



Sécurité alimentaire & services d'information par satellite



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Netherlands Space Office (NSO)





Les effets du réchauffement climatique sur la sécurité alimentaire et l'approvisionnement en eau



p.ex.

- Averses abondantes
- Sécheresse



Téledétection & recueillir de données

cartographie et de prévision

réduire la vulnérabilité des agriculteurs

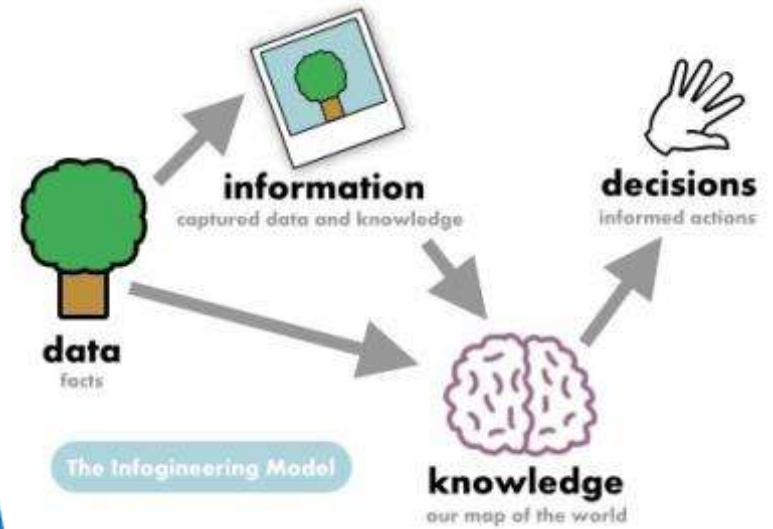
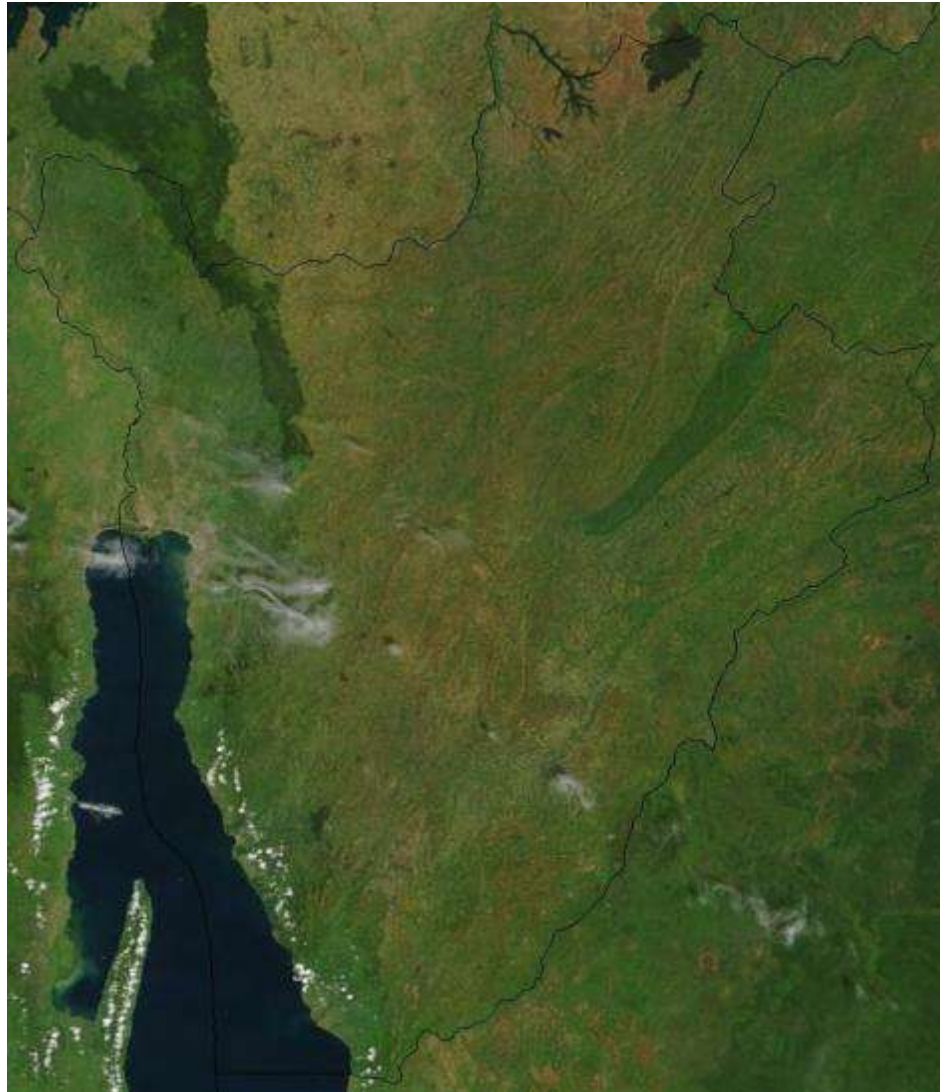


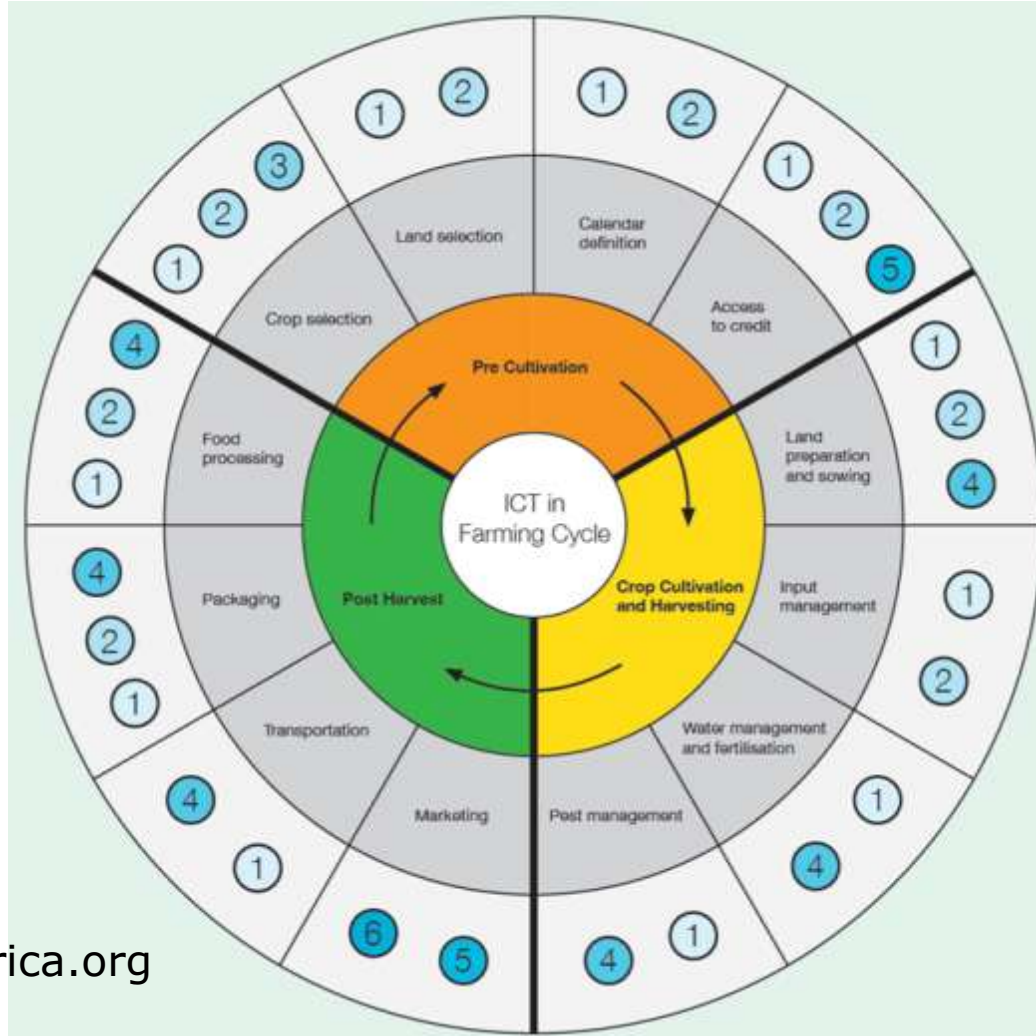


Image satellite du Burundi





- ① Information systems including DSS/MISS/GIS etc
- ② ICT-enabled learning and knowledge exchange
- ③ Modelling solutions
- ④ Sensory and proximity devices
- ⑤ ICT-enabled networking solutions
- ⑥ Online commerce tools (eCommerce/mCommerce)



www.eTransformAfrica.org

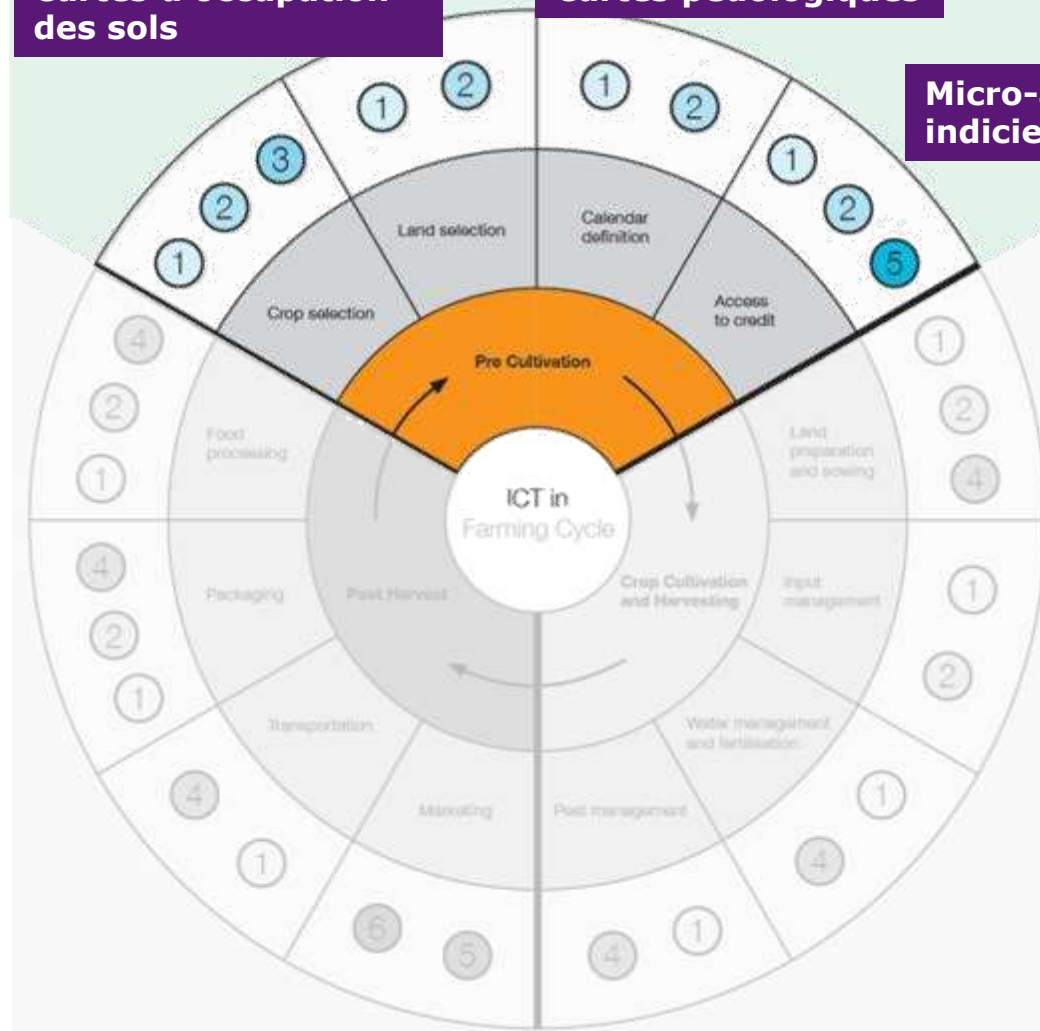


Cartes d'occupation des sols

Cartes pédologiques

Micro-assurance indicielle

- 1 Information systems including DSS/MISS/GIS etc
- 2 ICT-enabled learning and knowledge exchange
- 3 Modelling solutions
- 4 Sensory and proximity devices
- 5 ICT-enabled networking solutions
- 6 Online commerce tools (eCommerce/mCommerce)





Marcela

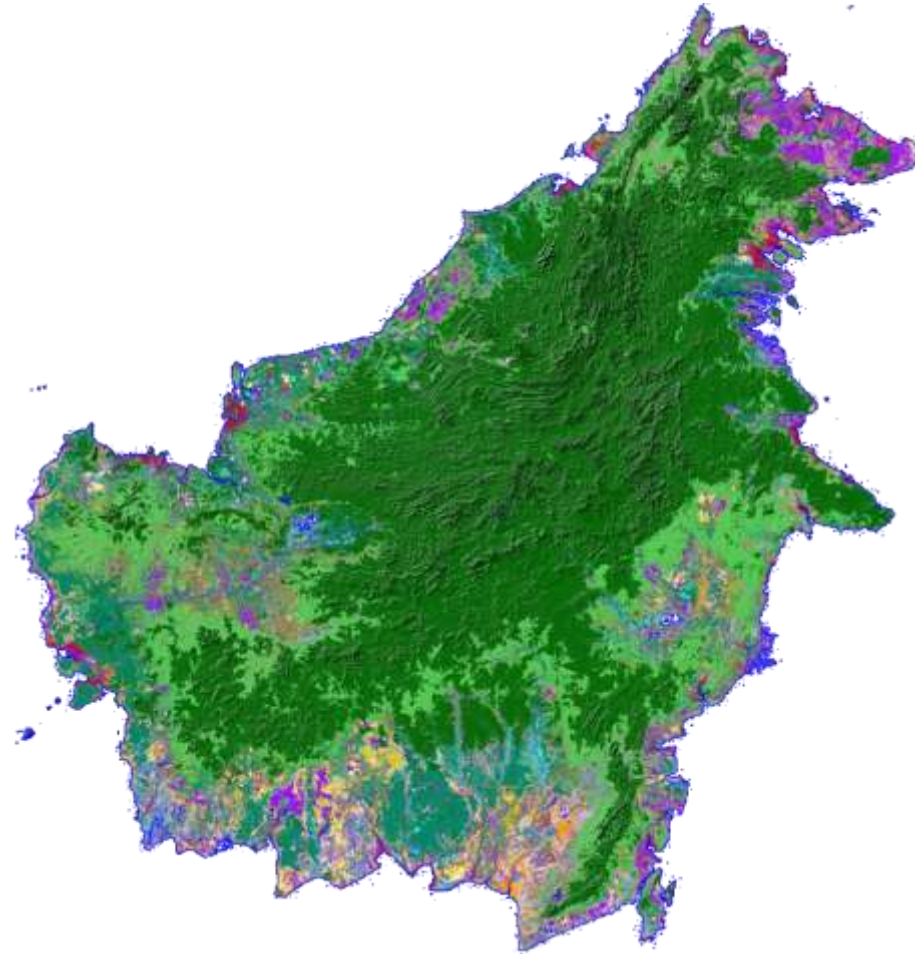
Cartes d'occupation des sols (radar)



IDEAM



	Lowland forest
	Riverine forest
	Swamp forest
	Mangrove forest
	<i>Nipah</i> mangrove forest
	Peat swamp forest (pole)
	Peat swamp/riverine shrub
	Forest mosaics/degraded
	High shrub
	Medium shrub
	Ferns / grass
	Grassland
	Cropland (upland)
	Cropland (irrigated)
	Plantations (oil palm)
	Tree cover, burnt
	Water bodies
	Layover /Shadow
	No strip coverage
	Mountain forest

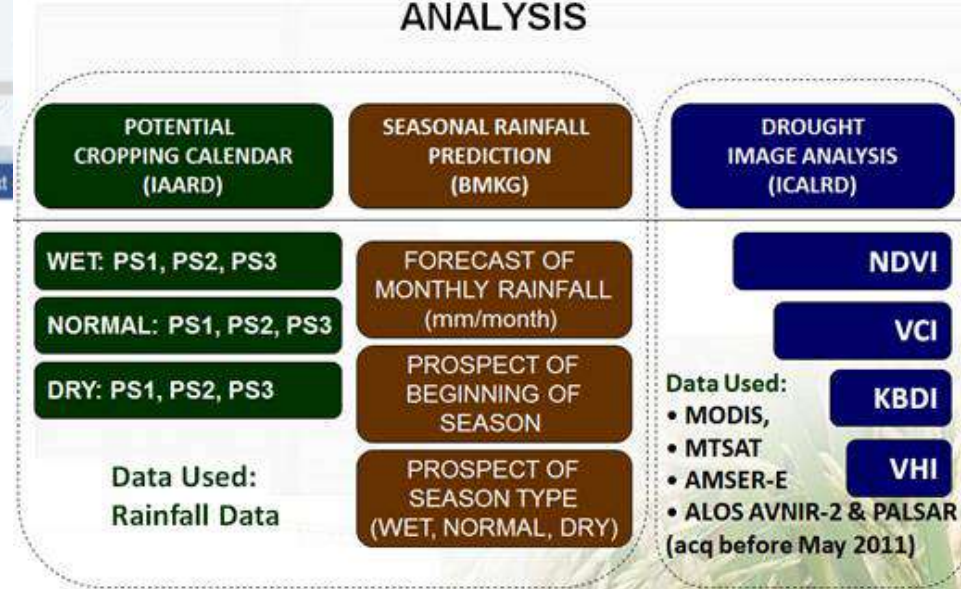




Crop calendar



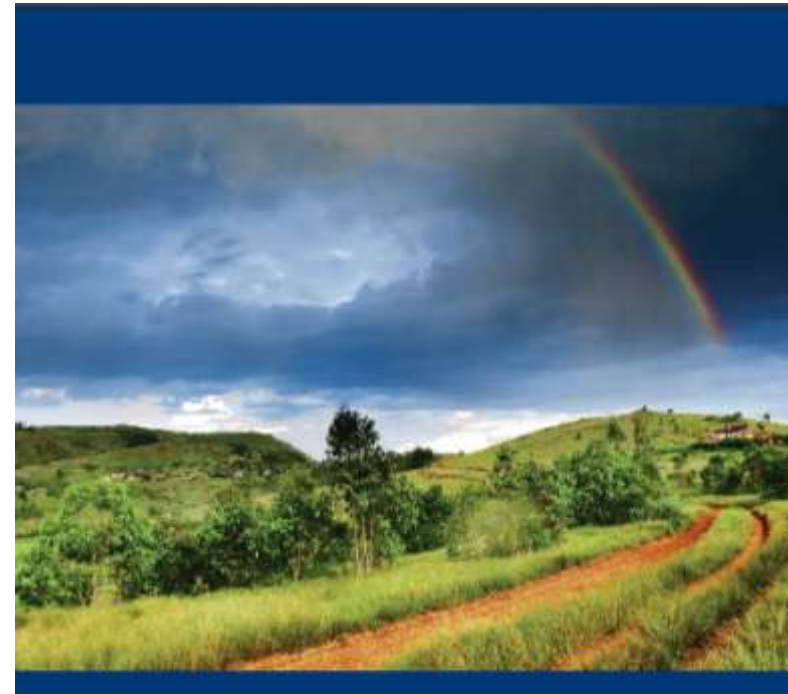
INTEGRATION OF CROPPING PATTERNS, SEASONAL RAINFALL AND SATELLITE IMAGE ANALYSIS





Micro-assurance indicielle

- De nombreux projets pilotes
- Exemples :
 - Kilimo Salama
 - Planet Guarantee (projet EARS-FESA)
 - MicroEnsure
 - et autres
- Techniquement réalisables
- Utilisation majeure de mobiles →
Atteindre les agriculteurs
- Temps de passer à une échelle supérieure



Weather Index-based Insurance
in Agricultural Development
A Technical Guide



World Food
Programme



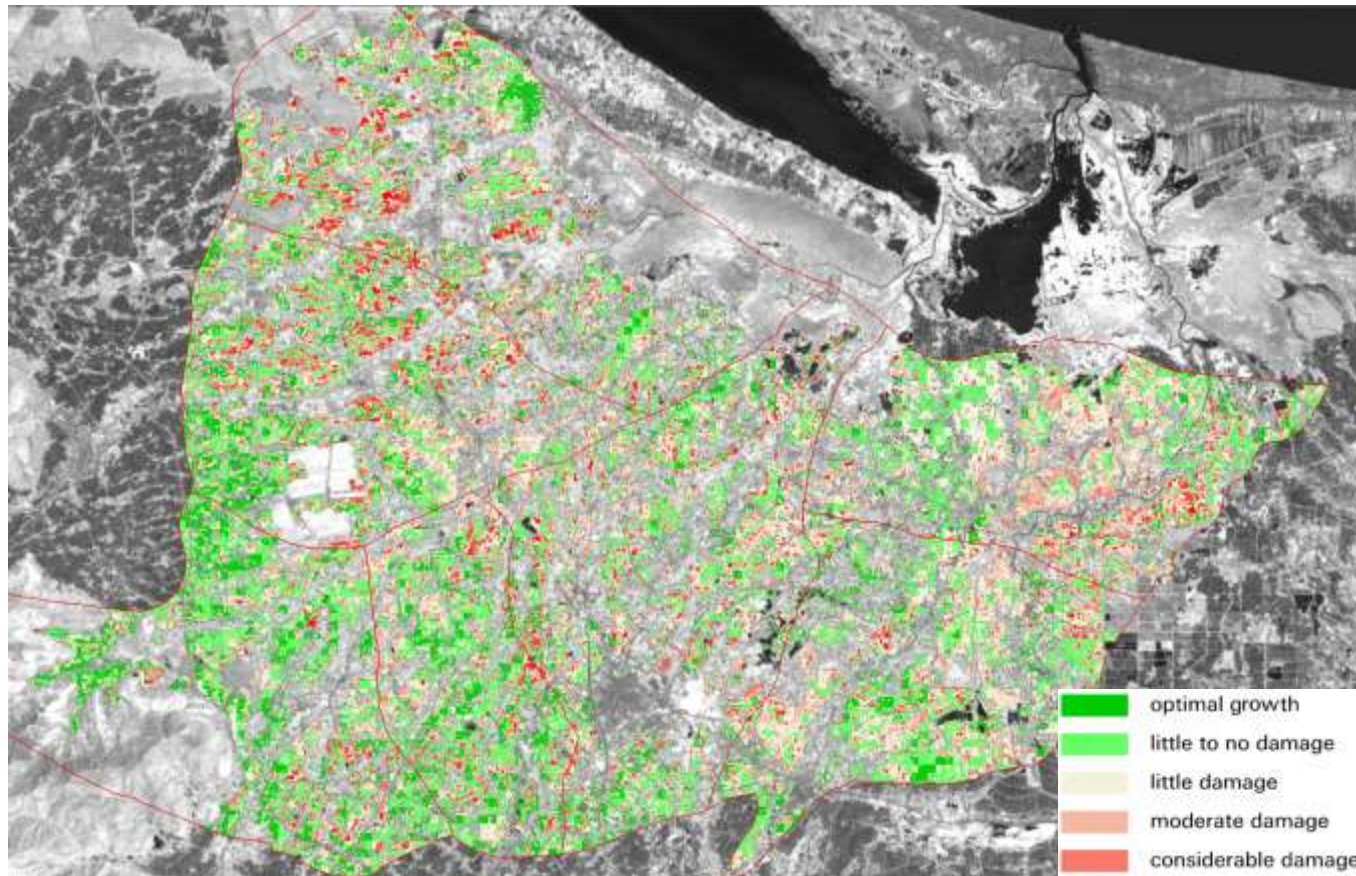
Enabling poor rural people
to overcome poverty

http://www.ifad.org/ruralfinance/pub/WII_tech_guide.pdf



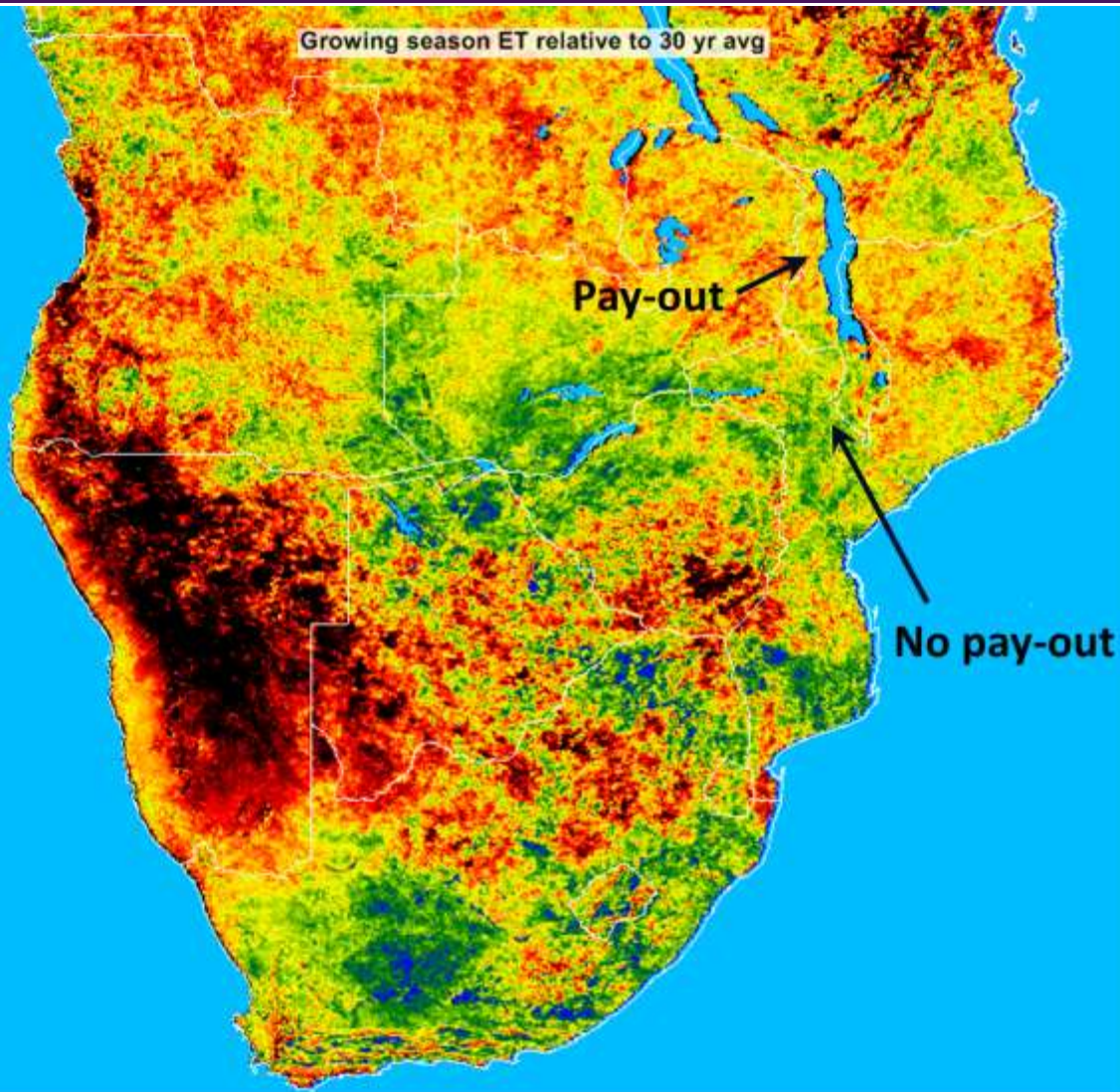
Micro-assurance indicielle

Assurance météorologique de la riziculture





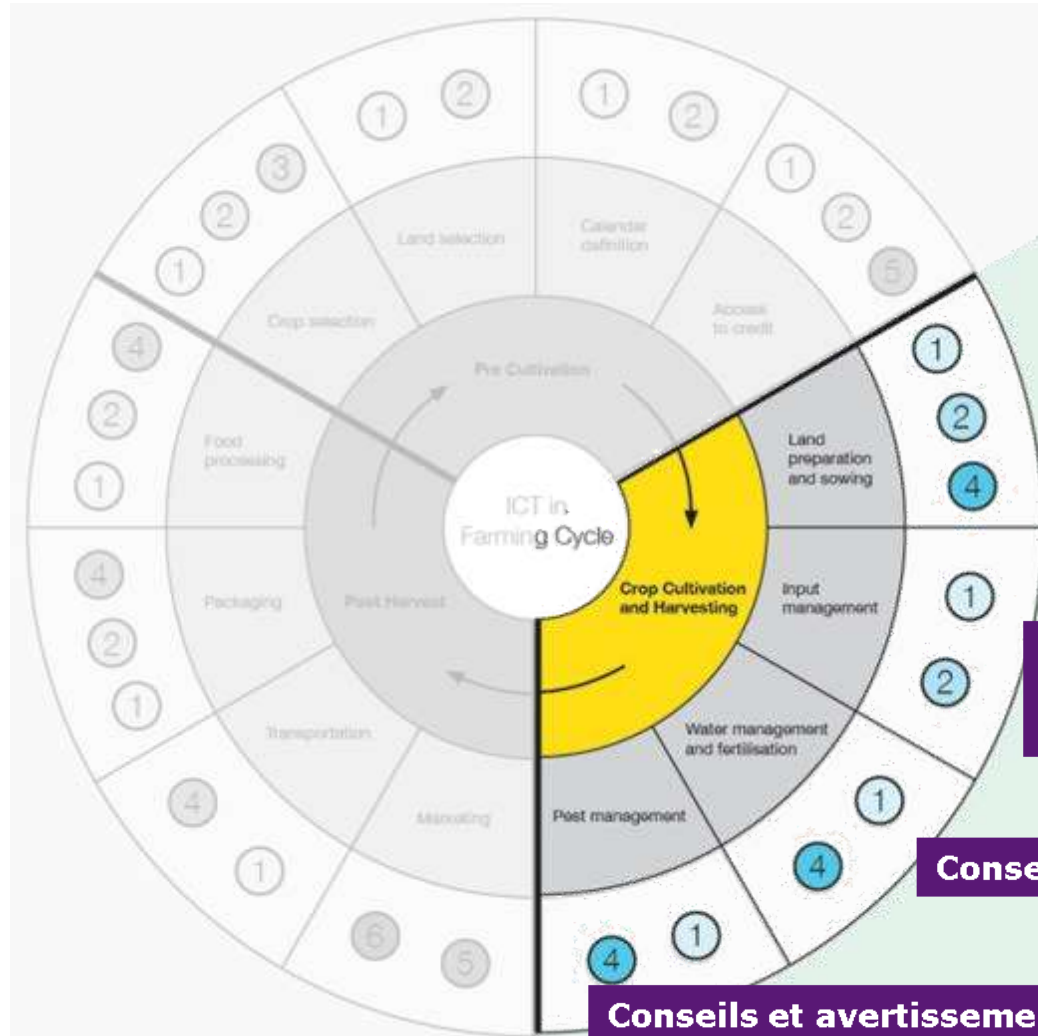
Micro-assurance indicielle



Malawi:
Assurance
indicielle maïs
(EARS)



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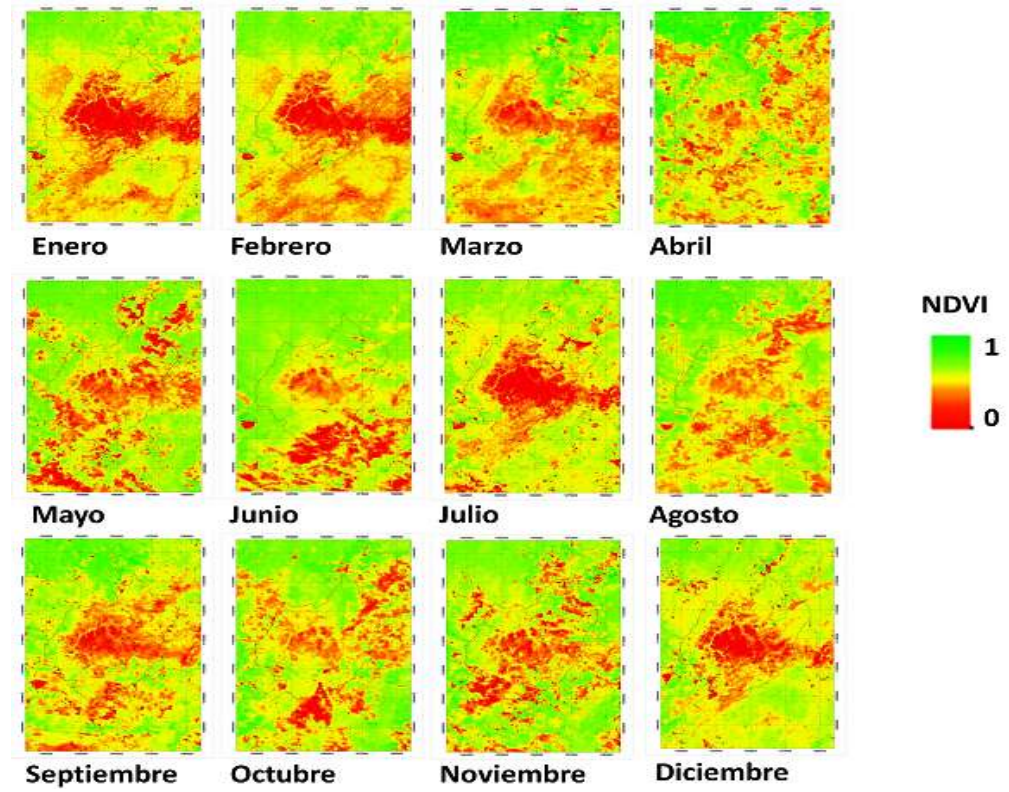
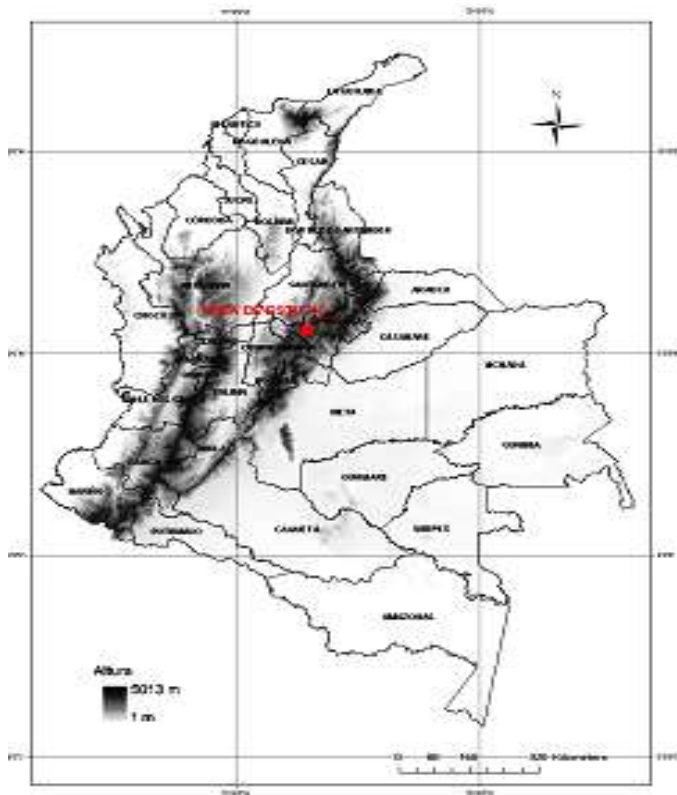


Cartes d'occupation des sols
Cartes pédologiques

Surveillance de la croissance des cultures

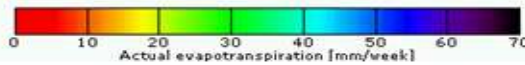
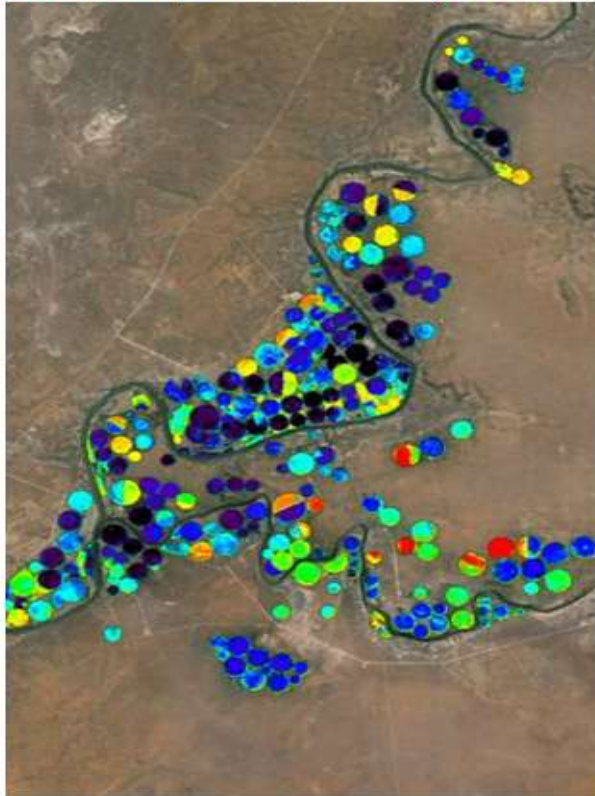
Conseils d'irrigation

Conseils et avertissements

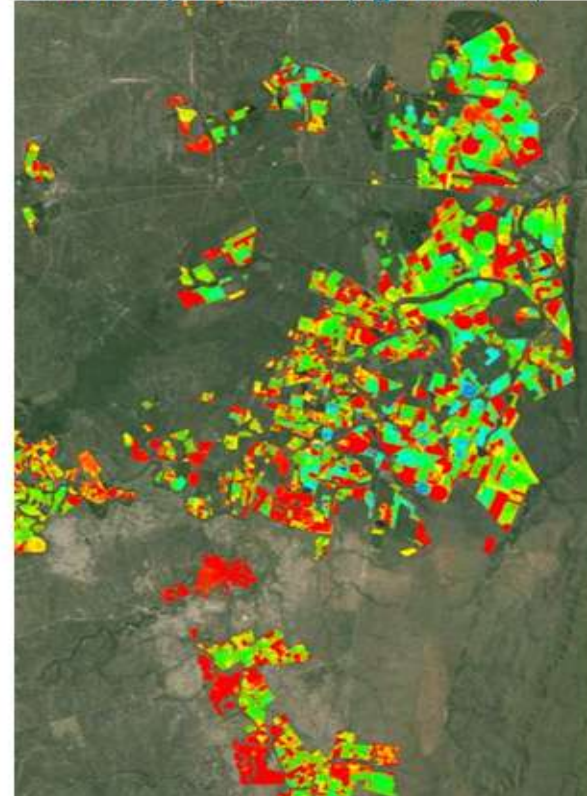




GrainLook – Douglas
Actual Evapotranspiration (mm/week)

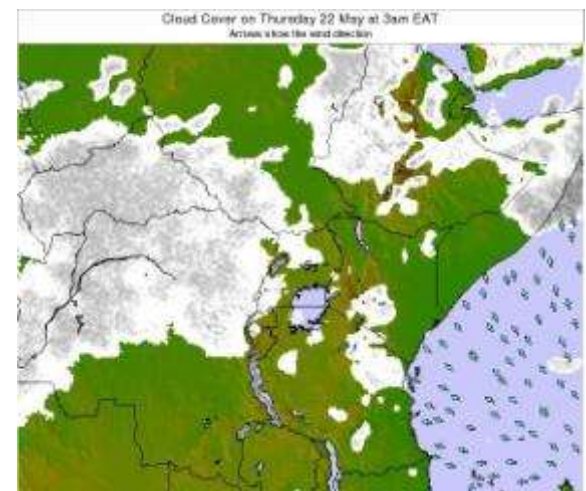
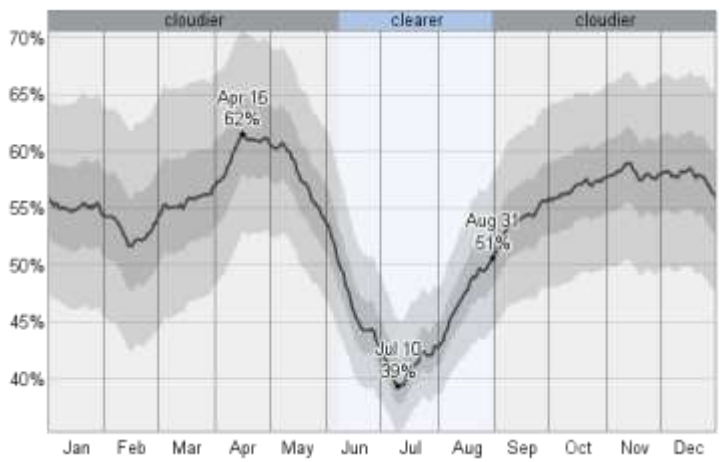
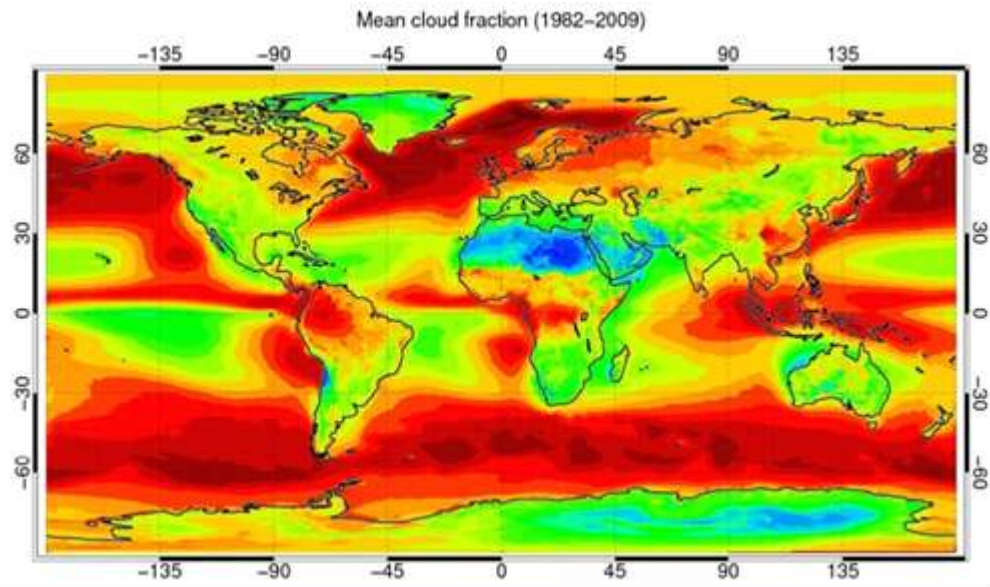
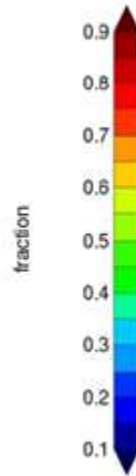


SugarcaneLook – Mpumalanga
Biomass production (kg/ha/week)



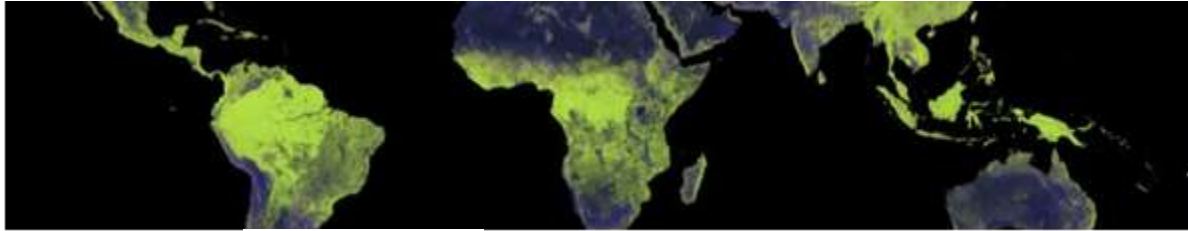


Nébulosité

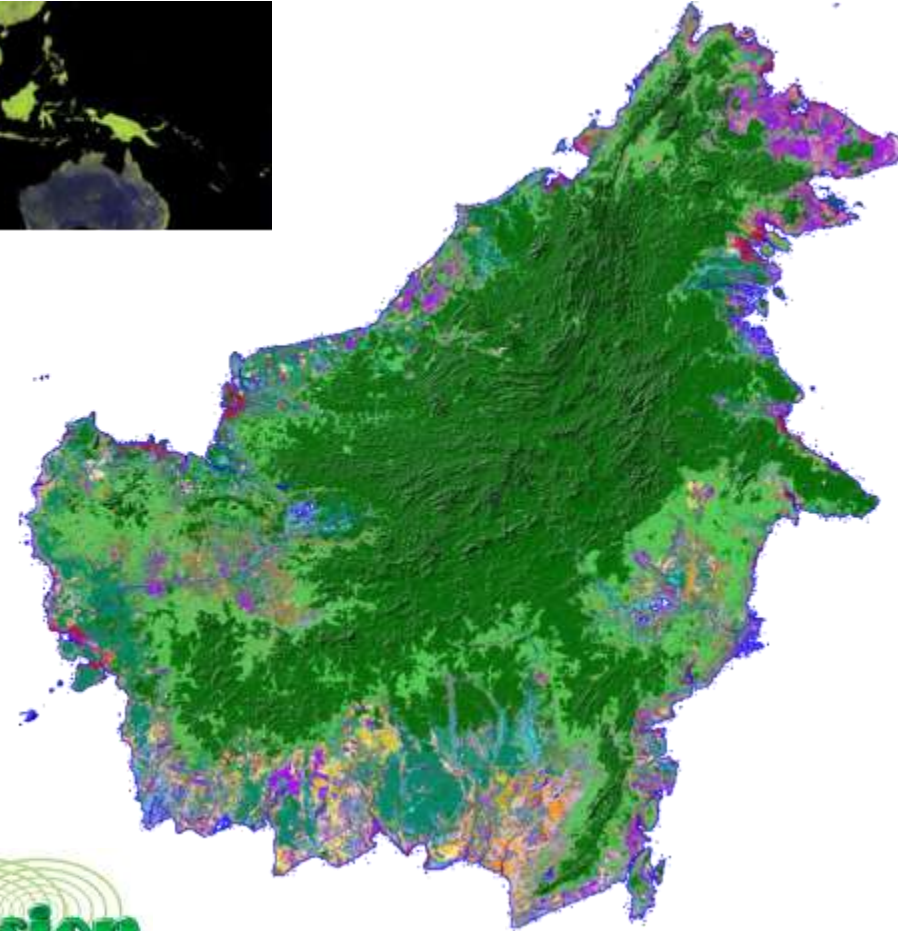




Radar regarde sous les nuages



	Lowland forest
	Riverine forest
	Swamp forest
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	<i>Nipah</i> mangrove forest
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Kalimantan
Land cover
map (radar)



Surveillance de la croissance des cultures



Image
radar
sans
nuages



©2012

Surveillance de la croissance des cultures



Betterave sucrière, 25m résolution chaque 24 jours

22/04/2012



Radar analysis

Sol nu



©2012

Surveillance de la croissance des cultures



Betterave sucrière, 25m résolution chaque 24 jours

16/05/2012



Radar analysis

Sol nu
Émergence



©2012

Surveillance de la croissance des cultures



Betterave sucrière, 25m résolution chaque 24 jours

09/06/2012



Radar analysis

Sol nu
Émergence
Accroissement



©2012

Surveillance de la croissance des cultures



Betterave sucrière, 25m résolution chaque 24 jours

03/07/2012



Radar analysis

Sol nu
Émergence
Accroissement
Fermeture



©2012

Surveillance de la croissance des cultures



Betterave sucrière, 25m résolution chaque 24 jours

07/10/2012



Radar analysis

- Sol nu
- Émergence
- Accroissement
- Fermeture
- Récolte

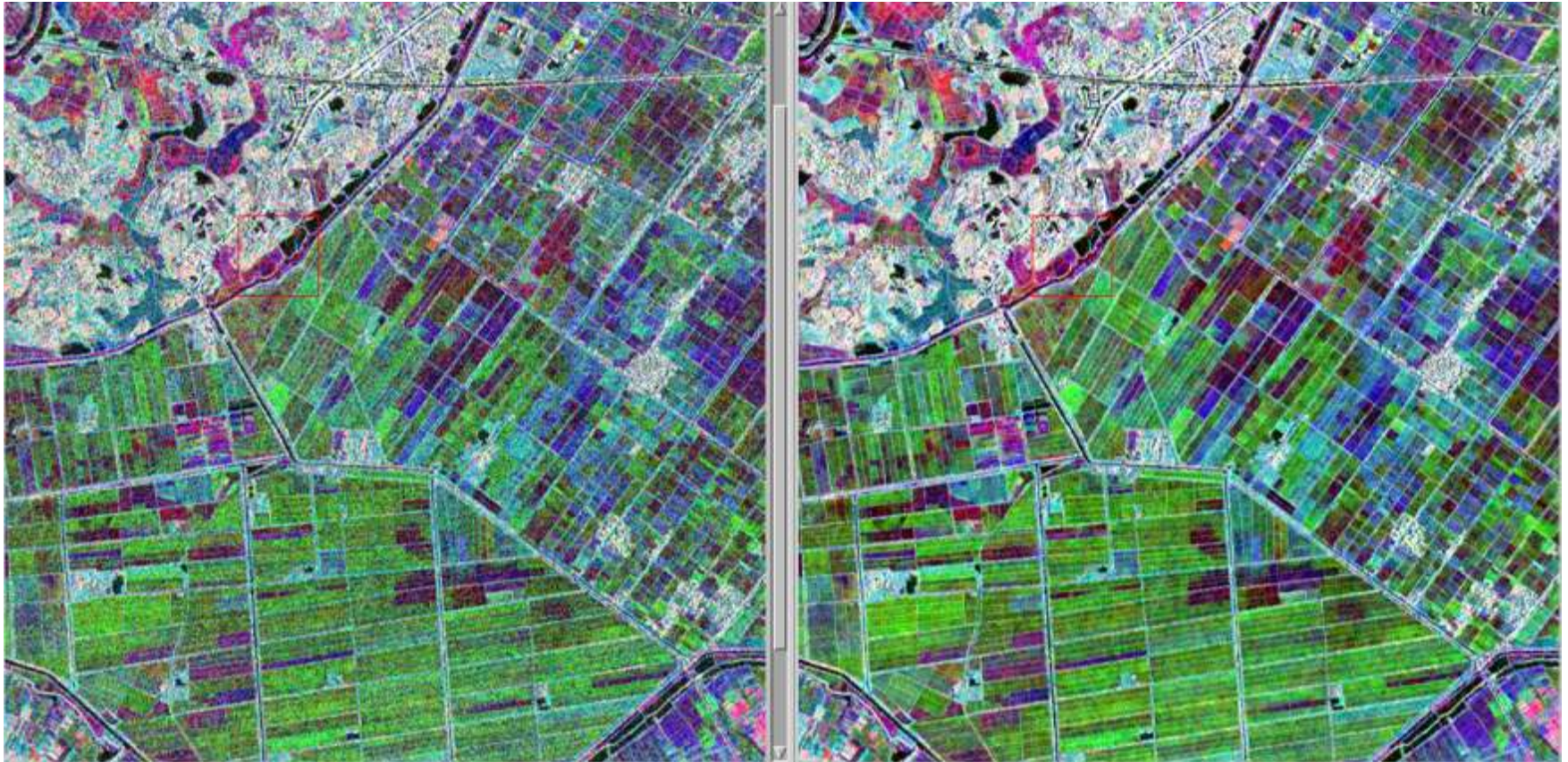


©2012

Surveillance de la croissance des cultures



La riziculture avec une résolution de 5m tous les 5 à 11 jours

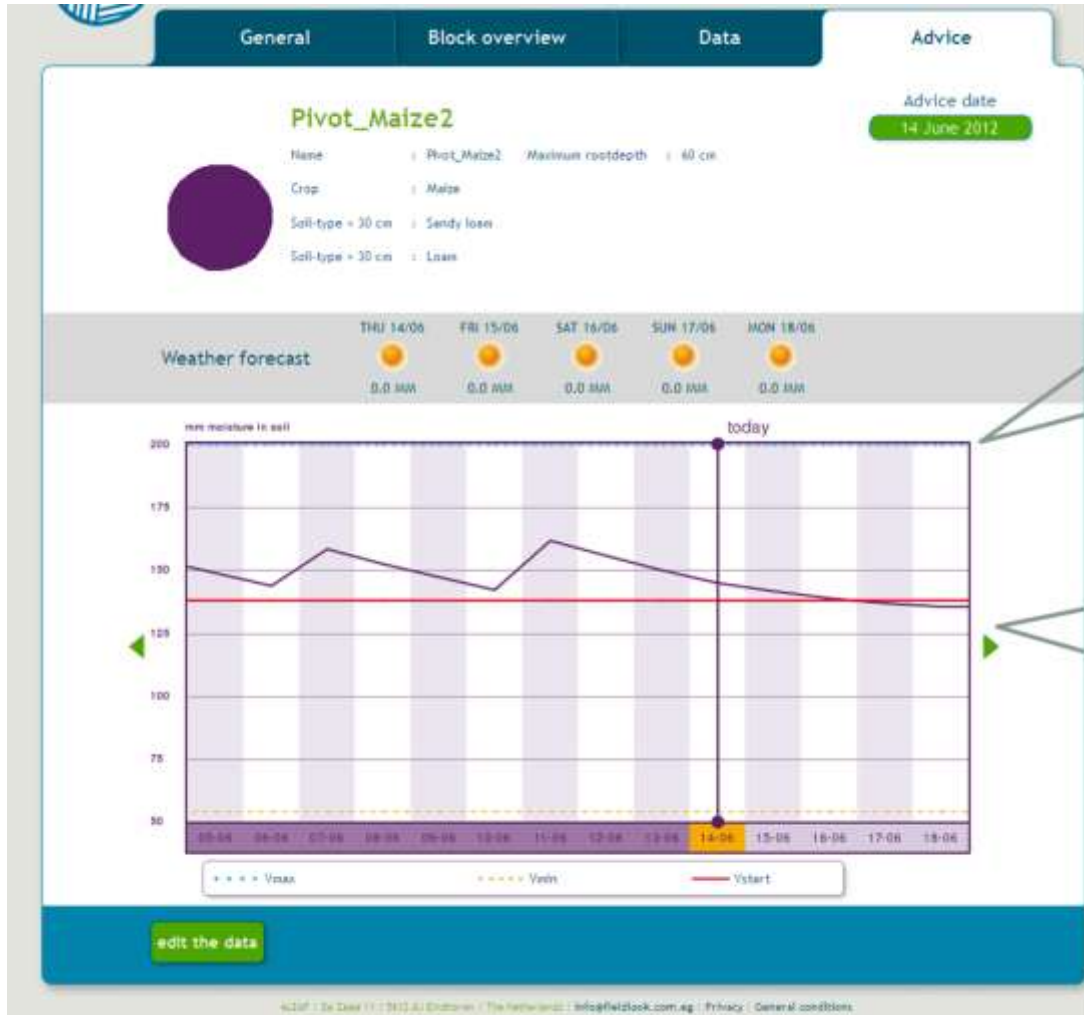


Le niveau de détail de 5m permet la surveillance des exploitations de petite taille





Conseils d'irrigation



The crop has no water stress when the soil moisture is above the critical level and below the field capacity

When the soil moisture drops below the critical line, irrigation is advised

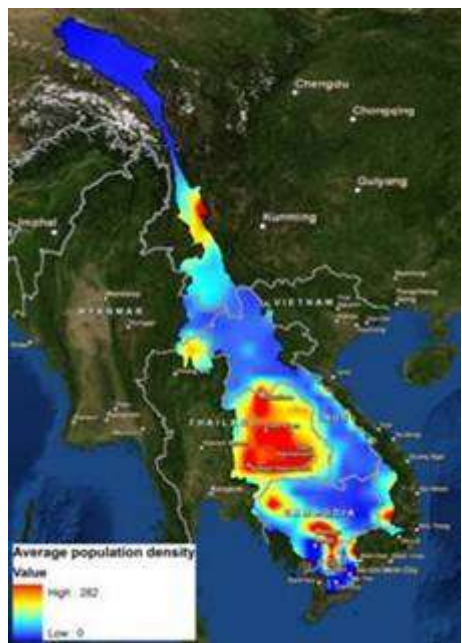


Conseils et avertissement

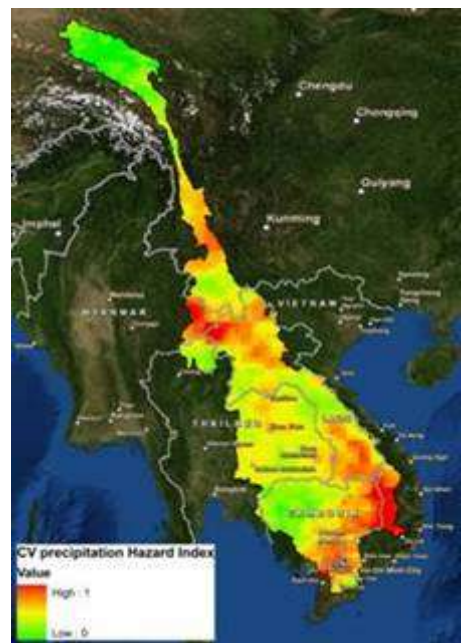
Hazard & Risk Analysis



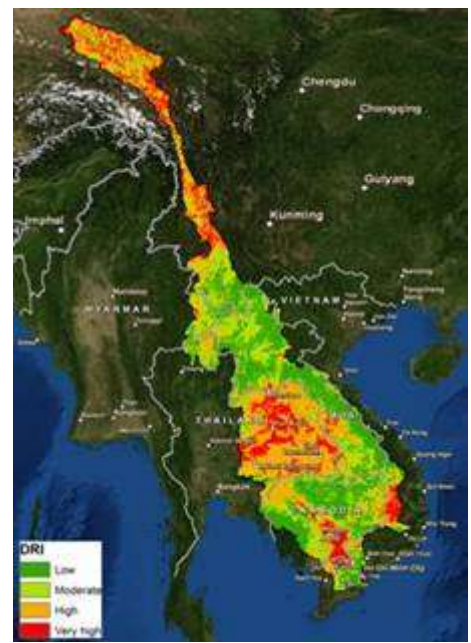
Indice de vulnérabilité
Distance à une rivière



Indice de vulnérabilité
Densité de population



Indice de vulnérabilité
Précipitations



Carte des risques de sécheresse





Conseils et avertissement

Early warning

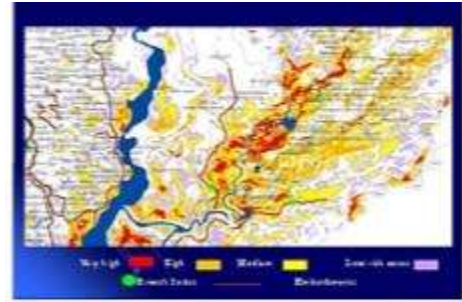
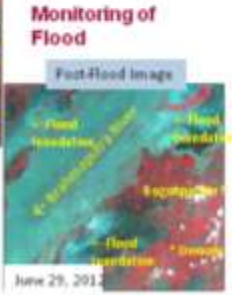
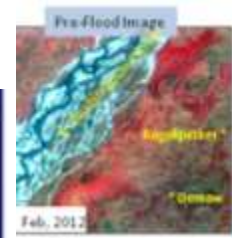
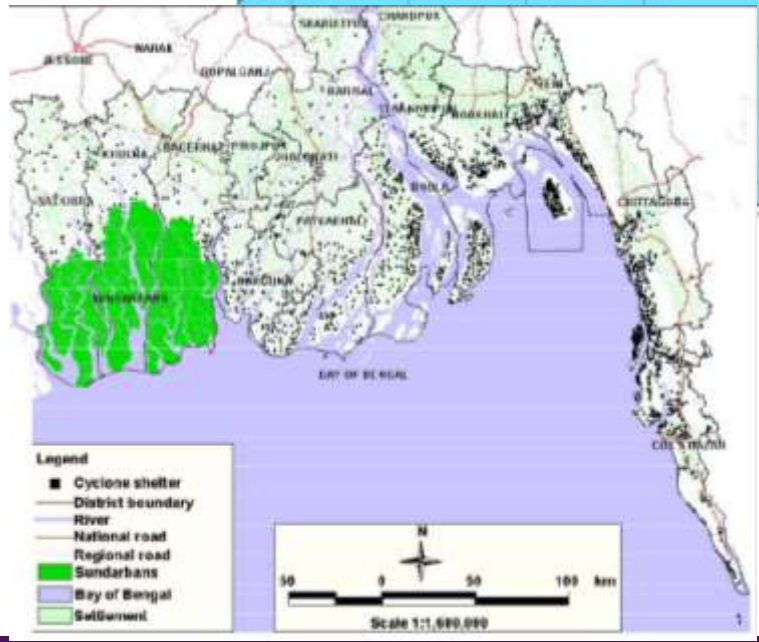
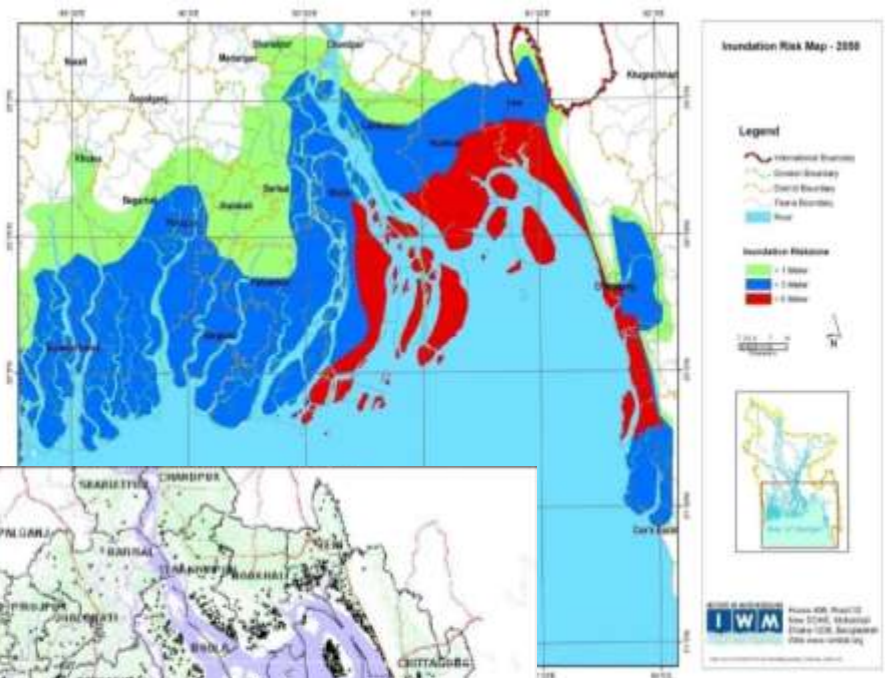


Fig: Flood hazard maps corresponding to various flood discharge and levels

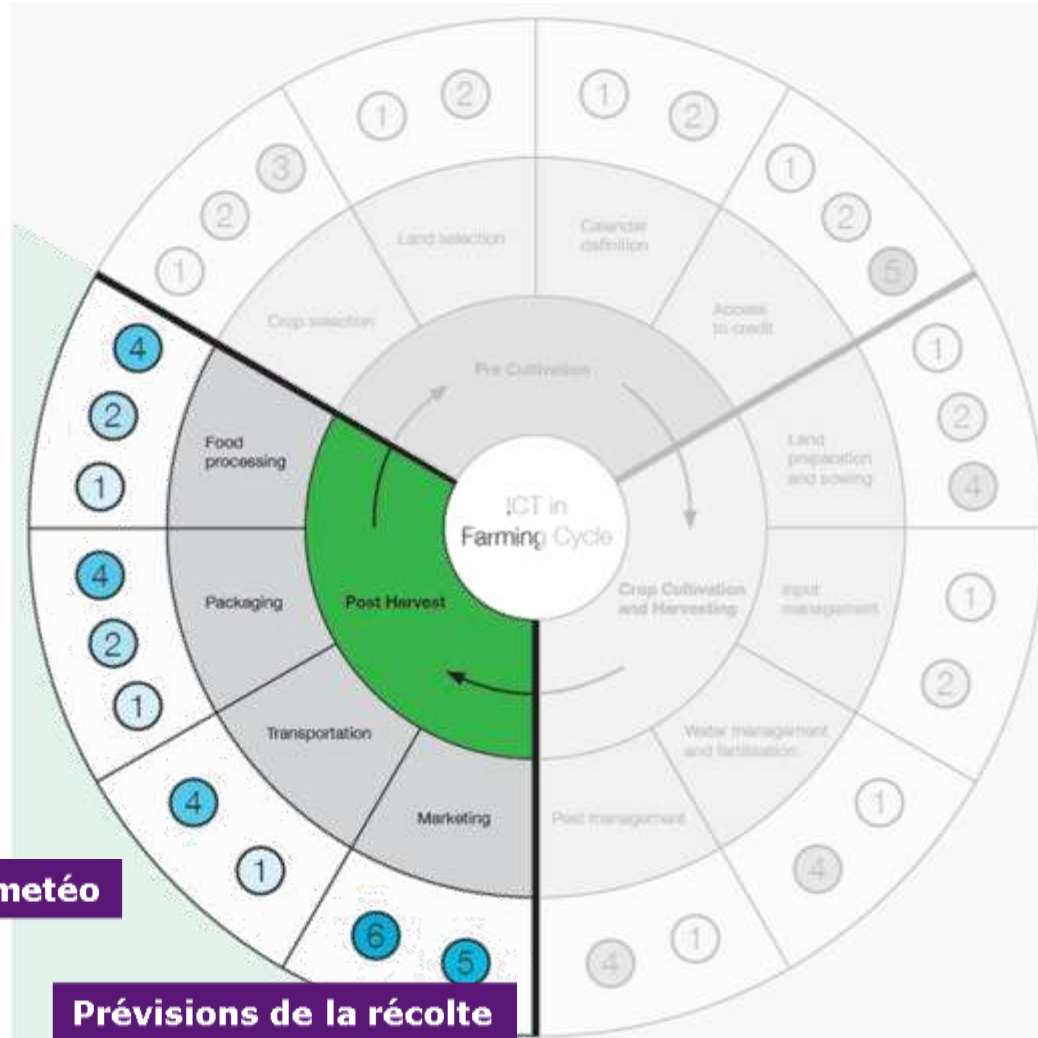


Monitoring of Flood





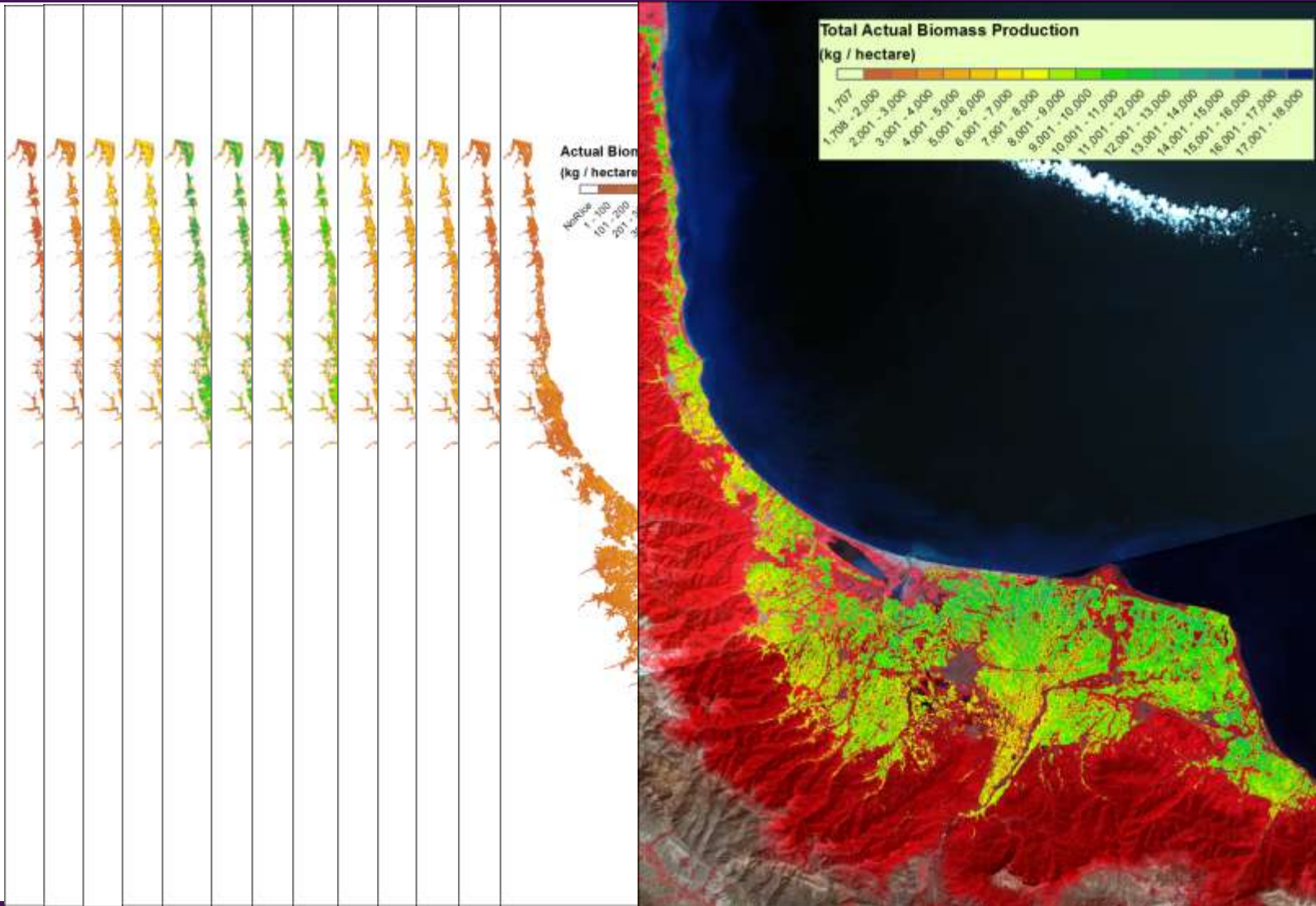
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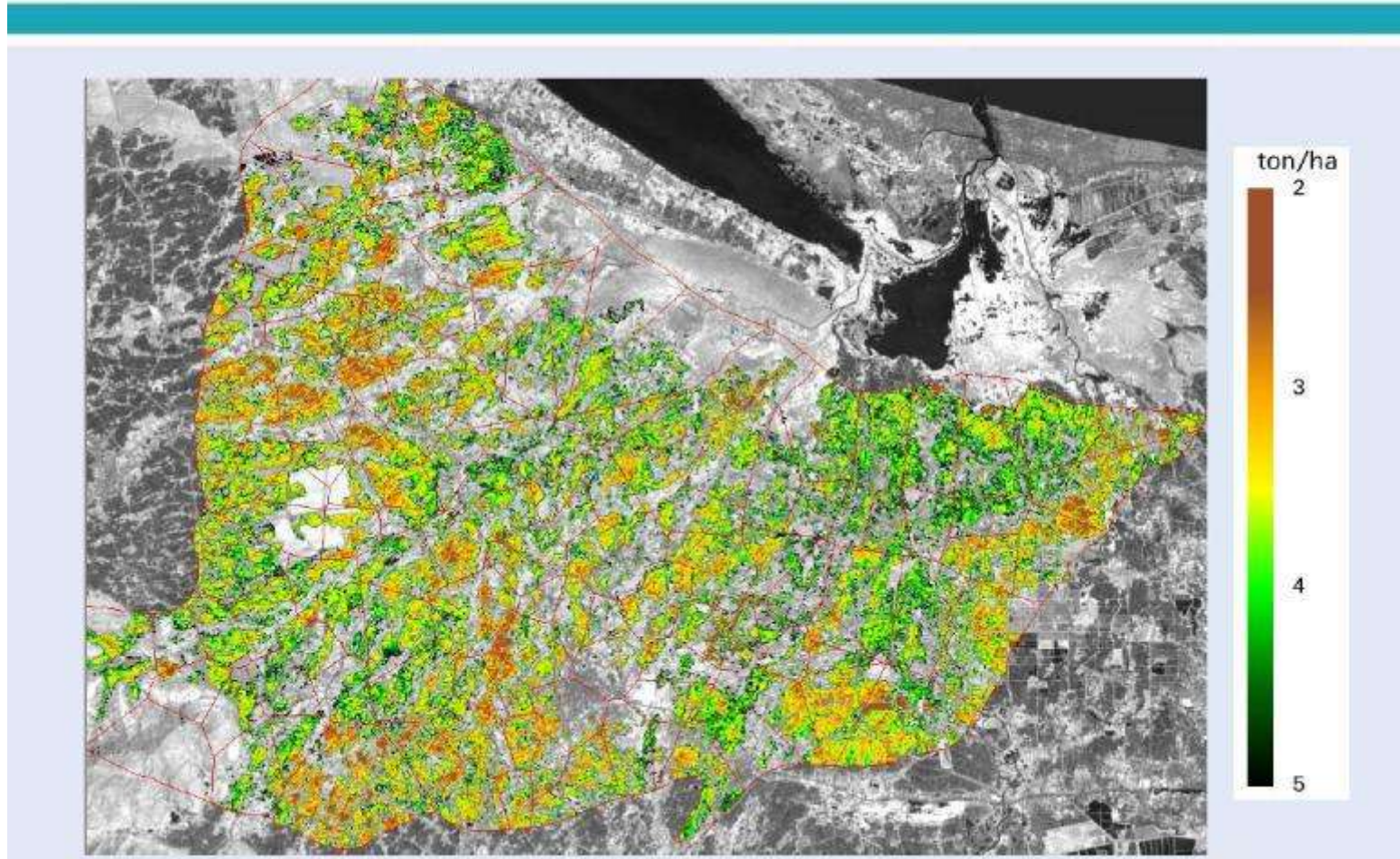
Prévisions de la récolte

Actual Biomass Production





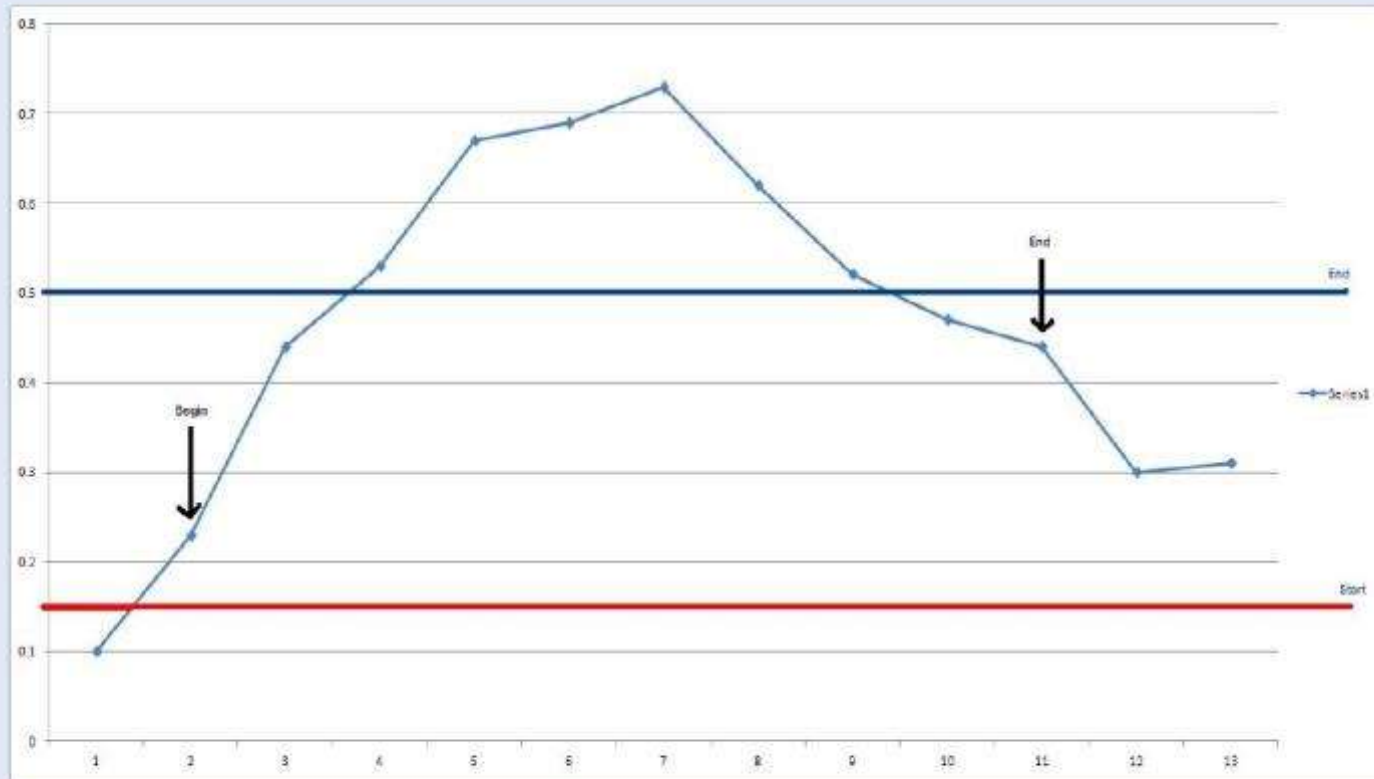
Rice Yield maps



Prévisions de la récolte

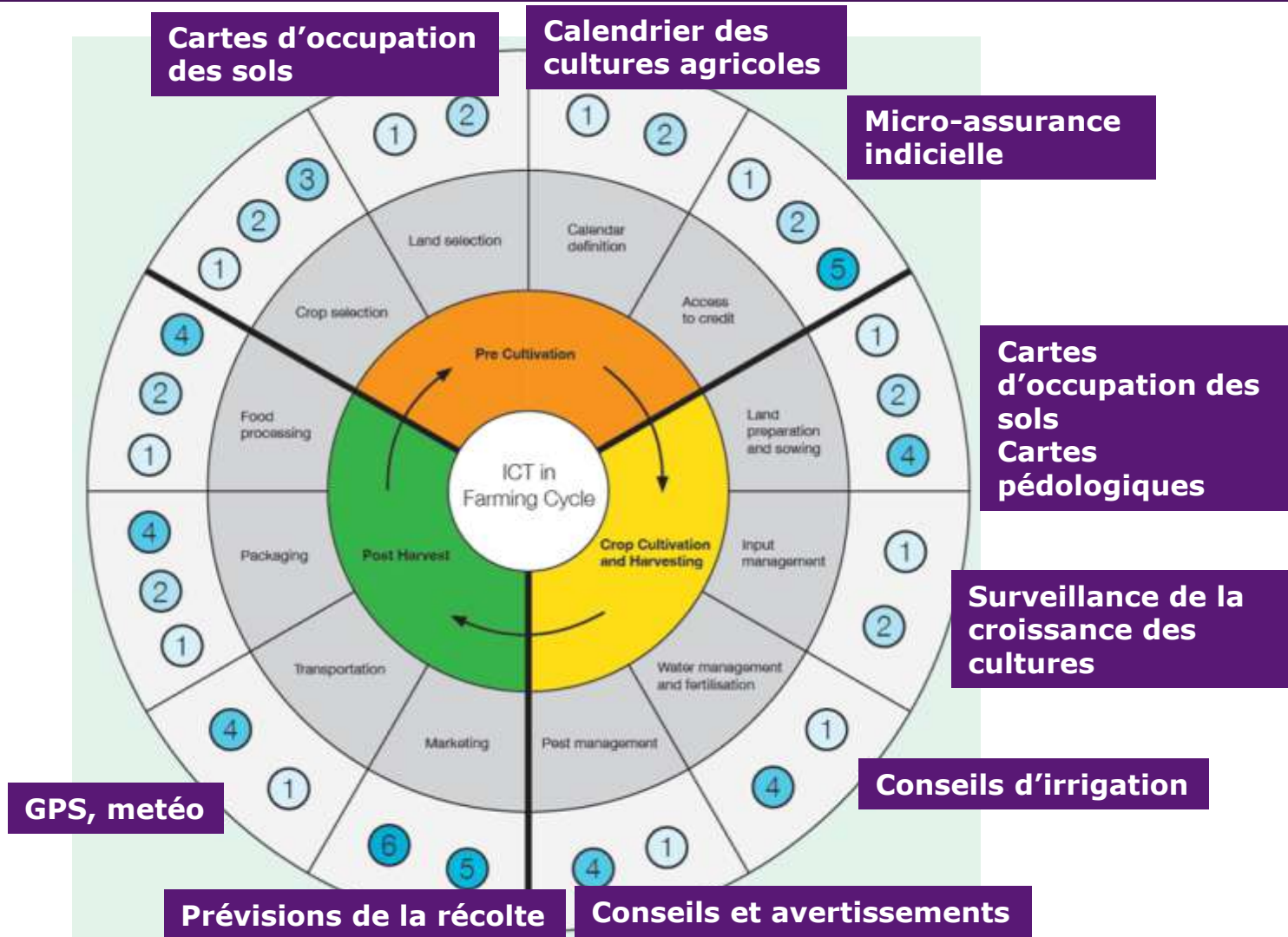


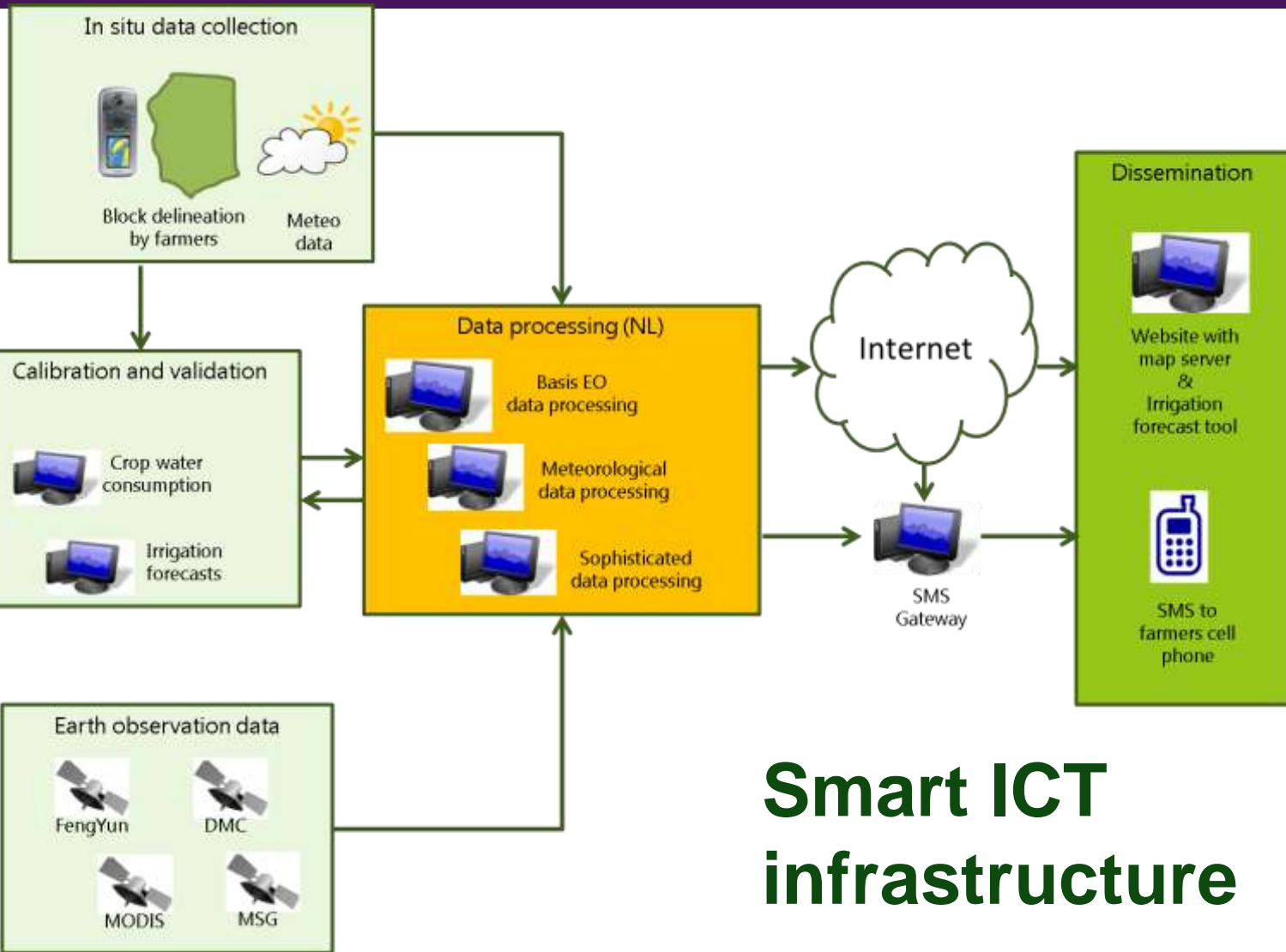
Rice yield monitoring example using remote sensing





- ① Information systems including DSS/MISS/GIS etc
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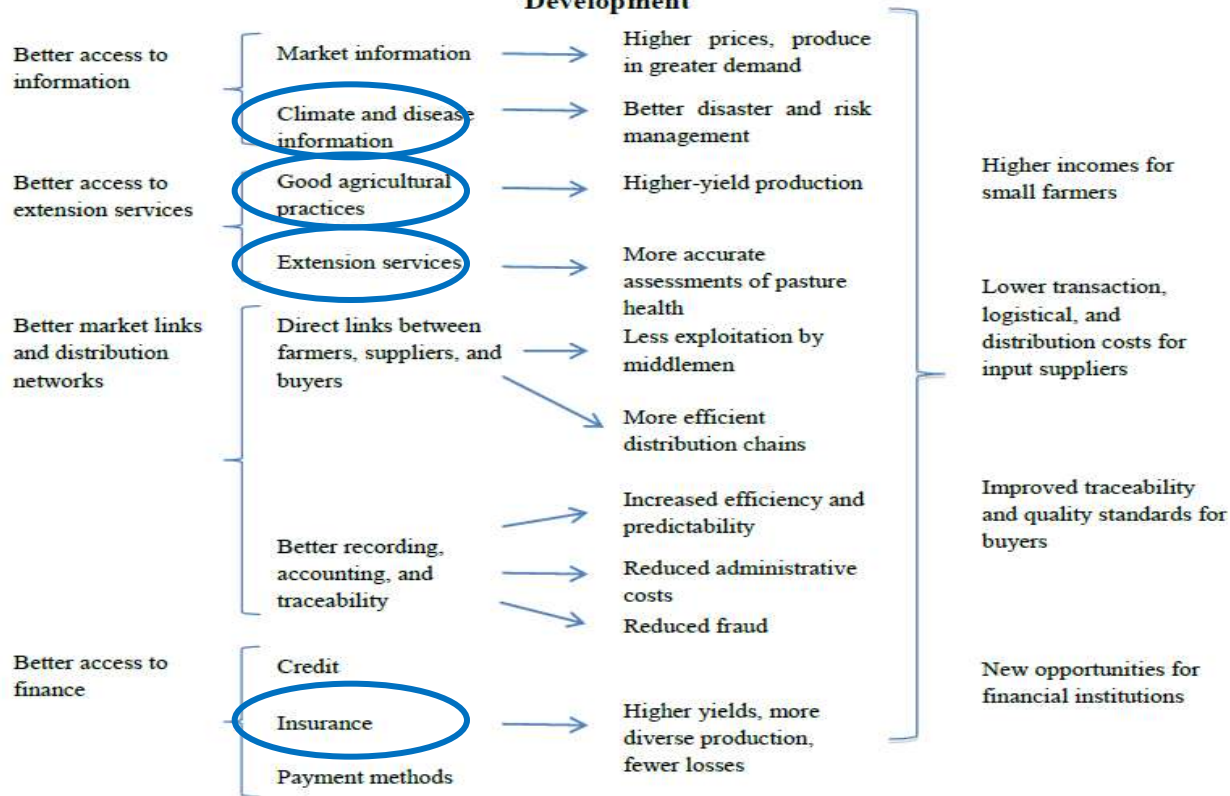


Smart ICT infrastructure



Mobile/ICT applications

Figure 1. Results Generated by Mobile Applications for Agricultural and Rural Development



Mobile Applications for Agriculture and Rural Development

Christine Zhenwei Qiang, Siou Chew Kuek*, Andrew Dymond and Steve Esselaar

ICT Sector Unit
World Bank

December 2011



Advisory



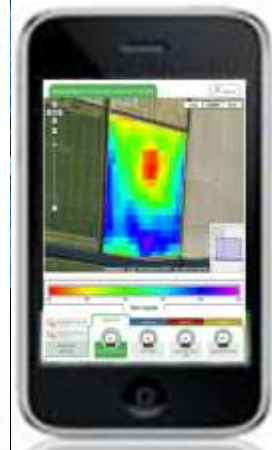
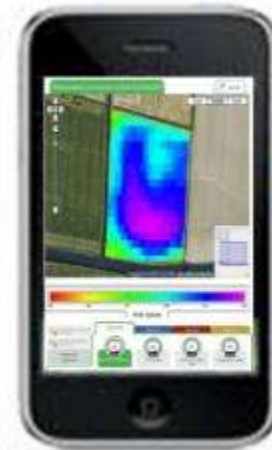
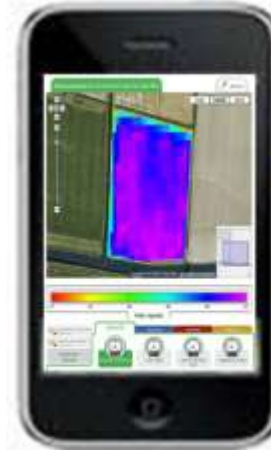
Insurance/finance





Possible service provision

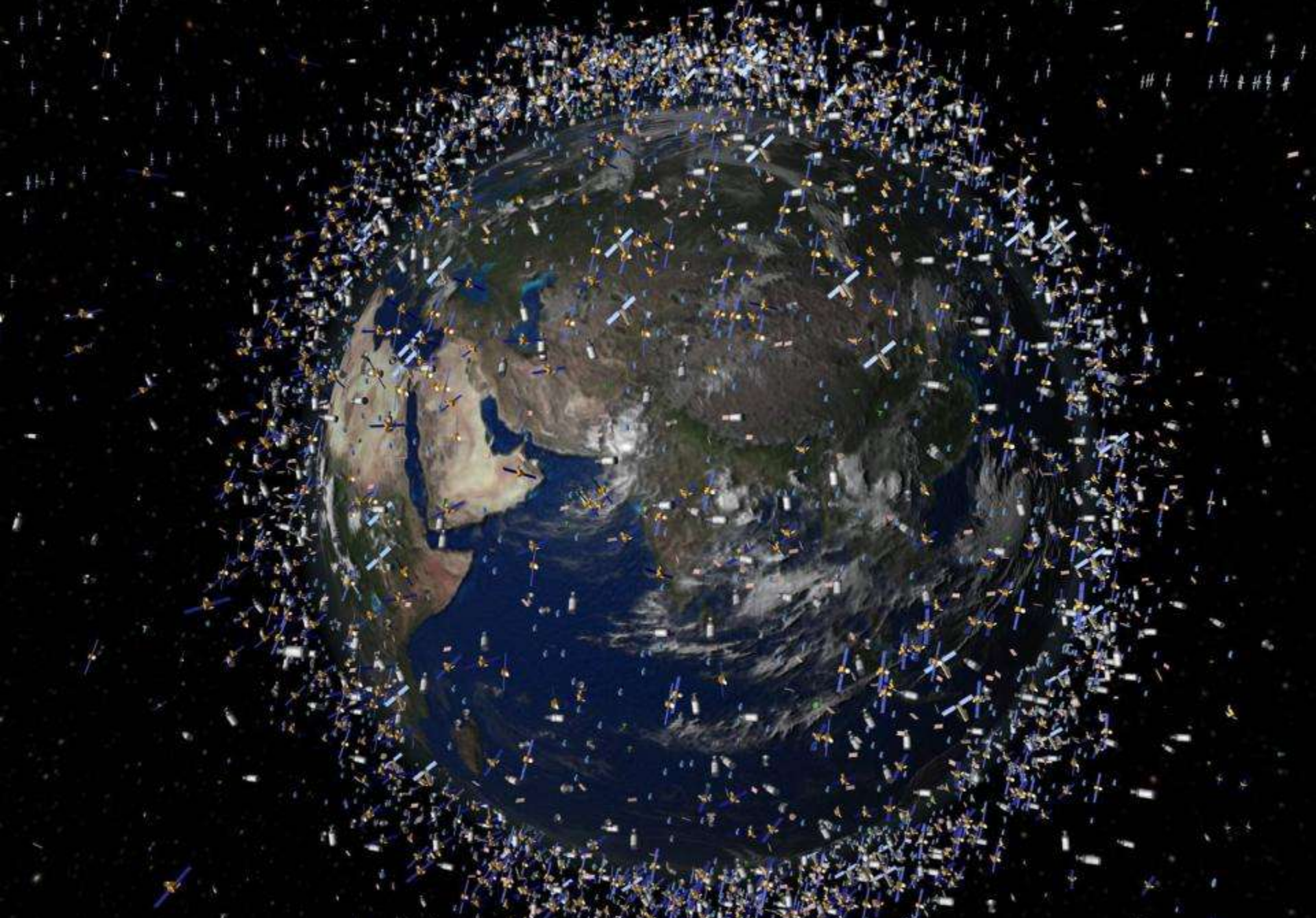
- Calendriers des cultures
- Informations météorologiques
- Cartographie
- Surveillance (p.ex. la croissance végétale)
- Irrigation / conseil d'approvisionnement d'éléments nutritifs
- Sur base individuelle
- Intégré aux services de chaîne de valeur
- Complémentaire à la micro-assurance





Pourquoi utiliser des données satellitaires?

- Objectif, consistant, transfrontalier
- Peu ou pas d'infrastructures de surveillance (locales)
- >25 ans de séries chronologiques (satellite géostationnaire, Landsat)
- Beaucoup de nouveaux satellites ont été (et seront) lancés, peu ou pas de frais



Landsat 8 (US, 2013)
No cost



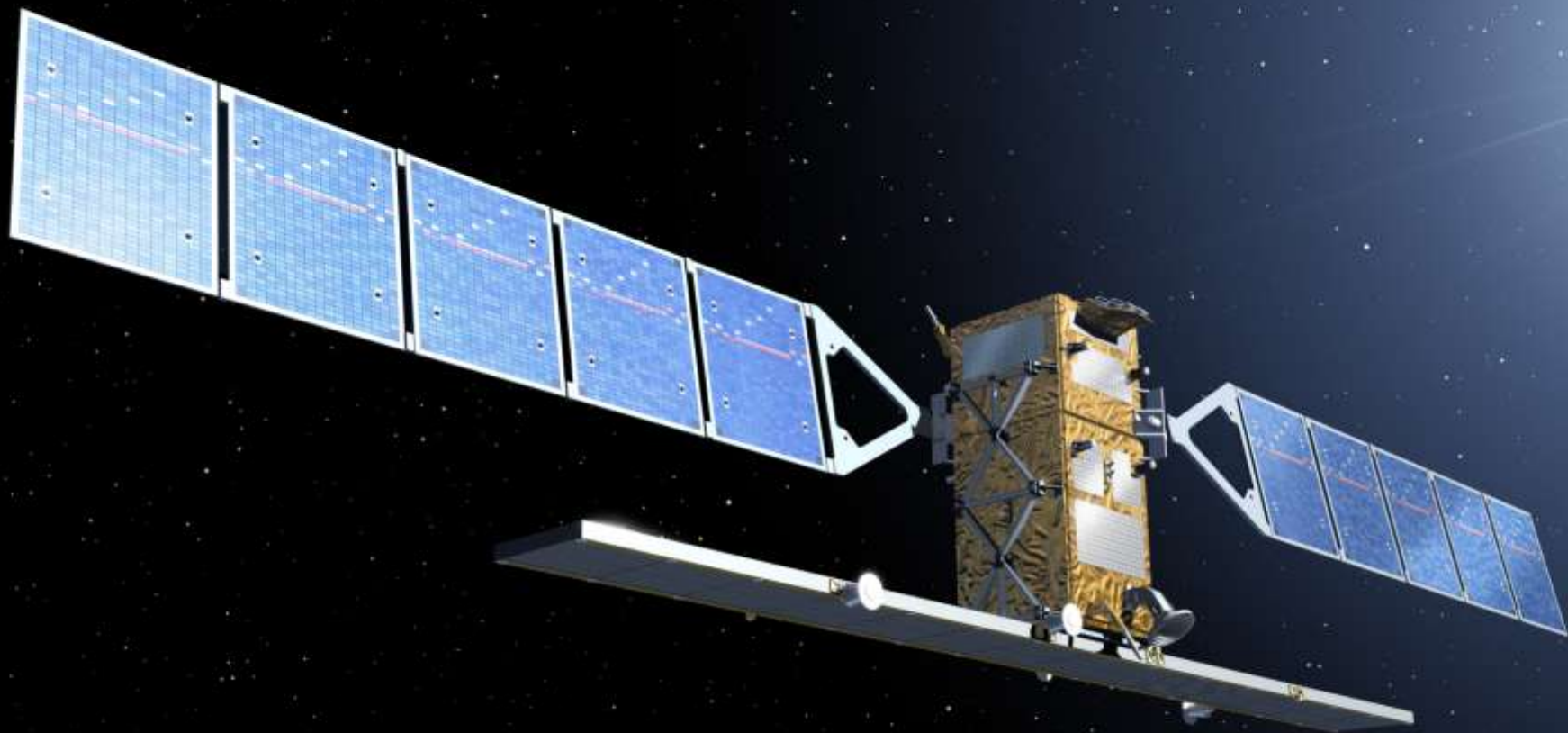


Planet Labs (2014)

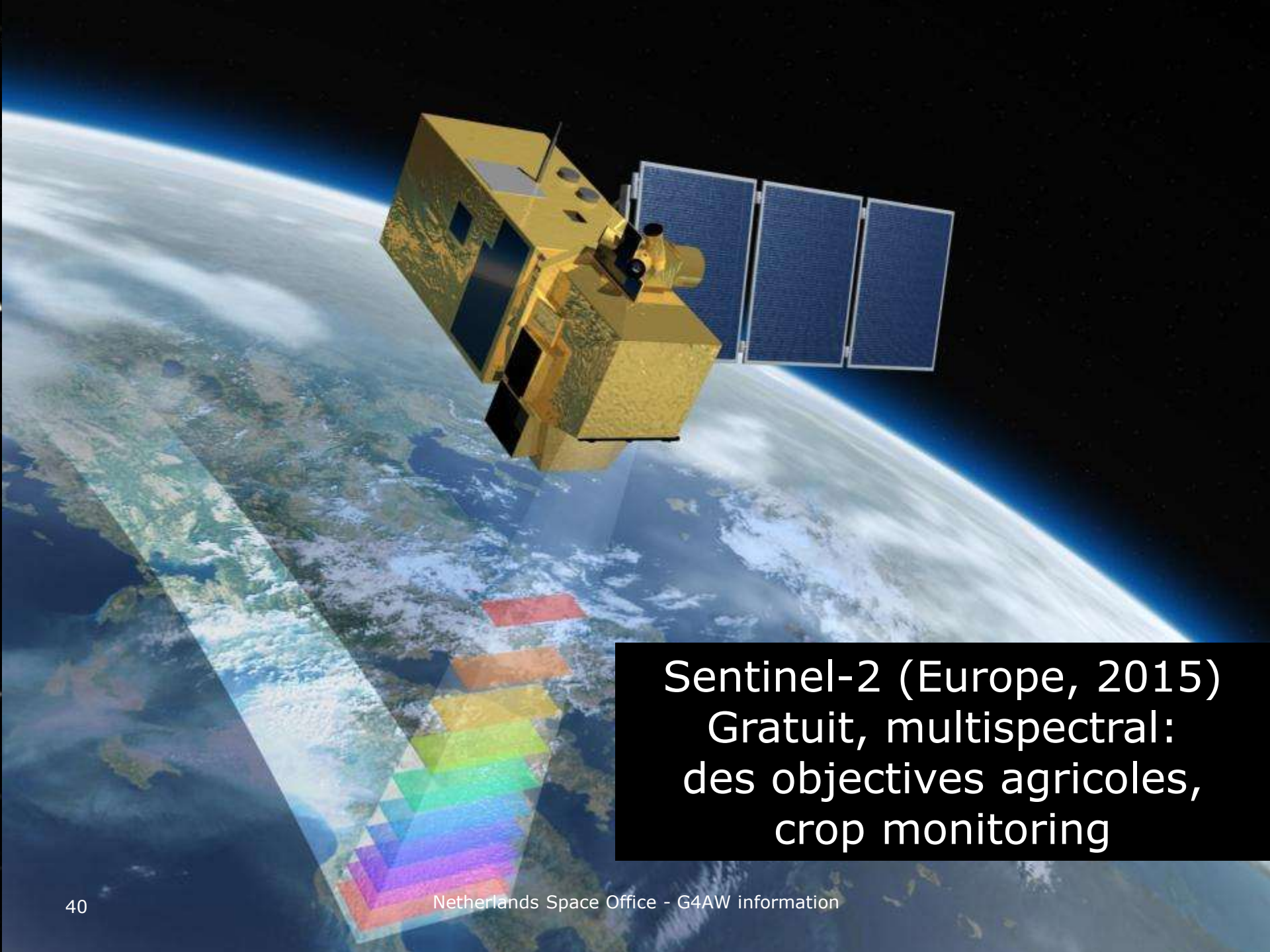


Skybox (2014)

Constellation
Temps de revisite haut
Commercial
Économique



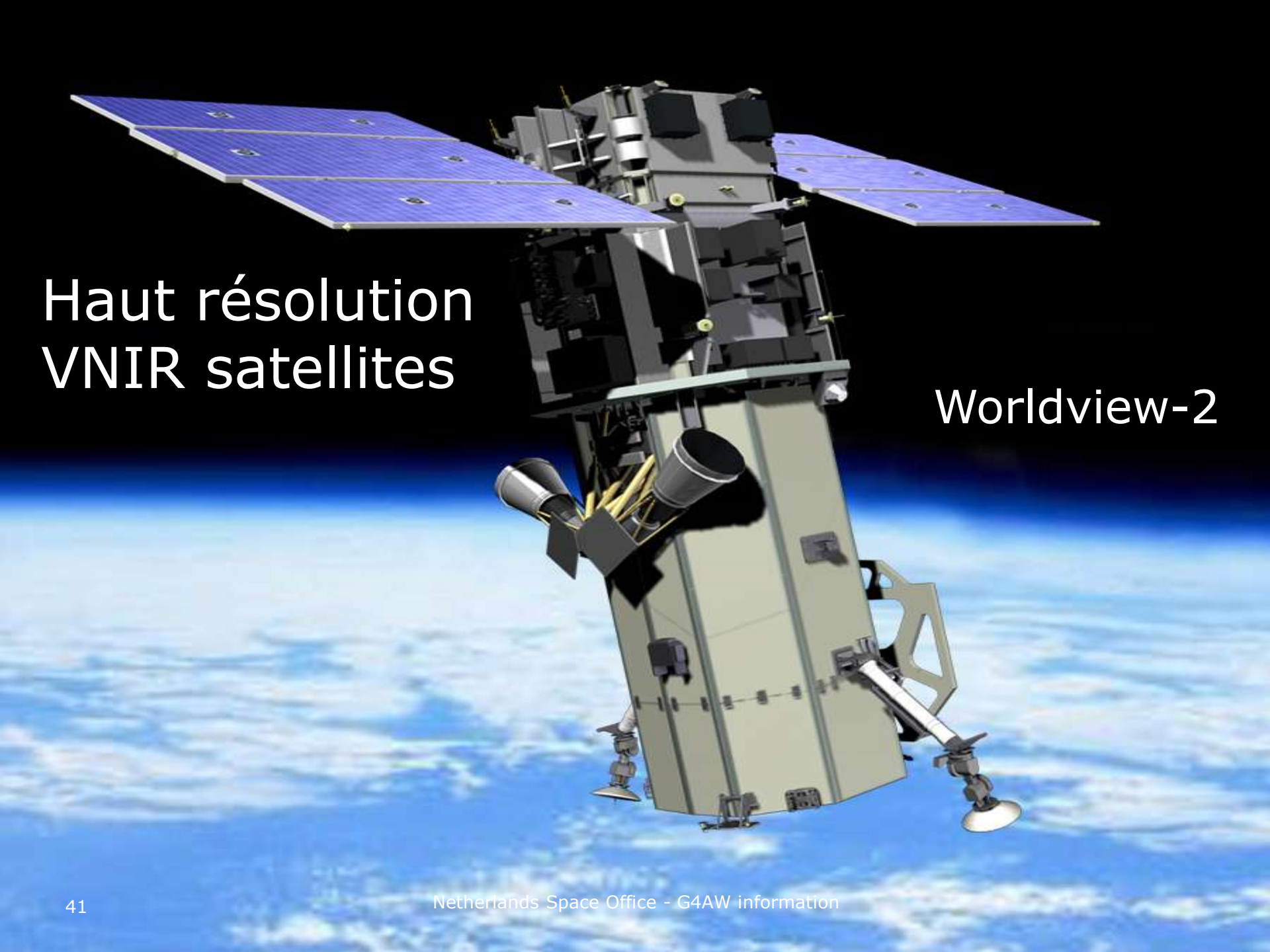
Sentinel-1 (Europe, 2014)
Gratuit, nuit & jour,
en regardant à travers les nuages



Sentinel-2 (Europe, 2015)
Gratuit, multispectral:
des objectifs agricoles,
crop monitoring

Haut résolution VNIR satellites

Worldview-2



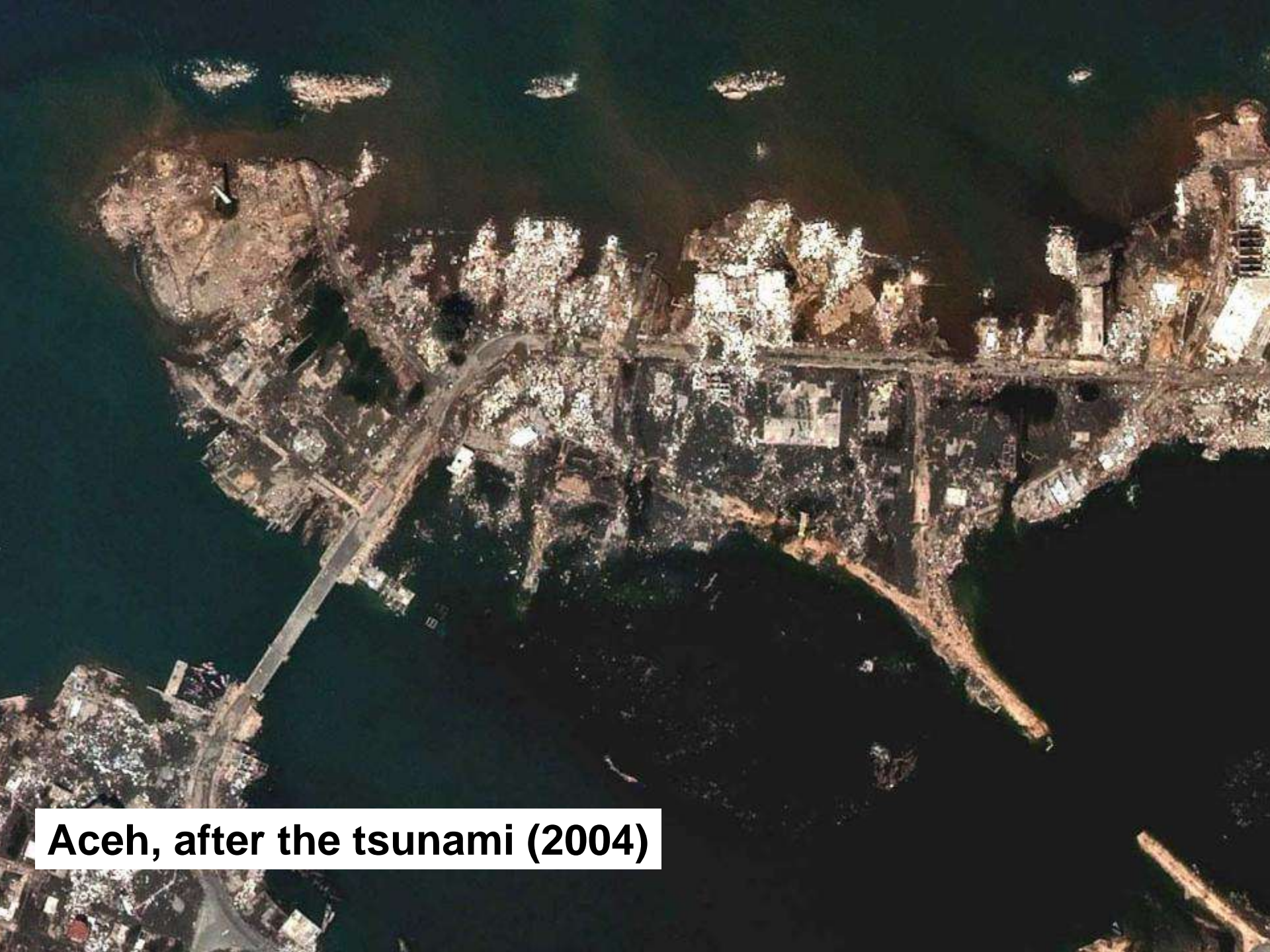


Optical images : 50 cm resolution





Aceh, before the tsunami (2004)



Aceh, after the tsunami (2004)



Sarawak Oil Palm plantations (Google)



Merci