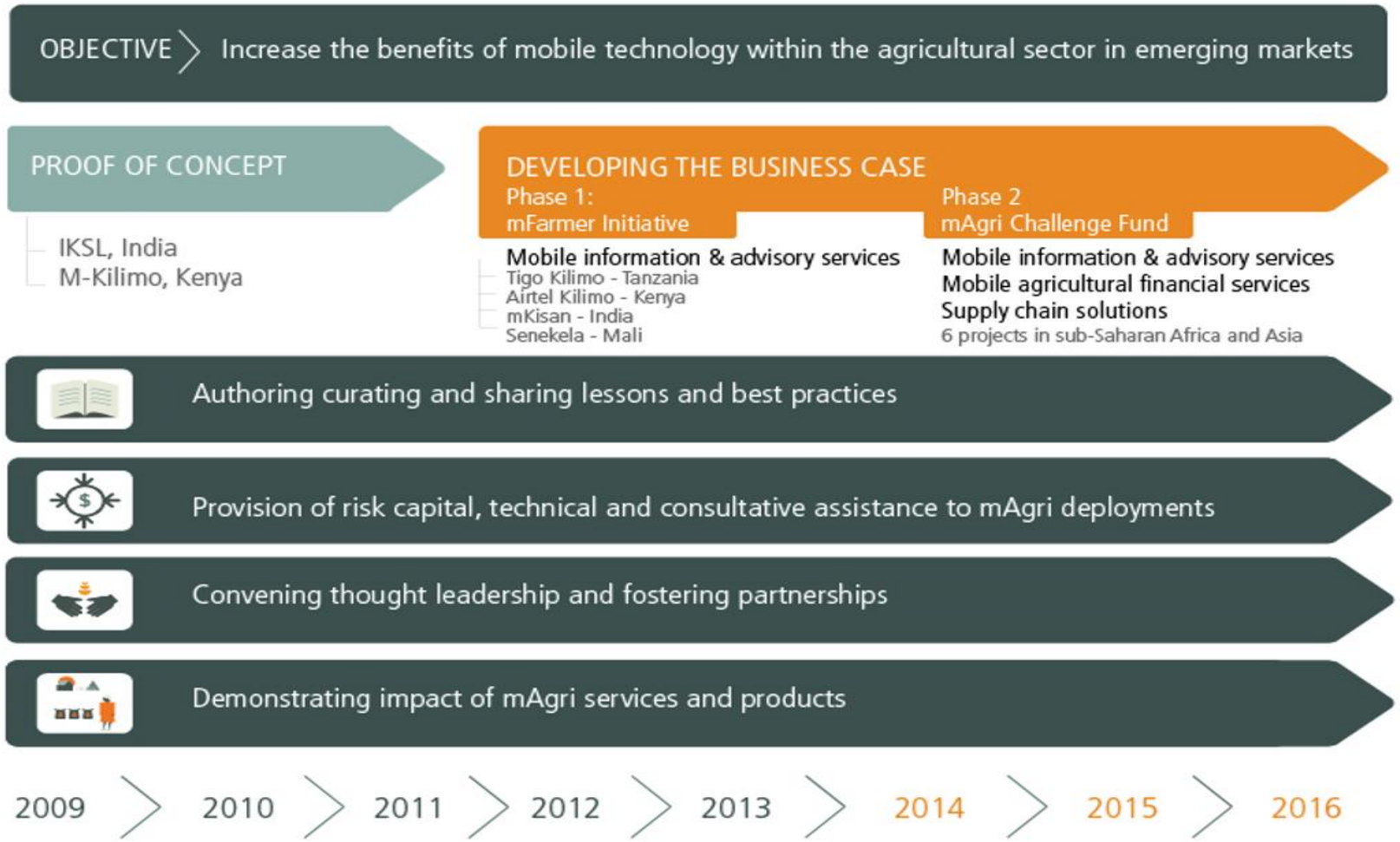
Weather Forecasting & Monitoring: Mobile Solutions for Climate Resilience - GSMA mAgri Webinar, Wednesday 31 August 2016

1. Introducing GSMA mAgri

GSMA mAgri aims to catalyze the industry through direct engagement and knowledge sharing



Our report “Weather forecasting and monitoring” explores mobile solutions for climate resilience

The report advocates for increasing focus from the mobile industry on technologies that provide localised and relevant weather advisory for smallholder farmers:

- Localised weather forecasts via mobile
- Weather adaptive, climate smart advice via mobile
- Digitisation of weather index insurance

http://www.gsma.com/mobilefordevelopment

2. Why mobile?

The dependency of the economy on climate means that weather forecasts are (in theory) in demand

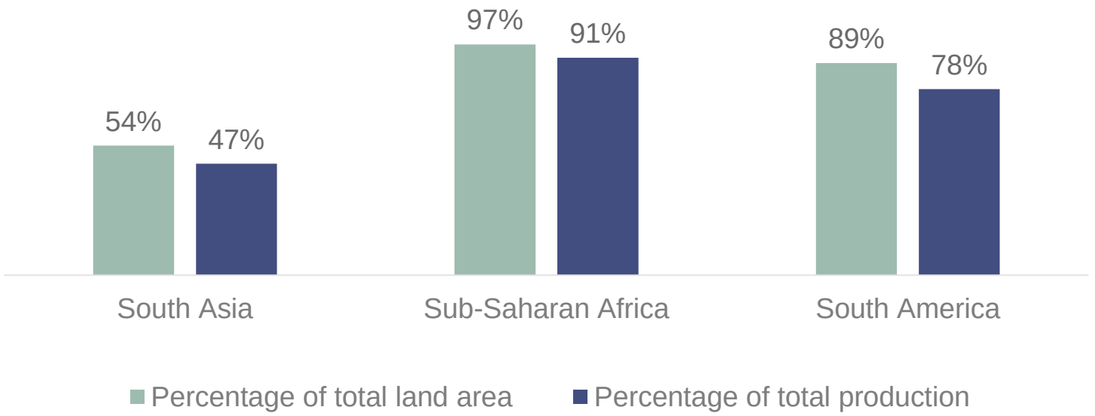
Agriculture = 32.3% of GDP in low income countries; 16.7% in lower middle income countries

Dependency of the economy on the climate in the developing world

Weather monitoring and forecasting tools = Key for economic growth and food security

...But people in rural areas rely on met agencies with low capacity, obsolete technologies

Rain-fed agriculture as a percentage of total agricultural land and total agricultural production



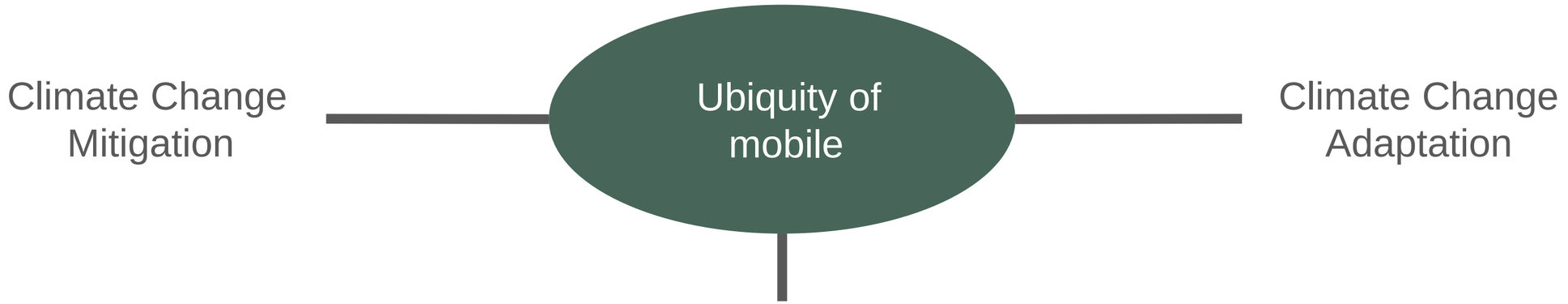
Source: International Food Policy research Institute (IFPRI)

The need for accurate weather advisory is made greater by climate change

Environmental + Humanitarian Impact: More frequent droughts/floods → 2015 Malawi floods wiped out 90K hectares, 2.8 million people (17% of pop) require food assistance.*

Economic Impact: Price to rise for staple crops – rice, wheat, maize (most reactive to increasing CO2) → In Africa food prices to increase by up to 12% (2030), 70% (2080). **

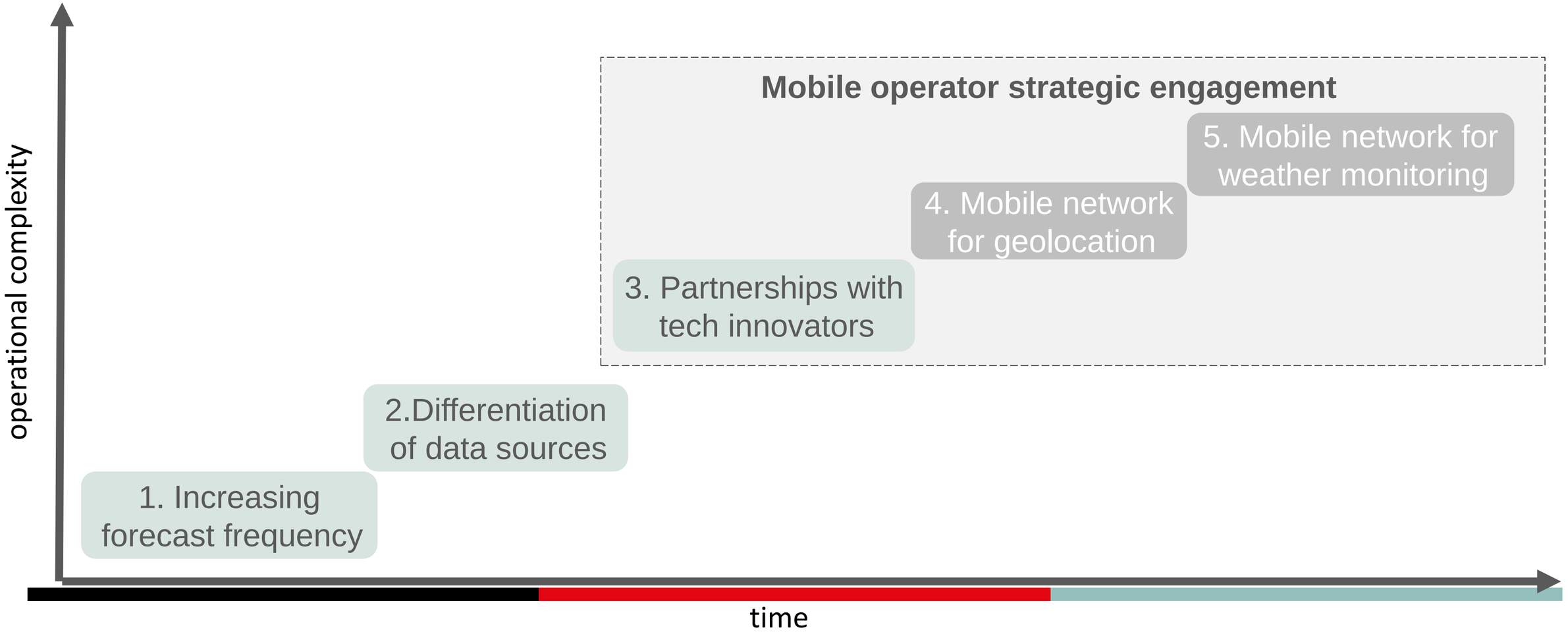
The role of mobile to address climate change



- Source: FAO GIEWS Country Briefs
- **Source: Shock Waves: Managing the Impacts of Climate Change on Poverty", World Bank 2015

How can mobile service providers improve weather advisory for smallholders in emerging markets?

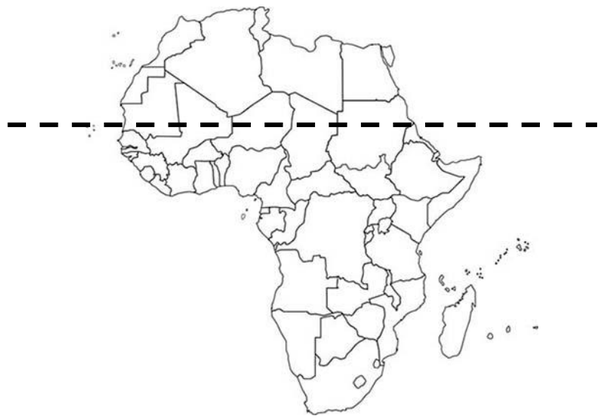
The building blocks to developing actionable weather advisory



3. The role of mobile in improving the quality of weather data

Most emerging markets lack the ground level data that is required to create localised forecasts

- Weather forecasts are created by super computers using data provided by satellites. Weather stations are required for calibration and to create localised forecasts.
- Current and historic weather data is important for agricultural, climate monitoring, and many hydro-meteorological applications (e.g. weather index insurance).
- Around the world, there are ~66,000 stations but most developing world countries lack the necessary weather station infrastructure.



Sub-Saharan Africa:

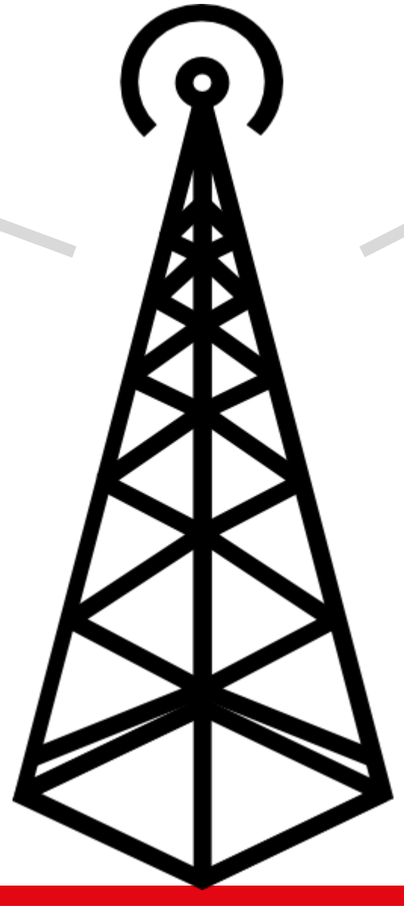
Need: 13,000 weather stations

Reality: ~500 functioning and reporting

Mobile operators have key assets to improve the quality of weather forecasting and monitoring

Mobile network for geolocation

- Allows localised, granular forecasts and weather index insurance
- Automated geolocation presents best chance to scale services
- Cell-ID is virtually a no-cost solution
- Triangulation requires LBS system



Mobile network for weather monitoring

- Weather station at BTS
- Spectrum Propagation analysis

- Pervasiveness of mobile, 90%+ 2G population coverage in most countries
- Decreasing cost of weather sensors
- Opportunity to locate weather stations at BTS sites
- “Passive weather monitoring” (analysis of spectrum propagation) is technically feasible and allows for accurate rain precipitation mapping

Innovators are deploying low cost weather stations for weather forecasting and monitoring

- Early initiatives: In 2009, **Ericsson and Zain** planned to implement a weather station network on 5,000 BTS in East Africa to provide accurate weather forecasts.

- Ongoing initiatives: The **Trans-African Hydro Meteorological Observatory (TAHMO),** aims to develop a vast network of weather stations across Africa (≈ 20,000) by locating them at schools and educational institutions.

- Recent initiatives: In Africa, **Kukua** works with telco tower companies, educational institutions to co-locate its low cost weather stations ($500).

  Arable low cost weather station ($500) integrates sensors for weather, crop measurements.

Source: Arable

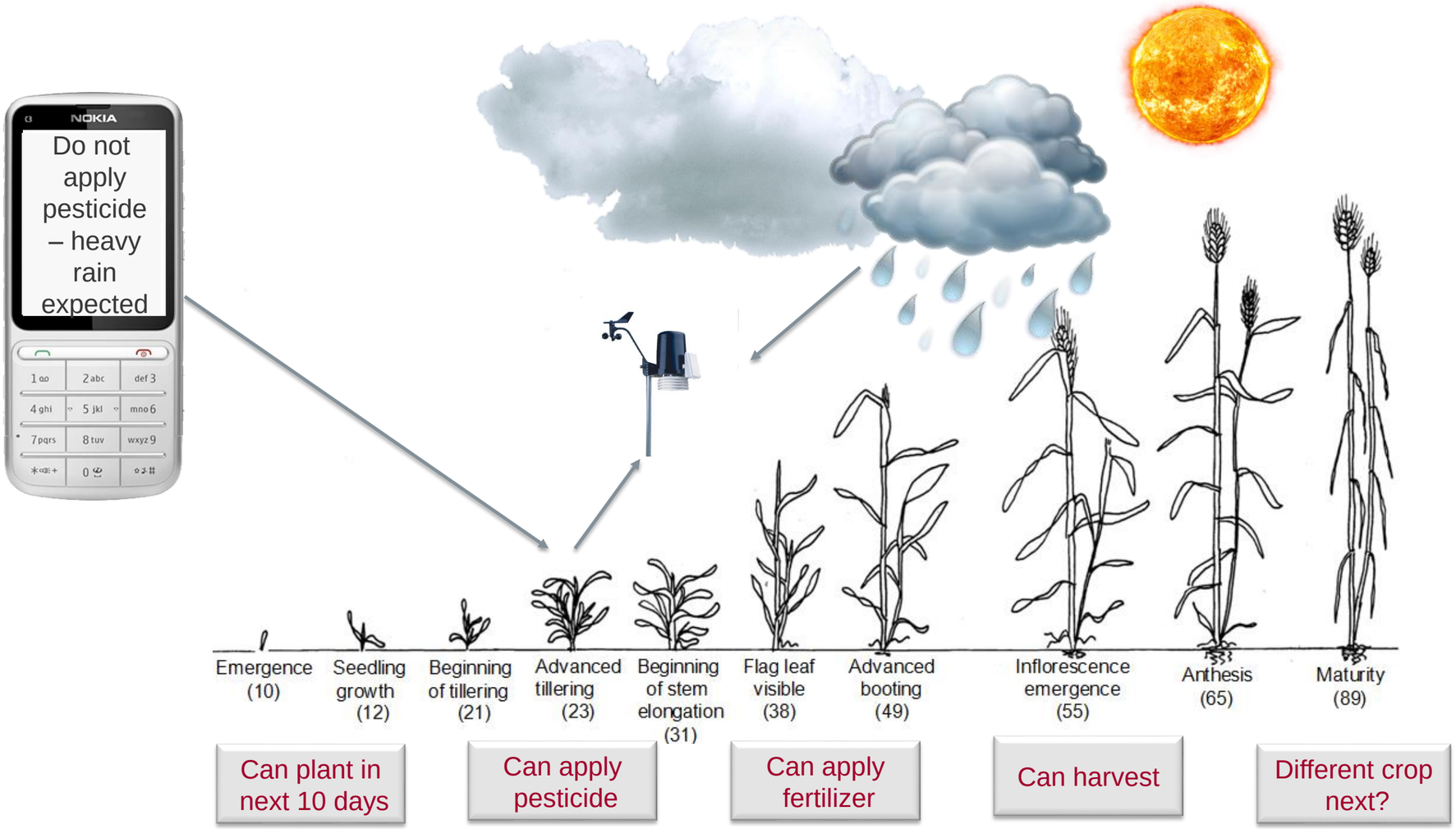
Innovation is also happening in weather forecast modelling for tropical regions

- Social enterprise **Ignitia** has created a model that is able to better predict weather patterns for tropical regions.
- Ignitia claims 84% average accuracy due to a model achieving 3KM resolution VS 27KM resolution, 39% average accuracy of equatorial belt of established models.
- In West Africa, Ignitia has partnered with **MTN Ghana** and **Orange Mali** to provide standalone two day rain forecasts, monthly outlooks and six month seasonal outlooks days to smallholder farmers during the rainy season.

Source: Ignitia

4. Evolution to weather adaptive and climate smart services

There is a growing opportunity to provide weather adaptive agronomic advice to farmers via mobile



Source: Kukua

It is already possible to offer agronomic advice that is dynamically linked to weather data

Two routes for service providers to create weather adaptive mAgri services

Develop In-House Capability

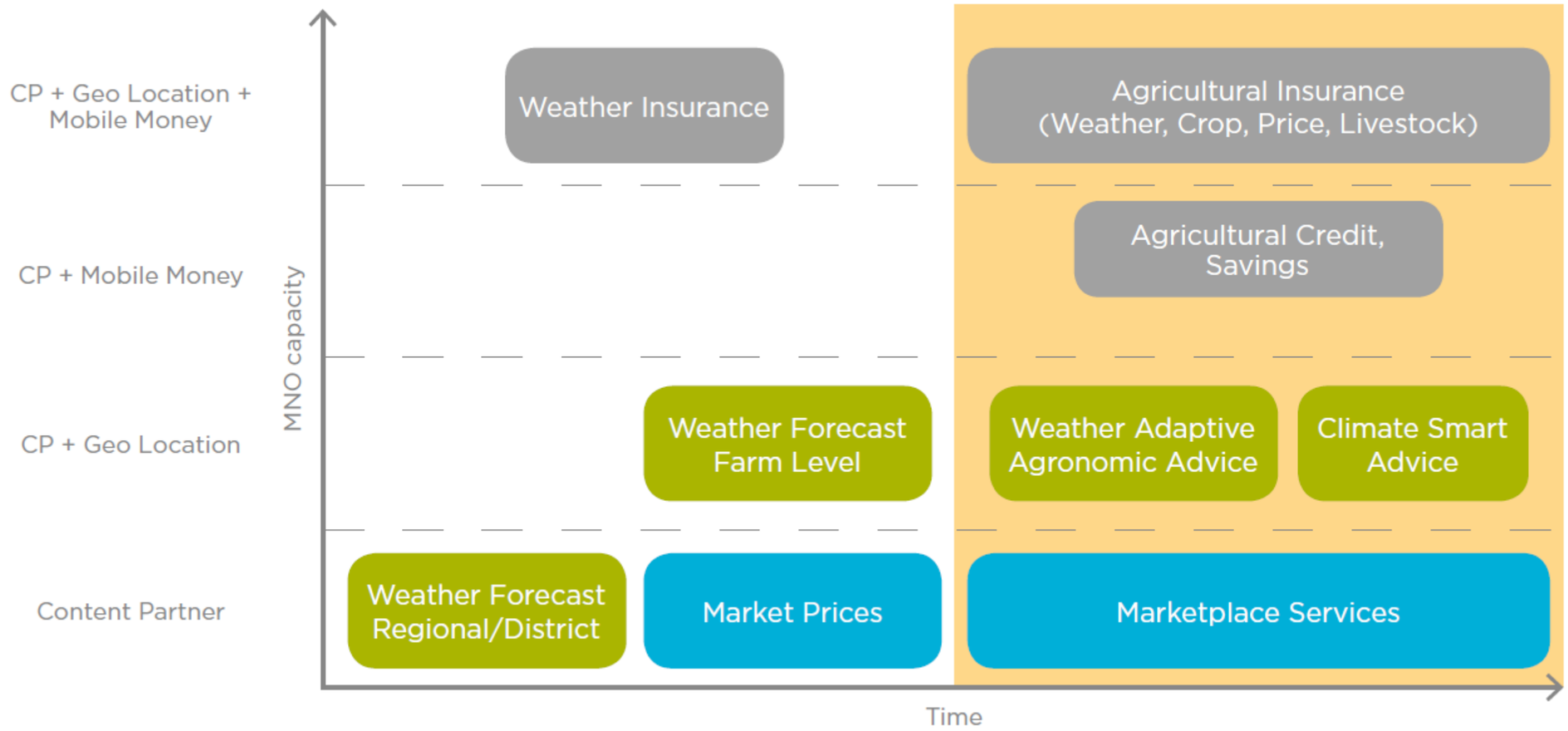
- In-house agronomists at content provider
- Adaptation tips based on weather forecasts
- Examples: mKisan (India), Esoko (Sub-Saharan Africa)

Partner with specialists in weather/agronomic data

- Predictive analytics for the computation of weather/agronomic data
- Examples: aWhere (Global), RML (India)

critical factor

Mobile operators have key assets to evolve their offering to weather-centric mAgri holistic bundles



Source: GSMA, Weather Forecasting and Monitoring: Mobile Solutions for Climate Resilience
http://www.gsma.com/mobilefordevelopment/programme/magri/weather-forecasting-and-monitoring-mobile-solutions-for-climate-resilience

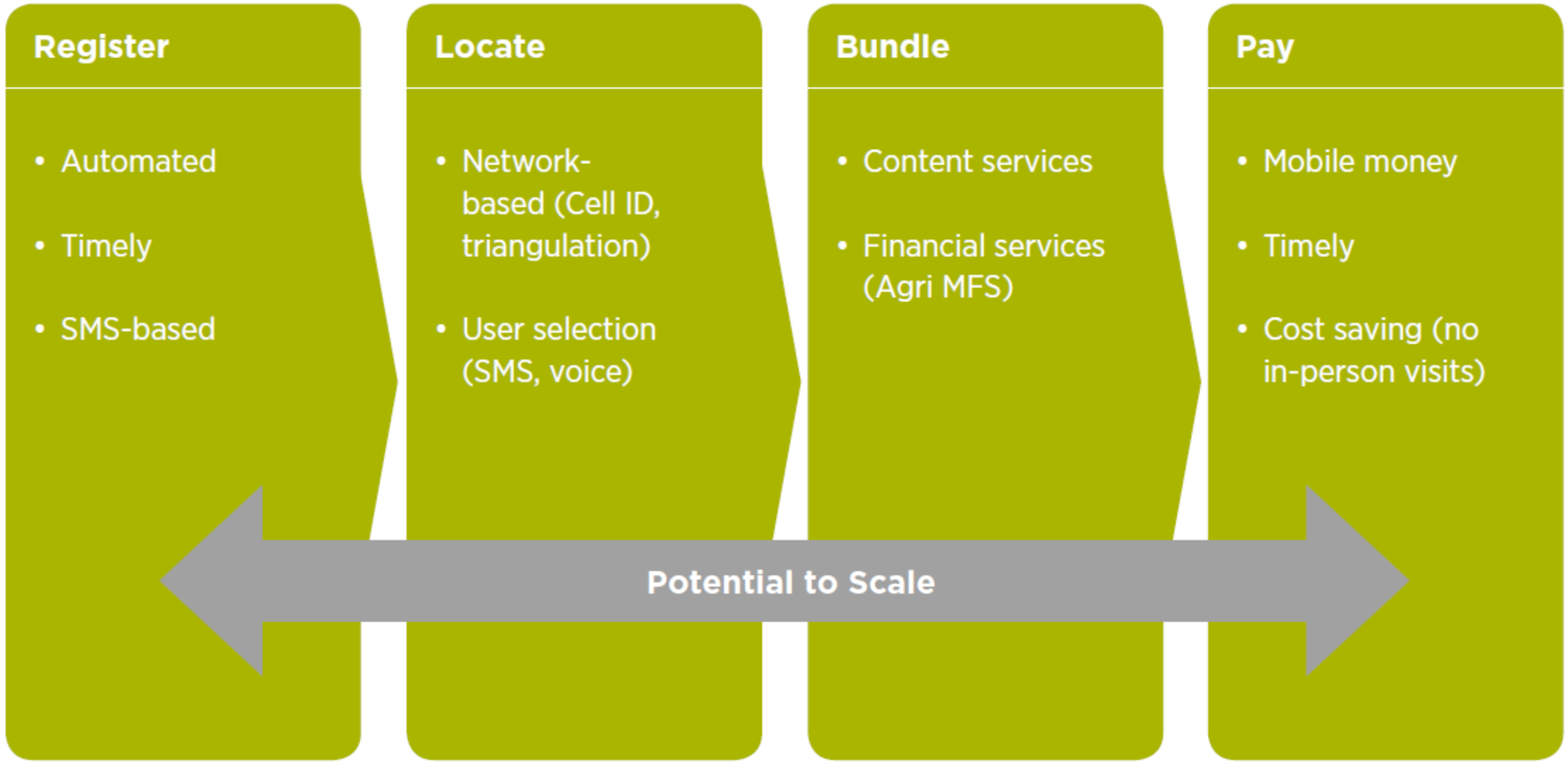
5. Mobile weather index insurance

Weather index insurance addresses climate change by protecting rain-fed agriculture

- Weather index insurance (WII) is a relatively new concept to insurance provision for rain-fed agriculture against weather calamities such as draughts and floods.

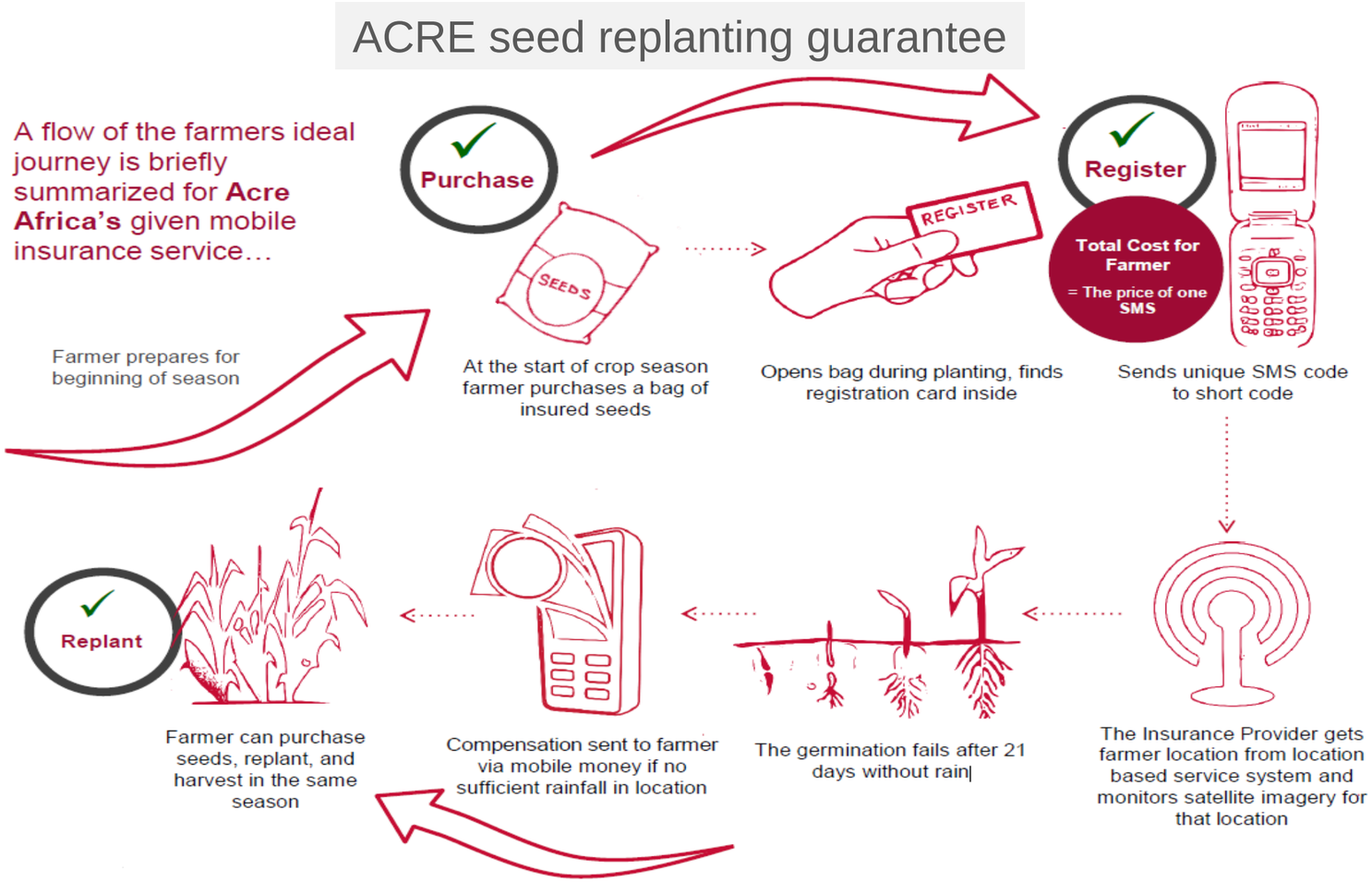
- WII products pay-out benefits for loss of assets and investments on the basis of a predetermined rainfall index based on historical weather data.

The mobile operator plays a critical role in the digitisation of weather insurance



Source: GSMA, Weather Forecasting and Monitoring: Mobile Solutions for Climate Resilience
http://www.gsma.com/mobilefordevelopment/programme/magri/weather-forecasting-and-monitoring-mobile-solutions-for-climate-resilience

Mobile channels are proving to be effective means of distributing micro-insurance products



Source: Micro Insurance in Mobile Agriculture: Case study and takeaways for the mobile industry
http://www.gsma.com/mobilefordevelopment/programme/magri/micro-insurance-in-mobile-agriculture-case-study-and-takeaways-for-the-mobile-industry

6. Key takeaways

Key takeaways

For **mobile operators**:

- Put weather services at the core of the value proposition with a view to develop holistic bundles.
- Use network intelligence to create value with geo location, and consider using the network to generate weather data

For **all service providers**:

- Extend partnerships to new providers to improve quality of weather forecasts and drive service stickiness.

For **donors**:

- Consider investing in technology projects that aim to improve weather forecasting in the developing world.

Questions?

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