CSIR Annual Performance Plan

Presentation to the Portfolio Committee on Science and Technology

20 March 2013

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CSIR Mandate

"The objects of the CSIR are, through **directed** and particularly **multi-disciplinary research** and **technological innovation,** to foster, in the national interest and in fields which in its opinion should receive preference**, industrial and scientific development**, either by itself or **in co-operation with principals from the private or public sectors,** and thereby to contribute to the improvement of the **quality of life** of the people of the Republic, and to perform any other functions that may be assigned to the CSIR by or under this Act."

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CSIR staff

Demographics (Dec 2012)

- 2428 members of staff
- 1595 in SET base

- 297 Doctorates
  - 93 staff supported for doctoral studies
- 503 Master's
  - 104 staff supported for Master's studies

- 48.3 % of SET base black (SA)
- 34.6% of SET base female (SA)

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Collaborative programmes

National departments

- Science and Technology
- Trade and Industry
- Defence
- Health
- Communication
- Water Affairs
- Environmental Affairs
- Home Affairs

SoEs

- Transnet
- Eskom
- Denel
- SITA
- Joburg water

Africa

- SANBio
- African Laser Centre
- NEPAD Water Centres of Excellence

Partners & Funders

- IDC
- TIA
- DBSA
- Gates Foundation
- European Union
- UN-Aid

Private sector

- Aerosud
- Du Pont
- Nestlé
- Sector-based

International

- EU, Airbus
- South Korea, LG
- Chinese Academy of Science
- Saudi Arabia, KACST
- US, Boeing & General Dynamics

All TEIs

Working in support of national initiatives

- **National Health Insurance**
  - Infrastructure Unit Systems Support Project on acquiring, operating and maintaining health care facilities
  - Implementation of eHealth
    - Health information systems
    - Electronic collection of household data
- **PICC Infrastructure Plan - Strategic Integrated Projects**
  - SIP 14: Higher education infrastructure
  - SIP 15: Expanding access to communication technology
    - Development of a roadmap for ICT RD&I
    - National cyberinfrastructure: CHPC, SANReN
  - SIP 18: Water and sanitation infrastructure
    - Technical support

Multi-drug resistant TB ward at the Catherine Booth Hospital in KwaZulu-Natal

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RD&I for uptake and impact

Enterprise creation for development

Challenge
- Decent employment
- Poverty reduction
- Sustainable rural communities

Development
- S&T solutions sourced to create sustainable enterprises
- Agro-processing and green economy

Outcome
- 349 project beneficiaries
- 34 people trained and mentored (April – Dec 2012)

RD&I for uptake and impact

Green components for aerospace

- Lighter parts: less fuel
- Earlier research on sisal: used in car seat covers
- CSIR made panel for Airbus that meets all specifications: strength, weight, fire/smoke/toxicity
- Joint patent filed
- Working with automotive industry e.g. Volkswagen on vehicle parcel tray (kenaf)
- Natural fibre hub: Collaboration with industry, Eastern Cape government

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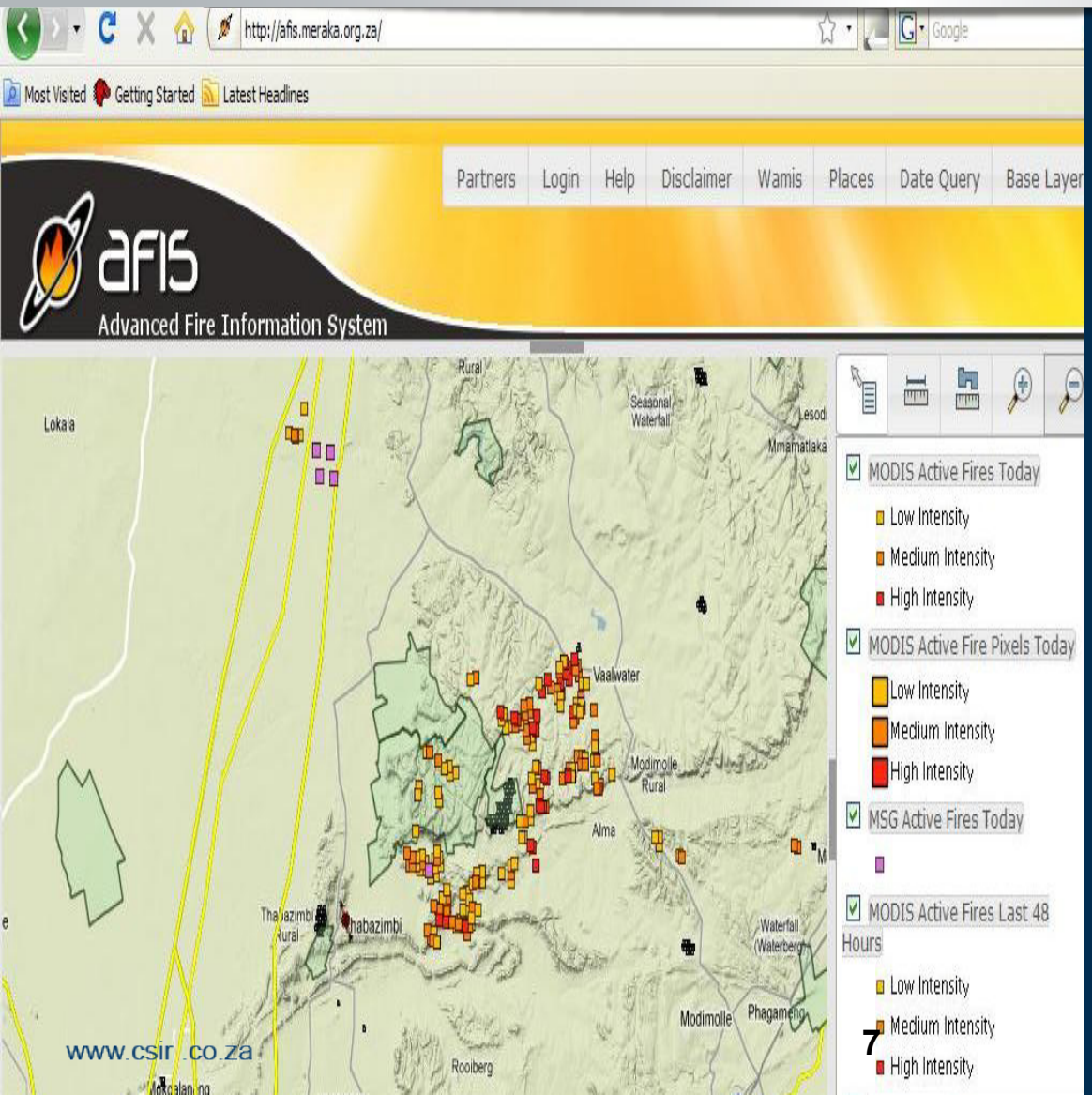
RD&I for uptake and impact



Advanced Fire Information System

- Sub-Saharan Africa has the highest frequency of fires in the world
- Enormous losses: agriculture, industry, infrastructure
- Used by Eskom, Working for Fire, farmers, disaster management authorities in SA and Mozambique
- Pilot project in California to start soon

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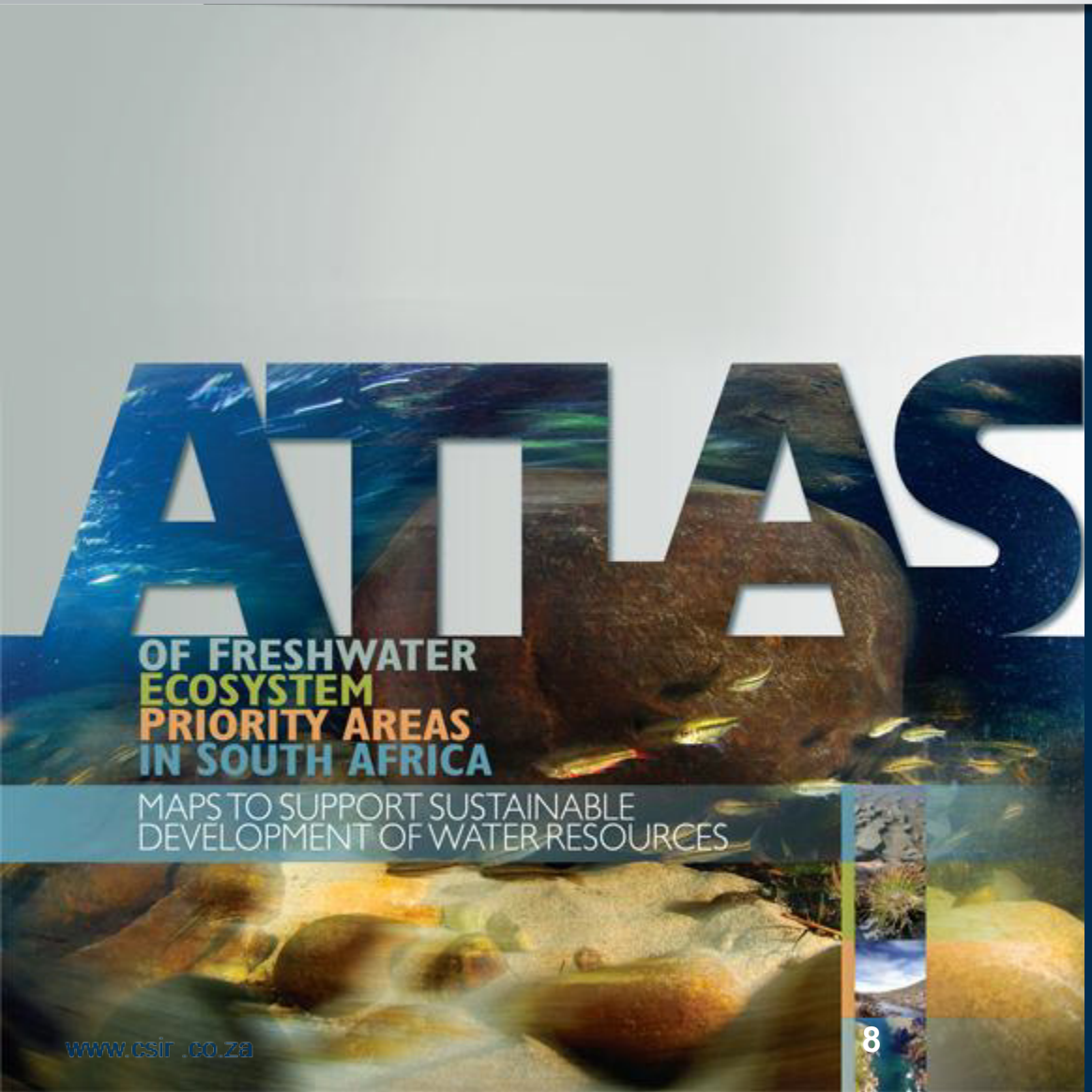
RD&I for uptake and impact



National freshwater ecosystem priority areas

- Collaborative project in which agreed freshwater priorities for SA were set
- Used by Cape Nature, Endangered Wildlife Trust, Department of Environmental Affairs, Department of Water Affairs

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RD&I for uptake and impact

Digital doorway

- Access to computers, information through self-learning
- Product innovations continue: solar; drum; container
- *New:* Installed for Pretoria Portland Cement (PPC) Foundation in Atteridgeville and North West University pilot site and research cooperation
- Contract concluded with Department of Rural Development and Land Reform: upgrade of container DD and deployment of new generation DD

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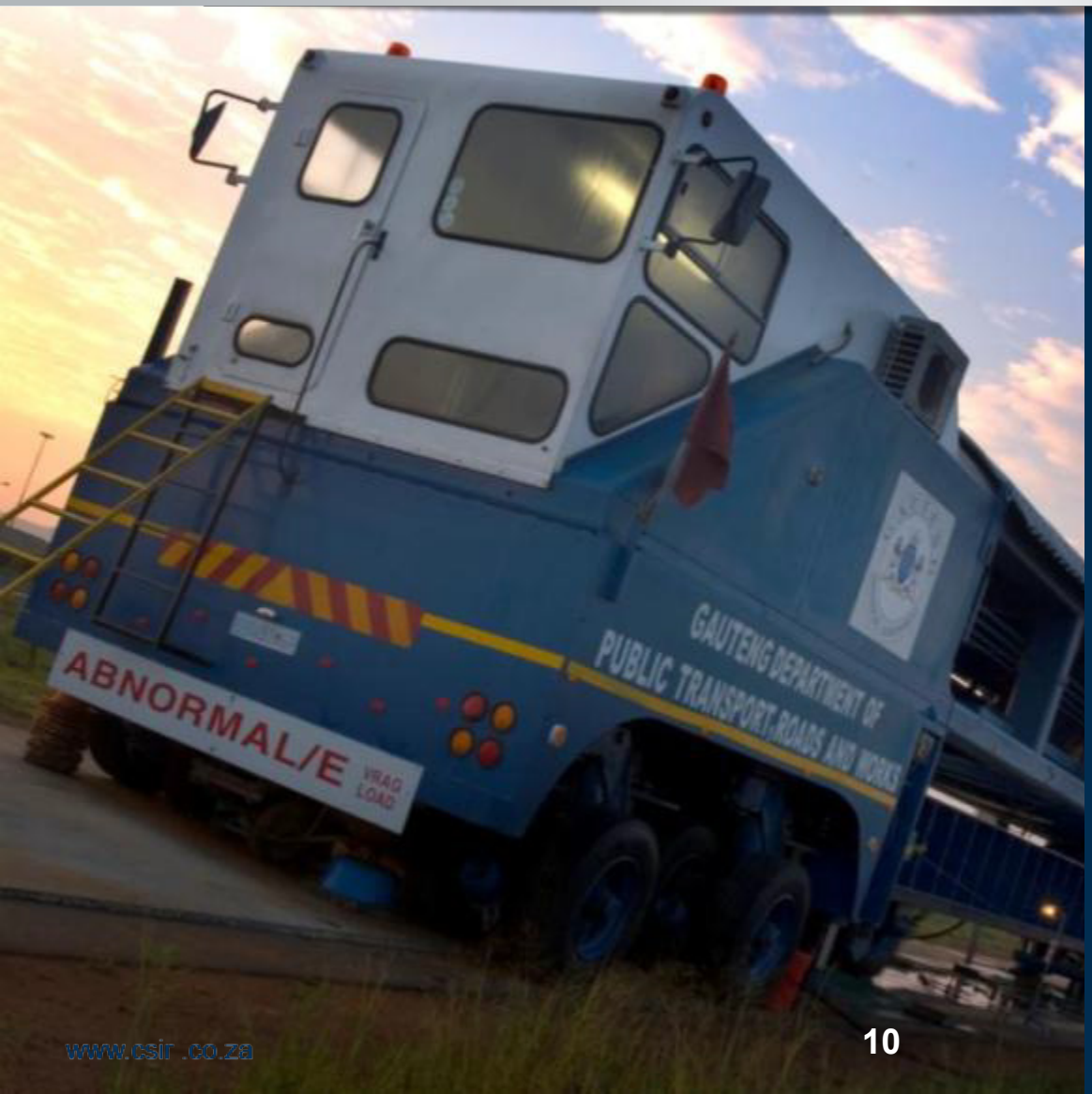
RD&I for uptake and impact



Heavy Vehicle Simulator

- Accelerated pavement testing facility
- More than R200m in foreign revenue since ’94
- 11 units in operation worldwide
- Enabled improvement of road construction

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RD&I for uptake and impact

ReSyn™ Biosciences

- Attachment, separation and recovery of biomolecules
- Applications: Diagnostics, drug discovery, DNA sequencing
- Licensed to a start-up

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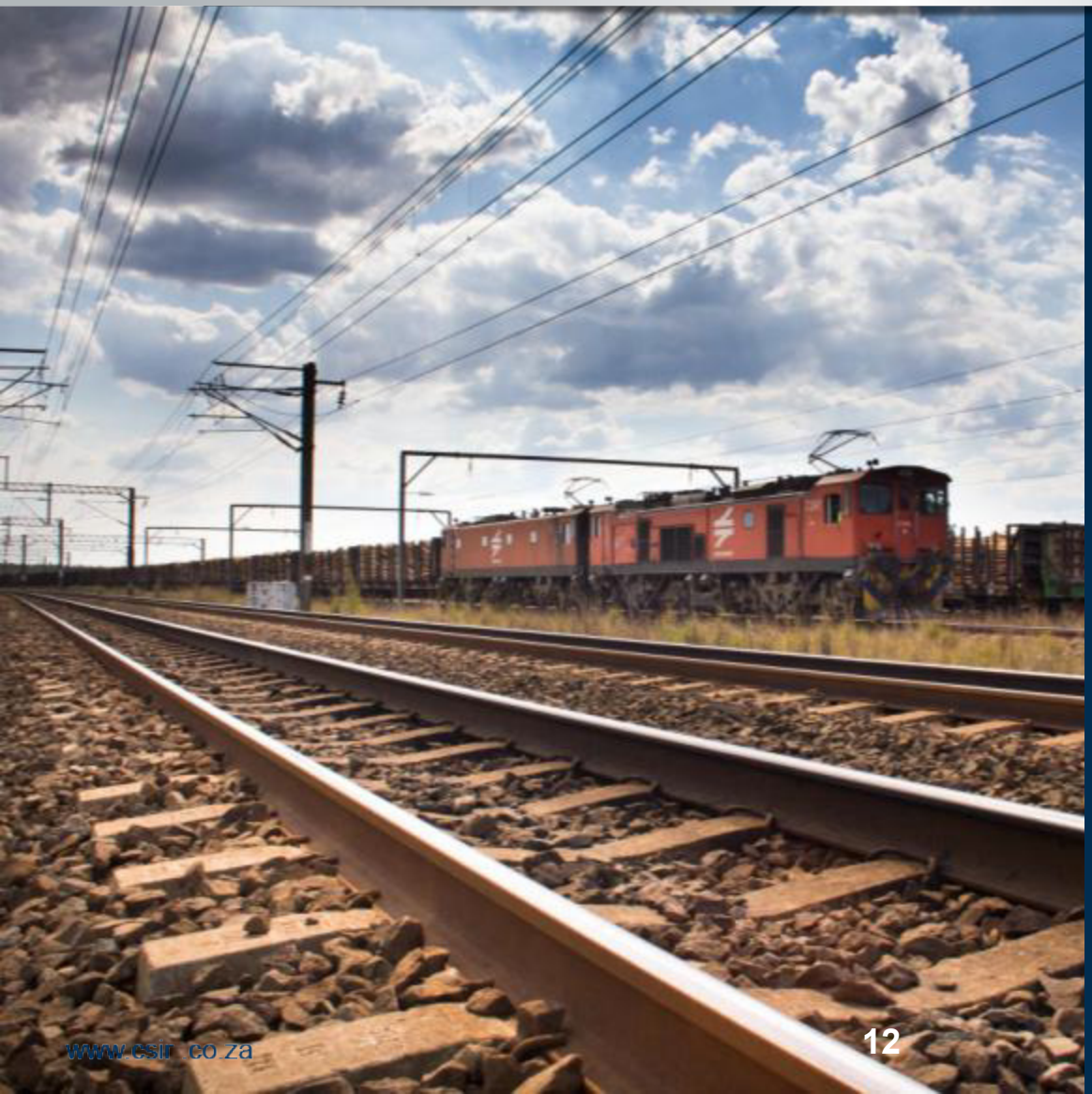
RD&I for uptake and impact



From the labs to the rails: Technology to prevent derailments

- Transnet installing ultrasonic broken rail detectors on Sishen-Saldanha iron ore railway
- Derailments: damages and down-time
- CSIR making 2000 units for 756 km stretch of rail
- Commercialisation under way
- DST funding further product improvement

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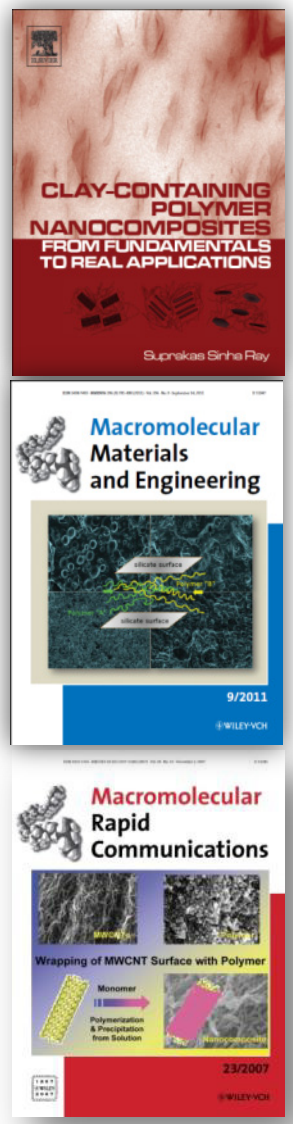
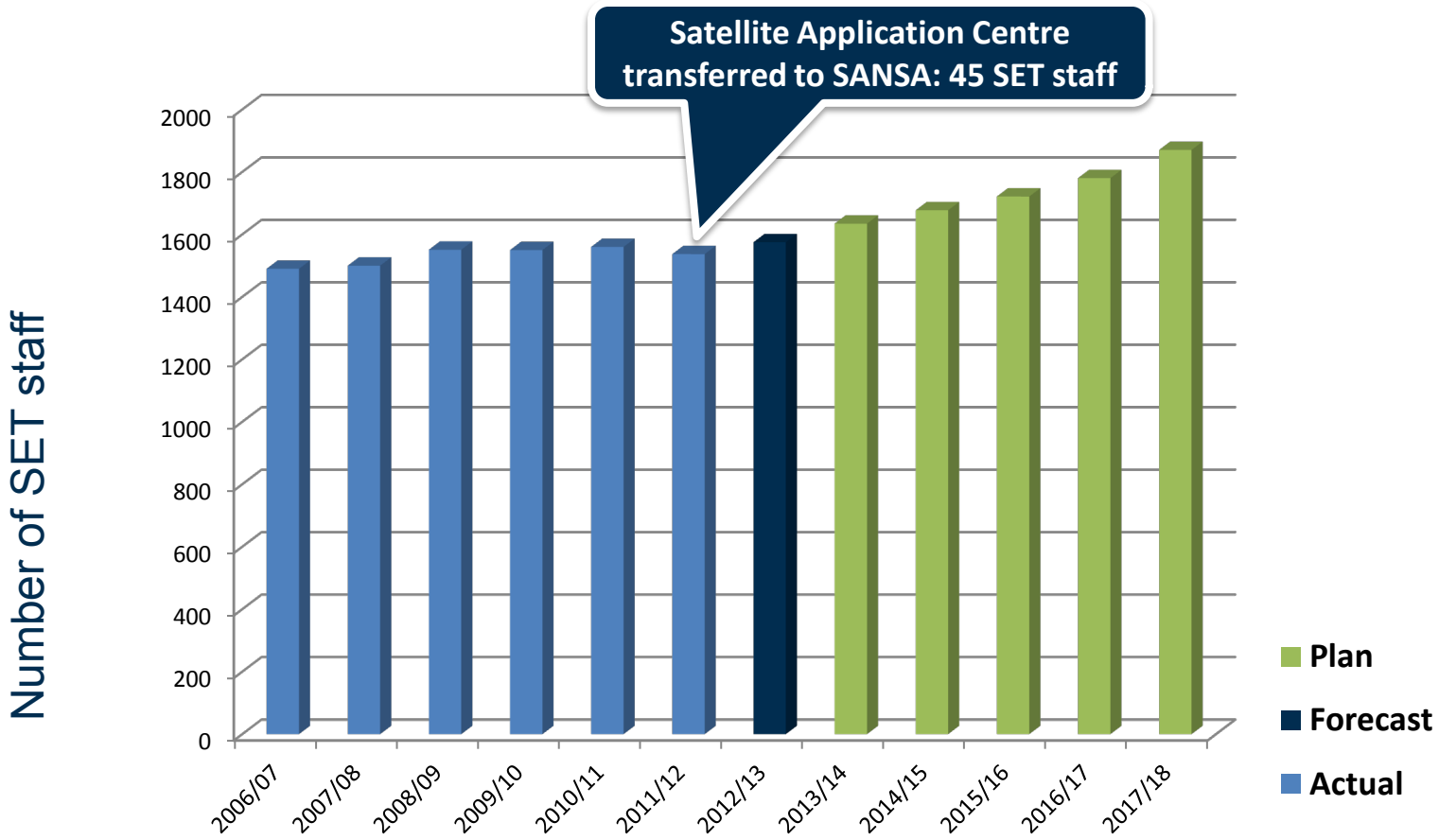
Excellence in science publishing

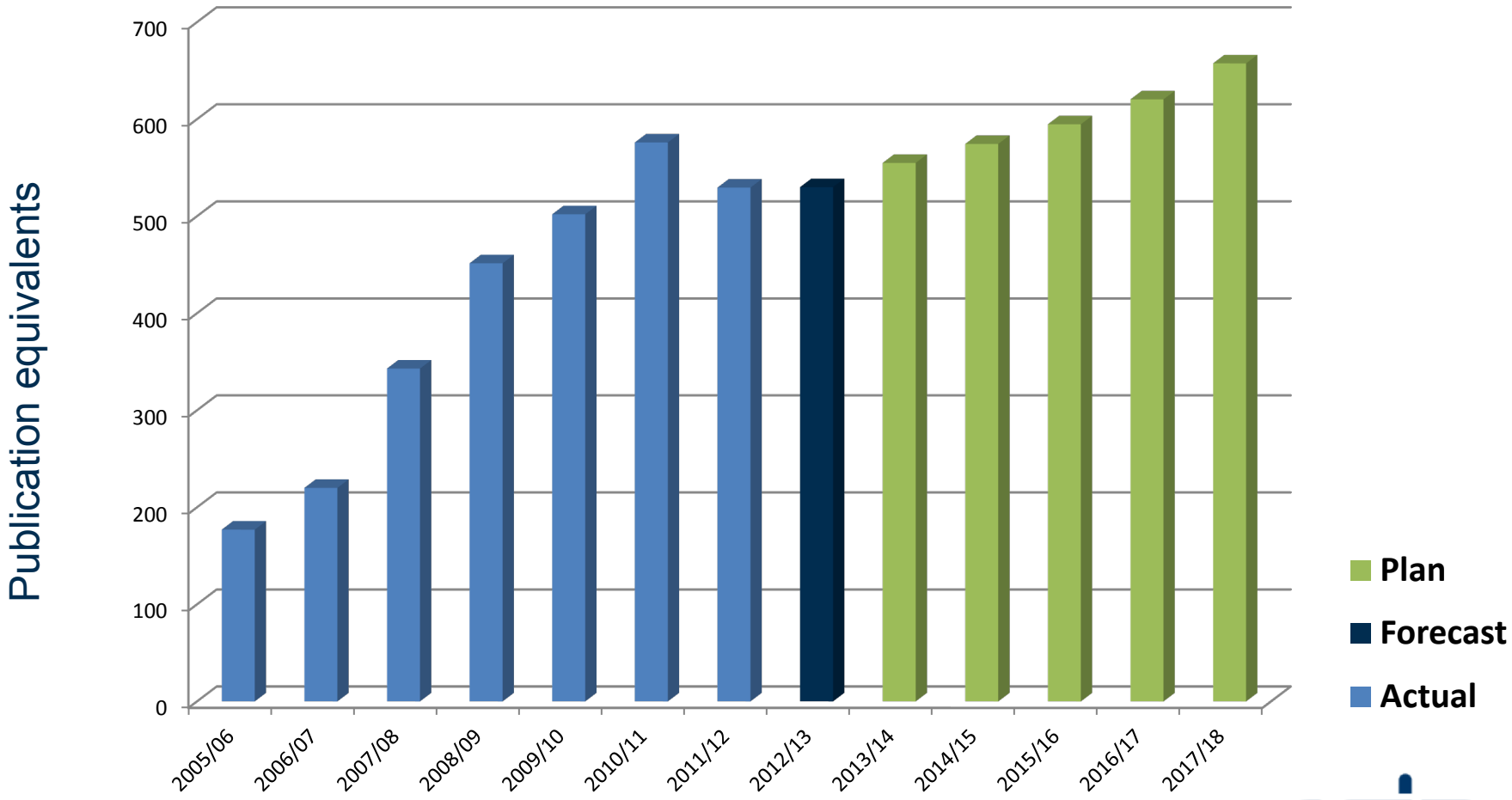


- CSIR chief researcher Prof Suprakas Sinha Ray will receive the prestigious Morand Lambla Award from the International Polymer Processing Society in America in July
  - Most prestigious award in the field of polymer processing
- One of most highly cited authors (>7900 times), rated one of the world's top 50 high impact chemists (Feb 2011)
- 2 single author and 3 edited books, 140 articles in international journals and holder of several patents
- Articles in most prestigious chemistry journal - *Accounts in Chemical Research*

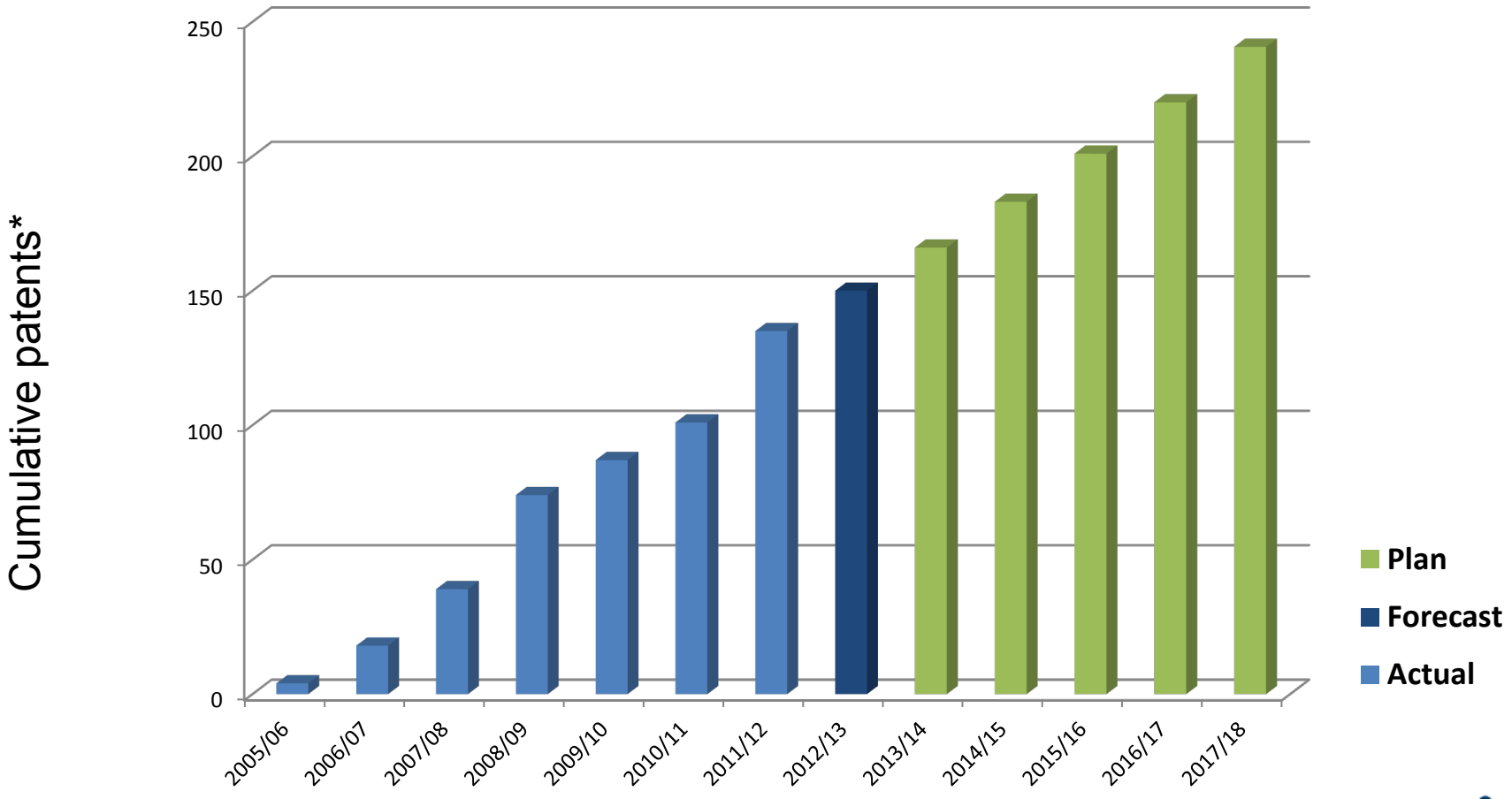
Number of SET staff: RD&I capacity



Publication equivalents: Indicator of scientific excellence

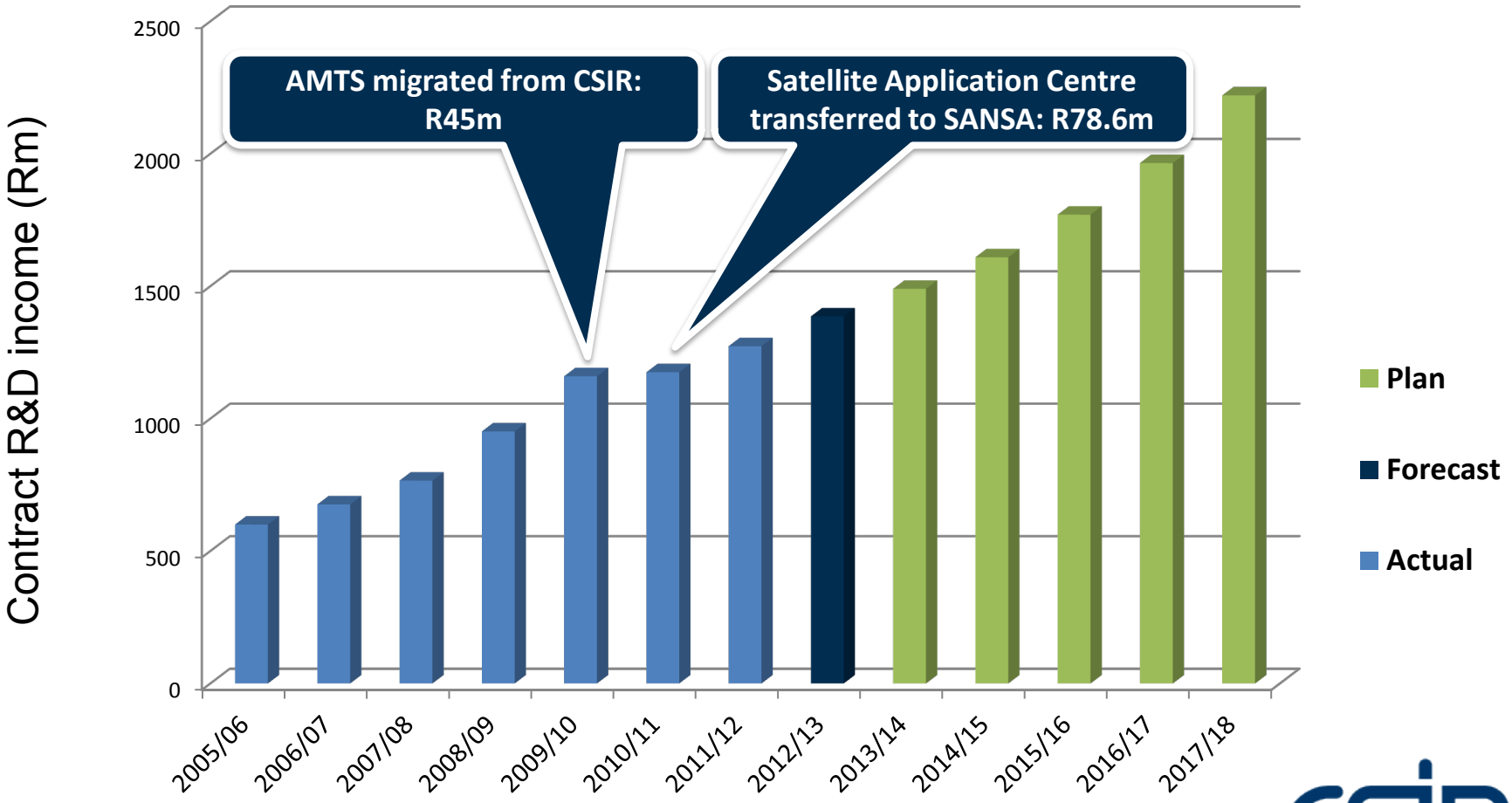


Cumulative patents

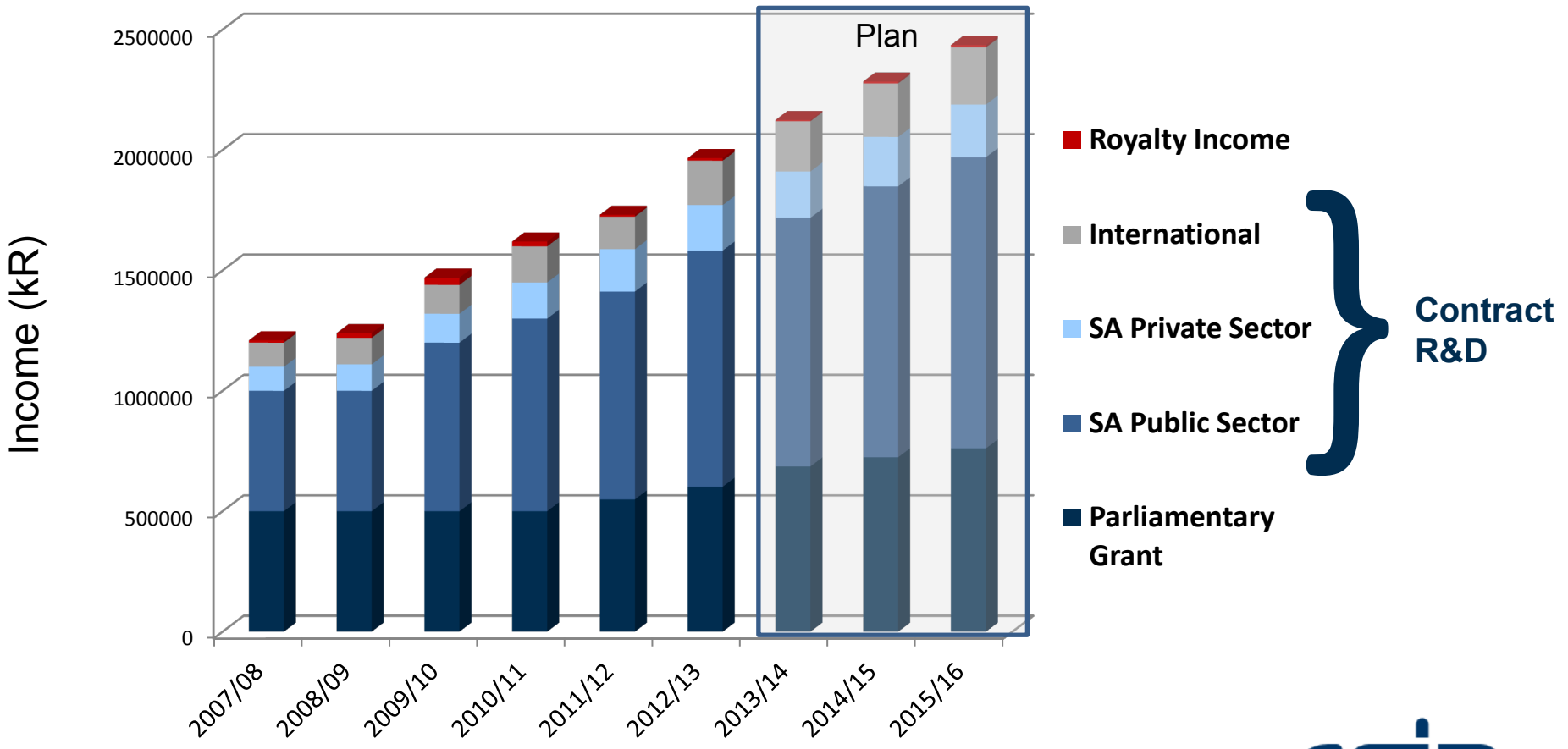


* Granted in countries with an examining office

Contract R&D income (Rm): Perception of value



Income sources



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Good governance and corporate citizenship

- **Risk management plan in place**
- **Fraud prevention plan in place**
- **Corporate governance**
  - Improve operational excellence and quality
  - Comply to relevant ISO standards:
    - 9001 Quality
    - 14001 Environment
    - 17025 Laboratories
- **Corporate citizenship**
  - Maintain B-BBEE level 2 status in the medium term
  - Focus on safety
    - Maintain DIFR below 0.3
  - Continue Employee Well-being Programme
  - Continue role of the HIV/AIDS committee

Aim to maintain an unqualified audit

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Planning for improved communications: The concept

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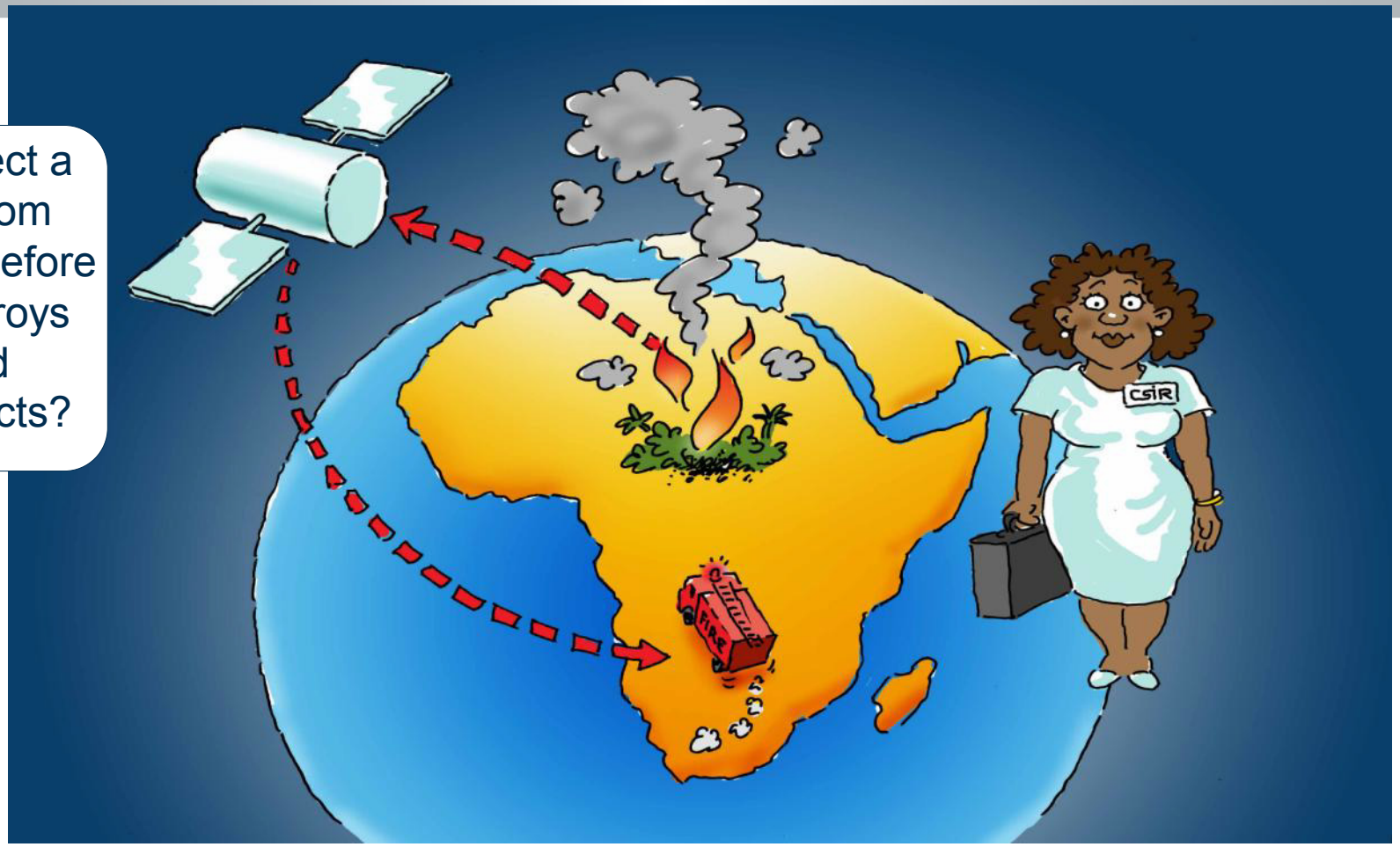
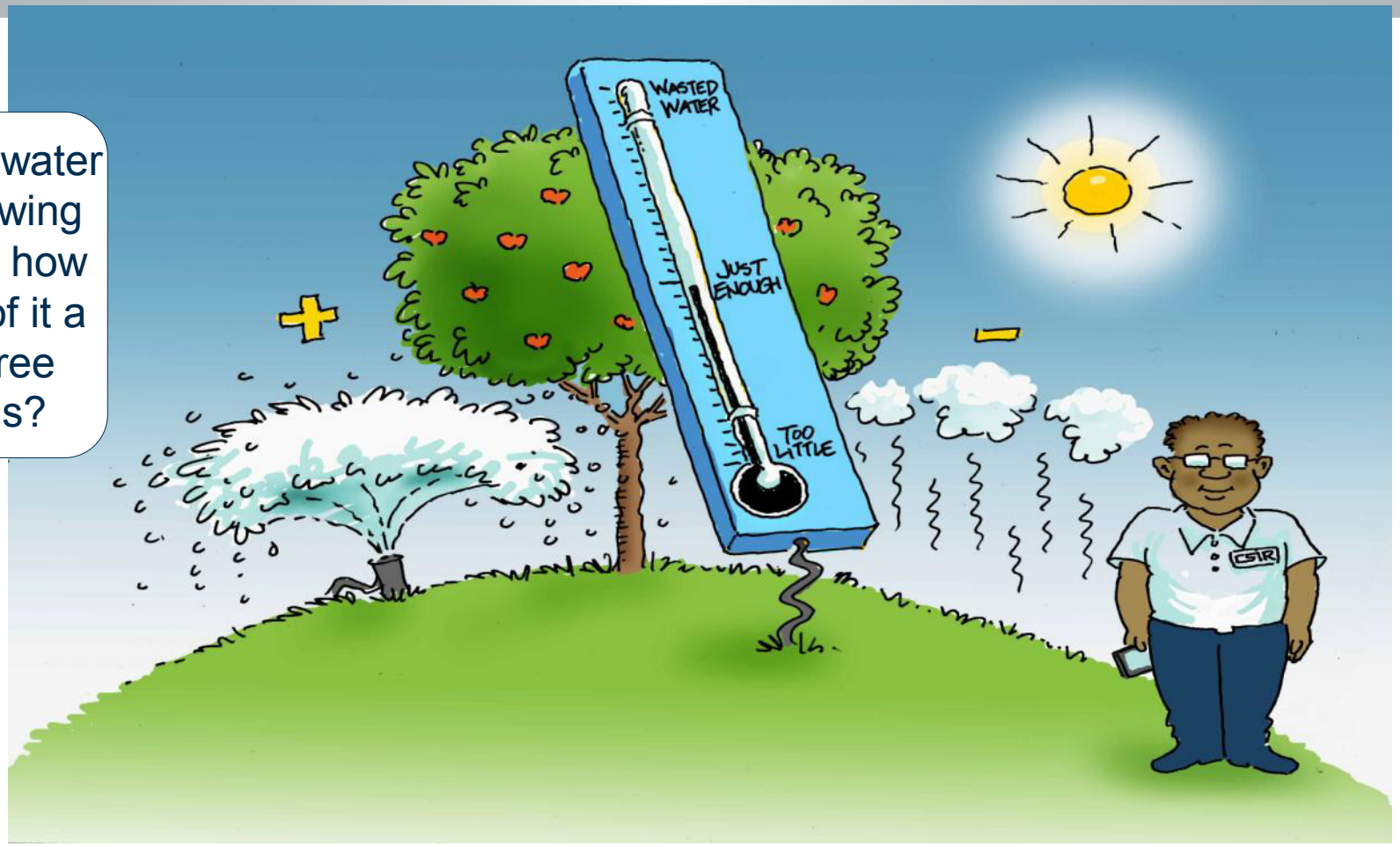


Planning for improved communications: The concept

... save water by knowing exactly how much of it a fruit tree needs?



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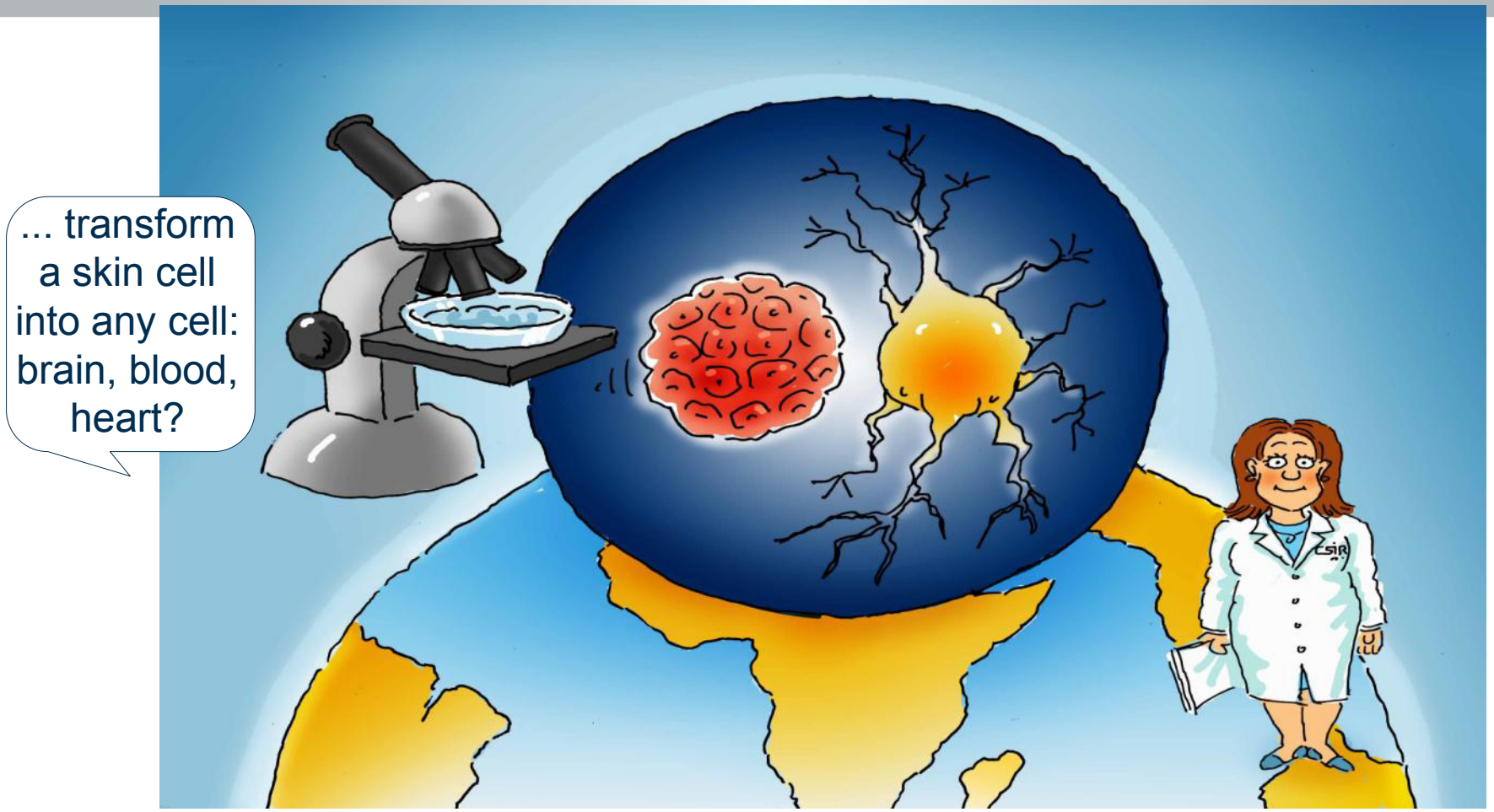

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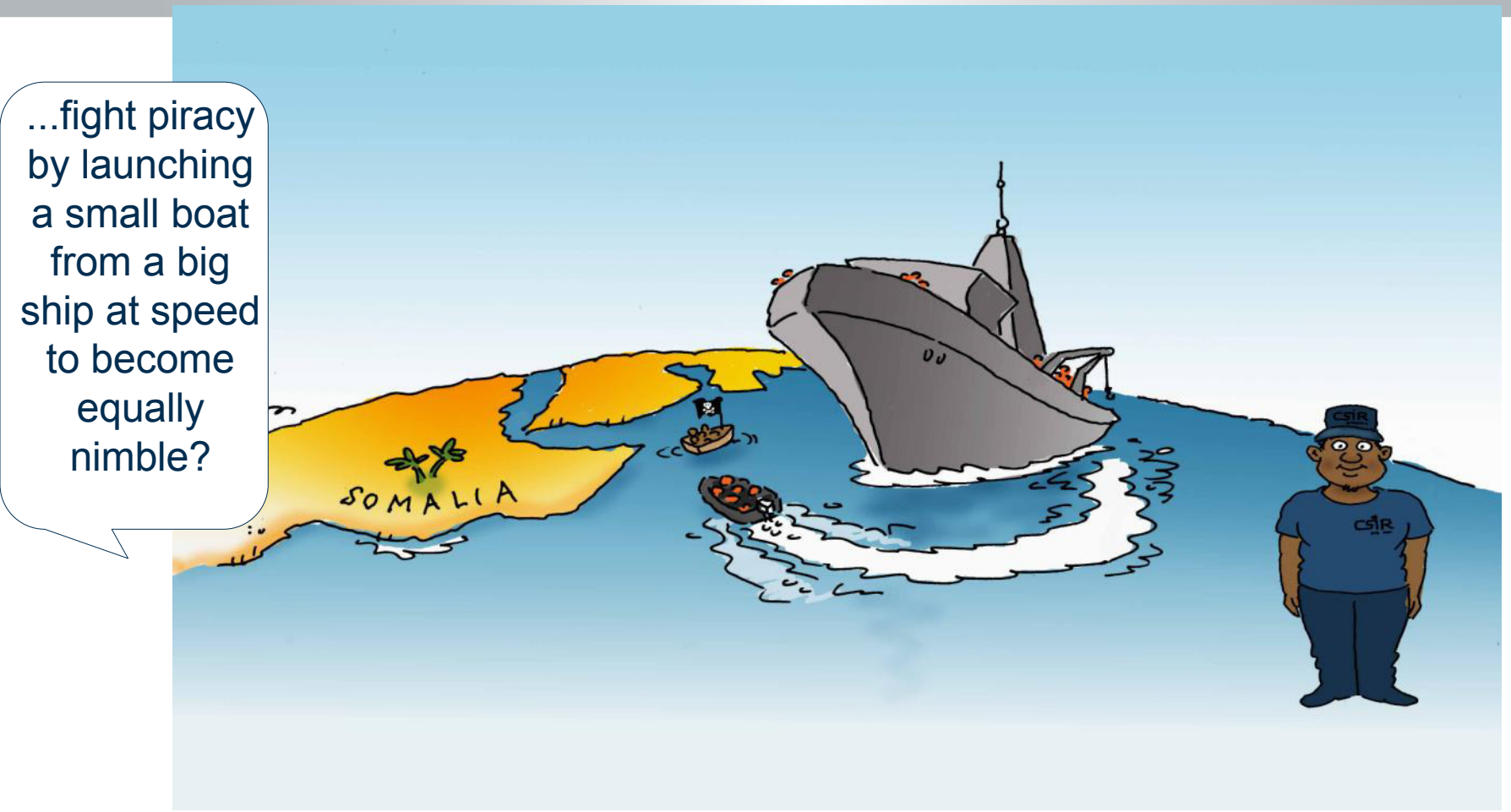

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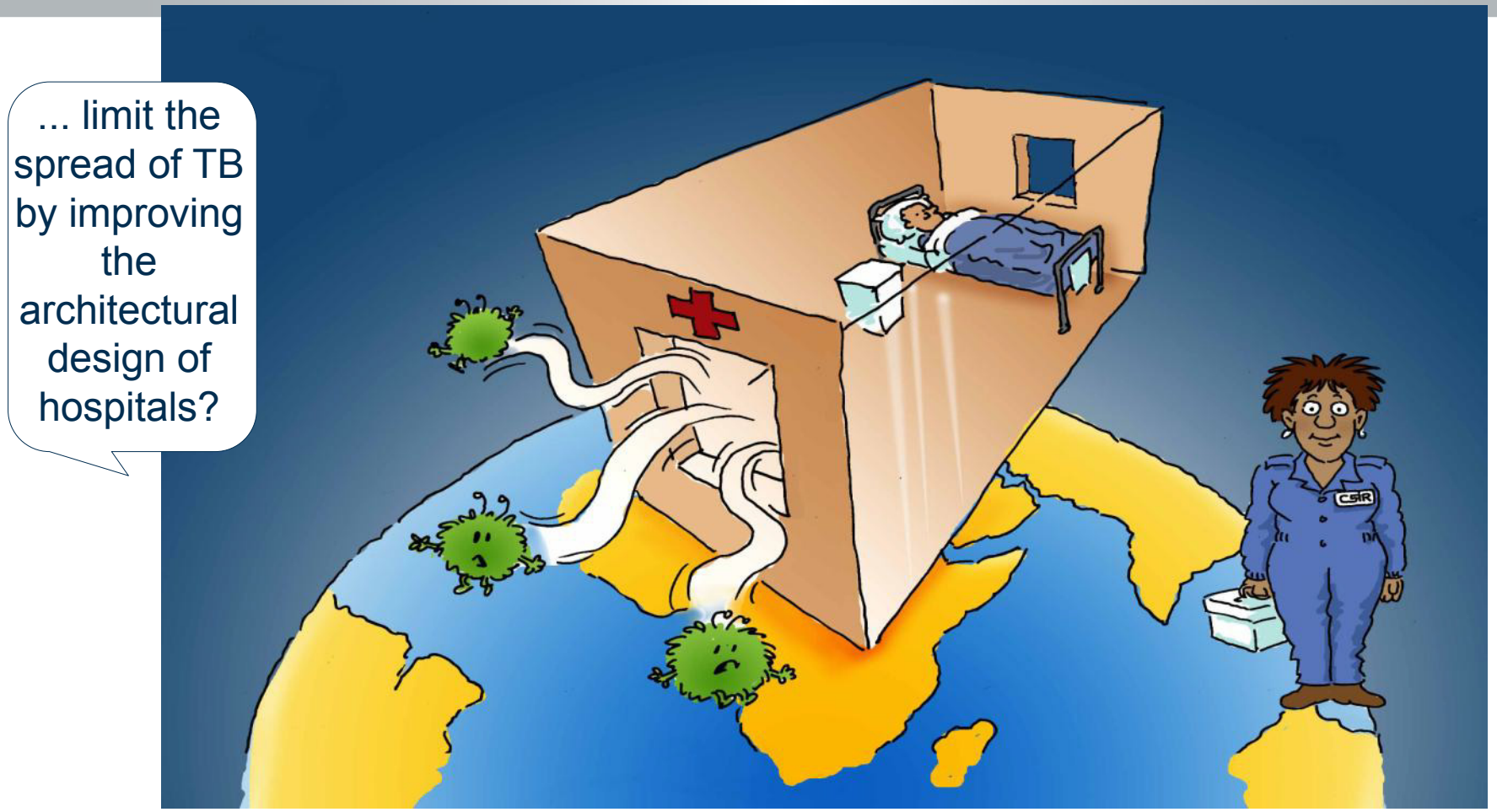

Planning for improved communications: The concept

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Thanks to some of our country's brightest minds.

The CSIR.
Our future through science.

Uptake and impact in motion

Broadband for All

- Lack of broadband in rural areas
- Wireless mesh technologies
- Village operators model
- White space spectrum techniques, database and technologies
- 210 government facilities connected (190 schools)

Cofimvaba

- Poor rural educational outcomes
- Unfavourable environmental impacts on education
- Interventions: ICT; water and sanitation; energy; transport; agriculture
- Mobile learning: digital textbooks; experimental farming

View video clip

Thank you