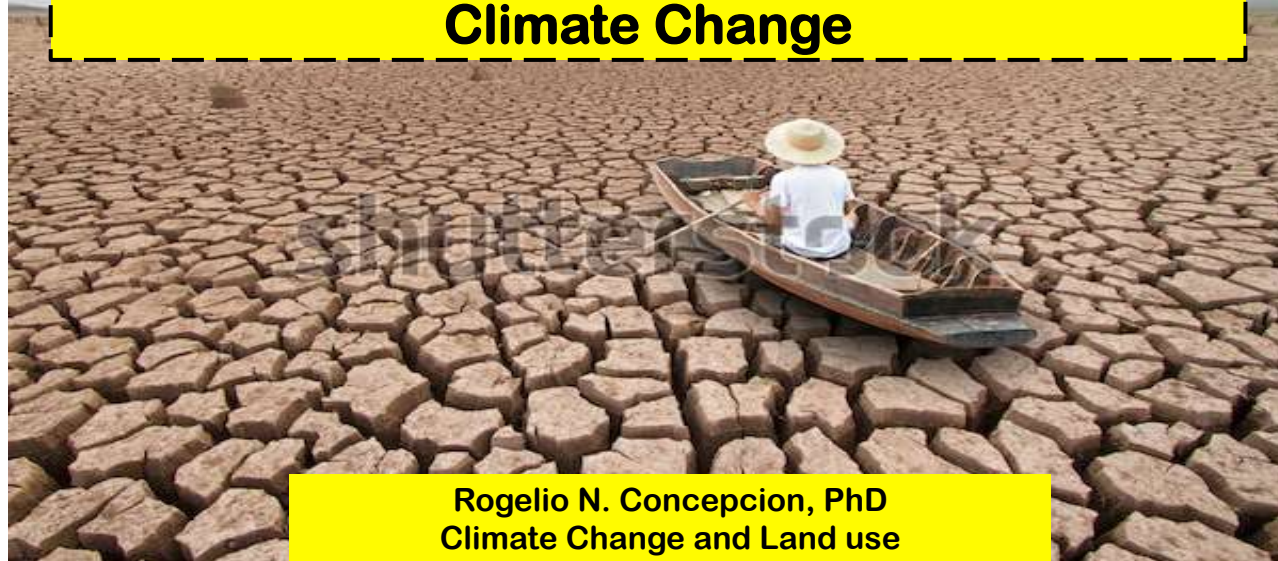
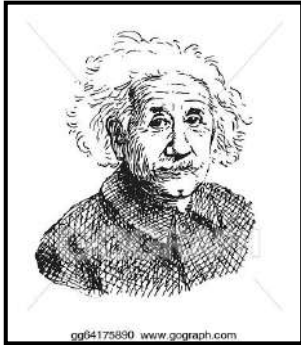


Challenges to Philippine Agriculture from Climate Change

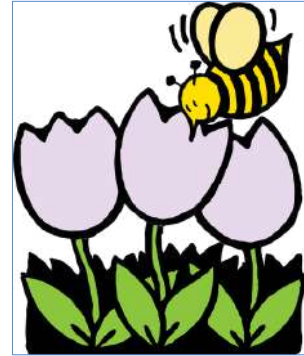


Rogelio N. Concepcion, PhD
Climate Change and Land use

BACKGROUND



**Climate change:
It's bad for bees
(Leah Duran)**



If the bee disappears from the surface of the earth, man would have no more than four years to live

**Climate Change, Build-Build-Build, Population NEXUS
Climate Change is notSTAND ALONE CONCERN ----**



Best mix of science and traditional knowledge to manage common and shared resource

Build-Build-Build



**The New Normal Game Changers
For the Same Hazards, More DRR-CCA**

IMPACTS

IMPACTS OF CLIMATE CHANGE



**TOO
LITTLE????
Drought,
Too Hot**





**TOO MUCH
Too Wet
Super-typhoons Tropical
Depressions
Thunderstorms**



**UNCERTAINTY
in Rainfall
patterns and
ANXIETY among
vulnerable
communities**

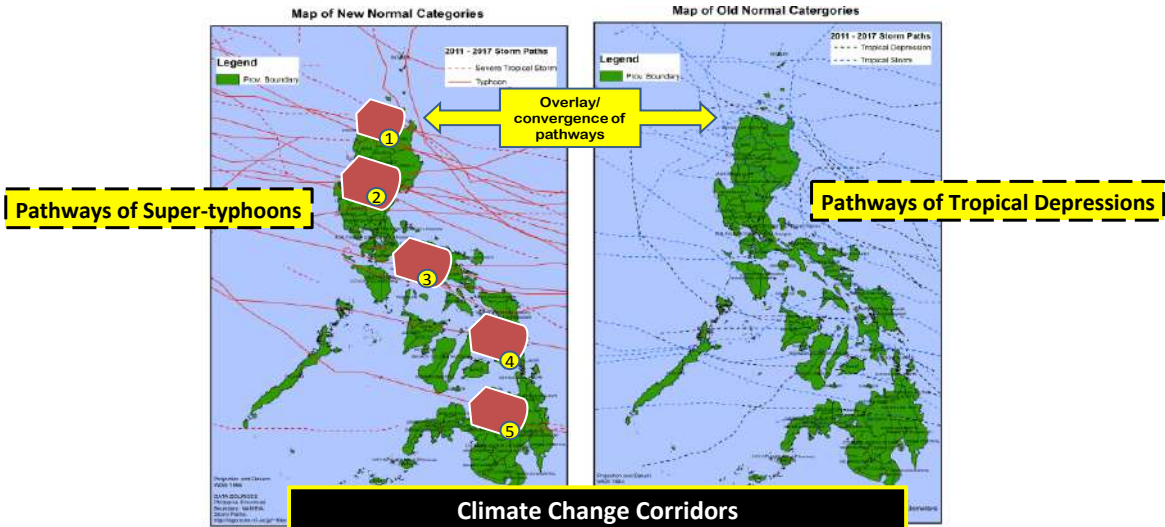
CONSTRAINTS






**New Normal of Climate Change:
Extreme climate events... The New Norm**




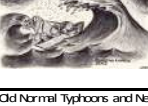

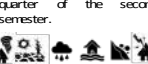
**THE CLIMATE CHANGE CORRIDORS
Integration of Climate Change Adaptation (CCA)
and Disaster Risk Reduction (DRR).**

EVIDENCE – BASED CLIMATE CHANGE CORRIDOR

Convergence and overlap of pathways of all typhoons




Climate Change Corridor 2 Central Luzon		
a. Benguet, Ifugao b. Pangasinan, La Union c. Isabela, Quirino, Nueva Viscaya d. Zambales, Nueva Ecija, Pampanga, Bulacan, Tarlac, Bataan, Aurora-Dingalan-Baler		
Regional Achievements: Niche Products and Practices	Climate Change Conditions	Implications to the Development
 Irrigated Lowland Agriculture	Increasing temperatures & Rainfall Variability 	<ul style="list-style-type: none"> ❑ Soil health reduction: soil fertility decline and massive release of soil Carbon as GHG ❑ Change in land suitability and shift in arrangement of key production areas of agriculture ❑ Change in plant varieties and technology requirement ❑ Reduction in yield and quality of produce (micro-nutrient deficient rice grain) ❑ Impacts on pollinators: pollination and production ❑ Increase in invasive weeds, pests and diseases
 B3 Program	Shift in patterns, trends, and intensity of New and Old Normal Typhoons toward 3rd and 4th quarters of year	<ul style="list-style-type: none"> ❑ Intensified, accelerated land degradation ❑ Bigger floods and landslides ❑ Dams release excess rainwater earlier than expected by local people causing massive flooding and erosion, damage to new and old infrastructure, farmlands and settlements, loss of lives
 Highland Agriculture	Potential increase of drought situation in the first semester of every year 	<ul style="list-style-type: none"> ❑ Water use allocation and prioritization to resolve conflict in water utilization between irrigation for rice production and water consumption of urban communities ❑ Heat stress among plants, greater vulnerability to massive attacks of pests ❑ Early senescence ❑ Loss of pollinators ❑ Disruption of pollination and flower and fruit abortion ❑ Increase in soil moisture and water requirement ❑ Reduced soil health: Rapid organic matter decomposition, loss of soil carbon

Climate Change Corridor 5 Caraga Corridor		
a. Southern Palawan b. Zamboanga del Norte, Zamboanga del Sur, Zamboanga Oriental, Zamboanga Sibugay c. Bukidnon, Misamis Oriental, Surigao Norte, Camiguin, Lanao del Norte, Misamis Occidental, Misamis Oriental d. Davao Oriental, Compostela Valley, Davao del Norte, Davao del Sur, Davao Oriental, Sarangani e. North Cotabato, South Cotabato, Sultan Kudarat, Lanao del Sur, Maguindanao f. Agusan Sur, Surigao Sur, Agusan Norte, Dinagat Islands, Surigao del Norte, Siargao g. Agusan del Sur		
Regional Achievements: Niche Products and Practices	Climate Change Conditions	Implications to the Development
Top Coconut Producer Top Banana Producer 2 nd Mango Producer Woodcraft 	Increasing temperatures & Rainfall Variability 	<ul style="list-style-type: none"> ❖ Loss of disposable income and unable to diversify their crops (poor access to superior seeds and planting materials). ❖ Yield reduction and increased cost of soil fertility management of irrigated and rainfed rice. ❖ Widespread flooding in the plain areas and soil erosion, land and habitat degradation and soil fertility depletion.
 <p>Highland corn</p>	Mindanao Island, formerly known as typhoon-free is now getting their share of storms and super typhoons 	<ul style="list-style-type: none"> ❖ Landslides which hinder the transport of produce from the farms. ❖ Access to market and agricultural supplies and immobilization and loss of livelihood of the most vulnerable people. ❖ Damage to farm to market roads. ❖ None or no access to insurance and other forms of safety nets. ❖ Out migration of able-bodied family members. ❖ Potential problem of massive attacks of locust and other mass-attacking insects. ❖ Aquaculture ponds and facilities in mangrove forests are vulnerable. ❖ Aquaculture operations are affected by extreme events. ❖ Integrated fisheries landing facilities are vulnerable. ❖ Fishing days are reduced.
 <p>FISHERIES</p>	Old Normal Typhoons and New Normal occurred in 1 st Quarter and in the last Quarter of the year but in the following years, Old Normal Storms and New Normal Super Typhoons were more concentrated in the 4 th quarter of the second semester. 	<ul style="list-style-type: none"> ❖ River diversion dams will have severe water losses. ❖ Salinity intrusion in coastal farm areas. ❖ Danger of damage to crops from overflow of dams. ❖ Severe water shortage. ❖ Unwise use of water used for sanitation and drinking water (fresh high grade water are also used in farming and irrigation). ❖ General lack of effective technologies to combat climate change. ❖ Socio-cultural issues on technology use and application.


Ineffective Traditional Knowledge application for climate uncertainties and changing environment




3. Documentation of successful mainstreaming efforts remains inadequate and communication ineffective.



There is no one-size-fits-all approach to mainstreaming.



4. The journey from a plan on paper to action on the ground can be slow ---

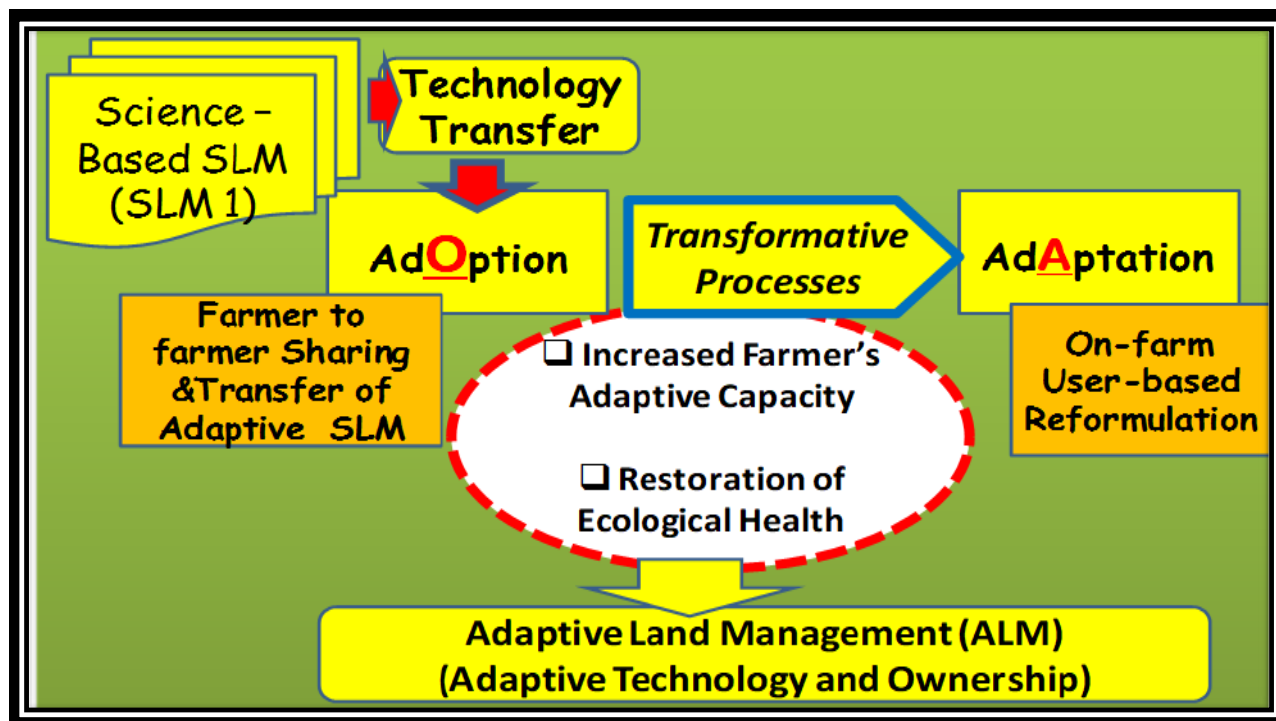
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5. Multiplicity of stakeholders with different mandates and priorities

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SOLUTIONS

**Community vs Individual
Adaptation of Science-Base
Technologies**

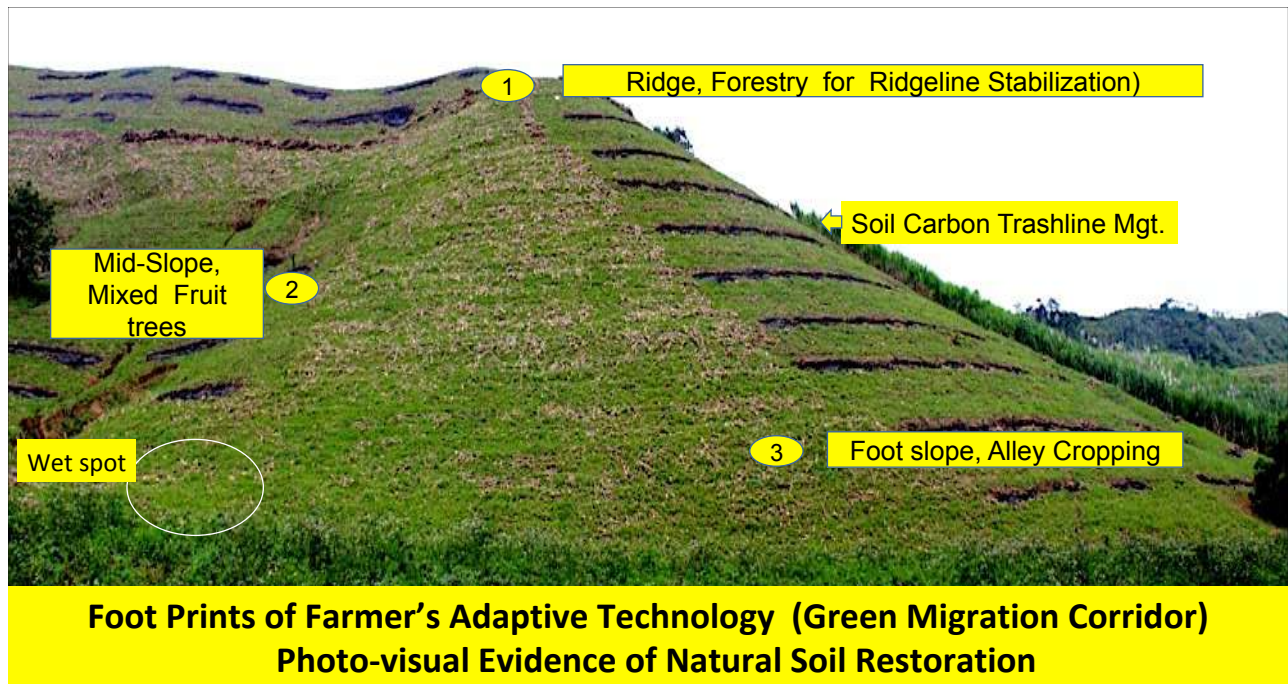


EVIDENCE-BASED SOIL HEALTH RESTORATION

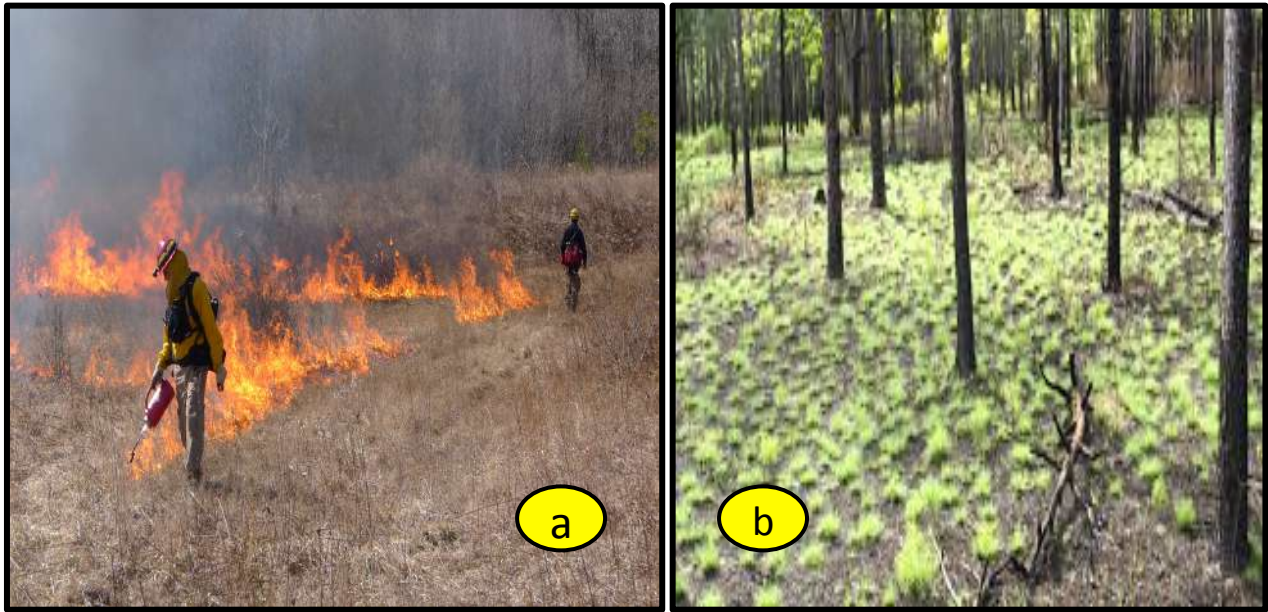
Responsible Transformative Development

PHASE 1: Responsible Farming to Nurture Soil and Nature's health and in return -----

PHASE 2: Healthy soil and nature to nurture farm family's health and wealth



Should we discourage the burning of farm waste?



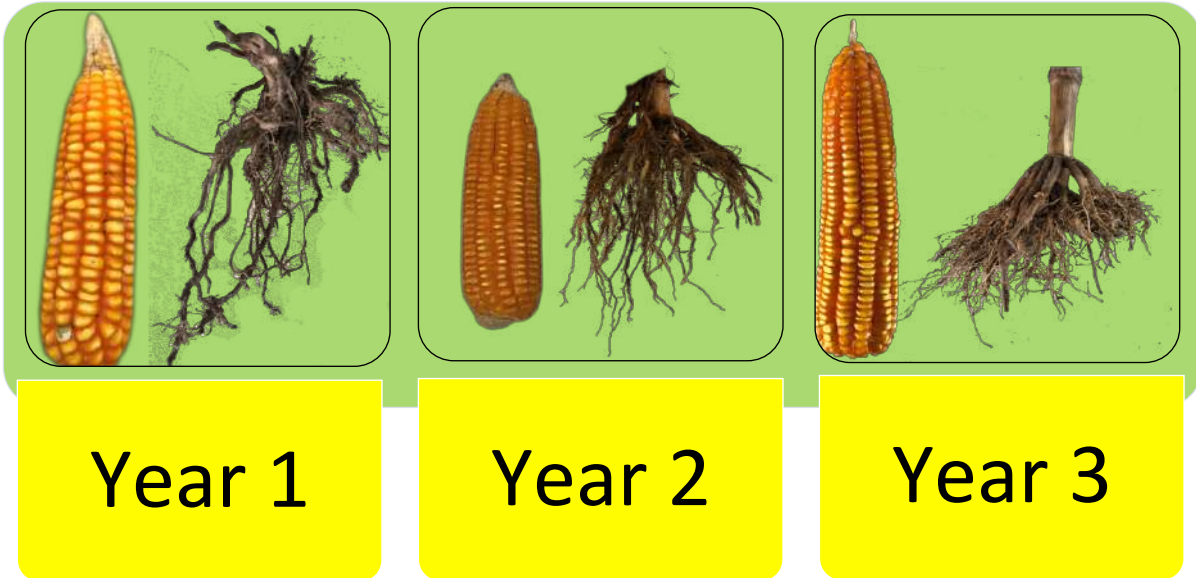
Low-intensity, Controlled Burning (a) and Recovery of Ground Vegetation (b) (Source /Credit: Wikipedia, undated)



- 1. Guma-guma – *Meonorus marriabstrum, burm*
- 2. Elepante – *Heliotropium indicum*
- 3. Gapas-gapas – *Gossypium herbaceum*
- 4. Kanding-kanding – *Waitheria angustifolia*

Farmer’s Adaptive Practices: Bio-indicator of Land Degradation

Corn Yield and Root Development



After three Years of the Project implementation of Soil Health Restoration



Complementation of the forest tree and corn plant for diversified sources of incomes

**The
Nurtured
Roots
after 2
years**



**The
Nurtured
Landscape
after 3
years**



THE New FARMER-Entrepreneur AFTER 3 years of the the project



Food readily available, the new diversified source of income

Shifting Agri-based livelihood to full Agri-based entrepreneur in the near future



Converting Old annex of her house into agro-supplies store: Now with disposable income to start small agri-related business

RECOMMENDATIONS

- Establishment of National Data Base
- Documentation and Mainstreaming of Climate Change Corridor as the Physical Framework for CCA-DRR Integration

