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| **Work Package Number** | "**6**" | | | **Start/End Month**[[1]](#footnote-0) | | | | \_\_/\_\_ | |
| **Work Package Title** | Agriculture Risk Management | | | | | | | | |
| **Lead Beneficiary[[2]](#footnote-1)** | LIST | | | | | | | | |
| **Participating organisation Short Name\*\*** | ULIEGE | UOH | UCHILE | | IAV | INRA | IAAA | | AURA |
| **Total Person Months per Participating organisation:** | 4 | 18 | 9 | | 21 |  |  | |  |
| **Objectives:**  Better climate risk management can help farmers’ ability to adapt to climate change. Adaptation challenges are significant, since current farmers’ climate risk management systems are insufficient to address climate change. Agricultural insurance is a financial protection granted to agricultural investments. It allows farmers to minimize the financial implications of production variability, and protect income from the catastrophic effect of losses from extreme weather events. Agricultural insurance can be used, in combination with other climate risk management measures, to strengthen the resilience of agricultural systems (conservation agriculture, supplemental irrigation, selected varieties and plants, crop diversification, etc.). Agricultural insurance, as a tool for managing climate risks, is expected to gain momentum in Africa due to climate change, with enormous development potential. The profession of farmer is a risky trade, much more than most trades, because of its dependancy on climate which he does not control and also on the evolution of the market price which he controls very little (if at all). This can sometimes put the farmer in a very difficult situation to the point that he may go bankrupt or find himself in a situation of poverty that prevents him from continuing his activities. The globalization of the world agricultural production system, the new demands of consumers towards healthier and environmentally friendly food production and climate change have all accentuated this uncertain production framework which can lead to a fatal outcome. This demands the development of a reframed food production industry. The risk management is not something different from management of other aspects of a farm, every farm management decision has risk implications. Agricultural insurance nevertheless remains a precarious and largely untapped sector due to the insufficiency or rather the inexistence of suitable insurance products. The overwhelming majority of farms are deprived of any form of protection against weather hazards. Indeed, many challenges must be overcome, such as the lack of depth and quality of yield data and / or meteorological data, the absence and / or reliability of weather stations, low subsidies granted to premiums, lack or insufficient structuring of the agricultural insurance ecosystem (the organization of insurance, the existence of cooperatives, etc.). Solutions must therefore be found to remedy these various constraints, but also to create an insurance model, at national or regional scales, but adapted to local conditions, and drawn from contextualized international experiences (private, public or caritative insurance, index insurance, blockchain insurance, catastrophe funds, etc.).  The objective of our project is to lead to a more resilient agriculture which will be able to restart regardless of the harvest or production of the previous season. The assumption of this WP6 is that farmers do not consider enough the risks they take when they decide their production activities and that a better knowledge of the taken risks and the acquisition of risk reduction methods would give them keys to be more resilient.  The objectives of this WP are  1) Improve the assessment of production risks taken by farmers.  2) Propose methods to reduce production risks.  3) Propose and develop new indicators and tools for financial risk analysis in agriculture.  4) Develop effective strategies to manage the different kinds of risks in agriculture with particular attention to the feasibility of agriculture insurance, on the whole value chain, including agricultural insurance.  **Collaboration Objectives**: Effective knowledge transfer between partners during secondments and workshops and trainings on different agriculture risk management methods and tools for the participants. | | | | | | | | | |
| **Description of Work and Role of Specific Beneficiaries / Partner organisations broken down and listed into numbered tasks including the following details:**  **Task 6.1 “Develop methods and tools to improve the assessment and forecasting of production risks taken by farmers”**   * Total number of Person Months allocated to secondments=18PM: "9PM (UOH), 8PM (IAV), 1PM(ULIEGE)" : * Use of historical data (satellite images, climate, etc.) and machine learning techniques for characterizing and analyzing trends on crop production across a region, followed by developing forecasting techniques to enable the development of risk reduction techniques (UOH). * Use of new tools for tools and agricultural insurance (Index based agricultural insurance , BlockChain agricultural insurance, etc.) * Analyze and characterize the effect of different production technologies and infrastructure (equipment or building) on the uncertain scenarios due to geography, climate, consumer trends, for different crops to construct tractable measures of investment risk. * Improve crop early warning systems by integrating available market information (activity shared with WP5) as new explanatory variables of crop yield. * Analyse the financial risk in agricultural investments, find a way to merge profitability and risk into a common indicator and explore partnership opportunities like Public Private Partnership. * Propose approaches to develop these new indicators to analyze the financial risk in agricultural investments.   **Task 6.2 "** **Develop methods and tools to reduce/mitigate production risks** "   * Total number of Person Months allocated to secondments= 18PM: "9PM (UOH), 8PM (IAV), 1PM(ULIEGE)" : * Develop agronomic risk reduction techniques (seeding of different crops, diversity of varieties, seeding at different times, selection of crops adapted to the present and future climate and soil conditions, etc…) * Assess the Conversion impact of CAPEX (equipment, buildings) for farmers to the OPEX for an easier adaptation to the highly changing context of production (avoiding farmer's overburden) through a several methods (Monte Carlo simulation, portfolio optimization, etc.). * Development of adapted and sustainable Fodder/Crop insurance systems in order to switch a climate/market risk to into a financial one !!! * To handle risks (dynamic consumer behavior, weather risks and climate change) by designing of optimization under uncertainty models and temporally adaptive agriculture strategies in order to. Our models need to be flexible in order to handle potential reshaping in the food production industry. (UOH) * Develop risk management strategies in agriculture to ensure a balance between the gain in protection (possible loss) and the potential profit which is usually given up. Generally, farmers would like to avoid major losses, but would also like to be in a position to benefit from favorable events. The goal is to develop strategies and tools for managing financial risks in agriculture without sacrificing profits. * Assess the possibility of developing common strategies against production, management and financial risk   **Task 6.3 "** **Agriculture Risk Management** "   * Total number of Person Months allocated to secondments= 7PM: "5PM (IAV), 2PM(ULIEGE)" : * The objective of this task is to prepare a report that summarizes all the tools and methods that can be used to manage agriculture risk. From the first two tasks, we will have a global and clear vision on the best methods and tools that will allow to reduce and mitigate the risk in agriculture. The report will also analyze international initiatives in the field of crop insurance (Agriculture InsurTech, Global Index Insurance Facility, digital solutions, financing mechanisms, etc., and Agriculture Stress Index System). | | | | | | | | | |
| **Description of Deliverables:**  D6.1 Technical report on “methods and tools to improve the assessment and forecasting of production risks taken by farmers” prepared in co-autorship  D6.2 Technical report on “methods and tools to reduce/mitigate production risks” prepared in co-autorship  D6.3 Technical report on “Agriculture Risk Management” prepared in co-autorship  D6.4 Annual Workshop on Risk Forecasting and Management with researchers and local stakeholders.  D6.5 Generation of data repository to be shared across participants  D6.6 Hands-on Course / Lectures/ trainings on risk management for local producers  D6.7 Training on weather risk management and agricultural insurance.  ~~D6.7 Generation of a recommendations report / tool set for local producers~~  … | | | | | | | | | |

1. **Start/End Month** refers to months of the project not calendar months [↑](#footnote-ref-0)
2. **A "lead Beneficiary" must be a Beneficiary (= organisation established in a MS/AC)** and cannot be a TC Partner organisation [↑](#footnote-ref-1)