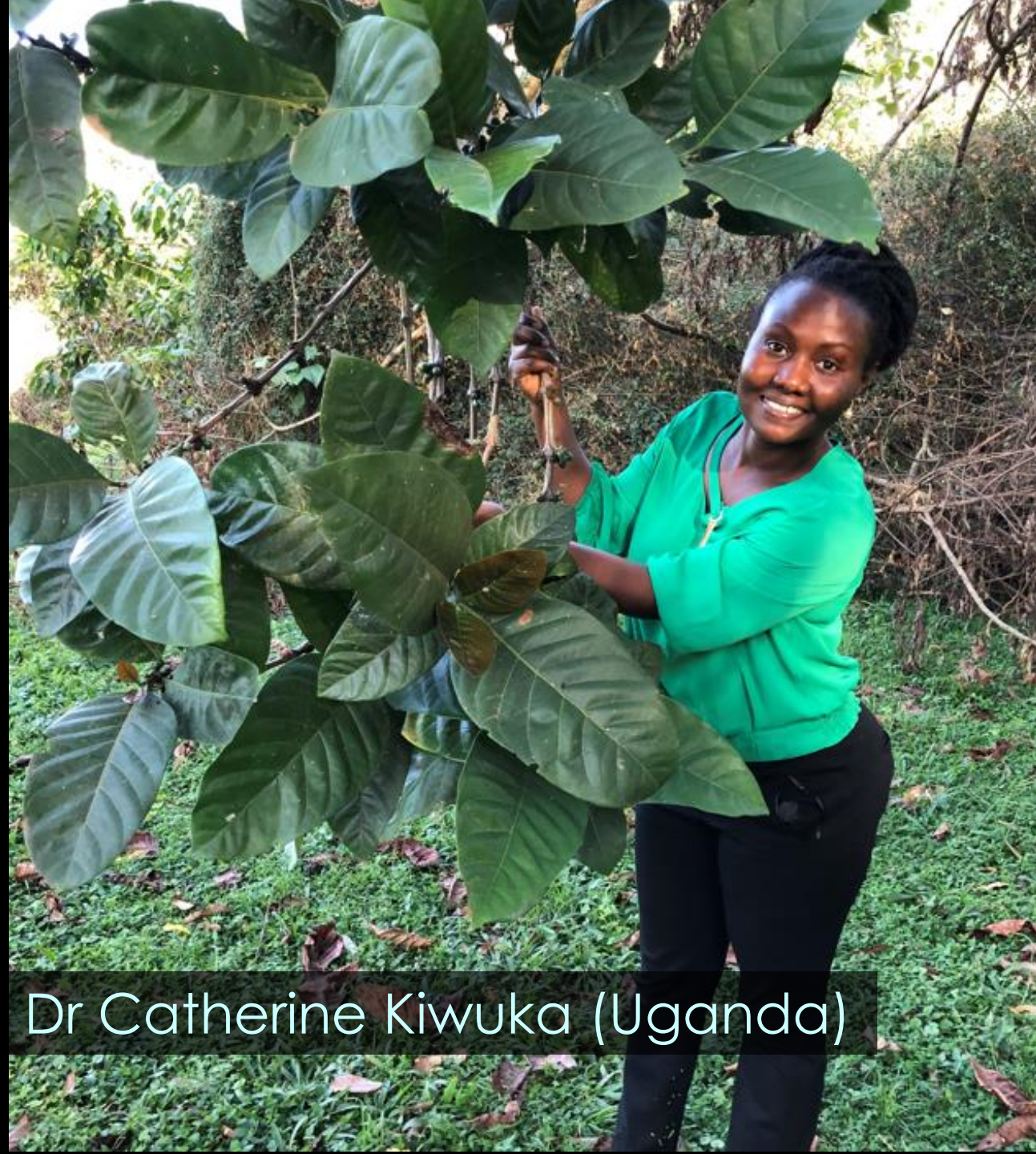


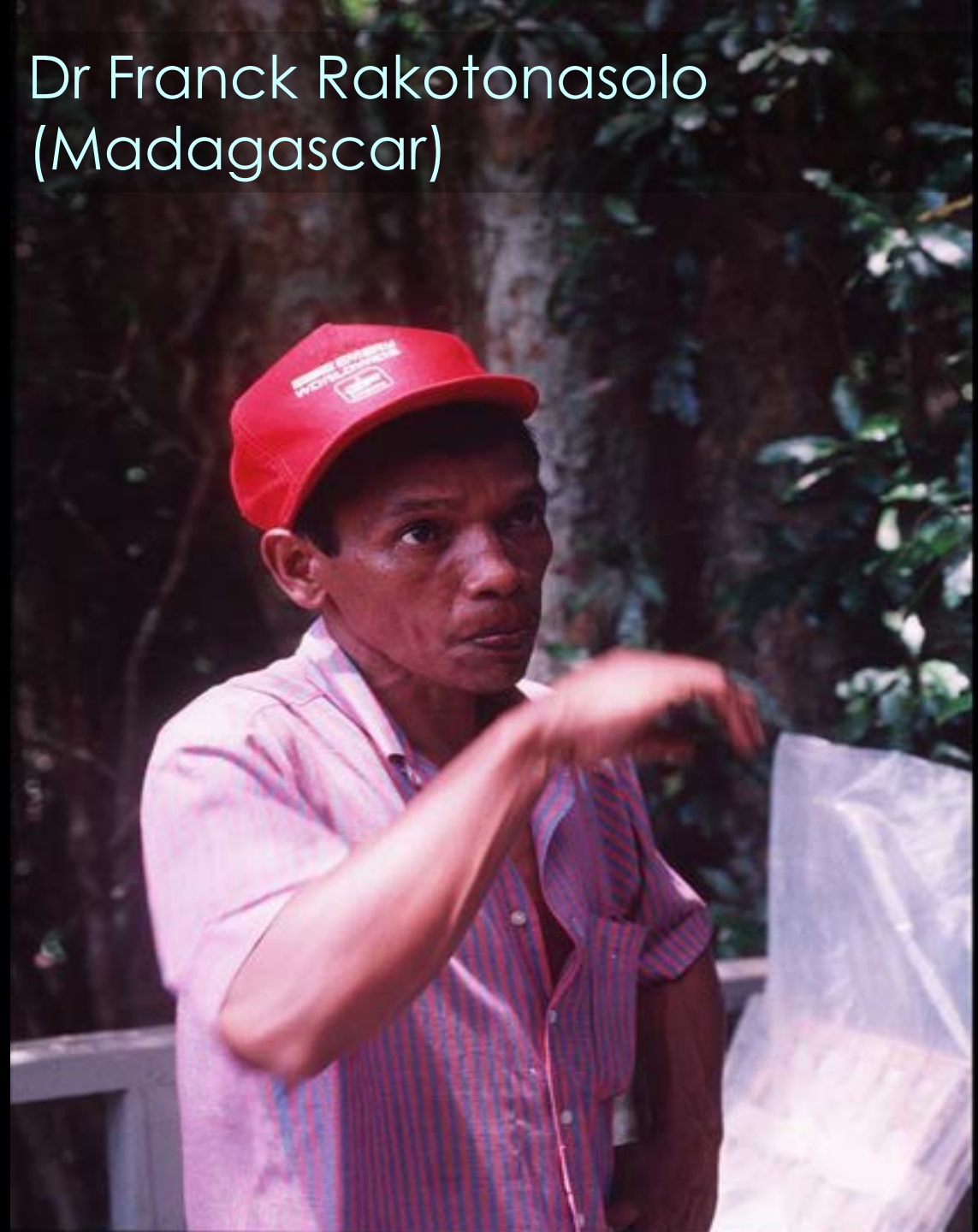
# The Royal Botanic Gardens, Kew

## Recent coffee research





Dr Catherine Kiwuka (Uganda)



Dr Franck Rakotonasolo  
(Madagascar)





Diane Bridson



FIG. 1. *Coffea fadenii*. A fruiting branch  $\times 1$ ; B stipule  $\times 3$ ; C domatium  $\times 6$ ; D single-flowered inflorescence  $\times 8$ ; E corolla  $\times 3$ ; F stigma & style  $\times 3$ ; G section through calyx  $\times 8$ ; H fruit  $\times 1$ ; I seed (2 views)  $\times 2$ . A-C & H from *Faden* 72/269, D-G & J from *Faden* 71/56. Drawn by author.

## *Psilanthus* (Rubiaceae) for part 2 of 'Flora Africa': Rubiaceae

BRIDSON

new taxa (seven species and two subsp.) and  
others African species, including incompletely

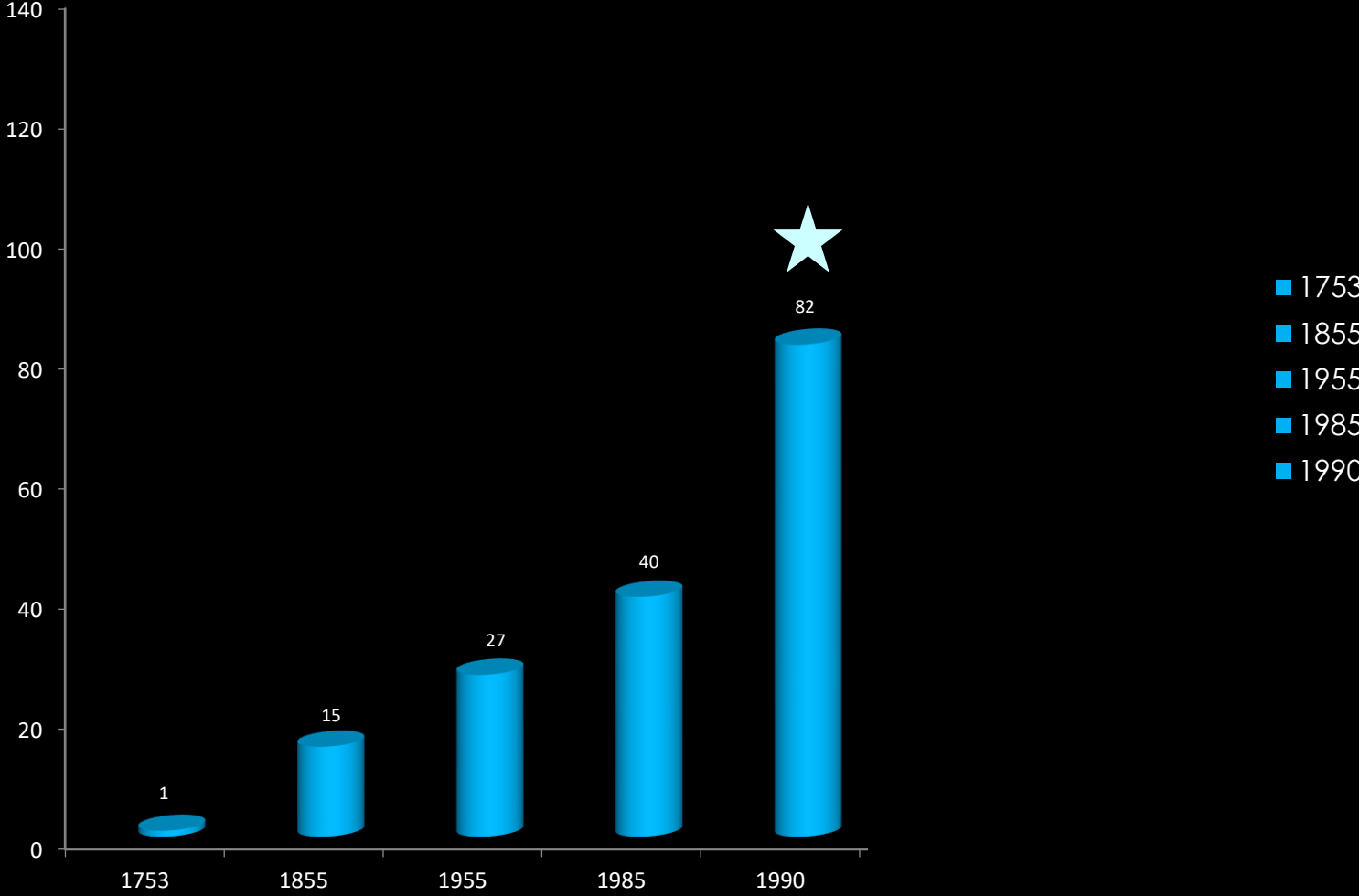
the genus *Coffea* L. for the F.T.E.A.  
at some of the East African species  
du Globe 3 (1947)) were in need of  
requently been misapplied. Not only  
[*Coffea* sensu stricto very much larger  
of *Coffea* falling outside the definition  
-4) and three species of the closely  
8) were found.

full formal description of five new  
al 11 taxa (probably worth specific  
considerable economic importance of  
l in as much detail as possible so as to  
uld lead to re-collection of both good  
al for experimental culture. As well as  
requirements for the description of  
existing taxa, this paper includes  
l a character list which will enable it  
nel with a moderate knowledge of

species *C. arabica*, *C. canephora* and *C.*  
this paper, although they have been  
list. In addition to cultivated plants,  
*C. arabica*: SE Sudan (Boma Plateau);  
abit) (fide Friis in Proc. 9 Plenary  
*C. canephora*: Sudan, Uganda & Tan-  
osest to *C. liberica* var. *deweveri* (De  
*excelsa* Chev.): Sudan & Uganda.

ng the species in *Coffea* are generally  
imperfectly known, definite opinions  
only be made with difficulty. Furth-  
infrageneric taxa in this paper as the  
s have not been considered. In my  
*bicoffea* is artificial, especially with  
which is much closer to *C. canephora*

# Historical increase in the number of coffee species





Western Madagascar 1997







Namaroko coffee (*Coffea namarokensis*)



Ambongo coffee (*Coffea ambongensis*)



# Ambongo coffee The world's largest coffee bean



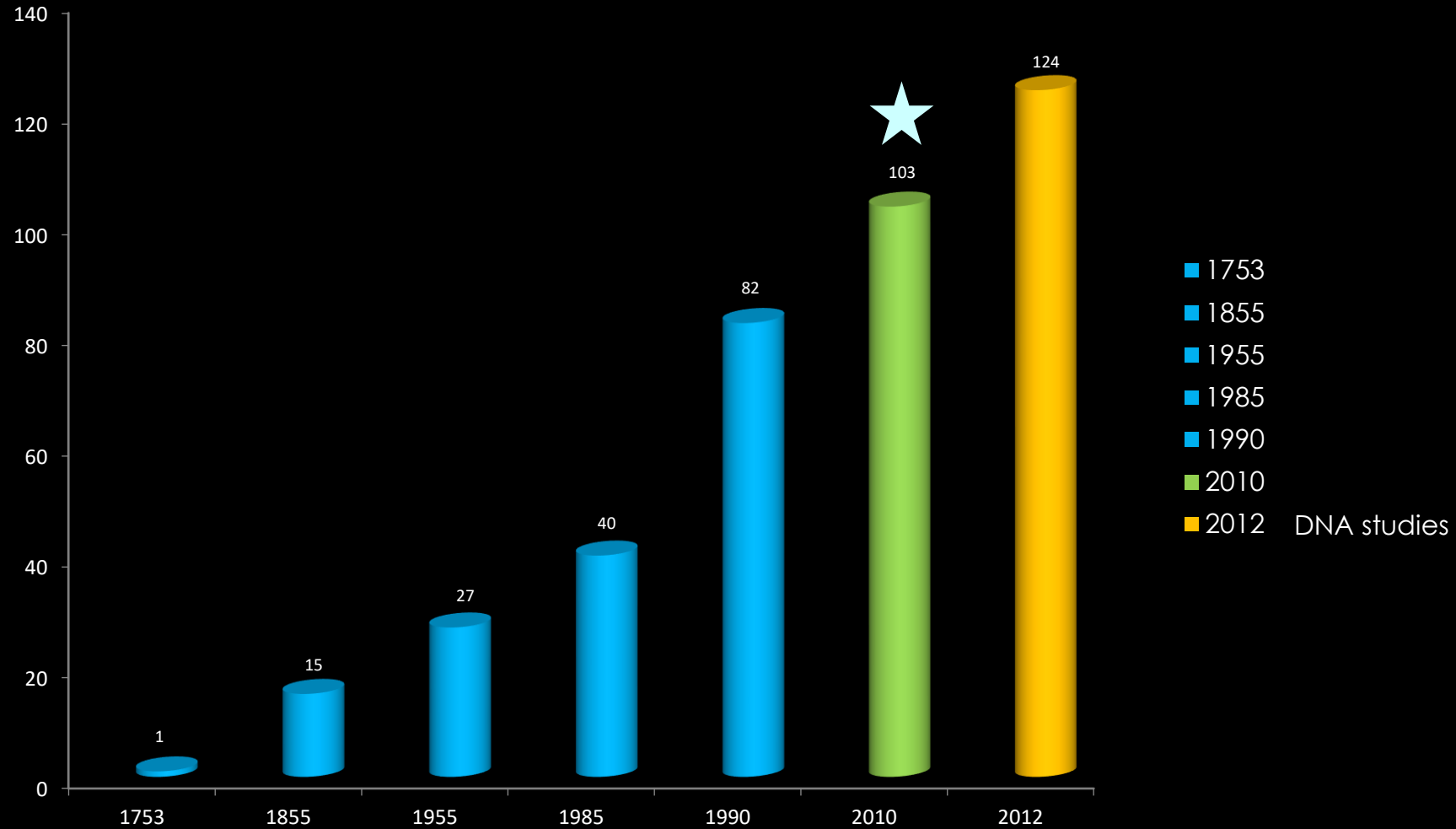
*Coffea ambongensis*



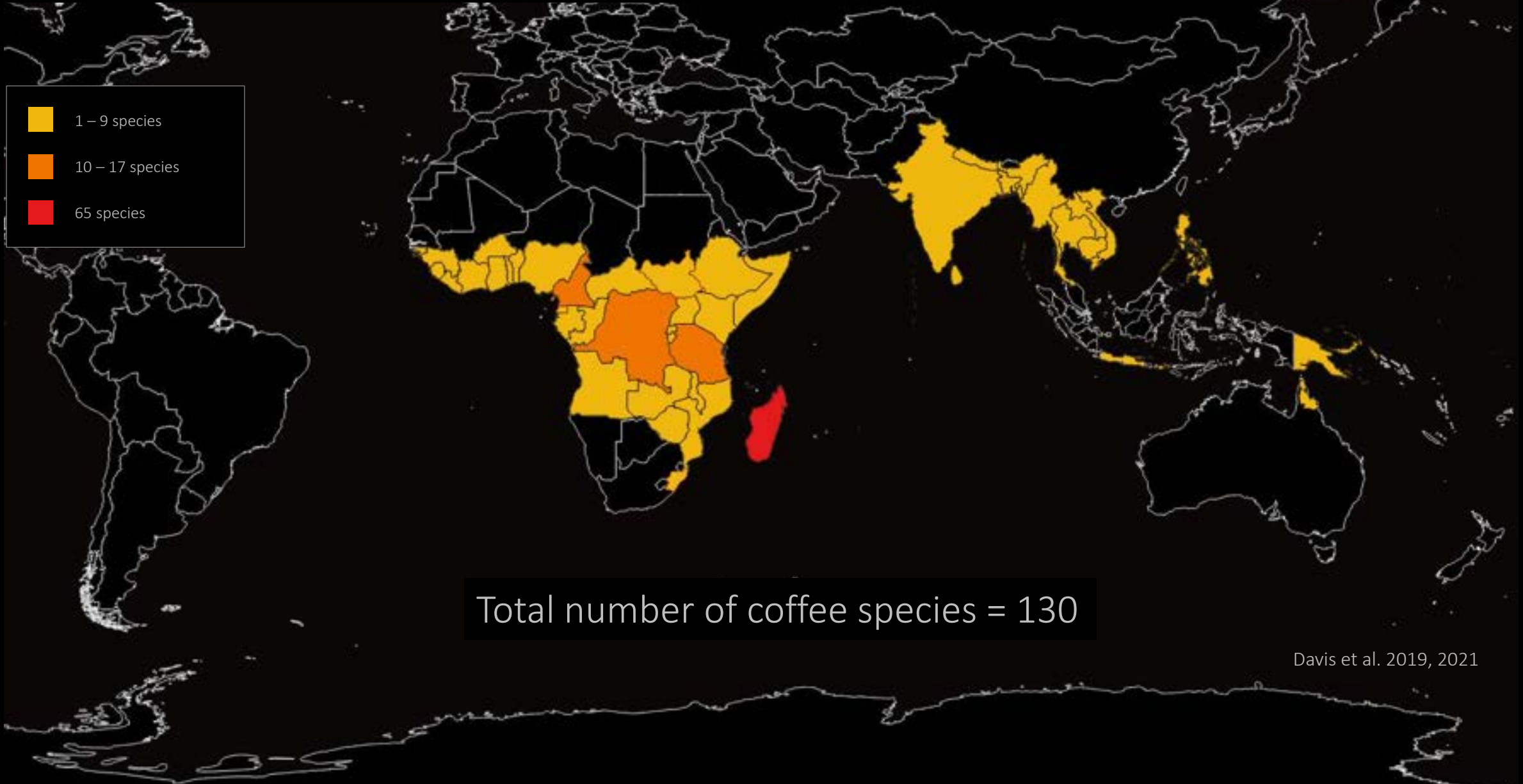
*Coffea arabica*



# Recent increase in the number of coffee species



# Distribution of wild coffee species diversity



Total number of coffee species = 130



All coffee species have coffee beans



# Coffee and climate change



# Wake Up and Smell the Coffee

Before It's Too Late



If you're one of those people who needs a cup of coffee to get going in the morning, your world may be changing.

In fact, it already is.

Climate change is threatening coffee crops in virtually every major coffee producing region of the world. Higher temperatures, intense rainfall coupled with long droughts, and more pests and disease — all associated with climate change — have reduced coffee supplies dramatically in recent years.

It ought to be a wake-up call for all of us. Because who wants to be around coffee drinkers who can't get their morning fix?

Find out what you can do at:

[www.ucsusa.org/CoffeeAndClimate](http://www.ucsusa.org/CoffeeAndClimate)

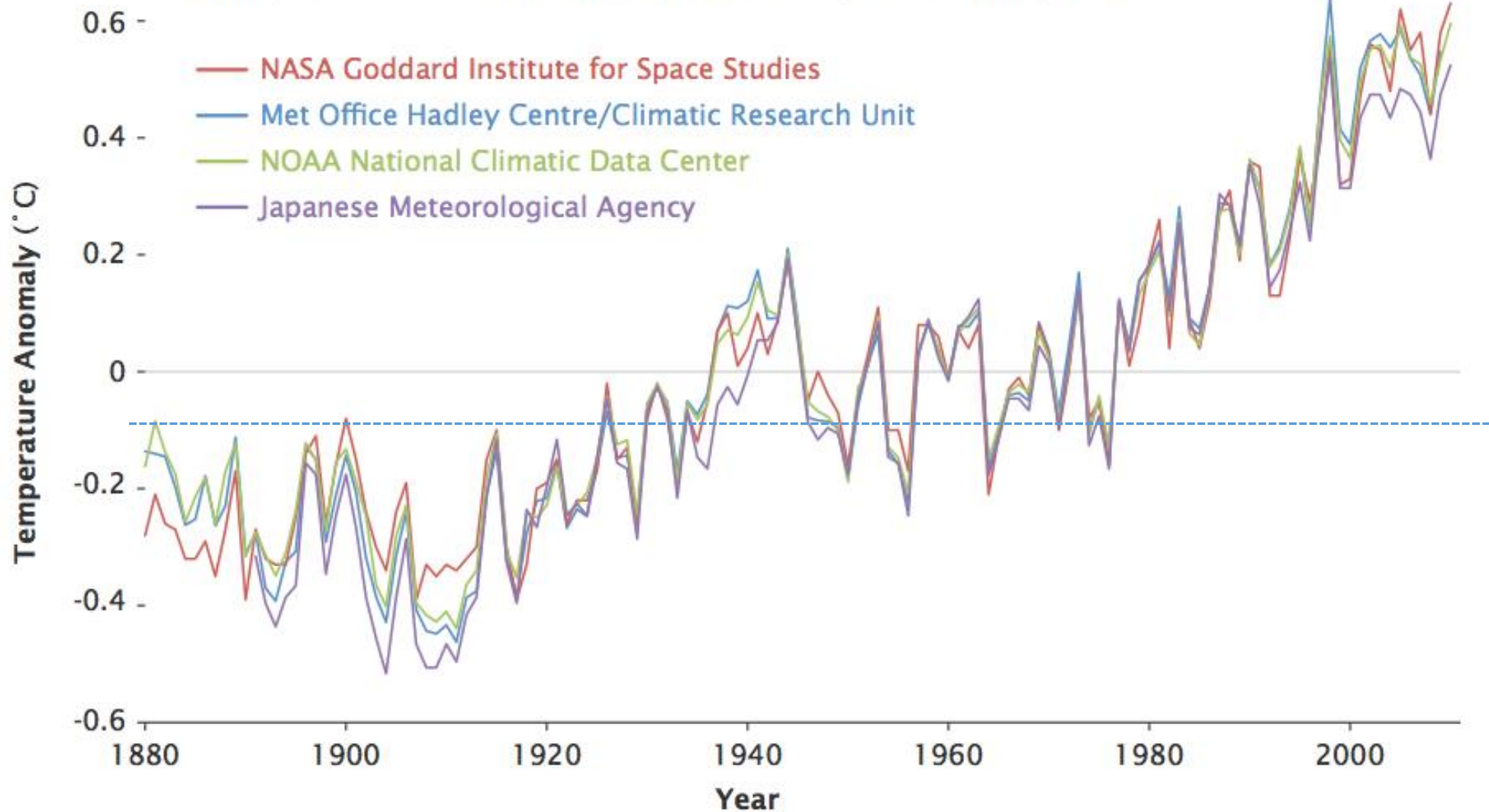


Union of Concerned Scientists



## Global Surface Temperatures

Four independent records show nearly identical long-term warming trends.









# Ethiopia and coffee

A woman wearing a purple short-sleeved shirt, blue trousers, and a light blue hairnet stands in profile, looking towards a massive stack of coffee sacks. The sacks are piled high, reaching the ceiling of the warehouse. The lighting is dramatic, with strong highlights and deep shadows, emphasizing the texture of the sacks and the woman's silhouette.

There are

**15,000,000**

coffee farmers

Coffee provides

**25-30%**

of export earnings

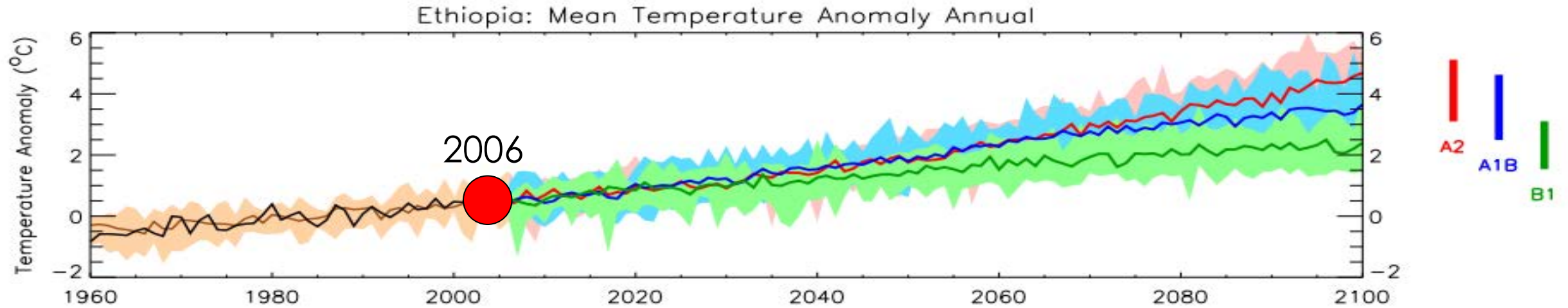
The world's

**5<sup>th</sup>**

largest exporter



# UNDP Climate Change Profile for Ethiopia



1.3 °C

That's an 0.28°C increase per decade

Financed by the SCIP Fund



Royal Botanic Gardens  
**Kew**

**ECFF**  
Environment & Coffee-Food Future

**Coffee Farming and Climate  
Change in Ethiopia**  
Impacts, Forecasts, Resilience  
and Opportunities

Summary



Royal  
Botanic  
Gardens **Kew**



Ethiopia is the birth-place of coffee, the home of wild Arabica coffee (*Coffea arabica*), and the largest coffee producer in Africa. Coffee drinking is an important part of Ethiopian culture and society. Ethiopian coffee is renowned for its wide diversity of flavour profiles, including the celebrated coffees of Gesha, Hama, Limu and Yirgacheffe, and for its association with forest-based farming systems.

The *Coffee Atlas of Ethiopia* maps the coffee landscape of Ethiopia, showing where coffee is (and could be) farmed, and the location of wild Arabica coffee forests. The maps include the main coffee-growing origins, coffee towns and coffee delivery centres, as well as other useful features. The maps are accompanied by introductory text on geography, coffee use and consumption, history, the coffee-growing climate and environment, coffee farming, harvesting and processing, and an overview of the main coffee areas. The *Coffee Atlas of Ethiopia* is an essential resource for anyone working with, or interested in, coffee, and serves as a key geographical reference for Ethiopia.

**ECFF**

**Coffee Atlas of Ethiopia**

Aaron P. Davis, Tim Wilkinson, Zetola Ketebebe Cholla, Jerry Williams,  
Susana Eason, Tadesso Woldeamanian Gogo and Austin Mout

Kew

# Coffee Atlas of Ethiopia

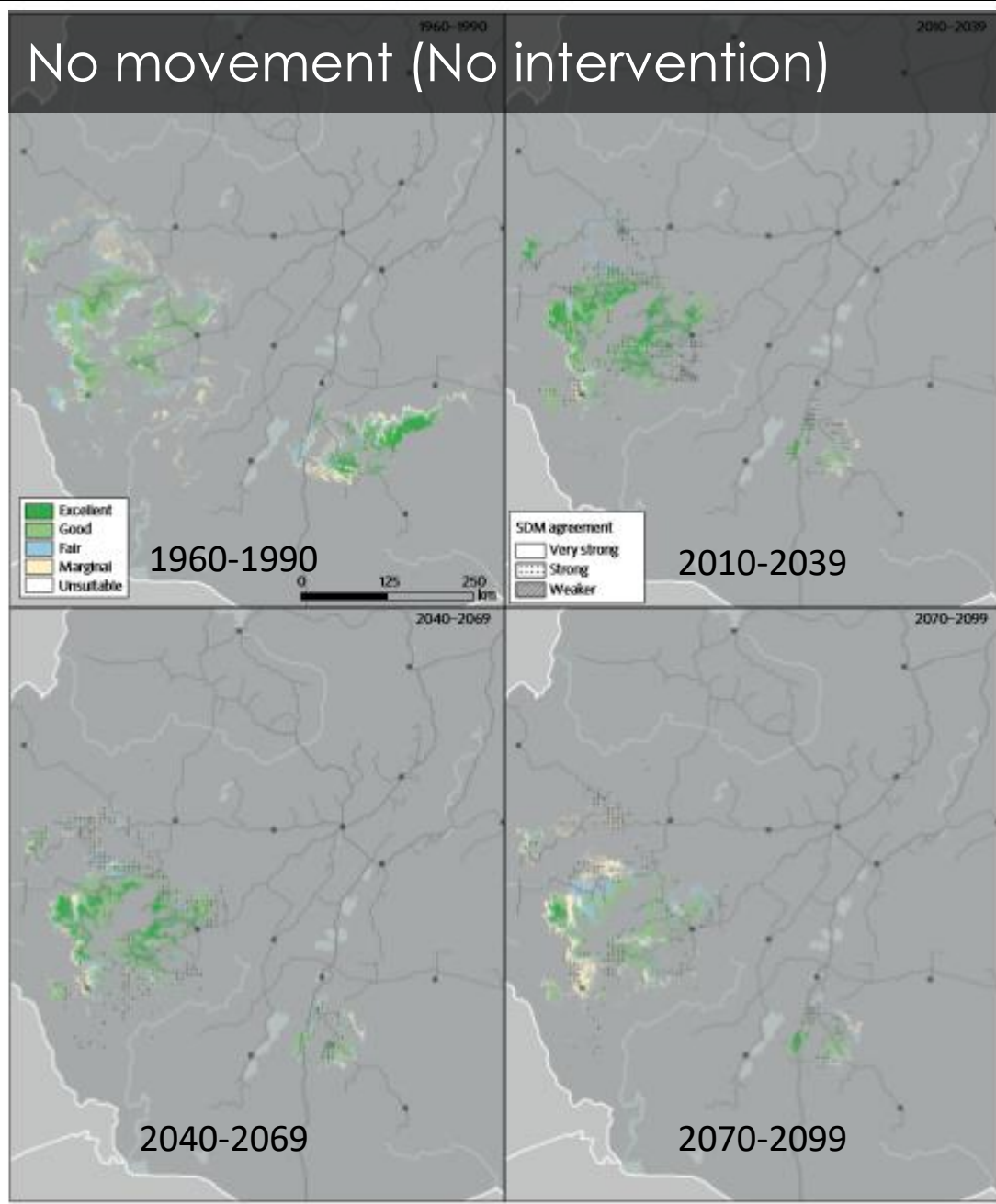


Aaron P. Davis, Tim Wilkinson,  
Zetola Ketebebe Cholla,  
Jerry Williams, Susana Eason,  
Tadesso Woldeamanian Gogo  
and Austin Mout

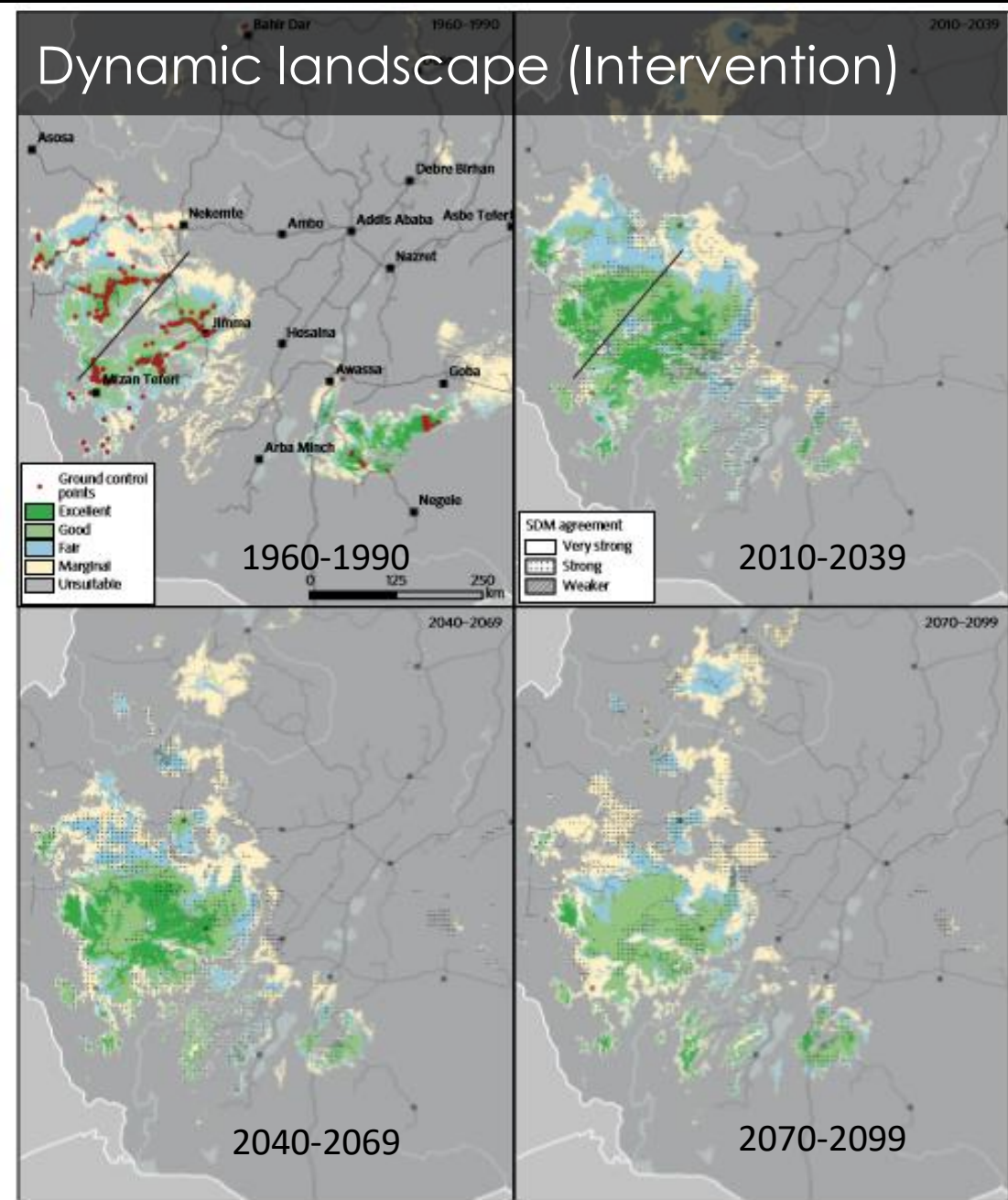




# No movement (No intervention)



# Dynamic landscape (Intervention)





# Coffee forest restoration



# The environmental impact of Coffee



# Coffee farming and deforestation





# Intensive coffee farming with no tree shade





# Mainstreaming biodiversity conservation and climate resilience in Ethiopia





# Yayu Biosphere Reserve

At Yayu, coffee generates up to 70% of the cash income for over 90% of the population

Image: Emily Garthwaite  
Union Hand-Roasted Coffee



# Forest-based coffee farming



Image: Emily Garthwaite  
Union Hand-Roasted Coffee









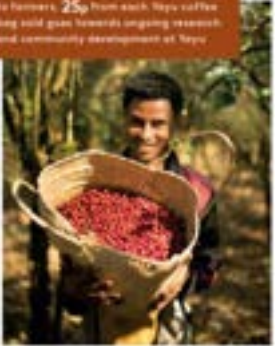




Steven Macatonia and Jeremy Torz — Co-founders Union Hand-Roasted Coffee (London)



In addition to the quality premium paid to farmers, **25p** from each YAYU coffee bag sold goes towards ongoing research and community development at Yayu.



**UNION DIRECT TRADE MEANS MORE THAN JUST PAYING A FAIR PRICE**

It means we work together with coffee farmers in long-term relationships, improving both the quality of coffee and livelihoods.

**25p GOES TOWARDS THE YAYU PROJECT**

READ MORE ABOUT THE YAYU PROJECT AND LATEST UPDATES ON:

[www.unioncoffee.com/YAYU](http://www.unioncoffee.com/YAYU)  
[www.few.org/science/projects](http://www.few.org/science/projects)

PHOTOS BY ALAN SCHALLER AND DAVID BARTHMEIS

**PRESERVING WILD ARABICA AND IMPROVING LIVELIHOODS**

The Yayu Forest Reserve in Ethiopia is one of the last and most important remaining places for the conservation of wild Arabica coffee.

Wild coffee forests and surrounding forested areas are part of a coffee farming system that benefits livelihoods and nature conservation. We are working with the communities at Yayu to improve the quality of their coffee, which via Union Direct Trade means that better prices are paid to the farmers. If the coffee is worth more, the value of the forest also increases, providing an incentive for its preservation.



**THE YAYU PROJECT**

Working together with the Royal Botanic Gardens, Kew, the Darwin Initiative, and local partners, our aim is to:

1. Improve the long-term livelihoods of coffee farmers at Yayu
2. Protect the biodiversity of the forest, which is home to hundreds of plant and animal species, and important natural populations of Arabica coffee

Working in partnership with:






146–154% increase for processed (green) coffee prices

20–30% increase in household income



Image: Emily Garthwaite  
Union Hand-Roasted Coffee





Total kg of green coffee purchased

195,560 kg (195 metric tonnes)

Total £ of green coffee purchased

\$1,031,010 (2014–2018)

Image: Alan Schaller  
Union Hand-Roasted Coffee



# Benefits of a forest-based farming

- Sequestering carbon (trees and soil)
- Providing ecosystem services (pollination, water recycling, soil preservation)
- Ameliorating climate (lowering temperatures)
- Preserving biodiversity
- Providing societal benefits (firewood, honey, building materials)





Consumer choice and its importance







