



Biocultural Innovations for Climate Resilient Food Systems: Results of the SIFOR project

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Side event on “Future cities for climate change targets, Agroecology and local Biocultural Assessments” organised by COBASE, Gherush92 and ANDES

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SIFOR - Smallholder Innovation for Resilience (2012-2017)

- Aims to strengthen Indigenous Knowledge-based innovation systems for food security in the face of climate change.
- Participatory Action Research in 64 indigenous communities:
 - **Peru – Potato Park (Quechua):** Alejandro Argumedo (ANDES) (high Andes)
 - **China – Guangxi & Yunnan (Naxi):** Yiching Song (CCAP) (karst mountains)
 - **India - Central & Eastern Himalayas (Lepcha):** Ajay Rastogi (LCM)
 - **Kenya - Coast (Mijikenda):** Chemuku Wekesa (KEFRI, Kenya) (semi-arid & dryland)

Clear evidence that Climate change is already adversely affecting SHF / I.P.s esp. in Mountains, Drylands & Arctic – eg:

SIFOR: surveyed <900 HHs:

- Reduced/erratic **Rainfall** – 83% HHs
- Increased **Drought** -75% HHs
- Increased **Temperature** – 73% HHs
- Increased **Pest & Diseases** – 70% HHs
- More **extreme events**. More *variable/unpredictable* weather.

INMIP: 21 mountain communities in 10 countries: **As above** + severe drought/famine PNG; severe typhoons (Phil & Thai); mudflows (Tajik).

Paris Agt. Targets to limit temp are already reached:

- High mountains: temp. rising faster, eg. 1.5 degrees inc. Himalayas
- Artic: 2-4 degrees increase >> severe impacts.

How to Respond? Two Options:

Science/Conventional Ag – Productivist logic	TK & Agroecology – Resilience logic
Monocultures & costly chemical inputs - degrade soil, water; loss of biodiversity	Diversification - conserve/recycle NRs, enhances biodiversity
Maximise yields in short term – but less productive over time & in drought years	Maximise yields over time by reducing risk of crop failure
Contributes to loss of TK for adaptation	Enhances TK for adaptation
IPRs undermine seed security & rights	Strengthen local seed systems/ rights
Low nutritional content	High nutritional content
High GHG emissions (19-29% of GHG)	Organic inputs & mitigation co-benefit
<i>Most 'CSA' is this model, with less chemical inputs</i>	<i>This is more resilient in marginal areas & in long term</i>

Paris Agreement does not mention agriculture explicitly, but:

- Recognises that **adaptation** should aim to protect “**people, livelihoods and ecosystems**” (7.2)
- **Adaptation action** “should be based on the best available science and, as appropriate, **traditional knowledge, knowledge of indigenous peoples** and local knowledge systems” (7.5)
- **Preamble**: Respect Human Rights & Rights of Indigenous Peoples

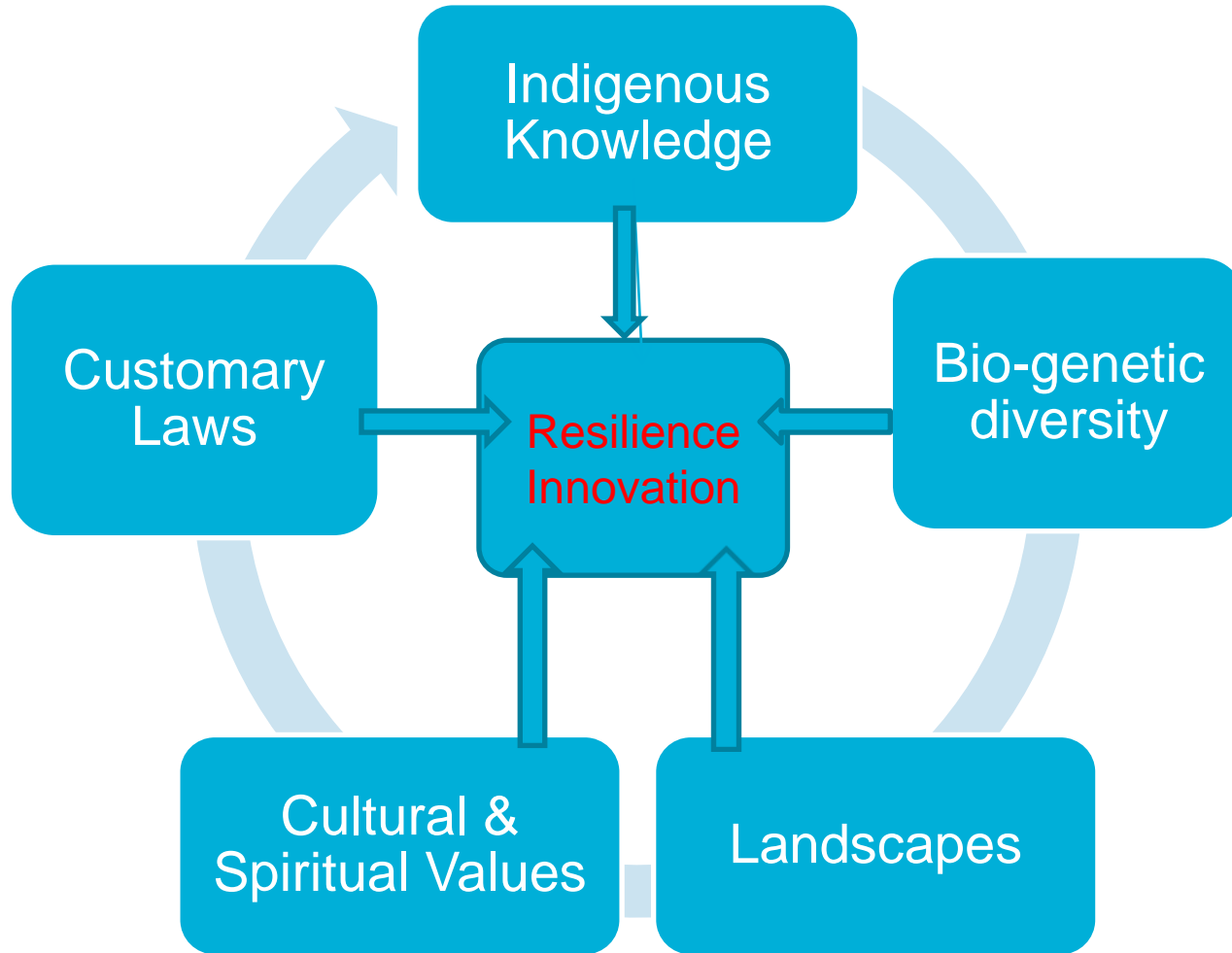
IPCC: Recognises **importance of Indigenous Knowledge and Worldviews** for effective adaptation (AR5)

NDCs: Many include EbA vision - but **very few mention Indigenous Knowledge/People** (except Peru & India)

SIFOR: Biocultural Heritage-based Innovations - Overview

- Identified **more than 600 biocultural innovations** for enhancing resilience to climate change – evidence that TK & agroecology are **effective** alternatives to increase productivity & income.
- *Technological, Institutional and Market* innovations
- **Technological Innovations:** diversification (traditional crops/varieties); revitalising traditional practices (inter-cropping & IPM); new crop varieties; new cropping systems; improved tools; bio-pesticides; S & W conservation.

Focus on “Biocultural Heritage-based Innovations” because IK is part of BCH





Potato Park, Peru: Indigenous Biocultural Heritage Territory (6 Quechua comms & ANDES): Impacts between 2002 & 2012 (Baseline study)

- *Diversification*: Doubled potato diversity (to 1400 types or c.650 varieties) – CIP repatriation, in-situ evolving gene bank.
- Nearly **doubled HH incomes** (micro-enterprises, eco-tourism)
- Slightly **increased potato yields** despite *serious* CC impacts - soil pests. Lower planting line for potatoes shifted up by 200m in 30 yrs.
- Built strong **collective** institutions & adaptive capacity



Guangxi, SW China, since 2002 (with CCAP): responding to drought in Karst mountains

- **Participatory Plant Breeding:** maize yields increased by 15-30% & increased resilience to drought and pests. PPB in Africa drylands increased yields by 50%. Also leads to changes in national seed policy.
- **Community Supported Agriculture:** Supply to ecological restaurants in urban areas >> HH incomes increased 3-4 fold; revitalised agroecological practices & heritage varieties; reversed out-migration.
- Built **strong local institutions** – farmers' organisations & women's groups



Biocultural Innovations in Kenya

- Planting pruned cassava tops: productivity increased 4-5 times & maturation time reduced by 6 months.
- Planting coconuts to avoid termites.
- Soil fertility: turning & manure > High product.
- Domestication of wild fruit & medicinal trees for increased income & planting trees on farm.
- Effective treatments for livestock disease.
- Cultural Village: Protect Kaya forest through eco-tourism, revitalise traditional crops & culture.

Biocultural Innovations in India

- Farmer developed **high yielding variety** of radish - crossed modern & traditional variety; higher yielding rice bean; drought tolerant cardamom.
- More intensive mixed cropping improved soil moisture & provides food throughout year
- New composting techniques > higher yields & **v. efficient water use**
- Switch to finger millet > inc. resilience to drought, nutrition and income.
- **Far improved yield** of onions, cauliflower and gadheri by changing sowing times, planting depth and weeding practices.
- Women **planting fodder trees** on farm
- Crop protection committee to reduce raiding

Conclusions

- Urgent investment is needed in solutions that strengthen Indigenous Knowledge, crop diversity and biocultural heritage for adaptation – before it all disappears.
- “If we loose IK, we will have to invest millions of dollars to re-invent solutions for adaptation”

Side-events at COP 22: 15th Nov, 14.30-16.30, Indigenous Pavilion.

www.bioculturalheritage.org
Thank-you!

