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# Capitalizing on Biological and Agricultural Sciences for building a sustainable and resilient food system



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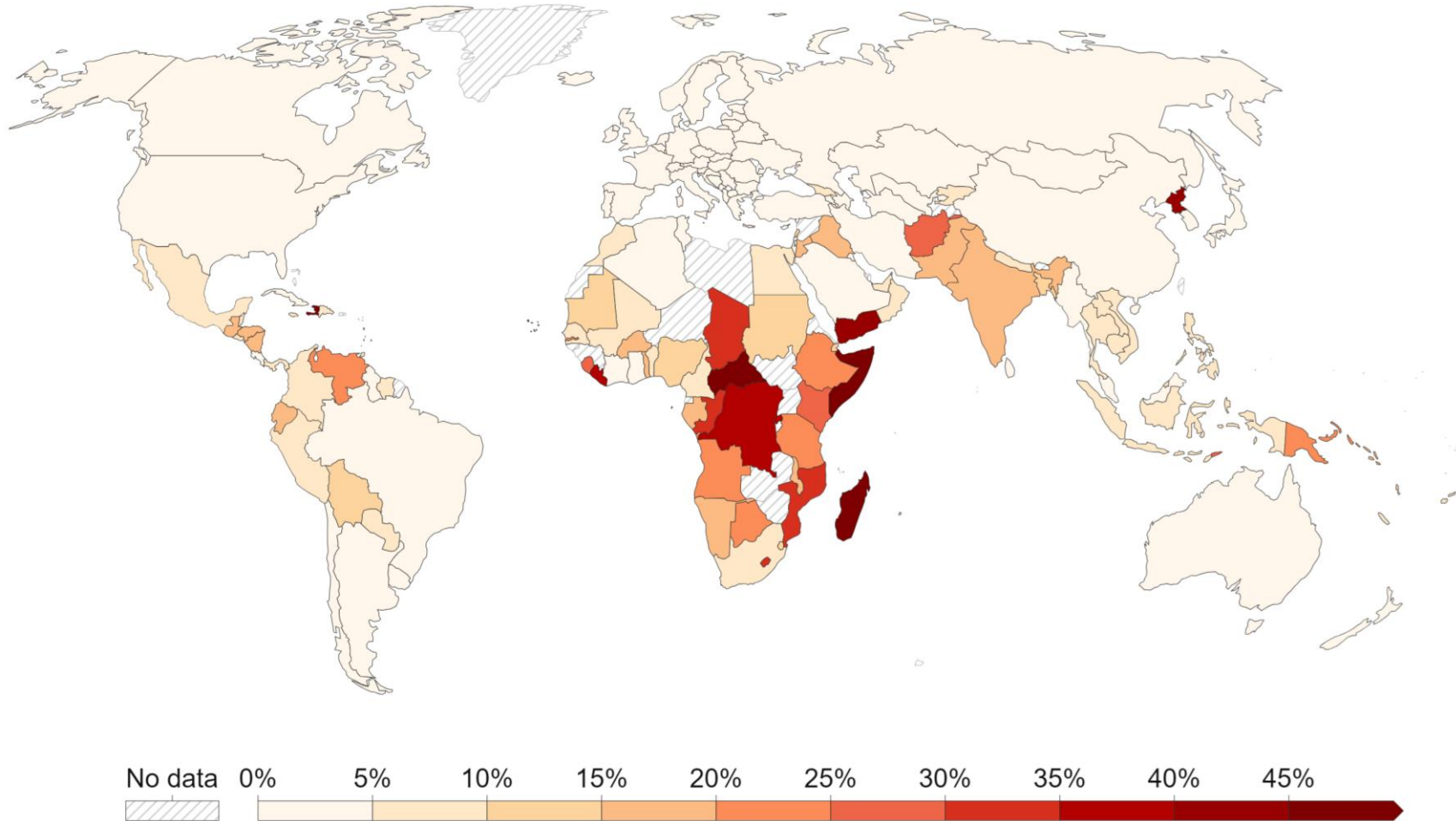


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## Undernourishment is high in Africa



Source: Food and Agriculture Organization of the United Nations (via World Bank)

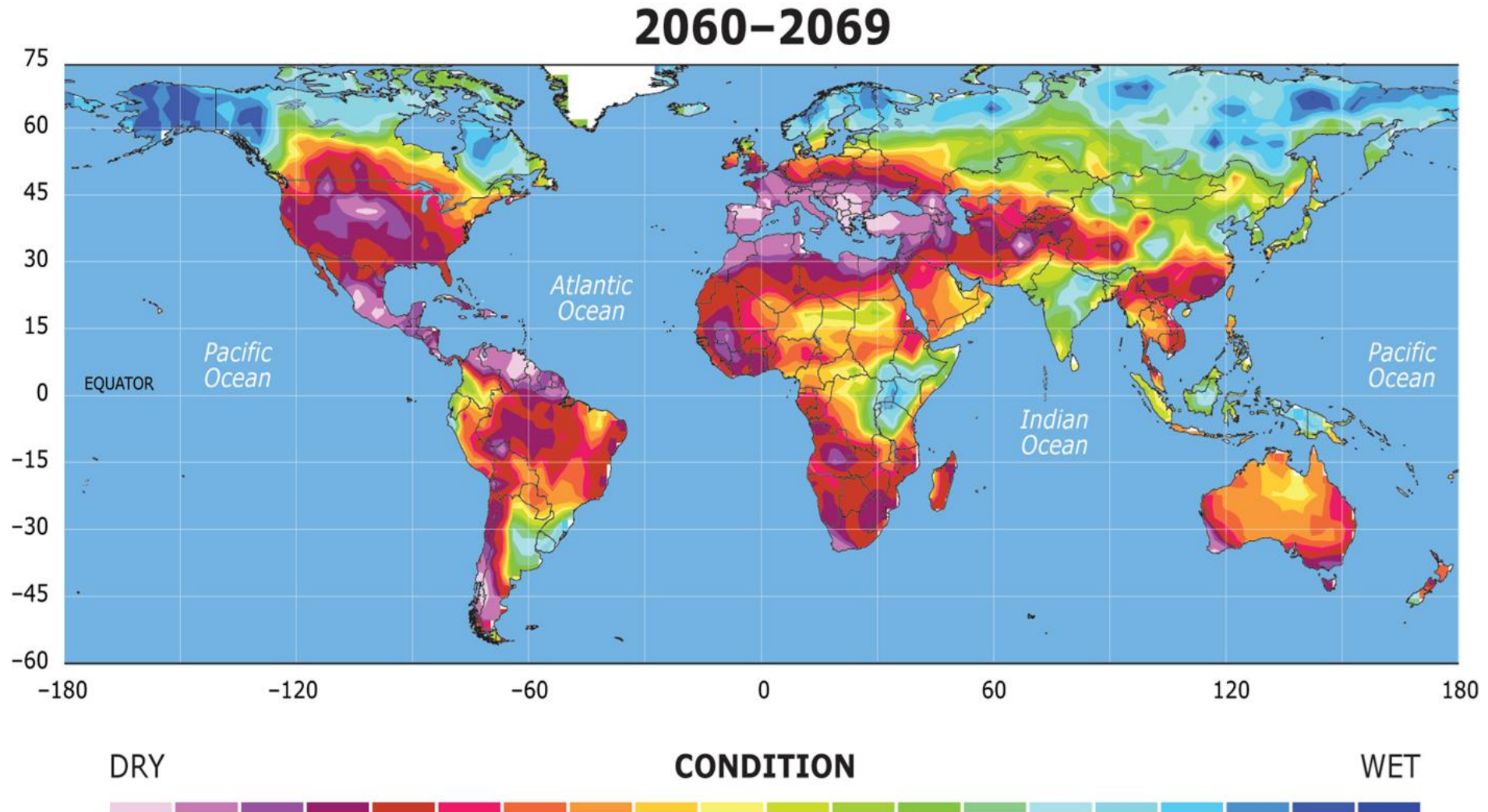




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## Climate change is a major threat to human life



<https://www.noaa.gov/climate>



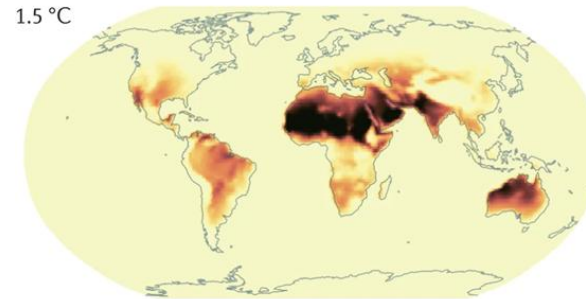
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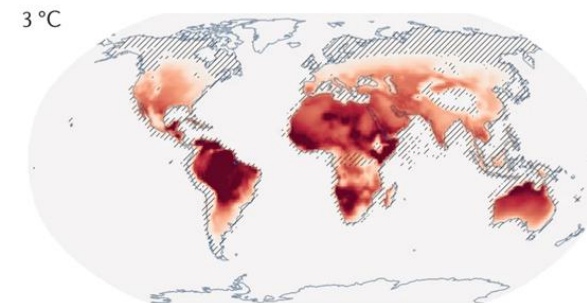
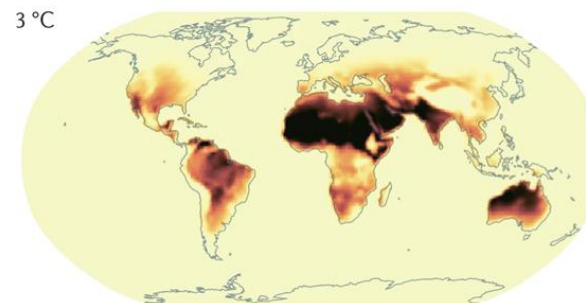
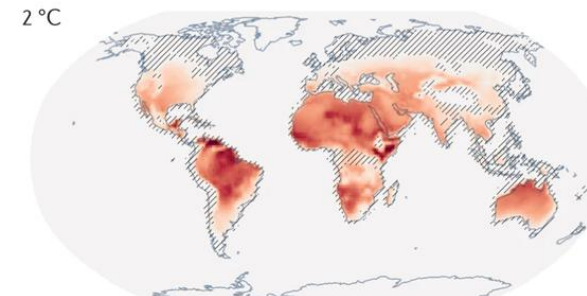
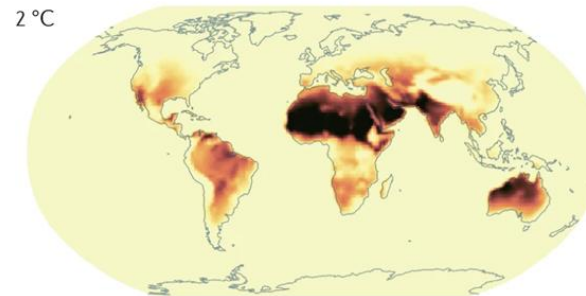
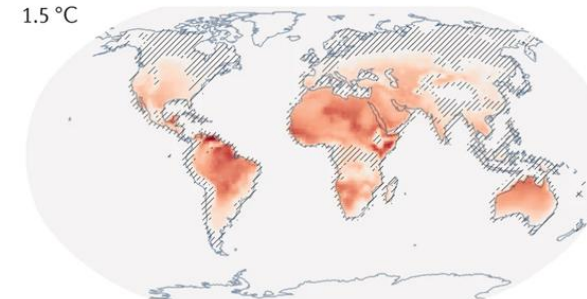
# Climate change is a major threat to human life



a Number of days with  $T_{\max} > 35^{\circ}\text{C}$



b Change in the number of days with  $T_{\max} > 35^{\circ}\text{C}$



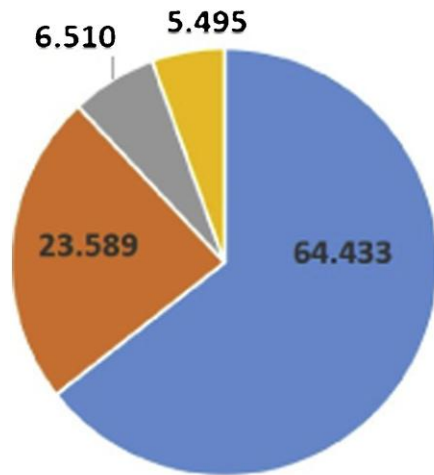
Domeisen et al.  
Prediction and projection  
of heatwaves. Nat Rev  
Earth Environ 4, 36–50  
(2023)



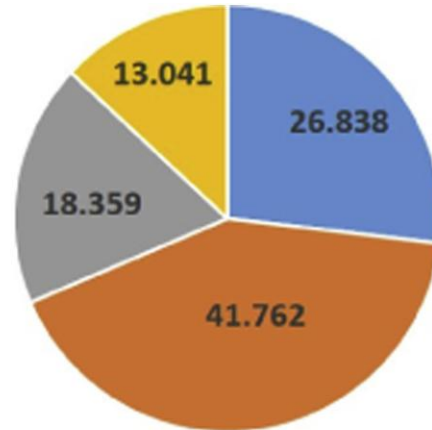
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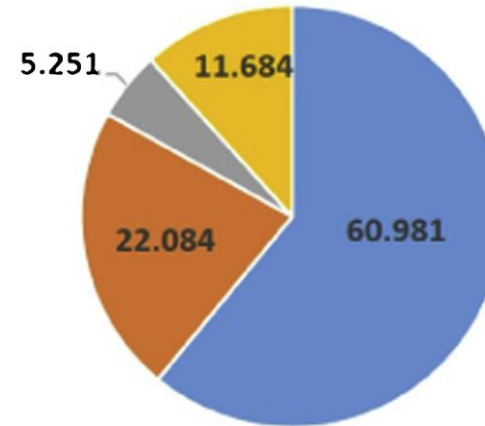
**We can explore biodiversity to build climate resilience to ensure sustainable production of nutritious food and feed**



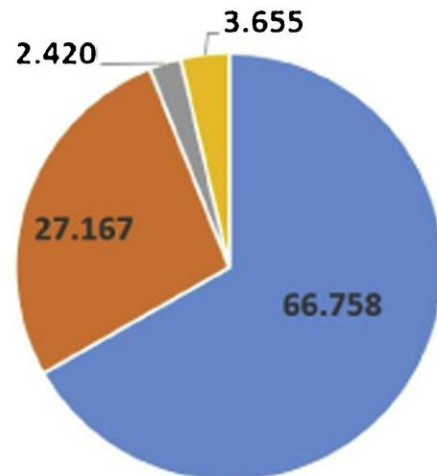
Bambara groundnut  
(*Vigna subterranea*)



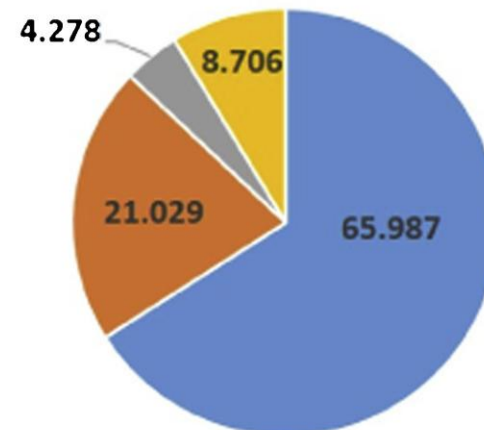
Soybean (*Glycine max*)



Chickpea (*Cicer ariteneum*)



Cowpea (*Vigna unguiculata*)



Mungbean (*Vigna radiata*)

Blue - carbohydrate  
orange – protein  
grey - total fat  
yellow - total dietary fibre





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**We can explore biodiversity to build climate resilience to ensure sustainable production of nutritious food and feed**



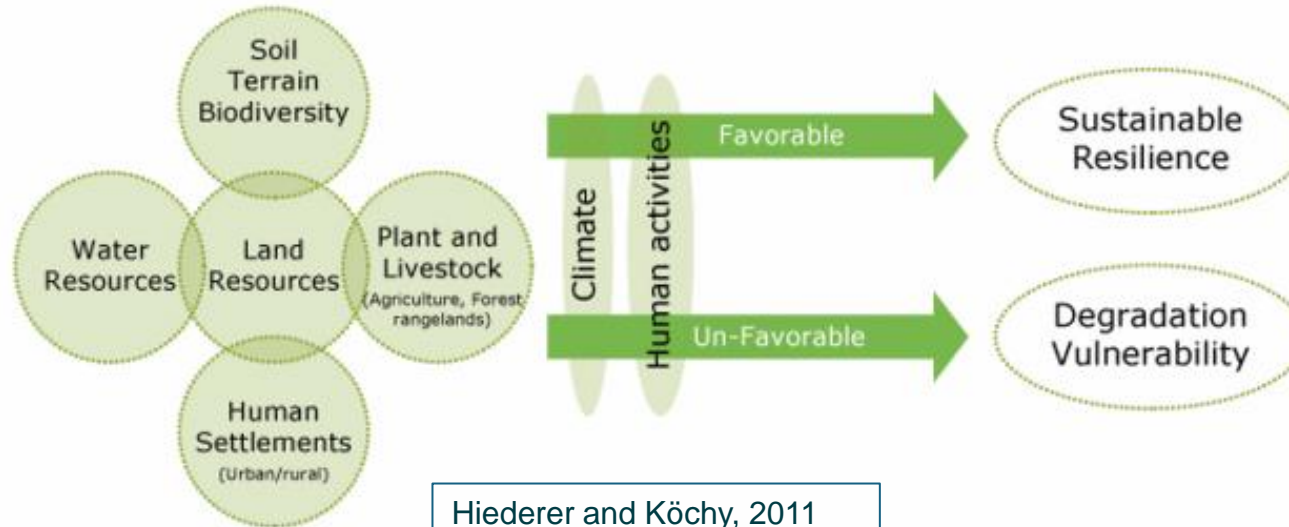
NUTRIENT (per 100 g dry edible portion)	FINGER MILLET	PEARL MILLET	SORGHUM	WHITE MAIZE	WHITE RICE	WHEAT
Energy (kcal)	336	361	329	365	345	346
Protein (g)	7.7	11.6	10.6	9.4	6.8	11.8
Fat (g)	1.5	5.0	3.5	4.7	0.5	1.5
Carbohydrate (g)	72.6	67.5	72.1	74.3	78.2	71.2
Dietary Fiber	11.5	11.3	6.7	7.3	4.1	12.5
Calcium (mg)	350	42	13	7	33	30
Iron (mg)	3.9	8	3.4	2.7	0.7	3.5
Zinc (mg)	2.3	3.1	1.7	2.2	1.3	2.7
Folic Acid (μg)	18.3	45.5	20	0.5	8	36.6



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**None of the sustainability and resilience can be achieved  
without sustainable land use and management**



Hiederer and Köchy, 2011  
Vargas, 2013  
Lal, 2013

### Expertise Required, offered by the network:

- Agricultural Extension
- Horticulture/Agronomy and Crop Science
- **Plant Breeding**
- **Animal Breeding**
- Livestock and Rangeland Sciences
- Ecology and Nature Conservation
- Soil Sciences
- Climatology
- Policy Analysis
- Agricultural Economics
- Data Science



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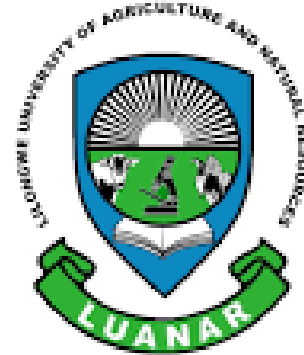
# Thank you



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HOHENHEIM



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UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA



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