SHAPING CLIMATE-SMART COFFEE LANDSCAPES TO UNITE FARM-BASED CLIMATE-SMART PRACTICES WITH LANDSCAPE SCALE BENEFIT

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INTRODUCTION

Coffee farming and the livelihoods of millions of smallholder farmers are threatened by climate change; suitable areas are expected to decrease by up to 50% for Arabica and Robusta coffee [1; 2]. Farm-based climate adaptation practices hold great potential to provide valuable secondary benefits for the landscape, but can also lead to landscape trade-offs [2]. Applying an approach of climate-smart landscapes and integrated landscape management (ILM) may be a way to reconcile local with landscape benefits [3; 4].

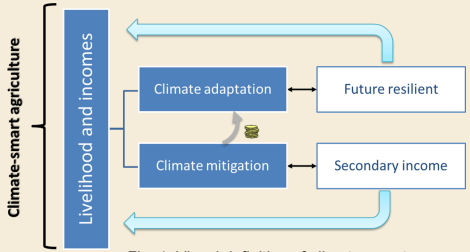

Fig. 1: Visual definition of climate-smart agriculture. Based on [5].

METHODS

We perform an explorative review to identify climate-smart practices suitable for coffee farming and analyse possible positive effects at farm, landscape and global scale. We adapt the approach of climate-smart landscapes and ILM to coffee farming system and propose a framework how climate-smart coffee landscapes can be shaped.

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RESULTS (I): BENEFITS

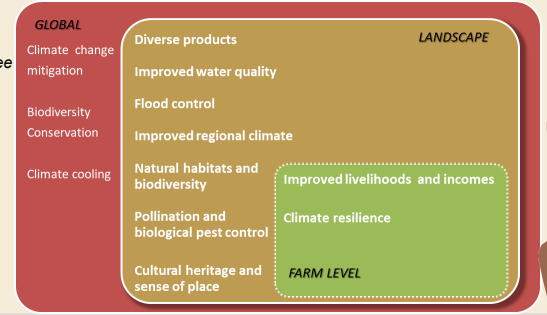
We identify 7 functional groups of climate-smart practices for coffee farming: i) altering soil characteristics (e.g. building up soil organic matter; ii) improved water management; iii) crop and genetic diversity (including secondary crops); iv) nutrient management (e.g. mulching and green manure); v) climate buffer and adjustment (e.g. shade trees); vi) structural elements and natural habitats (on- and off-field); vii) system functioning (e.g. integrated pest management).

Not only does the integration of such practices provide for local ecosystem services, including provisioning and regulating functions, but depending on the spatial configurations in the application of elements, additional landscape benefits can be provided, including flood and pest control, climate regulation, water regulation and filtering, amongst others (see Fig. 2). Additionally, global benefits are provided, including climate change mitigation and biodiversity conservation.

RESULTS (II): IMPLEMENTATION

To enable such benefits at multiple scales, we propose a dual step framework with farm-scale based assessment for climate risk and climate-smartness opportunities, integrated within a landscape wide multi-stakeholder platform that identifies the vital landscape patterns and harmonizes local adaptation action with landscape wide benefits.

Fig. 2: Multiscale benefits offered through adoption of climate-smart practices in coffee farming.



CONCLUSION

In a changing climate and with implementation of new practices always requiring some lead time, climate adaptation in coffee farming has to be started now. Our research illustrates which pathways farmers may draw on to adapt their farming systems and secure livelihoods. Meanwhile, the dual step framework elaborated enables to move from aspiration to action and to seize on synergies also for the landscape and global level. Future steps would include to connect such concepts with further financing options, but above all on-ground action has to be taken.

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