# Increasing Resilience of Smallholders with Multi-Platforms Linking Localized Resource Sharing

PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA

RESILINK

Prof. Congduc Pham
http://www.univ-pau.fr/~cpham
Université de Pau, France

UNIVERSITÉ DE PAU ET DES PAYS DE L'ADOUR

LIUPPA

WAZIUP
IoT – from idea to reality
WAZIHUB

# PRIMA programme

- **Partnership for Research and Innovation in the Mediterranean Area** involves19 participating states countries which "have a common research and innovation strategy addressing the challenges in climate change, population growth and food security, water scarcity and overexploitation of natural resources, sustainable agriculture, agro-biodiversity loss"
- **Call: Section 2 Multitopic 2021**
- Thematic Area 3-Agrofood chain
- Topic 2.3.1 Increasing the resilience of small-scale farms to global challenges and COVID-like crisis by using adapted technologies, smart agri-food supply chain and crisis management tools

# Smallholder farmers (SHFs)

- According to FAO, small-scale farming has an enormous contribution to food security and to rural economy
- Smallholder farmers are usually the first to be impacted by unexpected crises and are very economically fragile
- Increasing the resilience of smallholders to face unexpected crises is a multidimensional challenge
- RESILINK **will increase smallholder's resilience by providing continuity of access to both resources and markets in crisis situations**
- It will promote and link local and localized usage of resources that are less impacted by restrictions on movements
- Generalizing local resource sharing approach will enable SHFs to maintain their activity thus securing their revenues

# RESILINK objectives and ambitions

- RESILINK has the clear ambition to make digital smart technologies attractive & accessible to smallholders
- RESILINK will ensure that the digital revolution does not leave further behind the smallholder farmers and producers who have less digital technologies experience
- RESILINK adopts a multi-actors approach, taking specificities of the whole agri-food value chain in order to propose innovative digital resource management features
- RESILINK seeks on creating new business opportunities and new markets for smallholders thus innovating in the smallholder agri-food chain on a long-term basis

# Consortium

**ACICT**: Arab Company for Information and Communication Technology

Egypt

**ARC**: Agricultural Research Center

Egypt

**INRA**: National Institute of Agronomic Research

Morocco

**Orange**

France

**UMCM**: University Mohammed-Chérif Messaadia Souk-Ahras

Algeria

**USMS**: University Sultan Moulay Slimane

Morocco

**UPPA**: University of Pau & Adour Country

coordinator

France

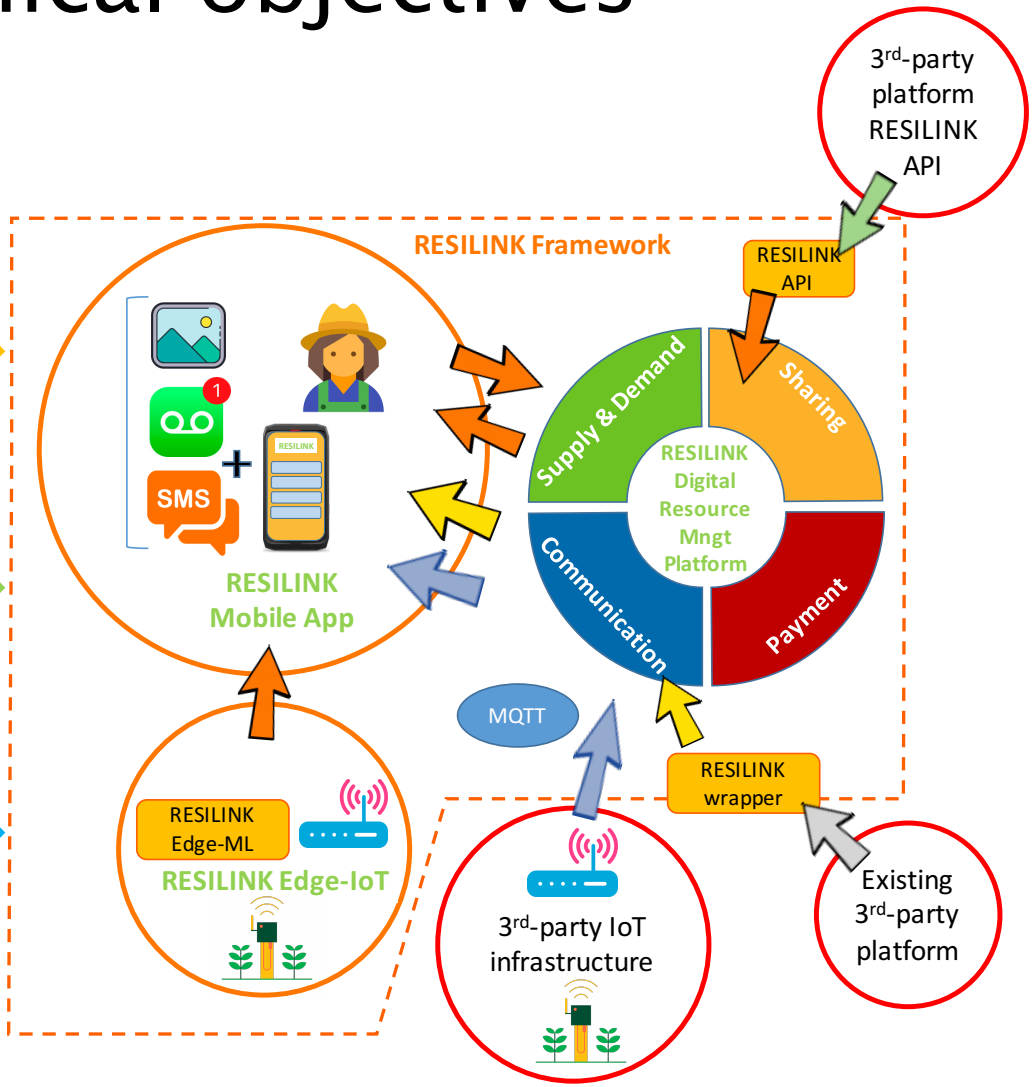
**WAZIUP eV**: WAZIUP association

associated partner

Germany

# Strategic and technical objectives

1. **Improve the agri-food value chain by optimizing usage of local resources, generalizing local resource sharing approach and facilitating territorial markets**
2. **Develop distributed digital resource management platform for real-time exchange of information on territorial resources and supplies & demands; connecting smallholders to new supply, sharing opportunities and distribution channels**
3. **Use cutting-edge digital technologies to connect fields and farms resources, automatize and add intelligence in the agri-food value chain to provide simple application interfaces adapted to smallholders**

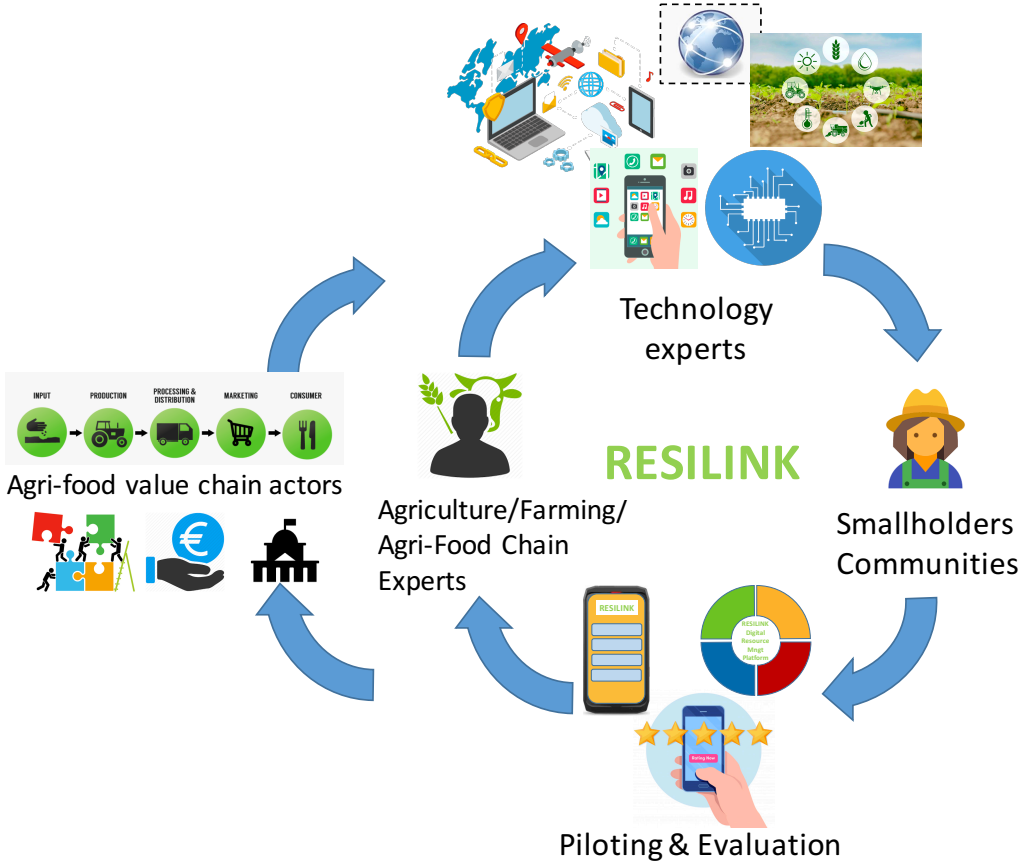


# Strategic and operational objectives

4 **Implement an incremental piloting & evaluation program to maximize smallholders' acceptability, large-scale adoption and sustainable usage (even in non-crisis situations)**

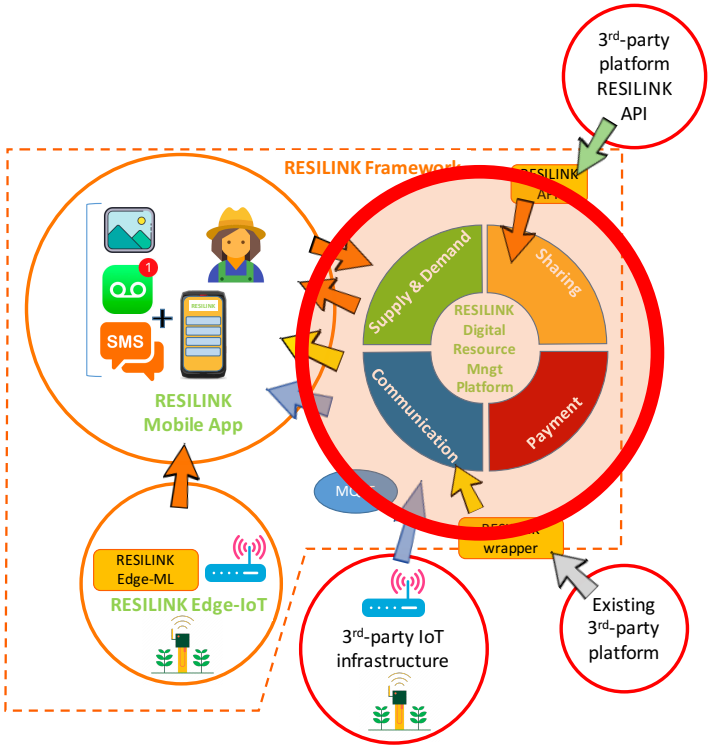
5 **Provide a long-term and sustainable crisis management in the agri-food value chain**

6 **Improve local innovation capacity and facilitate technology appropriation**



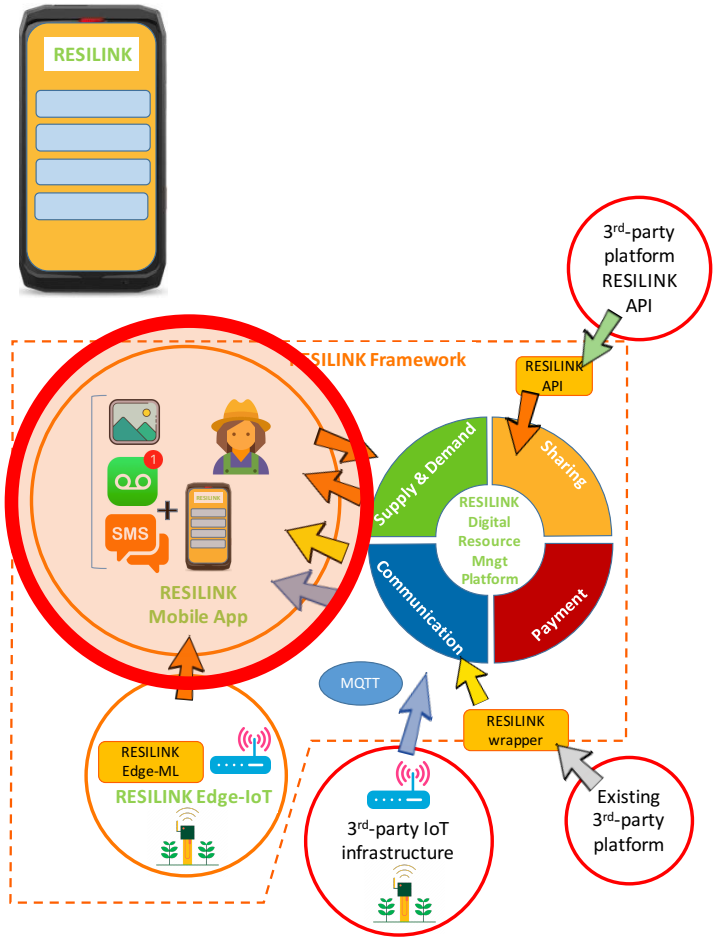
# RESILINK digital platform

- A distributed digital platform will enable real-time exchange of information on territorial resources and supplies & demands; connecting smallholders to new supply, sharing opportunities and distribution channels
- Will provide an open architecture and API to seamlessly integrate third-party platforms into comprehensive dashboards/portfolios
- Incrementally add disruptive technologies such as Internet-of-Thing (IoT), Edge Computing, Linked-Data and AI-based Decision Support System (DSS) for information sharing automation in agriculture/farming processes



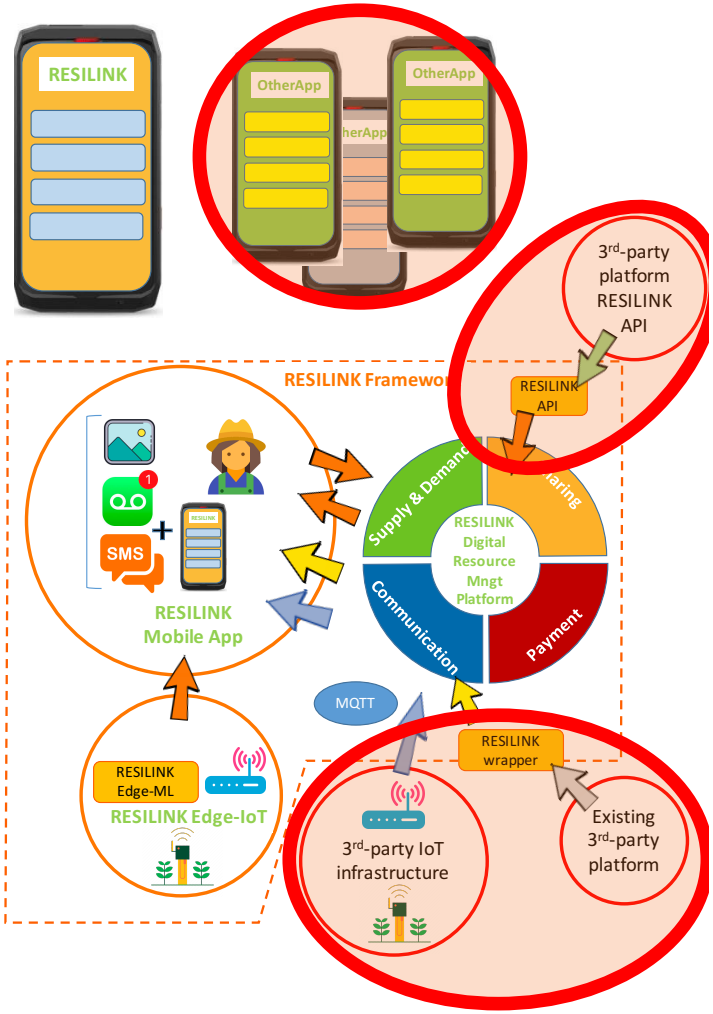
# RESILINK user mobile application

- A mobile application for smallholders will be the main interface to simply, quickly and intuitively interact with the RESILINK digital resource management platform
- The user interface will be adapted to the smallholder communities and simple interaction methods can also be supported such as SMS, voice attachment, pictures, etc.
- Smallholders can enable reception of notifications for correlated local resources found by the intelligent digital resource management platform, in addition to resources matching explicit requests



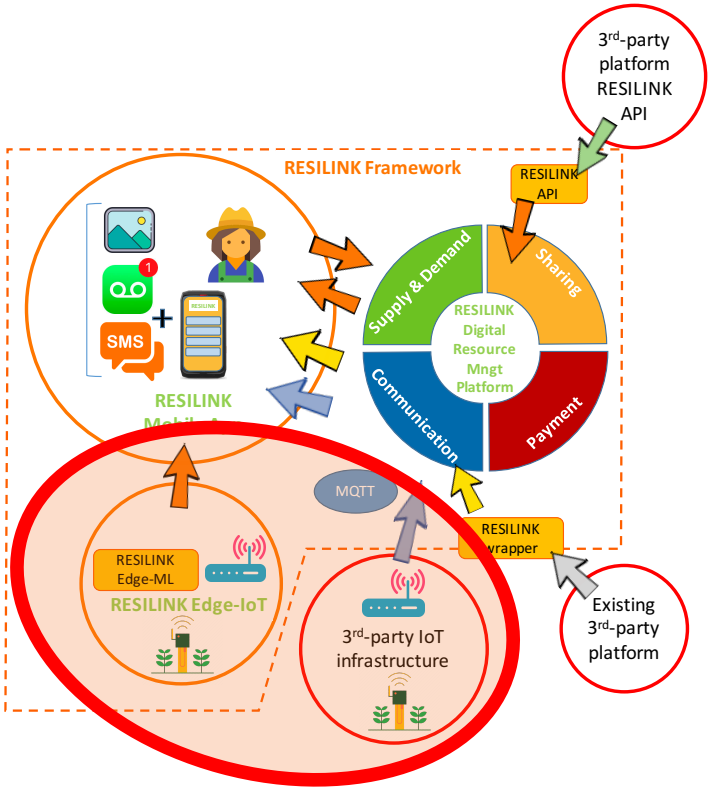
# RESILINK open API

- RESILINK will design and propose an Application Programming Interface (API) for the development of new resource sharing platforms to provide interoperability
- The open API will maximize re-utilisation and facilitate the integration of new platforms that can fully inter-operate with the RESILINK digital resource management platform
- Software wrappers will de developed for the integration of existing platforms, enabling resources from existing digital platforms to be discovered & integrated
- The open API will enable the platform-of-platforms approach for promoting a much wider and appealing ecosystem

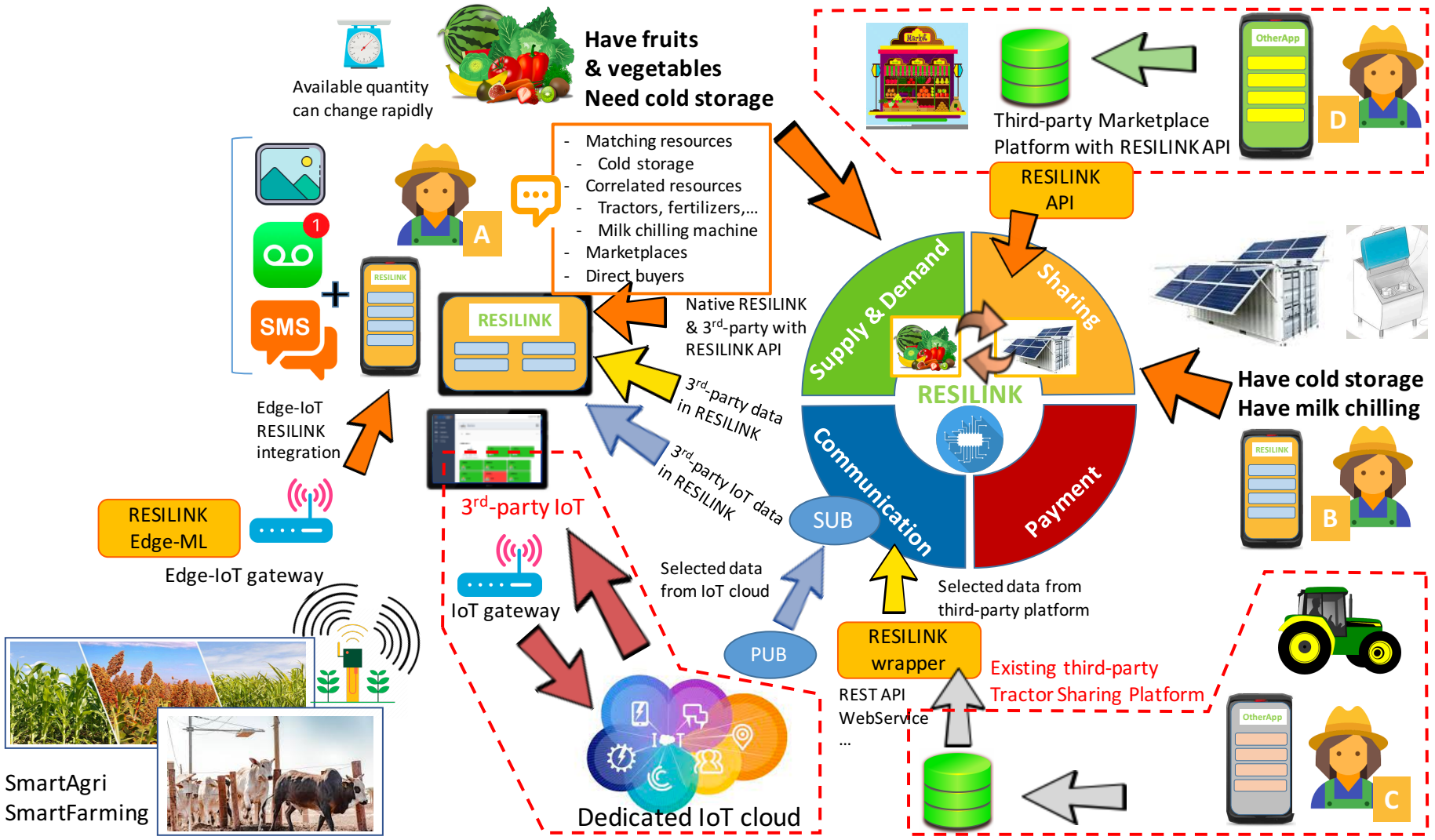


# IoT/AI automation

- RESILINK will seamlessly integrate IoT technologies to automatize a number of information exchanges related to resource sharing
- With Artificial Intelligence and Machine Learning (ML) advanced analytics capabilities, RESILINK's digital platform will leverage contextual intelligence to efficiently discover resources, identify trends, forecast and propose pertinent correlated resources
- RESILINK will develop efficient Edge-Machine Learning mechanisms into Edge-IoT gateways to also push intelligence and decision-making processes directly at the Edge of the infrastructure



# RESILINK big picture



# It is NOT ONLY about technology!

**5** **Provide a long-term and sustainable crisis management in the agri-food value chain**



**6** **Improve local innovation capacity and facilitate technology appropriation**

# Living-Lab piloting program

- The main objective of RESILINK is to link & promote localized resources both at the production level and food transformation by developing a short agri-food value chain
- The approach is a major change in smallholder's mentality and practice compared to the traditional agri-food chain
- The RESILINK "living-lab" piloting program will maximize smallholder's acceptability of these new technologies that may imply radically new practices for smallholders
- The sharing principle and the mobile app user interface will be extensively tested for more than 2 years
- RESILINK will run the piloting & evaluation program taking into account regions & territories specificities in each country (Egypt, Morocco and Algeria)

# Synergies and sustainability

- RESILINK will contribute to the overall ambition to innovate in the smallholder agri-food chain: digital smart technologies, improving efficiency and creating new business opportunities
- RESILINK will ensure market access by developing the localized agri-food value-chain integrating it with the local supply actors and distribution channels
- With the platform-of-platforms approach, RESILINK is capable of progressively adding new innovative models of the smart agri-food value chain, thus diversifying sharing models
- RESILINK platform will also seek to connect with local potential businesses through the creation of a territorial map of business users, e.g. agri-food processing industries, local restaurant, school, hospital, community centres, etc.

# Boosting local innovation

- All source codes with documentation and tutorial materials will be made available on the RESILINK GitHub code repository
- RESILINK will organize technology training sessions to present the generalized resource sharing approach, the RESILINK digital platform and the RESILINK API to tech & developer communities
- RESILINK will launch the RESILINK Apps Development Challenge targeting local ICT enthusiasts &entrepreneurs to demonstrate the RESILINK public API
- Local developers can build specialized platforms for specific resources and use the open API to link their platforms with the RESILINK framework

# Dissemination events & partnerships

- Create awareness about the RESILINK generalized resource sharing for the smallholder communities: at least 8 communication & dissemination events to reach at least 500 smallholders through these events
- Recruit smallholders into the "Living-Lab Piloting Program" and the large-scale RESILINK mobile app evaluation program: at least 40 small-scale farms for Living-Lab Piloting of the RESILINK digital platform and at least 200 smallholders for the mobile application
- Engage on a longer term local economic and technology actors for innovative partnerships and solutions: initiate at least 5 third-party platforms using RESILINK open API

# Increasing Resilience of Smallholders with Multi-Platforms Linking Localized Resource Sharing


**ACICT**: Arab Company for Information and Communication Technology
Egypt

**ARC**: Agricultural Research Center
Egypt

**INRA**: National Institute of Agronomic Research
Morocco

**Orange**
France

**UMCM**: University Mohammed-Chérif Messaadia Souk-Ahras
Algeria

**USMS**: University Sultan Moulay Slimane
Morocco

**UPPA**: University of Pau & Adour Country
coordinator
France

**WAZIUP eV**: WAZIUP association
associated partner
Germany