SMALLDERS PROJECT

SMART MODELS FOR AGRIFOOD LOCAL VALUE CHAIN BASED ON DIGITAL TECHNOLOGIES FOR ENABLING COVID-19 RESILIENCE AND SUSTAINABILITY

D1.4

Knowledge and Innovation Management Plan

Project Information

Acronym: SMALLDERS

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Consortium:

University of Calabria, Italy (UNICAL)

University of Parma, Italy (UNIPR)

University of Extremadura, Spain (UEX)

IMT Mines Ales, France (LSR)

Faculty of Science of Tunis, Tunisia (LAPER)

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Main Contributors: Greg Zacharewicz (LSR), Oussama Ben-Ammar (LSR), Manuella Germanos (LSR), Francesco Longo (UNICAL), Sergio Rubio (UEX), Lilia Sihdom (LAPER), Giuseppe Vignali (UNIPR).

Reviewer(s): Sergio Rubio (UEX)

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List of Acronyms

AI: Artificial intelligence.

API: Application Programming Interface.

BPMN: Business Process Model and Notation.

CA: Consortium Agreement.

FOSS: Free and Open-Source Software.

ICT: Information and communication technology.

IoT: Internet of Things.

IP: Intellectual Property.

IPR: Intellectual Property Rights.

KPI: Key Performance Indicator.

MRL: Manufacturing Readiness Level

R&D Research and Development.

TRL: Technology Readiness Level.

WP: Work Package.

Executive Summary

This deliverable D1.4 outlines the innovation and knowledge management practices and procedures for the SMALLDERS project. The innovation management plan of SMALLDERS is based on exploiting the potential of the project innovation and knowledge for various smallholders and other supply chain actors. This includes citizens, critical stakeholders of the agri-food sector, freight transport companies, and policymakers. The second objective is to provide them with access to several key technologies and methodologies practically and effectively. Once opportunely integrated, these key technologies and methods will provide a unique environment (the SMALLDERS platform). This platform will ensure the sustainable exploitation of the project results. The pillars of the innovation management plan are (i) identification of the project outcomes with a high innovation potential tackled in WP1 (Project Coordination and Management); (ii) continuous monitoring of the adequateness of project progress vis-à-vis the business opportunities and environmental needs via coordination of the WP2 (SMALLDERS Framework Design); (iii) Integration of feedback from various smallholders in various countries in WP4 (New Business Model in the Smallholders' Supply chain) and WP8 (Integration, Testbeds implementation and, evaluation); and (iv) setting up an adequate IPR management strategy in WP9 (Dissemination, Exploitation and, Long-Term sustainability).

The document summarizes the legal boundaries in the project Consortium Agreement (CA) regarding generation, ownership, and access rights to project results. An IP repository has been created as a living document, which will be updated during the project life, listing all project results with their respective owners and the conditions under which these results are available for exploitation to project partners or third parties.

1 The innovation management plan in SMALLDERS

"Innovation is understood as any activity aiming to promote not only the dissemination but especially the subsequent exploitation of the results of the R&D projects" (Akinlosotu et al. 2016). The goal of the innovation management task in SMALLDERS is to maximize the exploitation potential of the project results by:

- Identification of early platform concepts,
- Identification of threats and opportunities for commercialization,
- Support IPR management.

The project results aim to enable interactions between the different participants in the agri-food value chain, providing them with a series of resources and functionalities that allows them to achieve their respective objectives. These results can be grouped into five major categories, also defining the project Milestones:

1. **SMALLDERS Roadmap**: a roadmap including requirements, architecture, dissemination and exploitation plans, website, and visual identity is wholly defined.
2. **SMALLDERS Methodologies**: most essential methodologies, conceptual and mathematical models, are defined. Disseminations are ongoing.
3. **SMALLDERS Software parts**: the demonstrators of the SMALLDERS software parts are completed (not yet integrated).
4. **SMALLDERS platform**: the demonstrator of the SMALLDERS platform has been released.
5. **SMALLDERS Experimentation, Evaluation, dissemination, and exploitation**: the SMALLDERS experimentation, dissemination and evaluation, and exploitation have been completed.

1.1 Users' involvement

The participants can log into the platform through a credential-based system and create and modify their user profiles. Furthermore, they can choose what information to share and with what types of users on the platform. **The innovation potential of SMALLDERS** can be traced by outlining the exploitation potential of the categories mentioned above depending on the target groups described in the WP2: D2.1 (SMALLDERS actors' operational scenario and User Management Layer Requirements), WP3: D3.1 (Report on Network resources and ICT skill gap analysis), and D3.3 (Software of the SMALLDERS Users' Management Layer), and WP4: D4.2 (Report on Citizens' needs and policymakers' decision process). These target groups are:

- Smallholders located in the different participating countries (but even in other EU countries) interested in project developments, results, and innovation that can benefit their activities. The SMALLDERS platform targets smallholders whose needs are a subject of study in WP3: T3.1 "Analysis of Network resources and users' ICT Skills."

- Citizens of the different participating countries (but even other EU countries).

- Large-scale retail companies and large food producers as actors in the Smallholders supply chain.

- Small freight transport companies struggling to survive against large competitors may benefit from the SMALLDERS project. The main idea is to limit them to local and regional freight transport companies.

- Policymakers whose role is crucial to allow the SMALLDERS platform to have an impact on ensuring incomes to smallholders facing COVID-like crises and increasing their mitigation capabilities.

The main innovation concerns the presence of these multiple actors in a single platform. They should share information quickly and safely with each other to increase the sustainability of the agrifood chain from an economic, social, and environmental point of view. The project will deal with both Users' Management Layer back-end and front-end design in T3.3 and the Users' Management Layer back-end and front-end development in T3.4.

The SMALLDERS project is implementing a user-centred design approach to the solution. All interactions in the design, development, and testing phase are closely synchronized with the needs of the final users (including not only Smallholders), evidenced in the project work package structure and partner involvement. SMALLDERS targets the following groups of final users:

- Group 1: Smallholders,
- Group 2: Citizens of the different participating countries,
- Group 3: Critical Stakeholders (Large Scale Retail Operators and Large Food Producers),
- Group 4: Freight Transport Companies,
- Group 5: Policy Makers.

Therefore T1.4 will not deal with moderating or managing this process via separate procedures as it is organically embedded in the project work and followed closely during technical meetings and general conference calls. From the beginning of the project, WP3 (Users' Management Layer) partners have been working on end-users of different groups mentioned above to identify user requirements. WP3 will highlight the relevant Innovations in this field in the design and conceptualize (within the other use cases) the Users' Management Layer front-end and back-end. D9.4 of WP9 will detail the users' profiles.

1.2 Innovation assets

In addition to helping smallholders and bridging the gap between the smallholders and the citizens as well as the other target group of this project, the resulting system of SMALLDERS will be a cluster of subsystems that use varying technologies. This initiative will attempt to advance these technologies and synchronize their work innovatively.

The framework will first implement websites, mobile apps, and virtual shops to build an e-commerce environment. This would help increase the perceived value of smallholders' products and ease their sales, making smallholders more resilient to change and COVID-like crises. Additionally, Blockchain technology will protect the traceability, quality, safety, and perceived value of the smallholders' products. Artificial Intelligence will also be used to improve clients' shopping experience and answer their questions.

The COVID crisis and the lockdowns triggered a workforce shortage that impacted many businesses, including smallholders. The proposed framework will account for such scenarios by offering modules to allow posting job offers and requests, drawing near employers and potential employees.

Furthermore, this project presents a subsystem that uses sensors, IoT, QR technology, GPS technology, and a digital twin approach to help increase farm production. This subsystem will manage water usage, storage conditions, real-time monitoring of livestock, and tracking of products.

Finally, to ensure the sustainability of smallholders on a plethora of fronts such as environmental, financial, ethical, human, and many more, SMALLDERS will use simulation to analyse different scenarios based on indicators put forward by the

project. This would help identify the shortcoming of various smallholders and guide them toward more sustainable procedures.

The previously mentioned innovation assets that the SMALLDERS project provides will be revisited in D9.4, "Exploitation Plan and impact assessment."

Table 1 is extracted from the current D9.4 "Exploitation Plan and impact assessment" in Tables 6 and 7 listed in the annex. It summarizes the partners' assets and the related innovative results and applications identified during the project's first year.

Table 1. Partners' assets and expected innovative results of SMALLDERS

Partners' Assets (tools, technologies, models, etc.)	Innovative results and applications
Templates for Web applications and mobile applications for the User Management Layer	The SMALLDERS web application and mobile web view will be completed to allow the different users to create their profiles and access the platform functionalities.
A Knowledge Navigator based on Artificial Intelligence for providing a new shopping experience to citizens	The AI-based Knowledge Navigator will be able to interact with the user and answer different questions.
Specific Business models for SMALLDERS actors	A set of business models for Smallholders, Citizens, Critical Stakeholders, and Freight Transport Companies will be defined and enabled by specific functionalities of the SMALLDERS platform.
Public-available-blockchain solutions	Blockchain solutions will be applied in some realistic scenarios.

Available/commercial sensors	Integration of the available commercial solutions into the SMALLDERS architecture.
Models and Indicators for Multi-capitals Sustainability of Smallholders	A set of capitals will be defined and accompanied by Mathematical models and equations can be used to evaluate the multi-capital sustainability of Smallholders.
Available experiences in previous simulation model development	A set of BPMN process models derived from conceptual business models and simulations for smallholders, citizens, critical stakeholders, and freight transport will be defined and enabled by the company-specific functionalities of the SMALLDERS platform.

1.3 Innovation readiness

The innovation scorecards will evaluate the selected assets from section 1.2 (Innovation assets) across the following criteria at the end of the project. These criteria will be based on the "Innovation radar" methodology (De Prato et al., 2015) and KPIs defined in the project proposal in subsection 1.2 (SMALLDERS Specific Objectives). It will measure the technical maturity of the asset and evaluate whether it is ready to be proposed to the targeted users or if further development efforts are needed.

The following Indicators will be considered to evaluate the SMALLDERS platform readiness during the experimentations (and to demonstrate the final TRL=6 reached by the project):

- Models of the smart agri-food value chain: The central smart aspect of this project proposal is the simultaneous presence of multiple players on a single platform. Data and information, certified using blockchain technology, are

shared between various actors in real time. Smallholders can catch previously hidden business opportunities and can improve their condition. Sales to buyers and critical stakeholders are quick and accessible through the e-commerce channel. Policymakers can become aware of smallholders' social and economic status during the crisis and take corrective measures quickly (e.g., providing financial incentives and facilitating access to credit). The best supply-demand matching is guaranteed in the job market and distribution sector.

- Models for e-commerce channels: The SMALLDERS platform enables the use of e-commerce channels by smallholders with multiple users. Smallholders can make their product catalogue available to both buyer citizens and critical stakeholders. Direct selling of the product reduces the number of intermediaries along the chain and increases producers' margins by at least 5-10%.

- Number of smart technological solutions: The SMALLDERS project utilizes different smart technical solutions. Blockchain technology will make the supply chain more transparent and increase the quality of smallholder products. The AI-based multi-functional voice assistant will assist citizens in finding a job and purchasing the desired products quickly and easily; more specifically, the intelligent assistant will guarantee the user a highly personalized, immersive, and proactive experience. The QR Code technology will allow livestock and storage monitoring and production tracking and optimize resource use. The platform will be available online, and a responsive web view for the Android operating system will be released on mobile devices. Modern GPS-based technologies will track shipments to citizens and critical stakeholders in real time, while an

advanced simulation model will be used for scenario analysis and improvement.

The above-described KPIs are presented with more details in target values and opportunely categorized in the project proposal in Tables 1.1, 1.2, 1.3, 1.4 and 1.5 of the project proposal.

1.4 Interactions with SMALLDERS Advisory Board

The SMALLDERS Advisory Board will be formed by three well-recognized and high-profile experts who will advise throughout the project lifecycle. The Advisory Board will steer the project partners toward better research challenges and opportunities while providing an active link with other ongoing R&D projects. The following list of people has already been contacted, and they have provided their availability to serve as a member of the SMALLDERS Advisory Board:

- **Prof. Emilio Jiménez**, Full Professor at La Rioja University (Spain) with research interest in agri-food.

- **M. Jean-Paul Robert**, Director of Les mas des Agriculteurs, France. Expert with a strong experience in the smallholders and retail domain (with more than 21 years of experience in Carrefour).

- **Prof. Adriano Solis**, Full Professor at York University (Canada), with research interest in simulation, inventories, and production.

2 Innovation Management Strategy

2.1 Overall Framework

Some of the fundamental activities to be developed in this and any innovative process are as follows:

- Generation of ideas that potentially could become new products or processes,

- Acquisition of knowledge on the generated ideas,

- Implementation and market monitoring to verify customer satisfaction and after-sales.

Innovation management within the SMALLDERS project is a process that requires an understanding of both smallholders' problems to implement appropriate creative ideas successfully. Corresponding business models and process innovations are integral to creating, adapting, and maintaining a platform or service to market maturity. These new business models and process innovations are often triggered through technological innovations, which act as enablers and generate requirements for technology development.

As part of the SMALLDERS management structure, the Innovation Manager reports to the Project Technical Committee (PTC). The actions are based on both CA and technical proposal that define the functions of the Innovation Manager (sections 6.1 and 3.2, respectively). Those documents guide the Consortium about best practices on innovation management, such as:

- Planning for innovation success, understanding and using innovation management techniques and processes during the lifetime of the project,

- Identifying and fostering innovation enablers/driving factors,

- Evaluating and improving the performance of the innovation management system,

- Identifying the smallholder's needs of high potential innovations

- Systematically capture structured data on project innovations related to innovation readiness, innovation management, and potential (**TRL** – **T**echnology **R**eadiness **L**evel, and **MRL** – **M**anufacturing **R**eadiness **L**evel),
- Identification and exploitation of positive spillovers.

Innovation does not just require new technologies and products but also new business models. The European knowledge economy's production and services are based on knowledge-intensive activities. These activities contribute to an accelerated pace of technical and scientific advance. We will review the current state of the art in terms of methodological and technological solutions to explore.

- the use of ICT tools to support smallholders,
- the use of blockchain technology to support smallholders,
- the current link between business models and smallholders,
- approaches ensuring the social, economic, and environmental sustainability of smallholders,
- the use of simulation approaches to support smallholders.

2.2   Framework for Assessment

This section aims to inform partners about the processes or steps the Innovation Manager will follow to ensure that the previously established innovation SMALLDERS objectives are adapted. To achieve this, trends in the field of R&D must be closely and regularly monitored, as well as market needs. Some of the tasks for the overall assessment are:

- The SMALLDERS Innovation Management Plan will be first submitted during month 6 of the project and will be regularly updated throughout its development.

- Each partner will be responsible for updating the rest of the consortium in case they are aware of events affecting the Innovation Management of the project.

- A slot of the consortium meetings will be dedicated to the analysis of the Innovation Management strategy.

- Possible risks will be previously identified and classified according to the likelihood of occurrence.

- Given the context of a non-identified and unexpected threat emerging, the Innovation Manager will call for a meeting with the Steering Committee to jointly determine the next steps.

Below, we present a brief explanation of the work to be carried out in each of the innovation management activities:

- **Innovation management plan and tools preparation.** During the initial stages of the SMALLDERS project, the set-up and launch of the innovation management system and processes will take place,
    - Identification of the most relevant sources to conduct scientific and technological monitoring,
    - Selection of appropriate Innovation Management tools to be used and implemented throughout the SMALLDERS project.

- **IPR Management principles.** Related to these initial activities, IPR management mechanisms will also be defined as part of "D9.4 Exploitation Plan and Impact Assessment," and links will be established with the Innovation Management Strategy for coherence and consistency.

- **Innovation Management data gathering, analysis, and refinement.** The Innovation Manager will gather information related to potential innovations developed in SMALLDERS from all project participants using any of the tools

identified in the following section of this document or others when appropriate. Information will be compiled and analysed in parallel with the Steering Committee meeting schedule for the project. The previously collected information will be updated in every cycle. Moreover, Innovation and IPR results will be used to identify, assess, and prioritize ideas, establishing links between potential innovations and specified outcomes and their route to market.

- **Smallholder monitoring and links to exploitation strategy.** Within this task, and in liaison with the "D9.4 Exploitation Plan and Impact Assessment", SMALLDERS will monitor smallholders' needs and technical evolutions. This activity includes the continued monitoring of the smallholders and technological data sources in the innovation areas identified. It also consists of filtering and distributing relevant information among the project stakeholders.

3   Knowledge management

The project partners fully embrace the open-source vision. As clearly explained in section 2.2.4 of the project proposal, the business model that partners expect to put in place after the industrialization phase is based on the idea of providing the SMALLDERS platform as an open-source and free solution to regional governments by using what is usually called "Software ReUse catalogs for Public Administrations" that are available in many countries (including partners 'countries).

According to this approach, after the industrialization phase, the knowledge generated by the project will be available as open source for all public administrations. In the beginning, the ReUse catalogs of the participating countries, Italy, Spain, France, and Tunisia, will be considered; nevertheless, additional countries can be added as time goes by if the scaling-up of the SMALLDERS initiative is successful (cf. section 2.2.4.1 of the project proposal).

Communication activities also embrace the open-source vision. Indeed, the partners expect to publish 12 scientific articles (cf. section 2.2.7 of the project proposal), including the project results: 8 articles published in international conference proceedings (all the articles under the formula gold open access) and 4 articles published in international journals (1 article under the formula gold open access and three articles under the formula green open access). This presented deliverable is aligned with the D9.3 (Report on Dissemination activities) and D9.4 (Exploitation Plan and impact assessment).

3.1 Scope and outline

The primary purpose of this section is to provide the consortium of the project with the guidelines for potential pitfalls and issues relating to IPR that may encounter during the lifetime of the SMALLDERS project and to introduce the IPR repository.

This document should be considered in conjunction with the Consortium Agreement signed by each Beneficiary. If any provision of this deliverable conflicts with the provisions of the Consortium Agreement, the terms, and conditions of the Consortium Agreement shall prevail.

The management of IPR issues, knowledge management, and management of innovation-related activities, including exploitation of results and business creation, is handled by the Innovation Board. The consortium partners commit themselves to communicate any IPR issues that may arise during the project's lifetime.

The activities in scope for the knowledge management sub-task are:

- Identification of the project results and their ownership (Section 4 below)
- Deciding on the protection of project results

- Ensuring these decisions are reflected in the dissemination and exploitation strategies (Objective O9.3 of WP9 "Dissemination, Exploitation and Long-Term sustainability")

- Elaboration of a licensing model for the SMALLDERS platform

- If relevant, perform patent searches

3.2 Foreground (Results) and access rights

The present section reminds the consortium partners of some terms and conditions already set in place in the SMALLDERS CA (Section 3 above).

3.2.1 Background and foreground

'Results' (Foreground) means any (tangible or intangible) output of the action such as data, knowledge, or information — whatever its form or nature, whether it can be protected or not — that is generated in action, as well as any rights attached to it, including intellectual property rights.

Background:

'Background' means any data, know-how, or information — whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights — that:

a) is held by the beneficiaries before they acceded to the CA, and

b) is needed to implement the action or exploit the results.

The SMALLDERS background is defined in CA (Attachment 1) and is summarised in the following table.

Table 2. Partners' pre-existing knowledge/competencies

Describe Background	Specific limitations and/or conditions for exploitation (Consortium Agreement)	Status of IPR: type and partner owner (specify whether IPR has been applied to this background - e.g., patent, copyright, etc. - or not)
Development of planning models using simulation and combinatorial optimization (**IMT Mines Alès**)	The mathematical models are provided in several papers published in scientific journals and presented at scientific conferences.	IPR has not been applied to this background
Enterprise Modeling (**IMT Mines Alès**)	This pre-existing knowledge is already openly available	IPR has not been applied to this background
Design and development of web applications and mobile applications (**University of Calabria - MSC-LES Research Laboratory**)	This knowledge is available in many journal articles and conference papers published in recent years.	IPR has not been applied to this background

Identification of multi-capitals based mathematical models with their indicators' definition (**University of Tunis El Manar, LAPER**)	The mathematical models are provided in many papers published in scientific journals and conferences recently published.	IPR has not been applied to this background
Identification of relevant sensors to collect needed information. (**University of Parma**)	The mathematical models are provided in many papers published in scientific journals and conferences recently published.	IPR has not been applied to this background
Development of IoT platform and Blockchain-based mechanisms (**University of Parma**)	The mathematical models are provided in many papers published in scientific journals and conferences recently published.	IPR has not been applied to this background
Define and formalize the business model. (**Universidad de Extremadura**)	The knowledge is provided by many papers published in scientific journals and conferences recently published.	IPR has not been applied to this background

3.2.2 Ownership

Ownership of results:

According to the consortium agreement, results are owned by the Party that generates them. It has been defined in section 8.1: "Ownership of Results" of CA.

Joint ownership:

According to the consortium agreement, Joint ownership is governed:

Two or more consortium partners own results jointly if:

a) they have jointly generated them and

b) it is not possible to:

- o establish the respective contribution of each beneficiary, or
- o separate them from applying for, obtaining, or maintaining their protection.

The joint owners must agree (in writing) on the allocation and terms of the exercise of their joint ownership ('joint ownership agreement'). Unless otherwise agreed:

- each of the joint owners shall be entitled to use their jointly owned results for non-commercial research activities on a royalty-free basis, and without requiring the prior consent of the other joint owner(s), and

- each of the joint owners shall be entitled to exploit the jointly owned Results otherwise and to grant non-exclusive licenses to third parties (without any right to sub-license) if the other joint owners are given:

- o at least 45 calendar days advance notice; and
- o Fair and Reasonable compensation.

It has been defined in section 8.2: "Joint Ownership" of the CA.

3.2.3 Transfer

Transfer of results or Assignment of IP

As mentioned in Section 8.3 of the CA:

- Each Party may transfer ownership of their results following the procedures of Section 8.3.1 of the CA.

- It may identify specific third parties it intends to transfer the ownership of its results according to the agreements between partners. The other parties hereby waive their right to prior notice and their right to object to a transfer to listed third parties (Section 8.3.2 of the CA).

- The transferring Party shall, however, inform the other Parties of such transfer at the time of the transfer and ensure that the rights of the other Parties will not be affected by such transfer. Any addition after the signature of the CA requires a decision of the General Assembly (Section 8.3.3 of the CA).

- The parties recognize that in the framework of a merger or an acquisition of an essential part of its assets, it may be impossible under applicable EU and national laws on mergers and acquisitions for a party to give the full 45 calendar days prior notice for the transfer (Section 8.3.4 of the CA).

- The obligations above apply only for as long as other parties still have or may request Access Rights to the Results (Section 8.3.5 of the CA).

Licensing of project results (Section 9.8.4 of the CA):

Each beneficiary may grant licenses to its results (or otherwise give the right to exploit them).

It follows section 9.8.4.2.2 of the CA that states that access Rights, as needed for the Exploitation of the Party's Results, shall comprise the right to sublicense such Source Code, but solely for adaptation, error correction, maintenance, and/or support of the Software.

Further sublicensing of Source Code is explicitly excluded.

3.2.4 Access rights

'Access rights' means rights to use results or background. To exercise access rights, it must be requested in writing first ('access request'). Waivers of access rights are not valid unless in writing. Unless agreed otherwise, access rights do not include the right to sub-license (Section 9.2.2 of the CA). Also, access rights are granted on a non-exclusive basis, as mentioned in Section 9.2.4 of the CA.

The consortium partners have given access to their background and results for implementing the project royalty-free. Under Section 8.3.1 of the CA, they must give each other — under fair and reasonable conditions— access to results needed for exploiting their results. They can make this request in writing up to one year from the project's end. Access rights to Results for internal research activities shall be granted royalty-free (See section 9.4.1of the CA). Affiliated parties established in an EU Member State or associated country can be given access to project results if needed for those entities to exploit the results generated by the partners to which they are affiliated.

Access rights to the background for the exploitation of results:

According to Section 8.3.1 of the CA, the beneficiaries must give each other access — under fair and reasonable conditions — to background needed for exploiting their results, unless the beneficiary that holds the background has informed the other

beneficiaries that access to its background is subject to legal restrictions or limits, including those imposed by the rights of third parties (including personnel).

'Fair and reasonable conditions' means appropriate conditions, including possible financial terms or royalty-free conditions, considering the specific circumstances of the access request, for example, the actual or potential value of the results or background to which access is requested and/or the scope, duration or other characteristics of the exploitation envisaged.

Articles 9.7.1 and 9.7.2 of the CA give more information on access rights for partners leaving the consortium and new ones joining in.

As for most PRIMA Projects, and due to the specific area of those projects, the SMALLDERS CA foresees special provisions related to software. The CA of SMALLDERS states in Section 9.8.3 that access rights to a software project result includes access to the object code, API (if applicable), and the source code, if necessary, for the implementation and exploitation of that result.

3.2.5 Dissemination and Exploitation

Dissemination:

Unless it goes against their legitimate interests, each beneficiary must — as soon as possible — 'disseminate' its results by disclosing them to the public by appropriate means (other than those resulting from protecting or exploiting the results), including in scientific publications (in any medium). A beneficiary that intends to disseminate (through any dissemination mode, e.g., participation to conferences, seminars, articles published on conferences/journals, etc.) its results must give advance communication

to the other beneficiaries of, unless agreed otherwise, at least 20 days, together with sufficient information on the results it will disseminate.

Any other beneficiary may object within ten days of receiving notification if it can show that its legitimate interests about the results or background would be significantly harmed. In such cases, the dissemination may not occur unless appropriate steps are taken to safeguard these legitimate interests.

Dissemination activity is permitted if no objection is made within the time limit stated above.

The last is very important in not disseminating information infringing on someone's IPRs – ex. Sharing information that is about to be patented, therefore nullifying the patenting efforts. A detailed dissemination plan will be produced as part of T9.2 "SMALLDERS identity, website, and social media." The dissemination of project results must always be done with the following acknowledgment:

Exploitation:

As stated in Section 8.3.1 of the CA, each consortium partner must ensure exploitation of the project results up to at least four years from the end of the project by:

a) using them in further research activities (outside the action)

b) developing, creating, or marketing a product or process

c) creating and providing a service, or

d) using them in standardization activities.

3.3 Protection

According to Section 8.3.1 of the CA, each beneficiary must examine the possibility of protecting its results and must adequately protect them if:

a) the results can reasonably be expected to be commercially or industrially exploited and

b) protecting them is possible, reasonable, and justified (given the circumstances).

When deciding on protection, the beneficiary must consider its legitimate interests and the other partners' legitimate interests (primarily commercial). The commission can, in some instances, take ownership of the project results if adequate protection cannot be assured. We note that the costs for obtaining protection are eligible costs for the financial reporting of the project.

Only inventions or designs not publicly disclosed can be protected as utility models or designs. Moreover, trademarks and domain names are registered first-to-file in many countries. Therefore, **keeping the idea secret of getting the most benefit from the advantages of IP protection is essential**.

The following measures may help to keep the IP secret within the organization:

- Making sure that employees, researchers, and collaborators have in place confidentiality obligations and reminding them from time to time of the importance of complying with these obligations,

- Reviewing public disclosures (such as technical publications or communications with potential partners) to guarantee that confidential information is not included therein,

- Sign confidentiality agreements with partners and testers before performing concept and technical testing and with third parties when negotiating partnerships.

3.4 Software licensing models

This section presents the main licensing models used nowadays. For a license to be valid, it must be granted by the owner of the work's intellectual property rights. Software licensing can be divided into three categories: "free and open source," "proprietary," or a hybrid of the two.

Free and Open-Source Software (FOSS) Licensing: The primary intent of FOSS is to give the licensor the ability to maximize the output of their software by breaching barriers to software use, dissemination, and follow-on innovation. Each of the most used FOSS licenses grants free (as in freedom), open, and non-discriminatory access and rights to modify licensed software and associated source code. A common misconception is that FOSS is synonymous with "non-commercial." FOSS-licensed software can be, and often is, commercially exploited. FOSS can also help to extend the useful lifetime of a piece of software beyond the direct involvement of the creators.

Proprietary software (or non-free software or sometimes proprietary software): In contrast to FOSS, this software does not allow, legally or technically, or by any other means whatsoever, the simultaneous exercise of the four software freedoms that are the execution of the software for any type of use, the study of its source code (and therefore access to this source code), the distribution of copies, as well as the modification of the source code.

4 IPR strategy and repository

Regarding Intellectual Property Rights (IPR), at the beginning of the project, each partner provided to list of pre-existing know-how in the CA and Annex 1. It will be used throughout the project and the deliverable D9.4 Exploitation Plan and impact assessment.

Rules concerning IPR ownership and access rights to any pre-existing know-how and results of the project, as well as IPRs and the treatment of confidential information, have been agreed upon within the Consortium agreement before the start of the project. The SMALLDERS IPR strategy follows the cyclic process given in Figure 1.
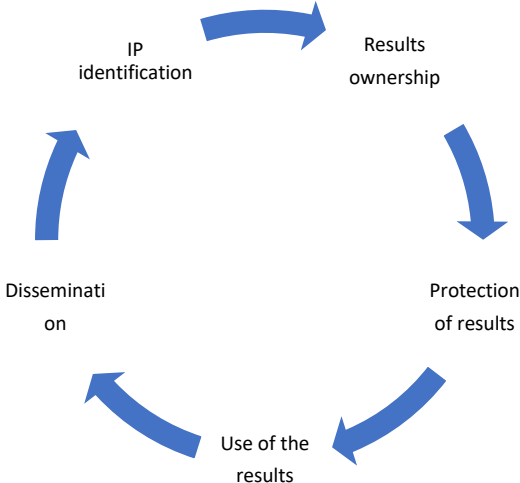
Figure 1. SMALLDERS IPR strategy

Project results, applications, and methods will be owned by the partner that achieves those specific results. In the case of results obtained jointly by two or more partners, results, applications, and methods will be jointly owned. It is worth mentioning that each partner receiving an innovative result for which IPR may apply must formally notify the project coordinator, pointing out, if needed, specific requirements for the use of the IPR (other partners will be duly informed and will have time to object to the state IPR).

Details about the IPRs management and freedom of action of each partner are detailed in the Consortium agreement.

4.1   Identification of ownership structure and needs for protection

Results are owned by the Party that generates them. See CA 8.1.

4.2 Commercialization of IP

The SMALLDERS project is characterized by relevant marketing potentials that, thanks to dedicated exploitation (described in D9.4 of WP9) and future industrialization, can lead to:

- **A commercialization push**: the project foresees the design and development (up to TRL 6) of the SMALLDERS platform that comprise entirely new methodologies and models as well as already available concepts and technologies (e.g., that start at TRL 4) that the partners have already investigated and used in previous research projects. Using both new toolsets and adding new features to already developed concepts and demonstrators helps reduce the future time to market and industrialization phase.

- **New business opportunities**: as reported in Section 2.2.4 of the Project Proposal, the SMALLDERS platform foresees a future roadmap for entering the market that is based on open-source licenses for the public administrations (under the idea that the SMALLDERS platform can be released as part of the Software ReUse catalogs for Public Administrations" that are available in many countries, including partners' countries). This is part of a more elaborate exploitation strategy that also sees the involvement of spin-off and start-up companies to join the marketplace and succeed.

The revenues are focused on the following:

- **Installation**: Systems installation and settings is one potential revenue. Details are provided in Deliverable 9.4.

- **Personnel and any User Training**: professional and educational training kits. The training can be organized in 4 ways: Face-to-face training, Distance learning,

Blended training, and Self-learning Programs. Details are provided in Deliverable 9.4.

- **System Maintenance**: System maintenance and hosting can be one potential revenue. Details are provided in Deliverable 9.4.

5   Conclusions

This deliverable D1.4, about the knowledge and innovation management plan of SMALLDERS, has described exploiting the potential of the project innovation and knowledge for various smallholders and other supply chain actors. The second objective was to provide management with access to several key technologies and methodologies practically and effectively. The SMALLDERS platform will ensure the sustainable exploitation of the project results. The innovation management plan's pillars are: (i) identifying the project outcomes tackled and detailed in WP1 (Project Coordination and Management); (ii) continuous monitoring of the adequateness of project progress vis-à-vis the business opportunities and environmental needs via coordination of the WP2 (SMALLDERS Framework Design; (iii) integration of knowledge from various smallholders in various countries in WP4 (New Business Model in the Smallholders' Supply chain) and WP8 (Integration, Testbeds implementation, and evaluation); and (iv) setting up an adequate IPR management strategy in WP9 (Dissemination, Exploitation and, Long-Term sustainability). In the project, different WP will apply the directive described in this deliverable. In particular, WP9 (Dissemination, Exploitation, and Long-Term sustainability) will exploit the knowledge and innovation findings.

As a result, the document summarized the legal boundaries in the project Consortium Agreement regarding generation, ownership, and access rights to project results. An IPR strategy and repository were proposed and will be updated during the project life,

listing all project results with their respective owners and the conditions under which these results are available for exploitation to project partners or third parties.

References

Akinlosotu, J., Jidong, D., & Omolayo, B. (2016). Transforming research findings into commercial products using technological innovations for national development.

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