



# WORLD FOOD&HEALTH SECURITY



# INTRODUCTION

EXPO 2015 left a large legacy of significant skills of international importance in the field of food security, providing adequate technological solutions and competences to timely meet emerging countries' needs.

The project, drafted to face food emergencies afflicting rural communities, was launched during the XV Infopoverty World Conference (UNHQ, New York, 9-10 April 2015); it was further illustrated during the International Conference 'Beyond Expo: new digital services for food security' (Palazzo Regione Lombardia, Milano, 20 October 2015) and validated during the 16th Infopoverty World Conference (UNHQ, New York, 14-15 April 2016) and during the Infopoverty Seminar at COP 22 (Green Zone, Marrakech, 17 November 2016). In light of the recent Migrant Compact promoted by UN and the results of the XVII Infopoverty World Conference, (UNHQ, New York, 21 April 2017), the project was further empowered.

ICTs' applications realized by Infopoverty Program during the last 17 years in villages in Latin America (San Ramon and San Francisco Lempira in Honduras, Villa el Salvador in Peru), in the Middle East (South Lebanon thanks to UN Peacekeeping operations), in the USA (Navajo Nation portal for Native People), in Africa (Borj Touil in Tunisia, the UN Millennium Village of Sambaina in Madagascar, Mahobong in Lesotho) and its support to Governmental Digital Plans in Liberia, Lesotho, Ethiopia, Ecuador, Madagascar, represent an evident and experimented demonstration of the power of these innovative solutions.

# MISSION

The Food & Health Security e-Center is finalized to apply innovative services to assist countries in order to develop adequate, rapid and efficient food security and safety policies on a large scale in the world scene.

It will rapidly operate in countries strictly in touch with public and private entities, thanks to the devoted broadband satellite network, to optimize launched projects, create new ones, and monitor results; it will also provide participant countries a high-level range of e-services and assist them in programming food policies.

Technology and knowledge, that provide to transfer appropriate digital services for rural development and urban nutrition and overcome the existing gap, are fundamental and essential to update and strength operation of the more advanced Information and Communication Technologies (ICTs) solutions on the food sector in emerging countries. Moreover, in this way, the causes of conflicts based on the competition for natural and agricultural resources could be reduced.

The global connectivity and smartphone large diffusion allows now to implement better life conditions for disadvantaged people and communities: sharing knowledge and transferring technology is the best way to fight poverty and accelerate sustainable development. Our task is to create a HUB able to understand users' needs and find adequate solutions to help them.

# HOW IT WORKS

The Infopoverty Digital Services Global Platform, through remote communication tools to the Hub of the Health & Food Security e-Center, is able to connect the Service Providers (research centers, universities, laboratories) which could deliver directly the services requested by the Service Users (ICT Villages, governments, institutions of developed countries).

In this way technicians, using the broadband, could be available to give information, operative indications, advices and create human capital while working and interacting with farmers technicians and local government's employees. The Platform will be provided as a permanent structure even at the service of the UN mission for the Sustainable Development Goals.





# THE GLOBAL PLATFORM OF DIGITAL SERVICES

The Food & Health Security e-Center (HFSeC) aims to implement rural development in emerging countries, mitigate migrant emergency and empower local structures to fight poverty and hunger in the spirit of UN Sustainable Development Goals.

The Global Platform, generated within the framework of the Infopoverty program and validated by the UN, provides the supply of e-services and e-governance to the final users in cooperation with local and national institutions.



Digital service providers, such as Specialized laboratories, research Centers, Universities, International Organizations associated to the UN, are able to evaluate emerging issues from different users, elaborating best solutions. Indeed, the Center makes use of the following partners, acting as Service Providers: Associazione Italiana Delle Società Agricole di Scienza, Centro di Ricerca Desertificazione di Sassari, PTP Science Park, Università di Milano per Expo, Confconsumatori, Ordine Ingegneri di Milano and the Christopher D Smithers Foundation



## SERVICE PROVIDERS

## SERVICE USERS

The already excellent level reached through the application of these advanced technologies can be further implemented in order to successfully face the main issues linked to food security and safety, by means of specialized e-services covering a wide range of countries and functions.

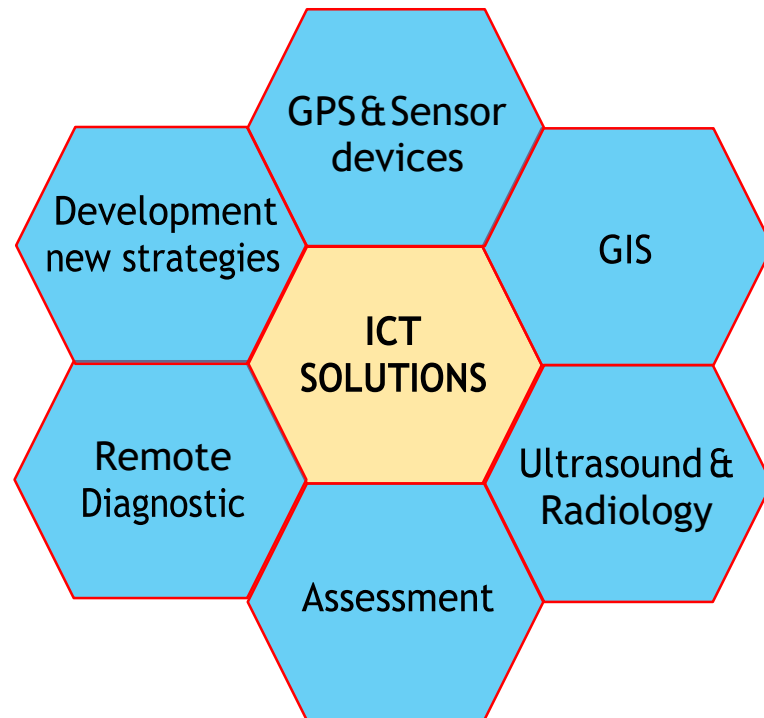
Furthermore, the Platform can be accessed from PCs as well as from mobile phones, both on-line and off-line, providing a synchronous and asynchronous information exchange.



Service users are institutions and communities, situated in Countries in difficulty. By joining the project, they will benefit from skills and technologies of the Center, receiving adequate support. In regard to the Service Users, we are currently working to create local Hubs in 6 African Countries: Democratic Republic of Congo, Sao Tomé, Sierra Leone, Lesotho, Ethiopia, and Madagascar.

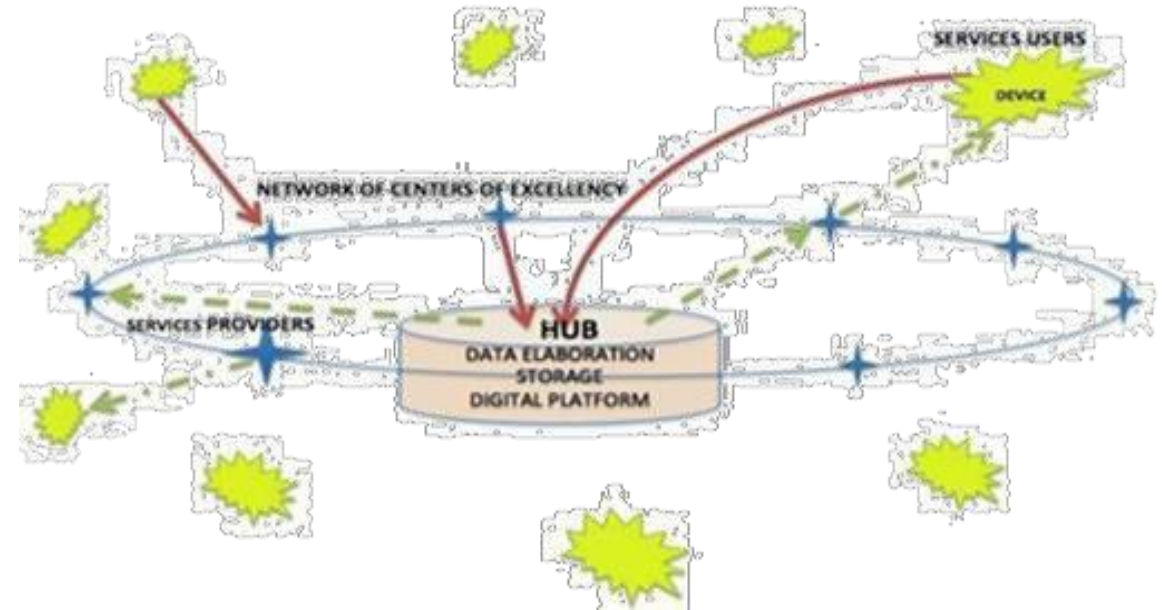
# NEW DIGITAL SOLUTIONS: e-Center

The e-Center is designed to transfer competences and adequate technologies providing remote support and assistance to disadvantaged Countries in the sectors of primary importance, such as health, food security, tele-medicine and education.



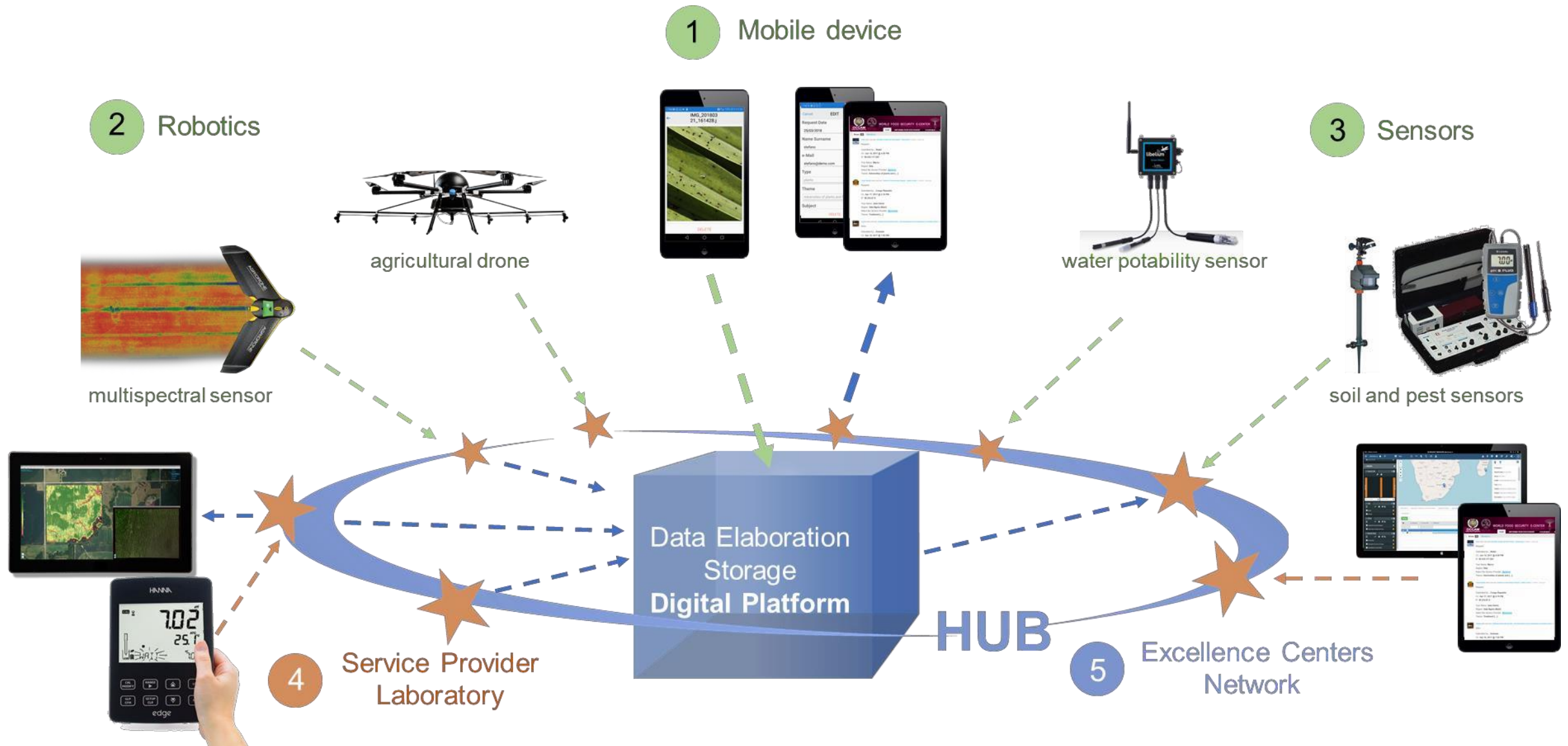
This innovative approach is now possible thanks to the Global Platform, which operates as IoT architecture using the newest sensor and robotic devices.

The Architecture of the System is simple and intuitive. Based on the network of Service Providers and Service Users managed by the Platform, the HUB works as a node with the aim to share ICT solutions, connecting all the subjects by adequate tools.



On one hand, Service Users, through devices such as smartphones, forward a request to the HUB, which after a drafting process, sorts it to the most appropriate Service Provider based on the category to which it belongs. On the other hand, Service Providers analyze, process and resolve the Service Users' request.

# NEW DIGITAL SOLUTIONS: HUB Architecture





# NEW TOOLS FOR DIGITAL SOLUTIONS

The inter-networking of physical devices, buildings and other items embedded with softwares, sensors and network connectivity which enable these objects to collect and exchange data, is known as Internet of Things (IoT).

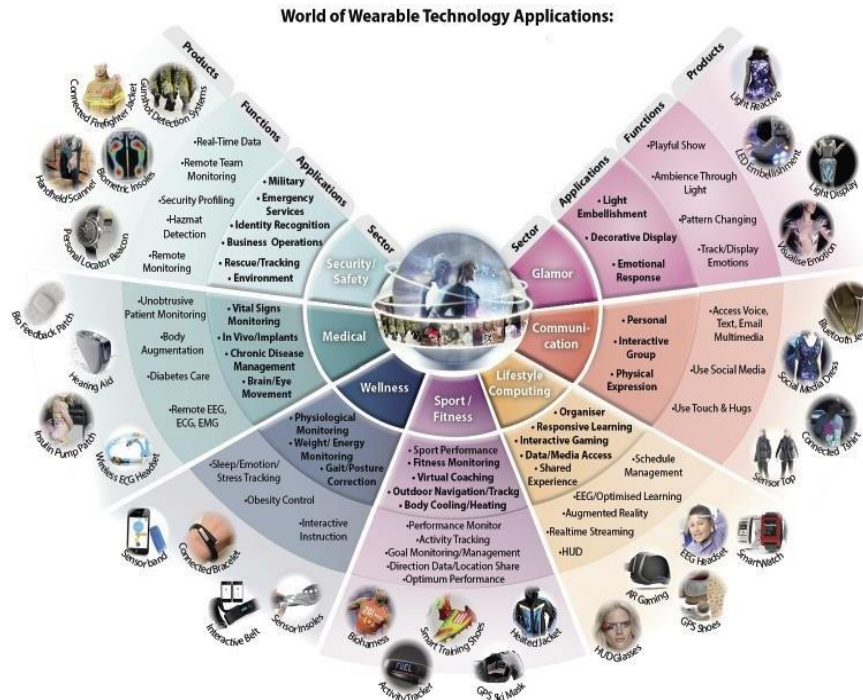


Also defined as global infrastructure, it enables advanced services by interconnecting things based on evolving interoperable information and communication technologies.



Moreover, the IoT has significantly contributed to implement farming methods. Indeed, the integration of wireless sensors with agricultural mobile apps and cloud platforms helps in collecting vital information pertaining to the environmental conditions, in order to automate farming techniques and minimize risks and wastes.

In our Platform, you can find a page focused on IoT. After logging in with username and password, given you by the Service User IoT manager, you can enter the number related to the chosen sensor and you will be directly connected by our Server to the real-time data coming from the device.



The Center counts a great panoply of tools. Among others, it is possible to underline converging technologies for smart environments and integrated ecosystems: sensors and health diagnostic, Servers, Personal Computers.



WiFi devices, Laptops, Tablets, IP phones, Smartphones, Microrobotics, GPS, Virtual Reality, VideoConference, Satellite Detectoris, IP Camera.



About other Technologies Internet (wireline communications) – WiFi (wireless communications) – GSM 3G (mobile communications) – LTE, i.e. Long Term Evolution (mobile communications) – GSM 4G (mobile communications) – GSM 5G (mobile communications) – ZigBee (wireless communications), technological standard that is specific for Wireless Sensor Networks.

# WORLD HEALTH FOOD SECURITY E-CENTER: FIELDS OF APPLICATION

## E-A GRICOLTURE

In many developing countries, rich natural resources are sufficient to adopt more rational systems to increase productivity without damaging the environment. The Food & Health Security e-Center will provide: Modern agronomic and geomatics techniques for monitoring and managing crops and GIS for the integrated analysis of the resources; Support for the assessment of the agricultural vocation of the soils; Assessment of the water needs of crops; Best practices in crops: rotations, field sizes, agrochemicals low inputs; Guide to the choice of agricultural machinery and information on the best technologies, appropriate for the country; Fertility detection by satellite technology.

## ANIMALS

Animal diseases are responsible for serious damages on the quantitative production of animal-origin food and represent a constant threat to human health. The Food & Health Security e-Center will provide: Remote diagnostics system, that allows the recognition of microscopic and orcytological pathologies: the digital image of the sample taken with a camera connected to the microscope will be sufficient to understand the pathology. The sharing of radiographic images and ultrasound with the requirements of digital equipment.

## FOOD

Technologies and processes of transformation of raw materials assume great importance for the quality of the final product. The Food & Health Security e-Center will provide Systematic application of storage and transformation processes oriented to the minimization of the product's contamination risks and the managing of the transportation system, from the production chain to the table, adopting the right criteria to improve the conditions of hygienic safety.

## WATER

Ensuring the best quality of drinkable water is a fundamental issue in the food security field. Most of the major causes of human and animal diseases are due to water infections. The Food & Health Security e-Center will provide remote assistance in the monitoring of water conditions, Analysis of local water wells, Specific sensor and robotic devices for the analyses.

## PLANTS

Highly topical issues are the protection of plants against biotic and abiotic adversities in agricultural ecosystems, the protection of food from contaminants and parasites carriers of pathogenic microorganisms of man.

The Food & Health Security e-Center will provide: Prevention policies to reduce damage related to the transmission of pathogenic microorganisms; Accurate disease diagnosis together with parasites' classification and geolocation; Decision support in the management of emergencies.

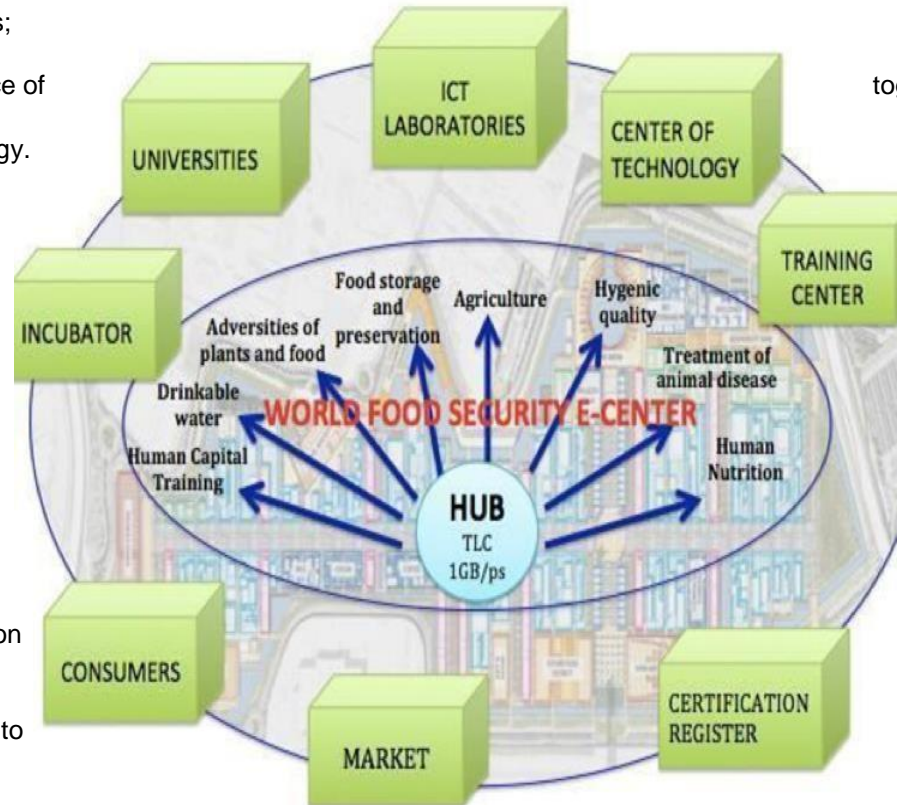
## TELEMEDICINE

Telemedicine is the use of telecommunication and information technology to provide clinical health care from a distance. It has been used to overcome distance barriers to improve access to medical services that would often not be consistently available in distant rural communities. It is also used to save lives in critical care and emergency situations. The World Health Food Security e-Center, in particular, would provide prevention and remote diagnostic analysis, assistance to post-traumatic diseases thanks to the partnership with the SMITHERS FOUNDATION and the Mental Health Project of Prof. Milton Wainberg.

## HUMAN NUTRITION

Targeted interventions are necessary, considering differing local realities and eating habits, together with the improvement of the resources already available or developed in terms of raw materials and food.

The FHSeC will provide: The study of the nutritional properties of food; The assessment of nutritional status of individuals or population groups; The implementation of intervention measures to address the nutritional imbalances; The development of strategies to optimize the diet and new products with specific nutritional features.





# HOW TO OPERATE: e-Center Platform Access

The Center services are directed to those who work in the development sector of countries, for example: NGOs or local communities. The aim is to increase programmes and actions in these countries.

The Center is available for cooperation and collaboration, and especially is available and ready for the partnership of Global Alliance.

To access the Platform you need to register. The registration consists in filling out an Accreditation Form in order to specify the function required, with the possibility to express the motivation for accessing the Platform by writing a short description.

Username and password will be given by OCCAM after registration on the OCCAM blog form and, this done, allows immediate access to OCCAM.

On one hand, if you are a teacher, a NGO, a researcher, a company, a public private or governmental Institution, or also a private citizen, you can share your skills and knowledge to increase global development or be empowered in your activity.

On the other hand, if you are a farming community, a local institution or if you live in Africa or in LDCS (least developed countries) and need knowhow and technological solutions, you can register or send a SMS to FHSeC platform and follow tutorials or go straight to Service Providers.

This is the Accreditation Form you have to complete and submit to receive username and password.

**FOOD & HEALTH SECURITY e-CENTER**

Accreditation Form

Name and Surname \*  
Name Surname

City / Country \*  
City  
Seleziona  
Country

E-mail

Action Fields \*  
☐ Water  
☐ Food  
☐ Plants  
☐ Animals  
☐ Other

Select your Role / Function \*  
☐ Service Users  
☐ Service Providers

Description \*  
Describe your motivation for accessing the platform

Submit

The whole platform is coordinated by the WFSEC Hub managers, that control the correct addressing and finalization of all the information transactions.

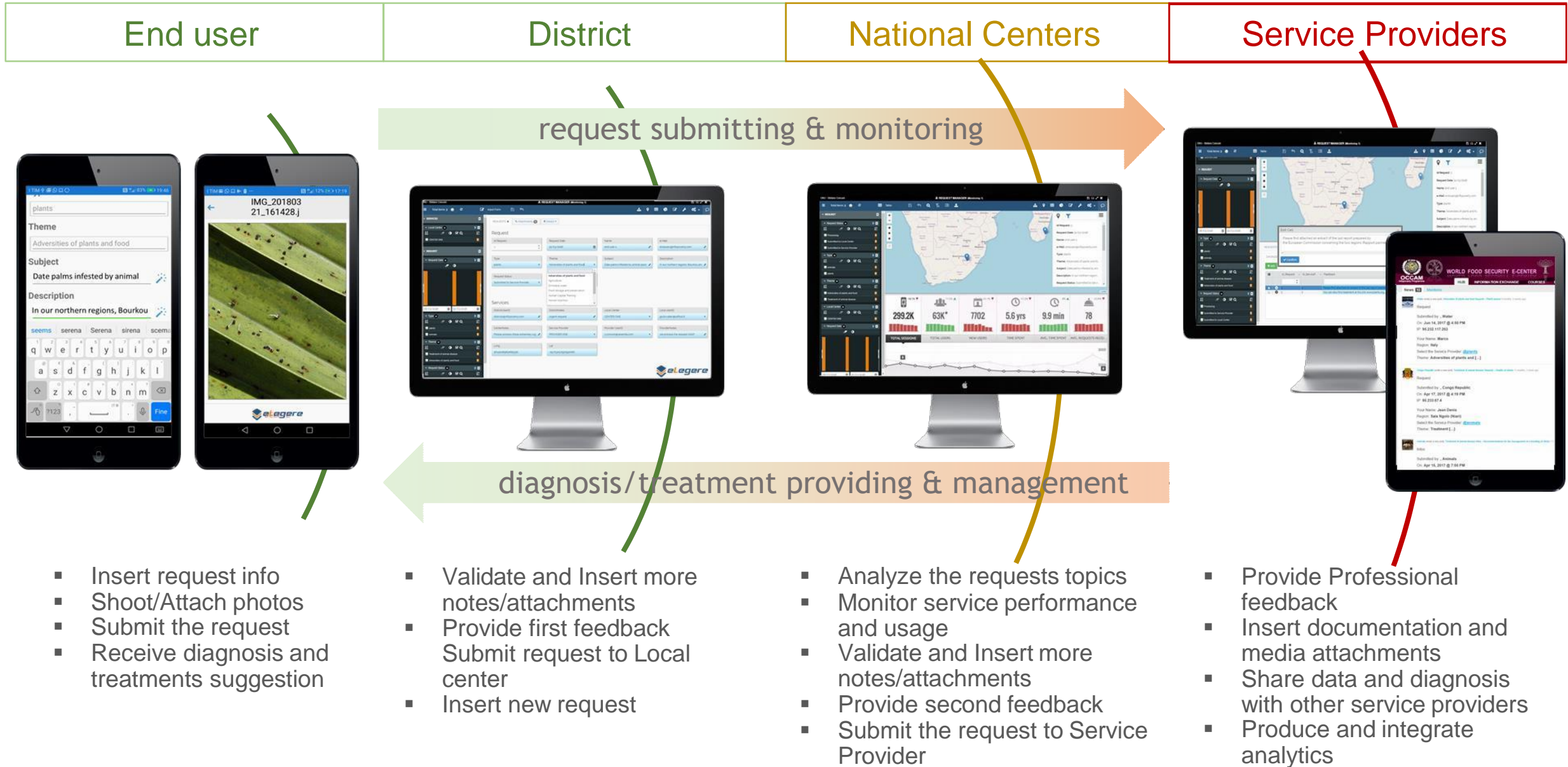
Service and Provider User, to perform the accreditation to The Food & Health Security e-Center with his credential and e-mail.

The Food & Health Security e-Center proposes several main aims, and is called to operate in different and heterogeneous action fields. Both Service Users and Providers can select the most appropriate action field related to their needs.

In this section it is possible to state if you are a Service Provider or a Service User.

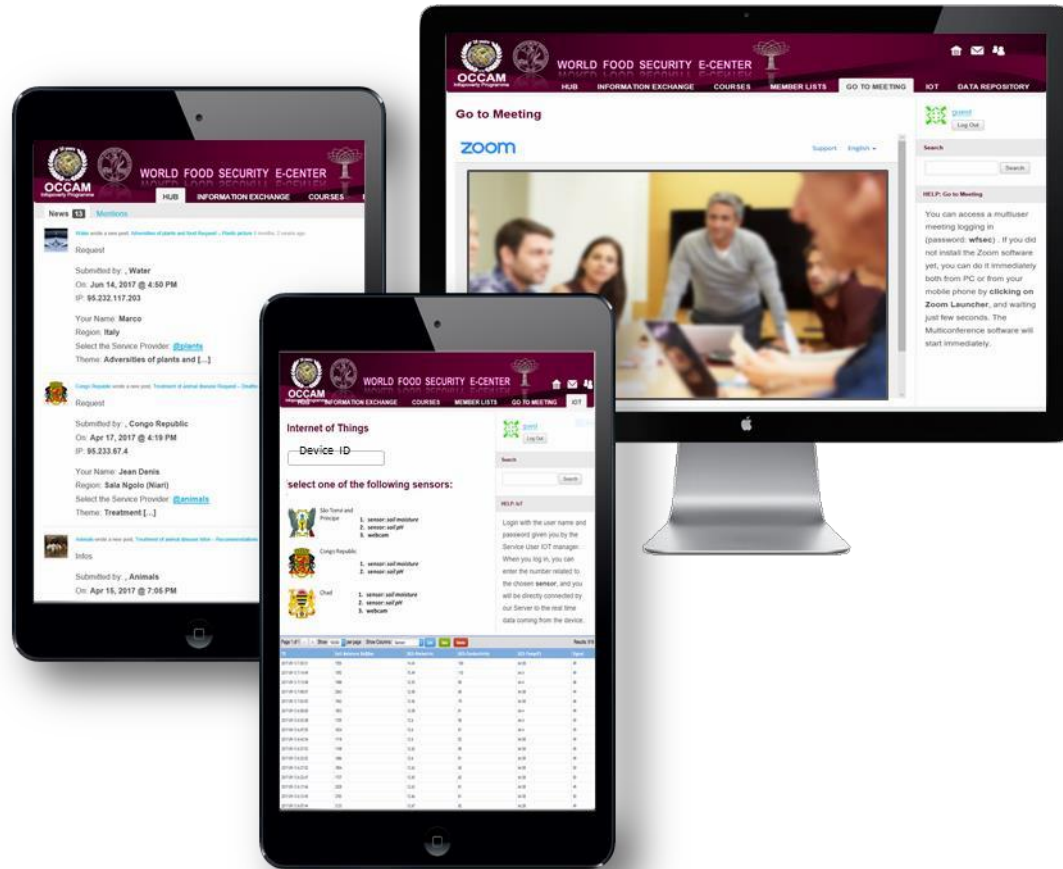
Here, the Service User or the Service Provider describes the motivation for accessing the platform. Of course, motivations are different according to the profile you represent.

# HOW TO OPERATE: Service Request Workflow





# HOW TO OPERATE: Information Exchange



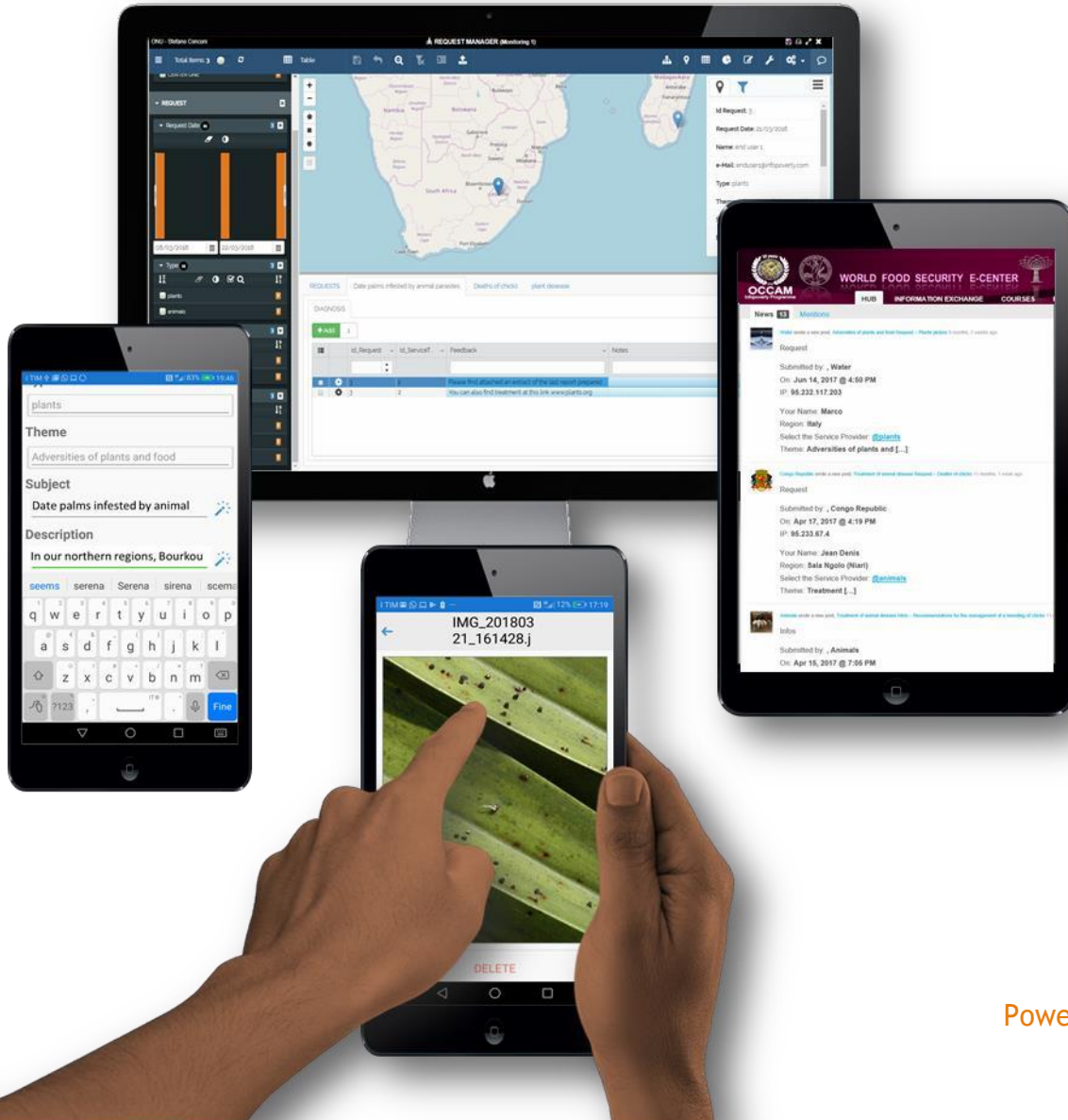
The WFSEC Hub allows Service Provider Experts to exchange and address information in order to analyze and solve all the requests, coming from End Users, validated and submitted by Service Users.

In particular, all the Experts will be able to:

- View the global, personal and experts group activity stream, post directly their questions or sending a short message to other users.
- Be able to request or provide information, submit files or view the published ones.
- Provide courses uploading documents, images and links to videos.
- Manage or join a real time multiuser VOIP videoconference.
- Connect to a suitable channel for transmission of the Internet of Things signals coming from suitable sensors installed in the developing countries, yielding useful real time data.
- Query the data repository to access all the data and the published information, and create reports and statistics.

The online platform, as well as all the generated documents, can be accessed from PCs as well as from mobile phones, both on-line and off-line, providing a synchronous and asynchronous information exchange.

# HOW TO OPERATE: from APP to HUB



- Desktop & Mobile smart user experience
- Smart inputting by image/text/voice recognition and GPS localization



- All registered users with secure access from web
- User access auditing and data history tracking to govern data privacy



- Web centralized knowledge base enriched by Local/National centers and Service Providers
- Web DBs to store data/metadata, media and documents
- Georeferenced data entry and geovisual data navigation



- Data collection, validation and sharing centrally governed work-flow
- Profiled data entry/access on visibility, editing and extraction
- Notification engine to support services and monitoring operation



- Interoperate with external data sources (Institutional/Scientific communities)
- Integrate external operative/analytics tools
- Scalable in functionalities and operational modules



- Integrated with WFSEC Information Exchange Services

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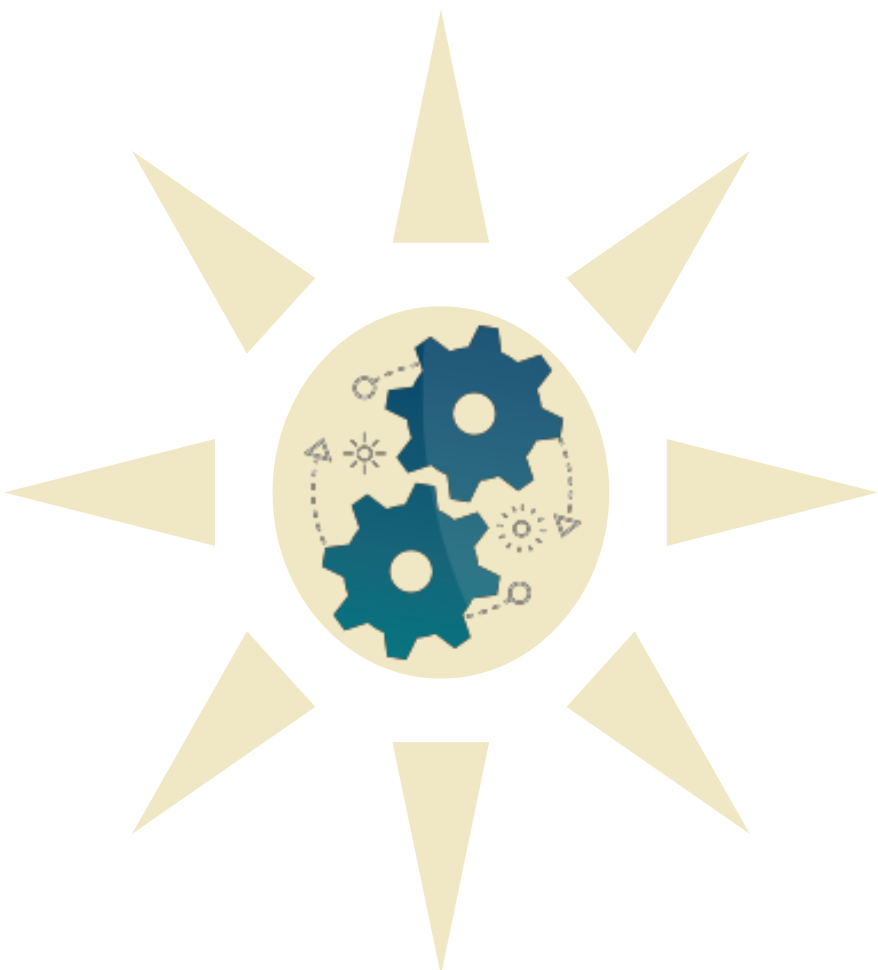
- Based on innovative Smart Operational Process Web Platform



# HOW TO OPERATE: Current Players



## SERVICE PROVIDERS



## SERVICE USERS



São Tomé and Príncipe



Congo Republic



Chad



Madagascar



*Associazione Italiana Società Scientifiche Agrarie*

*Italian Association of the Agricultural Science Societies*

## Service Providers

### AGRONOMY AND PLANT PRODUCTIONS:

- 1-Italian Association of Agrometeorology
- 2-Italian Society of Agronomy
- 3-Italian Society for the research of weeds
- 4-Italian Society for Horticultural Science

### CROP PROTECTION:

- 5-Italian Society of Plant Pathology
- 6-Italian entomology society
- 7-Italian Plant Protection Association
- 8-Italian Society for virology

### ECONOMICS and AGRICULTURAL POLICY:

- 10-Italian Association of Agricultural and Applied Economics
- 11-Estimation and Local Economics Studies Center
- 12-Italian Society of Agricultural Economics
- 13-Italian society of agro-alimentary economics

### SCIENTIFIC SUPPORT FOR AGRICULTURE:

- 14- Italian Society of Agricultural Chemistry
- 15- Italian Society of Pedology
- 16- Italian Society of Soil Science
- 17- Italian Society of Agricultural Genetics
- 18- Italian Society of Agri-Food  
and Environmental Microbiology
- 19-Italian Association of Agricultural Engineering
- 20- Association for science and animal productions
- 21-Italian Association of Forestry and Forest ecology
- 22- Italian Society for Food Science and Technology



# WORLD HEALTH FOOD SECURITY E-CENTER: CONFERENCES



## **The World Food Security eCenter was successfully presented at Beyond EXPO Conference in Milan – October 22-23, 2015**

EXPO 2015 left a large legacy of significant skills of international importance in the field of food security, providing adequate technological solutions to timely meet emerging countries' needs.

In the wake of such progress, the project of a Center for digital services of food security, born in the UN in 2013, was drafted to face the main problems afflicting poor countries, by transferring to rural communities competences and technologies to fight food emergencies, activating development processes from the bottom up.



## **The World Food Security eCenter was successfully presented at COP22 in Marrakesh – November 17, 2016**

The COP stands for the "Conference of the Parties." It is the supreme decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC), opened for signature in 1992 during the Earth Summit in Rio de Janeiro and later entered into force in 1994. Through this instrument, the United Nations has equipped itself with an action framework to fight global warming. The last edition of COP, COP22, took place in Marrakech, Morocco from November 7 to 18, 2016; on that occasion, parties began preparations for entry into force of the Paris Agreement.

During COP 22, OCCAM led an Infopoverty Seminar to present the results achieved and the main tasks of the World Food Security e-Center (WFSeC), illustrating its architecture and platform, and sharing the main services set-up for e-agriculture.

# WORLD HEALTH FOOD SECURITY E-CENTER: CONFERENCES



## **The World Food Security eCenter was successfully presented at Conference on Digital Agriculture at UBIBanca in Milan – January 23, 2018**

The World Food Security eCenter was presented in Milan at the Conference held on January 23, 2018, at the headquarters of UBI Banca.

The Conference, focused on how new digital technologies can contribute to the promotion of sustainable development in the field of agriculture, breeding, microbiology, was held in 5 sessions, each of which was able to count on the experience and professionalism of industry experts.

Thanks to the testimonies, stories and knowledge disseminated at the Conference, the World Food Security e-Center is increasingly ready to start changing lives through a safe, fast, efficient, adequate and sustainable approach to production, monitoring and consumption of food in Africa but also in Italy; thus contributing to the realization of the Sustainable Development Goals such as the eradication of poverty, the fight against hunger and the transfer of know-how for well-being and health.

The same themes will be explained in the next Infopoverty World Conference, to be held at the UN in New York on April 13, 2018.





Dacarà -Ethiopia



Villa S. Salvador, Perù



E-health Dispensary



S. Salvador norte, R. Dominicana



Meis el Jabal. South Liban



S. Ramon, Honduras



Sambaina Madagascar, the UN Millennium Village 2006



Borii Ettouil. Tunisia



Navaho Hoqan e-center



Mahobong-Lesotho



Jarapa, Ghana, with Ray Found,



# REFERENCES

## ADVISORY TASK FORCE

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# XVIII INFOPOVERTY WORLD CONFERENCE

APRIL 13TH 2018, UNITED NATIONS HEADQUARTERS, NEW YORK