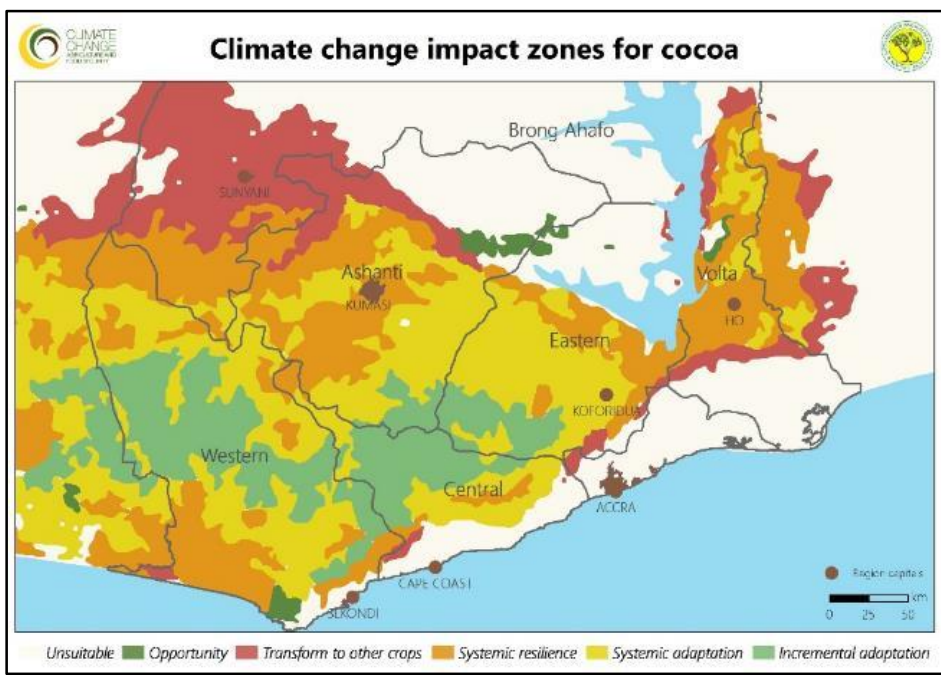


Forward Looking Prioritization of Farmer Innovation for Climate Change Adaptation in Cocoa Production in Ghana

Christian Bunn¹, Martin Noponen², Mustapha Dalaa³, Laurence Jassogne³, Mark Lundy¹
¹ International Center for Tropical Agriculture (CIAT), Cali, Colombia; ² Rainforest Alliance, Landscapes & Livelihoods Programme, United Kingdom; ³ International Institute of Tropical Agriculture (IITA), Uganda

Introduction



Several regional studies demonstrated drastic impacts of climate change on cocoa production in Ghana

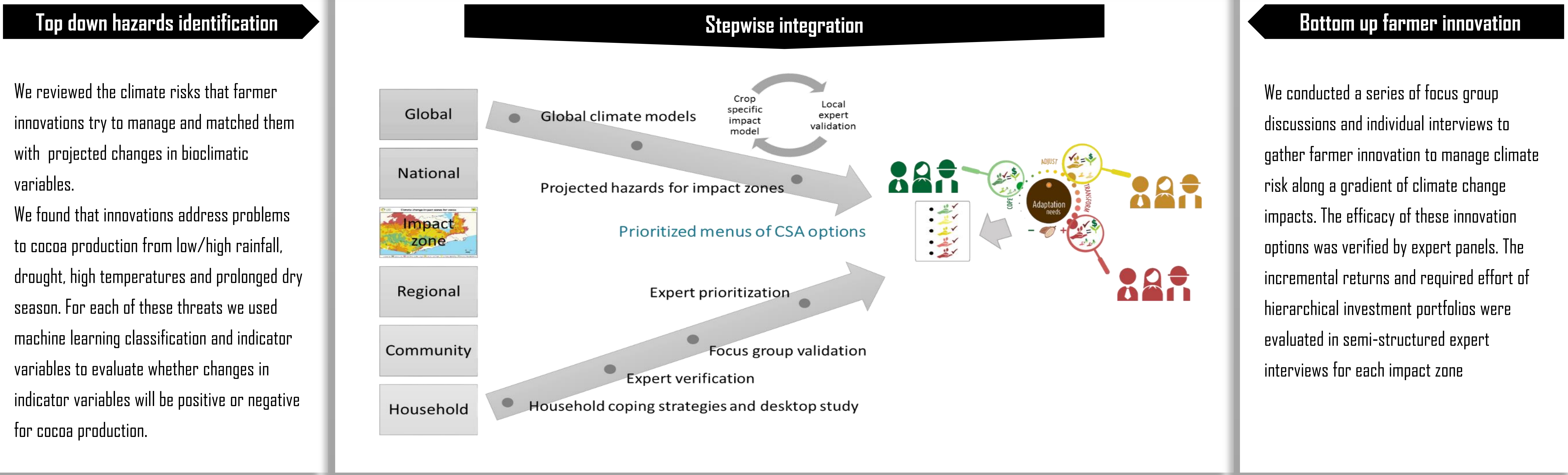
Climate change impacts differ spatially by the degree of impact relative to the coping range of the production system, and by the nature of the hazards. An obvious approach to climate smart cocoa development would be to promote the scaling of adequate farmer coping strategies within suitable decision domains.

Farming households possess vast knowledge about coping strategies to manage climate risk



We demonstrate an approach to develop prioritized menus of climate smart options for cocoa production in Ghana

Prioritization framework



Results

Gradient of climate change impacts

GCM projection	Drought				High temperatures			
	Unsuitable	Reduced	Unchanged	Improved	Unsuitable	Reduced	Unchanged	Improved
Transform	100	100	0	0	100	100	0	0
Resilience	100	100	0	0	100	100	0	0
Change	95	100	0	0	100	100	0	0
Incremental	89	100	0	0	100	100	0	0
Opportunity	100	100	0	0	100	100	0	0

GCM projection	Prolonged dry season				Total precipitation			
	Unsuitable	Reduced	Unchanged	Improved	Unsuitable	Reduced	Unchanged	Improved
Transform	95	79	0	21	79	42	0	58
Resilience	26	47	5	47	11	42	11	47
Change	0	37	11	53	0	47	5	47
Incremental	0	5	37	58	0	63	37	0
Opportunity	16	21	74	5	5	26	5	68

Proposed CSA practices by impact zone

Intervention	Coping zone	Adjustment	Transformation
Plant	Improved Planting material and propagation	Improved Planting material and propagation	Improved Planting material and propagation
	Spacing	Spacing	Spacing
	Pruning	Pruning	Pruning
Plot	Diverse shade	Diverse shade	Diverse shade
	Flood tolerant shade species	Buffer strips	High shade level
Diversification	Mushroom cultivation, snails production, optimize shade	Food crop diversification	Intercropping with Cola nut/African plum/cashew/timber
Soil	Mulch	Biochar	Soil organic carbon enhancement
Pest and Disease	Cover crops	Irrigation	Irrigation
	Manual weeding	Zero burn and tillage	Zero burn and tillage
	Integrated pest management	Integrated pest management	Integrated pest management
Household	Phytosanitary measures	Phytosanitary measures	Phytosanitary measures
	Resistant varieties	Resistant varieties	Resistant varieties
	Join a farmer group. Form credit unions	Provide financial management training and access to financial information to farmer groups	Enhance farmer access to input/credits
Landscape and enabling environment	Provide financial/ credit support to farmers for the acquisition of basic farm assets and technologies (such as radio sets, mobile phones, tricycles, and solar systems for lighting and home appliances) which when these are needed for facilitation the adoption of CSA among farmers	Watershed protection	Riparian buffers
	Farmer field school approach and mass media campaigns should be adopted to raise awareness about the threat of climate change and preventive measures against forest fires, and to educate farmers against slash and burn, deforestation.	Forest and wildlife protection	Farmer groups for re-forestation
	Cocoa roads, bridges and other construction activities should be planned away from riparian areas, wetlands and aquifers.	Protection of off-reserve forests	The Forestry Commission, the Minerals Commission, the Water Resources Commission and other relevant agencies should be well resourced to enable them to live to their mandate.

Expert interviews to categorize CSA practices into baskets of practices resulted in a hierarchy of recommended practice application. A distinction was made to differentiate between cocoa farms in the establishment phase and mature plantations. In the perennial cocoa system several CSA decisions are taken before planting, e.g. variety choice, shade tree choice, planting density etc. During the productive phase of the plantation CSA baskets include best management practices such as weeding, pruning and pest and disease management.

Conclusions

- ☞ We demonstrated how global climate model based climate impact projections may be combined with locally conceived climate smart practices to develop actionable portfolios of CSA practices by using local experts as mediators.
- ☞ Global climate models exhibit great uncertainty about projections of precipitation changes. Such changes are most relevant to cocoa production and farmers demand extremely detailed information. We reconciled these extremes by presenting and evaluating uncertainty with local experts.
- ☞ The developed packages include many widely applied practices but prioritized them according to projected climatic risks.
- ☞ The packages of CSA practices resulting from this work will be scaled by inclusion in training materials for application in the different impact zones.

Literature

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Contact: cbunn@cgiar.org