut, oak and poplar.

North America: PAs containing wild relatives of grape.

Central and South America: PAs containing wild relatives of avocado, Brazil nut, custard apple, maize, peanut, pepper, pineapple, potato and tomato.

The African continent, Madagascar and the Mascarene Islands: PAs containing wild relatives of cowpea, millet, olive, rice and sorghum.

The Middle East, West and Central Asia: PAs containing wild relatives of cereals, pulses, fruits, nuts and forestry species, such as wheat, faba bean, pea, plum, almond, pistachio, walnut, oak and poplar.

East and Southeast Asia: PAs containing wild relatives of banana and plantain, citrus fruits, mango and other tropical fruits, rice, tea, yam, and spices, such as cardamom, cinnamon, clove and nutmeg.
Local cosmologies and perceptions of landscapes enable farmers to develop and adapt crops to niches in their ecosystems.
Karen rotational farming system (northern Thailand)
Cultural Adaptation to Difficult Environments Increases Biodiversity: Arab and Berber peoples in desert oases maintain drought resistant plant varieties and plant communities around a key species, the date palm (Phoenix dactylefera)
Farming in the Guantanamo Man and Biosphere

- Cosmology and Rules
- Transmission
- Conservation
- Innovation
Agricultural Biodiversity Conservation and Cuban Man and Biosphere Reserves: **Bridging managed and natural landscapes**

- Restoring diversity and health to Cuban agrarian landscapes and food systems.
- Supporting protected area management and conservation of agricultural biodiversity
Restoring Tropical Agriculture through products from Biosphere Reserves

Food Sovereignty and Healthier Diets
BIOSPHERE RESERVES, Centers of Crop Domestication and Crop Genetic Resources, and Innovation

Elaeis guineensis (var. drura) ; Bixagos MAB Reserve Mangrove Rice (salt and flood tolerant)

Wild peanut, *Arachis spp*  
*MAB reserves Bolivia*

Wild yam, *Dioscorea*,  
*MAB reserve W- Burkina, Niger, Bebin*

Nuts and Fruit trees  
*Juglans, Malus, Pyrus, Morus*,  
*Sary Chelek MAB Reserve Kyrgyzstan*
Indicators for resilience of socio-ecological production landscapes

Dr. Pablo B. Eyzaguirre
Socio-ecological resilience indicators

- Measuring community’s capacity to adapt to change while maintaining biodiversity.
  - Ecosystems protection and the maintenance of biodiversity
  - Agricultural biodiversity
  - Knowledge, learning and innovation
  - Social equity and infrastructure

- Developing strategies for
  - Conserving biodiversity at various scales (from genetic to landscape level)
  - Sustaining evolution and adaptation processes that maintain and generate diversity
  - Empowering local communities and strengthening their role as innovators and custodians of biodiversity
Socio-ecological resilience indicators

Testing sites

- IPSI partners in Cuba, Kenya
- Community Development and Knowledge management for the Satoyama Initiative (COMDEKS).
  - Brazil, Cambodia, Ethiopia, Fiji, Ghana, India, Malawi, Nepal, Slovakia and Turkey
- Further testing
  - Several IPSI partners expressed interest in testing the indicators
    - The Potato Park in Peru
    - Co-management and sustainable herding in Mongolia
Indicators to measure the resilience of social-ecological systems

Retention and acquisition of indigenous knowledge

Complexity and intensity of interactions with the ecosystem

Conservation of resources

Multiple uses of land and plants

Food sovereignty and self-sufficiency

Cultural values

Use of indigenous and local languages

Demographics

Customary laws, social institutions and autonomy

High resilience

Low resilience