

Eco logical
nomic

cultural

justice

Africanizing aesthetics of South African Biodiversity for Our Creative Economy

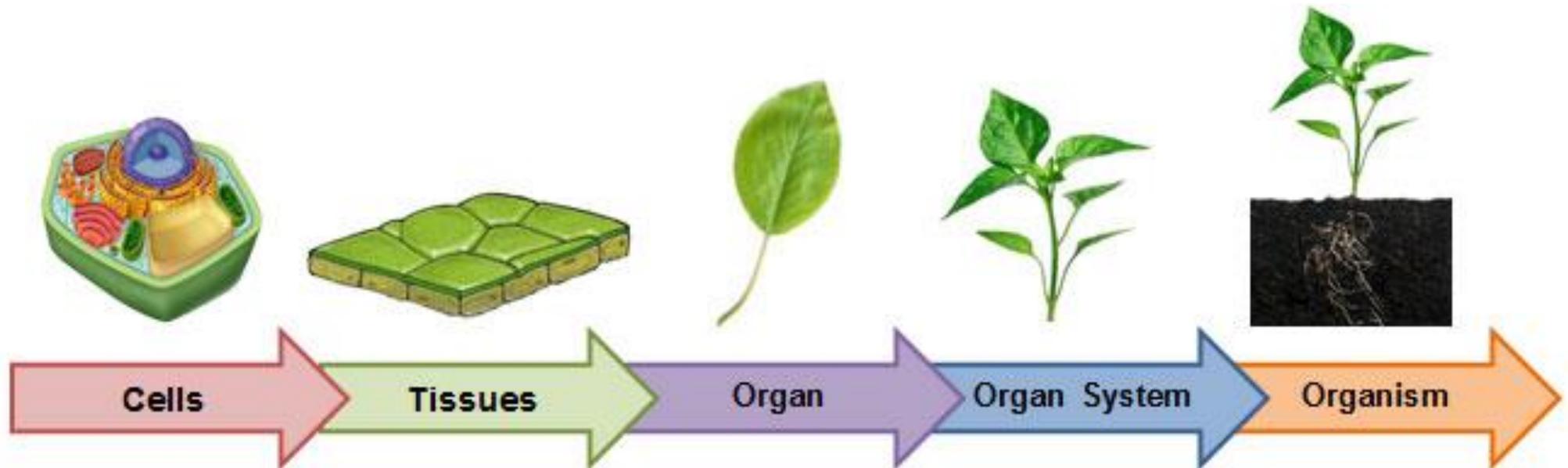
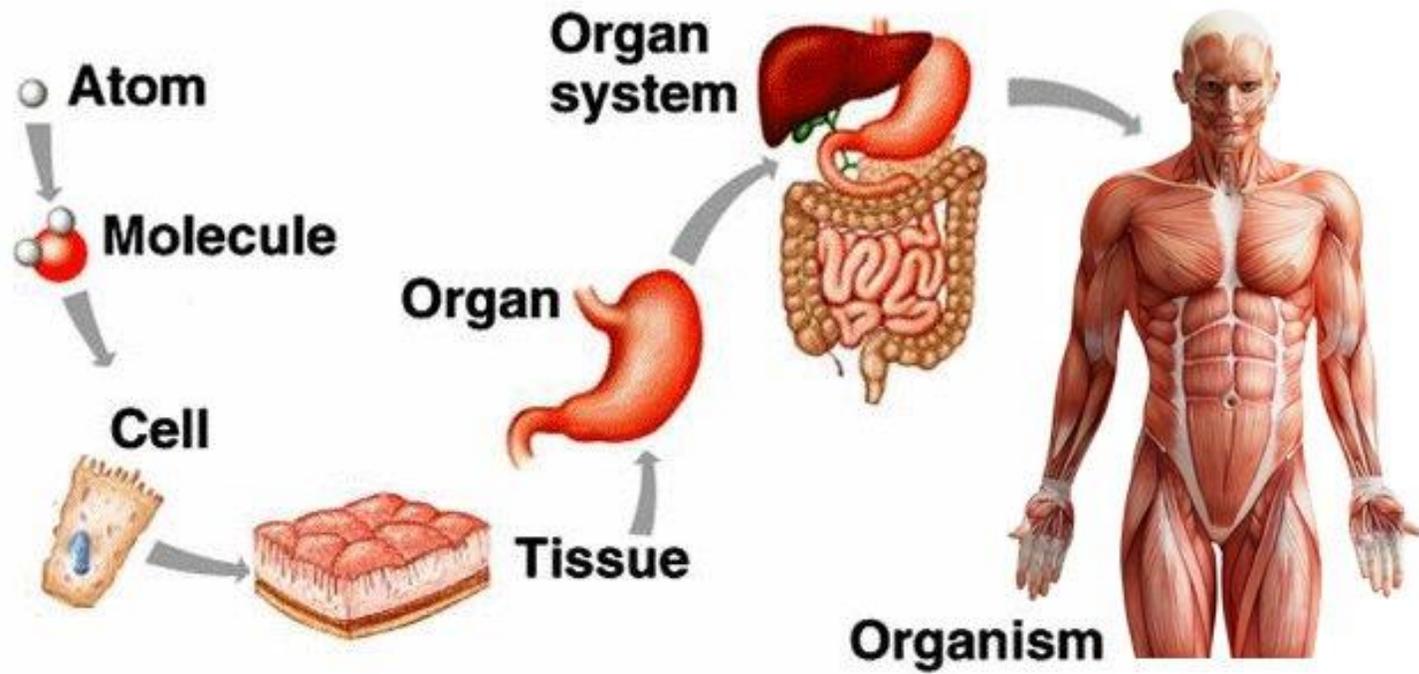
Eshchar Mizrachi



Eco logical
nomic

cultural

justice





Protea



Erica



Cancer Bush



Pincushion

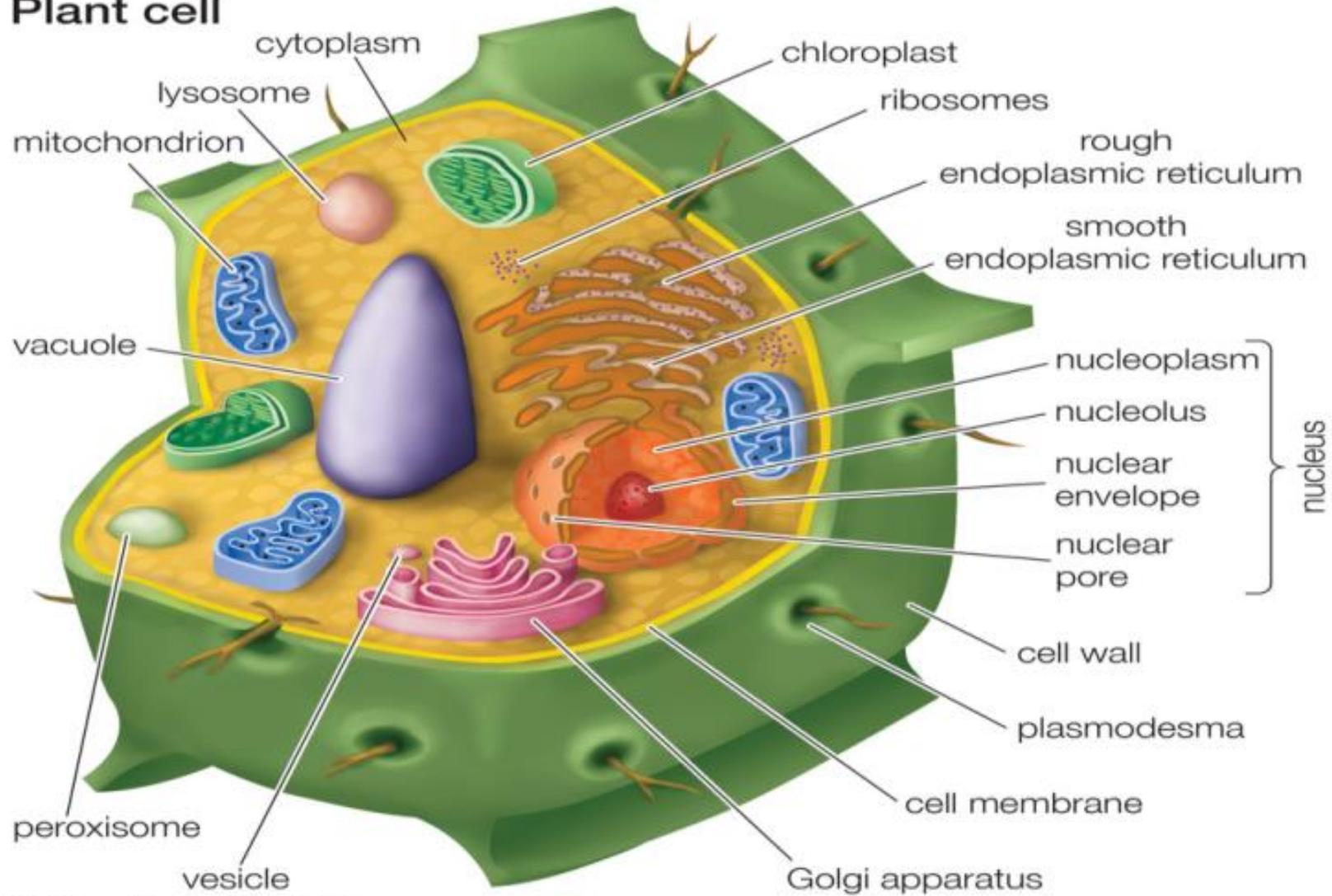


Rooibos



Asparagus

Plant cell

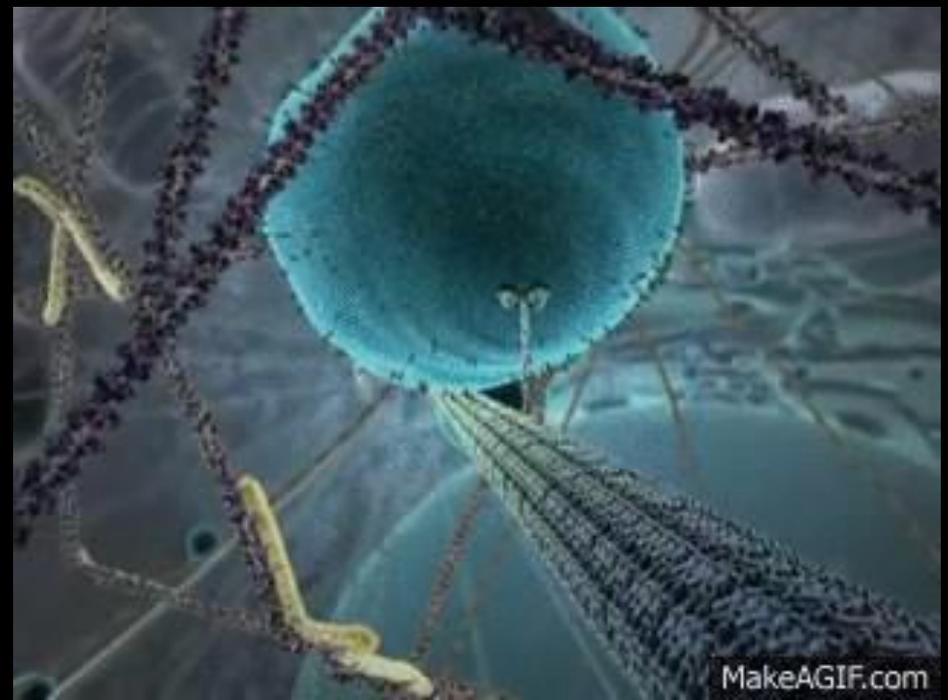


© 2010 Encyclopædia Britannica, Inc.





MakeAGIF.com



MakeAGIF.com



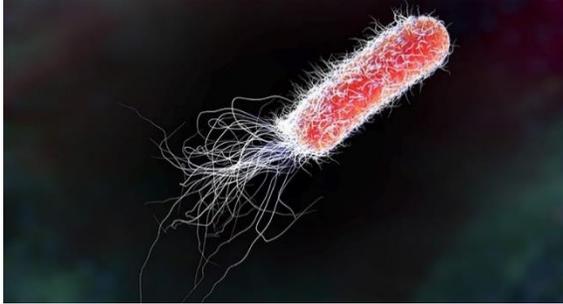
MakeAGIF.com



Plasma membrane

MakeAGIF.com

Genome sizes and numbers of genes?



***E. Coli* – 5Mb, 5,000 genes**



***D. melanogaster*– 175Mb,
17,000 genes**



***H. sapiens*– 3,000Mb,
20,000 genes**

900 Mb, 38,000 genes

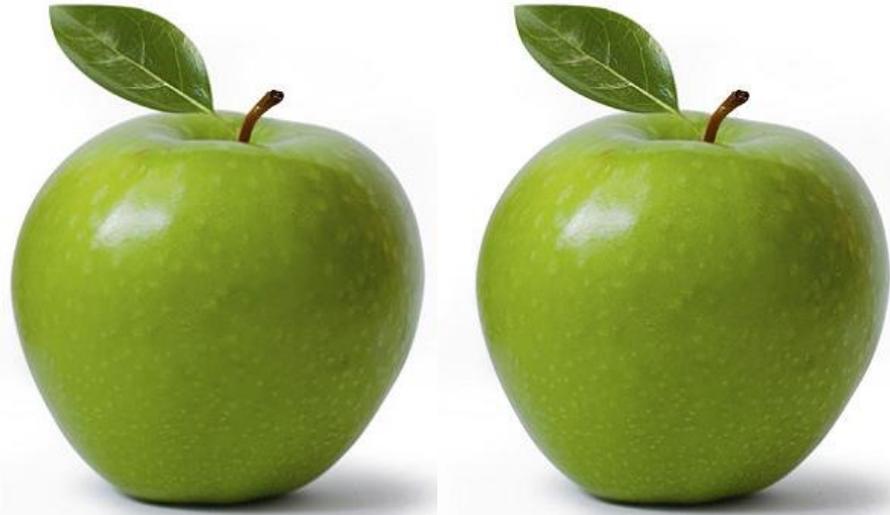
2,500 Mb, 39,000 genes



1,300 Mb, 56,000 genes

15,9 Gb, ??? genes

790 Mb, 57,000 genes



2,500 Mb, 32,000 genes







Conventional breeding



http://www.nsf.gov/news/mmg/media/images/corn-and-teosinte_h1.jpg

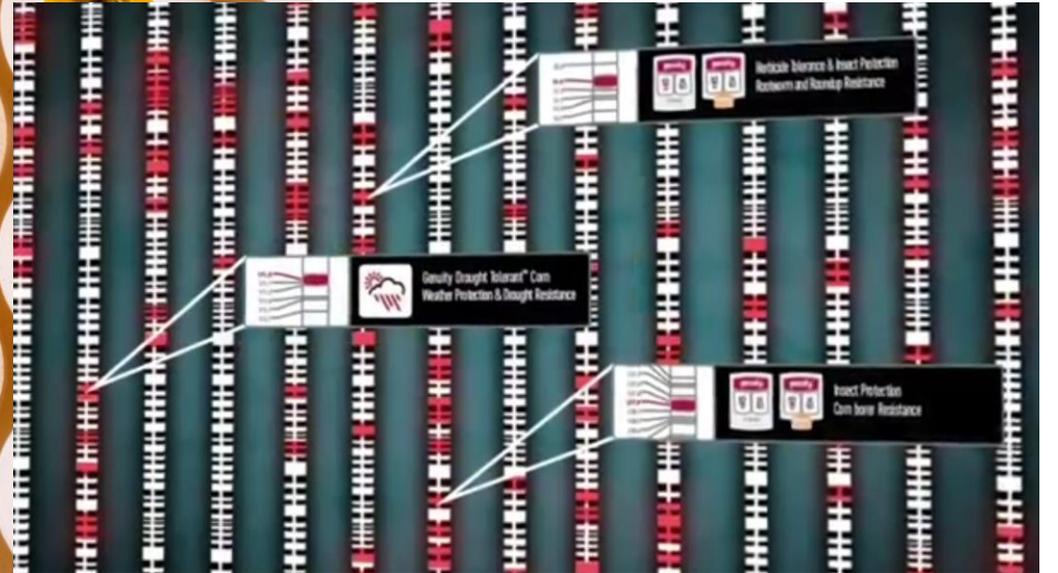
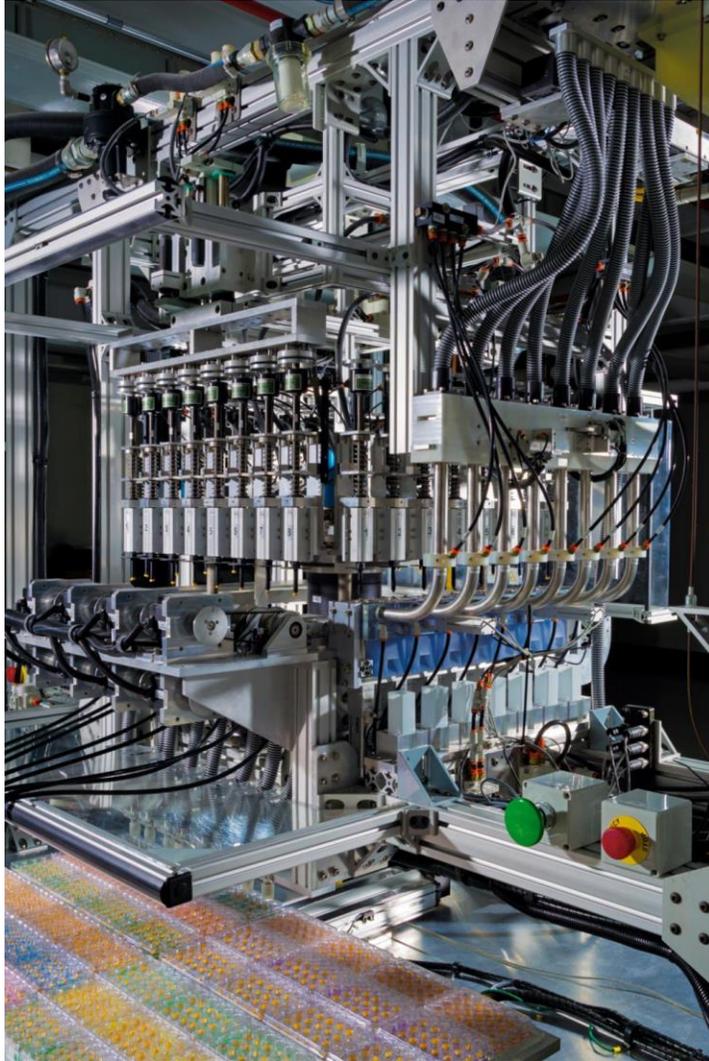
Teosinte was gradually modified into modern maize over 10,000 years

(Conko *et al.* 2016)

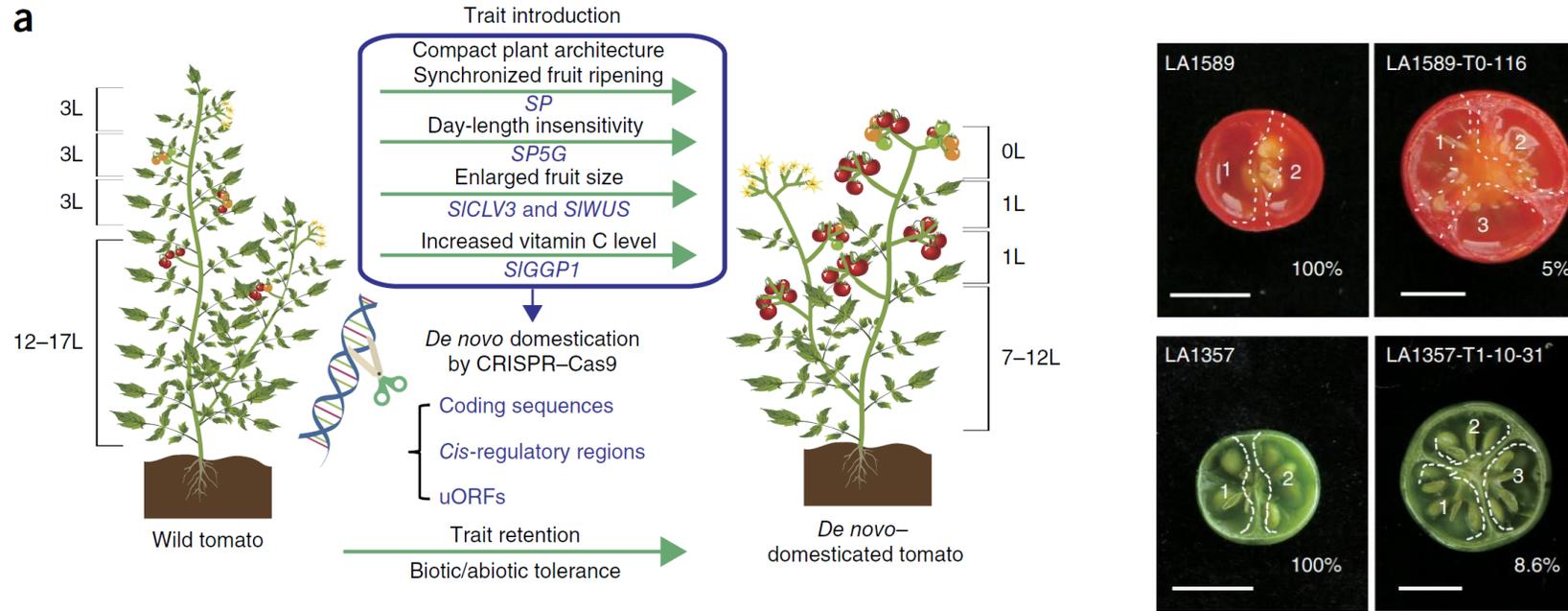
A revolution in technologies driving solutions and bioeconomies

- Genomics
- Systems Biology
- Genome editing and Synthetic biology

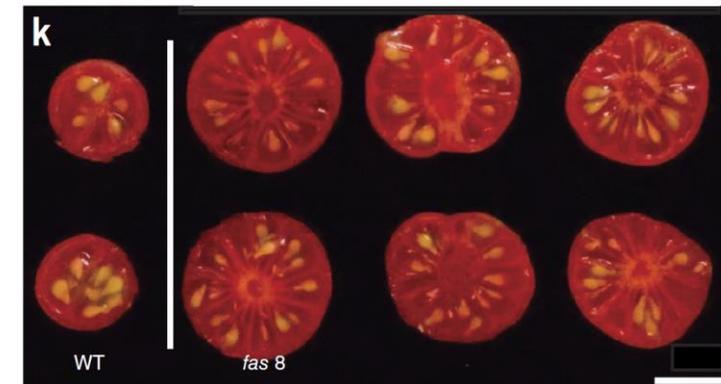
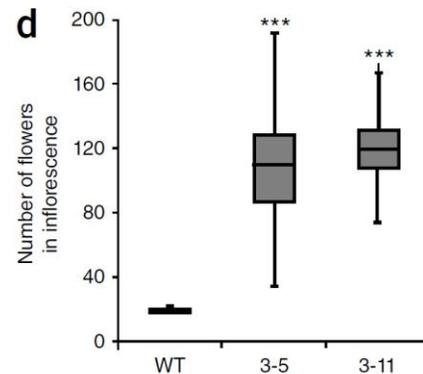
Marker assisted selection



Genome editing for rapid domestication



Li et al., 2018. *Nature Biotechnology*



Zsögön et al., 2018. *Nature Biotechnology*

Why is decoding a plant genome important?

- Evolution
- Conservation
- Molecular biology and Ecology
- Domestication
- Synthetic biology

The value and the challenge

- Genomics, systems biology and synthetic biology will play a major role in **feeding the world** and **producing new greener products**
- Unique plants become even more important resources

70% of the world's biodiversity
can be found in 17 countries



bioRxiv
THE PREPRINT SERVER FOR BIOLOGY

bioRxiv posts many COVID19-related papers. A reminder: they have not been formally peer-reviewed and should not guide health-related behavior or be reported in the press as conclusive.

New Results

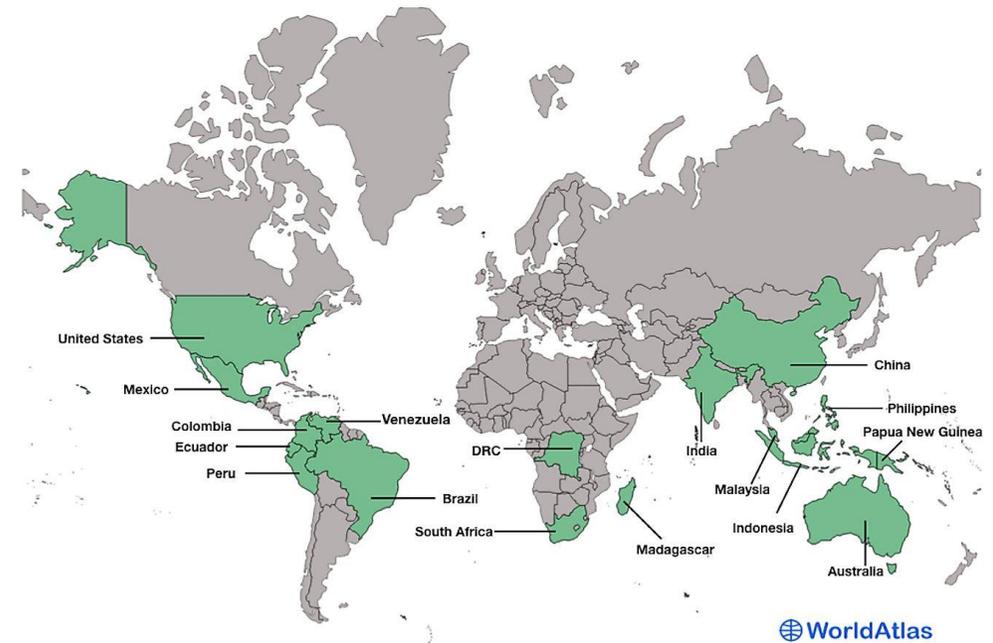
[Follow this preprint](#)

Global disparities in plant science: a legacy of colonialism, patriarchy, and exclusion

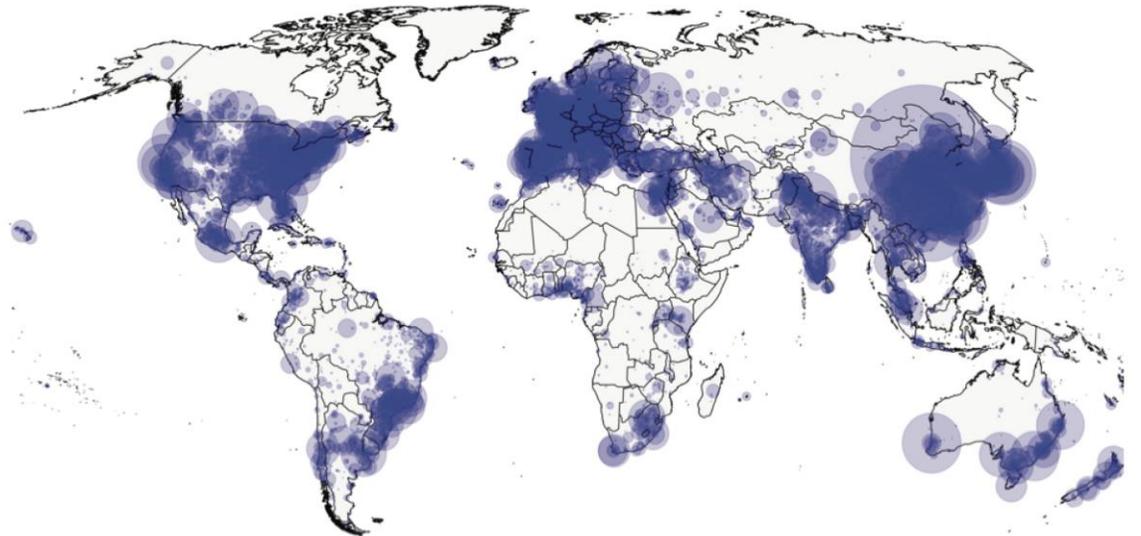
[Rose A. Marks](#), [Erik J. Amézquita](#), [Sarah Percival](#), [Alejandra Rougon-Cardoso](#),
[Claudia Chibici-Revneanu](#), [Shandry M. Tebele](#), [Jill M. Farrant](#), [Daniel H. Chitwood](#), [Robert VanBuren](#)

doi: <https://doi.org/10.1101/2022.10.15.512190>

Global hotspots of biodiversity



Global distribution of plant scientists



Africa and SA

- Southern Africa: 10% of the World's plant species on 0.5% of the Earth's surface.
- Fynbos: ¼ of Africa's biodiversity on 2% of its land
- Table Mountain: As many species as the UK

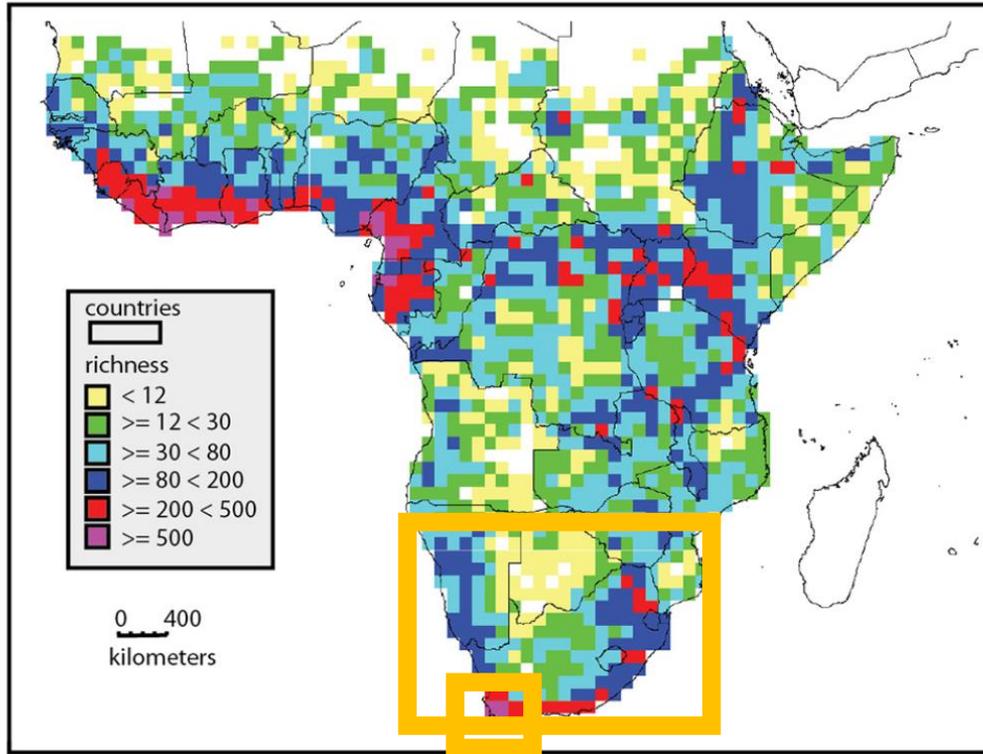


FIGURE 1 | Distribution of species richness in sub-Saharan Africa, based on analysis of 5881 species mapped to a 1° grid. Richness is color coded, yellow squares are most species poor and purple most species rich. This illustrates the high richness of the West African coast, the East African uplands, and the southern tip of the continent.





OPEN

Representation and participation across 20 years of plant genome sequencing

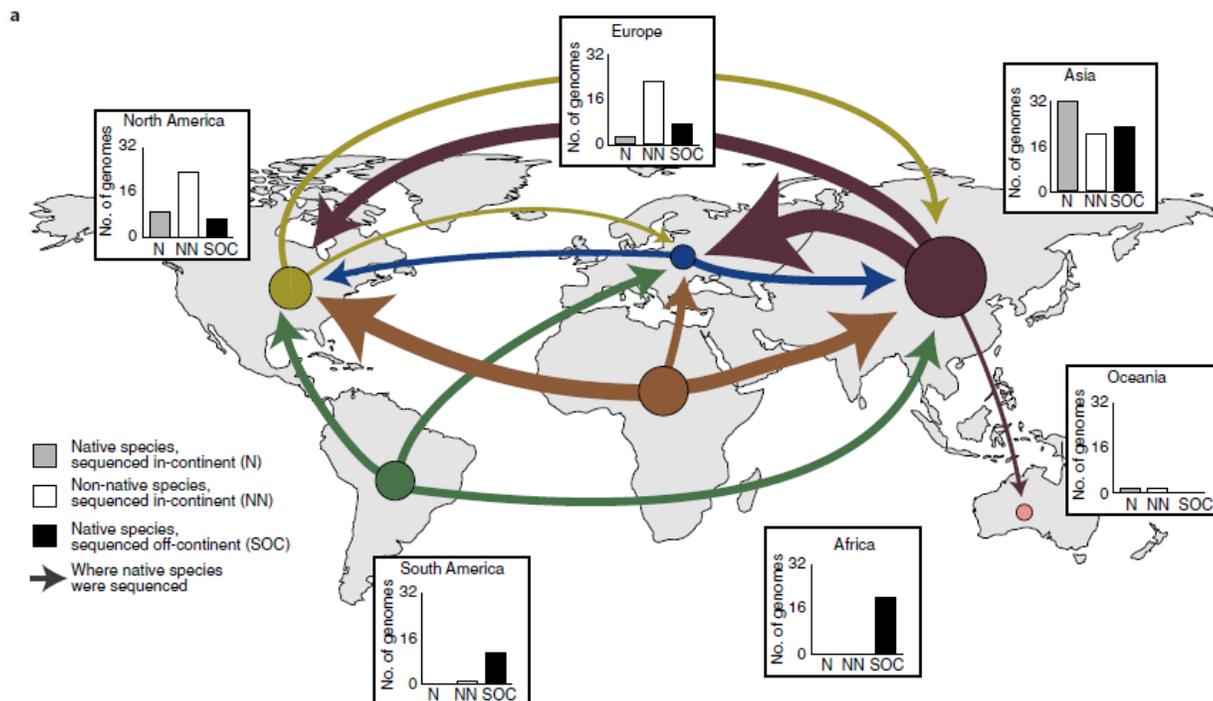
Rose A. Marks ^{1,2,3}✉, Scott Hotaling ⁴, Paul B. Frandsen ^{5,6} and Robert VanBuren ^{1,2}

The field of plant genome sequencing has grown rapidly in the past 20 years, leading to increases in the quantity and quality of publicly available genomic resources. The growing wealth of genomic data from an increasingly diverse set of taxa provides unprecedented potential to better understand the genome biology and evolution of land plants. Here we provide a contemporary view of land plant genomics, including analyses on assembly quality, taxonomic distribution of sequenced species and national participation. We show that assembly quality has increased dramatically in recent years, that substantial taxonomic gaps exist and that the field has been dominated by affluent nations in the Global North and China, despite a wide geographic distribution of study species. We identify numerous disconnects between the native range of focal species and the national affiliation of the researchers studying them, which we argue are rooted in colonialism—both past and present. Luckily, falling sequencing costs, widening availability of analytical tools and an increasingly connected scientific community provide key opportunities to improve existing assemblies, fill sampling gaps and empower a more global plant genomics community.

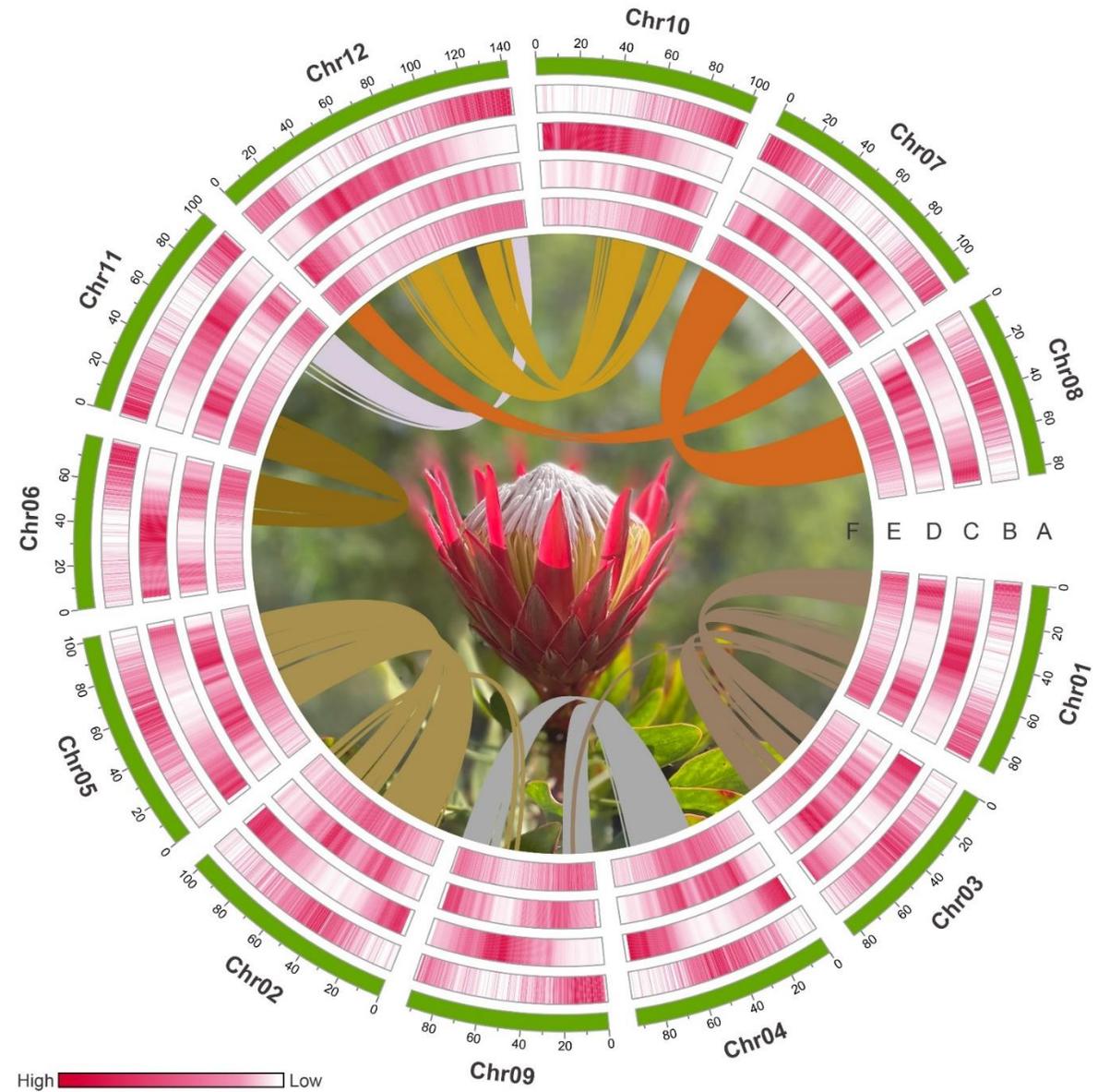
Of the 800 fully sequenced plant genomes, none were led by African researchers and almost none represent endemic African species



Fig. 3 | Geographic distribution of the submitting institutions for 798 plant genome assemblies. Circles are scaled by the number of genome assemblies produced in each nation and coloured by the relative proportion of domesticated, cultivated, feral, natural commodity, wild and wild relative species sequenced.



King Protea: SA National flower and the first endemic SA and Fynbos species to be sequenced and led from the African continent



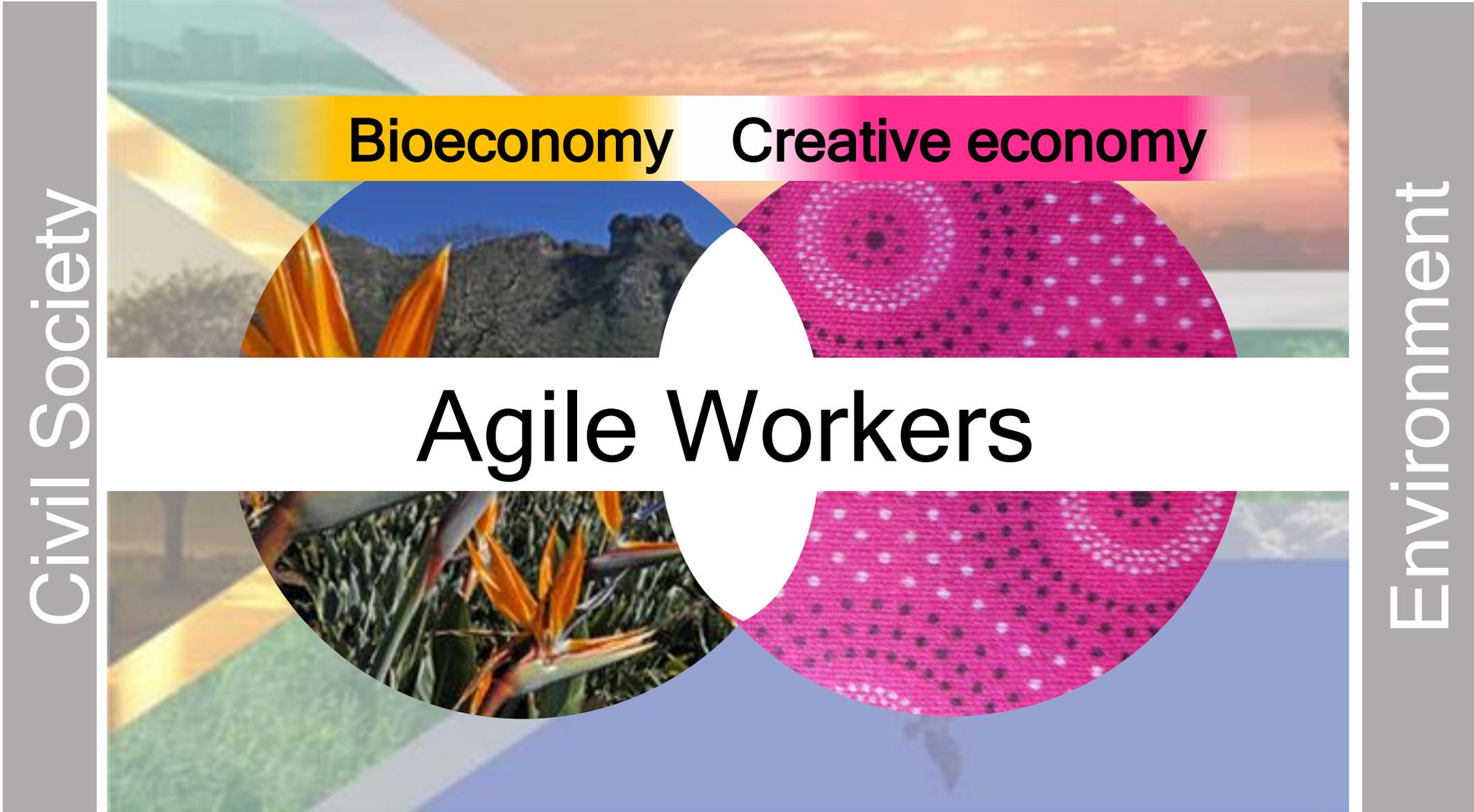
Biodiversity

Biotechnology

Bioeconomy

Our current definition of Bioeconomy is limited and follows similar models to extractive thinking

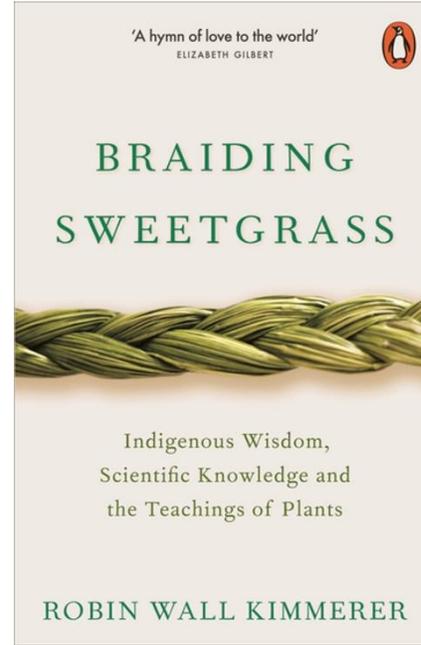
The future of work will rely on traversing multiple economies for sustainable and equitable economic development



Relationship with Nature

New Zealand river granted same legal rights as human being

After 140 years of negotiation, Māori tribe wins recognition for Whanganui river, meaning it must be treated as a living entity



Ecuador's High Court Affirms Constitutional Protections for the Rights of Nature in a Landmark Decision

The seven justices of the Constitutional Court found that mining activities pursued by a state mining company and its Canadian partner threatened the Los Cedros protected area's right to exist and flourish.

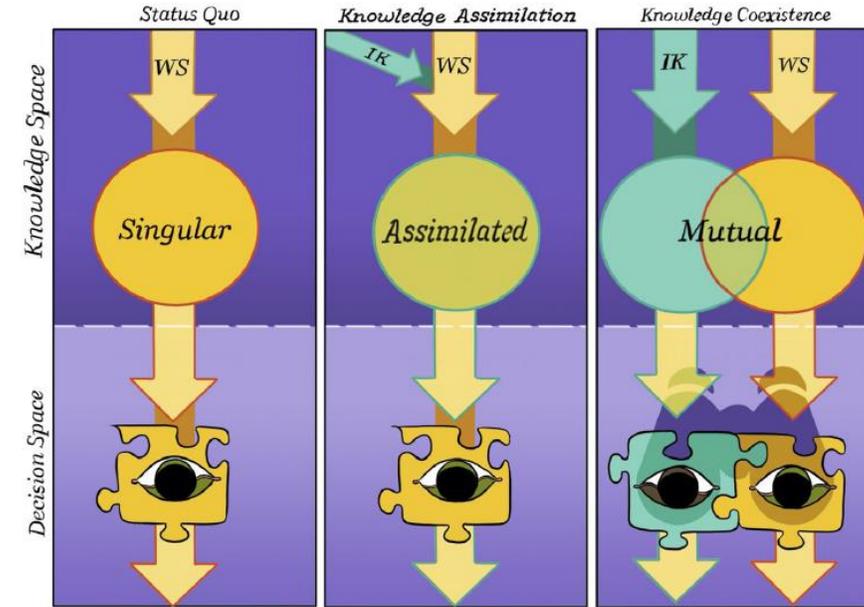


FIGURE 3 A conceptual framework detailing the flow of knowledge (IK, Indigenous knowledge; WS, Western science) that underpins researchers' understandings or views of reality, and ultimately guides their research and management decisions, as classified under three main archetypes. Status Quo (left) depicts a "one-eyed" approach that accepts solely Western science as a valid knowledge system, producing a singular understanding that informs decision-making. Knowledge assimilation (centre) is typical of many management approaches that incorporate Indigenous knowledge into Western science for an improved understanding to inform decision-making, ultimately producing another "one-eyed" approach (however, the reverse situation can also occur whereby Indigenous peoples utilize Western scientific approaches to inform their decision-making that is guided principally by Indigenous knowledge; also "one-eyed" but in the inverse orientation). Lastly, Knowledge coexistence (right) shows an approach where Western science and Indigenous knowledge contribute in parallel to produce a mutual understanding from which context-specific decisions are formed—this reflects an approach that is congruent with Two-Eyed Seeing (represented here by the same symbology shown in Figure 1). Artwork by Nicole Burton [Colour figure can be viewed at wileyonlinelibrary.com]

Bioeconomy

Creative economy



Representation of SA biodiversity

Culture and Identity

Protea: “Emblem of the beauty of our land and the flowering of our potential as a nation in pursuit of the African Renaissance.”





Strelitzia reginae Aiton 'Mandela's Gold'

Family: Strelitziaceae

Common names: Mandela's Gold strelitzia, yellow strelitzia, yellow crane flower, yellow bird of paradise, geelkraanvoel blom, geel piesang

[QR code link](#)

Strelitzia reginae 'Mandela's Gold' is a rare yellow form of



Description

'Mandela's Gold' is a stemless, evergreen clump-forming perennial. Greyish green, banana-like leaves grow to a height of about 1.5 m and during winter and spring the large bird-like flowers are held above the foliage on the tips of long, sturdy stalks. The structure and pollination of the flowers is fascinating. The hard, beak-like sheath from which the flower emerges, is called the spathe. This is held at right angles to the stem, and has the appearance of a bird's head.

Each spathe contains 4 to 6 flowers, and these emerge one at a time from the spathe. Each flower consists of 3 clear yellow sepals and 3 deep purple petals. The yellow sepals give the appearance of a crest on the 'bird's' head. Two of the purple petals are joined together around the stamens and the style to form an arrow-like structure. The third purple petal is visible as a small scale.

Corporate



PROTEA HOTELS®

MARRIOTT



PROTEA
CAPITAL MANAGEMENT



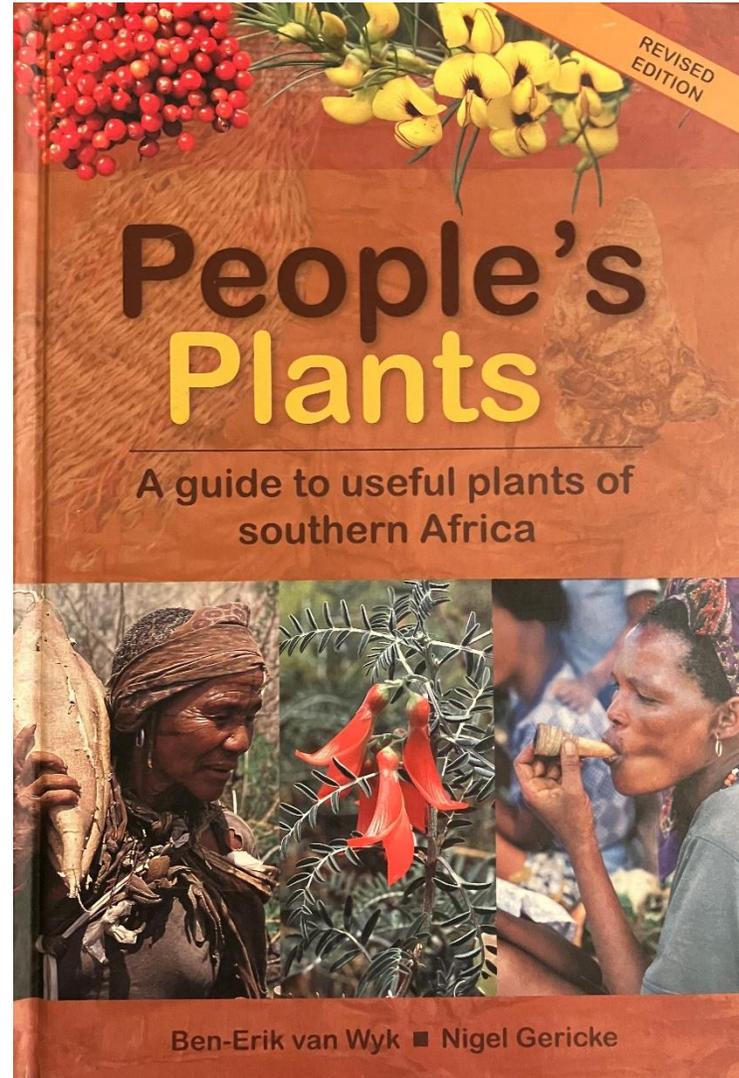
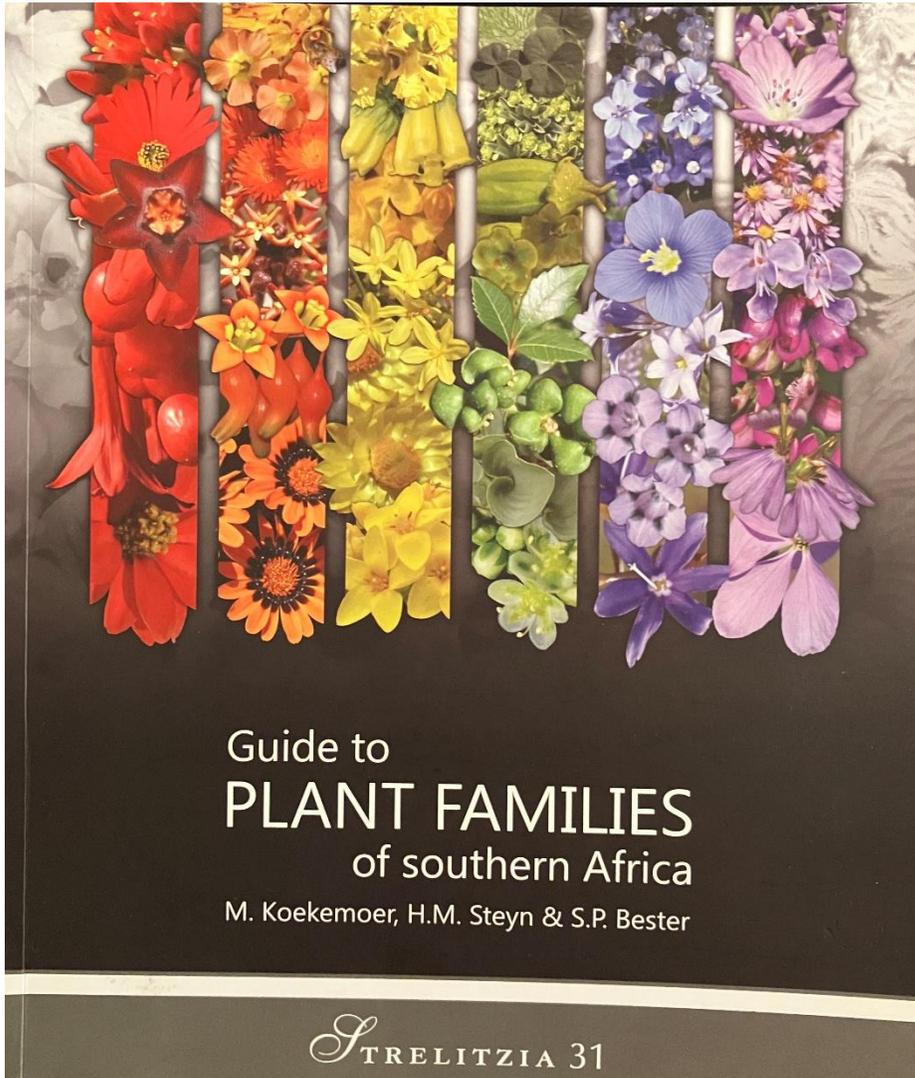
PROTEA FINANCIAL



Protea
engineering
INNOVATIVE ENGINEERING SOLUTIONS



Access to knowledge



- Botanical language
 - Aimed at scientists
 - Book format
 - Relatively high cost
 - Lack of representation of indigenous knowledge
- English**

Aesthetics of Biodiversity

Ads · Shop protea art



King Proteas | Framed & Canvas...
ZAR 995.00
Pixalot



Queen Protea Art in Cobalt 100cm W x...
ZAR 3,300.00
Hertex Haus



Protea | Framed & Canvas Wall Art b...
ZAR 995.00
Pixalot



Peachy Proteas | Framed & Canvas...
ZAR 1,150.00
Pixalot



Protea Wall Art, 2900 x 1400 x 20 ...
ZAR 14,894.00
Design11



Protea Wall Art, 1040 x 535 x 20 /...
ZAR 3,660.00
Design11



View all



Protea - Premium Quality Wal...
livingcanvas.co.za



Protea art, Flower painting, ...
pinterest.com



KING PROTEA PAINTING CO...
addictedtoart.co.za



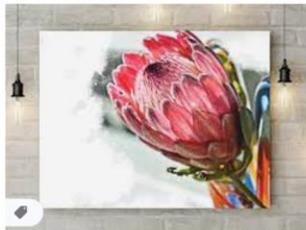
Proteas - Nw...
nwabisa.com



Protea Art | Fine Art America
fineartamerica.com



King Protea | Posters, ...
europosters.eu



Art Cube | Protea 4 - Odyssey Apparel
artisansmarketapp.co.za · In stock



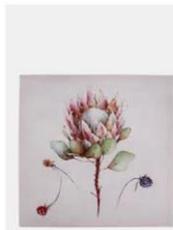
King P...
redbubli



Protea Art Print by Nadja |...
society6.com · In stock



Protea Art Set Print 693 - ...
artworld.co.za · In stock



Fallen Protea Canvas ...
mrphome.com



Wall Art



Painting by Lauriana Glenny | Saatchi Art
saatchiart.com · In stock

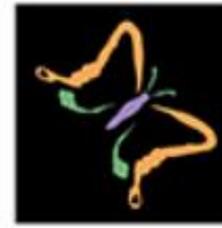


Navy Blue Protea Wall Art So...
etsy.com · In stock

SANBI

Biodiversity for Life

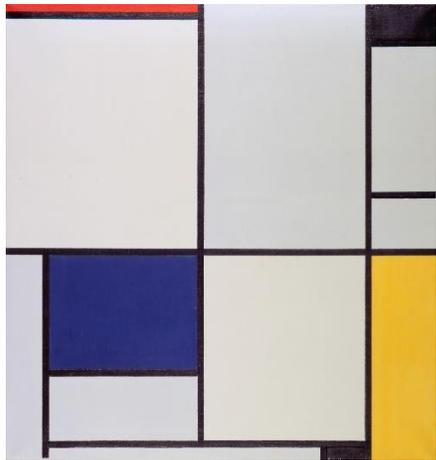
South African National Biodiversity Institute



[Home](#) »

[Gardens](#) »

[Pretoria](#)



Creative Economy





FREE DELIVERY..... ALWAYS! No minimum spend!

Home > Creator Expert > LEGO® Creator Expert Bird of Paradise



FROM THE DESIGN TEAM

Chris McVeigh travelled all the way from his native Canada to become a LEGO® designer at LEGO HQ in Billund, Denmark and this Bird of Paradise set is his first model in the LEGO Botanical range. Chris is particularly proud of the model's repositionable flowers and the fact that the model sways just like a real plant when placed in a light breeze.

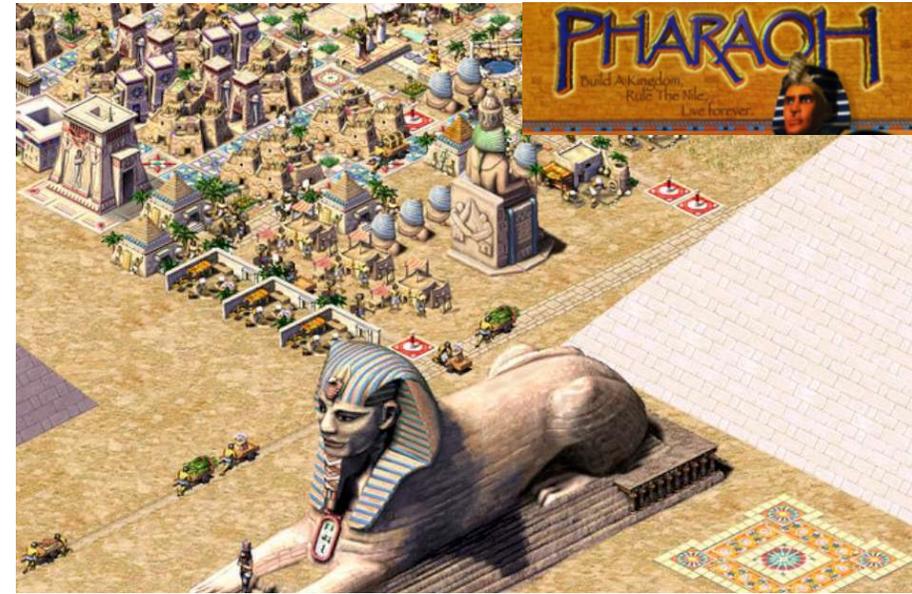


STRELITZIA REGINAE

This stunning flowering plant is indigenous to South Africa and can grow up to 2 meters (6.5 feet) tall. It produces a brilliant orange plume-like flower that resembles the head of a bird, which inspired the plant's more colloquial names, Bird of Paradise, or Crane Flower. The brilliant beauty of its flower tends to leave a lasting impression on anyone who sees it during their tropical travels.



<https://bit.ly/3LL4N3w>





Birding Like It's 1899: Inside a Blockbuster American West Video Game

In "Red Dead Redemption 2," a birder finds joy and despair in a realistic portrayal of wildlife in the pre-conservation era.



By **Nicholas Lund**
January 02, 2019

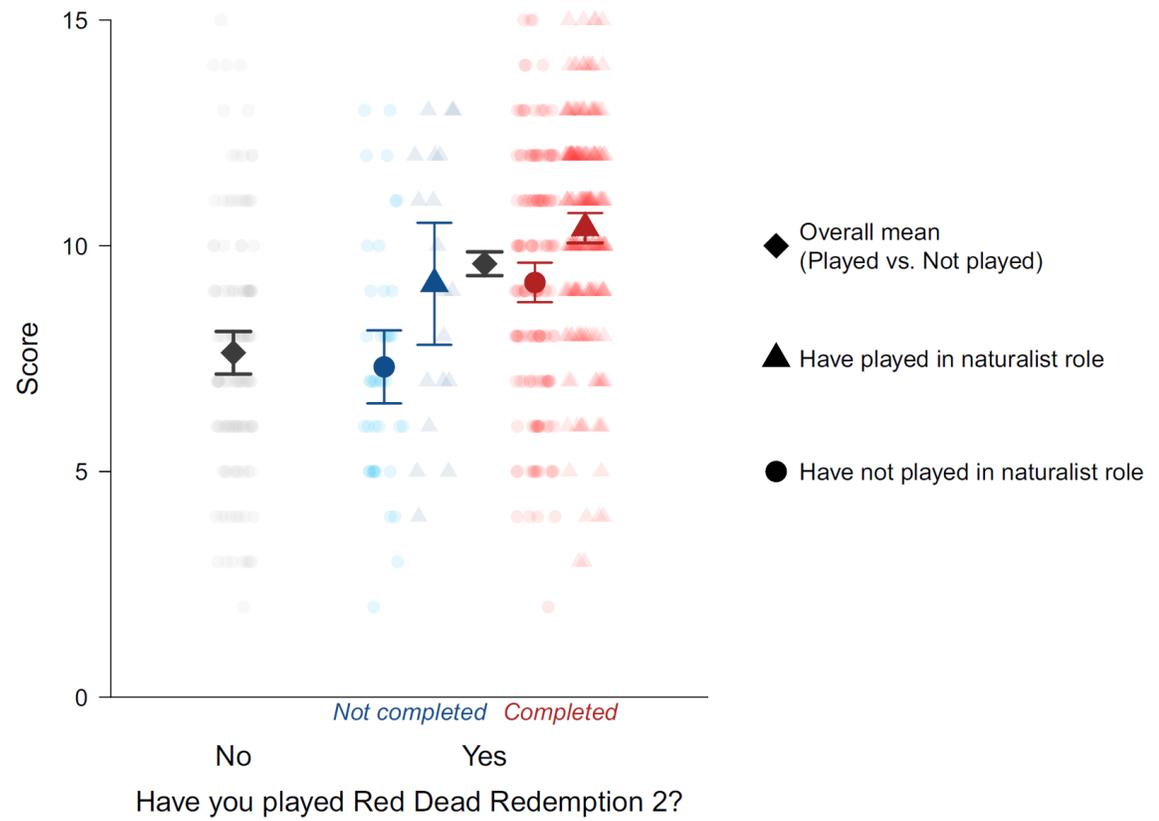
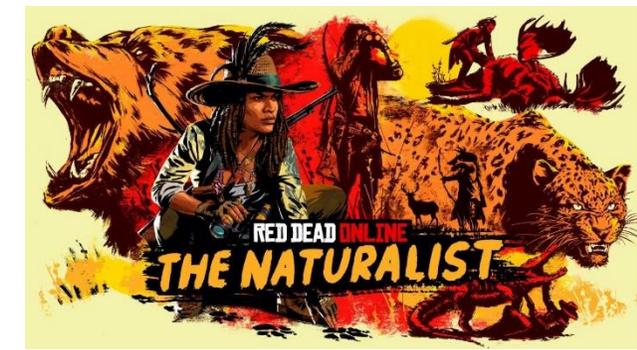
The first time I see ravens, I flush them out of an alpine meadow carpeted with wildflowers. I pause to watch the flock fly off towards the distant, snow-capped peaks, trailed by their echoing croaks, when a man riding by on horseback bumps into me. Irritated, I shoot the man dead, and take his hat. So it goes in "Red Dead Redemption 2."

Birds Tell Us to Act on Climate

Pledge to stand with Audubon to call on elected officials to listen to science and work towards climate solutions.



The educational value of virtual ecologies in Red Dead Redemption 2



there was a hidden quest to kill a certain species of bird, after enough kills I got a notification of a finished quest, reading the description it said they were wiped from the face of the earth. It made me feel really bad for doing it, and the fact that all I got was that message with no reward, showed how evil and careless I was...

If you accidentally glitch outside the map, all the animals are frozen in place... I remember walking up to every animal I could find just to stare. Each and every one was so beautiful and life-like. Even down to the twitch of a deer's nose... I just remember thinking hey, this is real. You can go outside right now and see all of this.

Riders Republic Rebirth and Climate March – Creating Real World Change With an In-Game Demonstration

July 28, 2022
Jessica Sandifer



Eco logical
nomic

cultural

justice

Ecocultural justice

- **Refers to:** Intersection between economic, ecological and cultural justice
- **Can be observed in:** Intersection of Bioeconomy and Creative Economy
- **Ecocultural Injustice can be broadly defined as:**

Exclusion from or exploitation of Nature and Peoples

Corporate Branding



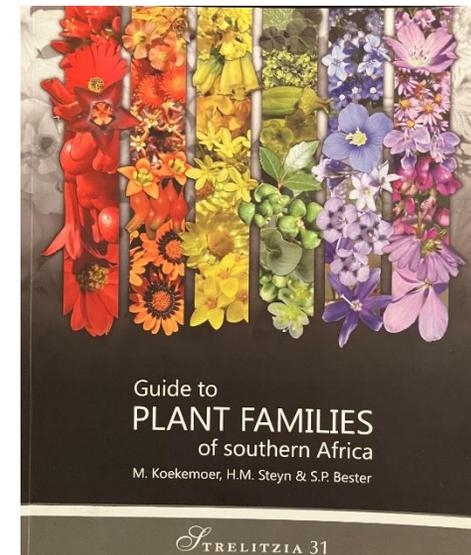
Aesthetics of Biodiversity



Creative Economy and Education



Access to Knowledge



Eco-cultural justice

+ Contribution to Identity

Produced for commercial value

+ Environmental Impact

Depiction of Nature



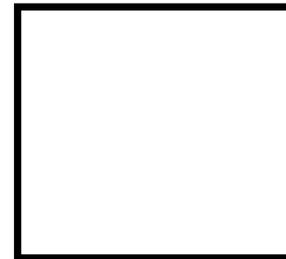
Identity



- Anchors of identity
- Sources of pride
- Sources of shame
- Sources of conflict and identity crisis
- Anchors for others for exclusion



Abundant representation
of these identities and
communities in my
environment



First Generation
Immigrant

David Tlale's top picks from #AFIJFW

SOLD OUT



MSHRT8 - SHIRT

R 9,400.00 ZAR

SOLD OUT



MNSSHRT1 - SHIRT

R 8,600.00 ZAR



MSH13.1

R 4,600.00 ZAR



MUTP7

R 5,600.00 ZAR



What have I started doing?

The genome of the king protea, *Protea cynaroides*

Jiyang Chang^{1,2}, Tuan A. Duong^{2,3}, Cassandra Schoeman², Xiao Ma¹, Danielle Roodt², Nigel Barker³, Zhen Li¹, Yves Van de Peer^{1,4,5} and Eshchar Mizrahi^{2,*}

¹Department of Plant Biotechnology and Bioinformatics, Ghent University and VIB Center for Plant Systems Biology, Ghent, Belgium,

²Department of Biochemistry, Genetics and Microbiology, Forestry and Agricultural Biotechnology Institute, University of Pretoria, Pretoria, South Africa,

³Department of Plant and Soil Sciences, University of Pretoria, Pretoria, South Africa,

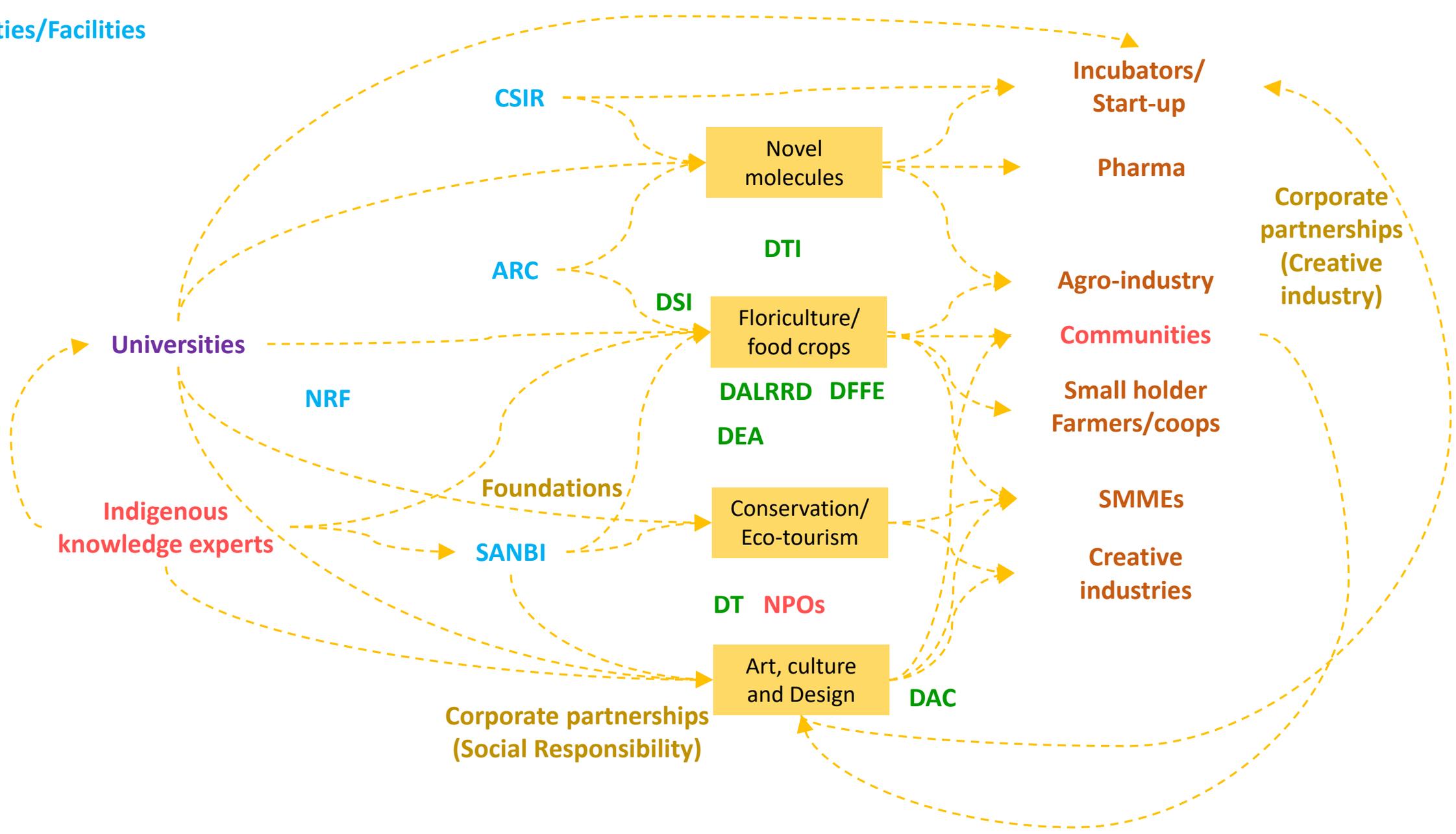
⁴Department of Biochemistry, Genetics and Microbiology, Centre for Microbial Ecology and Genomics, University of Pretoria, Pretoria, South Africa, and

⁵College of Horticulture, Academy for Advanced Interdisciplinary Studies, Nanjing Agricultural University, Nanjing, China

ACKNOWLEDGEMENTS

EM acknowledges funding from the Technology Innovation Agency of South Africa, the Genomics Research Institute, University of Pretoria, and from South Africa's National Research Foundation (Grant UID 116239). YVdP acknowledges funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program (No. 833522) and from Ghent University (Methusalem funding, BOF.-MET.2021.0005.01). TAD acknowledges infrastructure support from Prof. Brenda D. Wingfield, made possible by the DSI-NRF SARCHI Chair in Fungal Genomics (Grant UID 98353). NB acknowledges funding from the National Research Foundation of South Africa (Grant UID 113296) and the Genomics Research Institute, University of Pretoria. The authors acknowledge that the King Protea is a cultural icon of South Africa, and that it is "an emblem of the beauty of our land and the flowering of our potential as a nation in pursuit of the African Renaissance. It also symbolizes the holistic integration of forces that grow from the earth, nurtured from above" (Government Communication and Information System, n.d.). We dedicate the completion of this genome to all past, present and future researchers working on – as well as peoples benefiting from – South African Biodiversity.

- Government department**
- National Entities/Facilities**
- Academia**
- For Profit**
- Donors**
- Civil society**





**Dr. Puleng
Makhoalibe**



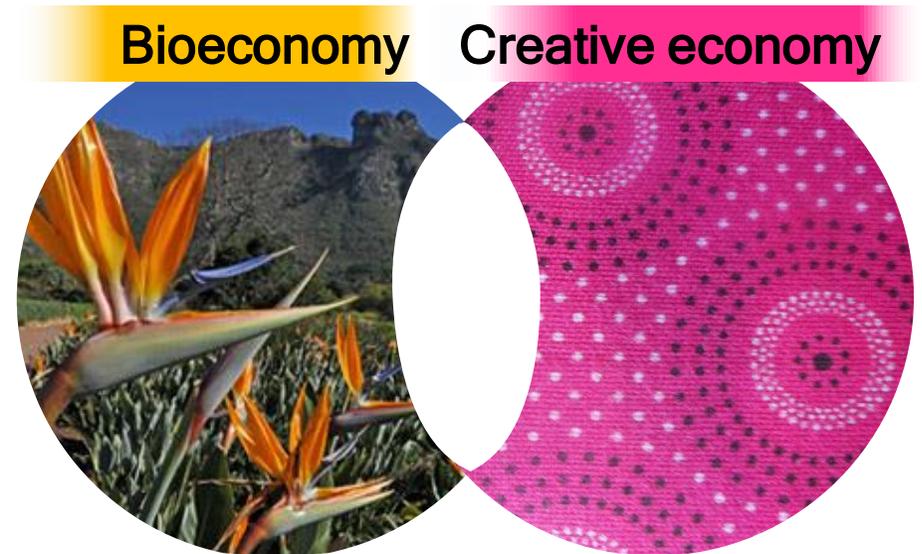
How might we?

- Build industries of the future that
- Promote Resilience and Sustainability
- Integrate Resilience and Creative Learning
- Enhance digital skills culture
- Empowering youth and other stakeholders
- Foster alignment of private and public



How might we?

- Unlock these new economies through the lens of
 - Biodiversity
 - Sustainability
 - Unique SA culture
 - Empowering youth and elder wisdom
 - Building industries of the Future





Fynbos Biome Sticker packs

Brando Tucker

0+

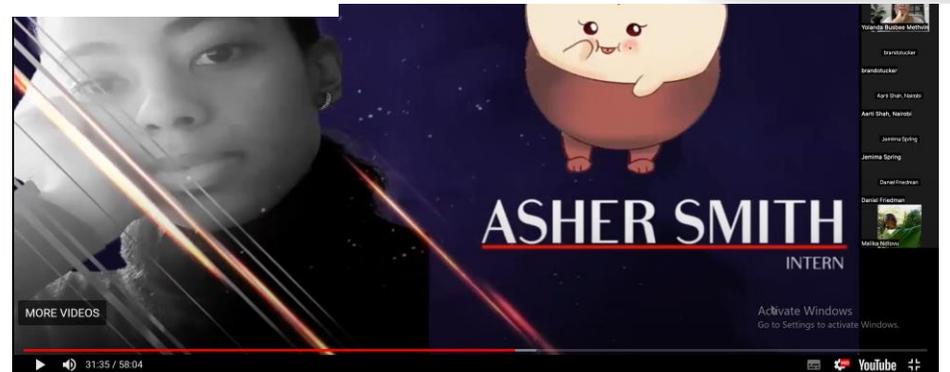
Downloads

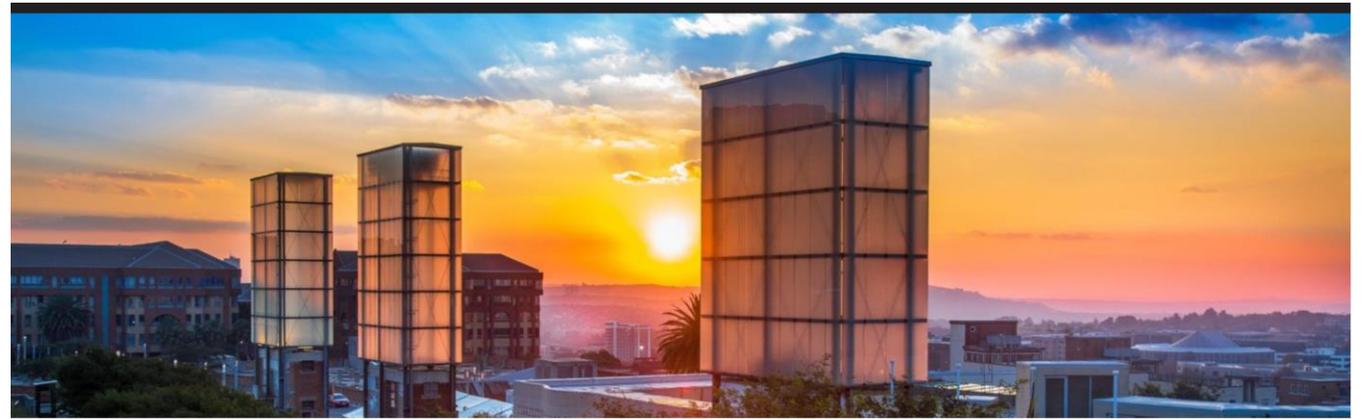
3+

Rated for 3+ ⓘ

R 16,99 Buy

Add to wishlist





Welcome to Constitution Hill

**CREATIVE ECO PROJECT:
DIGITAL ECO RESPONSE**

**A project connecting
ECOLOGY//ECONOMY//CREATIVITY**

We are looking for creatives that are passionate about their environment, South African biodiversity, public art, engagement, and the sharing of knowledge.

visual artists x20

animators / graphic designers / bloggers x10

Click on link in description to apply

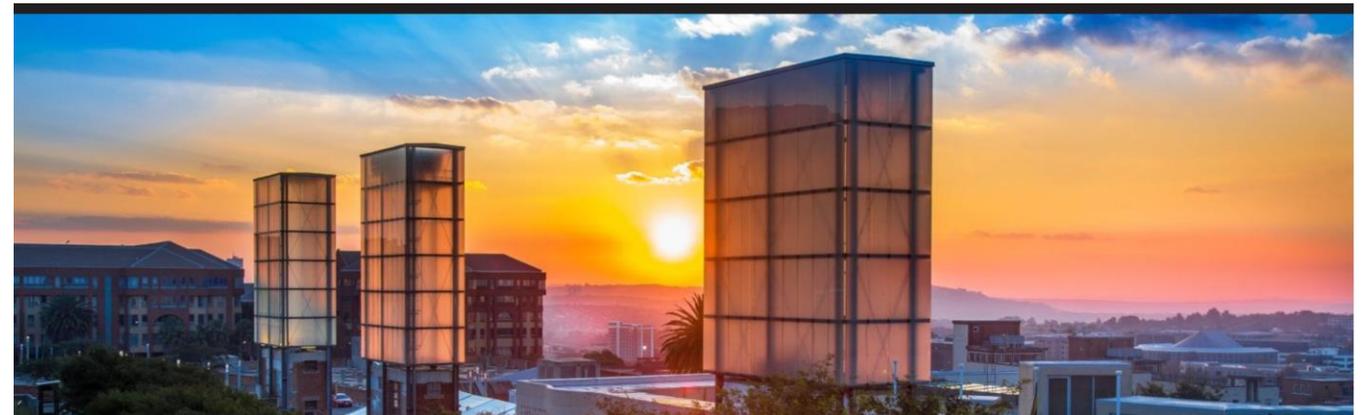
OPEN CALL CLOSSES ON 22 FEBRUARY 2023





Faculty of Natural and Agricultural Sciences

Fakulteit Natuur- en Landbouwetenskappe
Lefapha la Disaense tša Tihago le Temo



Welcome to Constitution Hill

My Invitation

- Common gardens and Biobanking
- Accessibility to scholarly resources
- Urban gardening and agriculture
- Bio+Creative economy opportunities
- Coordinate united push for funding and collaboration across SA

Questions to ask ourselves regarding “Justice”

- What gets portrayed?
- Is there a particular aesthetic that is dominant in the environment?
- Who is the target audience/consumer?
- Who benefits?
- How much does educational content cost?
- To what extent is it SA and Africa focused?
- What language is it available in?
- Is it produced in SA? Do South Africans benefit and if so is there representation of who benefits?
- How much do the creative industries deal with SA biodiversity? Music? Fashion? Other media? Games? Podcasts? What else?

Reflecting as art leaders

- What is my role as an art leader in South Africa?
- What could I do in this ecosystem of creativity to restore and create eco cultural justice?

Thank you.



[FABI](#) [Research Groups](#) [People](#) [Resources](#) [Galleries](#) [Vacancies](#)



Eshchar.Mizrachi@fabi.up.ac.za

Or Google “APSB FABI”