



Webinar Space for Financial Services

Roberta Mugellesi Dow, ESA

Christophe Christiaen, UK Centre for Greening Finance and Investment

Guillermo Gonseth, SCOR, CH

07/07/2021



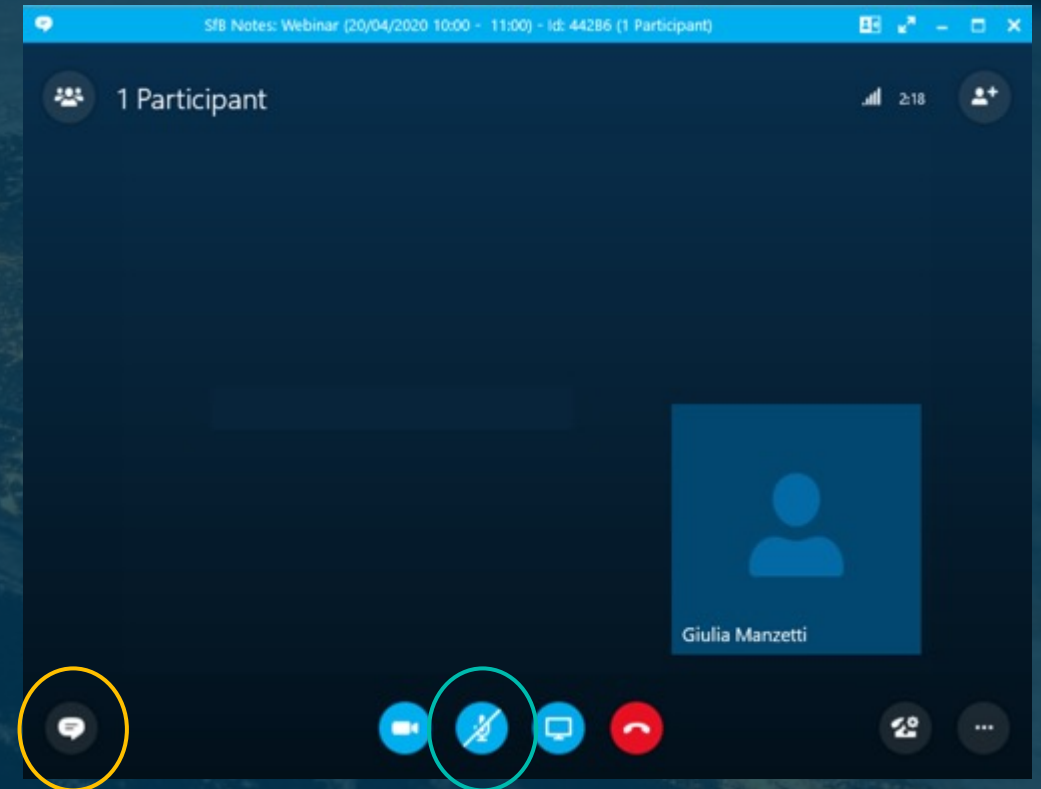
Roberta Mugellesi Dow - ESA



WELCOME TO THE WEBINAR!

Due to the number of attendees, please **keep your microphones muted** at all times and switch off the webcam function

You can use the **conversation function** anytime to submit your questions. They will be addressed during the Q&A at the end of the webinar



ESA introduction

Introduction to Kick-Start Activity

Space for Financial Services:

Background

Key topics

Enablers from space: SatNav, SatEO, SatCom

Financial Services Invited Speakers:

Christophe Christiaen, **Smith School of Enterprise and the Environment, University of Oxford, UK**

Guillermo Gonseth, **SCOR, UK**

How to apply

Open Questions & Answers session



To provide for and promote, for exclusively peaceful purposes, cooperation among European states in space research and technology and their space applications.

- Over 50 years of experience
- 22 Member States
- 8 sites across Europe and a spaceport in French Guiana
- Over 80 satellites designed, tested and operated in flight



space
transportation



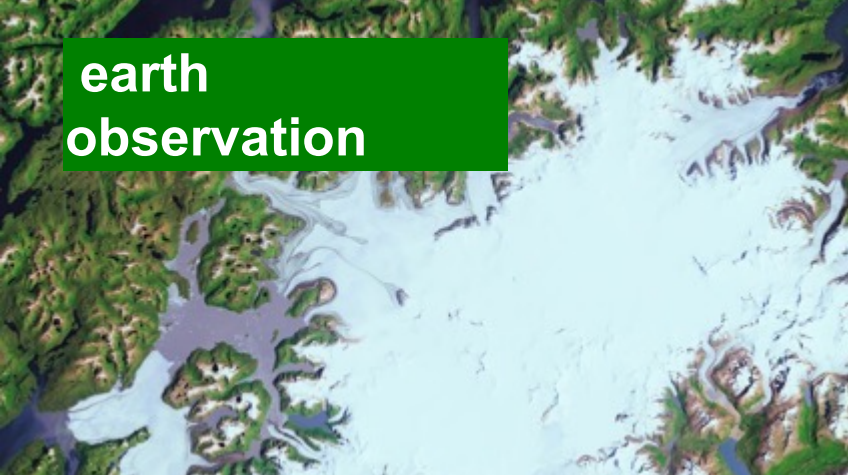
science



human
spaceflight



earth
observation



telecommunicatio
and
applications



navigation



exploration



operations



technology



ESA SPACE SOLUTIONS

The largest space innovation network in the world

- The go-to place for great business involving space to improve everyday life.
- Supporting European start-ups and SMEs to develop businesses using space technology and data.
- Offering funding, business and technical support to help to generate successful business, and create positive socio-economic impacts.



ESA Space Solutions



Zero-equity funding (from €50k to €2M+ per activity)

A personalised ESA consultant

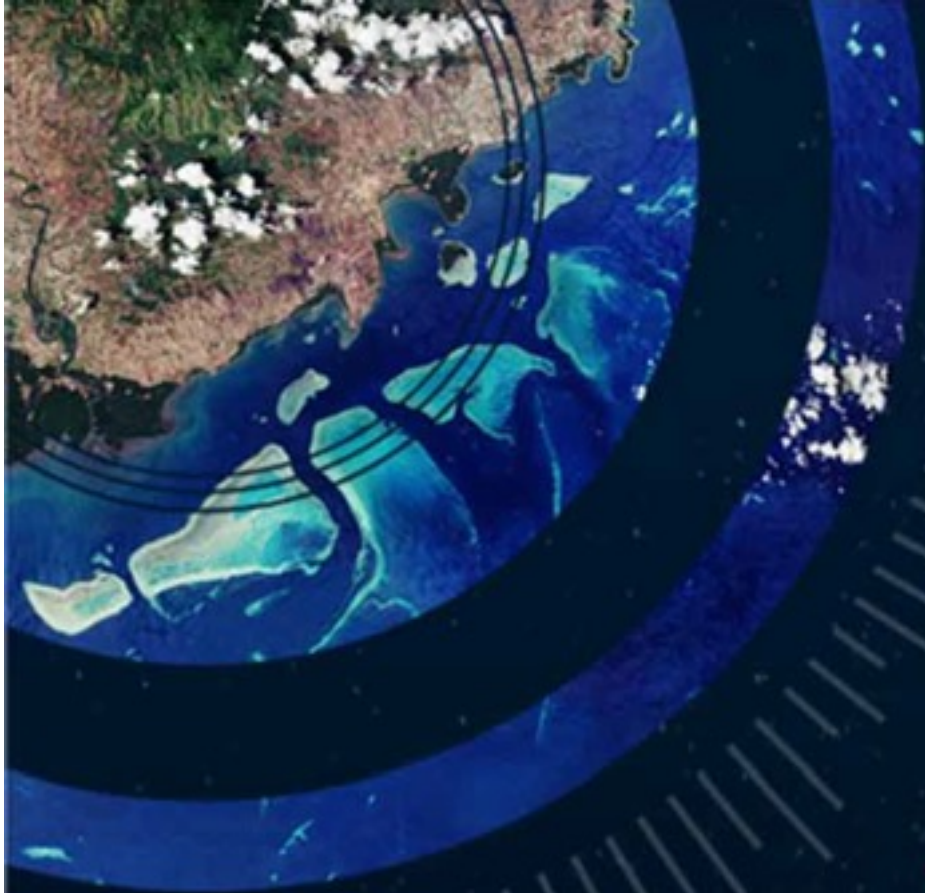
Technical support and commercial guidance

Tailored project management support

Access to our international network of ESA and partners

Access to our network of investors

Credibility of the ESA brand



ESA UNCLASSIFIED



Next step...

Space for Financial Services

Planned ESA's Kickstart Call



- Kick- Starts are ESA's funding scheme enabling companies to undertake short Feasibility Studies, up to 6 months, that explore new service and application concepts making use of space capabilities.
- Kick-Starts offer an instrument to assess the technical feasibility and commercial viability of an idea with limited initial investment by companies. As such, this scheme is considered particularly attractive for SMEs and start-ups, granting them an easy entry into ESA Business Applications.
- Successful Kick-Starts can be further developed into commercially-viable businesses with follow-up support from ESA Business Applications in the form of Demonstration Projects[*]

[*] <https://business.esa.int/funding/direct-negotiation-call-for-proposals/demonstration-projects>



Kick-Start on Space for Financial Services

Kick-Start activities are funded at 75 % for a maximum amount of 60,000 Euro per contract

Duration: 6 months

The Thematic Calls for Kick-Start Activities follow a competitive tendering procedure

- **Get Customer Engagement** incl. needs and value proposition validation.
- **Technical Feasibility Assessment** incl. Service and System Architecture, Space data/technology integration.
- **Commercial Viability Assessment** incl. Business Model and Plan



Kick-start Launch 9 August 2021

Financial Services

Financial services is a broad range of activities including banking, investing, and insurance facing many challenges. Most of it has to do with the digital transformation, the organization of data and analytics, the incorporation of AI and automation in the processes, blockchain technology and the increase in regulatory compliance.

There are also challenges in delivering accessible, affordable and appropriate financial services to small businesses and customers in remote areas.

How space technology can support financial services facing the above challenges, helping institutions to make responsible financial decisions and development of applications to increase the access to customers in remote areas?



Use case: Banking Services

Banking services is concerned with several different financial activities provided to different segments: personal banking, offering financial services tailored to individuals, business banking dealing with small businesses and investment banking, not for the general public but large corporations.

Space data can support the banking services:

- to provide reliable insights and forecasts related to loan provision to individuals and businesses in real estate/agricultural/energy sectors by integrating AI in the decision-making processes for the monitoring of the assets of customers;
- by providing access to banking to individuals/businesses located in remote areas;
- by enabling currency transfers, record transactions, trading of goods and services by integrating blockchain technologies.

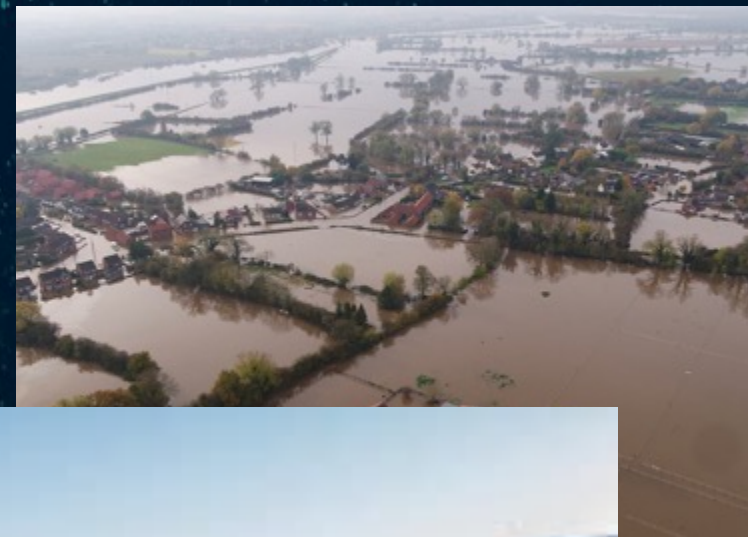


Use case: Insurance Services

Insurance services include protection against property loss or damage, underwriting and re-insuring tasks, selling insurance to the insurers themselves to help protect them from catastrophic losses.

Space data can support the insurance services:

- risks estimation, automated claims settlements, also through blockchain technology;
- automated risk modelling, for example for farmers or home owners, to assess or re-insure the insurance policies
- for the verification of insurance claims and risk profile and mitigation.





Satellite Navigation

- To support the development of applications requiring the geo-referencing and/or timestamping of transactions metadata.
- To support crowdfunding by giving information about the real origin of contributions.



Satellite Communications

- Act as a back-up to terrestrial communications..
- provides broadband internet, voice over IP, real-time video and reliable communications.



Earth Observation data

- To provide diverse geospatial, environmental, weather, mapping information, which will support services
- EO images to provide key information to diverse applications

GREEN FINANCE MARKET OPPORTUNITY FOR SPACE SOLUTIONS

Christophe Christiaen
Data and Innovation Lead
Oxford Sustainable Finance Programme

The UK Centre for Greening Finance and Investment (CGFI) is a national centre established to accelerate the adoption and use of climate and environmental data and analytics by financial institutions internationally. It will unlock opportunities for the UK to lead in greening finance and financing green.

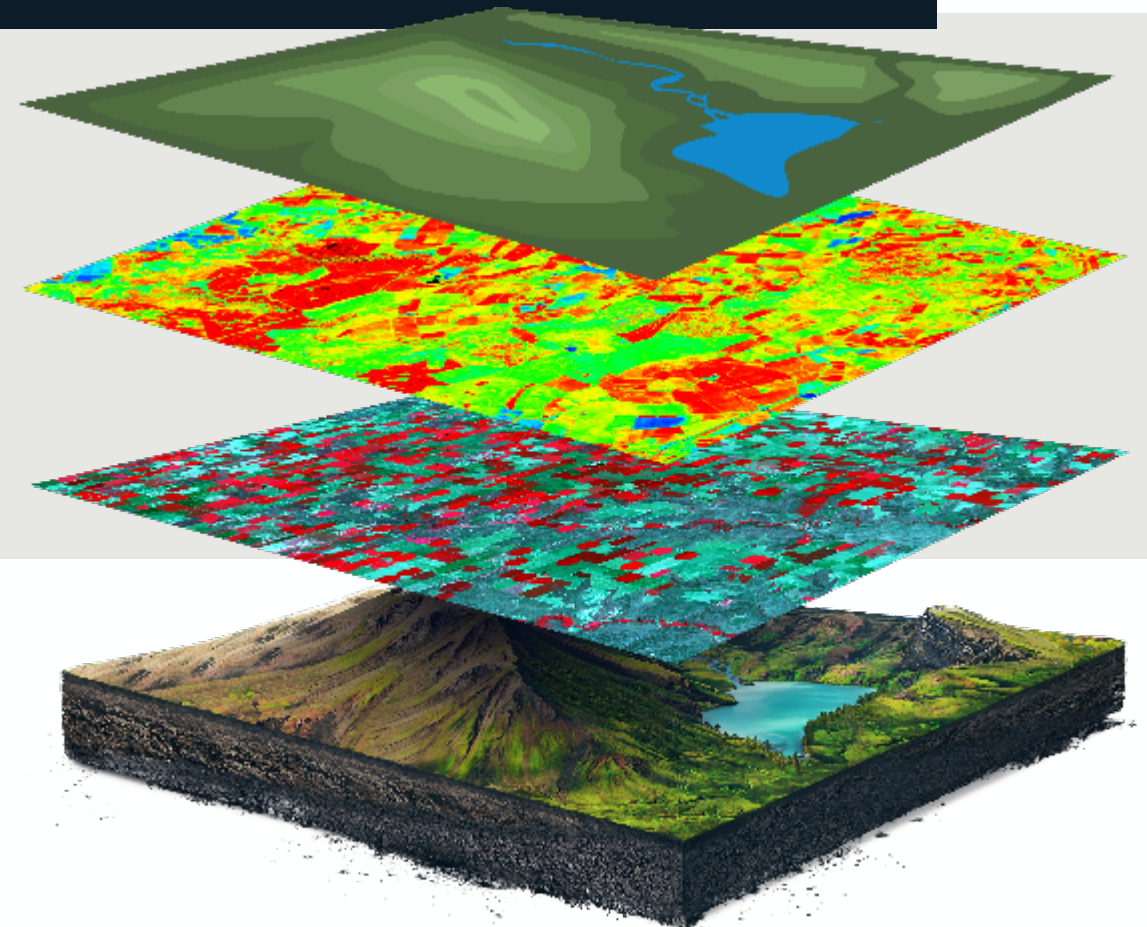
ULTIMATE VISION

Financial institutions able to access and use climate and environmental data and analytics for:

- Any point on earth
- Past, present, and future
- Every major sector
- Material climate and environmental factors

SUCCESS WILL MEAN

- Enhanced solvency of financial institutions
- Reallocation of capital towards green
- Resilient global financial system
- Realise the opportunity for UK plc



SCALABLE FOUNDATIONS

From across the flagship projects, the CGFI will draw out products, learning, and good practice that will be shared in the form of standards, guidance, data and analytical products that will be openly available to all.

Each flagship will share a common foundation in being based upon robust asset-level data that can be aggregated up to inform asset-specific, portfolio-level, or macro-financial stability considerations.

Together they form a set of building blocks that cover the key risks, use cases, asset classes, and users, covering trillions of assets.

**UK CENTRE
FOR GREENING
FINANCE &
INVESTMENT**

**END
USERS**

INTERNATIONAL FINANCIAL INSTITUTIONS | PUBLIC FINANCE | ASSET OWNERS & ASSET MANAGERS | BANKS | RE/INSURANCE | CENTRAL BANKS & SUPERVISORS

USE CASES

RISK PRICING | CAPITAL ALLOCATION | PORTFOLIO RISK MANAGEMENT | STRATEGIC ASSET ALLOCATION | CHANGING BEHAVIOUR | DISCLOSURE, SCENARIO ANALYSIS | CREDIT RISK | STRESS TESTING

HAZARD LAYERS & PROJECTIONS

CLIMATE AND WEATHER EXTREMES | TRANSITION RISK & CARBON PRICING | ENVIRONMENTAL DAMAGES | SUPPLY CHAINS & SYSTEMS | BIODIVERSITY LOSS | POLICY | TECHNOLOGY | CONSUMER BEHAVIOUR | CUMULATIVE EMISSIONS | SYSTEMIC ISSUES | MACROECONOMIC IMPACTS

COMMON FOUNDATION OF ROBUST ASSET-LEVEL DATA BY SECTOR

ENERGY | INFRASTRUCTURE | HEAVY INDUSTRY | REAL ESTATE | TRANSPORT | MANUFACTURING | EXTRACTIVES | LAND USE

GREEN FINANCE DRIVERS - FINANCIAL

UK's biggest money manager warns on climate catastrophe



Simon Jack
Business editor
@BBCSimonJack

16 April 2019 721

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The world is facing a climate catastrophe and businesses around the world must address it urgently or face the ultimate sanction for a public company, shareholders who refuse to back them any more.

The reason why ESG funds outperformed during the market sell-off

The relative outperformance of ESG funds since the start of the coronavirus sell-off is almost entirely down to low exposure to energy companies.

March 24, 2020 by Tom Bailey

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GREEN FINANCE DRIVERS - REGULATION

UK to make climate risk reports mandatory for large companies

Rishi Sunak says disclosures will be mandatory within five years as part of net-zero plans



▲ Sunak said departure from the EU meant the UK's financial services sector - which employs more than a million people - was entering a new chapter. Photograph: Toby Melville/Reuters

The New York Times

Bank Regulators Present a Dire Warning of Financial Risks From Climate Change



A neighborhood in New Bern, N.C., flooded by Hurricane Florence last year. Real estate markets are already feeling the effects of climate change, researchers say. Jim Lo Scalzo/EPA, via Shutterstock

GREEN FINANCE DRIVERS – CUSTOMER PREFERENCES

FTfm: Responsible Investing

Ethical and responsible investment

Reputations at stake for asset managers as biodiversity concerns mount

Institutions are paying more attention to preserving natural habitats in their investment decisions



Deforestation is damaging the diversity of some species' natural habitats © AFP/Getty Images

Jennifer Thompson OCTOBER 21 2019

The Principles for Responsible Banking were [launched](#) by 130 banks from 49 countries, representing more than USD47 trillion in assets, on 22 and [23 September](#) 2019 in New York City, during the annual United Nations General Assembly. More than 45 CEOs together with the UN Secretary-General attended the launch ceremony – watch the official launch [here](#).

The Principles for Responsible Banking

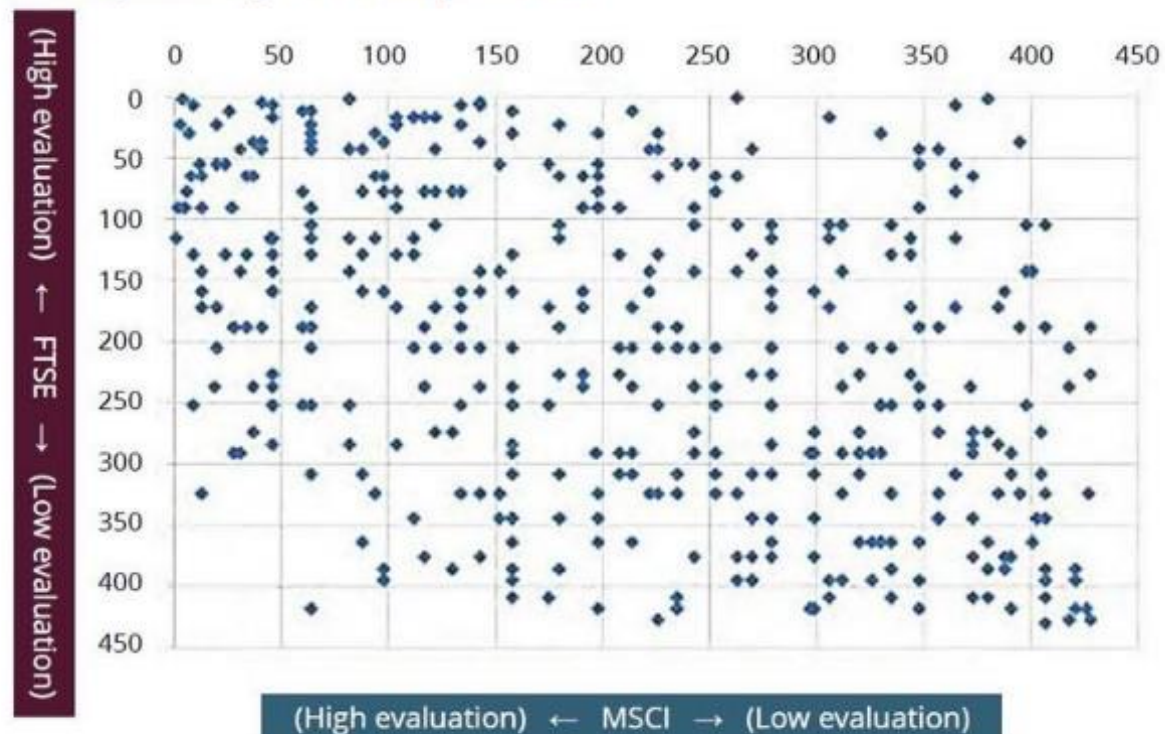
 <p>PRINCIPLE 1: ALIGNMENT</p> <p>We will align our business strategy to be consistent with and contribute to individuals' needs and society's goals, as expressed in the Sustainable Development Goals, the Paris Climate Agreement and relevant national and regional frameworks.</p>	 <p>PRINCIPLE 2: IMPACT & TARGET SETTING</p> <p>We will continuously increase our positive impacts while reducing the negative impacts on, and managing the risks to, people and environment resulting from our activities, products and services. To this end, we will set and publish targets where we can have the most significant impacts.</p>	 <p>PRINCIPLE 3: CLIENTS & CUSTOMERS</p> <p>We will work responsibly with our clients and our customers to encourage sustainable practices and enable economic activities that create shared prosperity for current and future generations.</p>
 <p>PRINCIPLE 4: STAKEHOLDERS</p> <p>We will proactively and responsibly consult, engage and partner with relevant stakeholders to achieve society's goals.</p>	 <p>PRINCIPLE 5: GOVERNANCE & CULTURE</p> <p>We will implement our commitment to these Principles through effective governance and a culture of responsible banking.</p>	 <p>PRINCIPLE 6: TRANSPARENCY & ACCOUNTABILITY</p> <p>We will periodically review our individual and collective implementation of these Principles and be transparent about and accountable for our positive and negative impacts and our contribution to society's goals.</p>

GREEN FINANCE DATA CHALLENGES

Main source of data on a company's sustainability performance is its voluntarily reported information or 'disclosures'. This comes with various challenges:

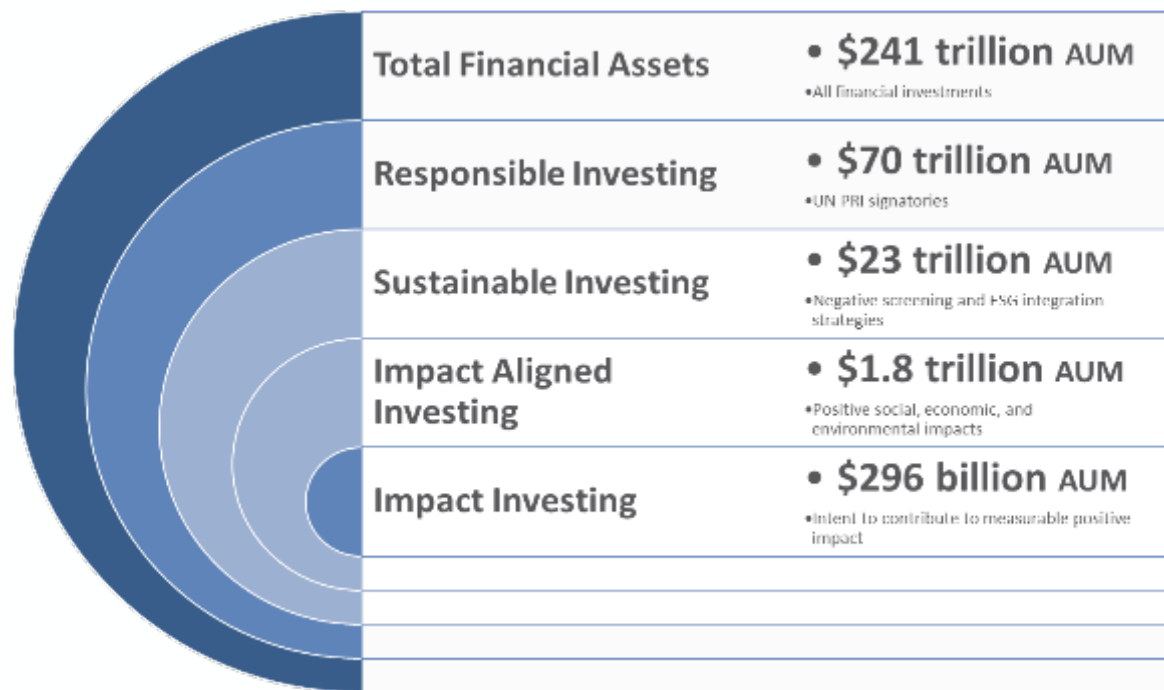
- Information is **self-disclosed** and typically compiled top-down
- ESG reporting is not mandatory, which means **not all companies report**
- ESG reporting not standardised, which means **data is not comparable**
- Annual reporting means ESG **data is outdated** once released

Figure 1 – Comparison of ESG scores from FTSE

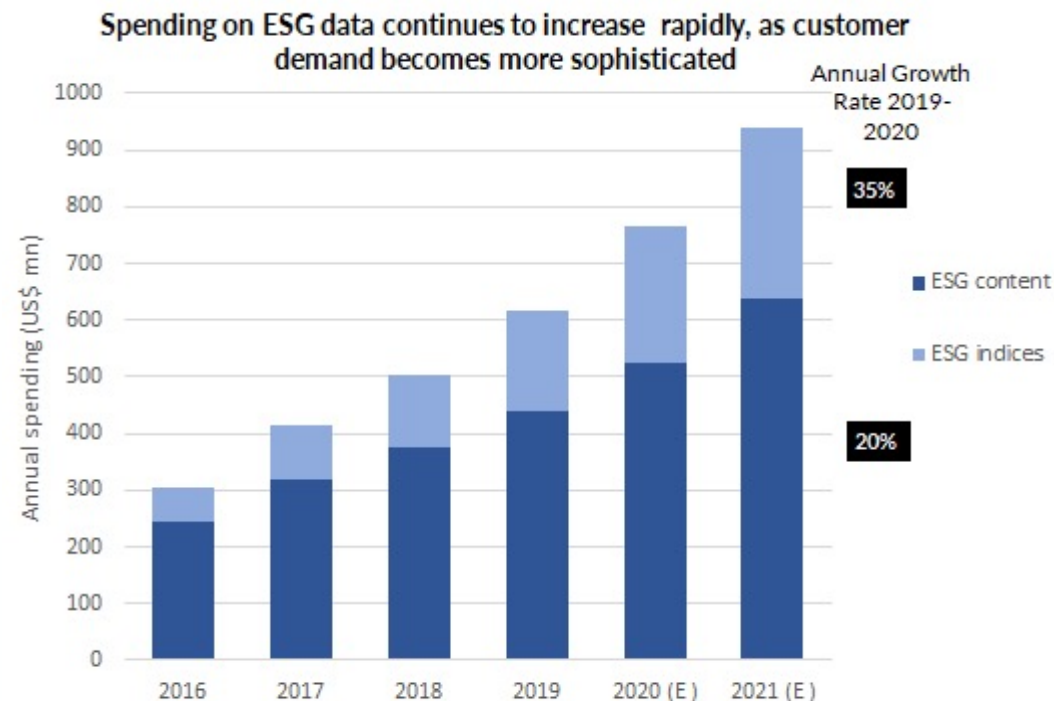


Source: CLSA, GPIF

GREEN FINANCE DATA MARKET



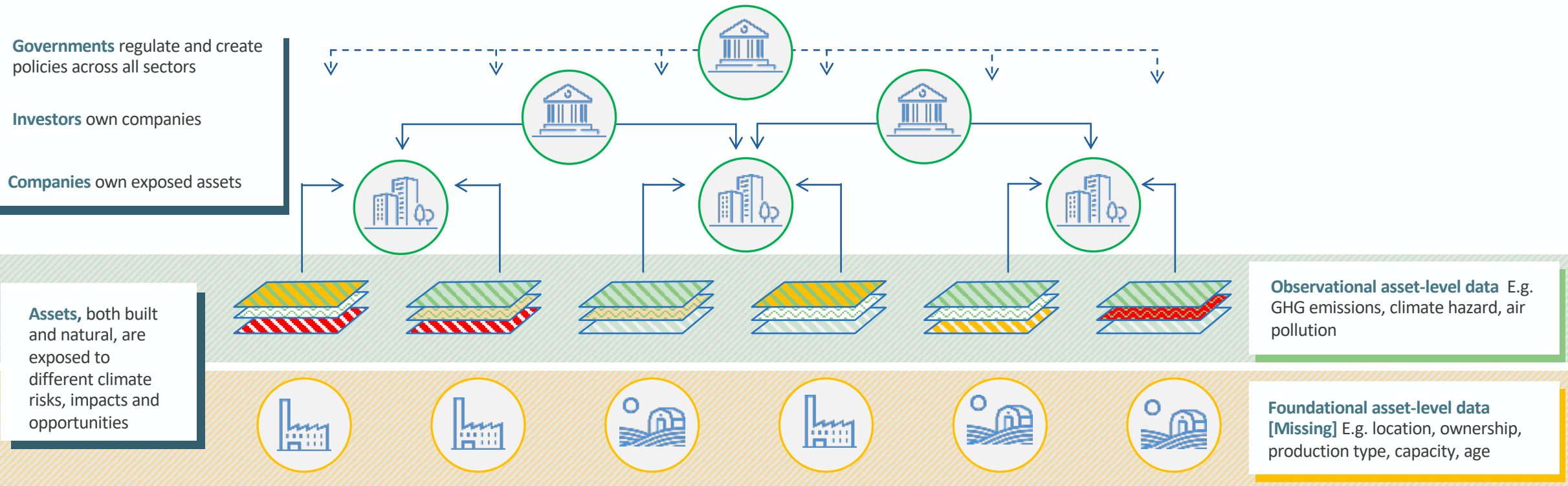
Source: International Finance Corporation



Source: Opimas

SPATIAL FINANCE & ASSET-LEVEL DATA

Bottom-up, asset-level analysis is essential to accurately assess physical and transition climate risks, opportunities and impacts across all sectors of the economy.



GREEN FINANCE USE CASES

Satellite data can support the assessment of risks, opportunities and impacts across various topics:

- **Climate change**
 - **Physical** risks/opportunities linked to location and how this will affect future operations and profitability
 - **Transition** risks/opportunities linked to carbon intensity and lack of compliance with Paris agreement and other climate/political accords
- **Environmental** topics
 - **Deforestation** particularly linked to soft commodity supply chains
 - **Biodiversity** often linked to supply chain impacts though could also be direct impacts
 - **Water** resources both in terms of availability and quality, needed for company operations
- **Social** topics
 - **Human rights** issues such as slavery, unsafe labour conditions, etc. could cause reputational damage
 - **Community** displacement or other negative impacts could create liabilities or reputational damage



Image credits: ESA

FUTURE APPLICATIONS

Asset managers

- Differentiate between companies and projects based on risk and impact
- Support active ownership, risk management and high-res stress testing

Asset owners

- Assess asset manager portfolios against investment beliefs

Corporates

- Verify internal data collection
- Peer benchmarking

Regulators

- Assess and manage systemic risks
- Verify and enhance regulation on corporate disclosures

Policymakers

- Track and manage Paris and SDG implementation

Civil society

- Verify company disclosures and track asset financing



THANK YOU

Contact: Christophe.Christiaen@Smithschool.ox.ac.uk



Imperial College
London



The
Alan Turing
Institute



GREEN FINANCE RESOURCES

Spatial Finance and Asset-level Data

- [Spatial Finance Initiative](#): The Spatial Finance Initiative contains various relevant market and research reports as well as open asset-level databases
- [Oxford Sustainable Finance Programme](#): The Oxford Sustainable Finance Programme publications cover various green finance research topics, often derived from asset-level data and analysis

Sustainable Finance Ecosystem


- [ESG Ecosystem Map](#): This tool by the World Economic Forum provides an overview of some of the key stakeholders across the ESG ecosystem.
- [Creating Impact: The Promise of Impact Investing](#): International Finance Corporation's assessment of the potential global market for impact investing.

Frameworks and Policies

- [Task Force on Climate Related Disclosures Recommendations](#): This widely supported market-driven initiative was set up to *develop a set of recommendations for voluntary and consistent climate-related financial risk disclosures*.
- [Green Finance Strategy - Transforming Finance for a Greener Future](#): The UK Government's strategy to *align private sector financial flows with clean, environmentally sustainable and resilient growth and to strengthening the competitiveness of the UK financial services sector*.

Satellite Data Use Cases

- [Climate risk analysis from space: remote sensing, machine learning, and the future of measuring climate-related risk](#): Overview by Oxford Sustainable Finance programme led consortium on how remote sensing and other technologies can help secure better asset-level data to support climate risk assessments.
- [Sustainability and satellites: new frontiers in sovereign debt investing](#): Report by asset manager Investec and WWF about the role geospatial data could play in assessing and managing environmental risks for sovereign debt investors.
- [Space, The Next Frontier: Spatial Finance And Environmental Sustainability](#): Report by S&P Global on how advancements in technology and data science are helping integrate satellite and other new forms of geospatial data and analysis into the finance sector.
- [Natural capital credit risk assessment in agricultural lending](#): Report by the Natural Capital Finance Alliance, highlighting how the Natural Capital Protocol could be applied for agricultural lending, highlighting relevant risk factors and potential data sources.



July 2022

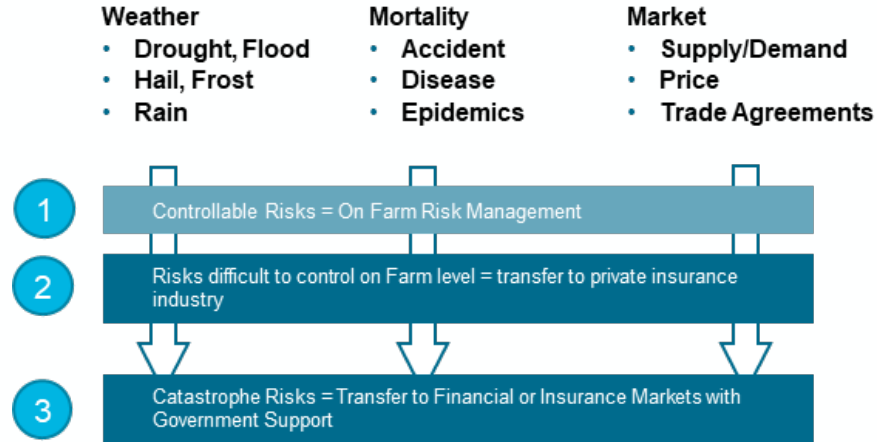


Use of Space Technology in Agricultural (Re) insurance

Guillermo Gonseth y Garcia

Senior Agriculture Underwriter

Major production risks



Future growth drivers

- The anticipated growth of world population
- Strategic importance to Governments
- Globalisation of markets in combination with improved income in emerging markets
- Sophisticated farm practice

Emerging Risks

- Climate change
 - Desertification / urbanization
 - Volatility / change in local weather patterns
- Political environment / stability
- Availability of fertilizer / Use of pesticides
- Access to clean water
- Cyber Risk

The management of existing and emerging risks requires significant investments into sophisticated farm practice/technology. The key role of the (re)insurance industry is to protect the insureds income or investment to contribute to livelihood and well-being by adequately:

- Defining/assessing the risk
- Bringing data, creating models to price risk
- Designing products and solutions to prevent/mitigate/transfer risk

The role of the Re-/Insurance Industry

Agriculture and Food are playing a key role in any sustainable development! Natural resources are limited, and the production industry must develop techniques, that not only meet future food demand but also avoid the same kinds of unintended consequences of the past. The development and implementation of technology that supports the decision process and foster a sustainable production environment will be key. In its latest report, the FAO states “Sustainable food and agriculture have a great potential to revitalize the rural landscape, deliver inclusive growth to countries and drive positive change right across their 2030 targets for sustainable first Green Revolution!” **This target can be achieved if Governments and Privat Industries work hand in hand and a clear alignment of interests can be found.**

Today, Agriculture Re-/Insurance has already a direct impact on Farmers in many markets

- access to productive resources, finance and services, by providing cover against natural perils and stabilize their income
- ability to respond to shocks and therefore enhance resilience

Key role of the insurance industry is to secure and stabilize farmer’s income

Our role is to support the Agriculture industry (incl. Governments) in the development and application of new technology, risk analysis and innovative products that help not only to respond to shocks, but also to

- prevent,
- prepare and
- protect

This requires an understanding of the potential use of new technology, its limitations and the ability to select the most appropriate tools for a specific transaction (i.e., tailor-made solutions).

Key requirements for development new or enhancement of existing products

To develop Agriculture insurance solutions, we need to be able to underwrite and manage risks in a fast, accurate and cost-efficient way.

Key challenges to develop appropriate solutions are often:

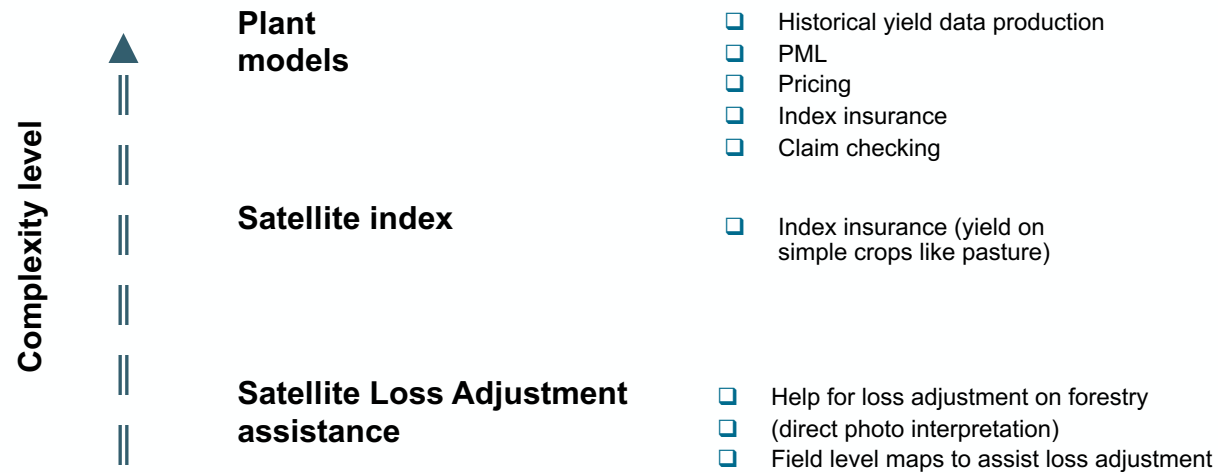
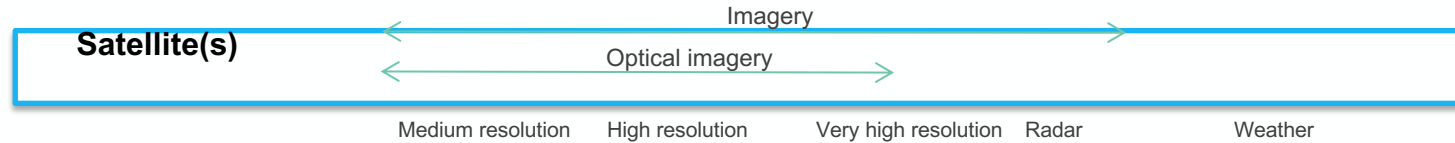
- ❑ Lack of access to historical data (not available or reliable / subject to data protection laws / big data volume etc.)
- ❑ Costs and time to set up a distribution, underwriting and loss adjustment infrastructure
- ❑ Affordability and awareness

How to overcome these challenges? When trying to develop solutions, we have to take a look at the main factors that are driving losses in Agriculture:

- ❑ Lack of / excessive rain
- ❑ Temperature (heat / freeze)
- ❑ Drought
- ❑ Livestock: Lack of fodder, adverse weather, disease

By making use of today's available technology (computing power, satellites, crop modelling, fertilizer modelling, weather stations, radar etc.), the industry is in the process of collecting, analyzing and modelling the potential impact of the above factors on a given crop production. The output is used to build a tailor-made index or model for structuring new insurance solutions / products.

New technologies in Agricultural (re) Insurance

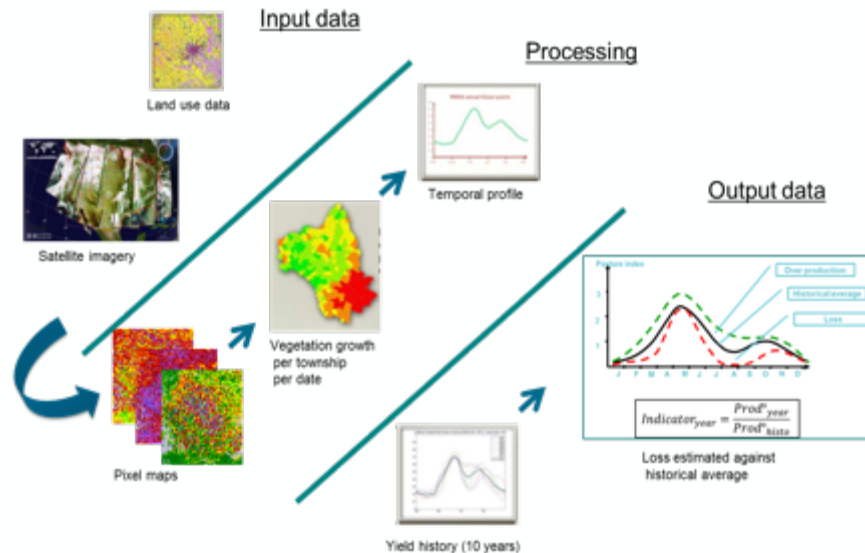


New product in Brazil → Satellite based In Pasture

- ❑ Globally around 20 % of the crops are insured
- ❑ For pasture this number drop to less than 2 %
- ❑ Pasture is the base for many productions, meat, milk and milk products etc..
- ❑ Pasture is complex because there is not only one harvest, 1, 2 or 3 cuts, grazing in between.
- ❑ Yield evaluation is very difficult.
- ❑ The technology presented has been developed by Airbus Defense & Space.
- ❑ The insurance product have been implemented :
 - By Credit Agricole Assurance in France since 2015
 - By Credit Agricole Assicurazioni in Italy since 2019
 - By AgroBrasil / ESSOR / SCOR / IRB in Brazil in 2021
 - Pilot project is currently running in Canada

Satellite based Index – Pasture

Capture the Annual profile of vegetation growth for one grid cell using Biophysical Parameters Technology. Covers all perils during the whole season (developed by AIRBUS).



The final pasture indicator corresponds to the relative value of an annual production compared to the historical production.

In case the yield of the current year is below the trigger a pay-out is made.

The model was developed by Airbus D&S.

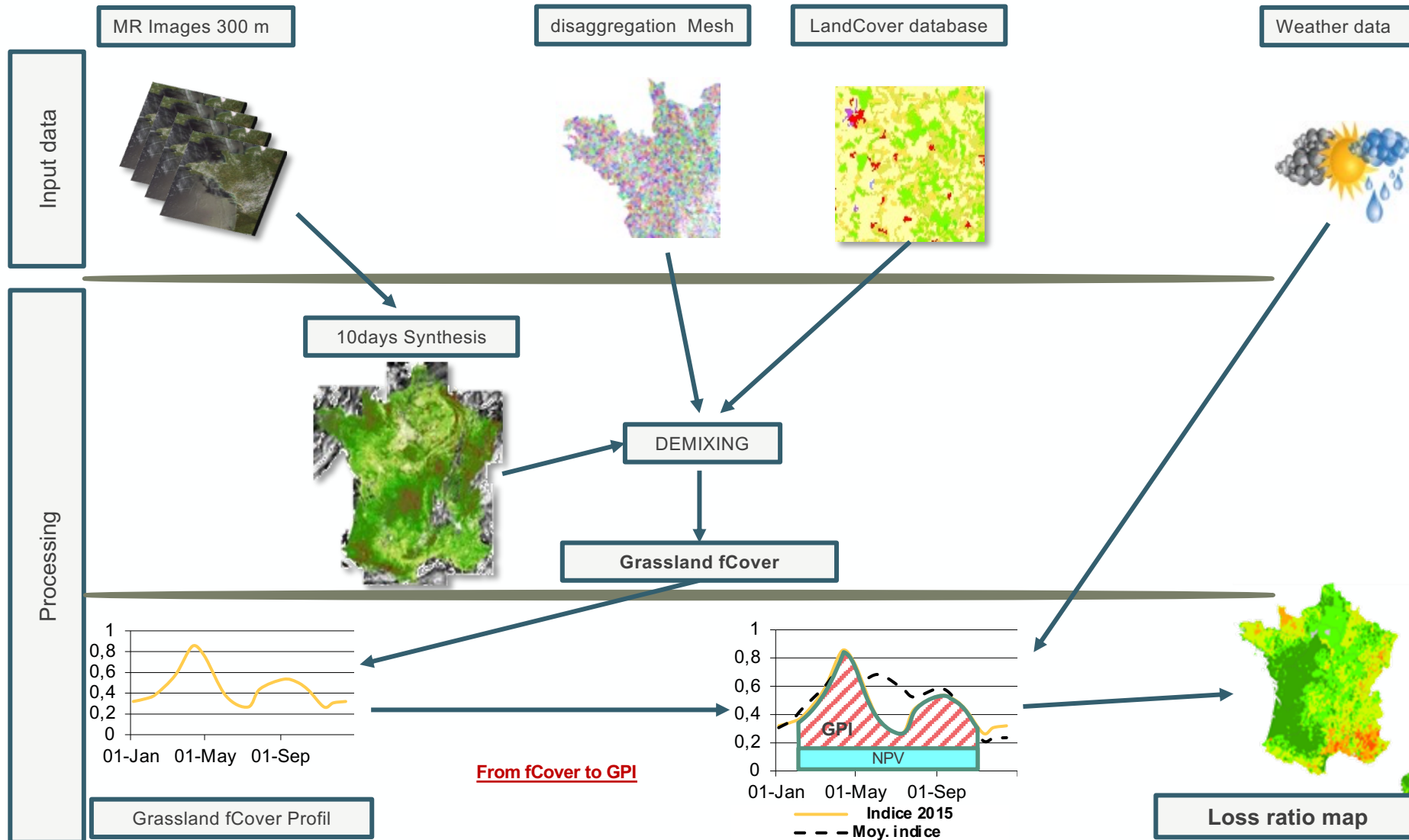
Advantages

- Traditional solutions are not suitable for Pasture
- Adaptable to customer needs
- 15 years of historical data
- Multi peril approach
- On time pay-out

Challenges

- Technicality and acceptance

The detailed method from Satellite to Index



Product

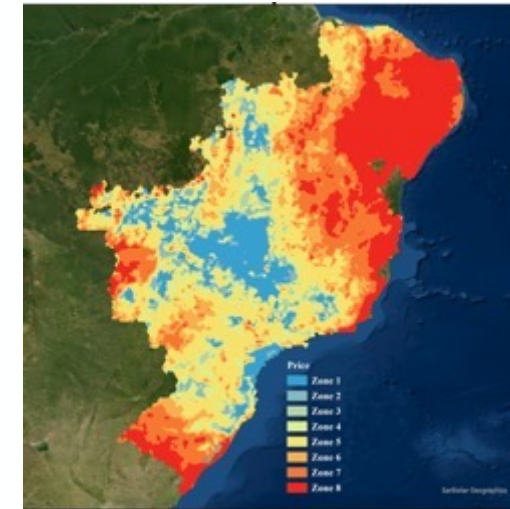
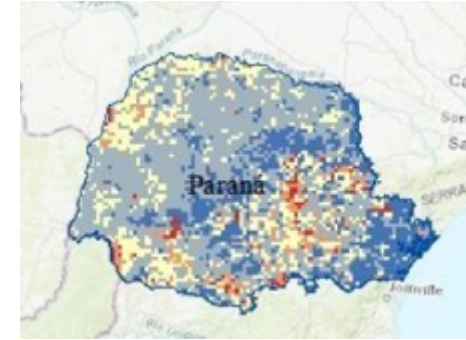
The product is defined by 4 Parameters

- The geographical unit
 - 15 zones
 - 300 000 cells (from 1000 ha to 3000 ha)
- The temporal aggregation
 - Full season aggregation
- The sum insured : Chosen by the Farmer (from 150 USD to 600 USD)
- The level of Franchise : 10 %, 20 % or 30 %

Pricing split in 8 zones

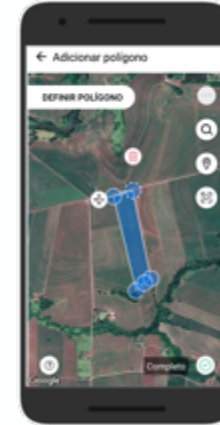
The product and the policy have been reviewed and validated by the SUSEP, Brazilian regulator.

The product has been labeled as eligible to subsidies. (20 % with CAP per fiscal number)



A local team highly involved !

In 15 months, we went from a plan to a product with price, policy, 20 years data, regulator approval, subsidies, web platform, phone app, commercial documents...



Is Index Insurance the solution?

By making use of the appropriate technology, index insurance can be the solution for a vast number of challenges. However, no solution fits all and the right tools have to be selected, for example:

Small-hold Farmers

Area Yield Index
Rainfall and Temperature Index
Satellite Indices

Large / Farm Enterprises

Area Yield Index
Production Statistic Index
Tailormade products (Weather index combined with crop models and other means of assessment)

Despite the potential for cost-efficient insurance solutions, there are still some factors to be taken into account:

Advantages:

- ❑ Cost-efficient technology
- ❑ Faster implemented than traditional infrastructure
- ❑ Independent source for index (no conflict of interest)

Challenges:

- ❑ Basis risk (not suitable for all client segments)
- ❑ Acceptance

Some thoughts...

- ✓ Satellite is not a magical problem solver...
...But is a very powerful tool
⇒ Know the limits
- ✓ Satellite is not A technology...
...But a family of technologies (choice is crucial)
⇒ Choose correctly
- ✓ Satellite imagery is not standard...
...The processing is as important as the picture
⇒ Understand your provider's technology
- ✓ Satellite is not 22nd century R&D...
...It is now a real industrial tool
⇒ Let's continue using it !



How to apply:
Funding and Tender Information

HOW TO APPLY

1. Register (minimum 'light registration') by completing online questionnaire on ESA-STAR Registration
2. Download the official tender documentation (Invitation to Tender), which will be available as soon as the ITT is open via ESA-STAR <https://esastar-publication.sso.esa.int/ESATenderActions/details>, AO xxxx
3. Create 'Bidder Restricted Area' in ESA-STAR
4. Write your Proposal using the template provided in the Tender documentation and obtain Letter of Authorization from your National Delegation (business.esa.int/national-delegations)
5. Submit your proposal via 'Bidder Restricted Area' in ESA-STAR Tendering
6. More info can be found here: <https://doing-business.sso.esa.int/>



Authorization from National Delegations

Participation to the kickstart is open to any company and/or organisation, residing in the following Member States: Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden.

Please note that, currently, Austria, Greece, Switzerland and the United Kingdom are not supporting Kick-Start activities.

The authorization from National Delegation for the specific Thematic Call against which you submit your Proposal is an admissibility criteria. Proposals not authorized at the closing date of the Thematic Call will not be admitted for evaluation.

For each individual Thematic Call, dedicated clarifications will be posted in ESA-STAR to provide information on the list of Member States that have already provided their pre-authorization to the Thematic Call. In case your company/organisation resides in a country which has not provided a pre-authorization to the Thematic Call you are interested in, you need to contact your National Delegation. The contact information of the National Delegations can be found at <https://business.esa.int/national-delegations>.

BASIC PRINCIPLES - ESA-STAR


esa-star
 registration

16 Apr 2020	ESA Home Page	EMITS	ESA Industry Portal	Contact Us	Help
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Home ▶ New Registration Maintain Entity Information ESA Entities Directory	<h2 style="margin: 0;">NEW REGISTRATION</h2> <p style="margin: 5px 0;">? Please select one of the two options:*</p> <p style="margin: 5px 0;"> <input type="radio"/> ? A. I am an Entity that has the capacity as "legal entity" </p> <p style="margin: 5px 0;"> <input type="radio"/> ? B. I am a Business Unit acting on behalf of a "legal entity", without being entitled to commit on contracts on my own </p>
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How to Apply

The Letter of Invitation to Call for Proposals is issued on ESA-STAR under 'AO xxxx' and includes:

- **Cover letter**
- **Appendix 1:**
List of Thematic Calls for Ideas (including the calendar of the Thematic Call for Ideas and specific information on the themes)
- **Appendix 2:**
Draft Contract
- **Appendix 3:**
Tendering Conditions for Express Procurement Procedure - EXPRO/TC
- **Appendix 4:**
Proposal Template





→ Proposal Template

Your Proposal shall include the following information:

- 1) Executive Summary (max 1 page)
- 2) Business Potential (max 5 pages)
- 3) Technical Concept (max 5 pages)
- 4) Team and Resources (max 3 pages)
- 5) Management (max 4 pages)
- 6) Financials (max 2 pages)



- For more information, please visit :

business.esa.int

+

THANK YOU!

Roberta Mugellesi

Roberta.Mugellesi.Dow@esa.int



OPEN QUESTION & ANSWER SESSION

