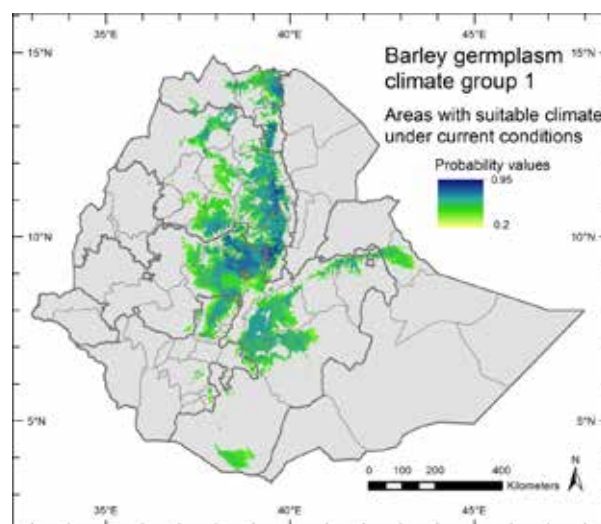


Atlas of crop suitability

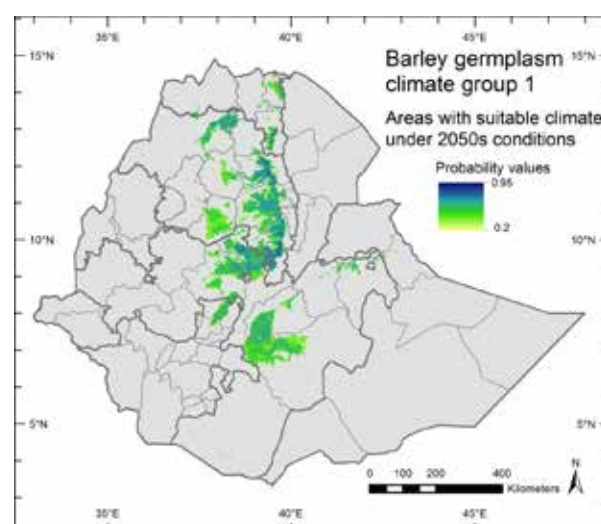
The 'Atlas of crop suitability' is an essential tool to predict the environment under which an accession or a group of accessions can grow based on the climatic characteristics of the locality in which they were collected. The more information is available on any given accession the more the prediction will be accurate. This is just a first step as many factors crucial for crop suitability are not part of the methodology and therefore the selected accessions need to be tested in the field and under different climatic conditions to validate the output of the Atlas.

The major output for this activity is the Crop Atlas. As shown on the maps it is possible to know which group of accessions can be used under which climatic conditions and therefore, when applied to future climate, it is possible to better plan for adapting the agricultural production systems to the changing conditions. First we created clusters of accessions based on climate similarities.

For each cluster we have created the following maps:



Map 1: Modeled distribution under current climate conditions



Map 2: Modeled distribution under 2050s climate conditions

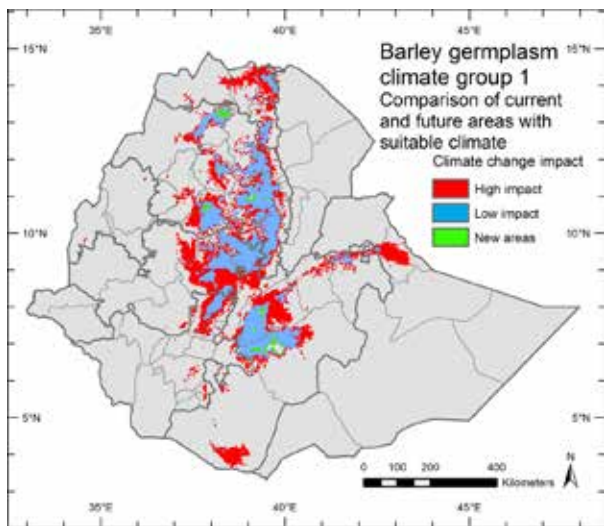
Methodology

First we created clusters of accessions based on climate similarities. For each cluster we have created 6 different maps. This map is the average of the modeled distribution layers developed for each 19 Global Change Models (GCM).

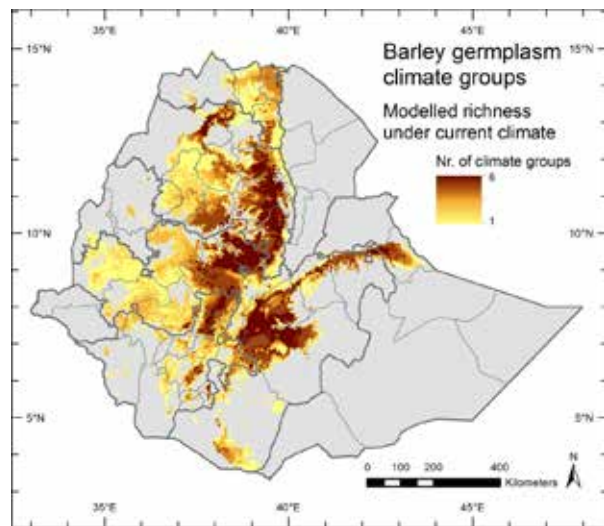
The first map represents the modeled distribution under current climatic conditions. The second map shows a representative of the modeled distribution for climatic conditions in 2050. This map is the average of the modeled distribution layers developed for each 19 Global Change Modes (GCM).

The third map shows the overlay of current and future modeled distribution indicating 1) high impact areas, i.e. areas that are predicted to become unsuitable for that specific climate cluster; 2) low impact areas, i.e. areas that are predicted to remain suitable; and 3) new areas that become suitable. The fourth map represents the consensus of the 19 GCMs on suitable 2050 areas (map 4). This map shows for each pixel in the distribution area, the number of GCM models predicting. The confidence that an area indeed is suitable in 2050s increases when the number of GCM models concordant on 2050s suitability is higher.

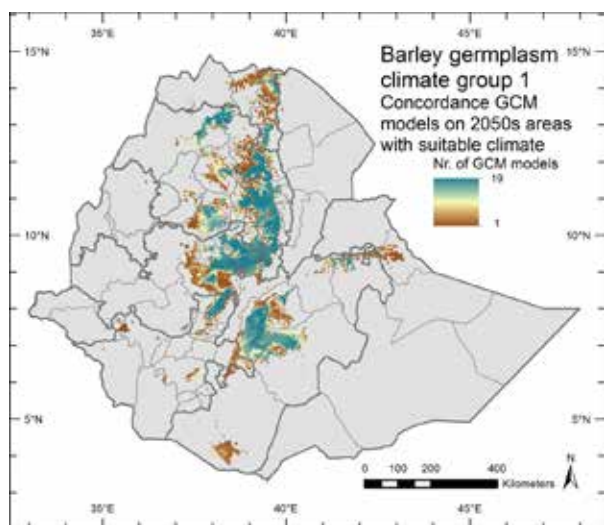




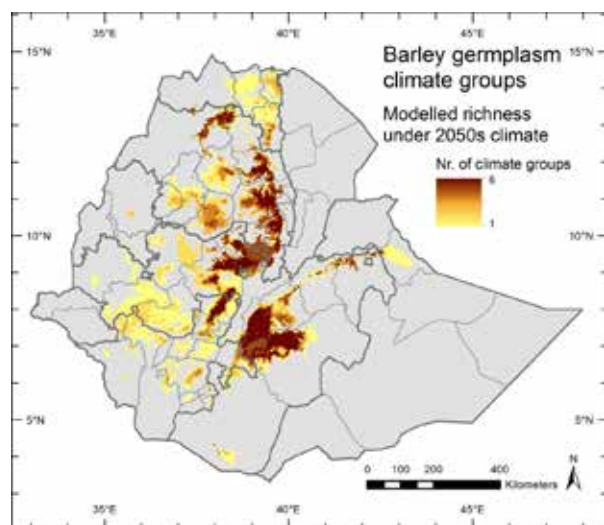
Map 3: Overlay of current and future modeled distribution



Map 5: Overlay of current and future modeled distribution



Map 4: Consensus of the 19 GCMs on suitable 2050 areas



Map 6: Consensus of the 19 GCMs on suitable 2050 areas

A summary of cluster richness is created for all the climate groups combined which can be used under present and future conditions (map 5 and 6). This will inform which types of accessions should be used.

The major output for this activity is the Crop Atlas. As shown on the maps it is possible to know which group of accessions can be used under which climatic conditions and therefore, when applied to future climate, it is possible to better plan for adapting the agricultural production systems to the changing conditions.

Policy recommendations

1. It is important to develop and use GIS based technology to improve the efficiency of adapting to climate change by pre-selecting potentially adapted accessions.
2. It is important to encourage the use of such a tool to provide farmers with better adapted varieties in the context of managing climate risks and to prepare a breeding program based on accessions with adaptive traits for future conditions.



RESEARCH PROGRAM ON
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