SKIM

Strengthening Knowledge Management for Greater Development Effectiveness in the Near East, North Africa, Central Asia and Europe

Morocco Country Source Book

Best Practices and Innovations in Knowledge Management assets, tools and approaches

Edited by Pr. Ait El Kadi Kenza, Dr. Zebakh Sanaa and Dr. Akramkhanov Akmal

SKIM
Strengthening Knowledge Management for Greater Development Effectiveness in the Near East, North Africa, Central Asia and Europe

ICARDA
Science for resilient livelihoods in dry areas

IFAD
Investing in rural people

Institut Agronomique et Vétérinaire Hassan II
IAV

Ecole Nationale d'agriculture - Meknès

Institut National de la Recherche Agronomique

Office National du Conseil Agricole

The Morocco country sourcebook is produced in the framework of the Morocco learning routes organization planned for June 2022.

SKIM Moroccan partners (IAV Hassan II, INRA, ENA, and ONCA) and various socio-economic partners presented several case studies regarding the knowledge management chain, starting from creation to valorization.

This sourcebook has been designed following the PROCASUR methodology and inspired by the Sudanese and Moldavian available sourcebooks.

Pr. Ait El Kadi Kenza and Dr. Zebakh Sanaa coordinated the compilation and edition of the Morocco country sourcebook in close collaboration with Dr. Akramkhanov Akmal, coordinator of the SKIM project.

June 2022

ACRONYMS AND ABBREVIATIONS

AMCEF	Moroccan association of strawberry export packers
AMPFR	Moroccan association of soft fruit producers
APIA	APIculture Agriculture
CGIAR	Consultative Group on International Agricultural Research
ENA/ENAM	Ecole Nationale de l'Agriculture-Meknès
FSA	Farm sustainability assessments
IAV Hassan II **IAV HII** **IAV**	Institut Agronomique et Vétérinaire Hassan II
ICARDA	International Centre for Agricultural Research in the Dry Areas
IFAD	International Fund for Agricultural Development
INRA	Institut National pour la Recherche Agronomique
KM	Knowledge Management
MEL	Monitoring, Evaluation and Learning
MESRI	Ministry of Higher Education, Research and Innovation
MLR	Moroccan Learning Route
ONCA	Office National du Conseil Agricole
ONSSA	Office national de sécurité sanitaire des produits alimentaires
PGR	Plant Genetic Resources
SKIM	Strengthening Knowledge Management for Greater Development Effectiveness in the Near East, North Africa, Central Asia, and Europe
SDG	Sustainable Development Goals
UM6P	Université Mohammed VI Polytechnique
UN	United Nations

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I. PROJECT PRESENTATION

SKIM
Strengthening Knowledge Management for Greater Development Effectiveness in the Near East, North Africa, Central Asia and Europe

SKIM in few words

SKIM project is initiated by ICARDA with IFAD financial support involving the following partners: IAM Bari (CIHEAM), Procasur, and Virginia Tech. The countries benefiting from the project are Morocco, Moldova, and Sudan.

This project facilitates and supports the growth of knowledge management and capacity development operations within the Near East and North Africa (NENA) and Central-Eastern Europe and Central Asia (CEN) regions.

Started in 2018, the specific objectives of SKIM project are given the following Box01:

Box 1: Objectives of the project:

i. Assess capacity and enhance knowledge management skills of key rural institutions and other stakeholders in Moldova, Morocco, Sudan (with the possibility of including two more countries);
ii. Foster and promote knowledge exchange in the country, cross-country, and trans-regional partners to foster knowledge uptake, transfer, and management.

Ending in March 2023, SKIM has organized several activities such capacity building sessions, workshops, and support on the KM tools (MEL tool). The project particularity lies in its flexibility to adjust the activities to the context and needs of the beneficiary countries.

Project Background

The SKiM project sets the following priorities:

- ✓ Support the sharing/dissemination of existing knowledge with a focus on strengthening capacity and the transfer of agricultural and rural solutions already considered "best practices" by farmers when tested and proven under local contexts. The knowledge garnered from this will be expanded upon and supported through strengthened capacity development at the level of public institutions;
- ✓ The project will strengthen institutional capacities in KM across the project region so that knowledge can be shared and disseminated more effectively to end-users/stakeholders;
- ✓ KM and dissemination will be achieved through the appropriate assessments, identification of KM capacity gaps, and prioritization of learning needs; and
- ✓ Knowledge dissemination for this project will be modelled on three thematic areas (financial inclusion of rural women and youth; natural resource management and climate resilience, and productive agricultural technologies) which are relevant to the strengthening of development effectiveness in the project countries.

KM in a variety of country contexts has well-recognized value, while some components (such as knowledge generation, capturing etc.) focus on KM either explicitly or implicitly. Although many organizations realize that knowledge is a great asset, they often lack to integrate KM in organizational processes. On the solutions supply side, the most of interventions in rural poverty reduction programs focus on supporting local and/or traditional knowledge or new innovations. Despite efforts from research, extension, and development programs to develop solutions, knowledge transfer is often mentioned as an obstacle to the sufficient use of existing or proposed innovations. In this context, this grant program applied the "Learning Route" methodology developed by PROCASUR. "Learning Route" (LR) methodology is a capacity-building tool with a proven track record of successfully integrating local knowledge and experiences with innovation and best practices from the field that have scaling-up potential.

The LR is based on the idea that successful solutions to existing problems in rural areas already exist, and that these solutions can be adapted and spread in other contexts. Across several continents and multiple rural contexts, the LR has shown to be a powerful method to foster capacity-building through peer-to-peer sharing of knowledge and face-to-face interactions.

The Contribution of SKiM to Moroccan KM in agriculture

The project in Morocco, one of the target countries of the SKiM project supported by IFAD grant program, has been implemented to facilitate stronger links for managing the knowledge and tools that have been built in recent years to promote access to financial services, improved access to and management of agricultural and water management techniques.

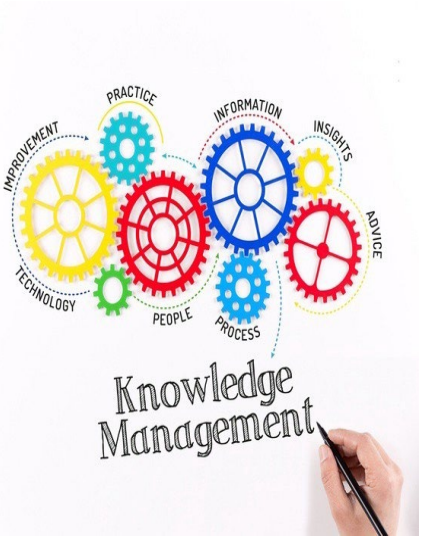
The Moroccan partners of SKiM project organized a workshop to discuss the KM strategy to be implemented at the national level.

Furthermore, higher education and research agricultural institutions (IAV, ENA, INRA) and the national extension office (ONCA) agreed to sign a framework agreement to formalize the knowledge management in agricultural sector. The purpose of that agreement is to identify the terms of collaboration for ensuring the knowledge transfer via ONCA.

Moroccan partners also participated in several workshops and training sessions organized by SKIM.

INRA is implementing an internal tool for KM inspired by the ICARDA MEL tool.

The SKIM project is a promising initiative for Moroccan partners to develop their vision and support actions for a better internal flow and more efficient sharing and use of their knowledge products.



II. LEARNING ROUTE AS AN IMPORTANT TOOL OF KM IN MOROCCO (MLR)

In Morocco, SKiM project focused on promoting up-to-date knowledge, practices and activities that enhance employment and entrepreneurship in agriculture. Successful case studies and lessons learned in Morocco were introduced as learning tools and guidelines for consultation when making interventions/programs within rural development. Gender-sensitive approaches, youth employment, family entrepreneurship, and farm-to-table approaches were incorporated as fundamental pillars of project activities in Morocco. The project does not only focus on content aspects (such as knowledge available) but also on practical aspects that incorporate practices and institutions and support the reform of current systems as required.

Morocco lacks a national strategy in KM in the field of agriculture; however, each institution belonging to the ministry of agriculture has developed own internal KM processes. In this regard, **Morocco country source book** has been developed to assemble six Moroccan cases that can facilitate "Bridging science and practice in agriculture". The sourcebook intends to inform the audience and the target groups of this project implementation about experiences in the country. Case studies were carefully selected through multiple consultations processes among stakeholders to ensure inclusivity and consideration of different aspects of KM and thematic areas on the SKiM project.

The target group is country institutions dealing with agricultural and rural solutions. Potential institutions for inclusion in this project include key decision and policy support agencies, departments, and units housed or associated with

different Ministries such as Ministries of Agriculture, Environment, or Water, and Rural Planning Institutions that are responsible for rural welfare, natural resources management, and agricultural production.

The organization of the learning route in Morocco aims to present to Moroccan and international partners participants best practices in the KM, focusing the whole chain of innovation. Indeed, the visits will start by presenting institutional arrangements regarding KM in higher education and research institutions (IAV, INRA and ENA) as well as in extension agency (ONCA).

The first set of institutions are producing knowledge through either research activities, expertise or capitalizing on end-users and stakeholders returns. ONCA, is one of the last chain links, holds the responsibility of sharing knowledge on the field. The designed program of the MLR considers several SDGs as presented in the following figure1. In addition, the case studies are located in different regions in Morocco which differs from their climate and soil conditions, economic development and agricultural specialties.

The MLR itinerary is planned from Chefchaouen - located in the Northern region of Morocco receiving about 880 mm of rain annually- to Marrakech in the South, suffering from drought with 240 mm/year. The objective of the visits aims at sharing the adaptation process of local stakeholders to different constraints regarding their agricultural and economic activities.

The genebank visit in Settat witnesses the government preoccupation regarding the management of biodiversity mainly through the conservation of local resources.

The university UM6P presents a new modern university model that is fully integrated into social and economic context. The university has developed within few years a high-quality level of training and research as well as entrepreneurial and innovation activities. An incubated start-up focusing on the quinoa valorization will be visited as well.

Finally, the agro-industrial sector is introduced through two different case studies. Apia shows how a local company started a few years ago from scratch, led by an engineer, and has now become an international company for local product valorization, employing thousands of people in different locations in Morocco and abroad. The second case concerns the cluster innovation mechanisms supporting women's cooperative, helping their empowerment and inclusion in society. The table 1 highlight the main topics to be discussed during each study visit, and table 2 shows a Cross-table of cases and thematic areas.

Figure 1 : Morocco learning route meeting the UN SDGs

Table 1 : Main discussion issues to be highlighted during the study cases visits

Case study	Visit	Points to highlight?
1	Institutional arrangements in knowledge management for the Moroccan agricultural sector	- Difference of KM according to institution type? - Digital tools for KM? - How to collaborate to improve KM at a national level?
2	Successful Operation of APIA, A National Company for the Promotion of Local Products: Notably Honey and Cosmetics products	- How to succeed a new business at the local level? - From local to international? - What is the strategy of APIA in terms of product innovation? - What is the flow process of KM in a big company such Apia? - Is there links with academic actors?
3	Bridging the gaps between academic research and practical farming	- What are the success factors for the farm growth? - How KM is ensured with universities and research centers? - How do you assure your visibility? - What is the process of adopting new technologies or farming processes?
4	Genetic Resources Management Strategy for Sustainable Agricultural Development in Morocco	- What is the Moroccan strategy for genetic conservation? - How is managed the genebank center? - How is valorized the genetic collection stored in this bank? - What links with international gene banks?
5	Community Engagement and Entrepreneurship in agriculture: Scaling up a sustainable ecosystem	- How is community engagement operated within the university? - What are the key factors of success for the innovation strategy implementation? - What are the means to ensure Sustainability in agriculture within the university plans? - Startup experience in incubation?

6	Development of the value chain of the aromatic and medicinal plants in the Marrakech-Safi region	- What is a cluster and how does it work? - Links with the cooperative and academic sector? - What is the main impact at the regional and national levels? - What are the challenges to overcome for a cluster success?

Table 2 : Cross-table of Cases and SKIM Thematic Areas

Case study	Institutional KM process	Natural Resource Management	Agriculture and livestock productivity	Gender and youth
1	✓			
2			✓	✓
3			✓	
4	✓	✓		
5	✓	✓	✓	✓
6	✓		✓	✓

Figure 2 : Map of Morocco learning route itinerary

Table 3 : Learning route agenda

Day	Time	Activity	City
Monday June 20	09h - 11h	Welcome ceremony in INRA Rabat ***Case study 1: Institutional arrangements in knowledge management for Moroccan agricultural sector: IAVH2, ONCA, INRA, ENA.*** ***Discussion***	Rabat
	14h-15h30	Visit of APIA Company (honey and cosmetic products) ***Case study 2: Successful Operation of APIA, A national company for the promotion of local Products: notably honey and cosmetics products***	Kenitra
	16h-18h	Visit red fruit farm ***Case study 3: Bridging the gaps between academic research and practical farming*** ***Discussion***	Larache
Tuesday June 21	11h30-13h30	Visit to Apia cooperative 2 ***Case study 2: Successful Operation of APIA, A national company for the promotion of local Products: notably honey and cosmetics products*** ***Discussion***	Ouazzane
Wednesday June 22	9h30-12h30	Visit of provincial agricultural directory (Canabis products extraction – Mr. Amine Karama DPA) (Chefchaoune) **2h: for discussion of 3 case studies**	Chefchaoune
Thursday June 23	10h-11h	Visit of the genetic bank ***Case study 4: Genetic resources conservation: a tool for sustainable agricultural development***	Settat
Thursday June 23	14h-17h 30	Visit of the University Med VI polytechnic de Benguerir ***Study case 5: Community engagement and entrepreneurship in agriculture (incubators, startup creation; agribusiness master)*** ***Discussion of the case study 4 and 5***	Benguerir
Friday June 24	09h30-12h30 15h30	Visit of the Marrakech cluster for aromatic and medicinal products" Marrakech, Health & Beauty Valley" ***Case study 6: Development of the value chain of the aromatic and medicinal plants in the Marrakech-Safi region*** ***Discussion.*** Visit of women cooperative: Extension services benefiting to Women empowerment in agriculture	Marrakech

III. MOROCCAN PARTNERS PRESENTATION

INSTITUT AGRONOMIQUE ET VÉTÉRINAIRE HASSAN II

(IAV Hassan II)

Who are we?

Polytechnic center of multidisciplinary expertise, IAVHII provides initial and continuing education of specialists in life and earth sciences and technologies (Engineers, Veterinary Doctors and Doctors of Agronomic Sciences).

The competencies of IAVHII extend to the following fields:
- Agriculture and agricultural resources
- Rural development and spatial planning
- Environment and management of natural resources
- Agro-industrial transformation
- Services associated with agricultural production, distribution, and commercialization - Plant, animal, and microorganism biotechnologies
- Veterinary public health

Priority directions/areas of expertise

IAV Hassan II is an institution of higher education and executive training as a polytechnic center of multidisciplinary expertise in the fields of agriculture, including agronomy, horticulture, veterinary medicine, surveying, rural engineering, and food industry. Moreover, IAV Hassan II is an active player in the deployment of the National Strategies of Training and Agricultural Research (SNFRA) and plays a crucial role in the deployment and support of the objectives of the new strategy of the agricultural sector Generation Green 2020-2030, especially in terms of the development of the human factor through training, research, innovation, and knowledge.

More information: https://iav.ac.ma/

ECOLE NATIONALE DE L'AGRICULTURE DE MEKNÈS

(ENA)

Who are we?

The National School of Agriculture of Meknes (ENA) is a Moroccan public institution of higher agronomic education in the following specializations:

- Fruit growing, Olive growing, and Viticulture
- Agro-Economic Engineering
- Development Engineering
- Animal Productions and Pastoralism
- Plant and Environmental Protection
- Sciences and Techniques of Plant Production

Priority directions/areas of expertise

ENA contributes to scientific research and agricultural and rural development through studies and projects carried out within the framework of the competence themes of ENA's teacher-researchers with internal or external funding and national or international public or private collaborations and partnerships. It has several laboratories and an experimental farm of 60 ha allowing it to carry out various training and research activities. ENA offers various assistance and consulting services through its structures of Interfaces with the professional world especially in the fields of production and development of the olive tree (Agropole-Olivier), management of soil fertility and crop fertilization (FertiConseil), crop protection (PhytoConseil). It also has a center dedicated to continuing education and support for agricultural and rural development (AGRODEV).

More information: http://www.enameknes.ac.ma/

OFFICE NATIONAL DU CONSEIL AGRICOLE

(ONCA)

Who are we?

Established in 2013, the National Agricultural Advisory Office is responsible for steering, coordinating, and monitoring the implementation of the agricultural advisory strategy at the national level as well as implementing the government's agricultural advisory policy. The National Office of the Agricultural Advisory has 4 main missions, namely

- The agricultural advice
- The accompaniment of the professional organizations
- The support of the actions undertaken by the other actors of agricultural development
- To ensure the role of interface between training and research

Priority directions/areas of expertise

The national strategy of the Agricultural Advisory Office considers partnership as an essential vector for the development of agricultural advisory services. One of the major challenges this strategy is to mobilize all the actors involved in the agricultural advisory system to coordinate and pool resources, skills, knowledge, experiences, and working methods. Thus, during the period 2014_2019, ONCA has signed 32 partnership agreements with various partners, 19 of which were concluded with professionals and 13 with research, development, and training institutions. These agreements are broken down into specific agreements at the regional level (e.g, partnership agreement with the Federation of Chambers of Agriculture in Morocco FECAM broken down into 12 specific agreements with the Regional Chambers of Agriculture).

More information: http://www.onca.gov.ma/

INSTITUT NATIONAL DE LA RECHERCHE AGRICOLE

(INRA)

Who are we?

The National Institute of Agricultural Research's "INRA" mission is to undertake agricultural development research. The origin of INRA remotes back to 1914 with the creation of Morocco's first official agricultural research services. It has recently undergone a structural reorganization aimed at modernizing its management process.

Priority directions/areas of expertise

INRA's research projects are defined with the participation of partners, clients, and regional prescribers. They are conducted within thirty research units hosted by the Regional Centers. They are supervised at the central level by ten scientific departments with a disciplinary vocation. INRA undertakes its R&D and expertise activities in the following fields through its 10 regional centers:

- Cereals sector
- Food legumes sector
- Annual oilseeds sector
- Forage sector
- Olive tree sector
- Citrus sector
- Date palm sector
- Arboriculture and viticulture sector
- Market gardening sector
- Red fruit sector

More information: https://www.inra.org.ma

IV. CASE STUDIES FROM MOROCCO

CASE STUDY 1: Institutional arrangements in knowledge management for Moroccan agricultural sector

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Introduction

Knowledge-based economy has been a smart decision for many developing and emerging countries, which have witnessed a significant increase in their development indicators.

Academic institutions, recognized as the principal knowledge producers, have witnessed an evolution over the last few decades in terms of their contribution to the society's development. Indeed, academic institutions are responsible for training new skills, generating knowledge through their scientific research activities, and also contributing to local and regional development through their role as entrepreneurial universities.

Knowledge management is of central importance in higher education and research since it deals with the process of knowledge creation and dissemination within these institutions. As Bartlett & Ghoshal (1995) argued, better knowledge management and use can have more value than capital. If knowledge is not managed, an organization will not operate effectively. Successful knowledge management affects the overall quality and efficiency of learning and research, retains the most talented professors and researchers, fosters the development of new curricula, enhances financial performance, and meets the community's needs.

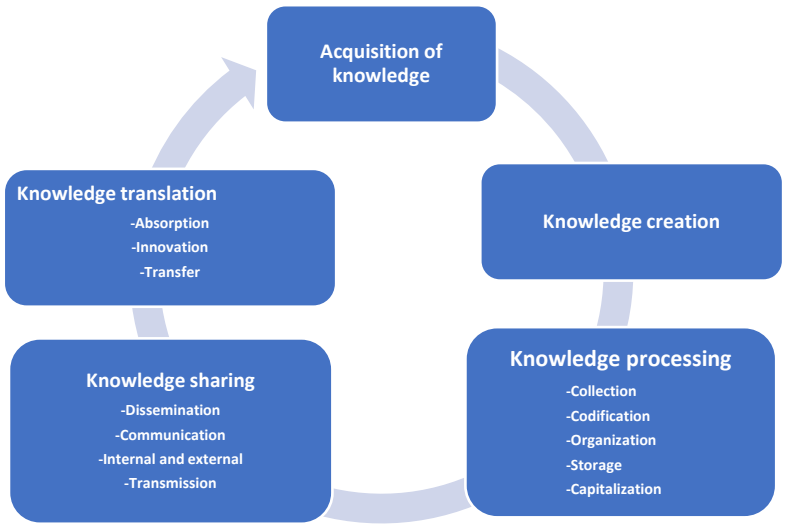


Figure 3 : Knowledge management process

It is therefore, it is important to stress that the ability to translate the knowledge into actions is the critical stage of the knowledge management cycle. (Pfeffer, 2000) considers that an organization's performance does not lie in the knowledge capital produced but rather in its ability to turn it into actions.

I. KM in Moroccan Higher institutions

In Morocco, studies on knowledge management in universities are not abundant. In Morocco, studies on knowledge management in universities are not numerous. The need for KM strategy and process implementation became evident mostly after the voluntary departure campaign of 2005, which led to a massive departure of the experienced professors, employees and managers, impacting organizations and their knowledge capital.

Considering the agricultural sector, the national higher education, research and innovation active actors are mainly institutions that are not part of universities such as IAV Hassan II, INRA, ENA and ENFI; universities, private institutions and ones created through public-private partnerships.

Within the framework of the SKIM project, the partner institutions are mainly those under the supervision of the Ministry of Agriculture. We will thus present the experience of these institutions in terms of knowledge management according to the type of organization.

In 1942, the Ministry of Agriculture and Fisheries (MAPMDREF) founded the first engineering-qualified school in agriculture, the National School of Agriculture of Meknes (ENAM). ENAM was succeeded in 1966 by a larger school (in terms of specialties), the Hassan II Agronomic and Veterinary Institute (IAV), and two years later by the National Forestry School of Engineers (ENFI). The research institutes in agriculture and fisheries, namely INRA and INRH, are the most important research centers at a national level. They contribute to specific research agenda to meet in priority local needs and hold several partnerships at national and international level.

In 2013, MAPMDREF implemented an independent Office National de la Vulgarization Agricole (ONCA) to support extension in the agricultural sector.

The knowledge transfer is mainly achieved through continuing education or direct expertise to farmers and industries. Several structures, such as the Agropole "Olivier", were created during the last decade to connect industries with the academic sector and promote regional entrepreneurship.

KM source funding is almost ensured through government funding. Except from INRA, research activities carried by IAV and ENAM are carried through calls for proposals launched at national or international level.

Several actors are involved in the KM at national level. The Relationships between the stakeholders of the higher education and research system can be summarized as follow:

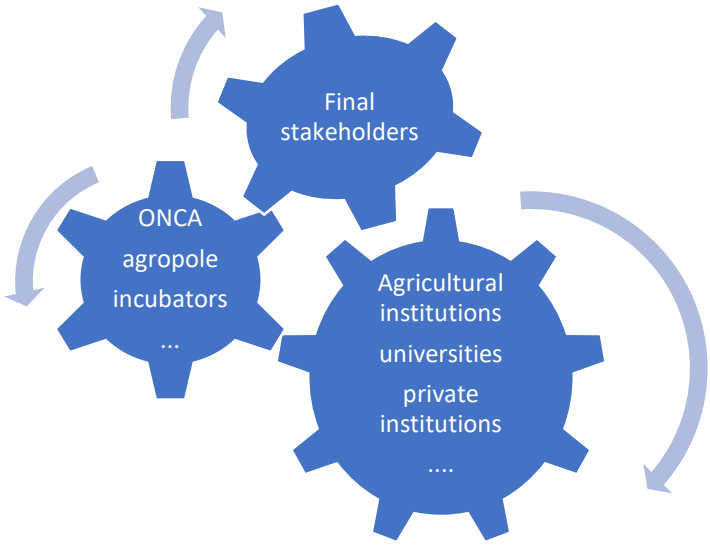


Figure 4 : Main actors involved in the agricultural KM in Morocco

1. **<u>KM at Higher education and research institutions: IAV Hassan II & ENA</u>**

These two institutions each capitalize on approximately 60 to 70 years of knowledge creation. The scientific research activities are mainly carried out as part of the final thesis for engineering but also through the joint doctoral program hosted by the IAV Hassan II. both institutions are very active in the ground through direct expertise with farmers, co-operatives or enterprises as well as thorough trainings for their employees. these activities create a significant flow of knowledge that is mainly materialized in dissertations, doctoral theses, publications and patents. Both institutions also have to their credit several national scientific journals that allow Moroccan and foreign researchers and PhD students to publish their articles.

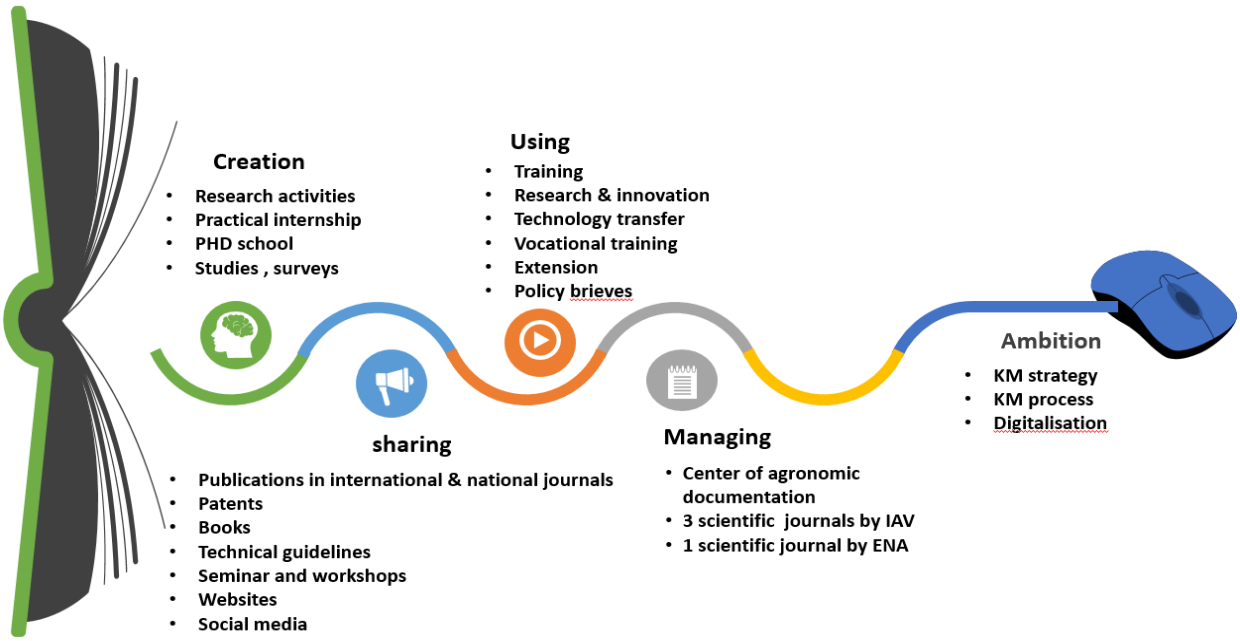
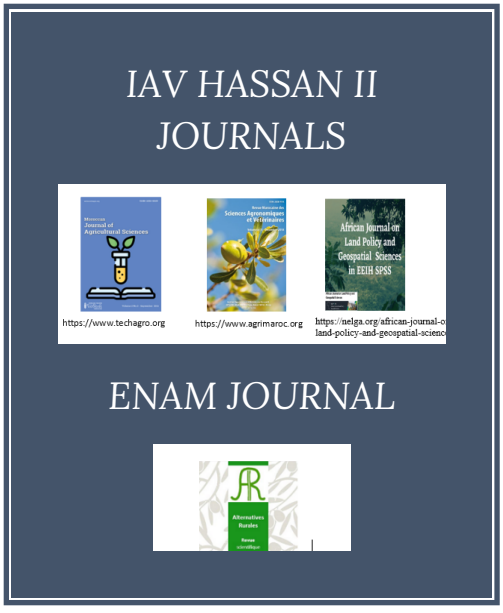


Figure 5: KM Process at IAV Hassan II and ENAM

1.1. Scientific Journals



The scientific journals edited by IAV Hassan II (3) and ENA (1) are peer-reviewed and indexed in several online portals (IMIST, International Standard Serial Number), libraries (Centre de documentation Méditérranéen du CIHEAM-IAMM, university of Saskatchewan library), directories (Directory of open Access Journals, Reseau Mirabel) and databases (Google Scholar, Agora).

The study carried by Zebakh & al., on the international visibility and citations of the IAV journal REMAV demonstrated that 44% of articles are submitted by authors of foreign origin, mainly from North Africa and sub-Saharan countries. Moreover, REMAV references are cited 227 times by articles published in Scopus.

1.2. Documentation centers and e-learning platforms

The two schools manage their own libraries that collect all the documents, thesis and books they produce and external sources.

The IAV Hassan II has hosted since the 80s, a national agricultural documentation center. This center offers over 9000 thesis (3 000 thesis on internal platform, around 20 000 Training reports, and more than 70 Books edited by IAV). Online access to several international databases such as AGORA is also available. An Integrated Library Management System (ILMS) help keep track of IAV documents inventory and loans. Moreover, IAV Hassan II is implementing a production center for e-learning and multimedia tutorials.

ENAM hosts a training and support center for rural development, aiming to produce audiovisual media on educational materials and new innovations.

Several structures deal with research, expertise, innovation, and technology transfer and connect stakeholders with IAV and ENAM.

*-**ENAM** : Olive agropole , laboratory for diagnostic and control of crops pests and stored goods 'PHYTOCONSEIL), laboratory for soil, plant and water analysis (FERTICONSEIL), Pedagogical Farm, etc.*

*-**IAV Hassan II** : university veterinary hospital center, laboratories of soil, plant , food analysis, equine clinic, etc.*

2. KM at Research institution: INRA

INRA is a public institution under the supervision of the Ministry of Agriculture with the mission of ensuring sustainable agricultural development and natural resources use through knowledge generation and technology creation.

The process of varietal creation at INRA is quite developed. To summarize the achievements in this field, INRA has a portfolio of 232 varieties in the official register, of which seed companies hold 154 varieties, i.e., 57.3%. Between 2009 and 2019, 31 new varieties were added to the Official Catalog, mostly cereals and legumes. New varieties are also protected for citrus and olive. With regard to crops with endemic and high added value, INRA has created six (6) varieties of the argan tree and eight varieties of cactus for the regeneration of plantations ravaged by the cochineal (INRA, 2019). Also, INRA contributes to the safeguarding of the world's genetic heritage through the repository of 983 accessions in the Svalbard World Seed Reserve in Norway (INRA, 2020). Through its 24 research units located in 24 regional research centers, INRA has a research strategy adapted to national and regional needs.

2.1. KM process

KM organisation at INRA

INRA has, without a doubt, the most organized process of agricultural education and research establishments. Indeed, a dedicated structure "division of information & communication" is dedicated to knowledge management both internally and externally (farmers, national and international institutions, ONCA, enterprises, cooperatives, professional organizations, etc) in collaboration with the different entities of INRA.

2.2. Knowledge products

INRA produces several products that are shared at internal and external levels. INRA is editing scientifc books, reports, technical leaflets, scientific papers, communications, and documentation about procedures , etc. INRA initiated Alawamia journal, in 1961 but stopped in 2012. This journal was edited again in 2020 under the name African & Mediterranean Agricultural Journal-Al Awamia.

It is important to mention the platforms and databases produced by INRA in collaboration with national and international institutions, which mainly focus on soil fertility maps, climate change impact simulators, and crop monitoring modelling. Platforms are available on line for free uses.

3. KM at Extension institution: ONCA

The National Agricultural Advisory Office (ONCA) is mandated to manage, coordinate and monitor the development of the agricultural advisory strategy at the national level as well as to implement the government's policy in the field of agricultural extension.

3.1. ONCA services

The Office is represented nationwide with more than 300 Agricultural Extension Centers, 50 provincial services, 12 regional offices, 3 central offices, and headquarter offices. The main objective is to implement a locally-based agricultural advisory system, guided by an integrated approach focused on results and impact. Services are offered to wide stakeholders and end-users' actors mainly represented by single farmers, association of farmers, cooperatives, professional associations. Industries, etc.

Training	*Digital advising*	
School fields	*Consulting Caravan*	*Study*

3.2. ONCA extension channels and tools

The ONCA provides farmers and agricultural advisors with a set of technical and economic information documents for each sector and for each of the country's regions (paper and online), as well as detailed technical sheets to guide farmers in developing their projects. Communication channels and tools are diverse and adapted to each end-user such: ONCA Website; Technical brochures, guides and Dalil elfallah- Flipbook; Broadcasting spots (TV and radio); ARDNA platform; Interactive platforms: "knowledge base" and "face agri"; Info center online; social media, youtube, ONCA TV; Storytelling; Extension caravan; Online trainings on the platform to 650 agricultural advisers.

II. Challenges to KM in Moroccan agricultural institutions

Although higher education and research institutions are making efforts in the area of KM, they are facing several challenges:

- Lack of vision and KM strategy at the national level;
- Coordination between institutions is not formalized regarding KM;
- Absence of initiative to capitalize on Tacit knowledge;
- Missing KM appropriate tool and process;
- Limited number of dedicated staff to manage knowledge
- Needs of training programs on KM and incentives
- Low attention is given to Copyright and Intellectual propriety;
- Unregular links with end-users;
- Low dedicated budget to implement KM.

III. Inspiring best practices

Strategy workshop on knowledge management in the agricultural sector in Morocco & KM collaborative agreement

On July 8 and 9, 2021, the IAV Hassan II hosted a workshop on development of a knowledge management strategy in the agricultural sector. This workshop is organized by the SKIM project, which aims to support knowledge management and capacity development activities in the Near East, North Africa (MENA), and Central, and Eastern Europe regions. The Moroccan consortium of agricultural institutions IAV Hassan II, INRA, ENA and ONCA met to coordinate their vision and to plan future common actions aiming at improving their internal KM and KM impact at national level in the framework of the new green generation policy for agricultural development in Morocco.

Partners have a strong will to collaborate for an efficient KM in agriculture at a national level. they decided to sign a specific agreement regarding KM at national level. The draft of the agreement focuses on the following pillars:

- Focus 1: The implementation of a knowledge transfer strategy,
- Focus 2: The development of an action plan for knowledge transfer,

CASE STUDY 2: Successful Operation of APIA, A National Company for the Promotion of Local Products: Notably Honey and Cosmetics products.

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1. Introduction, Background and Situation Analysis

Agriculture is one of the most important sectors in Morocco. Many people make their living through agricultural practices and the direct sale of their goods. With the advent of the Green Morocco Plan (GMP) in 2008, agriculture has taken center stage. The local products and services with the idea of adding value to the community as a whole. One of the objectives of GMP is improve the living conditions of over 3 million rural populations. Over the past few years, Various organizations have come together over the past few years to facilitate this plan.

At APIA (APIculture Agriculture) the adventure began 25 years ago when we opened our first shop. In the 1990s, we decided to create a food market that would support our local community and meet the needs of Moroccan consumers. We committed to relying on exceptional quality from local producers, artisans, and farmers following the model of "fork to farm" agriculture.

Today we succeeded the opening 14 stores in Morocco. Our business model guarantees quality for our consumers and affordable prices. As a result, the local customers are our biggest supporters. Our cooperative has been able to combine BtoB and BtoC practices over the years. We continue to support our small farmers through services and several essential products. Apia is proud to contribute to

the Green Morocco Plan by supporting the beekeeping value chain. We are a supplier of beehives, bee colonies, various beekeeping tools, and equipment. We also provide practical training in the field of beekeeping. Currently, APIA has ten beekeepers and 2 arborists on site.

In this report, we will outline our methodology and manufacturing policies. We will also outline our network of distribution.

2. History and Experience in Beekeeping

APIA has come a long way since its founding in 1998 by Abdelilah Daoudi. Mr. Daoudi is an agricultural engineer and beekeeper. His wife, Dr. Mohssine El Hassania, Ph.D., is a professor at the Hassan II Agronomic and Veterinary Institute in Rabat and specializes in bee genetics. They both created APIA, initially specialized in honey production which now evolved to the production and selling of various products from honey, olive oil, packaged olives, aromatic and medicinal plants, various jams, and argan oil. Today, APIA is a cosmetics company that invests in food and therapeutic supplements. One of the Innovative products is the cough syrup made from royal jelly, pollen, and propolis.

Figure 6: First APIA store in Ouazzane (1999)

3. Target Group and Beneficiaries

The geographical spread of 14 APIA sales points helps connect to various clients. APIA offers a variety of Business-to-Business marketing options through its network of partners (hotels and restaurants). We organize continuous training for farmers and beekeepers. More recently, APIA has expanded into pharmaceutical distribution. Our goal is to market and promote the company's products in the dietary supplements and food service industry.

Figure 7:Meetings and trainings with the beekeepers (2001 & 2008)

4. Essence of the Case Study

What activities and results/achievements have been made?

APIA has been developing a broad product range of food products. Almost 400 food products and at least 300 cosmetic products are on the market.

APIA is engaged to certify all products. ISO22000 for food products, and ISO22716 for cosmetic line. All APIA products are approved for exports according to FDA and ISO. In addition, the local certification is available with more than 15 local agreements and authorizations from the ONSSA.

We purchase raw materials locally and limit the number of intermediaries. Furthermore, we developed a new concept of restaurant based on local products use.

What are the tools applied to reach the purposes?

The scientific research and innovation techniques have greatly contributed to solving several problems. For example, Morocco has experienced a massive bee extinction. Many beekeepers have suffered a loss of 40% of their bee populations and were forced to stop their activities. Apia practiced effective bee colony control thanks to many years of experience, worldwide benchmarking and the latest scientific knowledge.

5. Our Partners

What networks are you part of?

APIA is member of the Menara Cluster (case study 6). Suppliers help us fixing our approach based on research and development. New ideas and innovative solutions are exchanges within cluster partners.

APIA is subscribing to “Les Terroirs Marocains” as a digital platform presenting online cooperative products.

6. How do you ensure visibility, promotion, and knowledge management?

The basis of our success relies on marketing, quality of packaging, customer service, communication with suppliers, diversification of commercial offers and a

commitment to our business partners. Innovation is a key component to ensure quality of our production and services such as the "Bag in Box", a special packaging that preserves all natural olive oil components. Digital marketing and social media are frequently used to communicate with our clients. Development of new restaurant well located in rural region contribute to enhance the rural tourism as it is the case of Ouazzane restaurant.

7. What are the Sources of Funding?

APIA relies on banks funding and some institutional support. In 2006, Apia benefited from a financial contribution from the European Union to create a margin recycling system to manage olive oil waste. Currently, APIA is considered as a friendly environmental enterprise.

8. What is Your Successful Experience?

Branding and Consumer trust - In 1998, the APIA cooperative was created. A few years later, in 2000, we implemented our first industrial unit in Ouazzane. dedicated to olive oil manufacture.

Industrialization and ISO Certification - In 2001, we opened our first center of distribution located in Rabat- Agdal followed by a second industrial unit in Kenitra. From 2012, we diversified our product and added cosmetics. Today, our facilities are certified organic/ECOCERT (for our Argan Oil), FDA approved, and ISO 22000/ISO 22716 compliant.

Figure 8: APIA Argan oïl Facilities (2022)

Opening Our Band of Stores - By 2015, Apia had opened 14 stores located at the main Moroccan cities: Casablanca, Rabat, Marrakech, Tangier, and many others.

Figure 9:Location of APIA Activity Shop and factories

Expansion into New Markets - In 2020, APIA launched ecotourism and catering activities through the opening of a restaurant in Ouazzane. Many other projects are yet to come in this area.

Figure 10: APIA Restaurant in Ouazzane

Promotion of a Local Economy – Apia future strategy aims at involving more farmers to our cooperative and launching new product brand entitled "local products." In this way, we can attest to our clients the credibility of local products.

APIA's Historical Timeline at a Glance:

1998: Creation of the APIA cooperative
2000: Implementation of an olive oil factory in Ouazzane
2001: Opening of our first Rabat Agdal store
2008: Installation of our specialized industrial unit in Kénitra
2009: Opening of our first storefront in Casablanca – Anfa Boulevard
2012: Opening of our 2nd shop in Casablanca - 2 Mars district
2012: Diversification of production, cosmetics products
2014: Opening of the in Marrakech store
2015: Opening store in Agadir and Tangier
2016: Integration of APIA into the "Union des Cooperatives, les Terroirs Moroccan" (UCTM). APIA's separation of the commercial activities from the agricultural upstream.
2016: Opening of a storefront in Tangier at the Hilton hotel
2019: Opening of a shop at the railways station of Tangier and Rabat Agdal
2020: Opening of the APIA restaurant in Ouazzane
2020: Opening of a 3rd shop called "APIA Casablanca," at the Morocco Mall

9. What are the main challenges?

Since large-scale retailing was difficult, APIA focused on selling directly to consumers. We are attentive to our clients and develop products according to their needs.

We intend to further develop and expand our company's national and international networks . This means improving our production capacity through constant monitoring and upgrading of the production tools.

Furthermore, we are committed to transparency with our customers through an open-door approach. As a result, customers can visit production facilities and experience how our products are manufactured. We strive to provide quality and authentic products to our customers through Research and development projects.

APIA is ready to expand its restaurant market. We want to start a local chain of refined gastronomy-focused restaurants. We are also excited to offer ecotourism in Ouazzane, a region rich in resources but presently lacking the tourist infrastructure.

10. What Lessons Can We Draw?

- The key strategy for us is to create value for our business while being conscious of our impact on agriculture.
- Marketing is a strong lever for growth, and our brand is the company's greatest asset.
- We are constantly looking for new market opportunities, which can arise rapidly, and we anticipate much competition. Currently, more than 10,000 cooperatives have been created under the Green Morocco Plan.
- In our view, the focus on product diversification is a strong signal to our customers. A continuing commitment to innovation is one of the key drivers of our business. However, we acknowledge that the export of products, although very attractive, is a complex business model. It requires a lot of investment and an effective business structure.
- Finally, we believe that a family-owned business model is always more solid over the long term. Today, Mr. Daoudi's whole family participates in business affairs. For example, his son Mehdi handles APIA's operations, Rayane deals with social media marketing, while Samy, the junior, is devoted to studying industry administration. We are optimistic about the future as a family.

CASE STUDY 3: Bridging the gaps between academic research and practical farming

Authors: Pr. ABOUABDLILAH Aziz* (ENA of Meknes), Mrs. EL MIDAOUI Kenza (BerryNOVA), Pr. EL AMRANI Mohammed (ENA of Meknes), Pr. ABOUDRARE Abdellah (ENA of Meknes)

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1. Introduction, background, situation analysis

Morocco has known a significant evolution in berries production during the last decade. The total area cultivated reached 9650 hectares in 2020/21 divided between strawberry (3500 ha), raspberry (3100 ha), and blueberry (3000 ha). The total production volume achieved 201,300 tons in the last year mainly destinated to the export sector. 90% of raspberry volumes and 100% of blueberry volumes are currently exported. As for the strawberry, it is mainly produced for processing, with approximately 65% of the total volume destinated to the frozen fruit industry and 25% for the fresh export market. The local market absorbs only about 10% of the production.

Moroccan red fruit producers have focused on improving their crop practices, which have allowed them to enter the markets of the five continents. The

European Union represents 90% of Moroccan red fruit exports in the last two years. On an economic level, the evolution of red fruit exports in fresh and frozen/frozen form today represents a source of foreign currency for the country worth 6 billion dirhams per year. The sector plays an important social and economic role in increasing state revenues and creating jobs. Ministry data indicates that the red fruit sector provides more than 10 million working days, half of which are in the Rabat-Sale-Kénitra region. At the organizational level, a Moroccan interprofessional soft fruit federation, Interproberries Maroc (IPBM) was created in January 2018.

Berry cultivation in Morocco first began in the north of the country, bringing together favorable pedoclimatic conditions, good land availability, and abundant water resources with the development of irrigation. Strawberry production is concentrated in the irrigated areas of Gharb (78 %), where it spread from the 1980s, and Loukkos (22 %), where it was initially introduced. Production is primarily situated around Moulay Bousselham, thirty or so kilometers south of Larache. The first raspberry and blueberry trials also started in this zone, where the majority of production is concentrated at present, though cultivation of these berries is also developing further south (Agadir, Souss Massa). This zone is characterized by a semi-arid climate enabling good performances and rapid adaptation to cropping requirements. Production can be a year-round activity.

2. What is your history? Past experience in the field?

Berry-NOva farm establishment was in 2018 when three friends came together and decided to start a berries farm in the region of Larache. All three of them are agricultural engineers so passionate about farming. So, they have chosen to cultivate raspberry. In the first year, the farm area was 5 hectares of land they rented and cultivated with two red raspberry varieties: Adelita and Lupita. In the second year, 3,6 hectares of adjacent land were added to the farm, from which 2,5 hectares were cultivated with strawberries, the rest of the surface was cultivated with two

different varieties of red raspberries: Yazmin and Maravilla. In the third year, the surface dedicated to strawberries decreased by 1,5 hectares in favor of raspberry while keeping the same varieties as the previous year.

3. Who are your target group and beneficiaries?

Our target group is the fresh strawberry and raspberry market, along with the frozen fruit companies. Beneficiaries are also students and interns in the agronomy field. BerryNova Farm aims mainly to produce high-quality and nutritional berries for consumers while also hosting and integrating students and newly graduated youth who want to learn about strawberry and raspberry production.

4. Essence of the case study. What activities and results / achievements have been made? What are the tools applied to reach the purposes?

BerryNOVA is a farm specializing in the production of high-quality raspberries and strawberries. Over three years of activity, we produced more than 400 tons of high nutritional berries exported to European markets. This achievement is the result of a long and determined work in which many components are involved. On the agronomic level, we work continuously on sustainable and rational fertilization and pest management practices so that we can supply the plants with the exact requirements in order to be healthier and more productive while preserving the farm's ecosystem in. o achieve the latter, improve our production technics, and be more efficient, we carry out many fertilization, irrigation, and disease management trials. Further, we organize training courses for workers and pickers on the farm regarding personal hygiene and hygiene in harvesting and handling products.

5. Who are your partners and what networks are you part of?

Our partners include actors in the fresh berries market (Driscoll's, Felgar), frozen berries factories (such as Messem, Dirafrost, bestberry), nurseries that provide us

with plant materials (Driscoll's nursery, Planasa), companies of the agrochemical industry (BASF, Syngenta, Bayer, UPL), companies of biocontrol solutions (Koppert, Biobest), The national office for food safety (ONSSA) and many other actors in the agricultural sector.

6. How do you ensure visibility, promotion and knowledge management?

Sales promotion of our product is mainly ensured by our partners such as Driscoll's, which provides us with plant materials in the first place and manages the relationship with the European market in the second. As for the local market, we receive potential buyers to whom we present our fruit; thus, we negotiate the selling price based on fruit quality, and quantity.

As for knowledge management, we established a system of collecting and documenting every operation executed on the farm. Technical and managerial decisions are made following an organizational structure (see chart). Furthermore, being a part of large network of berries farmers in the region, we are continuously kept in touch with each other in order to share valuable organizational insights, successful experiences, and failures and to reduce redundant work. We also are switching to digital farming by using new smartphone apps for storage management, labor management and irrigation scheduling.

7. What are the sources of funding?

The establishment of BerryNova farm was self-funded by the three associates who created the farm. For the purchase of inputs, suppliers offer a payment facility of up to 90 days after the invoice issue date.

8. What is your successful experience?

Our successful experience is that we managed to produce good quality, highly nutritional, and tasty fruit. Also, we achieved better yields in both raspberry crop and strawberry, in which we reached the higher yield per plant exportable for fresh market in the region of Larache this year. The core of our success is hard work, perseverance, and mostly creating and keeping an effective and healthy work climate.

9. What factors have facilitated and posed obstacles for the experience? What are the main challenges?

The main challenges that we deal with regularly are:

- ✓ Managing healthy plants, high yield, and good quality fruit in the context of a dynamic system affected by weather, insects, and diseases.
- ✓ Coping with the increasing pressure from climate change and biodiversity loss directly impacting our farming practices and productivity.
- ✓ Stay resilient against global economic factors, like fluctuating commodity prices and trade issues.

One of the topmost of these challenges is managing workers. Whatever control we have over production at the farm, it is achieved through people. The connection between employee productivity and farm profitability is direct and obvious.

10. What lessons can we draw? What can we learn from your experience?

- ✓ In our experience, we went from no organization or collection of pieces of information and no documenting of experiences to a more organized model where almost every single step made at the farm is documented and that made a huge difference in our management and our results. We must say that without the access to managed knowledge, every situation is addressed based on what the individual or group brings to the situation with them. With access to managed knowledge, every situation is addressed with the sum total of everything, anyone in the farm has ever learned about a situation of a similar nature. it allowed us to reduce redundant work, to avoid reinventing the wheel per se, and to be more efficient in making decision.
- ✓ Many circumstances seem to be beyond our control. However, as we learn to accept little disappointments in life and be patient, we realize that there may be a bigger reason as to why the original plan did not work out and that maybe, a bigger outcome is in store for us. Farming teaches us patience. Patience to accept what was, what is and what will be. And if we ever fail, patience also teaches us to start and wait all over again.

Youssef Ammar "Investor"

BerryNova farm was an idea that came to mind when I was in my third year as a student at IAV. I remember visiting one of the earliest berry farms in the region of Larache as a student, I was so impressed by their work, and I said to myself that one day I would establish my own farm as an agronomist to bridge my academic knowledge and real-life farming practices, and that is why I am along with my two friends and partners, Ammar Youssef, Investor the owners of the farm.

Lamrahli Douae, "Messem"

Our strength as a frozen fruit company is the relationship with our suppliers such as BerryNova farm. We select only farms that fulfill specific requirements in terms of food safety and hygiene. We engage our suppliers in Farm sustainability assessments (FSA) program with the aim of moving towards sustainable production of agricultural products… Our strategy is to keep supporting small farmers because we believe they are the future. Lamrahli Douae, Technical sales & Sustainability Manager at Messem.

CASE STUDY 4: Genetic Resources Management Strategy for Sustainable Agricultural Development in Morocco

Authors: Otman Sebbata* (INRA) & Abdelali Mouaaid*(INRA): Agricultural knowledge Management specialists
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1. Introduction. Background. Situation analysis

Seeds and plants collection have been practiced in the old days, particularly by farmers. But only about sixty years ago, countries became aware of the need to set up genuine conservation policies to deal with the intensification of crops, with a particular interest in species and varieties that were not directly useful or of little economic interest.

In the seventies, this mobilization at the global level resulted in the creation of several international centers of genetic resources conservation, notably under the aegis of the CGIAR (Consultative Group on International Agricultural Research). Research centers conduct breeding programs on cultivated species for developing countries. For this purpose, they manage large quantities of plant genetic resources in gene banks. These centers have proven their value, especially in the aftermath of wars and conflicts.

Market disruptions caused by health or political crises, in addition to the impact of climate change, are pushing for increased local resilience, productivity and diversification of species. This is only possible with strong mechanisms for

conserving genetic resources, which are the basis for balancing ecosystems and ensuring diversified, sustainable and quality agricultural production. Plant genetic resources consist of the diversity of cultivated and wild relatives' species, some of which can be used in selection by crossbreeding. It is important to conserve the diversity of genetic combinations, created or developed over time, in a wide variety of environments, as this is a pool from which to create new varieties.

Morocco is one of the richest countries around the Mediterranean in terms of genetic resources of food and agriculture. However, these genetic resources are threatened by overexploitation, destruction and fragmentation of habitats, introduction of invasive species and pollution.

2. What is your history? Past experience in the field

To meet this challenge, INRA is mandated by the public authorities to preserve and sustainably use genetic resources for food and agriculture. This mission is further affirmed by the recently promulgated law n°81.21 (April 2022).

But before 2002, the national germplasm was maintained in storage facilities at different INRA's units under risky conditions that resulted in the loss of many accessions. Following the adhesion of Morocco to the International Undertaking on Plant Genetic Resources and the adoption of the Global Plan of Action on Plant Genetic Resources, INRA has developed a gene bank at Settat Regional Research Center for medium and long-term conservation in 2003. A duplicate of all the genetic material held by different INRA's units were transferred to this platform as well as Moroccan origin accessions repatriated from international organizations. Thus, for several years, INRA has been undertaking prospection and collection missions with the main objective of ex-situ conservation of genetic material in the form of seeds in cold rooms at the gene bank that shelters now about 70 thousand accessions, and in the form of living collections at INRA's research stations.

To strengthen this conservation platform, INRA launched, in July 2020, the construction of the new National Centre for Genetic Resources (CNRG). This new Centre, which will have a storage capacity of 200,000 accessions, will make it possible to preserve a copy of existing accessions and to be enriched by new acquisitions and will also include animal genetic resources and micro-organisms.

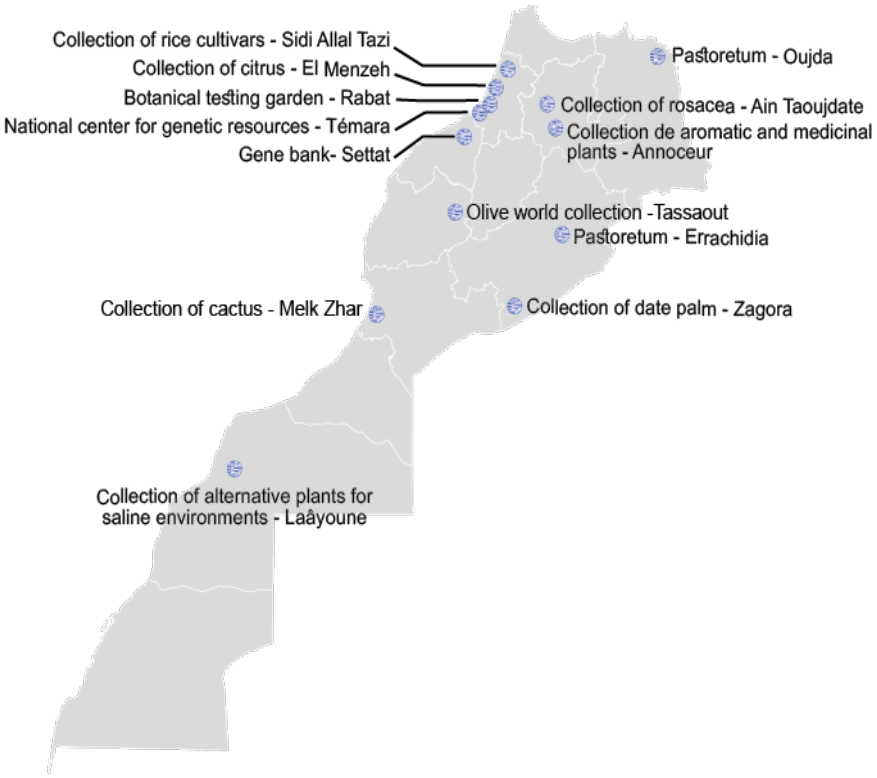


Figure 11: INRA ex-situ genetic collections of great interest

Figure 12: Settat Gene bank

3. Who are your target group and beneficiaries?

Genetic resources are a very valuable heritage that must be safeguarded and preserved, and that wild accessions and related species are vital for the development of new crops by selecting traits capable of coping with increasingly difficult conditions due to climate change. The Moroccan Green Generation strategy 2020-2030 considered conservation of biodiversity as a priority for sustainable agriculture in Morocco for the next decade. The beneficiaries are globally all the society especially farmers as end users and breeders as research and development.

4. Essence of the case study. What activities and results / achievements have been made?

The essence of this case study is to present the Moroccan experience in conservation and management of Plant Genetic Resources (PGR) that consist of implementing a strategy based on the FAO Global Plan of Action relevant to conservation, sustainable use, policies, and building capacities. The main activities and expected results of the strategy are mainly : (i) to promote the exchange of PGR, information sharing of relevant data between holders and users at national and international levels ; (ii) to set the conceptual bases for the development and adoption of national policies and legislation, as appropriate, for the conservation and sustainable use of PGA; (iii) to strengthen national programs including research, education and training on the conservation and use of PGR and to enhance institutional capacities.

5. What are the tools applied to reach the purposes?

Research activities on genetic resources at INRA are generally structured in five areas, including acquisition, characterization/evaluation, maintenance, use and management of collections.

The prospecting, collection and conservation of genetic resources are justified by the desire to counteract the loss, potential or actual, of genetic diversity on the field. This may be reflected in the disappearance or scarcity of old local races or old varieties that are supplanted by modern high-yielding varieties.

After prospecting and collecting genetic resources, characterization and evaluation related to the traits of interest is the first step in the exploitation of genetic variability. The objective is to optimize their management, conservation and use in breeding and genetic improvement programs.

Genetic resources stored in gene banks lose their viability, and their quantity decreases over the years. It is therefore imperative to multiply and/or regenerate the stored germplasm to ensure it conservation at acceptable levels. In terms of collection maintenance, Settat gene bank has regenerated almost 40% of its stock since 2003. The main multiplied species are cereals and food legumes.

Information related to conserved germplasm, both that of identification (passport), storage and that generated by characterization and evaluation is always voluminous, varied and complex. An information system is an unavoidable tool for the management of all generated data within the framework of the legal regulations and in compliance with the standards of traceability of exchanges.

6. How do you ensure visibility, promotion and knowledge management?

The conservation and management of genetic resources are promoted through national events with progressive farmers and officials of the ministry of

Agriculture (workshop and face to face and open days visit to the site). At international level, scientific events are organized with stakeholders and users.

At INRA level, several Management Information System tools were implemented to ensure Gene bank information sharing with national and international for scientists and decision makers.

7. What are the sources of funding?

Genebank is supported mainly by public fund and some collaborative projects with IPFRI and CGIAR.

8. What is your successful experience?

In the following, we will deal with three scenarios that we consider to be success stories in terms of using biodiversity for Sustainable Agricultural Development in Morocco:

EXAMPLE 1

Varietal diversification to control hessian fly (*Cecidomyiidae*)

The left plot is devastated by hessian fly

Through varietal creation, Moroccan farmers benefit from a vast potential of genetic diversity, of which INRA is involved with about 250 varieties. The cross-breed varieties, obtained from genetic mixing made possible by the prior maintenance of a large collection of existing varieties, are selected to adapt to environmental and biological conditions and to technological uses.

Plant breeding contributes to providing farmers with a wide genetic diversity that meets their needs. The weakness of Moroccan cereal production was always mainly related to the combined effects of drought and attacks by hessian fly, in addition to other cereal diseases. The frequency of droughts has increased over the last three decades. In unfavorable areas, the devastating effects of drought and hessian fly attacks are generally attributed to drought alone. Droughts at the beginning and middle of the cycle are more devastating because they favor the pullulation of hessian fly populations and intensify their attacks.

Several methods have been tested to hessian fly control in Morocco. Some practices can influence the attack degree, such as the sowing date, or other cultivation or chemical methods but had not given significant results at the farmer level. For this reason, genetic control was the only feasible, most economical and most sustainable way to control this pest.

In Morocco, the research of genetic control solution began in the 80s and now, INRA has produced several wheat varieties resistant to hessian fly. These varieties were the first to be developed in the Mediterranean countries.

The methods used for the development of genetic resistance in Moroccan wheat are generally of the conventional type: identification of the sources of resistance, and introgression of the resistance genes into adapted genotypes through long-term hybridization programs.

Figure 13:Field demonstration and INRA catalogue of varieties

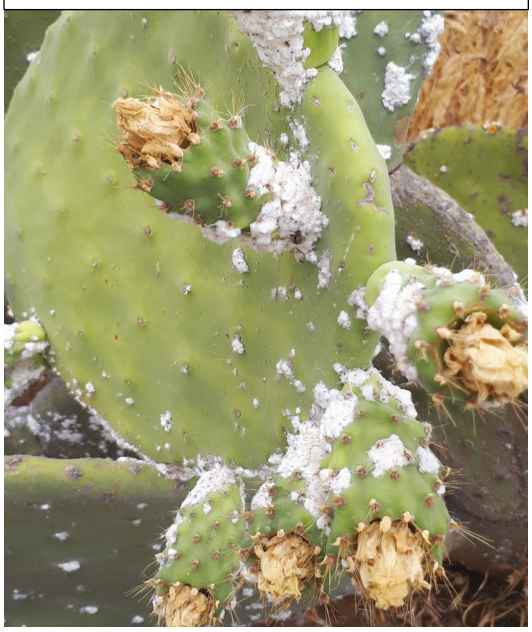
In terms of impact, the creation of hessian fly -resistant varieties has resulted in an annual gain of US$20 million for Moroccan agriculture. These varieties allow grain yields to be increased by 2 to 3 times compared to susceptible varieties.

EXAMPLE 2

Biodiversity conservation to rescue Moroccan cactus value chain

Cactus is a crop of great ecological and socio-economic importance and is perfectly suited to the development of the arid and semi-arid zones of Morocco. During the last decade, cactus has been surrounded by great interest and has benefited from the support of the Ministry of Agriculture and the interest of farmers. However, these supports were curtailed with the appearance, for the first time in 2014 of a wild and devastating cochineal; Dactylopius opuntiae. The cochineal spread rapidly and unpredictably, completely wiping out the cactus in certain areas where this crop is practiced for centuries.

Cactus attacked by cochenial



In the absence of any means of control, the Ministry of Agriculture set up a national emergency plan in 2016. In parallel to the chemical treatments, uprooting and burying of totally infested plants, the program considered a research component entrusted to INRA which consists of three main control axes: biological control, the use of biopesticides and the selection of resistant material to the cochineal. All these lines of research have produced encouraging results. But the selection of resistant cactus varieties was the most important achievement that was quickly adopted as an effective solution.

What is interesting in this success story is that the collection, whose first prospection and collection operations date back to 1999, covering the entire Moroccan territory from the desert to the mountains, came to the rescue of this crop. The selection work has indeed led to the identification of eight resistant varieties to the cochineal, all of which have undergone tests to verify the stability of their resistance and have been released.

Figure 14: Cactus collection under anti insect nets at the Melk-Zhar research station

Figure 15:The eight released varieties of cactus

EXAMPLE 3

Nadorcott (Afourer): The mandarin that exports the best Moroccan taste to the world

The variability of citrus fruits is considerable; it concerns both pomological and organoleptic characteristics and resistance to biotic and abiotic factors and opens very broad perspectives for the use of genetic resources in varietal improvement. INRA's collections of citrus germplasm have been installed since the 60s in the main citrus-growing regions of Morocco, particularly in INRA research stations at El Menzeh in Gharb plain and Afourer in Tadla plain. These collections, which contain more than 500 citrus accessions, preserve the diversity of citrus trees and other genera in the long term, and benefit the creation and selection programs of new varieties and rootstocks. In fact, several citrus varieties have been selected from these collections, notably the Nadorcott mandarin, which has marked the history of Mediterranean citrus.

In 1981, the variety was discovered by Nadori's research team, among seedling trees of the Murcott mandarin, which had certainly been crossed with another variety. Trials were carried out with citrus farmers. But by 1985, all the farmers had pulled up the variety, which contained a lot of pips. That could have been the end of the story for this variety! Except that in 1988, Nadori (then working with "les domaines agricoles" a Moroccan Agribusiness Company) noticed that the fruits out-of-season were seedless. He realized that the variety was self-incompatible, which he confirmed the following year with net isolation trials.

Nadorcott was then selected and planted for the first time by 'Les Domaines Agricoles'. It was a beneficial collaboration between INRA and this company that

made it possible to develop this variety of mandarin, which was announced to the world in 1990 at the World Fruit and Vegetable Fair (MOFEL) in Nice, France.

9. What are the main challenges Ahead?

Despite significant progress in plant genetic resources conservation, INRA needs to strengthen more its capacities in the field through national collaboration with National Agricultural research system and international partnerships.

In term of technology, recent progress in digital phenotyping and speed breeding will offers a powerful platform and tools to tackle the resource scarcity issue.

10. Lessons learned and conclusion

Biodiversity is an asset for food and agriculture and is a major resource for ensuring food security with quality nutrition. Aware of the importance of genetic resources, INRA has invested in the conservation of cultivated species, as well as crop wild relatives' species through living collections and the gene bank.

Biodiversity conservation is not the concern of agricultural research alone, it is everyone's concern. Biodiversity conservation is first and foremost a public matter. The government must strengthen its efforts to ensure the in-situ conservation of threatened species to defend them from any abusive exploitation or anthropological pressure. It must also strengthen prevention through the management of the introduction and spread of invasive species to reduce and mitigate the adverse effects on biodiversity of the introduction and spread of outlandish plants and other species. Agroecology should be promoted to foster biodiversity within farms. In addition, awareness-raising activities should be carried out for the public to promote the protection of plant genetic resources. These actions will aim to make the entire Moroccan population responsible for the protection of agricultural biodiversity by changing their habits and behavior.

CASE STUDY 5: Community Engagement and Entrepreneurship in agriculture: Scaling up a sustainable ecosystem

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1. Introduction: Background and Situation analysis

Meeting the challenge of feeding Africa on a sustainable basis requires a reliable ecosystem that favors strengthening knowledge generation and nourishing innovation and entrepreneurial mindset among its population. The foundational principle that presided over the creation of Mohammed VI Polytechnic University (commonly abbreviated as **UM6P**) lies within this framework.

UM6P is a non-profit private university with its main campus located in the 1000 hectares of Ben Guerir "Green City" near Marrakesh, a major urban development project to create a model city of sustainability.UM6P's entrepreneurial learning is embedded through the existing master programs and the launch of new ones dedicated exclusively to agribusiness, which benefits from shared infrastructure and resources and expertise.

State of the art education institution:

The new generation university has five founding principles: applied research, innovation and entrepreneurship, addressing Africa's socio-economic development challenges, adopting a partnership approach, openness to the world with a national focus, social equity and merit.

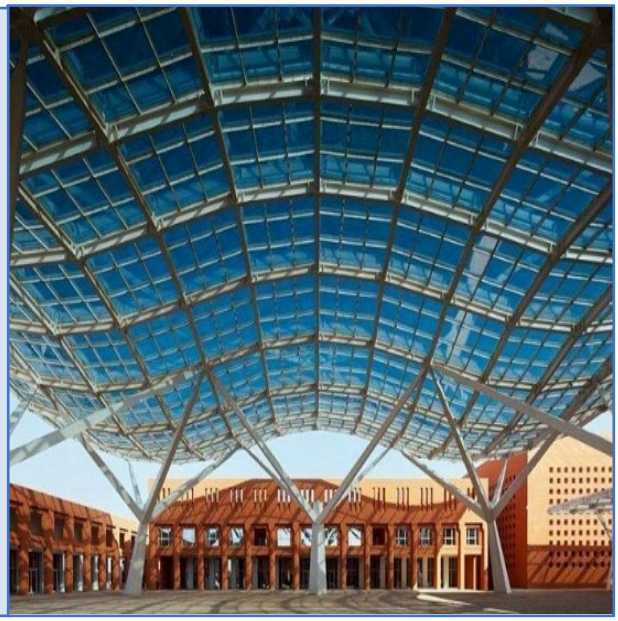
UM6P aims to place itself in the rank of world-renowned universities, especially in social responsibility, food security and sustainable development fields.

The university's building was awarded the international label of Leadership in Energy and Environmental Design (LEED), a first in Africa.

https://sd.um6p.ma/um6p_a_sustainable_campus/For-an-efficient-management-of-resources

As well as The Silver Star accreditation in recognition of UM6P's achievements in the field of Sustainable Development, in its different components: Training, Research, Operations, Planning, Administration and Innovation & Leadership.

https://www.um6p.ma/en/um6p-silver-stars-rating-sustainable-development



2. What is your history? Experience in the field

The university hosted its first cohort of students in 2013 before officially being inaugurated on January 12, 2017. Since then, it has continued to expand to become a leading research institution for collaborations between Africa and Europe. The UM6P, with its regional-oriented branches in Rabat and Laayoune, federates

several schools and research institutes, some of which predate the university's existence.

The university is composed of 11 semi-autonomous schools, grouped around four major research clusters, which are:

- SCIENCE & TECHNOLOGY CLUSTER
- HUMANITIES, ECONOMICS & SOCIAL SCIENCES
- BUSINESS & MANAGEMENT CLUSTER
- MEDICAL & PARAMEDICAL CLUSTER

Among these schools, ESAFE (School of Agriculture, Fertilizers and Environmental Sciences) is the agricultural education flagship of UM6P, known for the uniqueness of its curriculum related to knowledge of fertilizer and soil fertility alongside the entrepreneurial and leadership programs such:

Innovation hours: A hybrid program dedicated to studying fundamentals of innovation management and strategic thinking. Each student is required to design and launch an innovative project during the course

Open Lab hour: program that allows students free access to multiple laboratories on Friday afternoon to conduct tests and experimentation on their prototypes.

Experimental Farm Access: "Learn by farming" approach offers project holders students allocated plots to develop their prototyping.

3. Who are your target group and beneficiaries?

The Mohammed VI Polytechnic University, which will contribute to the training of Moroccan and foreign researchers and entrepreneurs, intends to promote higher education and applied research in Africa through partnerships with the African university fabric, mainly in doctoral training.

4. The essence of the case study: What activities and results/achievements have been made? What are the tools applied to reach the purposes?

The UM6P native startups' ecosystem reflects the pluri-disciplinary scientific & technological curricula of the schools linked to the university, the laboratory facilities, the platforms, the research capacities, and the global network.

The UM6P ecosystem is perceived as the pipeline of knowledge/ideas for incubation and speeding up the transition from lab to market.

The full range of programs covers the specific needs of the startup life cycle from ideation to scaling up stage.

Pcuriosity Lab is an innovation laboratory whose main focus is to unlock the full potential of the inclusive, sustainable and innovative services for rural populations that aim to improve their socioeconomic status, through interaction of diverse and varied clusters, namely: development socio-economic, sustainability, environmental health, access to energy, education, etc.

P-Curiosity Lab runs more than 20 programs with a mission to create innovative solutions in order to overcome the 44 identifies challenges of rural communities, such as access to education, health, clean energy, transportation, agriculture, and financial inclusion.

The innovation process is designed to yield outcome in terms of rural development and community engagement by:

- Providing innovative and radically inclusive services,
- Sustainable and economic value generation.
- Promoting research results in helping researchers transform academic and technological ideas into business solutions.
- Serve rural areas and farmers via consultancy or not-for-profit projects.
- Meeting challenges through social & community innovation.
- Students are incentivized to put their learning into practice by proposing projects to address the key problems faced by Agriculture sector stakeholders in Africa, including farmers, N.G.O.s, government, and industry.

The program has both external and internal Priority Targets.

- **Rural communities**: Create a virtuous circle of services around rural communities (education, health, energy, water etc.)
- **Students, Entrepreneurs, Innovators & Intrapreneurs**: Innovative and customized entrepreneurship programs for the incubation of startups
- **Researchers**: Transforming research findings into viable products and services
- **Institutions & Corporations**: Accelerating innovation through open innovation programs customized to the specific needs, thanks to our expert

- **Explorer**

UM6P Explorer is a tailor-made innovation program in collaboration with M.I.T Sandbox, which provides entrepreneurial education, mentoring, and potential funding opportunities to aspiring innovators and entrepreneurs from the UM6P and other national institutions. The Explorer program offers initial funding in the range of 10.000 MAD to 250.000 MAD* for each team, in addition to matching them with globally and locally experienced mentors in a vast array of technologies, businesses and disciplines to help usher the ventures through their various stages including business plans, customer discovery, early product definition, technology development, intellectual property and legal structure. The culmination of cohorts that last 4-5 months each is an Explorer showcase where groups can put their businesses on display and an opportunity to pitch to a funding board.

https://explorer.um6pventures.com/
*USD/MAD exchange rate is approximatively 9,86

- **U-Founders**

U-Founders programs aim to raise the entrepreneurship awareness initiative for UM6P students and researchers, participate in the valorization of research works, and contribute to the emergence of innovative startups in different fields.

U-Founders deploys awareness modules around:

- Entrepreneurship and innovation
- pre-incubation, where the focus is to reach the market-fit following the testing cycle;
- incubation program, the project reaches a high degree of development maturity.

The timeframe set for the three phases extends from 6 to 24 months. The programs turn around two themes:

- Deep Tech: Combines R & D and breakthrough innovation projects in sectors related to UM6P research agenda.
- Shallow Tech: For innovative projects with high added value from a social or a technological perspective.

- **AgriFoodTech Incubator**

This incubation program is co-founded by I.A.V. & UM6P with the financial assistance of the European Union Erasmus+ program and co-hosted jointly at their respective campuses in Rabat and Ben Guerir.

It matches the goals of the Moroccan government-sponsored schemes to improve rural communities' resilience and boost the entrepreneurial capacity of the young population.

The AgriFood Tech incubator is designed exclusively for the innovation-driven agricultural projects to support early-stage startups through:

- ✓ Business and technical mentoring
- ✓ Capacity building
- ✓ Field trial
- ✓ Fundraising assistance

The incubated startups can boost their development by leveraging UM6P-IAV's vast network in the local business ecosystem and worldwide scientific community.

AgriFood Tech targets startups in various agribusiness, especially:

Smart agriculture, Agroforestry, Agricultural machinery and equipment, Diets and healthy foods, Food waste management, Aquaculture.

https://www.agrifoodtechincubator.com/index.php#about_section

agri-food-tech@gmail.com

- **UM6P Ventures**

The venture capital fund of UM6P represents the university's investment arm and provides seed capital to startups with the potential to scale up. The investment ticket size was capped at MAD 500K (approximatively USD 50K) but reviewed higher after UM6P Ventures partnered with the global

innovation giant Plug and Play (based in Silicon Valley) to co-fund an acceleration program in Agro-Bioscience and Heath tech.

The prerequisites for funding eligibility revolve around four criteria:

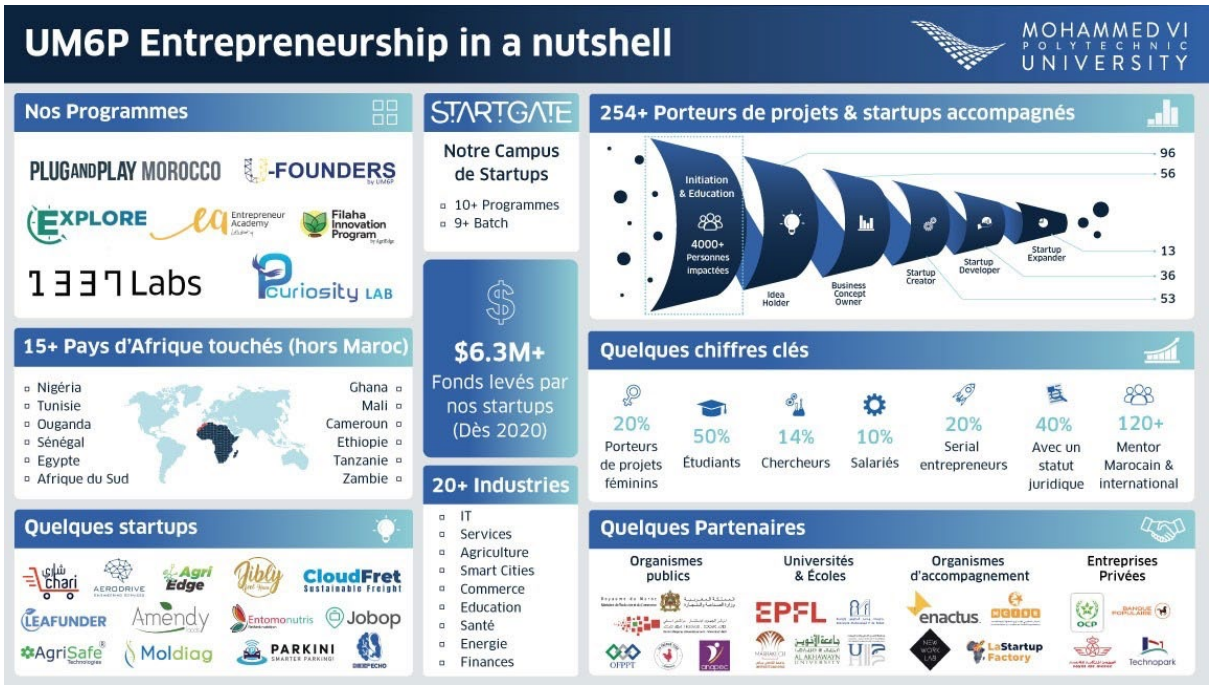
- Skilled and complementary team
- The availability of a prototype or the minimum viable product (M.V.P.)
- The target customer should be identified.
- The project should display high growth potential and genuine competitive advantage.

The joint acceleration program will allow startups with solutions in Agro Bioscience to have access to prototyping, testing, validation and production through the state-of-the-art living lab facilities through the UM6P ecosystem. In addition, the startups benefit from 40+ hours of workshops, 150+ of one-on-one mentoring, and access to Startgate UM6P's startup campus)

https://um6pventures.com/our-governance

5. What achievements have been made?

- More than a dozen programs to support the startups' development.
- More than 15 African countries benefited from these programs.
- More than 254 project holders & startups supported.
- More than USD 6,3 Million was raised by the incubated startups



6. Who are your partners, and what networks are you part of?

The university has numerous national & international partnerships with universities around the globe, including the Massachusetts Institute of Technology, Columbia Business School, Max Planck Society, H.E.C. Paris, Mines Paris Tech, and the École Polytechnique Fédérale de Lausanne, McGill University, and Sciences Po.

UM6P has agreements with many governmental and public bodies promoting entrepreneurship and private investment: Ministry of trade & industry, LaStartup Factory, and Enactus.

Big national corporates and banks: OCP, Banque Populaire, National air liner Royal Air Maroc, Technopark. The university participates in many networks like AgriEngage, RuForum, and A.A.A. Initiative (African Agriculture Adaptation).

7. How do you ensure visibility, promotion and knowledge management?

Comprehensive communication strategy turned entirely virtual when the pandemic crisis hit the country. Social media and the UM6P official websites and digital platforms served as the primary channels for exchanging experiences and knowledge accumulated by the university and promoting the entrepreneurial and innovative framework designed to develop solutions for small farmers and cooperatives and boost the resilience of the agriculture both in Morocco and Africa. As a sense of normalcy in social life is back, the conventional methods are reinstated again, which consist of organizing in presence events like:

- Workshops
- Networking events
- Industry-specific meetups
- Large scale events such as Expo days.
- Hackathons.

8. What are the sources of funding?

The university gets its revenues from research products, schooling fees, land-grant, endowments, grants & subsidies, and the organization of events. It was initially established by the charitable foundation of the state-owned OCP Group.

9. What is your successful experience?

Although the UM6P startup ecosystem is being built just recently, the outcome is promising, with dozens of startups reaching seed and scaling up stages. One of them is Amendy foods, a startup developing quinoa-based food staples.

https://www.youtube.com/watch?v=C1TekNbNeaE

Manal MHADA is UM6P based researcher and co-founder of Amendy foods, a startup developing a full range of quinoa-based food staples. The startup is deploying advanced research and experimentation to adapt the quinoa cropping in the region of Rhamana, known for its unfavorable soil and climate conditions to improve the livelihood of the local small farmers' community.

10. What factors have facilitated and posed obstacles to the experience?

The connections between the multi-disciplinary scientific community supported by an efficient infrastructure, entrepreneurs, and investors help speed up the knowledge sharing and the transition from the lab-to-market process. But issues out of the scope of UM6P still impede the full strength of the experience, such as the limited capital investment industry in Morocco, which is crucial for capital raising, fiscal and legal aspects related to the institutional startup setup that create the enabling environment.

What are the main challenges?

Finding skilled labor, dealing with supply chain efficiency, market traceability & transparency, and spreading the entrepreneurial mindset, especially in rural schools, remains the most challenging problems.

11. What lessons can we draw? What can we learn from your experience?

- ✓ The sustainability-centric model adopted by UM6P in its environmental and social dimensions shapes the whole ecosystem components and contributes to fostering open innovation and entrepreneurial culture among the involved stakeholders in Morocco and beyond.
- ✓ In the meantime, the regional focus is not omitted, as exhibited by various experiences like one in the Laayoune region (desert zone of Morocco), where the development of bio-saline agriculture is the top priority to empower the capacities of the local communities.

CASE STUDY 6: Development of the value chain of the aromatic and medicinal plants in the Marrakech-Safi region

Authors: Mrs FILALI Kaoutar (Cluster Menara Director)

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CLUSTER MENARA
INDUSTRIES DU LUXE AGROALIMENTAIRE & COSMÉTIQUE

1. Introduction of Cluster policy in Morocco:

The MENARA cluster is a Moroccan professional association specialized in the luxury industry agri-food and cosmetics. It has around a hundred members between industries, research centers applied, universities and state institutions. The Menara Cluster is labeled by the Ministry of Industry as part of its support program for the creation and development of industrial clusters.

Founded in 2012 with the ambition to consolidate and improve the competitiveness of the cosmetics industry and agri-food, Moroccan in the national and international markets via a triple dynamic:

- ✓ Creation of value at the local level (MOROCCO) through the implementation of synergies between all the actors of the two sectors,
- ✓ Recruitment and incubation of start-ups, researchers, companies and international investors.
- ✓ Support for Moroccan companies to conquer international markets,

The lever for action of the MENARA Cluster is networking, which generates the signing of partnerships with different types national and international structures. This dynamic makes it possible to strengthen the capacity for innovation of all members, actors of the Moroccan cosmetics and agri-food ecosystem.

2. Our missions and visions

- ✓ Facilitate collaboration between the members of our Cluster,
- ✓ Develop the visibility of the Cluster Menara in global markets in order to increase the Moroccan territory's attractiveness towards national and international investments.
- ✓ Promote innovation in the food and cosmetic industries; Incubate innovative startups;

Our vision is to work in a network to promote good practices, synergies and the performance of companies. It is the sine qua none condition for continuous sectoral innovation.

As an African proverb says: "Alone we go faster, together we go further"

3. What we do?

Among the activities of the Menara Cluster, **4 axes** are presented here:

Mentorship:

- ➢ Product development
- ➢ Internationalization
- ➢ Strategy
- ➢ Sales and business development

Trainings:

- ✓ Design Thinking.
- ✓ Lean management.
- ✓ Business Model Canvas.
- ✓ Production management tools.
- ✓ Innovation management, etc.
- ✓ Digital Marketing.
- ✓ Sales techniques.
- ✓ Psychology of the entrepreneur.
- ✓ Advanced techniques of E-commerce and Inbound Marketing.

- ✓ Project management

Collaborative projects

The setting up of collaborative projects is at the very heart of the functioning of the cluster to associate companies and universities. Several Collaborative R&D projects have been labeled by the Menara cluster at national scale. At the international level, the cluster has adhered to projects developed by Euro-Mediterranean consortia.

Labellisation CCG

Tamwilcom labels the Menara Cluster to finance innovative project leaders as part of the INNOV INVEST program over a period of 3 years. The objective of the program was to support and accompany young entrepreneurs in their first steps to demonstrate their potential and the feasibility of their projects based on an innovative idea.

- More than 100 Members adhere to our structure.
- More than 40 national and international fairs from which our members have benefited.
- More than **50 training** sessions organized.
- More than **50 experts** who support our members and startups benefiting from the InnovIdea program.
-

The Cluster Menara has been selected to benefit from the TAM III support program of the GIZ, implemented by ANIMA Investment Network. Within this framework, the Cluster's members and the team have benefited from the intervention of various experts, and have been able to access a range of activities (training, trade fairs, project support ...), which has given rise to success stories with positive impacts on companies (internal reorganization, access to foreign markets, generation of leads, etc.).

As well as our flagship project, the launch of CAIAC, the first African center dedicated to agri-food and cosmetics, as part of new cooperation with GIZ and our partner Cadi Ayyad University. The Cluster Menara has been selected to benefit from the TAM III support program of the GIZ, implemented by ANIMA Investment Network.

Roles:

- Operator in the creation of companies and industrial jobs in the region of Marrakech Safi.
- Key player in R&D: Improvement, Innovation, Optimization.
- Training center for professionals and upgrading of technical skills.
- Partner of higher education by providing technical means.
- Project Technical Feasibility Assessment Body.
- Technology transfer platform for the benefit of Moroccan and African companies.
- Facilitator of collaborations between the university and professionals.

Services:

- Support for project ideas through technology assessment,
- Carrying out pilot tests and prototyping,
- R&D Packaging, product and process,
- Assistance in setting up turnkey projects,
- Support for the management of innovation projects,

4. Who are our partners?

worldwide beauty connection COSMETICS Clusters International Network

ANIMA INVESTMENT NETWORK

THE NEXT SOCIETY INNOVATORS SHAPING THE FUTURE IN THE MEDITERRANEAN

A partnership has been signed with GCC to encourage the exchange of good practices, support the development of a global ecosystem, and benefit from their scientific expertise and complementarities.

The Cluster MENARA had the pleasure to collaborate with the next society and benefit from the Cluster Booster Track programs consisting of three components: Mentoring – Benchmarking Visits, and training – Tech days.

5. How do we ensure visibility, promotion and knowledge?

- ✓ The mobilization of tacit knowledge, collaborative formal and informal research and development work, competitive intelligence, contracting research and development work outside the cluster, strategic research and development partnership (ensured by academic collaboration), e-learning, coaching, mentoring, building project teams, and brainstorming.
- ✓ The support of our partners to develop innovative products, processes and technologies.
- ✓ The participation with our ministries and academic partners to solve technical and financial problems
- ✓ The organization of competitive event in order to gain sustainable competitive advantages.

6. What are our sources of funding?

- ✓ **Ministry of industry and commerce Grants**
- ✓ **Membership fees:** Each member must contribute a symbolic sum is order to benefit **from our offers (Training- Mentoring- some Trade fairs- b to b meetings, etc.)**
- ✓ **Value added Services:** Accreditation – Certification- Exhibitions organization.

7. Success story of the Cluster Menara

- ✓ The Launch of the Ecosystem project: Marrakech Health & Beauty Valley
- ✓ The promotion of the Aromatic and Medicinal Plant AMP sector.

8. What factors have facilitated and posed obstacles for the experience? What are the main challenges?

Among the challenges we faced in 2012-2013, companies lacked confidence in setting up the cluster. To this end, we had to develop our notoriety, our confidentiality, to have an ecosystem favorable to our future member companies. Today, we have become more mature, and new companies easily trust us. However, there remains the challenge of not being financially independent since we are limited by the amount granted by the Ministry of Industry, which hinders us from growing much more and achieving our goals and ambitions.

9. What we can learn?

- ✓ Mobilize all stakeholders with a key role for the Region and coordination by the Menara Cluster
- ✓ Need to secure the supply of raw materials (in quality and volume) to develop the industrial sector;
- ✓ Strongly stimulate national and international industrial investments to achieve minimum transformation rates of 50%;
- ✓ Strongly stimulate R&D and innovation through the development of collaborative projects and an extensive network of startups;
- ✓ Capitalize on existing mechanisms (in particular the mechanisms provided for in FDII, FDA and MarocPME);
- ✓ Capitalize on the strengths of the Region (Brand Marrakech, availability of raw material resources);
- ✓ Support the production of spontaneous and cultivated plants (support for planting, training of cooperatives and operators, the establishment of

logistics platforms for collection and recovery, upstream certification of actors, etc.);

- ✓ Skills development (industrial training, provision of experts, etc.);
- ✓ Support for innovation and R&D activities by capitalizing in particular on the City of Innovation in Marrakech (e.g., development of collaborative projects, support for innovative start-ups, etc.).

Visit of 3rd millennium cooperative for the valorization of couscous “Lammima RHAMNA: «A women’s cooperative, entrepreneurial pilot in the Marrakech-Safi region»”

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1. Introduction

The third millennium agricultural cooperative through this innovative project of valorization of couscous with varied local productions (Cactus, Cereals, Corn, millet, legumes, Carob tree, dried fruits, oilseeds, etc.), as well as gluten-free products such as quinoa, aims to enhance the region’s local products and the local know-how of rural women.

In the south of Rhamna, in the Douar "Abbas bin Al Maati", the visitor alludes to a building "Dar de Couscous", in which women of the territorial commune of Bourous, was involved an experiment of creation a pioneer and innovative cooperative in the production and valorization of Couscous, thus representing the rural woman entrepreneur, valuing a product and finding of allergic consumer to gluten.

2. Context and Location Map

The cooperative sector in Morocco has grown considerably in recent years, mainly due to the existence of a socio-economic and regulatory environment conducive to the development of its activities. This growth was also strengthened by the launch of the INDH in 2005, which gave a boost to the creation of cooperatives

especially in rural areas suffering from exclusion and poverty. Indeed, the members of the cooperative decided to experiment with the own means, before the support of the National Initiative for Human Development (INDH) in 2008, to help them with equipment to install the first components of their entrepreneurial project. Those women see their project as a first step towards independence in general, and more specifically the financial independence and helping them to meet the needs of their households. https://goo.gl/maps/k1shjzMfZUaG2ZTEA

3. History

The dream of these women began in 2008, when they met and thought about creating a cooperative and setting up an income-generating project, they decided to start with their own means. The implementation of the project began in a single Couscous room, this usually generated small orders. The cooperative has also gone through a number of steps since the creation till today and has been able to overcome many internal and external challenges and constraints, including:

"NO RURAL DEVELOPMENT WITHOUT RURAL WOMEN"

Hafida Al-Falahi: Founder and President of the third Millennium Cooperative

- ✓ No Membership and Appropriation of the project idea by men;
- ✓ Lack of local development infrastructure (Trail, difficult access,)
- ✓ Drought (Water table, Range,)

Today, the cooperative imagines a better future through the capacity building of members initiated by other cooperatives, INDH and ONCA. Hafida Al-Falahi explained that engaging in cooperative activity gives women the opportunity to earn an acceptable income. This couscous cooperative is now a model for pioneering women's projects, the village woman has found in the "The third millennium cooperative for the production and development of Couscous", a space to spend time and earn a living. This cooperative has been able to save some thirty women of Douar in difficult financial situation thanks to the Couscous production certified ONSSA (more than 32 types of couscous). This solution of cooperation of rural women has enabled these members to generate an income and to develop an entrepreneurial spirit thanks to the various capacity building programs from which they have benefited.

It should be noted that this project required an investment of around DH 2 million (MDH) financed by:

- Provincial Directorate of Agriculture RHAMNA (Plan Maroc Vert: 1.2 MDH)
- The German Embassy in Morocco,
- The Mohammed V Foundation for Solidarity,
- The National Initiative for Human Development,
- The National Promotion, the Commune Bourrouss,
- The National Mills Federation of Morocco,
- The Etoile France Association among others (0.8 MDH),
- The Regional Directorate of the Agricultural Council of Marrakech-Safi
- The Cherifien Phosphates Office,
- The Embassy of the Federal Republic of Germany.
- The National Office of the Agricultural Council contributed by equipping the women's cooperative with the necessary upgrading equipment to meet the standards required by ONSSA.

The cooperative has also benefited from a rigorous program of actions and agricultural council mechanisms including:

Trainings:

- ✓ Agricultural and para-agricultural entrepreneurship
- ✓ Techniques of production and upgrading of Quinoa
- ✓ Good Governance
- ✓ Women Entrepreneurship
- ✓ Awareness and information days
- ✓ Good hygiene practices and food safety standards

FFS

- ✓ A farmer field school was made to the profit of the cooperative members in terms of Quinoa's production and promotion.

Learning route

This cooperative has participated in many fairs to explore potential markets at local, regional, national, and international. It should be noted that its products are present in supermarkets and the fair-trade circuit.

4. Experience Analysis

It should be noted that among the success factors of this experiment are:

- ✓ Ambitious members,
- ✓ Solidarity spirit between members,

- ✓ Active participation of women in cooperative activities,
- ✓ Availability of natural resources,
- ✓ Good quality, natural raw materials,
- ✓ Production permanent, natural, and diversified,
- ✓ Low cost of production,
- ✓ Good price/quality ratio for most products,
- ✓ Positive health and safety effects of products,
- ✓ Products representing a cultural and artisanal heritage.
- ✓ Training in Income Generating Activities;
- ✓ Prospecting for potential markets through supermarkets and the fair-trade circuit.

In terms of the visibility and knowledge management of this experience, the cooperative is strengthening the capacities of about 280 young girls and rural women in functional education, literacy and promotion of local products.

Sources of Funding:

CONTRIBUTIONS	INSTITUTIONS	MONTANT
Terrain 400 m²	La coopérative	----------
Equipement (2008)	Direction provinciale d'agriculture kelaa des sraghna	100.000,00 MAD
Construction	Commune rurale BOUROUSS	80.000,00 MAD
Construction	Ambassade de la république fédérale d'Allemagne	270.000,00 MAD
Fondation Mohammed 5	Construction d un Terrace d un l laboratoire et équipement matériel	150.000,00 MAD
La Promotion Nationale	Clôture + salle de stockage	----------
INDH Rhamna	Moulin a mordre les céréales et emballages	100.000,00 MAD

The cooperative also plays an important role in women's self-employment; Hafida Al-Falahi affirmed that the production cooperative has restored respect for rural women, as women have gained, through the income-generating activities, a status in the family, which now helps to bear the costs thanks to income from cooperative activities.

5. Results and Impacts

The president and founder of the cooperative, Hafida El Falahi, noticed that this cooperative, which currently has more than 30 members, helped to build young girls capacities– more than 280 girls – and rural women in difficult and improve significantly their incomes, which range from 1,500 to 4,000 DH (depending on the demand on the product). This cooperative solution has contributed to:

- Create job
- Overcome the rural exodus (Towards Marrakech)
- Encourage rural women education
- integrate of rural women into the labor market by creating income-generating projects that achieve the rural women empowerment.

The cooperative member's capacities have been strengthened in terms of production of flavored couscous, packaging, food safety and hygiene as well as in the marketing of local products, the development of accounting and management capacities will enable the member's managers to acquire the knowledge necessary to achieve short-, medium- and long-term goals; as well as the improvement of the rural women standard living of; and education for sustainable development.

6. Lessons Learned

Madam Hafida Al-Falahi stresses that cooperatives and associations play a major role in rural development and values education: perseverance, solidarity and cooperation

- ✓ The local development of the region by integrating women into the economic activity. Indeed, the evolution of the number of women is one of the indicators of this positive dynamic.
- ✓ The reinforcement of skills, innovation and improvement of the quality products and services.
- ✓ The ambition, the motivation, the will, the responsibility, and the commitment of the leaders as well as of the members have ensured the continuity and the prosperity of the activity of this solution (which is the organization of rural women in a women's agricultural cooperative presenting a product appreciated and requested on the market).
- ✓ The harmonized support while avoiding the overlapping actions with complementary programming and the contribution of everyone according to the profession has made it possible to meet the needs of this initiative in terms of support and funding.

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SKIM

Strengthening Knowledge Management for Greater Development Effectiveness in the Near East, North Africa, Central Asia and Europe

This book presents an important work of reflection and synthesis on several aspects of knowledge management and transfer. We would like to thank all those who contributed to the writing of the chapters in this book, and all those who were involved in the collection and valorization of the information. Special acknowledgement to IFAD and ICARDA for their respective funding and coordination of this work.

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SKIM
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Science for resilient livelihoods in dry areas

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