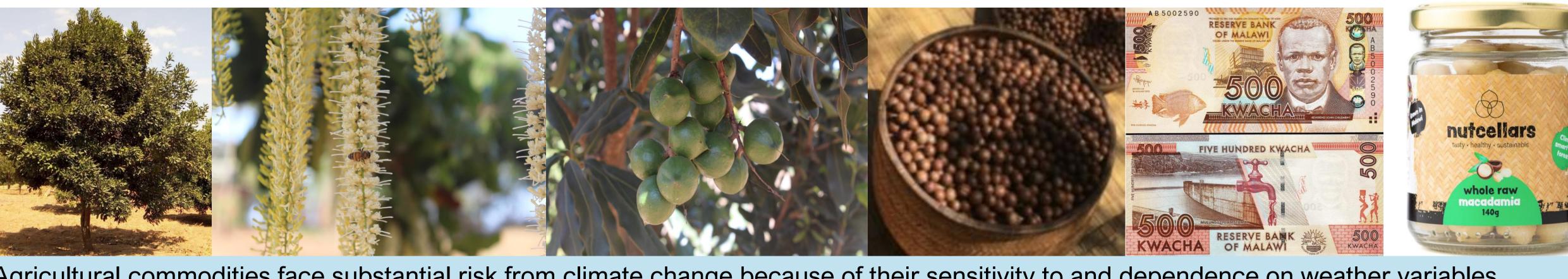
# Climate change and macadamia production in Malawi

EJ Zuza<sup>1\*</sup> • K Maseyk<sup>1</sup> • S Bhagwa<sup>1</sup>t • K de Sousa<sup>2</sup> • A Emmott<sup>3</sup> • W Rawes<sup>3</sup> • YN Araya<sup>1</sup>





Agricultural commodities face substantial risk from climate change because of their sensitivity to and dependence on weather variables. One such commodity is macadamia (Macadamia integrifolia) an important lucrative commodity in Malawi. This study presents evidence on the impact of climate change on the agro-ecological suitability of macadamia in Malawi

## RCP 4.5 Projections

- Temperatures expected to increase by ≥ 1.4 °C.
- Increase in number of hot (≥ 30 °C) days (15 days a year).
- Increase in number of hot (≥ 14 °C) nights (20 days a year).
- Variability precipitation (droughts & flooding).

### **RCP 8.5 Projections**

- Temperatures expected to increase by ≥ 2.5 °C.
- Increase in number of hot (≥ 30.5 °C) days (30 days a year).
- Increase in number of hot (≥ 14 °C) nights (40 days a year).
- Variability precipitation (droughts & flooding).

#### **Tree Sampling Future suitability (2050s)** 32°E 36°E 33°E 34°E 35°E 10°S -10°S 11°S-11°S data (rainfed macadamia 12°S fields). 12°S-12°S Ten-year-old orchards only. elevation was Data on 13°S collected. 13°S-13°S 14°S 14°S-14°S 15°S 15°S Suitability (RCP4.5) Suitability (RCP8.5) No longer suitable No longer suitable Unsuitable Unsuitable 15°S-Remains suitable 15°S Remains suitable New suitable areas New suitable areas Surveyed Fields Pseudo-Absent points □ District boundaries 17°S 16°S Lakes 35°E 36°E Total cultivatable area 94, 449 km<sup>2</sup> Losses in suitability Current suitability (~1970–2000) 17°S--17°S **RCP 4.5 RCP 8.5** Region 36°E 35°E 34°E 35°E 36°E 32°E 33°E 34°E Area (km<sup>2</sup>) Percentage Area (km²) Percentage **Ensemble Suitability** (%) (%) Modelling (GAMs + RF + MAXNET + 10°S 6,784.1 Central 7.2 7,950.1 8.4 SVM + CART) 2.0 3.9 3,730 Northern 1,850 Southern 8,380.9 9.2 8.9 8,733.9 17,015 18.1 20,414 21.6 **Total** 12°S **Shifts in suitability** 13°S 13°S variables Unsuitable 14°S 14°S **Temperature** Precipitation Remains suitable 1600 m.a.s.l 1400 m.a.s.l. 15°S 15°S Current suitability 1200 m.a.s.l. ≥ 0.51/Highly suitable New areas 0.34-0.51/Optimal 1000 m.a.s.l. 0.17-0.34/Moderate 0.01-0.17/Marginal Unsuitable No longer suitable Total suitable for macadamia 53,925 km<sup>2</sup> 500 m.a.s.l.

**Acknowledgements and References** 

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34°E

32°E

33°E

35°E

36°E

<sup>1</sup>School of Environment, Earth and Ecosystem Sciences, The Open University, Walton Hall, Milton Keynes.





