



No Better Time to Practice Open Science Than Now

Wikimedia GER Open Science Fellows Program

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Outline

William Kamkwamba's story and Open Science (OS) in Malawi

How Open Science influences my work

Bioeconomies in Africa

Open Science and COVID-19

Open Science projects and initiatives disrupting the status quo



Image: [Alvaro1984 18 - Own work](#)
Public Domain

William Kamkwamba and Open Science

Challenge: Water-scarcity due to drought

A 14 year old boy from Malawi

Applying the Principles of Open Science

To build an electricity-producing windmill



Image : Ilze Kitshoff/Netflix

Vidoe: [youtube.com/watch?time_continue=5&v=nPkr9HmgIG0](https://www.youtube.com/watch?time_continue=5&v=nPkr9HmgIG0)

Local challenges inspiring the use of OS in Africa

A need for frugal innovation

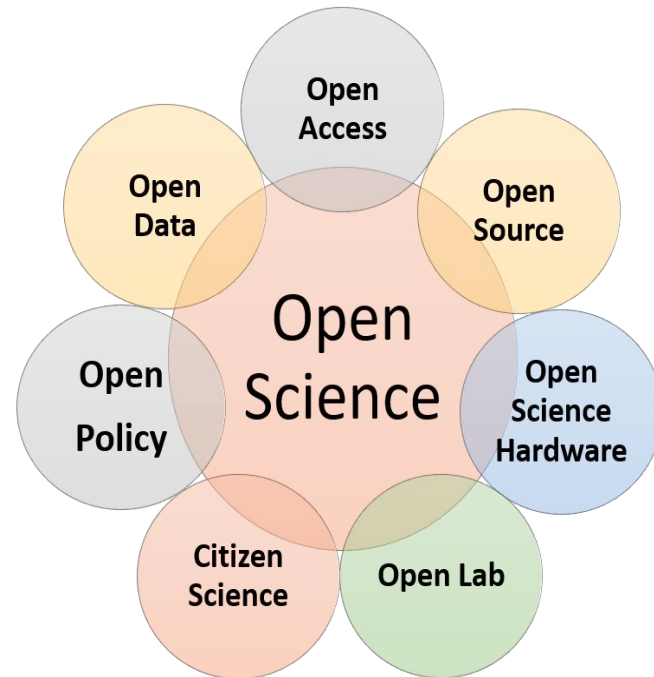
Frugal technologies cannot be developed without Open Science

Applied OS principles:

- Open Access

- Open Hardware

- Open Collaboration





How Open Science influences my work

everyday for the past 3-4 years.

In my formative years I was extensively involved in citizen science/ public engagement with science

Currently my work is at the interface of **open technologies** in biology and **Open Science Hardware**

My motivation to get into Open Science has largely been influenced by the word **ACCESS**



@prac_sciencelab



@AfricaOSH

AFRICA
OPEN SCIENCE
HARDWARE



@openbioeconomy

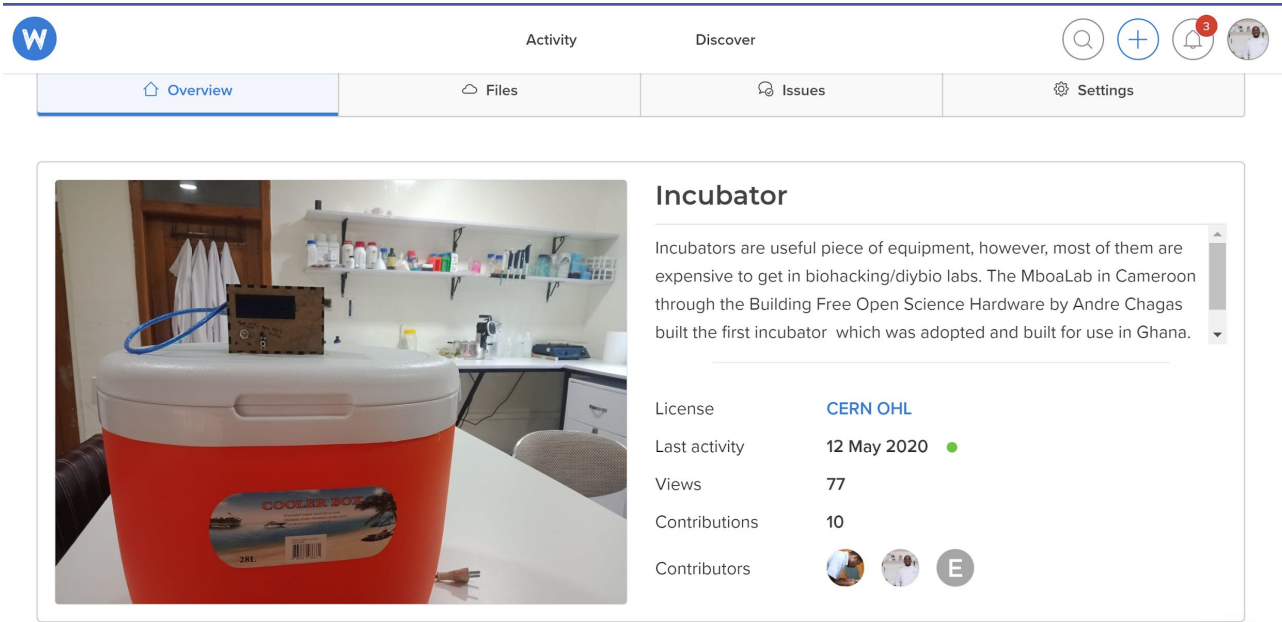


@hivebiolab



@beneficial.bio

My first Open Science Hardware at work



The screenshot shows a Wikifactory project page for an "Incubator". The page layout includes a top navigation bar with a "W" logo, "Activity", "Discover", and search, plus, and notification icons. Below this is a secondary navigation bar with "Overview", "Files", "Issues", and "Settings". The main content area features a photograph of a red and white cooler box with a cardboard incubator unit on top, situated in a laboratory setting. To the right of the photo, the title "Incubator" is followed by a descriptive paragraph: "Incubators are useful piece of equipment, however, most of them are expensive to get in biohacking/diybio labs. The MboLab in Cameroon through the Building Free Open Science Hardware by Andre Chagas built the first incubator which was adopted and built for use in Ghana." Below the description, the license is listed as "CERN OHL", and the last activity is dated "12 May 2020". Other statistics shown are "Views: 77" and "Contributions: 10". The contributors section displays three circular profile icons.

<https://wikifactory.com/+biolabkh/incubator>



André Maia Chagas



What do you think?

Does open mean free?



Bioeconomies in Africa

Africa has plenty of region-specific bio-based resources incl. flora, fauna, microbes

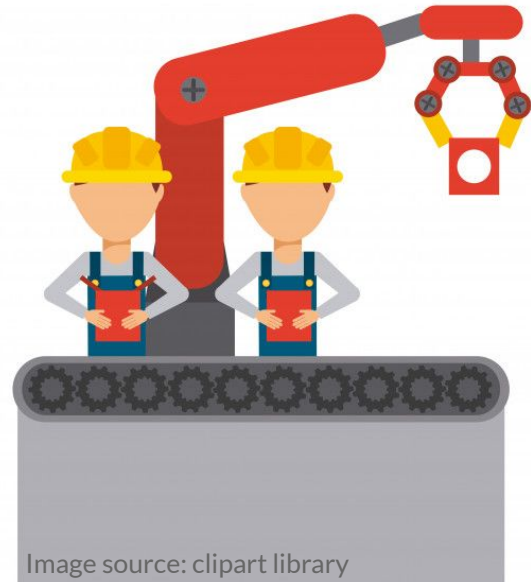
Need to invest in infrastructure and laboratory resources for e.g. medicinal supply such as vaccines



Image: [wikimedia.org/wikipedia/commons/
Martin23230](https://commons.wikimedia.org/wiki/File:Map_of_Africa_highlighted_in_green.png)

Transforming Bioeconomies

Biology is a manufacturing technology capable of transforming many African economies into a self-reliant and sustainable one without overdependence on foreign support.



Investment in African Bioeconomies

Investments by African governments and her development partners have been biased towards certain areas including the digital, service and traditional agricultural innovations to the neglect of her innate bioeconomies.



Image source: clipart library

What is lacking in Africa



NATIONAL BIOECONOMY BLUEPRINT

“The world is shifting to an innovation economy and nobody does innovation better than America.”

—President Obama, December 6, 2011

Economic activity that is fueled by research and innovation in the biological sciences, the “bioeconomy,” is a large and rapidly growing segment of the world economy that provides substantial public benefit.¹

The bioeconomy has emerged as an Obama Administration priority because of its tremendous potential for growth as well as the many other societal benefits it offers. It can allow Americans to live longer, healthier lives, reduce our dependence on oil, address key environmental challenges, transform manufacturing processes, and increase the productivity and scope of the agricultural sector while growing new jobs and industries.

Changing narratives: Ethiopian Biotechnology Institute



Visit us

Vision

Vision

To see product and services of biotechnology and emerging technologies utilize by our citizens as effective tools and innovative solution in their daily life.

Open Science and COVID-19



Overcoming the **#coronaviruspandemic** requires;

- Open Science; collective intelligence
- Better healthcare systems

Challenges

- Loss of livelihood
- Disrupted supply essential medical supplies
- Weak healthcare systems

Open COVID Pledge



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Open Bioeconomy Lab has supported the establishment of the Open COVID Pledge through Dr Jenny Molloy, who is a member of the Steering Committee that designed and rolled out the initiative.

The ethos of the Pledge is tightly aligned with the ideology of The Open Bioeconomy Lab. Projects operating in The Open Bioeconomy Lab that have escalated priority in these extraordinary times are the [Open Enzymes Collection](#) and the [Public Domain Gazette](#); however, all projects run in the spirit of open science, collaboration, and sharing information.

<https://opencovidpledge.org/>

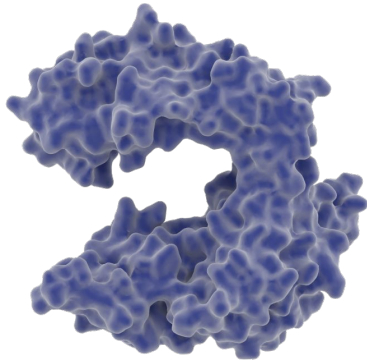
Research in Diagnostics Collection

Enable researchers globally to undertake research in diagnostic by producing their own reagents.

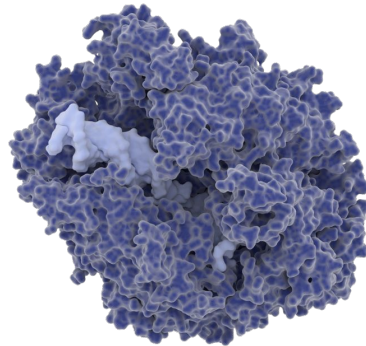
Genetic parts (plasmids, etc)

Local biomanufacturing of COVID-19 diagnostic reagents

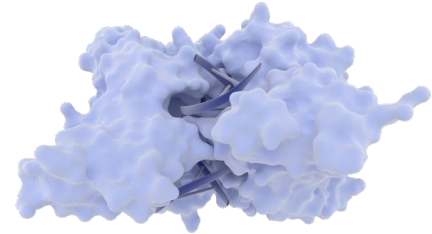
Overcome reagent supply chain huddles



DNA Polymerase



RNA Polymerase



Restriction Enzyme

Reclone.org

A global collaboration for equitable access to biotechnology

An open platform that enables scientists and researchers globally to share biological commons.

<https://reclone.org/>

A GLOBAL COLLABORATION FOR EQUITABLE ACCESS
TO BIOTECHNOLOGY

Reagent Collaboration Network

We are scientists from across the world seeking to support each other in accessing reagents for research and diagnostics, through sharing and partnership.

Our current focus is addressing the needs of scientists researching COVID-19.

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Just One Giant Lab

<https://app.jogl.io/>



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SUSTAINABLE DEVELOPMENT GOALS

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COVID-19 AND DEFORESTATION? NASA CHALLENGE

#NASAEnviroChallenge

Join this project to answer the question: "what are the environmental impacts of COVID-19 in Low- and Middle- income countries?"

by Arthur Donaldson

1 Member
0 Needs



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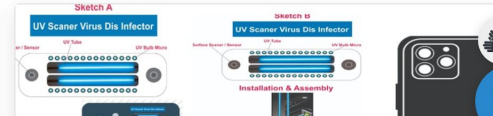
MATTERMORE

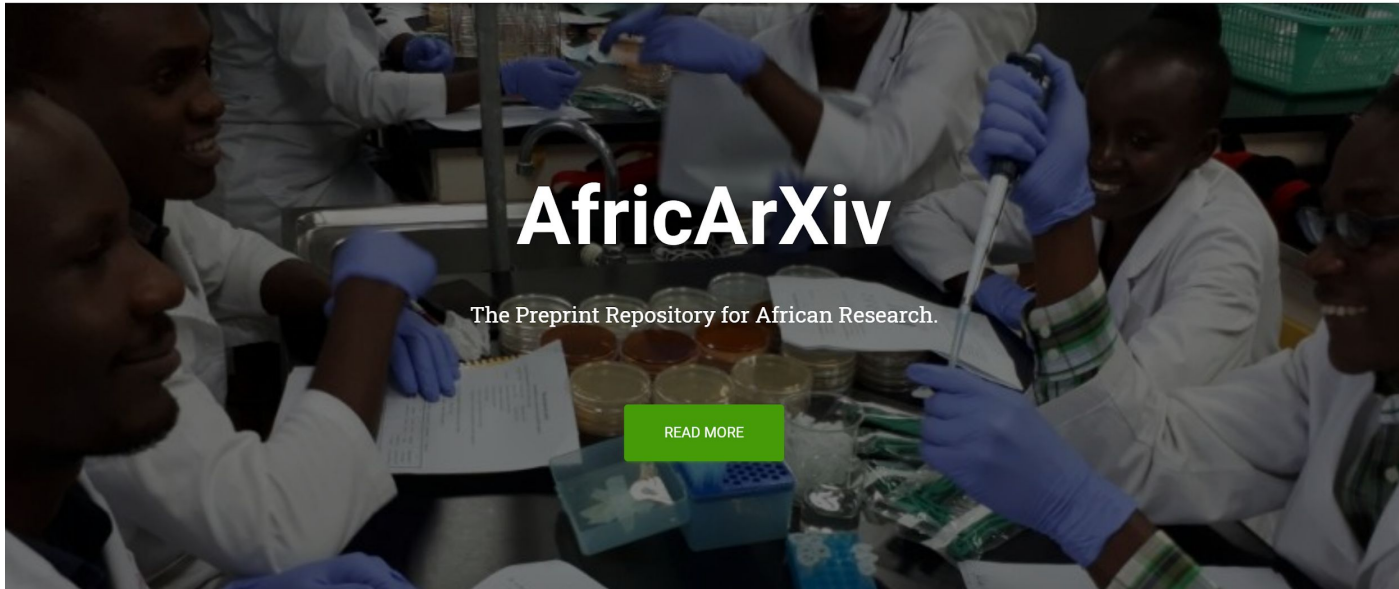
#Mattermore

Planetary health

by Olli Tiainen

1 Member
0 Needs





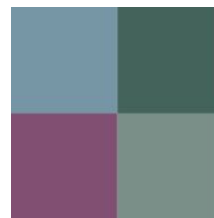
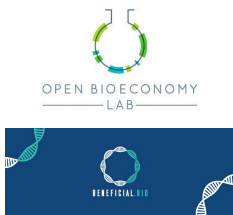


“Adversity is always a teaching moment if we approach it with a healthy mindset. Be it online harassment and bullying, or a pandemic. Each moment is an opportunity for introspection. The more difficult and challenging it is, the more room for growth.”

[Jon Tennant](#)

Heroes Never Die. Rest well dear friend

Acknowledgment



**OPEN
SCIENCE
FELLOWS
PROGRAM**



Jorge Appiah, Valerian Sanga, Thomas Landrian



Thomas
Mboa



Jenny
Molloy



Johanna
Havemann



Chiara
Gandini

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Ending notes and some call to action:

- The world needs OS now, more than ever and you are the agents to lead that change.
- If you're to lead a project in Africa on OS what will that be?



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