

Earth Observation data for the **Social Sciences**

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How to take advantage
of EO data to enhance
**transformative societal
practices**, in service of
the 2030 Agenda for
Sustainable
Development?

A satellite image of a tropical cyclone over the Bay of Bengal, with a black diagonal overlay. The cyclone is shown as a large, dense cloud system with a distinct eye. The surrounding landmasses are visible in shades of green and brown, with a grid of latitude and longitude lines overlaid. The text is positioned on the left side of the image, partially overlapping the black overlay.

140.000 fatalities

1991

Super Cyclonic Storm BoB 1 (Category IV storm)

Southwestern coast of Bangladesh

(Fourth-deadliest tropical cyclone on record)

3406 fatalities

2007

Cyclone Sidr (Category IV storm)

Southwestern coast of Bangladesh

>2.5 million

fatalities due to
natural disasters,
over the past 30
years.



MOVING AWAY FROM A
TRADITIONAL USE OF
EO TO BE A
GAME-CHANGER

From petabytes of data to action

The DIKW Hierarchy

An ounce of information is worth a pound of data.

An ounce of knowledge is worth a pound of information.

An ounce of understanding is worth a pound of knowledge.

Russell Ackoff



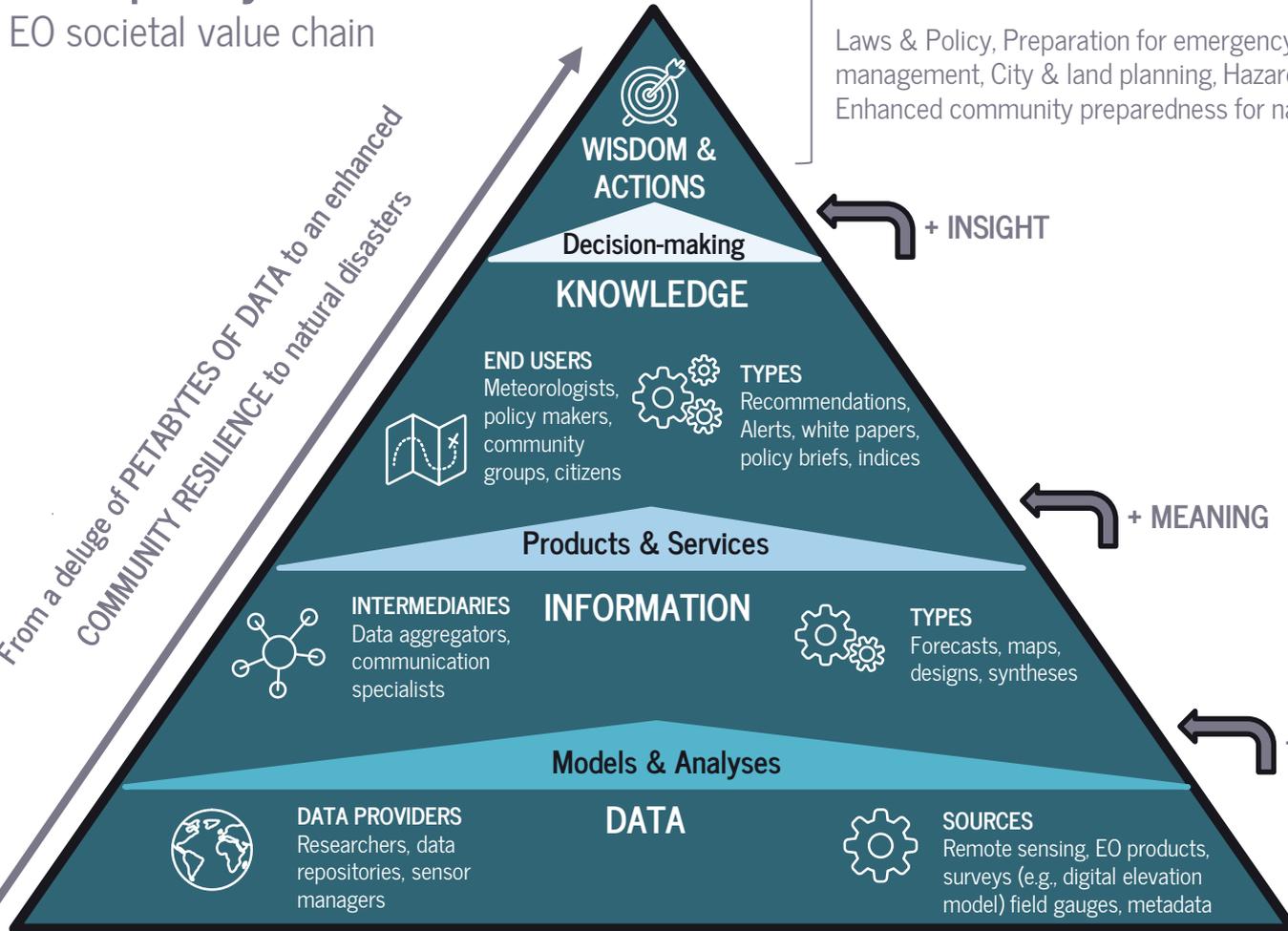
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Ackoff, R. L. (1989). From data to wisdom. *Journal of applied systems analysis*, 16(1), 3-9.

From petabytes of data to action

EO societal value chain

From a deluge of PETABYTES OF DATA to an enhanced
COMMUNITY RESILIENCE to natural disasters



Laws & Policy, Preparation for emergency events, Natural resource management, City & land planning, Hazard coping actions, Enhanced community preparedness for natural disasters, ...

Adapted from the DIKW Hierarchy

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Moving away from a
data-centric to
a **USER-DRIVEN**
APPROACH

INTERACTIVE/PARTICIPATORY APPROACH

Doing science and innovation "*with society and for society*"

- Stakeholders/end-users as key players in the research process
- Knowledge co-development by users and researchers; set in context, problem-focused and demand-driven
- Bottom-up space innovation



Enhanced impact of EO-based technological/
innovative services





Identifying the root
causes of a problem,
using a **SYSTEMS**
APPROACH

SYSTEMIC ROOT CAUSE ANALYSIS

From linear to circular causality

Linear Causality: A influences B, but B does not influence A. i.e., $A \rightarrow B$

VS

Circular causality: A influences B, and B influences A, i.e., $A \leftrightarrow B$ (the circle/dynamic is ongoing)

- Participative/Interactive root cause analysis
- A well co-defined problem



Targeted solutions, better dialogue
with end-users, optimal societal applications, ...

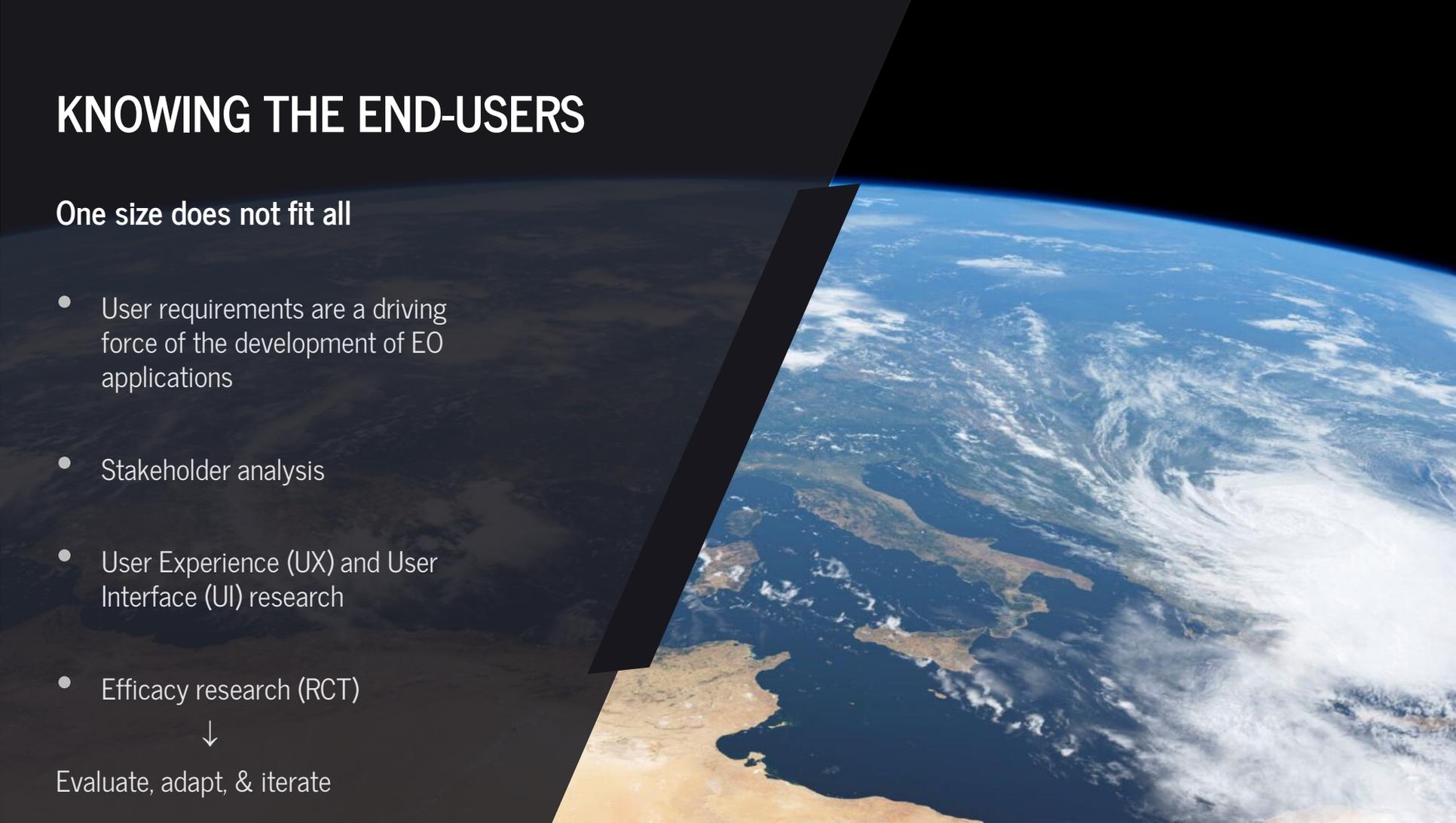




Understanding how
different people need
and want to use data
and information:

**KNOWING THE
END-USERS**

KNOWING THE END-USERS



One size does not fit all

- User requirements are a driving force of the development of EO applications
- Stakeholder analysis
- User Experience (UX) and User Interface (UI) research
- Efficacy research (RCT)

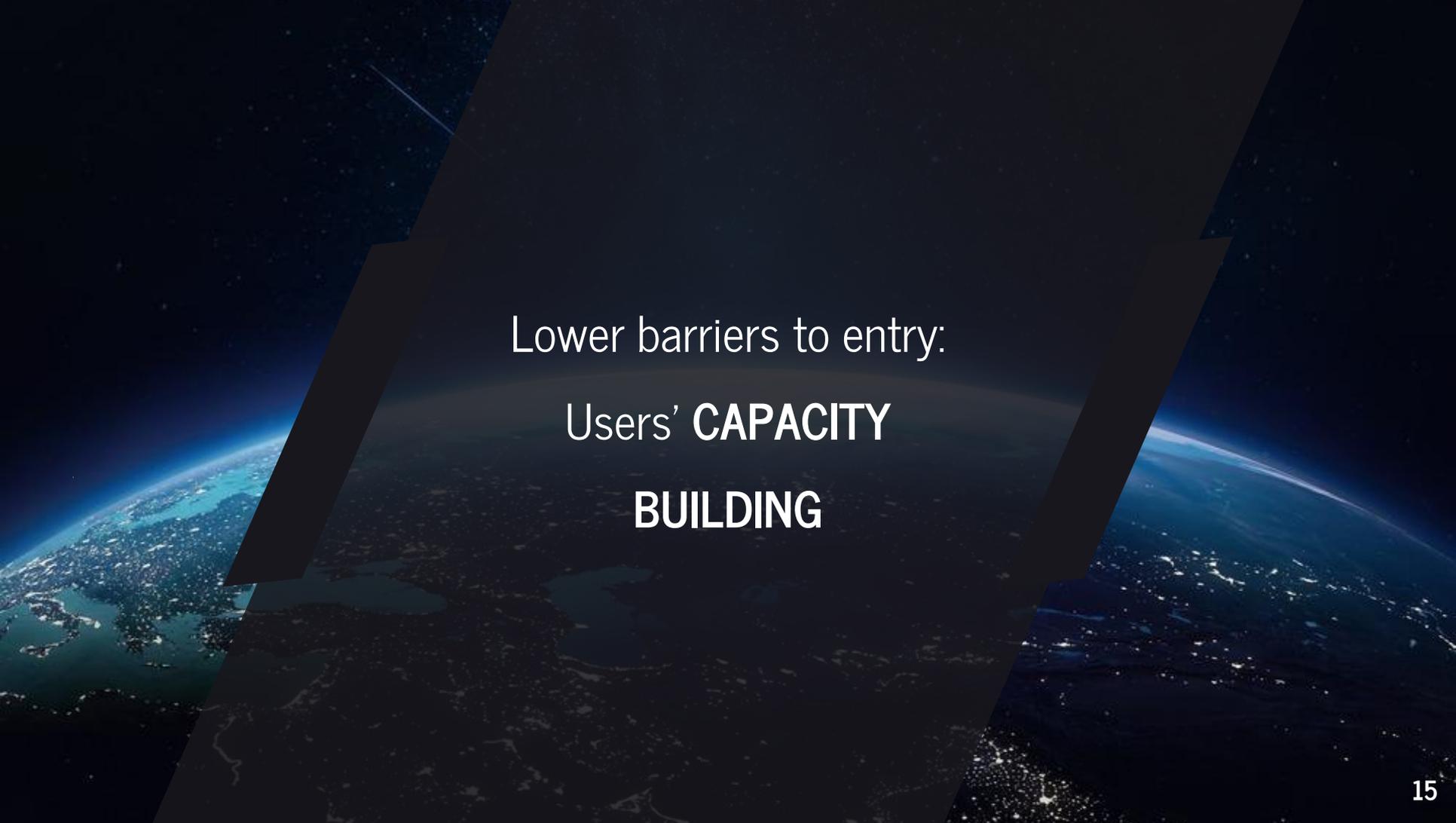


Evaluate, adapt, & iterate



Getting the right people
to the table and benefit
from an

**INTERDISCIPLINARY
COLLABORATION**



Lower barriers to entry:

Users' **CAPACITY**

BUILDING

CAPACITY BUILDING APPROACH

Bridging the gap between EO and users' communities

- Tailor information products to align with user capability
- Building capacity among users to apply information products



↑ User self-sufficiency, commitment, acceptance, and adoption of EO data and data p

- Capacity building approach: assessment, design, implementation, and monitoring (ADIM)



A composite space-themed background. On the left, a bright sun or star is partially obscured by the curved horizon of Earth, showing blue oceans and white clouds. In the center, a large, dark, cratered surface, likely the Moon, is visible. On the right, a view of Earth at night shows a dense field of yellow and white city lights against the dark blue of the planet's atmosphere and the blackness of space.

CONCLUSION

INCREASING THE SOCIETAL VALUE OF EO

The background of the slide is a composite image. The right side shows a satellite view of Earth at night, with city lights glowing against the dark blue of the oceans and the black of space. The left side is a dark, textured area, possibly representing a satellite image of a natural landscape or a stylized background.

There are still many challenges for utilizing EO data to benefit society.

EO data for societal benefit as a value chain: value is created when the decisions/actions lead to improved outcomes for society.

User-centered innovation can increase the positive impact of EO-based products.

Understanding the users' needs/requirements associated with data use help to reach a high level of success for solutions.

A capacity building approach increase user self-sufficiency, as well as to gain commitment, acceptance, and adoption of EO data and data products.

THANKS!

Any questions?

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