



Future perspectives for EO in Development

Meeting at ESA/ESRIN in Frascati
11th of September 2018

#WorldInCommon

AGENCE FRANÇAISE DE DÉVELOPPEMENT | FRENCH DEVELOPMENT AGENCY

01. What is AFD?



France's international development bank. AFD is the world's oldest development institution, committed for the last 75 years to the service of the people of the South and of Overseas France.



A tool for “a world in common”. Financing development means working to help all, to prevent crises and build shared prosperity.

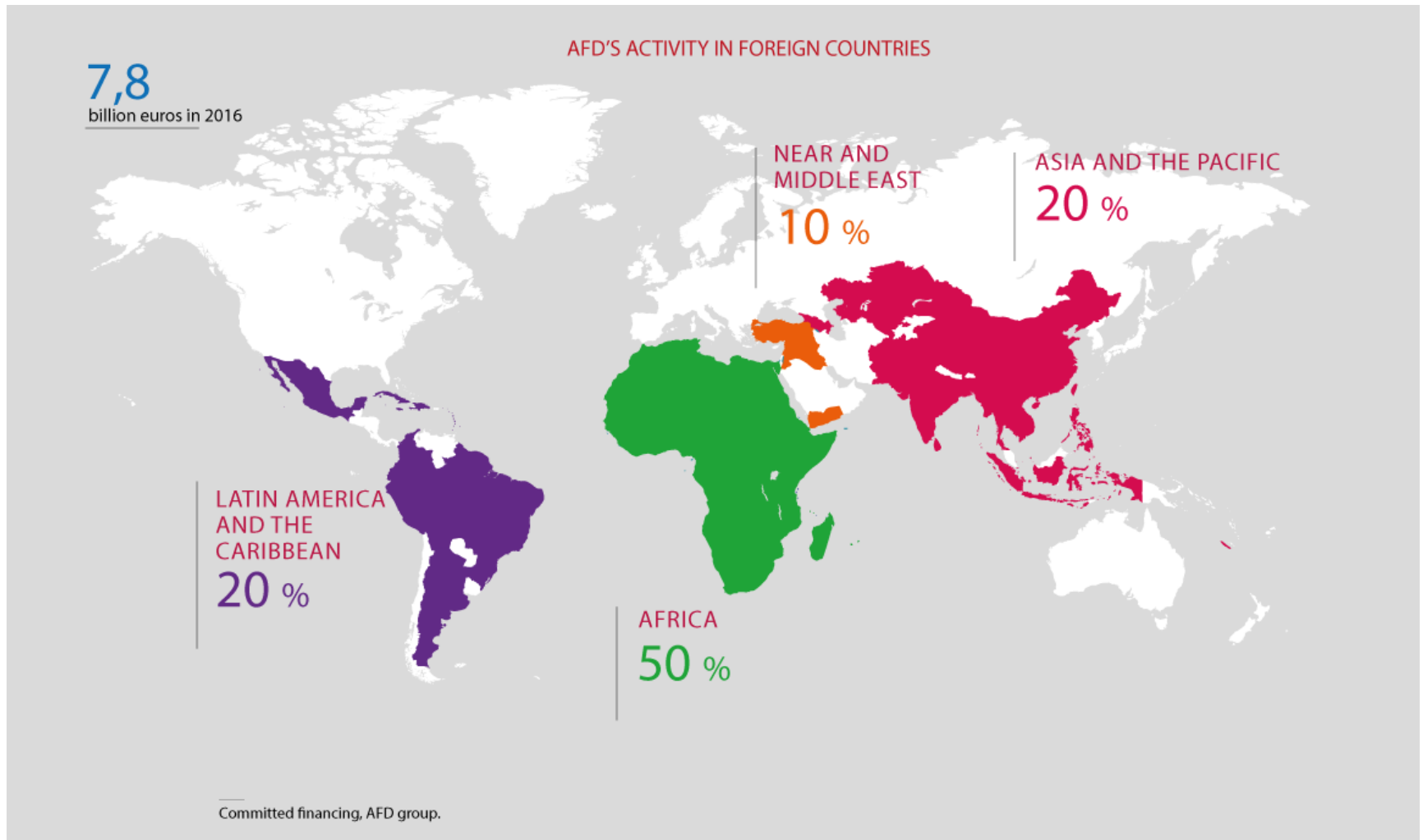


Adapted financial tools: Loans to States (€4bn), Loans to enterprises and local communities (€4bn), Grants (€1bn), Guarantees and equity investment (€0,5bn).



The agency that connects, in both directions, the actors of change. A link for action between France, Europe, and the world.

01. AFD's intervention area covers almost all the 'developing world'



02. Thematic and/or Geographic

- **Thematic**

- « Natural resources » already well explored at AFD!
- 5 thematics already in the CNES-AFD partnership
 - **Agriculture – Forestry – Land Use**
 - **Monitoring of hydrology**
 - **Ocean and coasting monitoring**
 - **Re-building post crisis**
 - **Reduction of the digital gap**
- Difficult to define specific priority. All the applications possible are usefull.

- **Geographic**

- No real priority
- EO usefull everywhere
- Always good to observe from « above »
- Added value in fragile states / areas => Priority ?
 - **Iraq**
 - **Syria**
 - **Sahel**
 - **Etc.**

03. Future information needs

- 3 levels of information
 - for our beneficiaries
 - for internal AFD teams
 - as a tool to create commons (global public goods monitoring)

LEVEL OF DIFFICULTY	BENEFICIARIES	AFD	COMMONS
« QUICK WIN »	Support in providing access to spatial data	Project monitoring via satellite imagery	Support acculturation to commons in satellite imagery
MID-TERM	Support in creating local observatories using spatial data	Create a baseline in a more systematic way	Support in building a database with indicators to understand territories (ex: distribution of population)
LONG TERM	Support research level of beneficiaries	Collect information from indirect variables through non-linear relationship	Support in creation of new methodologies to create commons from satellite imagery

03. Future information needs

Monitoring of keys indicators at global scale

- Monitoring of urban expansion
- Monitoring of non-connected population
- Urban information Platform

Monitoring and evaluation of AFD-funded projects

- Monitoring of an agricultural project
- Development of linear infrastructures
- Monitoring of land use
- Monitoring of flooded zones in urban areas
- Monitoring of water quality in rivers and lakes

Support of beneficiaries

- Access to Sentinel Data

03. Future information needs

NEEDS	LEVEL OF PRIORITY
MONITORING AND EVALUATION OF OUR PROJECTS (esp. in Fragile States)	Very High
ASSESS CLIMATE VULNERABILITY	High
MEASURE URBAN INDICATORS	High
SUPPORT OF STRATEGY DESIGN	High
MEASURE RURAL INDICATORS	High
HEALTH	Medium
COASTAL ZONES	Medium
EDUCATION	Low
TRANSPORT	Low

04. Issues or challenges

THEME	PROJECT	ISSUES or CHALLENGES
Forest and land use monitoring	Satellite images for sustainable forest management (OSFT)	EO data useful to monitor environnement in vast territory. => Data handling uneasy: Internet connection, big data server, lack of capacity, etc.
	Satellite images for sustainable land use management in Central and West Africa (OSFACO)	Many applications with EO data for sustainable land use. => Some of the previous mentioned issues are addressed, but still difficulties with big data (Sentinel) and internet connection.
	Environmental Monitoring through Earth Observation (SEAS- Gabon)	EO data useful to monitor environment in vast territory. => Business model of the development of a station difficult to consolidate + change of needs/demands with Sentinel Satellites.

04. Issues or challenges

THEME	PROJECT	ISSUES or CHALLENGES
Ocean and fishery monitoring	Infrastructure Development of Space Oceanography (INDESO)	EO data useful to monitor environment and law enforcement in vast territory => Issues of maintenance and sustainability
Space Hydrology in the Congo river basin	Strengthening hydrological monitoring in the Congo river basin for an Integrated Water Resource Management (IWRM) fostering climate change adaptation	EO data useful to monitor environnement in vast territory (data reliability, etc.). => Data handling uneasy: internet connection, big data server, etc.



Thank you

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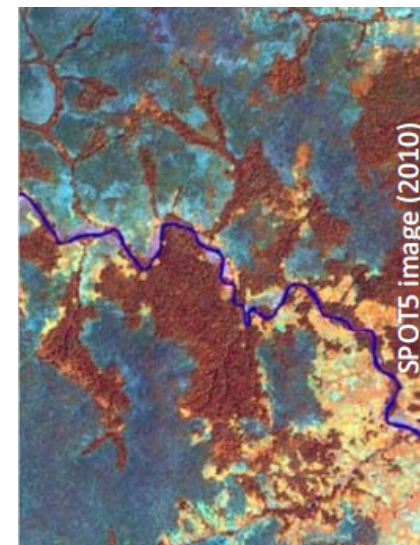
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ANNEX

02. Forest and land use monitoring

PROJECT	Satellite images for sustainable forest management (OSFT)
BENEFICIARY	Congo Basin Countries (Congo, DRC, CAR, Gabon, Cameroon)
PERIOD	2011-2015
AMOUNT	8,5 M€
KEY ACTIVITIES	<p>Objective: to give access to Central African countries to high resolution satellite images, in order for them to develop CC national plans and successfully mobilize REDD+financing resources</p> <ul style="list-style-type: none"> - SPOT satellites images on the Congo Basin (2010 reference dataset over 3 million sq. km and 2015 reference dataset over 1.8 million sq.km) - Forest mapping covering Central African Republic and Cameroon (historical maps 1990/200/2010 and detailed maps for 2010)
ENVIRONMENTAL INFORMATION FROM SATELLITES	SPOT 4/5 and 6/7 for recent data + Landsat (for forest mapping)
USERS	Any party from the forestry sector (administration, public institutions, NGOs, Research Centers, Forest concessionaires)
INFORMATION PROCESSING	Assistance from IGN FI / IRD / CNES / IGN Airbus DS
DATA COST	Free for the users (financed by AFD)
FEEDBACK ON USEFULNESS	EO data is useful to monitor environnement in such a vast territory. But data handling is uneasy (problems of internet, big data server, lack of capacity, etc.)

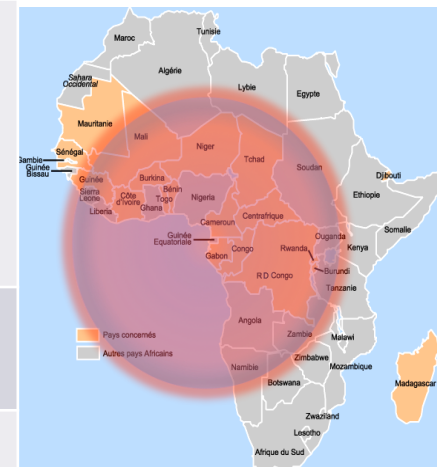


02. Forest and land use monitoring (2)

PROJECT	Satellite images for sustainable land use management in Central and West Africa (OSFACO)
BENEFICIARY	Congo Basin Countries (Congo, DRC, CAR, Gabon, Cameroon) West Africa: Guinea, Côte d'Ivoire and Benin
PERIOD	2016-2018
AMOUNT	5 M€
KEY ACTIVITIES	Objective: to give access to African countries to high resolution satellite images, in order for them to sustainably manage land use (forestry, agriculture, development) <ul style="list-style-type: none"> - SPOT satellites images (2015 reference dataset) - Forest mapping - Support to users (capacity building, equipment, research programs)
ENVIRONMENTAL INFORMATION FROM SATELLITES	SPOT 6/7 for recent data + Sentinel 2
USERS	Any party from the land use sector (administration, public institutions, NGOs, Research Centers, Forest concessionaires)
INFORMATION PROCESSING	Assistance from IGN FI / IRD / CNES / IGN Airbus DS
DATA COST	Free for the users (financed by AFD)
FEEDBACK ON USEFULNESS	Many applications with EO data for sustainable land use Some of the previous mentioned issues are addressed, but still difficulties with big data (Sentinel) and internet connexion.

02. Forest and land use monitoring (3)

PROJECT	Environmental Monitoring through Earth Observation (SEAS-Gabon)
BENEFICIARY	Gabonese Spatial Agency (AGEOS)
PERIOD	2011-2016
AMOUNT	9 M€
KEY ACTIVITIES	<p>Objective: to develop an Earth Observation Center for environmental monitoring (forest, marine areas, etc.) in Gabon and Central Africa</p> <ul style="list-style-type: none"> - Satellite reception station in Libreville - Development of AGEOS (equipment, capacity building, applications, etc.) - Forest cover mapping
ENVIRONMENTAL INFORMATION FROM SATELLITES	Cosmoskymed Landsat
USERS	Administration, public institutions, NGOs, Research Centers, Private sector
INFORMATION PROCESSING	Assistance from IRD & CNES
DATA COST	
FEEDBACK ON USEFULNESS	EO data is useful to monitor environment in such a vast territory. But business model of the Station difficult to consolidate Change in the need / demand with Sentinel Satellites



03. Ocean and fishery monitoring



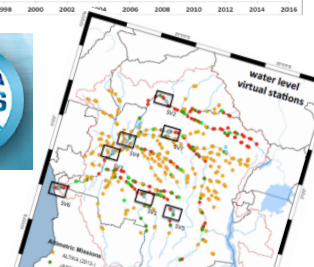
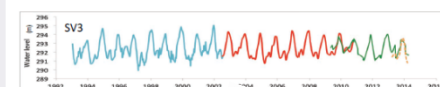
PROJECT	Infrastructure Development of Space Oceanography (INDES0)
BENEFICIARY	Ministry of Finance + Ministry of Fisheries (KPK) in Indonesia
PERIOD	2013-2017
AMOUNT	30 M USD
KEY ACTIVITIES	<p>Objective: Develop sustainable fisheries based on coastal management and law enforcement, based on Earth Observation data</p> <ul style="list-style-type: none"> - Installation of a satellite reception Station in Bali - Information System - Capacity development and training - Development of applications to monitor marine pollution, illegal fisheries, coral reefs' whitening, CC, coastal erosion, etc.
ENVIRONMENTAL INFORMATION FROM SATELLITES	Radar + optical
USERS	Ministry of Fisheries,
INFORMATION PROCESSING	Assistance from CLS for project conception, infrastructure development and capacity building
DATA COST	
FEEDBACK ON USEFULNESS	<p>EO data is useful to monitor environment and law enforcement in such a vast territory</p> <p>Issues of maintenance and sustainability</p>

04. Space Hydrology in the Congo river basin

PROJECT	Strengthening hydrological monitoring in the Congo river basin for an Integrated Water Resource Management (IWRM) fostering climate change adaptation
BENEFICIARY	CICOS (International Commission of Congo - Oubangui - Sangha) Kinshasa, DRC
PERIOD	2016-2018
AMOUNT	500 k€
KEY ACTIVITIES	<ul style="list-style-type: none"> - Installation of 2 hydrometric stations under satellite traces - Training on satellite data processing - Inventory on hydrological monitoring and spatial applications in the Congo river basin - Development of a hydrological information system at CICOS - Development of products and services for users such as hydropower, navigation, etc.
ENVIRONMENTAL INFORMATION FROM SATELLITES	Radar altimetry from ENVISAT, JASON-2, ALTIKA/SARAL Future perspectives : SENTINEL 3-A &3-B
USERS	CICOS experts in the Water Resource Department
INFORMATION PROCESSING	Assistance from LEGOS and IRD (THEIA / Hydroweb / CTOH)
DATA COST	Free
FEEDBACK ON USEFULNESS	EO data is useful to monitor environnement in such a vast territory (reduce O&M challenge, data reliability, etc.). But data handling is uneasy (problems of internet, big data server, etc.).



— TOPEX/POSEIDON — ENVISAT — JASON 2 — ALTIKA/SARAL



04. French Working Group on 'Space hydrology – SWOT program'

- Working Group created in 2014, building on a CNES initiative related to the preparation of SWOT mission
- Official formalisation in Nov. 2016 in COP 22 in Marrakech



- ~ 3 meetings / year
- Objectives:
 - Share visions of research, scientists, technicians, etc.
 - Consider that space altimetry = 1 component amongst others (in-situ, imagery)
 - Address issue of sustainable funding of hydrologic monitoring
 - Promote strong user-orientation
- Challenges
 - Manage measurement uncertainties / Complementarity with in situ
 - Specify goals: short-term warnings (a priori NO), prevision, planning