

Mining versus Cocoa Production – A case of Ghana – Challenges and Opportunities

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EARTH OBSERVATION, RESEARCH AND INNOVATION CENTRE (EORIC)

The vision of EORIC is to become a leading African Research Centre in the promotion and dissemination of value-added satellite and in-situ based data and information, transfer of ultra-modern affordable space science skills and technologies for meeting the needs of society.

The mission of EORIC is to promote, facilitate and support the acquisition and application of geospatial education, in areas of water, disasters, energy, climate, agriculture, ecosystems, weather, health and biodiversity.



Introduction

- Mining in Ghana, like in many other countries with substantial mineral resources, can have several economic, social, and environmental benefits. Here are some of the key benefits of mining in Ghana:
 - Economic Growth:
 - Job Creation
 - Technology Transfer
 - Revenue for Local Communities
 - Diversification of the Economy:

CONSEQUENCES OF UNREGULATED MINING

- Environmental Degradation : **SDG Goal 15**
- Water Pollution : **SDG Goal 6 , 14**
- Loss of Biodiversity : **SDG Goal 15**
- Social Issues:: **SDG Goal 8, 11**
- Health Risks: **SDG Goal 3**
- Revenue Loss: **SDG Goal 1, 8**
- Security Concerns: **SDG Goal 16**
- Diminished Investment: **SDG 9**



Zero Hungry



Clean Water
and Sanitation



Industry,
Innovation and
Infrastructure



Sustainable Cities
and Communities



Climate Action



Life Below
Water



Life on Land



Partnerships
for the Goals



**Clean Water
and Sanitation**



**Industry,
Innovation and
Infrastructure**

STATE OF OUR RIVERS



15 LIFE
ON LAND



Life on Land

Environmental Degradation



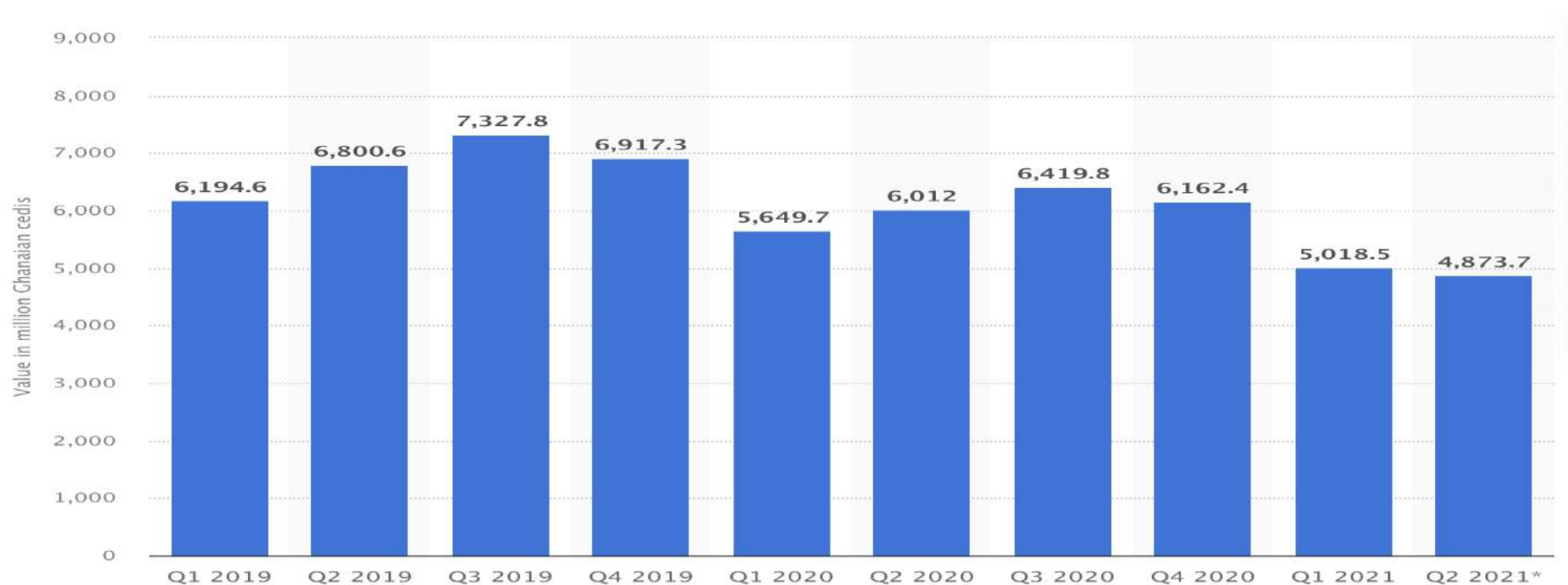
IMPACT ON COCOA INDUSTRIES

- The cocoa industry in Ghana is a critical sector that contributes significantly to the country's economy.
- Ghana is one of the world's top cocoa-producing countries, known for its high-quality cocoa. The cocoa industry is a vital component of Ghana's economy and has been a major source of revenue for the country for many decades.
- Where 25% of cocoa farmers are women and women's work is the most frequently used type of family labour on cocoa farms (Marston 2016; ICI 2016)
- However, it faces challenges from illegal mining, which can lead to environmental degradation, reduced cocoa productivity, and social disruption.
- Efforts are ongoing to address these issues and promote sustainable practices in both the mining and cocoa industries.

COCOA PRODUCTIVITY THREATENED



CONTRIBUTION OF THE MINING INDUSTRY TO GDP IN GHANA FROM 1ST QUARTER 2019 TO 2ND QUARTER 2021 - (IN MILLION GHANAIAN CEDIS)



<https://www.statista.com/statistics/1239449/quarterly-contribution-of-mining-to-gdp-in-ghana/>

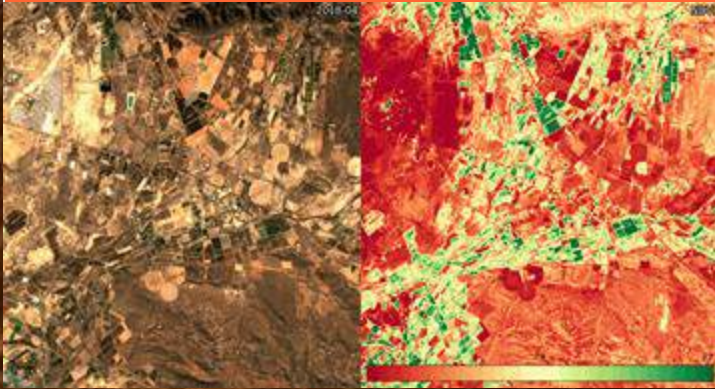
ROLE OF EMERGING TECHNOLOGIES

- Site Detection and Monitoring
- Change Detection
- Land Encroachment
- Environmental Impact Assessment
- Illegal Mining Hotspot Identification
- Regulatory Compliance
- Policy and Planning:

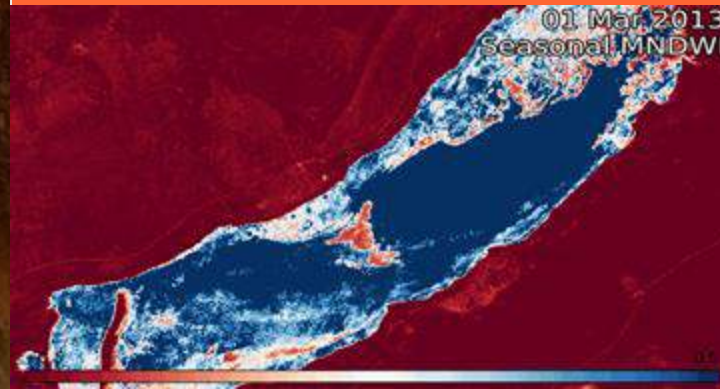
Our Vision

DE Africa will provide a routine, reliable and operational service, using Earth observations to deliver decision-ready products enabling policy makers, scientists, the private sector and civil society to address social, environmental and economic changes on the continent and develop an ecosystem for innovation across sectors.

Agriculture and food security



Water resources and flood risks



Land degradation



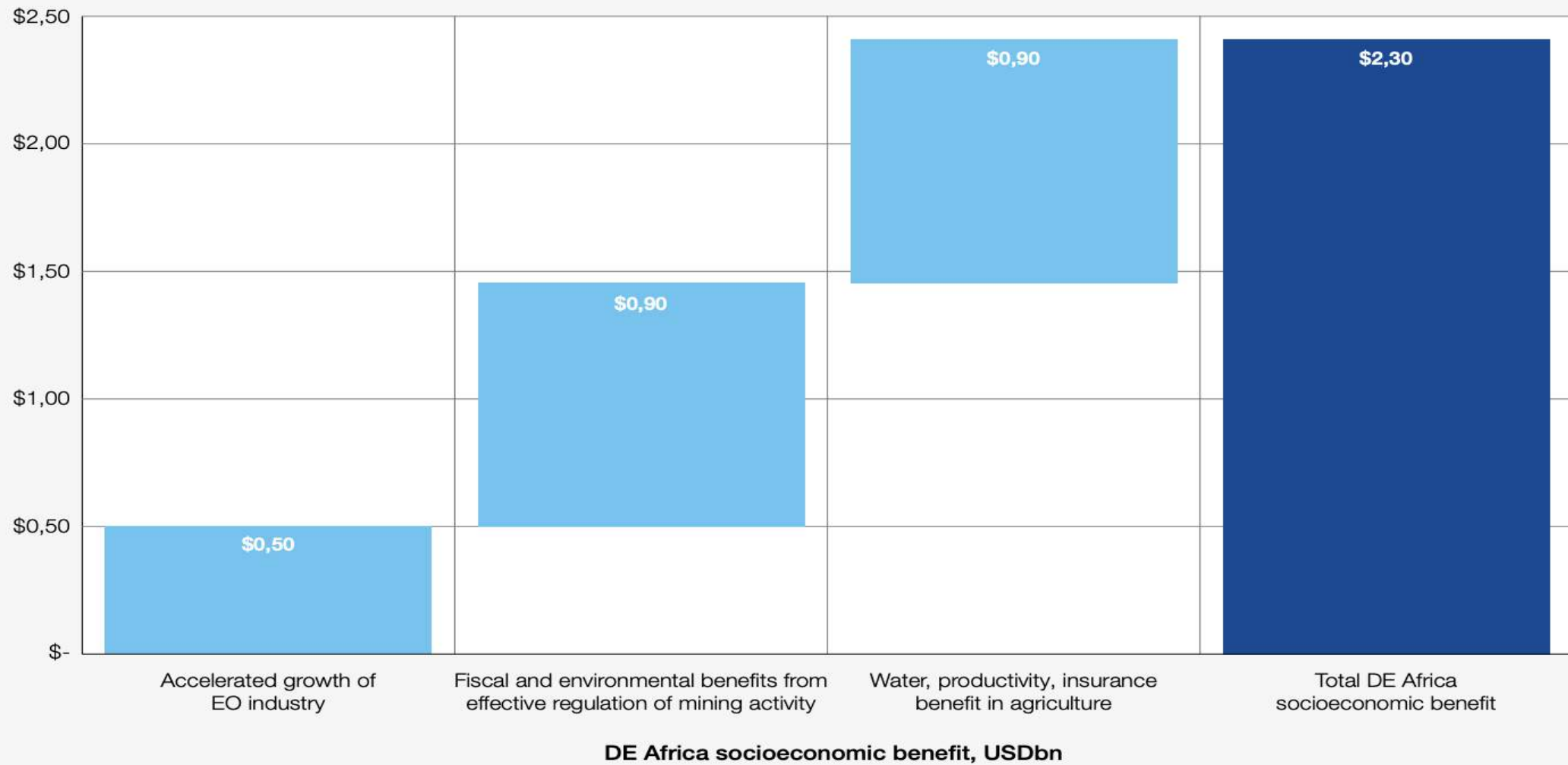
Urbanisation



Coastal erosion



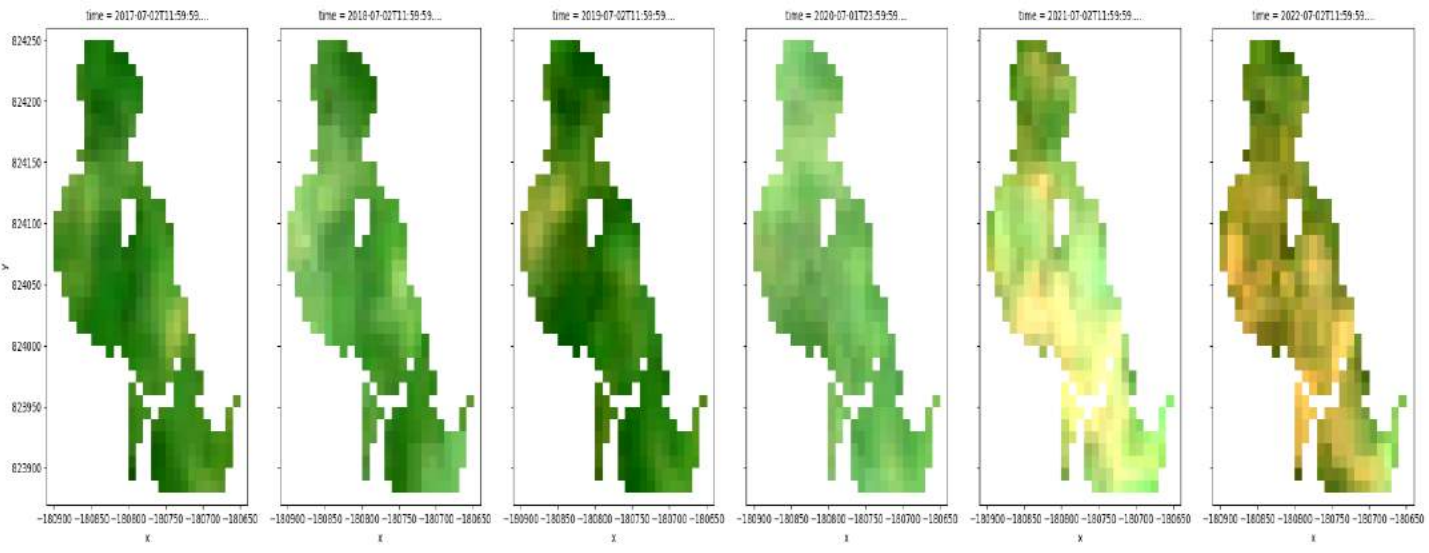
ROLE OF DE AFRICA



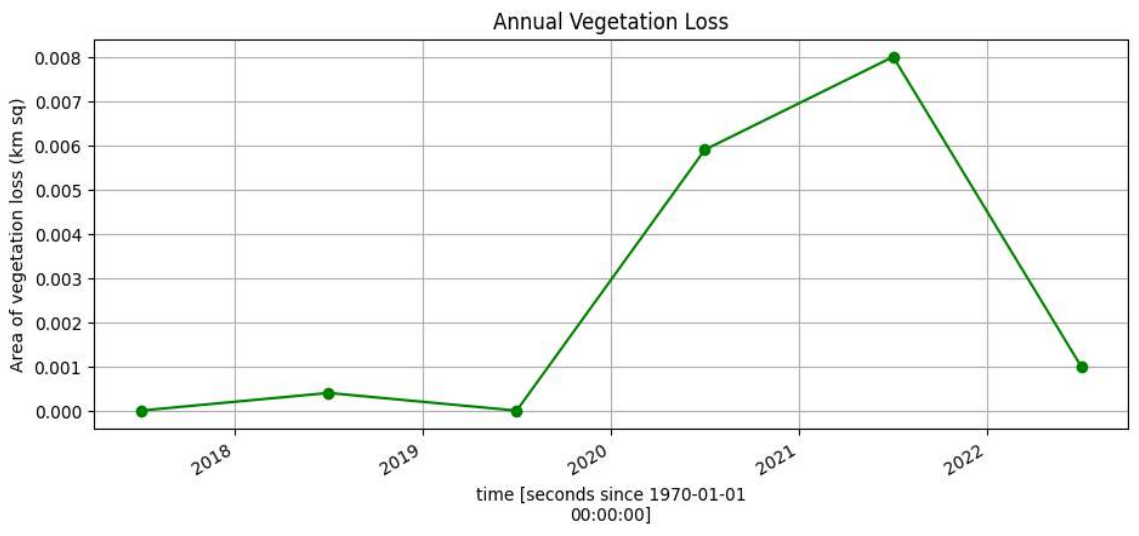
Source: Team Analysis

https://www3.weforum.org/docs/WEF_Digital_Earth_Africa_Unlocking_the_potential_of_Earth_Observation_to_address_Africa_2021.pdf

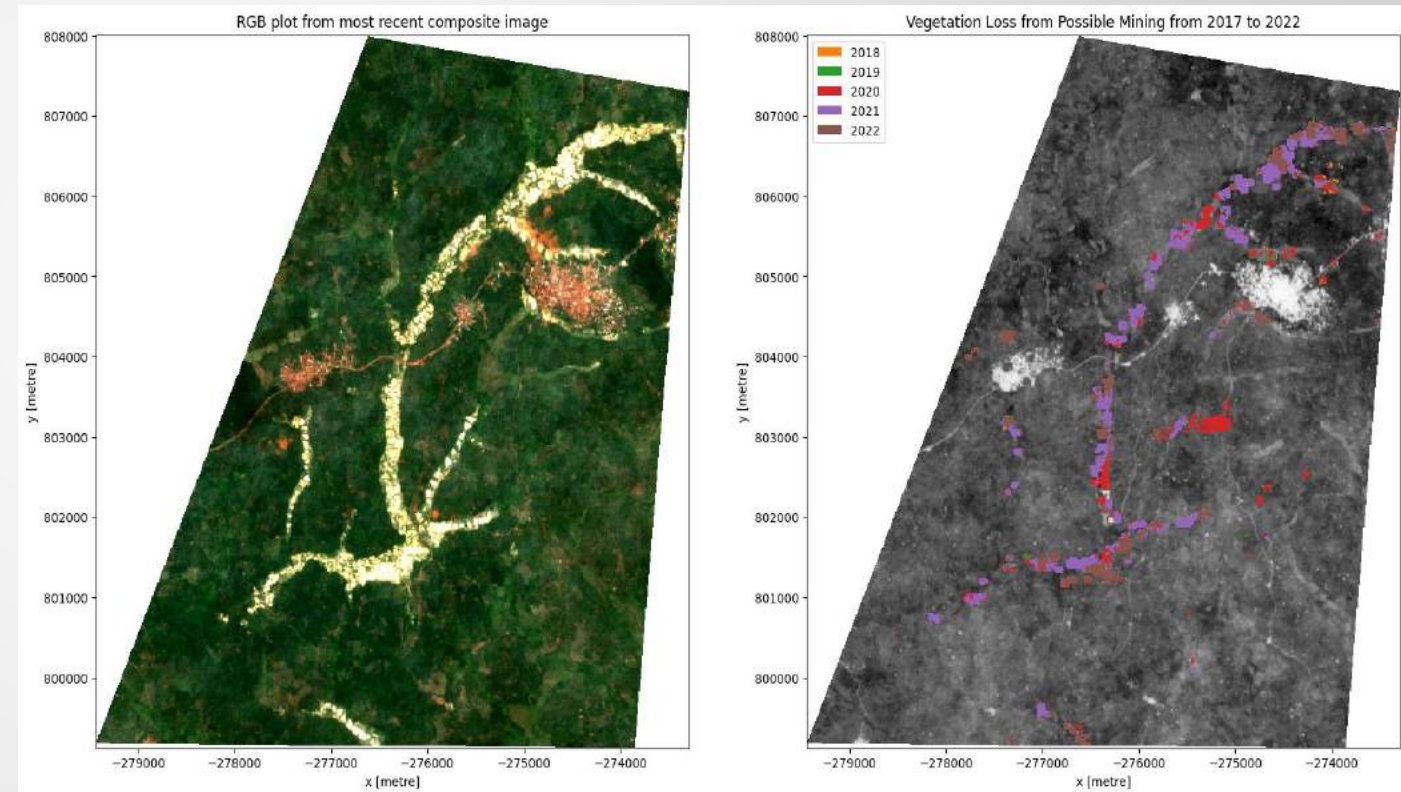
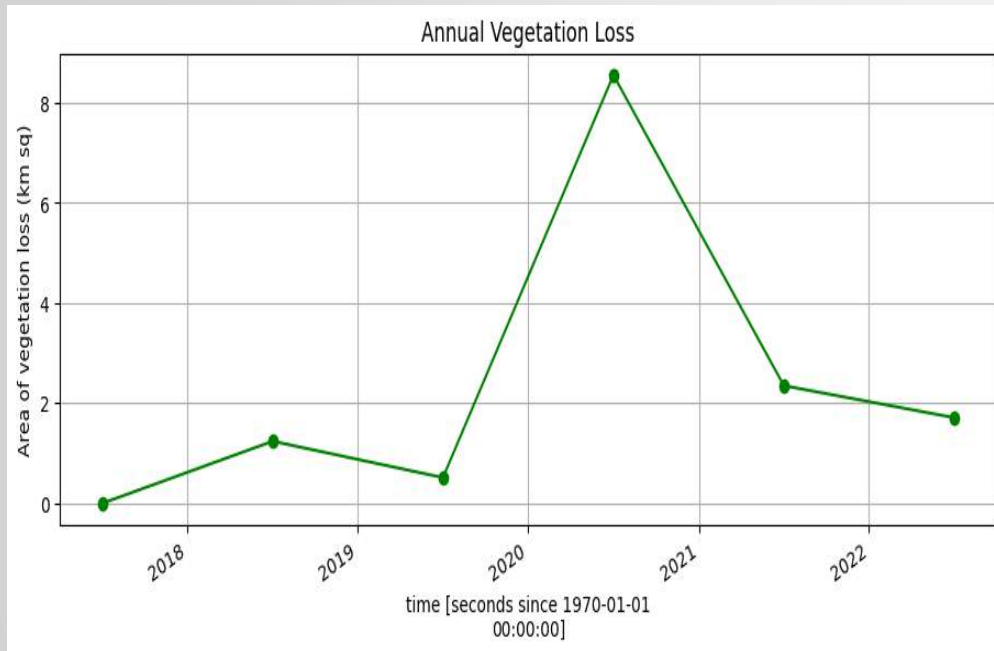
SATELLITE IMAGES FOR SELECTED FARM IN ANTOAKROM FROM 2017 TO 2022 – ASHANTI REGION



Generated from DE Africa using
Sentinel 2 Imagery



SATELLITE IMAGES FOR SELECTED FARM IN JUABOSO COMMUNITY - WESTERN NORTH REGION - GHANA



Generated from DE Africa using Sentinel 2 Imagery

SDG Satellite **Launched on 5 November 2021**



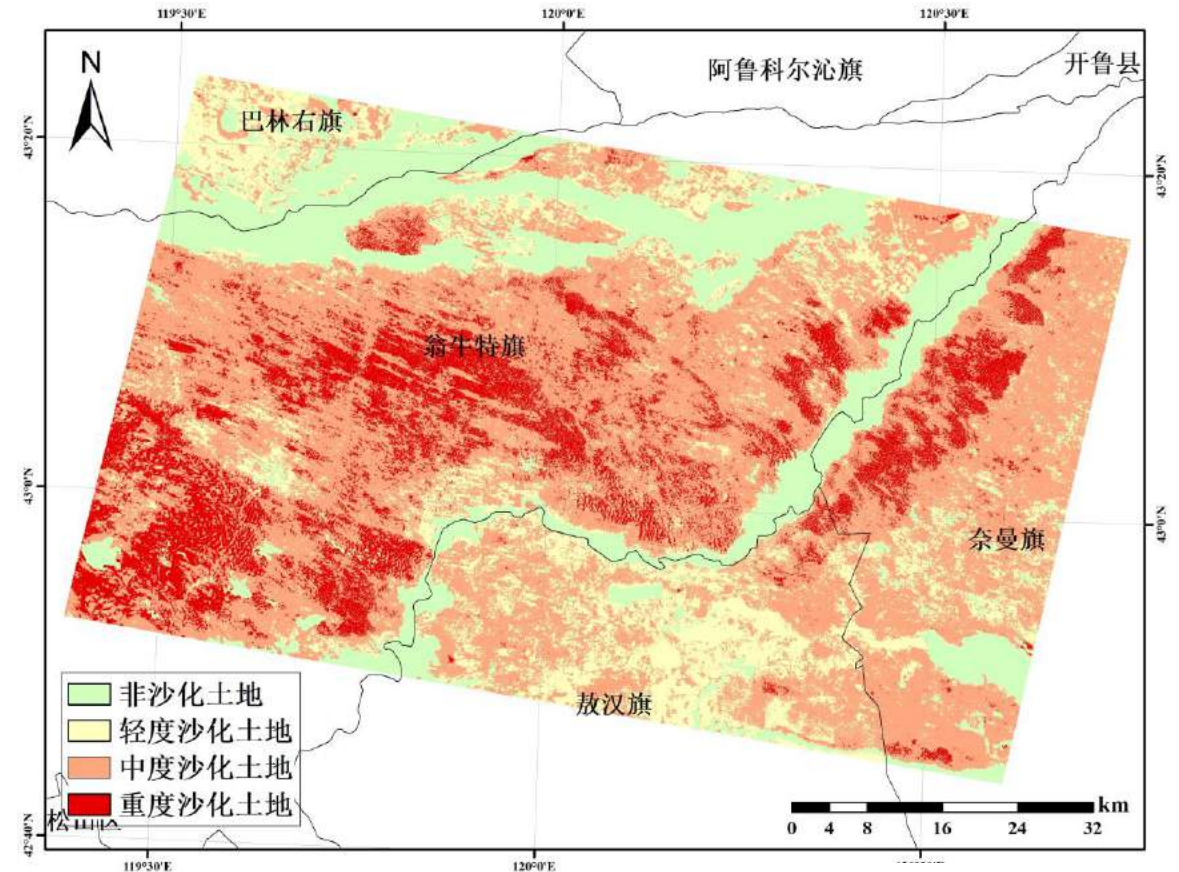
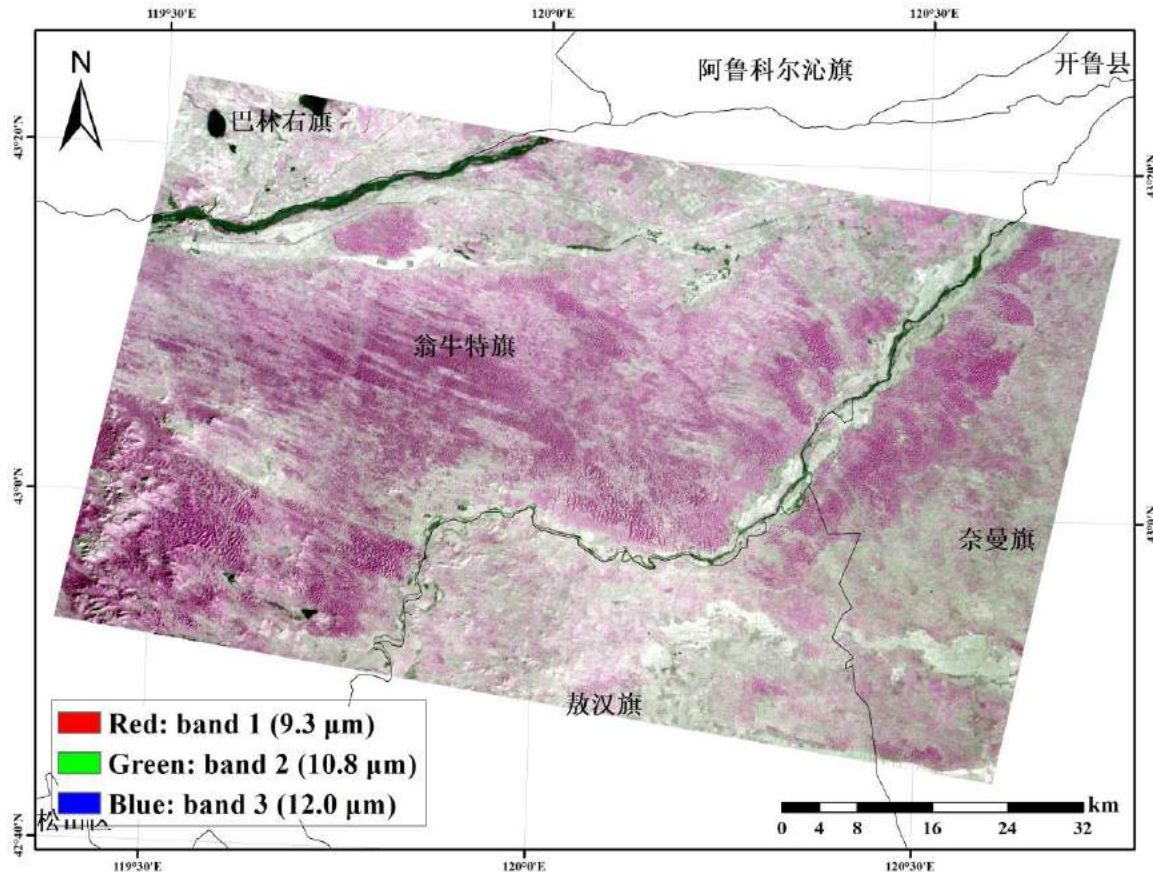
SDGSAT-1
可持续发展科学卫星

- Thermal infrared + Glimmer + multi-spectral
- Wide scale (300 km)
- High-resolution (10 m)

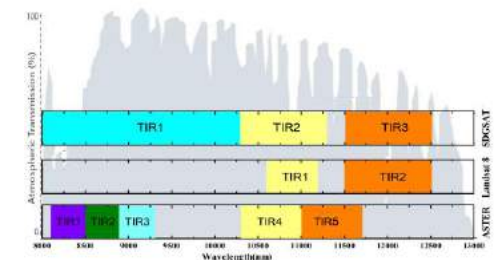
Explore new methods to sense Earth's environment

Data is accessible to the public since December 2022

“SDGSAT-1” Thermal payload



- 3 thermal bands, emissivity of 9.3 μm /10.8 μm is sensitive to sands
- 30 m spatial resolution, a relative high resolution for satellite thermal sensor
- 300 km wide swath, suitable for large scale data acquisition



ROLE OF REMOTE SENSING AND GIS

- SDG Satellite SDG-1, known as SDGSAT-1, is the first satellite developed specifically for the implementation of UN 2030 Agenda for Sustainable Development (SDG), and the first Earth science satellite among the satellites developed by the Chinese Academy of Sciences (CAS), which is launched successfully into orbit on November 5, 2021.
- Tailored to the needs of monitoring and evaluating indicators related to global SDGs.
- Work with dataset such as the SDGSAT-1 in collaboration with public dataset such as Sentinel and Landsat

COLLABORATIVE WAYS TO SAFEGUARD COCOA FROM ILLEGAL MINING

- Safeguarding cocoa from illegal mining in Ghana requires a collaborative effort involving various stakeholders, including government agencies, cocoa industry players, local communities, and non-governmental organizations.
- Government Regulations and Enforcement:
 - The government of Ghana plays a central role in regulating and overseeing both the mining and cocoa industries. Strengthening and enforcing regulations related to mining permits and environmental protection are essential.
 - Law enforcement agencies need to crack down on illegal mining operations, arresting and prosecuting those involved in such activities.

COLLABORATIVE WAYS TO SAFEGUARD COCOA FROM ILLEGAL MINING

- Interagency Coordination:
 - Government agencies responsible for mining, agriculture, and environmental protection should coordinate their efforts to monitor and address the illegal mining issue and its impact on cocoa production.
- Community Involvement:
 - Engaging with cocoa farming communities is vital. These communities can serve as eyes and ears on the ground, reporting illegal mining activities and collaborating with authorities to combat them.
 - Community-based organizations and local leaders can also play a role in educating farmers about the dangers of illegal mining and its effects on cocoa production.

COLLABORATIVE WAYS TO SAFEGUARD COCOA FROM ILLEGAL MINING

- Research and Innovation:
 - Research institutions and universities can contribute by conducting studies on the impact of illegal mining on cocoa farms and developing innovative solutions to mitigate these impacts.
- Technological Solutions:
 - Employing technology, such as remote sensing and geospatial tools, can help monitor mining activities, identify illegal mining sites, and track land encroachment on cocoa farms.
- Cocoa Industry Players:
 - These organizations can establish and promote sustainable cocoa farming practices that reduce the vulnerability of cocoa farms to encroachment by illegal miners.

CAN WE STOP CHOCALATE PRODUCTION? CAN
WE STOP THE LOVE FOR GOLD JEWELRY?



University College of Water Science and Engineering



Ministry of Science, Environment, Science, Technology and Innovation



Ghana Space Technology Institute (soon Ghana Space Agency)



Innovating on an AI Satellite Mission for future 2025 on EO for 3 day revisit and spatial resolution of 2m for Ghana

Thank You

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