

Crop Wild Relatives and Climate Change: Predicting the loss of important genetic resources

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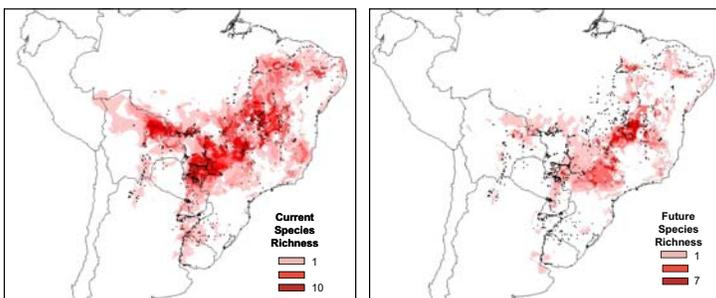
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Crop wild relatives are a vital source of genetic diversity that can be used to adapt crops to climate change. But the survival of crop wild relatives themselves is under threat from the impacts of climate change. Distribution modelling of wild *Arachis* (peanut), *Solanum* (potato), and *Vigna* using the BioClim approach showed that by 2055 :

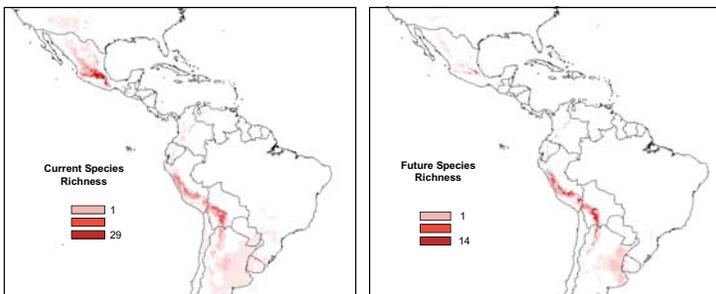
- **Potential range size** : reduced for 97% of species
- **Species threatened with extinction** : 16-22%
- **Habitat patches** : will be highly fragmented putting many species further at risk

There are strong differences in extinction rates between gene pools, reflecting their different habitats and magnitudes of climate change.



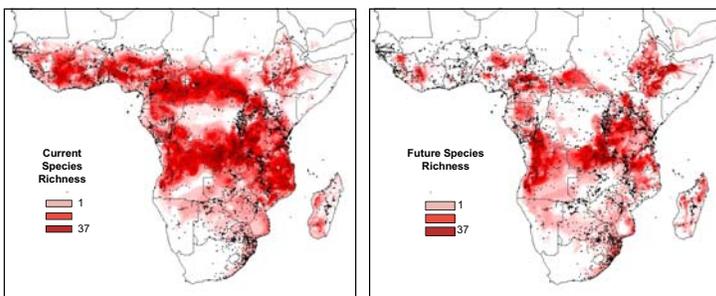
Wild Arachis

24-31 of 51 species extinct; 89% of distribution area lost, 77% of habitat patches lost and average patch size decreased by 80%



Wild Solanum

8-13 of 107 species extinct, 52% of distribution area lost, 42% of habitat patches lost and patch sized reduced by 23%.



Wild Vigna

1-3 of 48 species extinct, 51% of distribution area lost, 7% of habitat patches lost and patch size reduced by 40%.

Methods and data

- BioClim-based species distribution model
- Species with 10+ point locations
- WorldClim climate surfaces
- CCM3 model (1km resolution)
- 19 bioclimatic derivatives



Solanum sp. - PROINPA, Bolivia



Potato stall, Bolivia - Annie Lane, Bioversity International



Vigna platyloba - Stefano Padulosi, Bioversity International



Arachis sp. - Jorge Perez, MIDARyMA, Bolivia

Range metrics for quantifying threat

- Current and future area of distribution
- Area of overlap between current and future distribution
- Fragmentation of current and future distributions

Conservation responses

- Develop climate-change informed conservation strategies for crop wild relatives
- Identify and protect refugia for *in situ* conservation
- Develop habitat restoration and species relocation programmes
- Increase *ex situ* collections for the most threatened species