



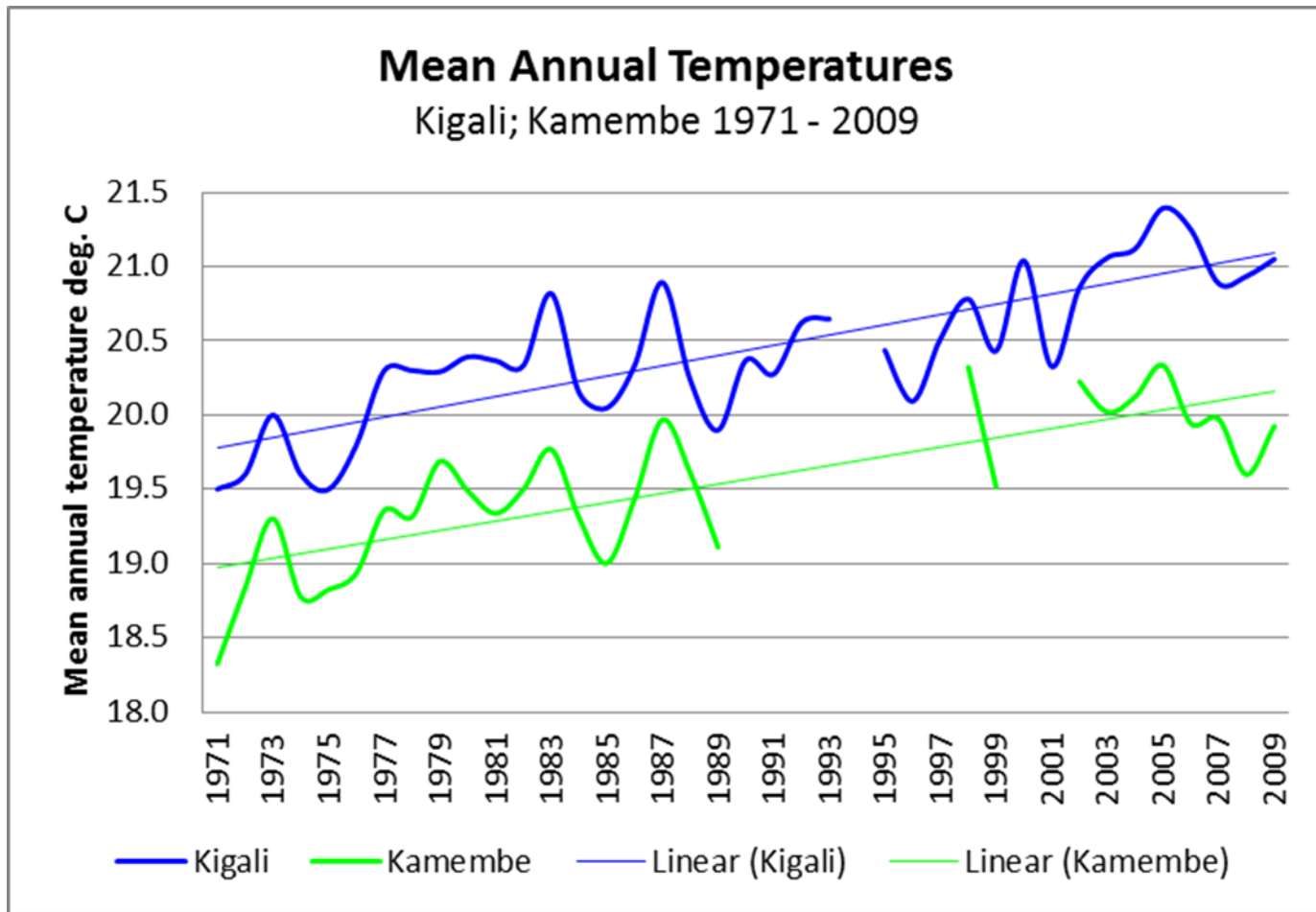
Climate Change and Resilience

Innocent Kabenga

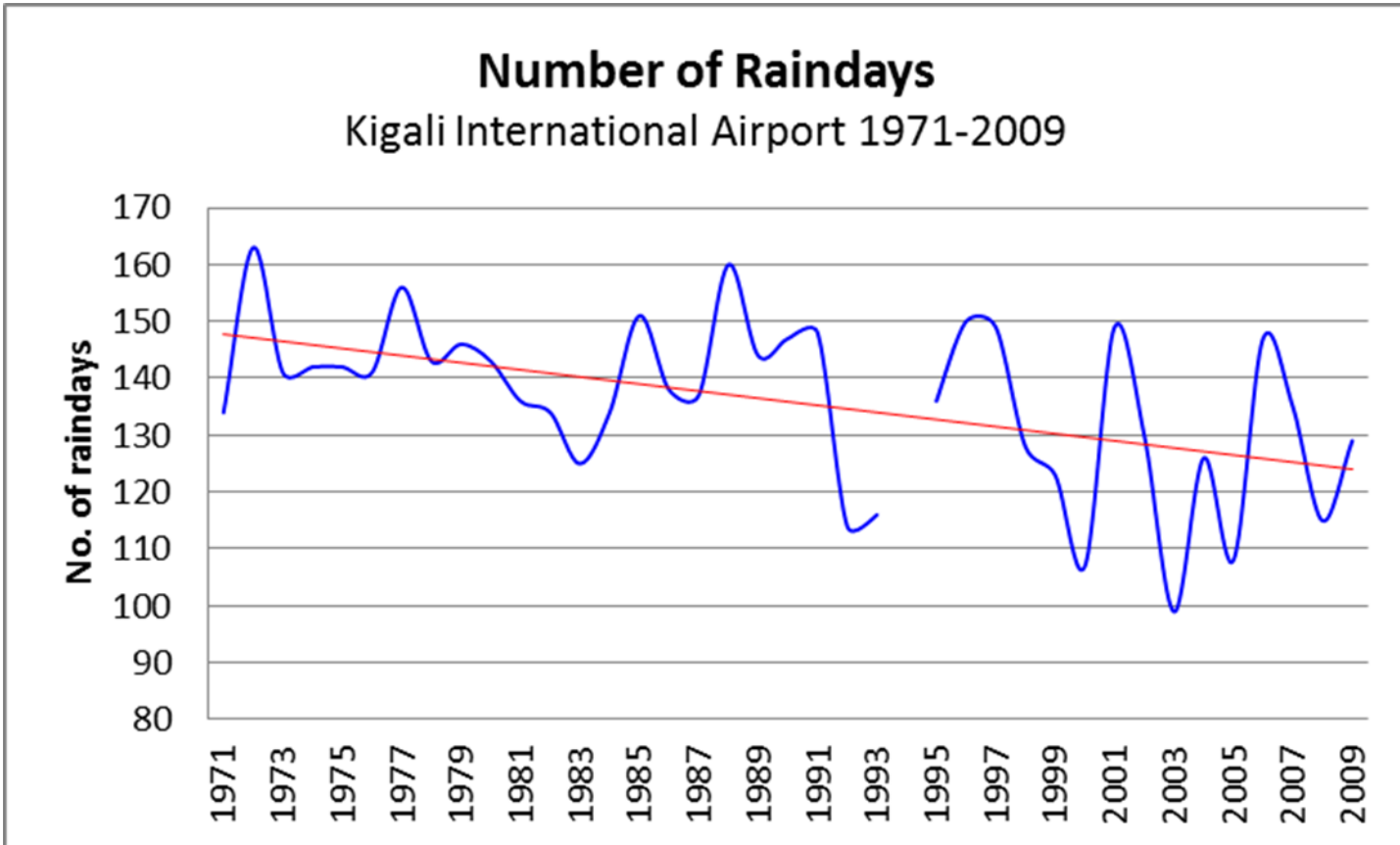
OUTLINE

- Climate change threats
- GoR efforts in mitigation and adaptation

Temperatures in Rwanda on the rise?



Erratic, more intense rainfall



Sustainability threats

Climate Change - a threat to all growth gains

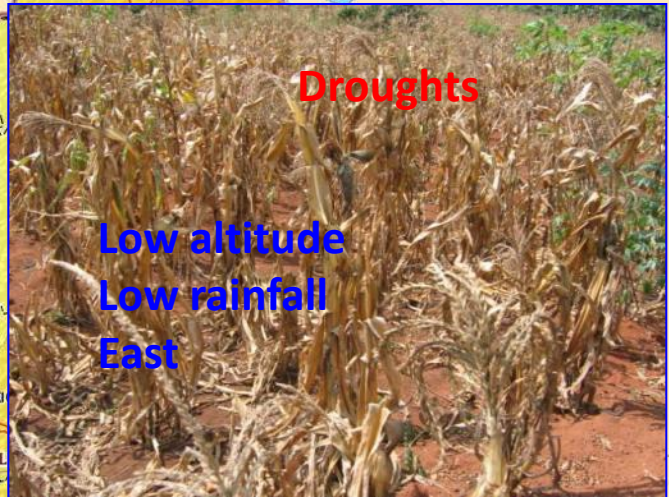
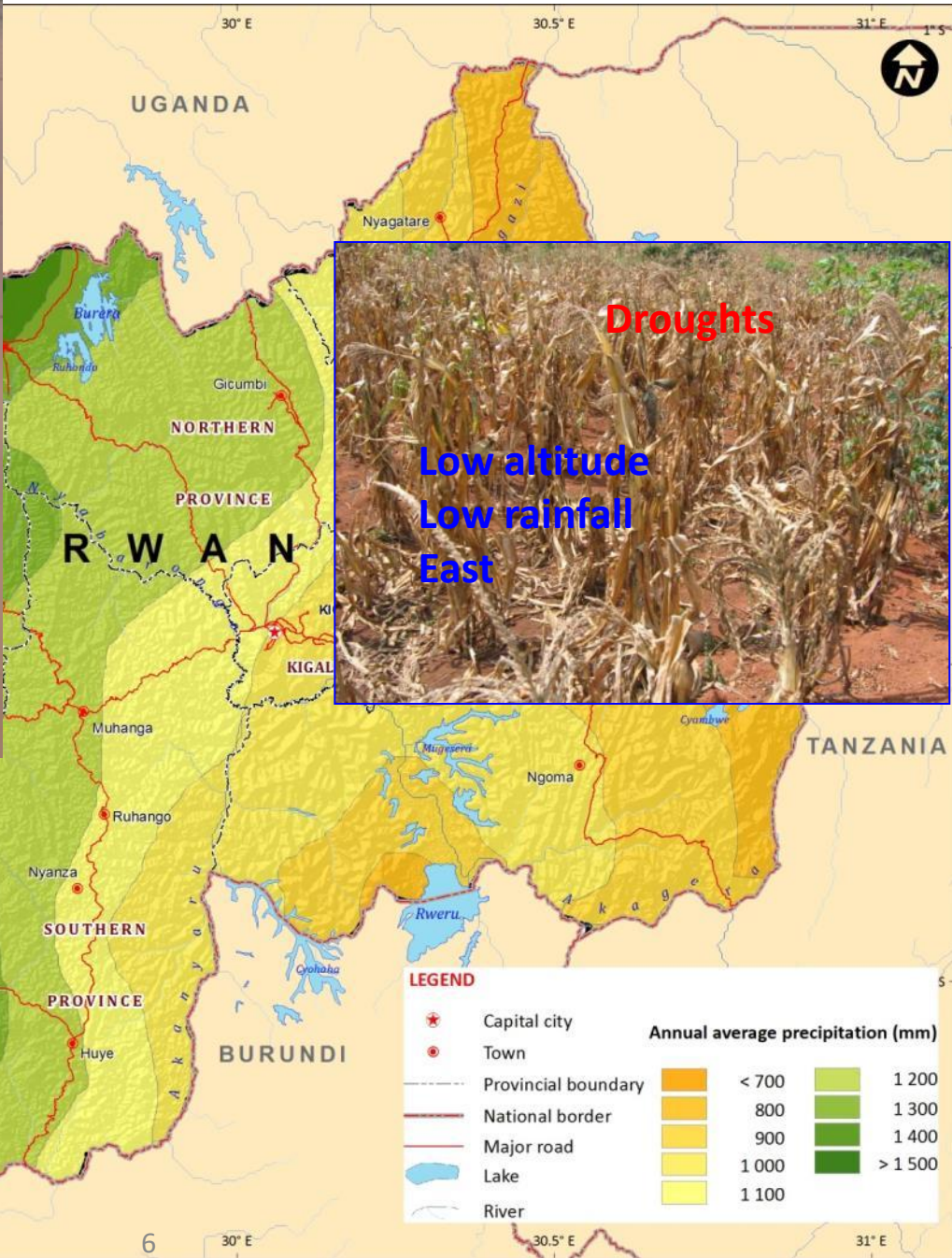
- **CO₂ emissions**





Floods & Landslides

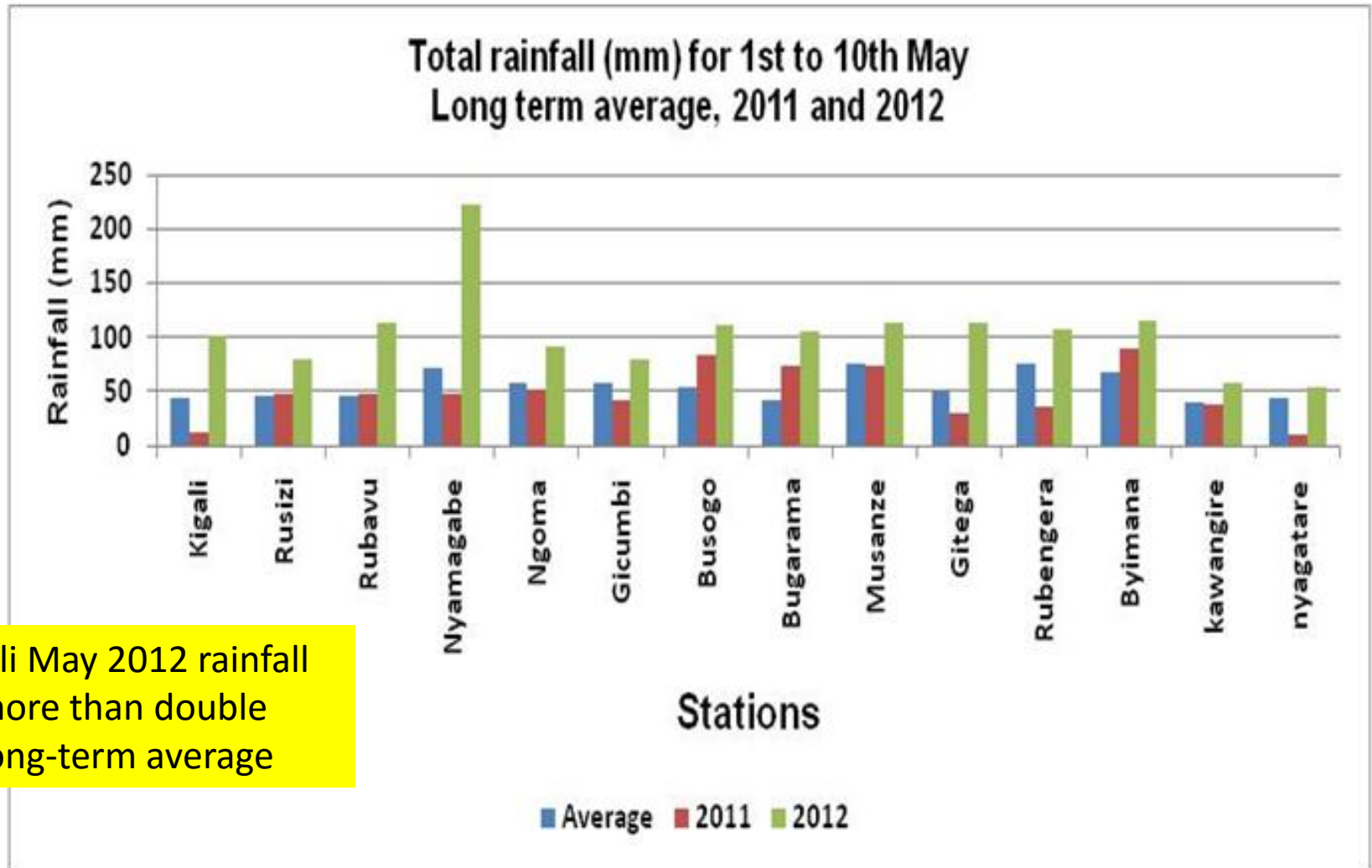
*high altitude, high rainfall
North, West, South*



Droughts

*Low altitude
Low rainfall
East*

Erratic rainfall



Sustainability threats

Climate Change a threat to all the gains

- **Extreme weather - loss of life and livelihoods**



Sustainability threats

Climate Change a threat to all the gains

- **Extreme weather crop & infrastructure damage**

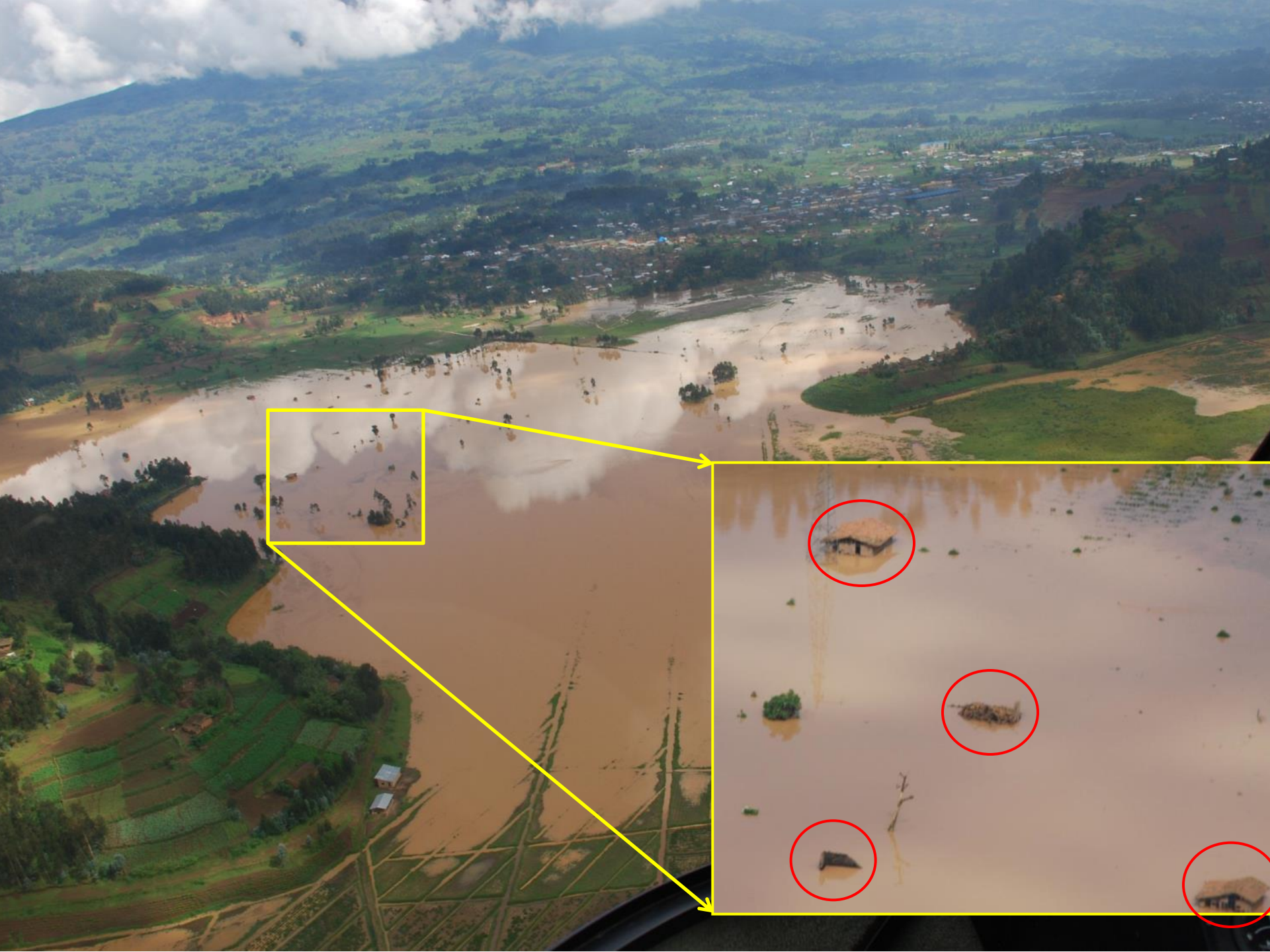




Bridge

Nyabugogo transport hub





*Ngororero District
Road damage - Kabaya*



Sustainability threats

Climate Change a threat to all the gains

- **Inappropriate land use vulnerable to climate impacts**



Response to Climate Change

Government of Rwanda

Transformation:

From Business As Usual

to

Resource Efficiency;

Low-carbon development;

Climate Resilience

Transformation Instrument

Green Growth & Climate Resilience Strategy

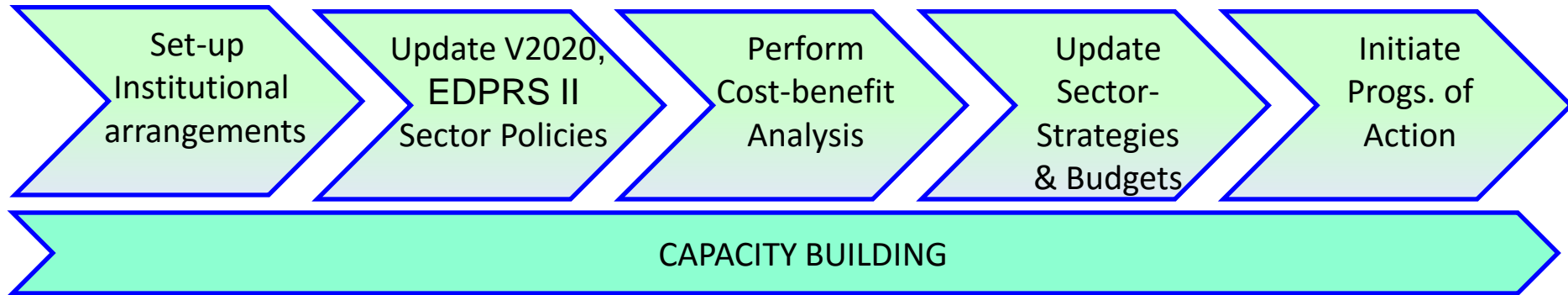
Rwanda to be a developed, climate-resilient, low-carbon economy by 2050

- **Energy Security & Low Carbon Energy Supply**
- **Urban Development**
- **Green Industry and Green Services**
- **Sustainable Land Use & Water Resource Management**
- **Biodiversity preservation & Payment for Ecosystem Services**
- **Reduced vulnerability to climate change**

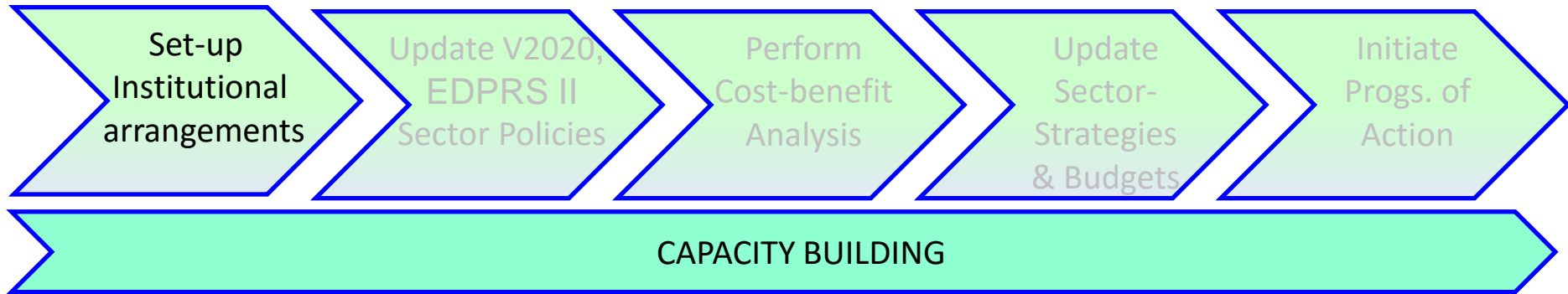
GGCRS Programmes of Action

Programme of Activity	Responsible Institution
1. Sustainable intensification of small scale farming	MINAGRI (RAB)
2. Agricultural diversity for local & export markets	MINAGRI (NAEB)
3. IWRM and Planning	MINIRENA (RNRA)
4. Sustainable Land Use Management & Planning	MINIRENA (RNRA)
5. Low carbon mix of power generation for national grid	MININFRA (REG)
6. Sustainable small-scale rural energy installations	MININFRA (REG)
7. Green industry & private sector investment	MINICOM
8. Climate compatible mining	MINIRENA (RNRA)
9. Efficient resilient transport systems	MININFRA (RTDA)
10. Low carbon urban settlements	MININFRA (RHA)
11. Ecotourism, Conservation & PES Promotion	RDB (Conservation & Tourism)
12. Sustainable forestry, agroforestry & biomass energy	MINIRENA (RNRA)
13. Disaster Management & Disease Prevention	MIDMAR
14. Climate data & projections	METEO & REMA

GGCRS Implementation Roadmap

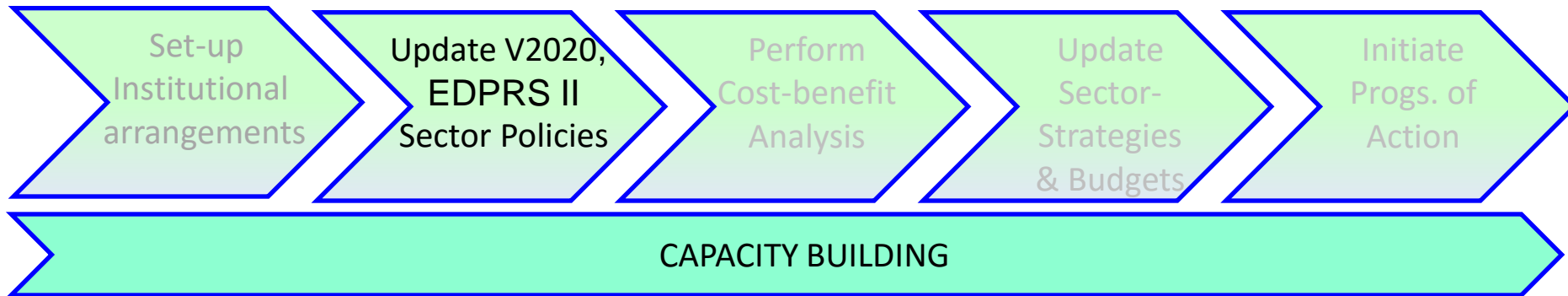


GGCRS Institutional arrangements



- **Ministry of Natural Resource** – Coordination (Chair, Inter-Ministerial Committee on Green Economic Growth & Climate Resilience)
- **Rwanda Natural Resources Authority** (mining; lands; water; forestry)
- **Rwanda Environment Management Authority**
- **FONERWA** – Environment and climate funds flowing into Rwanda
- **Rwanda Meteorological Agency**
- **Environment and Natural Resources (ENR) Sector Working Group**
- **Centre of Excellence on Biodiversity and Natural Resource Management**
- **Innovation Centre for Climate Change, Green Technologies and Green Urbanization (under development for 2018)**

Government programme update



- **V2020 updated & disseminated** - Focus on promoting green growth
- **EDPRS II (2013-2018) updated & disseminated**
- **Sector Policies**
 - Updates of sector policies (Energy, Urban and Housing Policies , New building code focusing on Green Building)
 - ENR Sector Strategic Plan updated
- **District Development Plans**
 - Ongoing DDP updates for all 30 districts

Cost estimates for implementation

Greening Energy, Agriculture and Water sectors

2015-2030 Costing the GGCRS

Sector-level Green Growth Costing:

- Additional **RWF600 billion** for:
 - diversified energy supply
 - security of supply
 - efficiency and reduction of CO₂ emissions
- Additional **RWF2,100 billion** for:
 - water supply reliability
 - efficient and equitable use
- Additional **RWF525 billion** for:
 - mainstreaming agro-ecology
 - strengthening value chain capacity

Financing Transforming

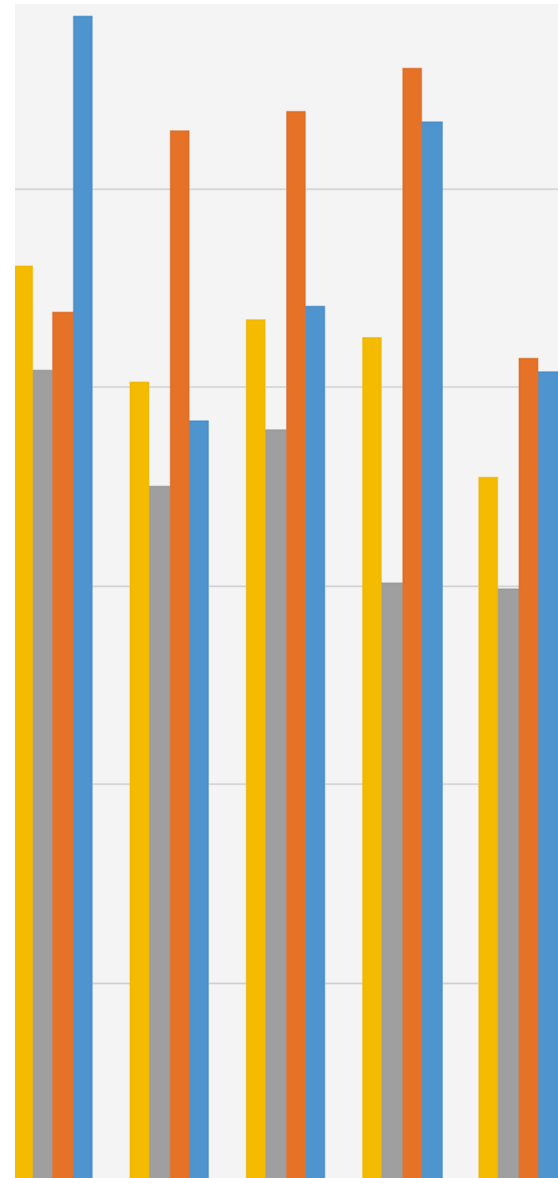
FONERWA – Climate Finance Instrument:

- National fund for environment and climate change
- Coordination, fund access facilitation, stimulating innovation
- Innovation Grant; Lines of Credit
- Thematic windows: conservation/rehabilitation of natural resources; research & development; green technologies
- Current funding levels ~\$75m
- Financing 20 operational projects
- <http://www.fonerwa.org/>

Measuring Effectiveness

Monitoring and Evaluation Tools:

- Green Growth & Climate Resilience Strategy results framework
- Green Economy medium term indicators
- Climate Change Vulnerability Index for Rwanda (2015 baseline)



3. GGCRS Monitoring Tool

Programme of Action	Implementation Progress				Delivery Status		
	Indicator	Baseline (2011)	Progress (up to Dec 2015)	2016-2018 Targets	on-track	on-watch	off-track
Activity / Responsible agency/ Programme Length							

GGCRS Implementation Progress?

Some achievements

MINAGRI

Programme 1: Sustainable Intensification of Small Scale Agriculture

Programme of Action	Implementation Progress				Delivery Status		
Action 2	3 Indicator options	Baseline (2011)	Progress (up to Dec 2015)	2016-2018 Targets	on-track	on-watch	off-track
Resource recovery & reuse	Decentralized composting plants		62% sites using quality compost	75% sites using quality compost	on-track		
	HH level organic waste recycling		70% HH using organic manure	80% HH using organic manure	on-track		
	Kigali landfill composting station						

Some Early Achievements

Low carbon mix of power generation:

- 8.5MW on-grid solar plant equivalent to 6% of renewable generation



MININFRA - Energy

Programme 5: Low Carbon Energy Mix Powering the National Grid

Programme of Action	Implementation Progress				Delivery Status		
Activity	Indicator	Baseline (2011)	Progress (up to Dec 2015)	2016-2018 Targets	on-track	on-watch	off-track
Oil-Fuel Phase Out	% Oil fuelled generation mix	25.3% (28 /110MW)	28% (52 /185MW)	16.5% (58/350MW)	on-watch		
Private Investment Incentives	% electricity generated by IPPs	15% (17/110 MW)	38% (71/185 MW)	63% (221/350 MW)	on-track		
Renewable Energy Codes of Practice	RE Codes of Practice available	Renewable Energy Feed-In Tariff - 2012	RE/ Rural Energy/SE4ALL codes/plans for approval	Energy codes implemented	on-track		
Strategy for Peat Phase Out	% Peat in energy mix	0	0	4.2% (15/350 MW)	off-track		

MINICOM Industry

Programme 7: Green Industry and Private Sector Development

Programme of Action	Implementation Progress				Delivery Status			
	Activity	Indicator	Baseline (2011)	Progress (up to Dec 2015)	2016-2018 Targets	on-track	on-watch	off-track
Resource Efficient Industries	GHG emissions reduced; Water usage reduced	930t CO ₂ eq/yr; 3,650m ³ /yr Water use reduction	3288t CO ₂ eq/yr; 10,424m ³ /yr Water use reduction	3,350t CO ₂ eq/yr 22,500m ³ /yr water use reduction				
Greening Special Econ Zone & Industry Parks	No. of Green companies established	0	3	18				
Promotion of Green Tech	No. of new green techs opted	32	118	300				

Early Achievements

Sustainable Land Use Management & Disaster Risk Management:

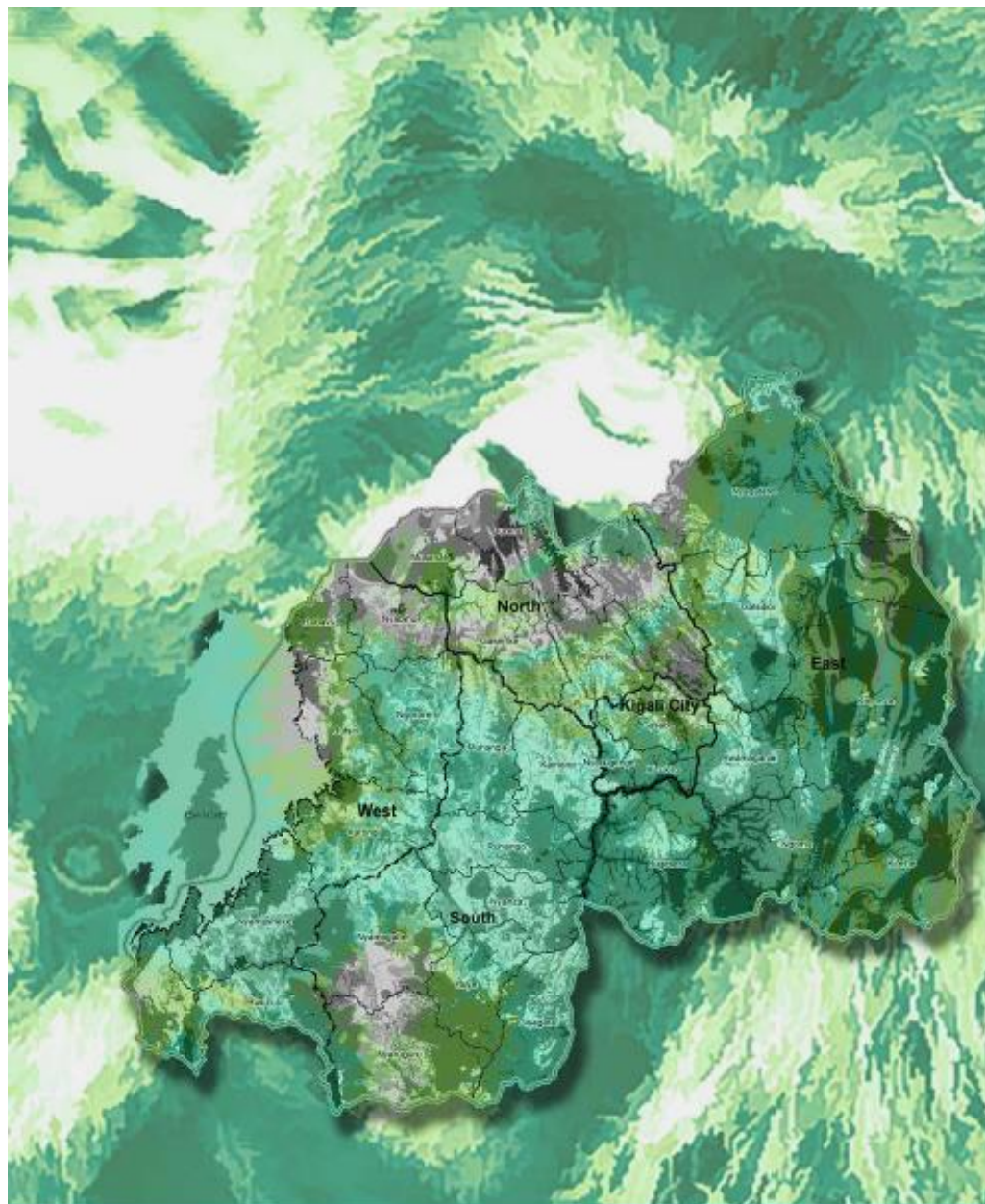
- Reforestation at 29.3% of national land area maintaining net carbon sink status



MINIRENA Forestry & Conservation

Programme 12: Sustainable Forestry, Agroforestry and Biomass Energy

Programme	Implementation Progress				Delivery Status		
Activity	Indicator	Baseline (2011)	Progress (up to Dec 2015)	2016-2018 Targets	on-track	on-watch	off-track
Improved Afforestation/ Reforestation	Survival rates; Area coverage	Survival TBD; 637,089ha	Survival TBD; 696,402ha (29.2%)	80% Survival rate; 714,000ha (30%)			
Improved Forest Management	% degraded forests rehab	1869ha rehabilitated	13 DFMP; Private mgt of 10;000ha; 30;000 poles exported	5000ha rehab 30 DFMP			
Joint Agroforestry Strategy	% Agroforestry coverage	TBD	TBD	Joint AF Strategy; 85% AF coverage			
ICS promotion; Charcoal licensing	% use of ICS	TBD	TBD	TBD			



The National Risk Atlas of Rwanda

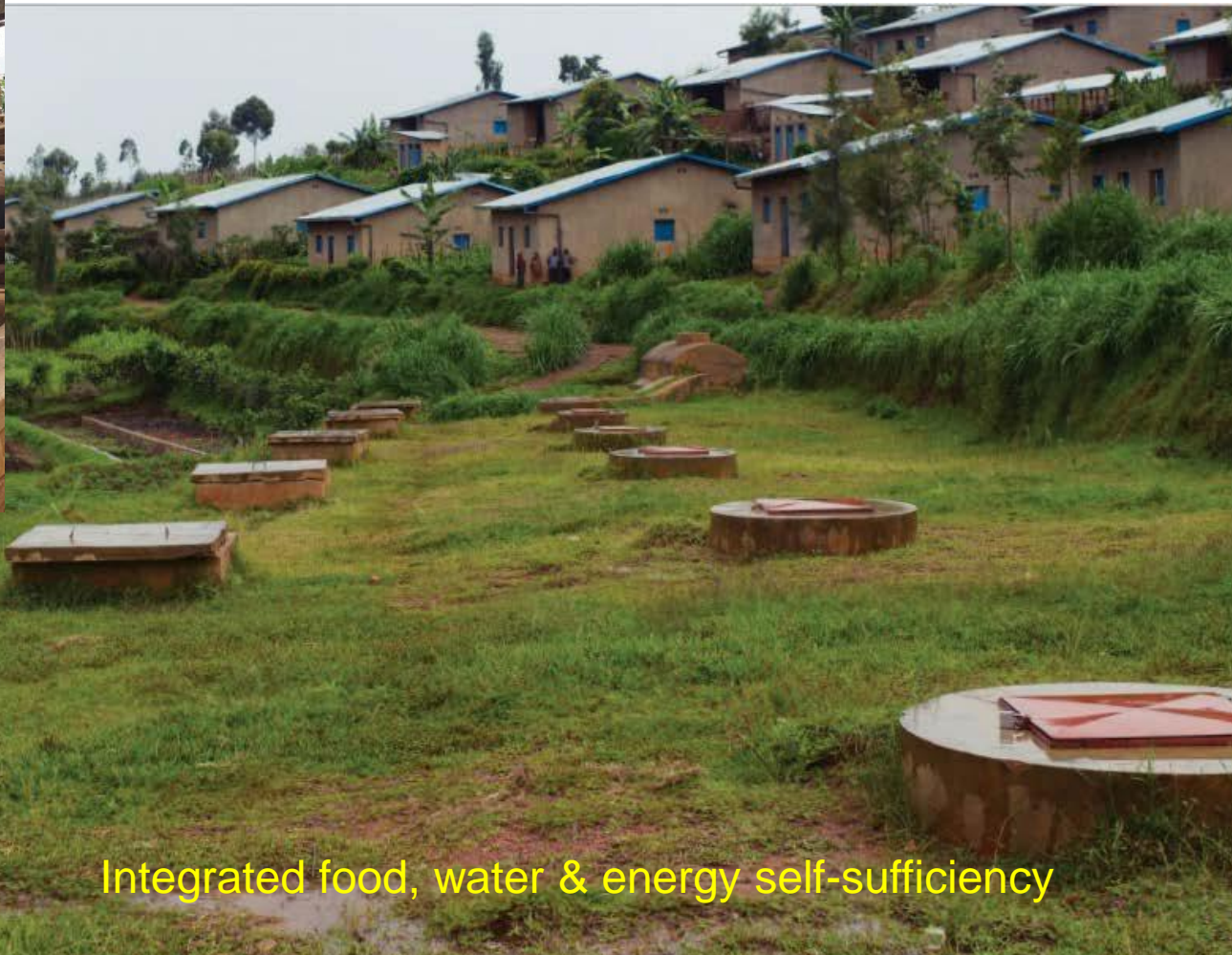
MIDIMAR Disaster Risk Management

Programme 13: Disaster Management and Disease Prevention

Programme	Implementation Progress				Delivery Status		
Activity	Indicator	Baseline (2011)	Progress (up to Dec 2015)	2016-2018 Targets	on-track	on-watch	off-track
Risk Assessment & Vulnerability Mapping	No. of vulnerability maps Risk assessment reports	High risk maps on floods & landslides	Rwanda Risk Atlas 2015; Disaster Risk & Vulnerability Analysis for Musanze, Burera, Nyabihu & Rubavu; Lightning vulnerable sites report 2013	Thunderstorm hazards mapping & mitigation strategy for Rutsiro Risk and vulnerability maps for L. Kivu			
Integrated Early Warning System	% coverage by early warning system	Seismic stations (Rusizi, Huye, Rubavu & Kigali); Rwanda hazards & disasters report for EWS	Disaster portal online; Disaster comm. & reporting; EWS protocols; EWS training in (Rubavu, Nyabihu, Ngororero & Rutsiro)	Disaster comm. merged with EWS; 80% of disasters pre-warned; IK in EWS; Disaster fund setup; Hazard warning MoU with MTN, Tigo & Airtel			

Early Achievements

Sustainable Land Use & Disaster Risk Management: *Green Demo Villages*



Integrated food, water & energy self-sufficiency

MINIRENA (RNRA/Lands & Mapping)

Programme 4: Integrated Approach to Land Use Planning & Sustainable Land Use Management

Programme of Action	Implementation Progress				Delivery Status			
	Activity	Indicator	Baseline (2011)	Progress (up to Dec 2015)	2016-2018 Targets	on-track	on-watch	off-track
Integrated Planning & Land Use Mgt	%land used according Land Use Master Plan	2005 Land Use Master Plan map	DLUPs approved; LU monitoring ongoing	Compliance rate; District LU monitoring				
Spatial Data Infrastructure	Geospatial portal operational	none	LU portal online in 2014	Web-based LU portal shared				
GIS/ICT Innovation for Central & Local Govt.	Land Admin Info System operational	Land Tenure Regularization Support system 2009- 2013	Staff of all 30 districts have access to LAIS	LAIS access for all sectors; Land mobile app available; Digital land titles; Online land transfers & subdivision				

Research Opportunities

Long term Green Growth Climate Resilience Strategy (GGCRS):

- Sub-sector Green Growth Costing
 - 7 Programmes of Action: Industry; Transport; Tourism; Mining; Urban Settlements; Disaster Management; Climate Knowledge Management
- Greening innovations

Medium term EDPRS and SDDs:

- Green technology prototyping
- Natural Capital Accounting

Research topics in land, water resources, forestry, Meteorology, environment and climate change under UR-MINIRENA Memorandum of understanding

End of Presentation

Many Thanks