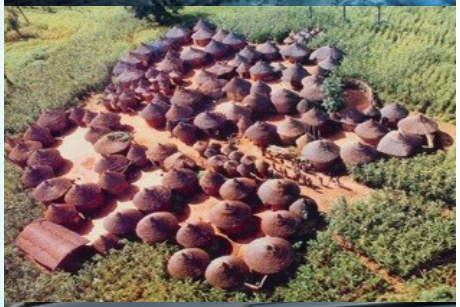

SV4D – SUSTAINABLE VILLAGES FOR DEVELOPMENT

A joint initiative of ARCTEL-CPLP & Fraunhofer Portugal

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1. Partners

ARCTEL – CPLP (9 Portuguese SpeakingCountries)

ARCTEL – Associação de Reguladores de Comunicações e Telecomunicações da Comunidade dos Países de Língua Portuguesa:

- Established in 2008;
- Promotes the exchange of knowledge and information between its members – official rulers – aiming to contribute to the development of the communications' market and sector.

ARCTEL represents the interests of 9 different Portuguese Speaking Countries:

- Angola;
- Cape Verde;
- Brazil;
- Guinea-Bissau;
- Equatorial Guinea;
- Mozambique;
- Portugal;
- São Tomé and Príncipe;
- East Timor.

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1. Partners

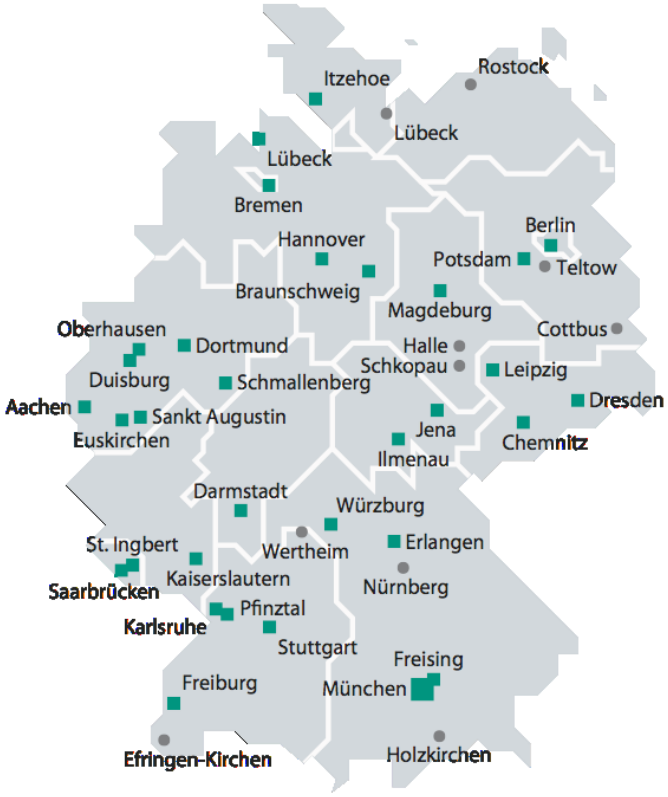
Fraunhofer-Gesellschaft

Fraunhofer society for the promotion of applied research

- 66 Institutes
- 24.000 employees
- Most notable creation: MP3 Format

7 Groups

- Information and Communication Technology
- Life Sciences
- Light & Surfaces
- Microelectronics
- Production
- Materials & Components
- Defense & Security



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3. SV4D – Sustainable Villages for Development - Motivation

- ARCTEL initiative deployed in 9 different Portuguese Speaking countries to:
  - Promote access to broadband Internet
  - Universalization of the use of ICT and Digital inclusion

- On a second layer of goals we have:
  - The creation of a network of living labs driven to R&D of ICT solutions for development (ICT4D);
  - Foster the implementation of e-services and ICT solutions to tackle local problems
    - Knowledge
    - Health
    - Education
    - Economical situation
    - Commerce
    - Freedom
    - Environment
    - Security
    - Government
- On a third layer the aim is:
  - Promote and enable data and information exchange between the different villages/labs to accelerate R&D proof of concepts deployment;
  - Enable Big Data and Analytics concepts.

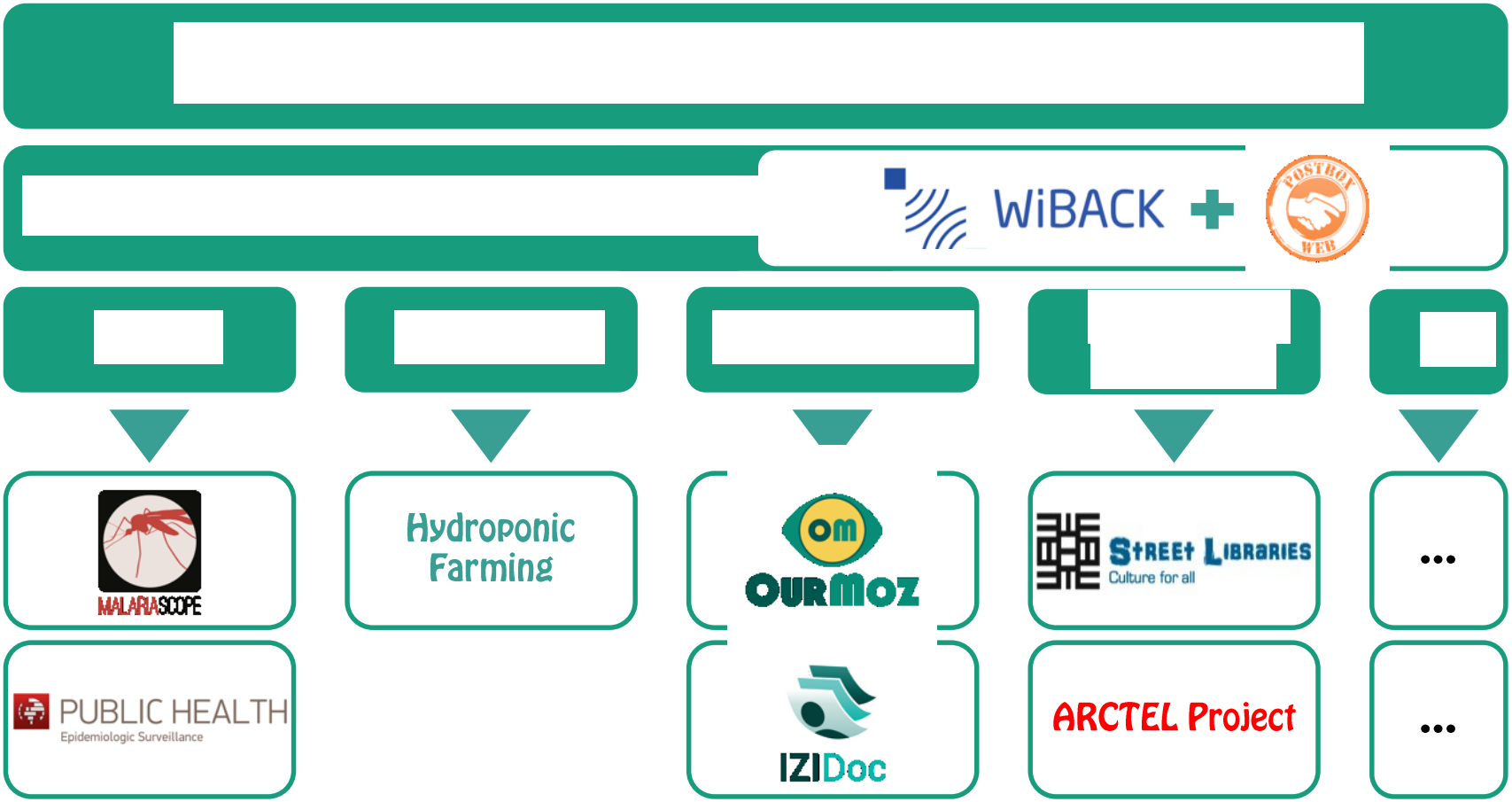
3. SV4D – Sustainable Villages for Development - Countries Map

- The goal is to interconnect a minimum of 20 laboratories in 15 rural villages of the 9 CPLP[1] countries (Angola, Cape Verde, Brazil, Guinea-Bissau, Equatorial Guinea, Mozambique, Portugal, São Tomé and Príncipe and East Timor).

Source: facebook.com/comunidade.paises.lingua.portuguesa June 2015

[1] CPLP – Comunidade dos Países de Língua Portuguesa (Portuguese Speaking Countries Community)

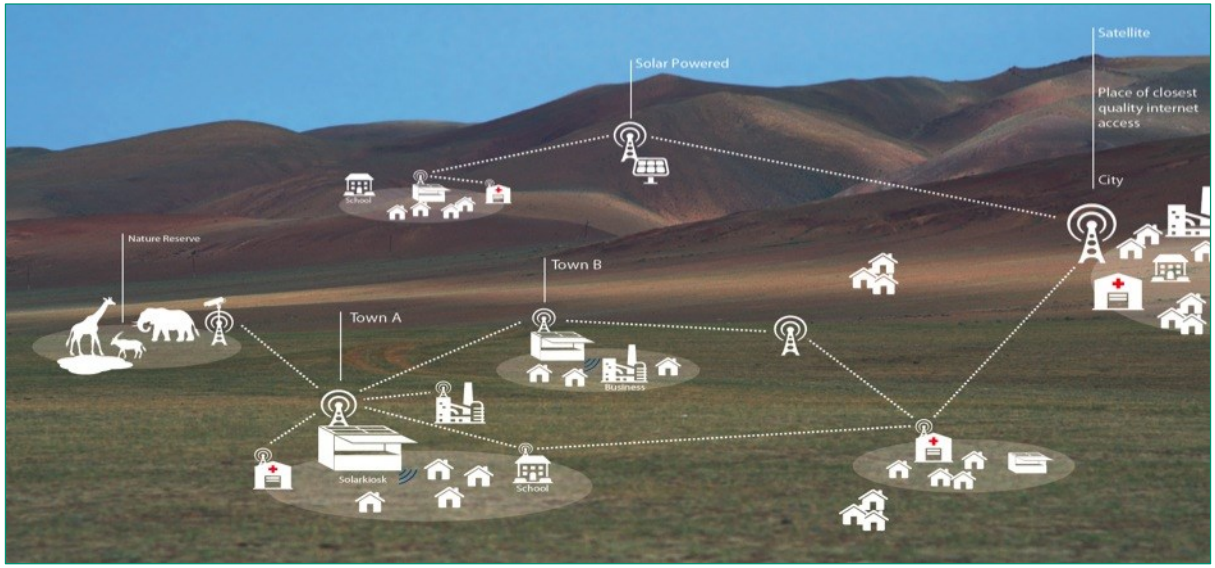
3. SV4D – Sustainable Villages for Development - Services Architecture



3. SV4D – Sustainable Villages for Development

ICT4D Communication Infrastructure - WiBACK

- Deployments in Africa, Europe and South America
- Very efficient and high Quality Networks
- ‘Plug&Play’ - System; Utilizable by e.g. Municipalities, not only Telcos



200 Mbps, <2ms Latency

Reach: 20 / 200km (p.h./total)

- Self-Managing Backhaul-Network
- Works in license free spectrum

> Access: WLAN, 3G, 4G, FM-Radio, …

3. SV4D – Sustainable Villages for Development

ICT4D Communication Infrastructure - WiBACK

For everywhere and everyone	Cost Efficiency	Quality
Plug & Play System	Low CAPEX / OPEX	High Ability / Potential
		
Networks can be build for and by everyone in need of connectivity - lower dependency, new busi. models	Cost efficiency, especially thanks to low need of labor and secure use of license free spectrum allows to reach further	Technology needs to be reliable and of quality as people become dependent on it and its the services
Auto Configuration	Little need for tech. expertise	Reliable due to auto config.
Usable for everyone	Self healing system	Carrier grade QoS
Solar powerable	Low power consumption	Reliable Hardware
Reliable	Use of licence free spectrum	HQ-VideoStreaming, VoIP, …

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3. SV4D – Sustainable Villages for Development

Thematic Projects – Malaria Scope

MalariaScope

- Preform automatic detection of malaria parasites using **image processing techniques and smartphones** (cooperation with the **National Health Institute Dr. Ricardo Jorge**);
- Develop a mobile-based solution for **pre-diagnosis of Malaria** in medically underserved areas;
- Create a **low cost alternative** to current microscopes;
- First triage framework to provide the **correct medication**.

3. SV4D – Sustainable Villages for Development

Thematic Projects – Hydroponic Farming

Hydroponic Farming

- **Low cost** mechanism for **mobile monitoring** of hydroponic farms in South Africa and Mozambique;
- **Improves farm management** through **monitoring and control** of **environmental parameters**;
- Real time **alarms,** short **monitoring** cycles and automated **reports** leading to **increased performance**;
- **Partnership** with the Nelson Mandela Metropolitan University in South Africa.

3. SV4D – Sustainable Villages for Development Thematic Projects – Environment

Turtle Monitoring System

- São Tomé e Príncipe hosts one of the 11th populations **of marine turtles with maximum risk of extinction worldwide** - the Sada turtle;
- It is important to **get information** on **where, when and why** turtles use **coastal marine areas**.
- Goal is to use **conventional telemetry systems such as radio transmitters (VHF)** and **satellite (via GPS and / or GSM)** to **track the movement of turtles** across large spatial and temporal scales.

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3. SV4D – Sustainable Villages for Development Thematic Projects – Agriculture

Farmers portal of São Tomé e Príncipe

- Create a **web portal** dedicated to **farmers communities of São Tomé e Príncipe**;
- **Improve dissemination** of premium **biologic products** in a **multilingual portal**;
- **E-Commerce fair trade platform** to allow consumers from all over the world to **purchase original products of São Tomé e Príncipe**;
- **Partnership** with local communities of pepper, cocoa and coffee farmers.

3. SV4D – Sustainable Villages for Development Thematic Projects – Risk Prevention

Floods warning System in Mozambique

- Create a monitoring system for floods;
- **Anticipates disasters and reduce crisis impact**;
- **Collects data to build analysis and predictions to enable action models**;
- **Partnership** with local authorities and civil population.

3. SV4D – Sustainable Villages for Development
Overview

- Project areas / Use Case
  - Bring connectivity to insufficiently connected villages to extend reach of a specific project or service in a remote area;
  - Provide valuable services in that specific region to span the Digital Divide;

- Sustainability
  - Use efficient and low maintenance technologies and concepts (technical sustainability);
  - Deploy services over the network to generate revenue and cover OPEX.

- **Empowerment**
  - **Empowers local ideas and coach them to become business.**
  - **Values local entrepreneurship and local Academia**.

3. SV4D – Sustainable Villages for Development
Overview

Challenges and constraints	Solutions and successes	Over the top outcomes	Toools
Low or no connectivity and access	Low CAPEX and OPEX Communications Infrastructure Solution	Enlargement of backbone	Wiback - Plug&Play and Self-Managing Backhaul-Network
Lack of interest from operators to invest	Use of public network by renting or exchange of services	Enable new investment models	Appropriated use of Universal Service Funds
Lack of digital skills	Use local Academia and expertise	Empowers new SME and entrepreneurship	Empowers local Academia and Researchers
Lack of internet and ICT use	Monitorization use of Internet and ICT and capacity building	Enables new regulatory models	Creates Digital Inclusion

4. Contacts & Location

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