

“Indigenous Knowledge Research Infrastructure and Remote Sensing for Sustainability Applications”  
Sixtieth session of the COPUOS – STSC, 6 to 17 February 2023



## Technical Presentation

# Indigenous Knowledge Research Infrastructure – IKRI and Remote Sensing For Sustainability Applications



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9<sup>th</sup> February 2022  
UN – Vienna



UNITED NATIONS  
Office for Outer Space Affairs





# Objectives and Expected outcomes

**Provide understanding of IKRI and Identify Remote Sensing collaboration and partnerships opportunities**

**Advance the design and development of IKRI with active participation of UN COPUOS stakeholders.**



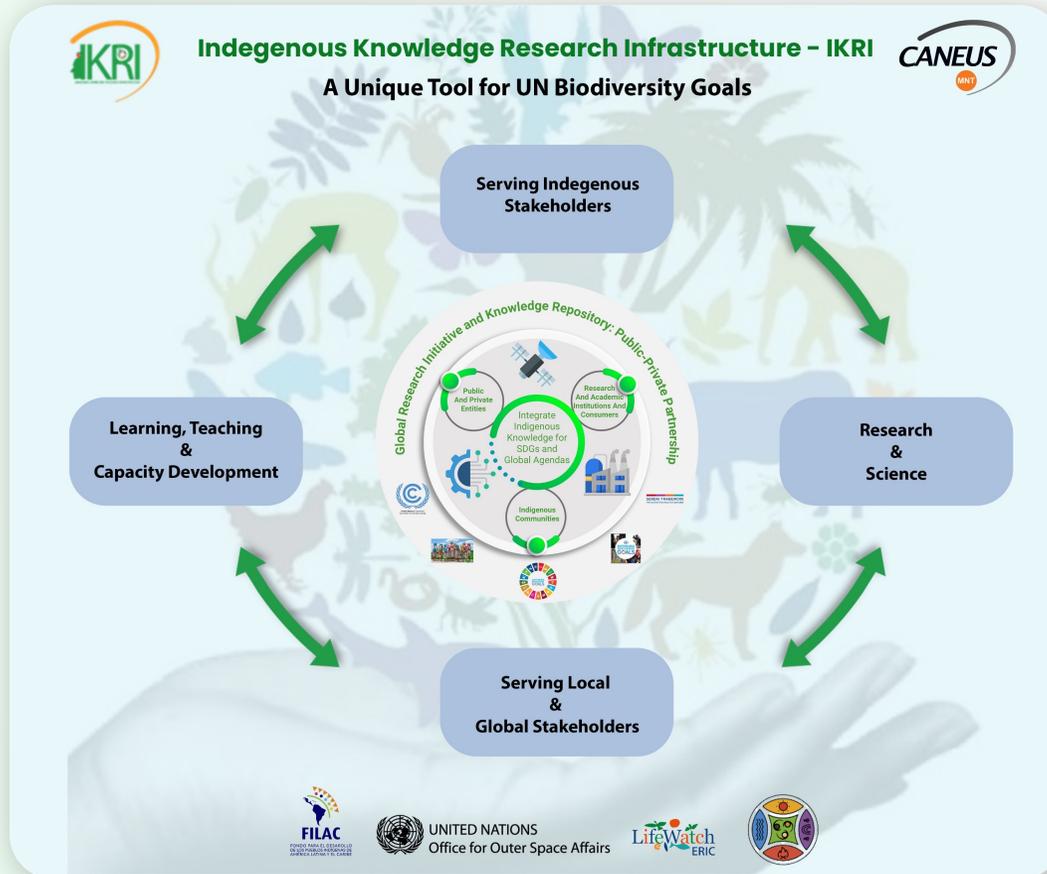
# Why IKRI



Indigenous Knowledge & practices needs to be **recognized & documented, to leverage, integrate** and address the challenges of **Biodiversity** and **Resiliency** of Ecosystem



# About IKRI



A **dynamic** digital **global collaborative research tool** that uses frontier technologies (**geo-spatial intelligence**) to **capture, process, analyze, and present** Indigenous knowledge from multiple sources



# IKRI Evolution



UN Indigenous Climate Summit – Sept 2019



UN HLPF July 2020



UN STI Forum May 2021



UN FSS Sept 2021



UN ECOSOC Forum Feb 2022



UN STI Forum – May 2022



UN GPDR May 2022

UN Summit of the Future Sept 2024



UNGA Sept 2023



UN Water March 2023



UN COP 15 Dec 2022



UN FCC Sept Nov 2022



UN HLPF July 2022



UN OCEAN June 2022

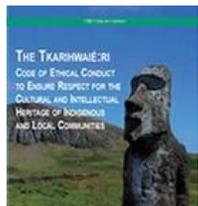




# IKRI Key Considerations



**Akwé Kon:**  
conduct of **cultural & environmental** assessments

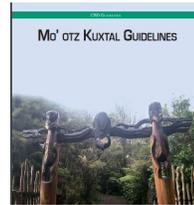


**Tkarihwaïeri:**  
ensure respect & **intellectual heritage**

## Article 8(j) of CBD



## Key voluntary guidelines



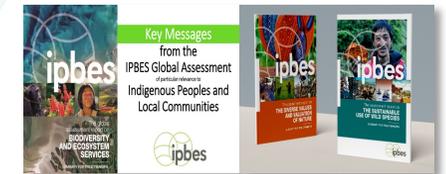
**Mo'otz Kuxtal:**  
mechanisms to ensure **“free, prior & informed consent”**



**Rutzolijirisaxik:**  
**repatriation of IK** relevant for conservation



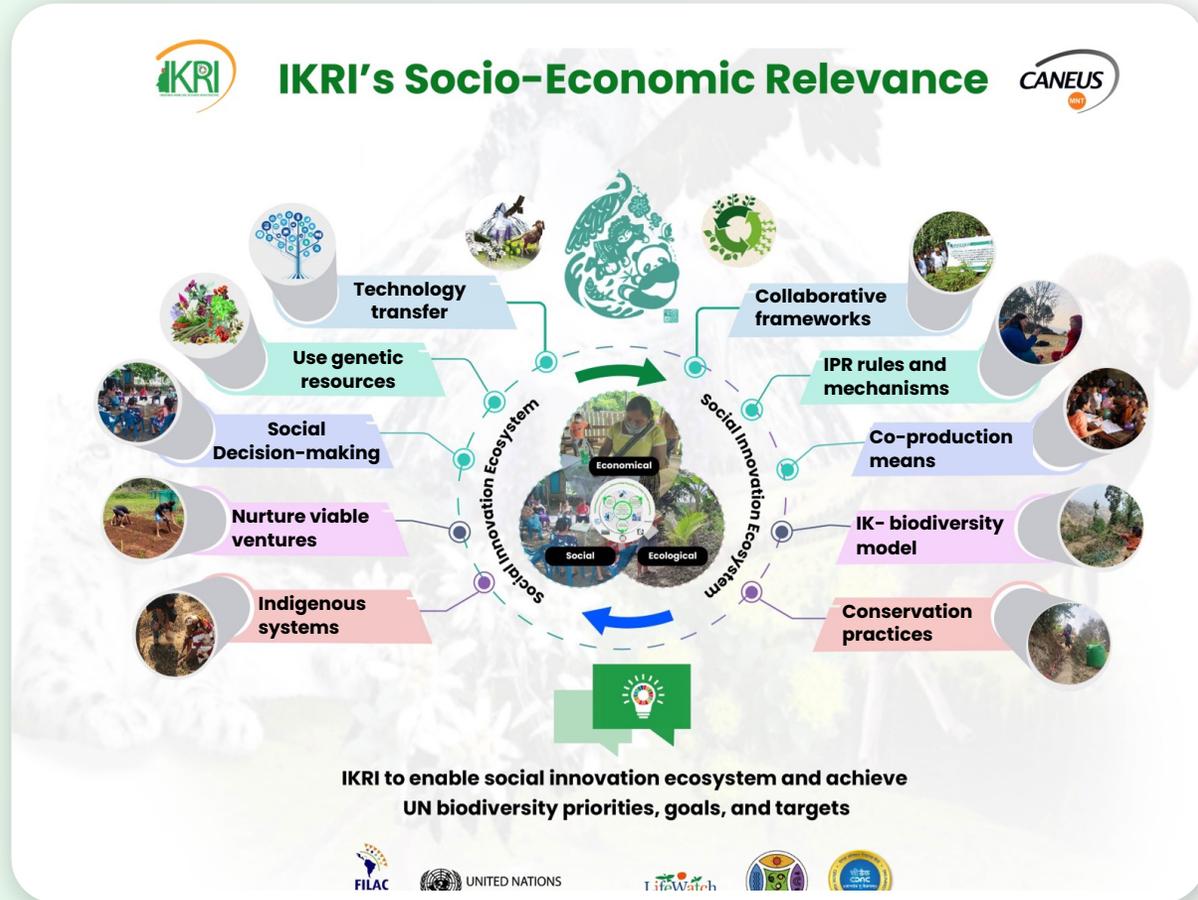
Adoption of **Nagoya Protocol** on Access and Benefit-sharing



**IPBES** attempts to bridge the divide between scientific & IK



# IKRI Goals / Relevance

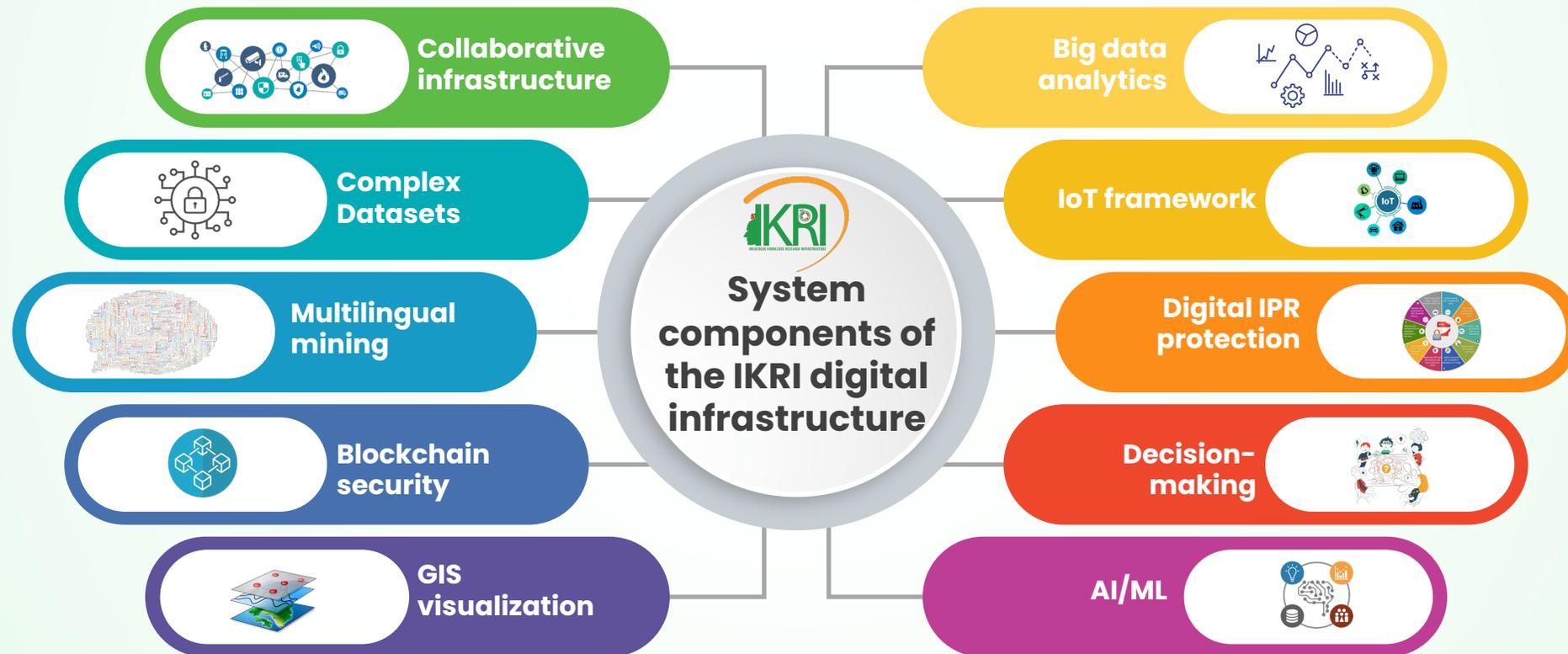


**Stimulate collaborations** between global stakeholders, researchers, and the Indigenous communities for the **conservation, protection, restoration** and sustainable management of biodiversity and ecosystems



# IKRI Functionalities

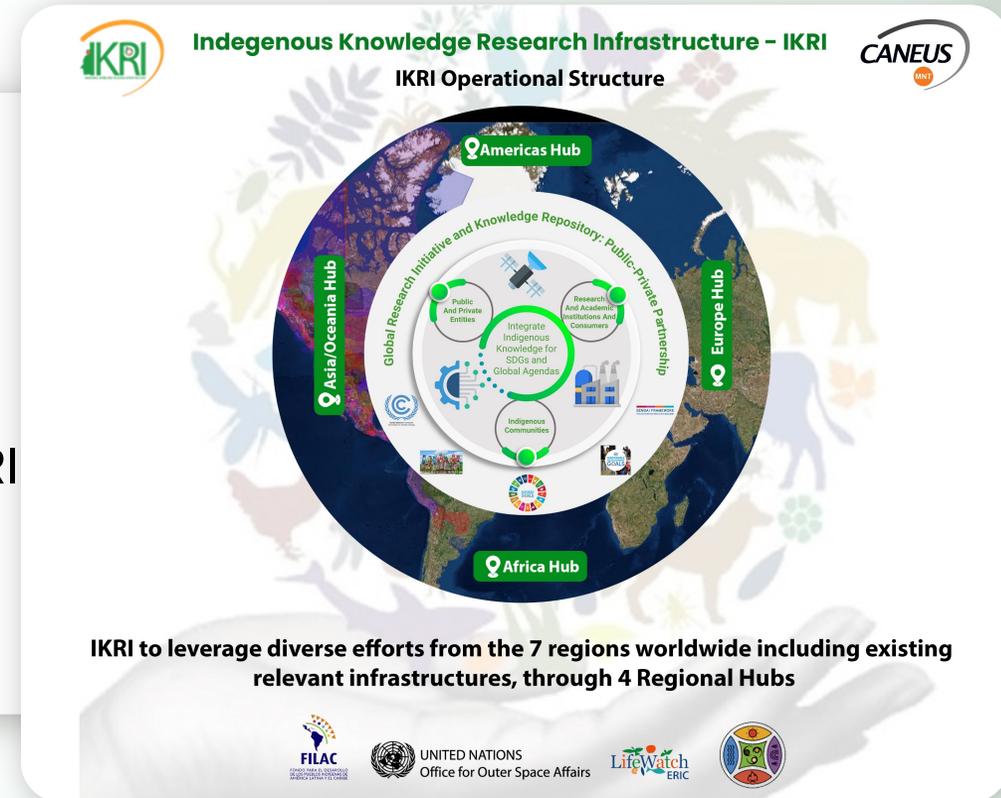
IKRI system architecture and functionalities addressing the “key considerations”





# IKRI Operation

- Serving **Indigenous & global** stakeholders
- Ensuring IP **rights & protection** of IK
- Supporting the **local & regional networks** for implementation of IKRI
- Creating structured **framework & partnerships**.





## Dr. Juan Miguel Gonzalez-Aranda

**CTO, Executive Board Member & Director LifeWatch ERIC, Spain**



Dr. Juan Miguel González Aranda is also Chair of ERIC FORUM, currently Executive Board Member (ENVRI cluster).

He was HoU Nanomaterials & e-Science Spain Science & Innovation Ministry public officer, Ministry Delegate for: GBIF, European Commission: e-IRG, ESFRI & Open Science, EOSC & EuroHPC establishment “Sherpa”, support Environmental ESFRI & related initiatives. European Structural and Investment Funds-RIS3 expert for ICT & ENV Research Infrastructures according to EU regions RIS3 & Framework Programme policies. EIT Climate Change KIC start-up activities. He had led several initiatives at Spanish Council for Scientific Research-CSIC

He is PhD. Engineer in Telecommunications and Industrial Organization-Enterprise Management. Dr González Aranda is Co-author of around fifty publications.



# Remote Sensing as one of the key enabling technologies, indeed !

*'We must challenge climate-change skeptics who deny the facts'*



- **Allows to compare different geopolitical scenarios in different parts of the world.**
- **E.g.: Facilitating the development of Europe-Africa, EU-LAC, etc... cooperation.**

Tackle the high level of global hunger  
Sustainable food production systems  
Adoption of the SDGs  
Under a Global Change scenario  
Adequate food quantity  
Secure access to stable food supplies  
Food quality beyond its calorific value  
Food affordability, reducing food losses and waste



## Linking Space & Wildlife Community



**Indigenous Knowledge in Food Systems**

- Adds diversity to food system
- Better nutrition
- Improves immune and health
- Environmentally sound practices
- Resilient to risks and disasters
- Climate sensitive



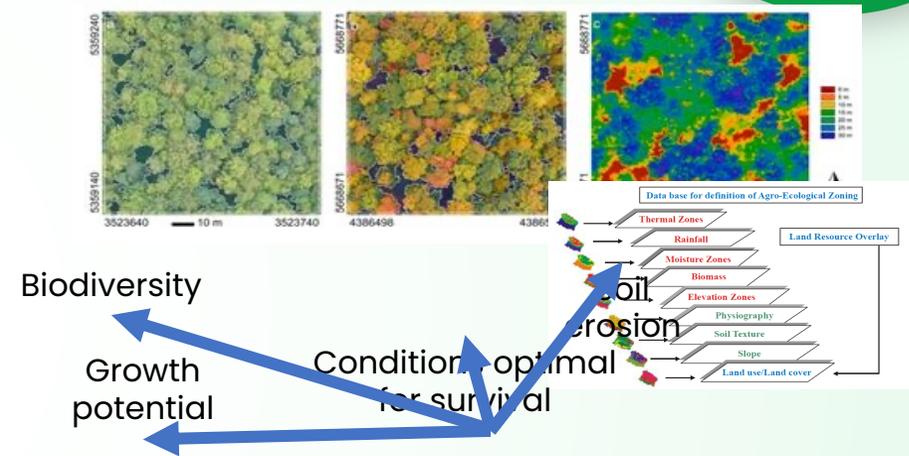
# Remote Sensing & Earth Observation disruptive technologies to operationally support AgroEcology

**Agroecological transition** is an **ambitious challenge**. Innovative **digital technologies** and remote sensing can be very helpful in this transition.

*Briney, A, ThoughtCo.; Bellon-Maurel, V. & Huyghe, C, OCL, 2017*

- USE CASE 1:** identification of **agro-ecological zones** for agricultural developmental planning to identify survival and failure of particular land use or farming system.
- USE CASE 2:** Satellite data were used to determine critical zones of erosion degradation of arable lands, requiring preservation and their inclusion to the natural fields, which had a positive impact on the **optimization of agrolandscape diversity**.

*Tarariko, O.H. et al, Agric. sci. pract., 2019; Shokati, B. & Feizizadeh, B., J. Environ. Plan. Manag, 2018.*





**FONDO PARA EL DESARROLLO DE LOS PUEBLOS  
INDÍGENAS DE AMÉRICA LATINA Y EL CARIBE – FILAC  
PATRIMONIO DE LOS PUEBLOS**





## Strategic Perspective Action: "Geopolitical Scope"

- **Indigenous Knowledge is key to collaborate in a Global Climate Change scenario.**

*'We must challenge climate-change skeptics who deny the facts'*



## Tactical Perspective Action: "Not reinventing the wheel"

- **By reinforcing-federating existing Biodiversity and Ecosystem Research & Sustainable Management Communities-of-Practice, particularly those currently working around successful Research Initiatives on Indigenous Knowledge good practices!!!**



## Operational Perspective Action: "Let's be FAIR together"

- **Creation of an "essential e-Research Collaboration middleware" to guarantee the interoperability & duly progress of previously identified initiatives' developments, the FAIRness of their (meta-)data, e-Services, but also Researchers, Decisions Makers & Innovators INTEROPERABILITY by providing the proper Virtual Research Environments (Digital Twins, Metaverses, etc.) mechanisms among Communities-of-Practice on Biodiversity and Ecosystem Research & Sustainable Management for Indigenous Knowledge reinforcement and preservation, to guarantee their Communities welfare too.**

# THANK YOU

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