



INTERNATIONAL
ASTRONAUTICAL
FEDERATION



Unlocking Space Economy Opportunities in Iran:

Advancing Socio–Economic Resilience
through Space Services and Applications



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Satellite
Data



Space
Services



Economic
Value



Socio–Economic
Resilience



Sustainable
Development



33rd UN/IAF Workshop
on Space Economy Opportunities
for Emerging Nations



Antalya, Türkiye
3–4 October 2026



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Why Space Services Matter for Emerging Economies

The real value of space emerges when satellite capabilities are transformed into services that solve economic and societal challenges.



Key Socio-Economic Challenges in Iran

Iran faces interconnected environmental and development challenges that create a growing need for scalable, timely and operational solutions.



WATER STRESS & AGRICULTURAL CHALLENGES

- Water scarcity and drought
- Irrigation efficiency
- Agricultural productivity
- Food security



LAND SUBSIDENCE & INFRASTRUCTURE RISK

- Ground deformation
- Groundwater depletion
- Urban and infrastructure exposure



FLOODS & NATURAL DISASTERS

- Flood exposure
- Rapid impact assessment
- Disaster preparedness
- Risk reduction



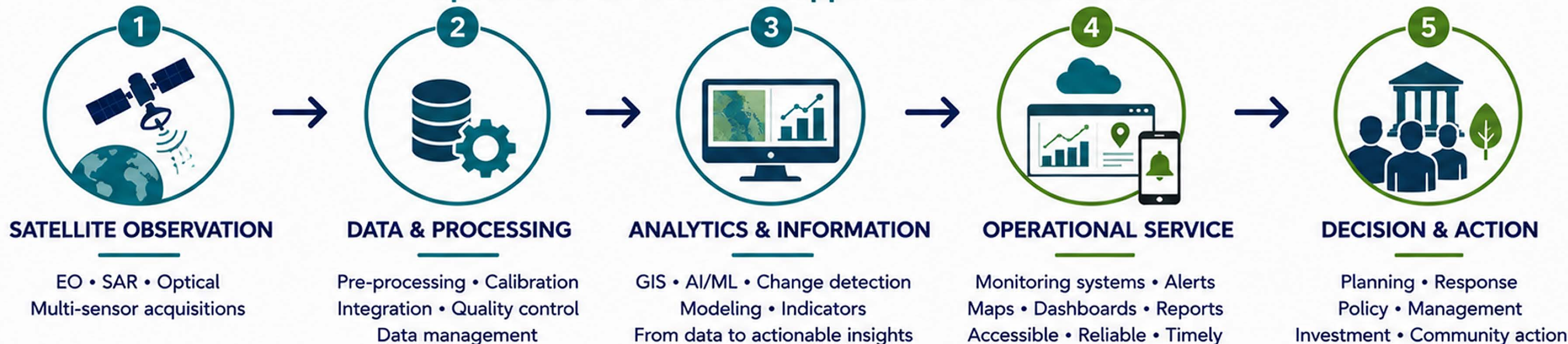
DUST STORMS & ENVIRONMENTAL DEGRADATION

- Dust sources and transport
- Air quality and health impacts
- Land degradation
- Ecosystem pressure



From Space Data to Space Services

The value of satellite data is realized when it is transformed into operational services that support real-world decisions.



The transition from data to service is where downstream economic and societal value is created.

ENABLING SOLUTIONS FOR KEY PRIORITY AREAS IN IRAN



Crop & Water Monitoring

Sustainable agriculture and water management



Flood Intelligence

Early warning, rapid assessment, recovery



Dust Monitoring

Air quality, health and environment



Subsidence Monitoring

Infrastructure safety and asset protection



Case Study 1: Agriculture & Water Management

Space-based monitoring can transform agricultural water management from periodic assessment to continuous, evidence-based decision-making.

1. PROBLEM



≈92%

of Iran's freshwater withdrawals are attributed to agriculture*

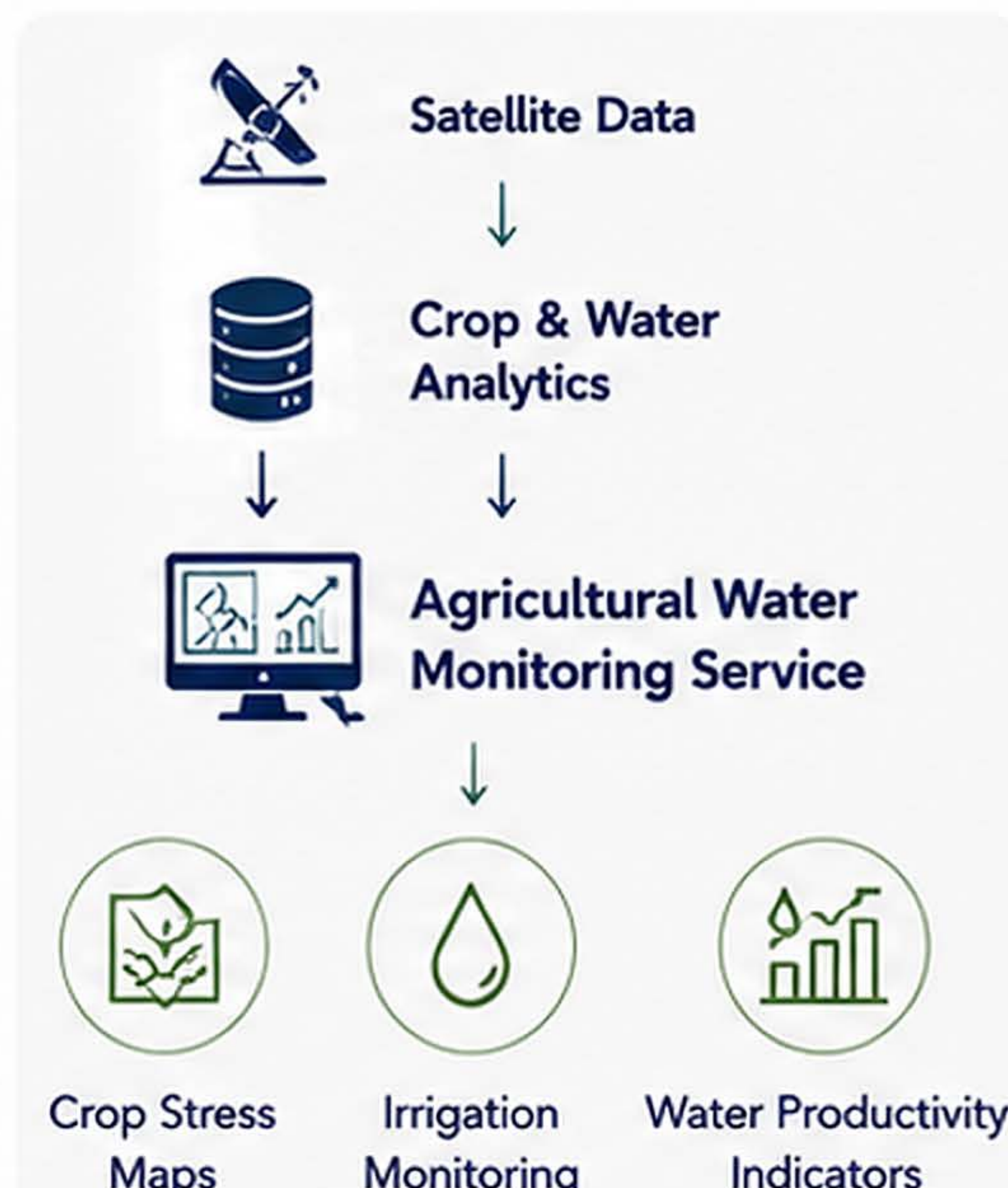


2. SPACE-BASED SOLUTION

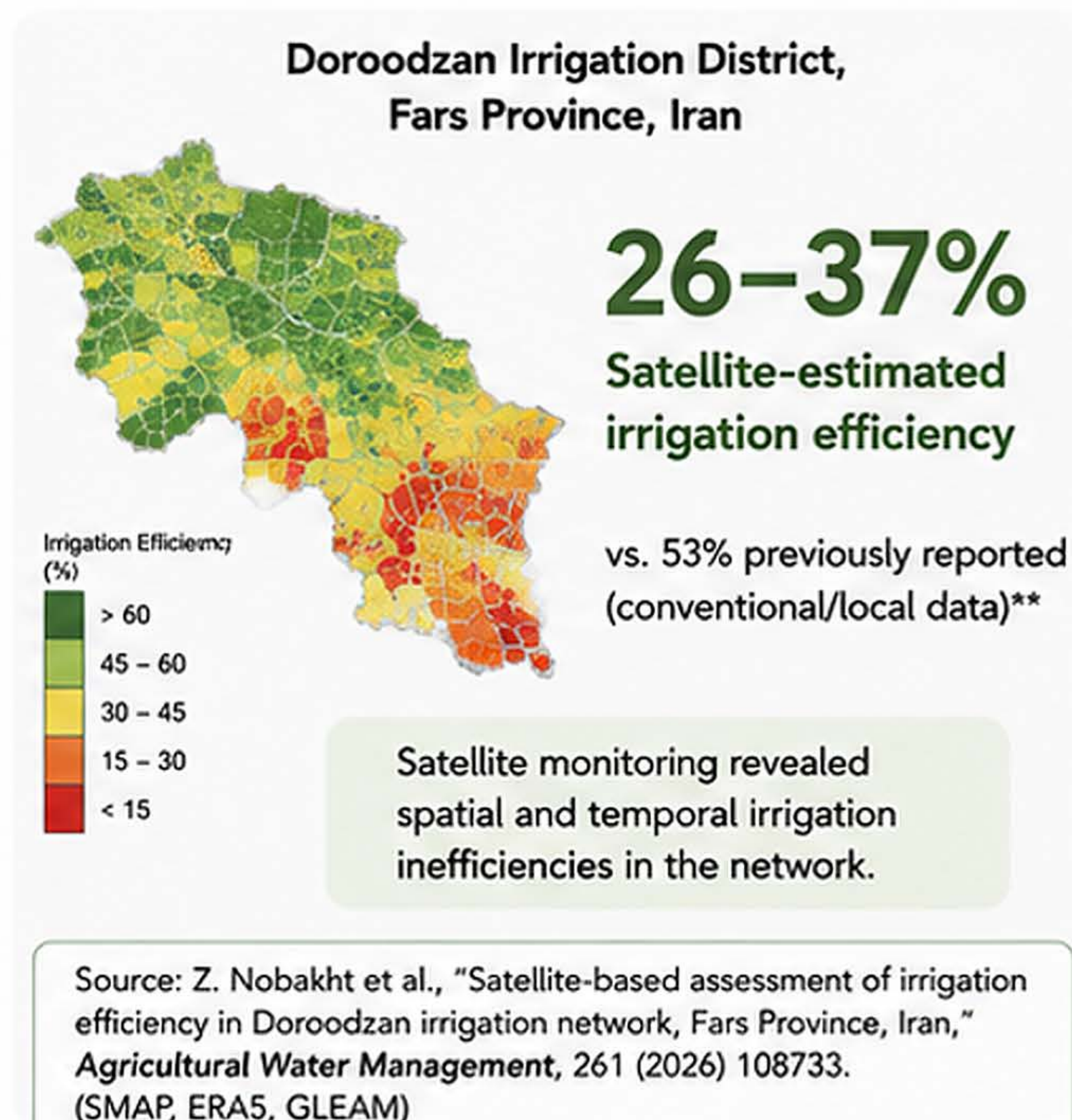


-  **Optical EO**
Crop condition monitoring
-  **Thermal / ET**
Water consumption (evapotranspiration)
-  **Soil Moisture**
Irrigation monitoring
-  **Vegetation Indices**
Crop stress detection

3. SERVICE: FROM DATA TO SERVICE



4. RESULT / IMPACT (IRAN EVIDENCE)



TRANSFERABLE LESSON

Satellite-based agricultural monitoring can provide scalable, objective and cost-effective evidence to improve water allocation and irrigation efficiency in water-scarce emerging economies.



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* Source: FAO AQUASTAT (2022)
** Efficiency based on satellite-derived ET and in-situ data comparison.

Case Study 2: Floods & Disaster Management

Satellite-based flood intelligence can rapidly transform observations into actionable information for emergency response and recovery.

1. PROBLEM: IRAN FLOODS 2019



25 of 31
Provinces

were affected by the 2019 floods



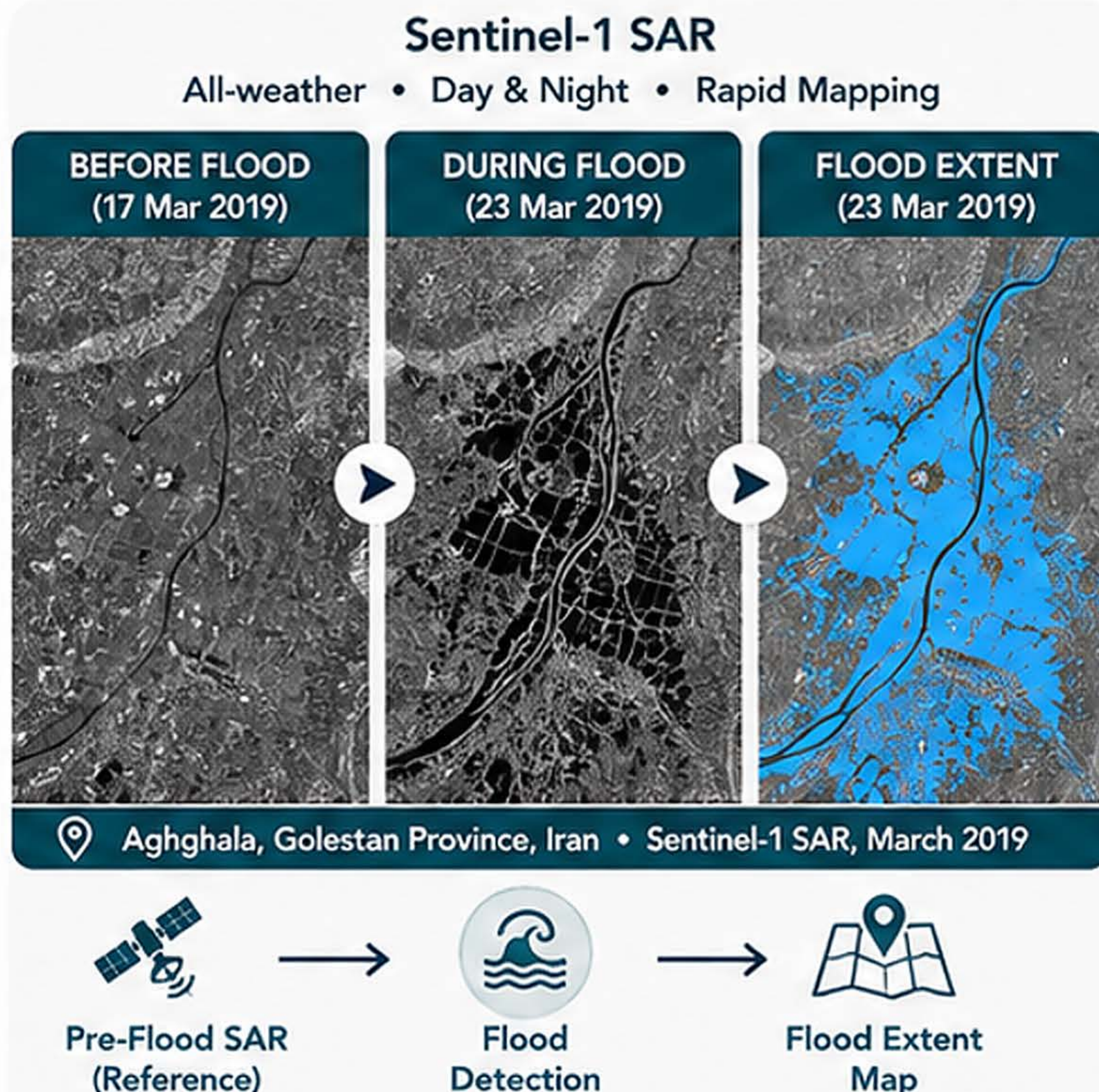
>10 million
people affected



~2 million
people in need of
humanitarian assistance

Source: OCHA/UN – Iran Floods Situation Report, 2019

2. SPACE-BASED SOLUTION: SENTINEL-1 SAR



3. SERVICE: FLOOD INTELLIGENCE



4. RESULT / IMPACT (IRAN EVIDENCE)

Nationwide analysis of the 2019 floods
using Sentinel-1 SAR



673

Sentinel-1 SAR
images analyzed



Nationwide
probabilistic flood &
exposure mapping

Flood Intelligence supports:

-  Emergency Response
-  Population Exposure Assessment
-  Infrastructure Prioritization
-  Recovery Planning

Source: Sherpa, S. & Shirzaei, M. (2022).
Journal of Flood Risk Management, 15(4), e12770.



TRANSFERABLE LESSON

SAR-based flood intelligence provides a scalable, all-weather capability for rapid disaster assessment in emerging economies.



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Case Study 3: Dust Storms & Environmental Monitoring

Earth observation enables dust storms to be detected, tracked and traced across borders—turning regional environmental observations into actionable monitoring and early-warning services.

1. PROBLEM: DUST STORM EXPOSURE



DUST STORMS

Air Quality • Health • Agriculture
Transport • Economy



>120

Dusty Days / Year
in some highly affected
western areas



Health
Impacts



Agriculture
Losses



Transport
Disruptions



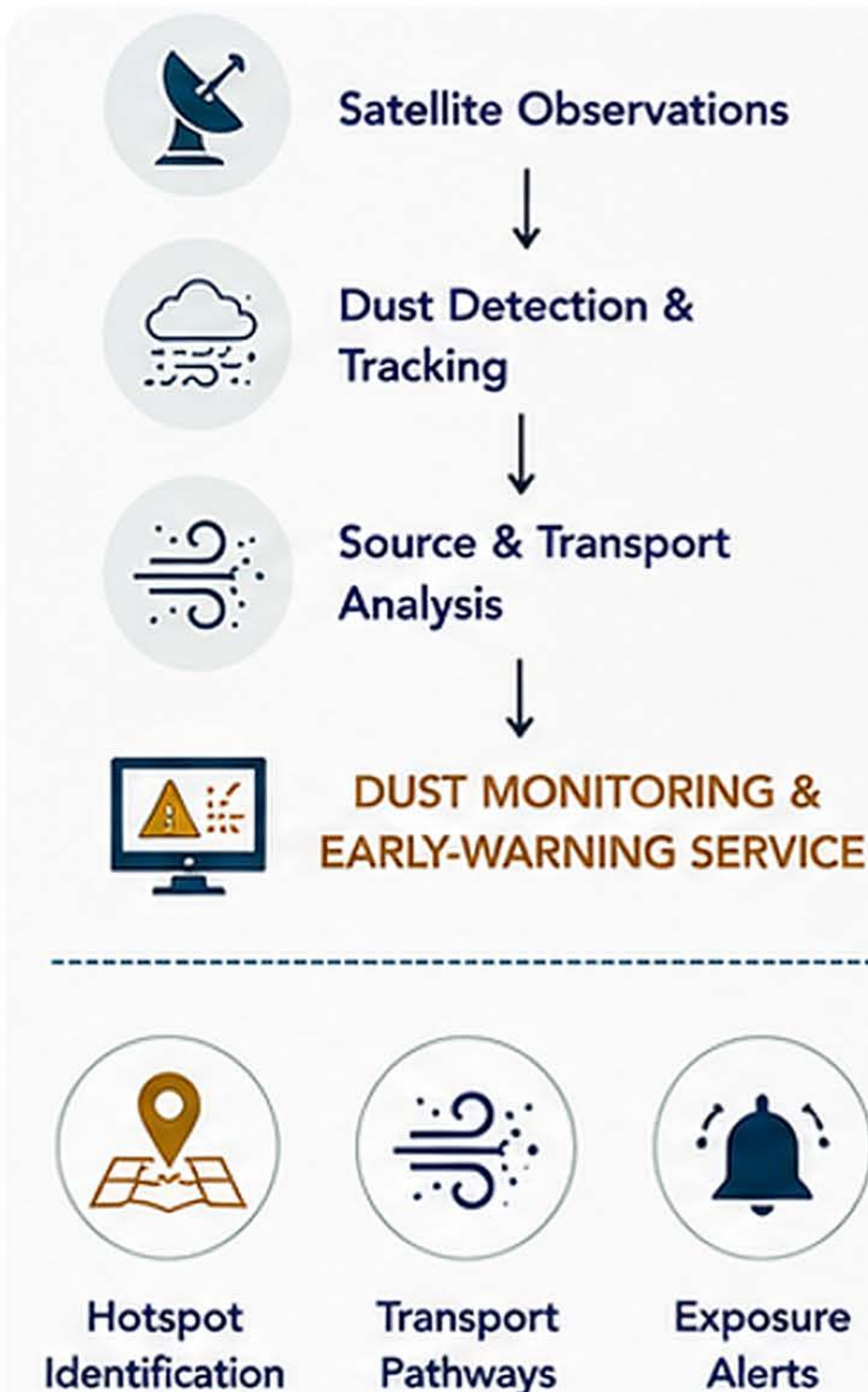
Economic
Costs

Source: IRIMO (National Dust Monitoring)

2. SPACE-BASED SOLUTION: MULTI-SATELLITE EO



3. SERVICE: DUST INTELLIGENCE



4. RESULT / IMPACT



Source: NASA MODIS / Sentinel-5P / ECMWF



TRANSFERABLE LESSON

Regional Earth observation can turn transboundary environmental risks into shared monitoring and early-warning services.



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Case Study 4: Land Subsidence Monitoring

Satellite InSAR transforms subtle ground deformation into actionable intelligence for infrastructure protection, urban planning and water-resource management.

1. PROBLEM: LAND SUBSIDENCE



LAND SUBSIDENCE

Groundwater Depletion • Infrastructure
Agriculture • Urban Areas

**>30
cm/year**

Subsidence rates reported
in some critical areas



Groundwater
Depletion



Infrastructure
Risk



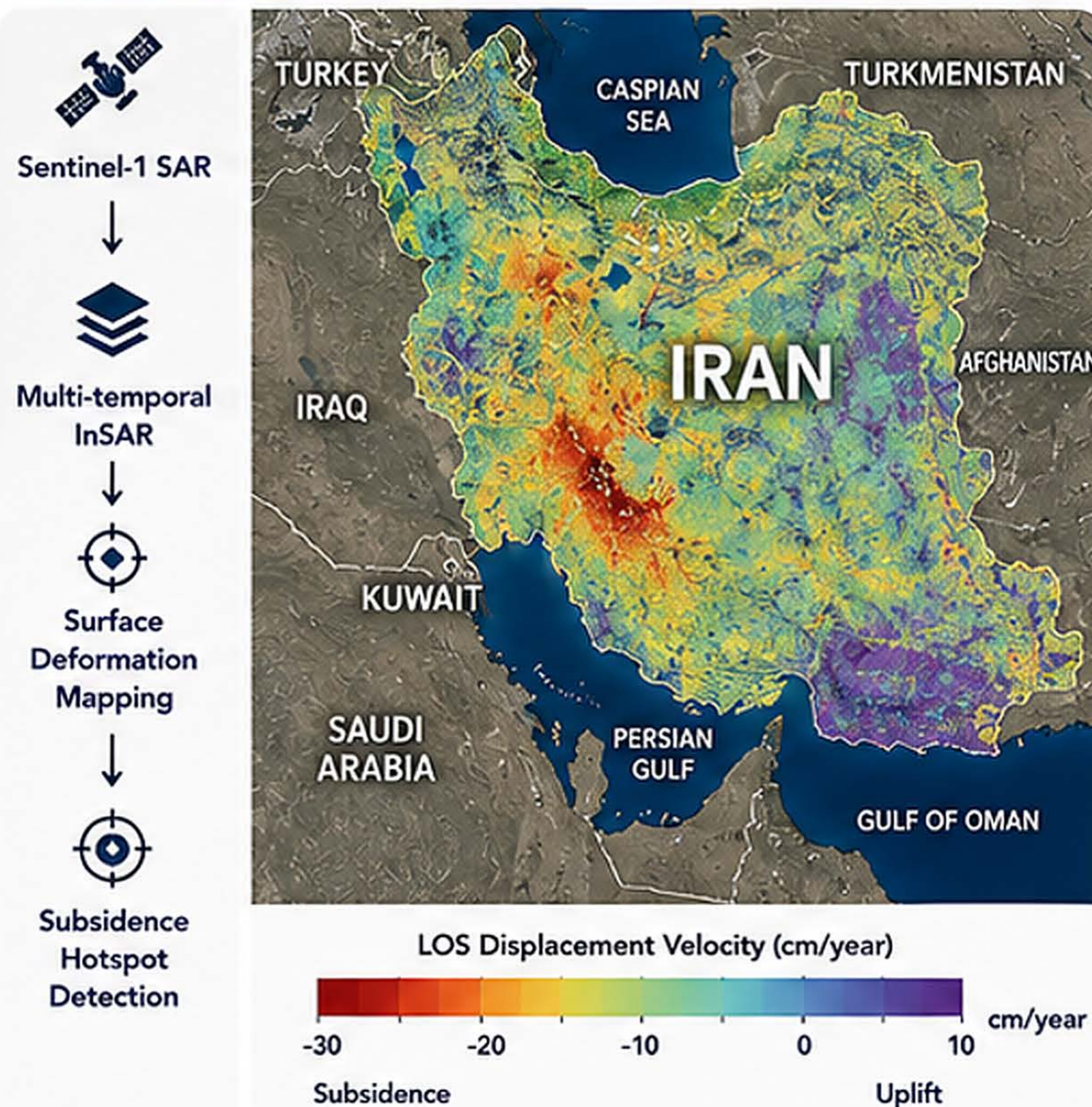
Agricultural
Impacts



Urban
Areas

Source: UN-ESCAP (2023), IROST (2022),
Iran Water Resources Research Institute

2. SPACE-BASED SOLUTION: InSAR MONITORING



3. SERVICE: SUBSIDENCE INTELLIGENCE



4. RESULT / IMPACT

From deformation maps
to risk-informed planning



Earlier Detection



Infrastructure
Risk Assessment



Better Land & Water
Management



Railways



Roads



Buildings



Water
Infrastructure

Source: Sentinel-1, COMET-LiCS, ESA



TRANSFERABLE LESSON

Routine satellite monitoring can reveal slow-moving risks before they become costly infrastructure and development problems.



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From Applications to Markets: Iran's Emerging Downstream Opportunities

Iran's downstream opportunity lies in transforming project-based satellite applications into recurring, decision-ready services.

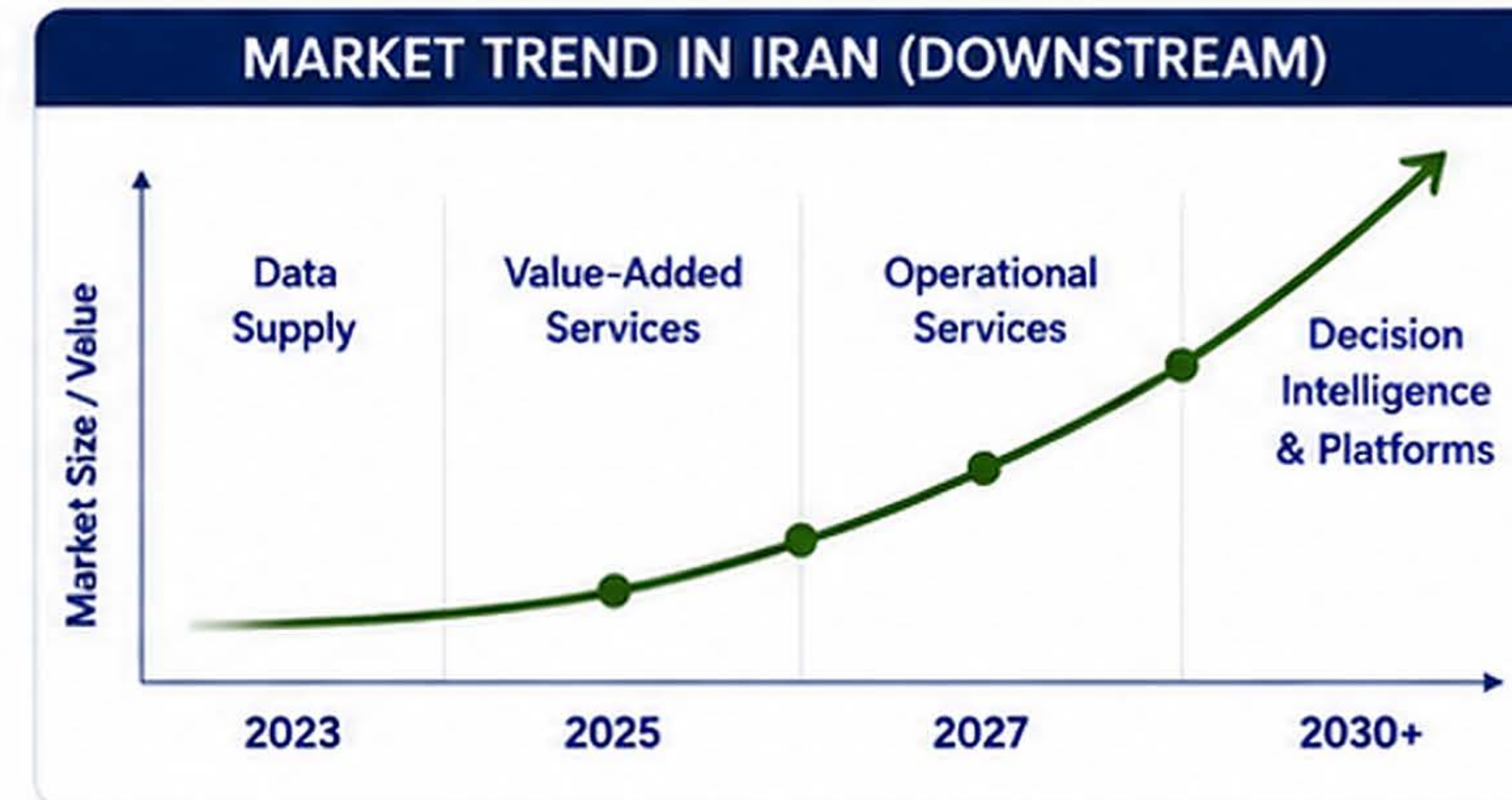


THE ECONOMIC VALUE OF DOWNSTREAM SERVICES

-  **\$78.8B** Global Remote Sensing Services market by 2034 (20.6B in 2025)
Source: Fortune Business Insights, 2024
-  **62%** of downstream EO value comes from value-added services (2024)
Source: Space Economy Report, 2024
-  **4 PRIORITY MARKETS** High potential downstream opportunities in Iran

KEY DOWNSTREAM MARKETS IN IRAN

 AGRICULTURE & WATER Precision agriculture, crop intelligence and water optimization	 DISASTER INTELLIGENCE Early warning, rapid mapping and risk management	 ENVIRONMENTAL INTELLIGENCE Air quality, dust monitoring and environmental alerts	 INFRASTRUCTURE INTELLIGENCE Asset monitoring, subsidence risk and infrastructure safety
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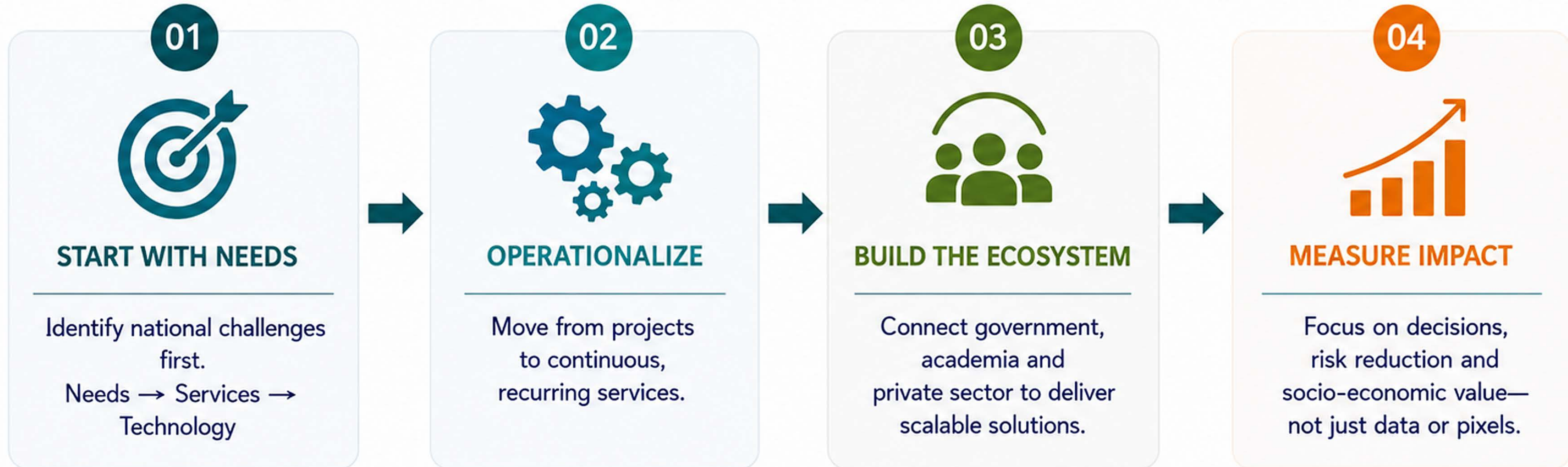
THE OPPORTUNITY FOR IRAN

 A growing shift toward value-added and operational services will create a scalable downstream market, enabling private-sector growth, skilled jobs and long-term economic value for Iran.

 **TRANSFERABLE LESSON** The real economic value comes downstream—when data is transformed into intelligence, services and measurable impact.

Lessons for Emerging Space Nations

*Emerging space nations do not need to build everything first—
they can create value by turning existing space capabilities
into services that address national priorities.*

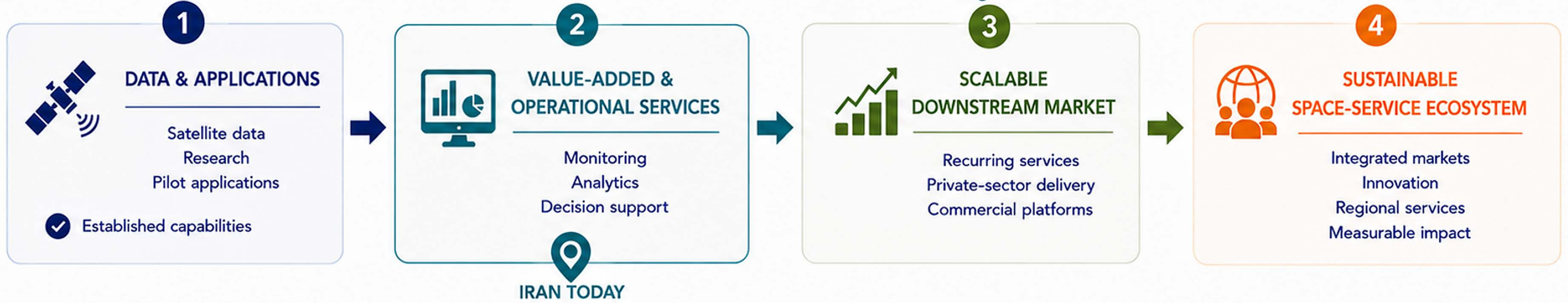


A PRACTICAL PATH FOR EMERGING SPACE NATIONS

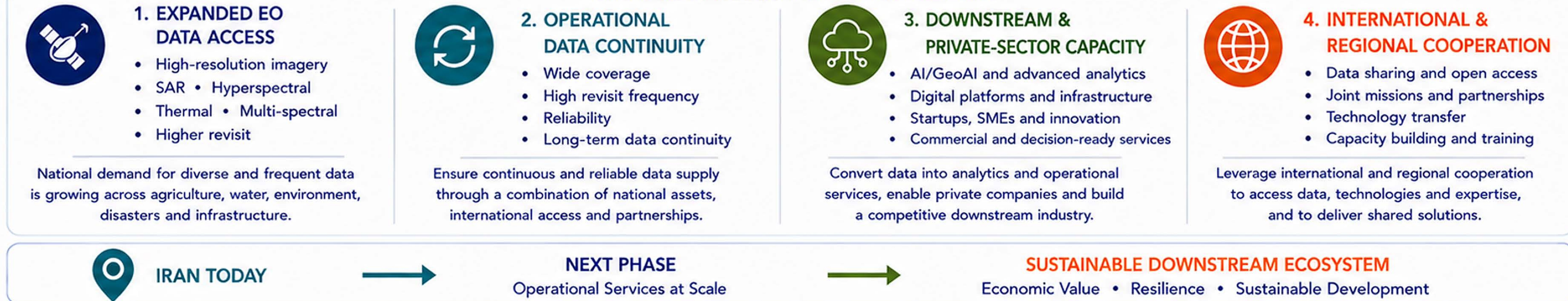
National Need → Space-Enabled Service → Market → Measurable Impact

Future Outlook: From Today's Position to a Sustainable Space-Service Ecosystem

*Iran has developed significant space and Earth observation capabilities;
the next challenge is to convert these capabilities into scalable,
recurring and market-driven services.*



WHAT IRAN NEEDS FOR THE NEXT PHASE



Key Takeaways



01

START WITH REAL NEEDS

Space creates value when it addresses real economic and societal challenges.



02

MOVE FROM DATA TO SERVICES

The greatest opportunity lies in transforming satellite data into operational, decision-ready services.



03

BUILD A SUSTAINABLE ECOSYSTEM

Data access, enabling government policies, private-sector participation and international cooperation are essential for scalable impact.

**For emerging nations, the opportunity is not simply to reach space —
but to bring the value of space back to Earth.**

From Space Capabilities



To Services



To Resilience



To Economic Value

