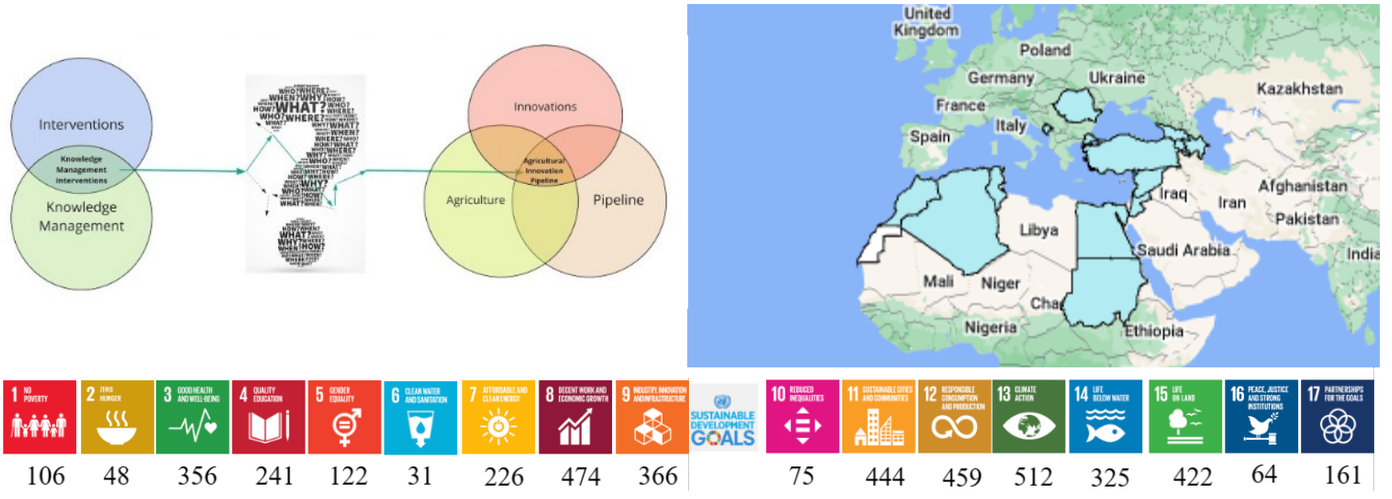
Evidence Synthesis Report

Evidence Synthesis Report on 'What Works in Improving Knowledge Management Systems in Low and Middle-Income Countries?'

With a Focus on Near East, North Africa, East Europe, and Central Asia

Dec 31, 2022



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CGIAR

ICARDA
Science for resilient livelihoods in dry areas

IFAD

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

This research was conducted as a part of the 'Strengthening Knowledge Management for Greater Development Effectiveness in the Near East North Africa Central Asia and Europe' led by International Center for Agricultural Research in the Dry Areas. It was financed and supported by International Fund for Agricultural Development. International Center for Agricultural Research in the Dry Areas is a part of CGIAR, a global research and innovation partnership for a world with sustainable and resilient food, land, and water systems that deliver diverse, healthy, safe, sufficient, and affordable diets and ensure improved livelihoods and greater social equality, within planetary and regional environmental boundaries.

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Executive Summary

This study provides a novel human-machine hybrid approach for creating learning about how knowledge management interventions can improve the performance of agriculture and food innovations to achieve sustainable development goals. It analyzes 2339 evidence resources, 500 of which are full texts reaching approximately 9600 pages of published high-quality academic text. It provides a big spectrum of results and presents the main findings in a concise way. It informs the main management question od what works in knowledge management interventions in improving innovation systems in middle and low-income countries. It provides high granular information generated in North Africa, Near East, East Europe, Central Asia, and contributes to overall IFAD learning in the NENA and CEA region and beyond.

It shows that only a tiny share of the evidence sources provided enough granularity to program better interventions. In addition, existing information was mostly about general knowledge management rather than other operational aspects like capture, retrieval, enhancement, etc. Moreover, how different types of knowledge management interventions differ has not been sufficiently articulated. Although impacts were discussed intensely, how it happens through effective delivery and scaling processes was hardly articulated. Most of the existing evidence is at the level of continents and regions rather than at the country and sub-country levels. In most of cases, heterogeneous areas and countries were bulked into a single group hindering the performance of knowledge management interventions significantly. In continents, the evidence available on different sub-regions varied significantly. Therefore,

The study showed that evidence sources informing about the role of knowledge management on SDG 1 (poverty) and 2 (hunger and food security) were much less than the average of all SDGs. Also, the number of IFAD-funded authored and informed evidence sources were minimal. Nevertheless, evidence could inform all IFAD result management indicators except the government budget. Especially information on nutrition, the only IFAD indicator target that could not be achieved in recent years, had the largest evidence. Furthermore, there was no single complete evidence resource for Moldova among some 2300 analyzed by the synthesis. Morocco and Sudan were in the medium range when it came to the availability of the evidence. Therefore, the study confirmed that the geographical focus of the IFAD regional SKiM project addressed a gap. Therefore,

The evidence synthesis has also some natural follow-ups to design more effective and efficient knowledge management interventions that can fast-track impact. The immediate follow-up is to extend the scope of the evidence synthesis to technical reports and gray literature produced by IFAD and other key partners like CGIAR, FAO, Asian Development Bank, African Development Bank etc. Knowledge management is a practical discipline in which learning is captured also in non-scientific forms. The methods and tools developed for this evidence synthesis can reduce the time necessary to cover gray literature significantly. Also, synergies with existing toolkits of IFAD, like the ones developed by ATHENA, could further increase the gains for IFAD.

The study concluded that

1. Actionable, context-specific knowledge management intelligence is a bottleneck for designing transformative delivery and scaling interventions required for impactful agriculture and food innovation systems
2. IFAD regional knowledge management efforts were crucial but insufficient in achieving the major poverty and hunger ambitions. It is necessary to increase investments in knowledge management with a co-investment model.
3. Extending the evidence synthesis by leveraging existing IFAD and partner tools can be a quick win in designing better-informed knowledge management interventions.

Highlights

The number of evidence resources informing the g-ToC of the evidence synthesis has been increasing until 2021 (Figure 3-3). The increase was characterized by relative stability and upward shift cycles (1997 to 2004, 2005 -2010, 2011-2016, 2017-2019). == (Looks like a program and project cycles) - speculate

Regarding the content dimensions of the g-ToC (knowledge management, intervention, innovation times and pipelines), coverage provided by the evidence sources were very similar except for knowledge management. Knowledge management was the lowest informed dimension with a distance and the limiting factor was the content relevance. = clearly knowledge management evidence and learning is lacking

IFAD participated in generating evidence sources about knowledge management, interventions, and innovations across the world in three major ways. IFAD

i) funded the teams who developed the evidence,

ii) staff produced or co-produced the evidence sources

iii) influenced the content of the evidence source indirectly

Among the sources studied in this evidence synthesis, IFAD funded of them. Three of the sources were co-produced by IFAD staff and of them IFAD work and learnings were presented. For the IFAD NENA and CEN region relevant sources, only was funded by IFAD, was authored and mentioned IFAD's contributions. (Infographic ##) - IFAD contributed but can play more active role

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Abbreviations and Acronyms

ARC	:	Agricultural Research Corporation in Sudan
AIP	:	Agricultural Innovation Pipeline
CHIEM Bari	:	The Mediterranean Agronomy Institute of Bari
ECA	:	(Eastern) Europe and Central Asia
IAV	:	Institute of Agronomy and Veterinary Hassan II
ICARDA	:	International Center for Agricultural Research in Dryland Areas
IDIS Viitorul	:	Institute of Development and Social Initiatives Viitorul
IFAD	:	International Fund for Agricultural Development
INRA	:	National Insitute of Agronomic Research (French Initials)
IOE	:	Independent Office of Evaluation of International Fund for Agricultural Development
ICT	:	Information and Communication Technologies
g-ToC	:	Generic Theory of Change about the Contribution of Knowledge Management
	:	Interventions in the Evolution of Agri-food Innovations
KARIA-NET	:	Knowledge Access in Rural Interconnected Areas Network
KM4AI	:	Knowledge Management for Agricultural Innovations
MEL	:	Monitoring, Evaluation and Learning
MinANRF	:	Ministry of Agriculture and Natural Resource/Forests in Sudan
NENA	:	Near East and North Africa
PROCASUR	:	PROCASUR Corporation
SDG	:	Sustainable Development Goals of the United Nations
SELECTIA	:	Selectia Research Institute of Field Crops in Moldova
SKiM	:	Strengthening Knowledge Management for Greater Development Effectiveness in the Near East, North Africa, Central Asia and Europe
SKS	:	Sudanese Knowledge Society
SSTC	:	South-South and Triangular Cooperation
UASM	:	State Agrarian University of Moldova
UCIP IFAD	:	Consolidated IFAD Program Implementation Unit
UofL	:	University of Khartoum
VT	:	Virginia Polytechnic Institute and State University
WoS	:	Clarivate Web of Sciences Collection

1. Introduction

This evidence synthesis study is a part of the IFAD Funded SKiM Project implemented by ICARDA. The study was requested to strengthen the evaluation of the knowledge management projects IFAD supports, facilitate learning in these projects and contribute to overall learning from IFAD knowledge management investments. The SKiM project, GRIPS ID: 2000001661, was developed by ICARDA in collaboration with CIHEAM Bari (Italy) and Virginia Tech (USA) following a co-design the process led by IFAD between January 2018 and December 2021. In consultation with IFAD, the proposals submitted by ICARDA, CIHEAM-Bari, and Virginia Tech University were integrated to have a comprehensive project SKiM built upon IFAD's commitment to expanding its capacity development support to monitoring, evaluation, and learning systems, in conformity with the Thematic Cluster III (Better results management through improved M&E system) of the IFAD Medium-Term Plan 2016-2018.

Knowledge management is one of the pillars of the capacity of IFAD member countries to innovate agricultural and rural solutions to achieve SDGs in low- and middle-income countries globally. Early IFAD investments in knowledge management revealed that there is a high value in generating comparative learning from different knowledge management projects as there are not only many similarities between knowledge management sectors in low- and middle-income countries but also some essential differences that make replicating the success of one project in another context very challenging.

The evidence synthesis follows two critical publications of the SKiM project, the approach paper, and the scientific method article. The approach paper described the scope of the evaluation synthesis process and presented the early versions of evidence resource selection criteria, and example outputs of the evidence synthesis described the evaluation synthesis process and finally provided the proposed timeline, team, and dissemination strategy. It also provided 5 annexes that contain critical information for this Evidence Synthesis.

The evidence synthesis has a special focus on the NENA and CEN regions of IFAD. It reports the findings in 26 countries separately. As the IFAD Knowledge Management Strategy and the Learning Theme on knowledge management highlight the lack of a standardized definition for knowledge management, the evidence synthesis uses a specific definition of knowledge management as “a set of processes, tools, and behaviors that connect and motivate people to generate, use and share good practices, learning, and expertise to improve IFAD's efficiency, credibility, and development effectiveness.” It extends the definition and defines KM as “using a set of concepts, principles, approaches, products, services, organizational and institutional arrangements to generate, capture, store, retrieve, and disseminate information which contributes to the learning of IFAD internally and the stakeholders involved in or benefiting from IFAD investments”.

The evidence synthesis distinguishes the general notion of knowledge management from KM4AI, which is more relevant for achieving rural economic and food system transformation. It uses the KM4AI as the basis of the research. KM4AI is “the contribution of knowledge management, as defined above, to formulating, designing, developing, delivering and improving the use of novel approaches, products, services, organizational arrangements, policies in the agricultural and food value chains.

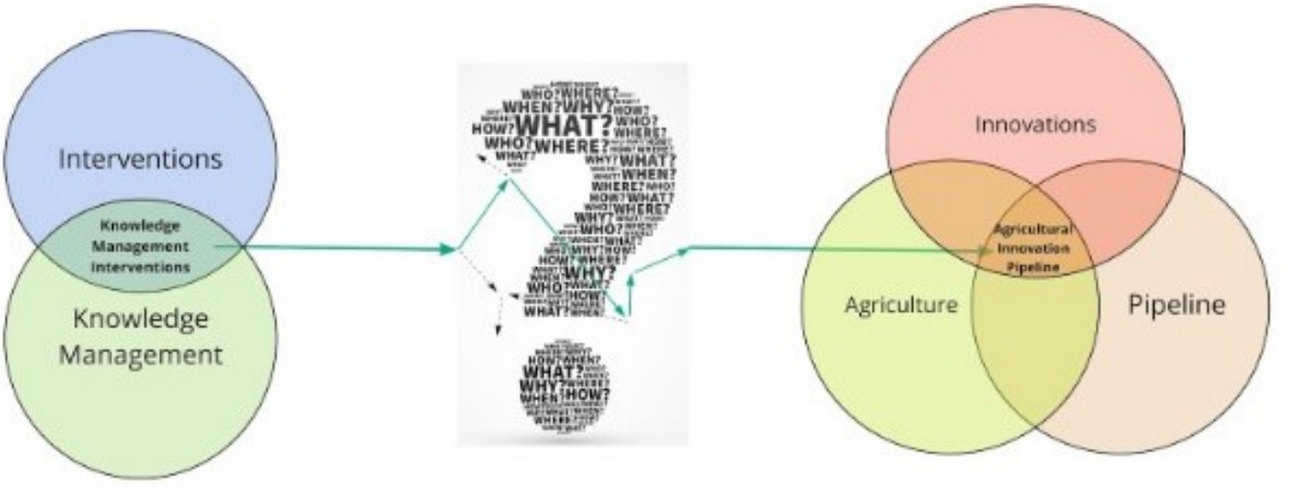
The evidence synthesis has five major sections. Following this short introduction, it provides a brief description of the methodology used in the study. Since the methodology was published as a scientific article, the details were not provided. Afterward, it provides an extensive result section summarizing the body of evidence on KM4AI and the g-ToC derived from it. Finally, it provides a short summary and a few key recommendations.

2. Methodology

This evidence synthesis has been prepared using a customized version of the recently published method paper "*A Human Machine Hybrid Approach for Systematic Reviews and Maps in International Development and Social Impact Sector*" (Sartas et. al. 2021). The first step of the method, ideation, was done within the SKiM project in diverse consultations with the SKiM members ICARDA, PROCASUR, VT, CIHEAM Bari, national partners, i.e., INRA Morocco, ARC Sudan, Selectia Moldova, UASM Moldova, IDIS Viitorul, KariaNet, SKS Sudan, UofK, MinANRF, UCIP IFAD and the IFAD team guiding the SKiM project. The main research question, "What Works in Improving Knowledge Management Systems in Low and Middle-Income Countries?" was selected as the main research question for the evidence synthesis. Since SKiM aims at developing effective and long-term knowledge management-related capacities in Moldova, Morocco, and Sudan and use the learning to accelerate similar efforts in IFAD regions of NENA, and ECA, the evidence synthesis provided more details about the evidence in Near East, North Africa, East Europe, and Central Asia Regions.

The second step, conceptualization, was based on the SKiM project theory of change, in which knowledge management was considered to improve the innovation and impact capabilities of national knowledge and innovation partners operating in Moldova, Morocco, and Sudan with a view on contributing to IFAD knowledge management toolkits. Following a few meetings and online consultations, the conceptual framework below was designed and agreed upon as the "generic theory of change (g-ToC)". The g-ToC has built on the IFAD evidence synthesis approach paper (Sartas et. al. 2020) (Figure. 2.1)

Figure 2.1: The Generic Theory of Change the Evidence Synthesis Tested



The g-ToC included five concepts, i.e. knowledge management, interventions, innovations, pipelines, and agriculture. All of the concepts were considered in their broadest definitions. The word "pipeline" was used to represent the evolutionary process innovative solutions go through according to the readiness approach spearheaded by NASA (Olechowski et al., 2015) and adapted to agricultural and food sectors by Sartas et. al. (2020).

The third step, building word sets for identifying relevant evidence sources and analyzing their content, was done in multiple steps (ontology review, expert opinion, crowdsourcing, keyword extraction by text mining, and query synthesis) as proposed by the human-machine hybrid methodology (Sartas et al. 2021). Four sets, including 10 words, were used for identifying relevant evidence sources. Seven word sets and 69 words, and three location typologies (UN country, continent, and sub-continental region) were used in analyzing the content of the evidence sources (Table 2-1). In choosing knowledge management words, actionability perspectives, i.e. the words informing about how, rather than what, was used.

Table 2-1: Words Used for Identifying Evidence Sources and Analyzing Their Content

Concept	Evidence Retrieval Set	Evidence Analysis Set
Knowledge management	knowledge	"knowledge management", "knowledge creation", "knowledge generation", "knowledge capture", "knowledge storage", “knowledge retrieval", "knowledge enhancement”, “knowledge dissemination"
Intervention	project, program, policy, support	project, program, policy, initiative
Innovation	innovation, novel	
Agriculture	agriculture, food, farm	
Pipeline	development, use, scale, impact	idea, design, development, delivery, scaling, impact
Innovation Type		technology, approach, procedure, principle, plan, technique. science, method, strategy, framework, tool, product, service, device, practice, mechanism, institution, organization, arrangement, law, workflow, process, system
Spatial context		UN country, continents, sub-continents names
Temporal context		year
Impact context		poverty, hunger, health, well-being, education, gender equality, sanitation, hygiene, energy, work, growth, industry, infrastructure, city, consumption. production, climate, water, land, peace, justice, partnership

The fourth step of building a literature set was done using a query combining the identification word sets in major academic databases (Scopus and Web of Science Collections) with statements as follows:

TITLE-ABS-KEY (knowledge)
AND TITLE-ABS-KEY (project OR program OR policy OR initiative)
AND TITLE-ABS-KEY (agriculture OR food OR farm)
AND TITLE-ABS-KEY (innovation OR novel)
AND TITLE-ABS-KEY (development OR use OR scale OR impact).

Identified evidence sources were inserted into a database with the help of export functions of the academic database. Afterward, full texts of all the evidence sources were searched and inserted into an advanced database. The method, result, and conclusion sections are stored exclusively to help the detailed analysis in the later stages.

The fifth step, mining the literature set, was done using a combination of keyword searches. If a literature source full text has the words listed in the Evidence Analysis Set (Table 2-1), it was considered to inform the g-ToC in terms of the concept the word is associated with. For example, if the full text of evidence source X has the word *project* in it, then it was considered to inform about the *intervention* dimensions of the g-ToC. If it has the word *poverty*, it was also considered to inform about the *impact context*. All the full texts in the literature data set were searched for all the words in the evidence analysis set, and associated concepts were identified.

The sixth step. extracting the synthesis dataset, was done by selecting the subset of the combined dataset of evidence sources, existing words in the evidence analysis set, and associated concepts. All the evidence sources with at least a word from each analysis set, i.e., the sources informing about all concepts of the g-ToC simultaneously, were considered to provide complete information and used as the base of the synthesis. For practical purposes, they are separated into another database.

The seventh step, analyzing the synthesis dataset, was done by using the conclusion sections of the sources with complete information. The relationships between different conclusion sections were mapped using a social network analysis tool with complex diagramming capabilities. For instance, if the conclusion section of a complete information evidence source mentions that a knowledge dissemination initiative caused improvements in the scaling of technology in North Africa in 2010 and led to improved hunger, lines between "knowledge dissemination" (knowledge management concept), "initiative" (intervention concept), "scale" (pipeline concept), "technology" (innovation type concept), "North Africa" (spatial context concept), "2010" (temporal context concept), hunger (impact context concept), dots are drawn with a positive association. If the mention was negative (instead of "led to," for instance, "failed to"), then the line with a negative association. All the dots are lines are combined into a single network map to integrate the relationships coming from individual positive and negative relationships.

3. Results

3.1 General Description of the Evidence Base based on the Evidence Types

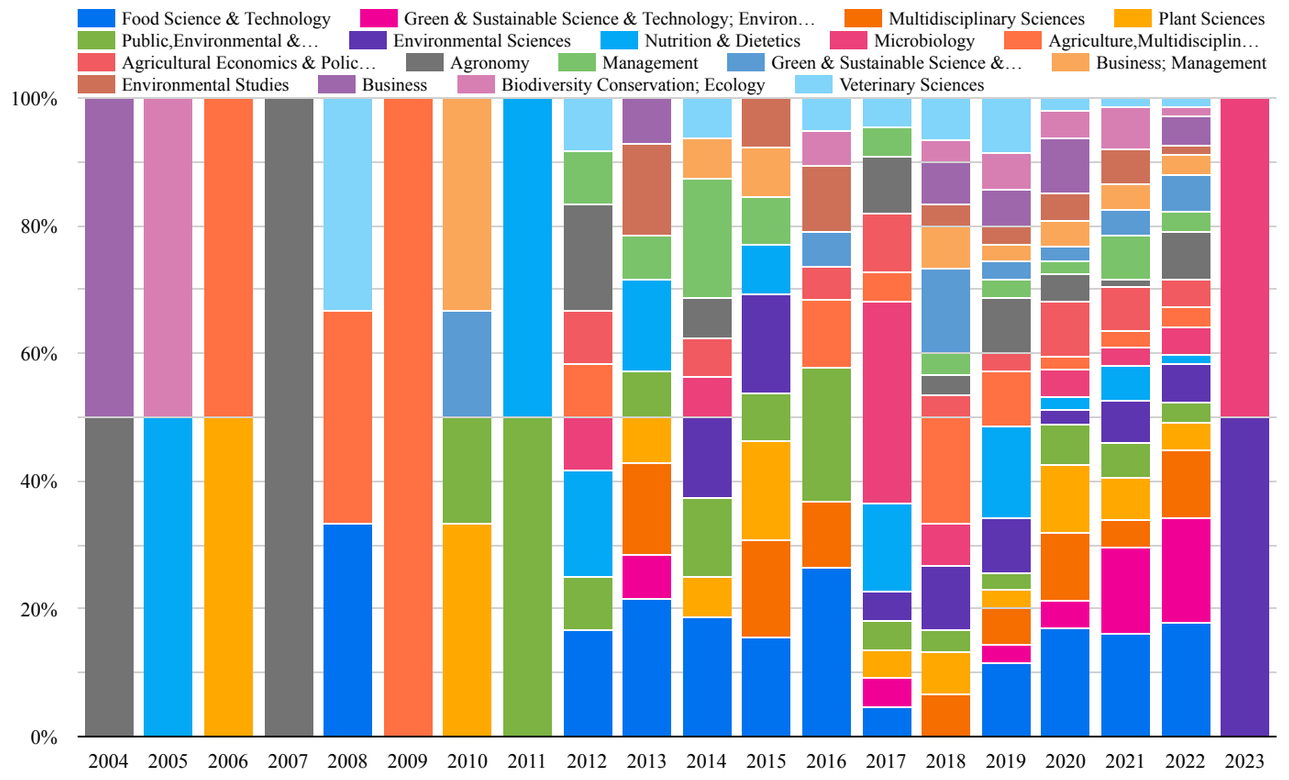
Table 3-1: General Facts about Evidence Synthesis

Number of processed sources	2,339
Number of full text evidence sources	511
journal articles	362
books	6
book chapters	17
conference papers	17
reviews	17
editorials	3
Total number of pages analyzed (est.)	9,614
Number of languages	14
Share of open access	67%

This study has identified 2,339 evidence sources using the search query presented in the method section. The full text of 511 could be accessed and processed using the open-access policies (67%) and the subscription rights of the Wageningen University Library to the most prominent academic databases. Most of the evidence sources were journal articles (362) as they came from academic databases. Sources from more than 10 languages were identified in the retrieval process. The evidence sources also included a significant number of books, book chapters, conference papers, and reviews. During the evidence synthesis, more than 9,614 pages were analyzed.

Based on the Web of Science Collection Classifications, the evidence sources were from 18 different literature themes (Figure 3-1). The thematic distribution of evidence sources changed continuously. Until 2012, when WoS theme tagging was intensified, the science and innovation theme that has complete information, i.e. including information about knowledge management and all the other concepts included in the g-ToC, was Food Science and Technology. Between 2012 and 2018, nutrition-dietetics and multiple disciplinary sciences were the second and third. After 2018, environmental and sustainability sciences gained momentum and became the second. Business, management, agronomy, and veterinary sciences were also present among the themes covered by full-text evidence sources studied in this evidence synthesis.

Figure 3-1: Thematic Distribution of Relevant Resources In the last Two Decades (Web of Science Classification)



3.2 Description of the Evidence Base in terms of Relevance to the Generic Theory of Change Concepts

Table 3-2: Facts on Knowledge Management Specific Evidence

Share of KM specific evidence	13%
Number of KM specific evidence	68
General knowledge management	27
Knowledge generation	22
Knowledge capture	0
Knowledge storage	11
Knowledge retrieval	0
Knowledge enhancement	0
Knowledge dissemination	4

Table 3-3: Facts on Intervention-Specific Evidence

Share of intervention specific evidence	93%
Number of intervention specific evidence	473
project	357
program	370
policy	340
initiative	230

Table 3-4: Facts on Pipeline-Specific Evidence

Share of pipeline specific evidence	99%
Number of pipeline specific evidence	506
ideation	347
design	405
development	475
delivery	125
scaling	86
impact	441

The g-ToC of the evidence synthesis included four main concepts, i.e., knowledge management, agricultural and food interventions, innovations, especially types, and the status of the innovations in the overall innovation pipeline.

Almost all the full-text evidence sources informed about the basics of the g-ToC concepts with the exception of knowledge management dimensions. Only 13% contained information about more granular knowledge management dimensions. In other words, only 13% of the sources indicating the word "*knowledge*" in the titles, abstracts, and keywords actually provided specific information about knowledge management.

Among the knowledge management dimensions, general "knowledge management" was the top (Table 3-2). It was followed by knowledge generation and knowledge dissemination. Knowledge capture, retrieval, enhancement, and dissemination received no or little reference in the evidence sources. In other words, knowledge management dimensions were hardly articulated except for generation and storage.

Intervention-specific evidence presented an interesting situation. There was no clear specific intervention type that was covered by the evidence sources (Table 3-3). Programs, projects, and policies had a very similar number of evidence referring to them. Only initiatives (including unformalized interventions) had less coverage than the others.

Evidence on the innovation pipeline and the various stages innovations go through also presented diversity. While development was considered more than 90% of the sources, scaling and delivery were mentioned in less than 25% of the cases (Table 3-4). The impact was the second-highest specific pipeline term. This could be partially due to the broader term of the impact outside of the innovation contexts. However, the difference between impact and delivery or scaling was big, which could indicate a more considerable impact reference even in the context of innovation pipelines.

Table 3-5: Innovation Type Specific Evidence

Share of innovation specific evidence	100%	method	467	mechanism	291
Number of innovation specific evidence	512	strategy	298	institution	277
technology	383	framework	325	organization	286
approach	461	tool	355	arrangement	107
procedure	198	product	485	law (legislation)	209
principle	230	service	331	workflow	17
plan	456	device	79	process	480
technique	268	practice	405	system	480
science	394				

Significant granularity difference was provided on the types of innovations by the evidence sources that refer to g-ToC in general terms (Table 3-5). While process, system, approach, method, and plan types of innovations were most highly mentioned, workflows, devices, and arrangement types of innovations were rarely covered. Procedures and principles were relatively less covered, whereas technologies, sciences, and practices were relatively more covered.

Across overall innovation types, i.e., information (passive) innovations (Table 5-4 - green color), practical (applied) innovations (blue color), and organizational innovations (red color), there was no significant difference. Although the variability among the information innovations was relatively less than the practical and applied innovations, on average terms, they are similarly covered by the evidence sources.

3.3 Geographical Context of the Evidence

3.3.1 Geographical Context of the Evidence - General

Table 3-6: Geography of Evidence

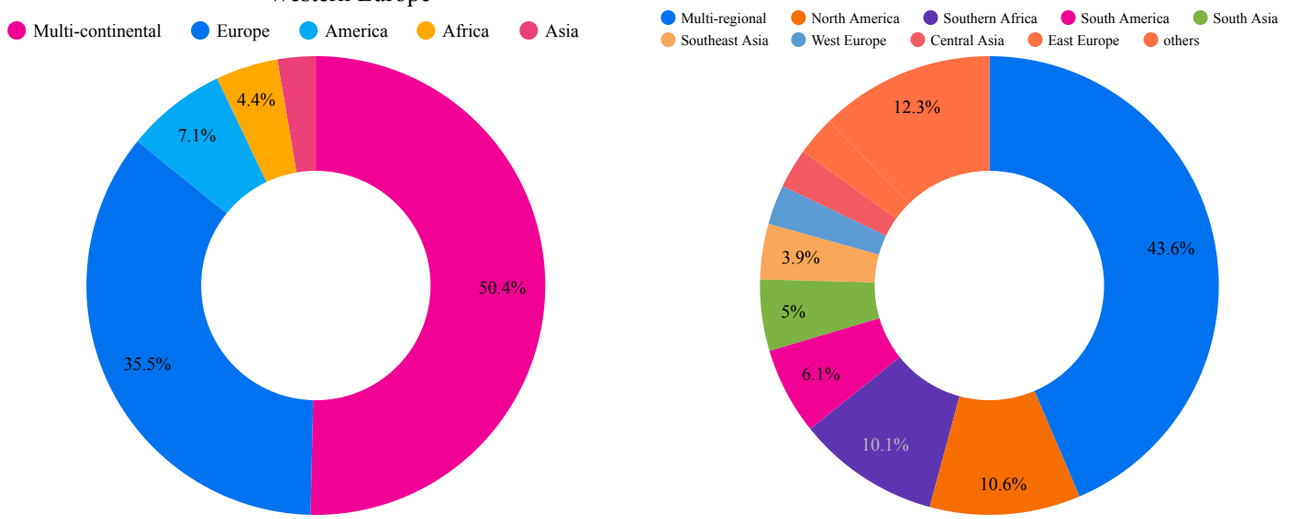
Share of location specific evidence	83%
Number of location specific evidence	426
continent specific	409
Europe	311
America	167
Africa	144
Asia	128
region specific	179
North America	51
South America	31
Central America	14
Southern Africa	46
East Africa	19
West Africa	21
North Africa	15
Central Africa	14
West Asia	1
Central Asia	14
South Asia	19
East Asia	22
Southeast Asia	19
North Europe	8
South Europe	7
Central Europe	8
Eastern Europe	22
Western Europe	19

Most evidence sources referred to a specific geographical area (Table 3-6). Among them, continents were the largest, more than doubling the regions. Among the sources referring to continents, some half mentioned multiple continents. Europe had the largest number of evidence, and Asia and Africa were the smallest (Figure 3-2). Among the regions., multi-regional coverage constituted about 44%.

Among the regions, North America and Southern Africa had the largest share of evidence sources covering all concepts of g-ToC. They were followed by South America and East Asia by a large distance. The region which were least covered by the evidence sources by far was West Asia. European sub-regions were also very low.

There were major differences among the sub-regions of the continents. Typically two regions had much better coverage than the other two. In Europe, the better-covered ones were East and West, in Asia, East and South, in Africa, South and In America South.

Figure 3-2: Continental and Regional Distribution of Evidence



3.3.2 Geographical Context of the Evidence - IFAD NENA and ECA and SKiM Countries

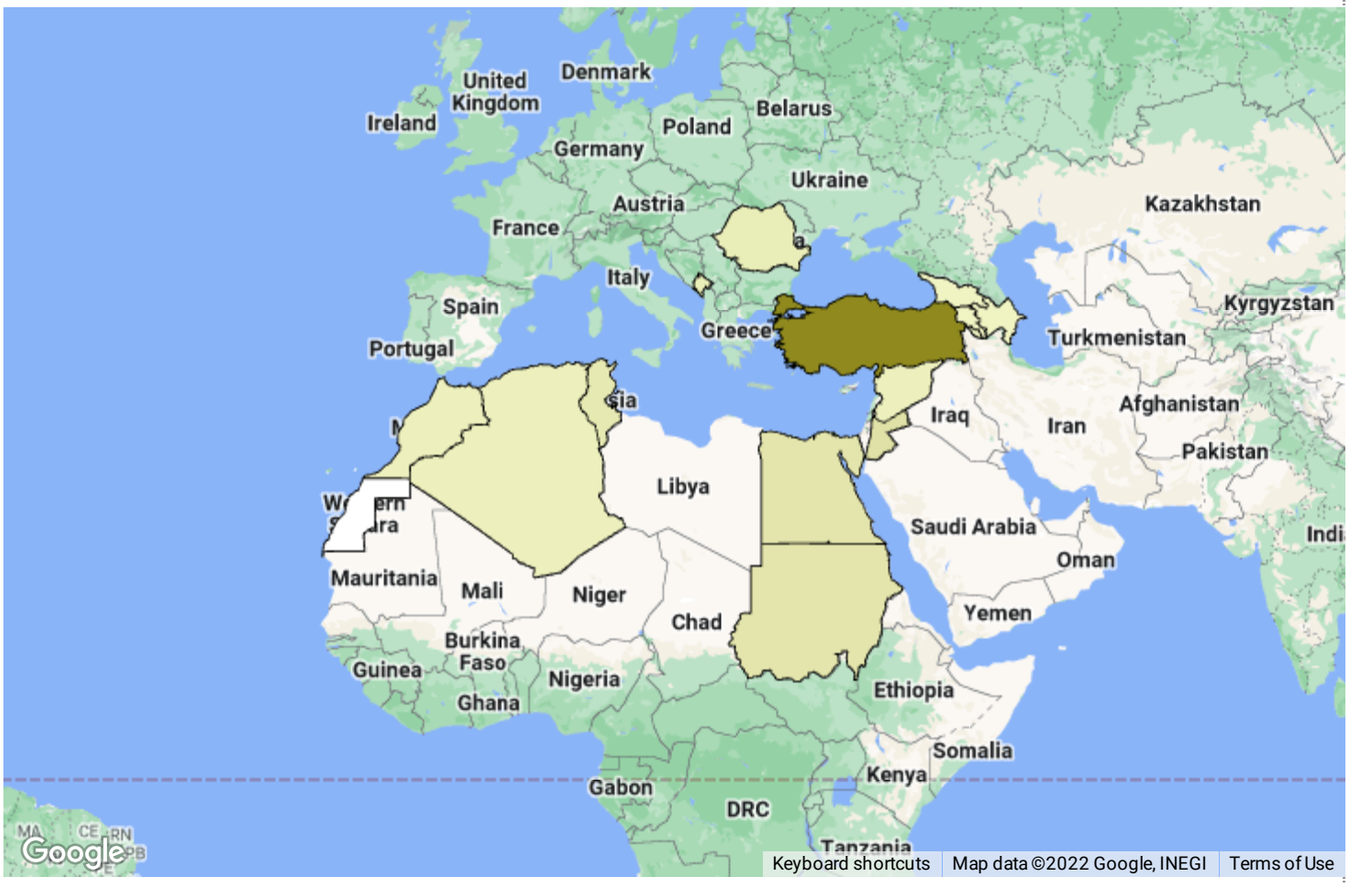
Table 3.7: Geography of Evidence - IFAD NENA ECA and SKiM Countries

Share of NENA ECA evidence	31%
IFAD NENA ECA country specific	134
Near East (West Asia)	1
North Africa	15
(East) Europe	22
Central Asia	14

Among the geographically specified evidence sources, IFAD Near East, North Africa, Europe and Central Asia Region covers 31% with 134 sources (Table 3-7). Regionally, all sub-regions except Near East, UN Classification West Asia, had a similar number of evidence resources covering them. West Asia had only a single evidence resource.

Countrywise, there was a spread among the 26 countries the NENA and ECA region consists of. The number of multi- NENA ECA country evidence sources (58) exceeded any single country evidence source number. Among the single country covering sources, Turkiye had the maximum with 31. Turkiye was followed by Egypt, Romania, Morocco and Tunisia at a big distance. Algeria and Sudan were the other countries with a significant number of evidence resources designated to them. Two of the three SKiM project countries, Morocco (17) and Sudan (14), were in the middle range while Moldova was covered only a few times as a part of evidence sources focusing on regional knowledge management aspects but not alone in any evidence sources (Map 3-1).

Map 3-1: Country Coverage of the Single Country Evidence Sources in IFAD's NENA and CEN regions



1 58 *Moldova:* 3 *Morocco:* 17 *Sudan:* 14

3.4 Impact Context of the Evidence

Table 3-8: Impact Relevance of Evidence

Share of impact specific evidence	100%
Number of impact specific evidence	512
IFAD TIER 1* SDGs	112
IFAD 2016-2025 Strategic Framework**	179

All evidence sources with complete information on the g-ToC mention specific impact dimensions in their full texts. The content of the evidence sources also covers all 17 Sustainable Development Goals of the United Nations, the most commonly used impact characterization approach in the world (Infographic 3-1).

Infographic 3-1: Number of Evidence Sources Informing About the Sustainable Development Goals

The most covered SDGs are SDG-13 climate action (100.00%), SDG-8 decent work and economic growth (92.76%), SDG-12 responsible consumption and production (89.63%) The least covered ones were SDG - 6 Clean water and sanitation (6.07%) , SDG-2 zero hunger (9.39%). SDG-16 peace, justice and strong institutions, SDG-10 reduced inequalities and SDG-1 no poverty were also relatively less covered.

Evidence sources also informed about the impact context, IFAD utilizes. Both IFAD Result Management Framework Dashboard and the IFAD 2016-2025 Strategic Framework were informed by the evidence sources (Table 3-9). Six of the seven Tier - 1 indicators were informed by the evidence sources (Table 3-9) . IFAD RF 1.2.1 (Prevelance of food insequrity) and IFAD RF 1.2.3 (Prevelance of malnutrition) were the most informed indicators both overall and in the NENA ECA region. Considering that NENA ECA is one of the five regions of IFAD, the region presented a larger share of information in RF 1.2.1 and RF 1.2.3, while it it was less informed in terms of IFAD 1.2.2 (Prevelance of stunded children under 5 years).

Table 3-9: IFAD Result Management Framework Dashboard - Tier 1: Goals and Context Relevance of the Evidence; overall (left) and specific to IFAD NENA ECA Region (Right)

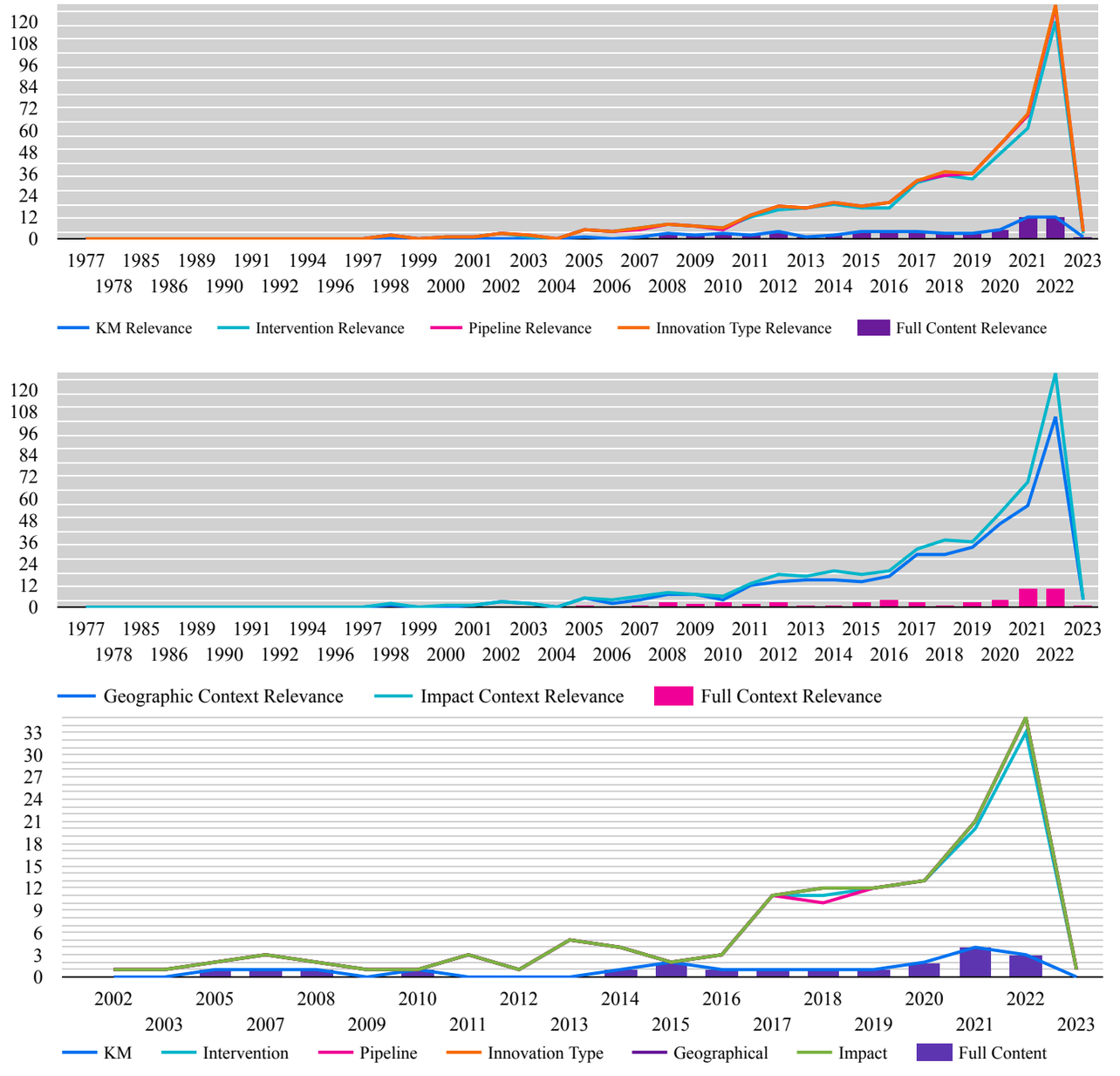
IFAD 1.1.1 Poverty Line (SDG 1.1.1)	6	2
IFAD 1.2.1 Food Insecurity (SDG 2.1.2)	49	20
IFAD 1.2.2 Stunted Children (SDG 2.2.1)	16	1
IFAD 1.2.3 Malnutrition (SDG 2.2.2)	41	17
IFAD 1.2.4 Smallholder Income (SDG2.3.2)	5	2
IFAD 1.2.5 Agricultural Investment (SDG 2.A.2)	7	2
IFAD 1.2.6 Agriculture Budget Share (SDG 2.A.1)	0	0

3.5 Time Trends of the Evidence

The number of evidence resources informing the g-ToC of the evidence synthesis has been increasing until 2021 (Figure 3-3). The increase was characterized by relative stability and upward shift cycles (1997 to 2004, 2005 -2010, 2011-2016, 2017-2019). Regarding the content dimensions of the g-ToC (knowledge management, intervention, innovation times and pipelines), coverage provided by the evidence sources were very similar except for knowledge management. Knowledge management was the lowest informed dimension with a distance and the limiting factor was the content relevance.

Evidence sources provided similar coverage to different context aspects (geographical and impact). In comparison to geographic coverage, impact coverage had slightly higher number of sources and slightly more variability. For the IFAD NENA and ECA regions, knowledge management had the lowest number of coverage. In the last two decades, there was on average a single source every year in the region with 2021 being the peak year among all the years.

Figure 3-3: Content (Above) and Context (Middle) Relevance of Evidence Sources Across Time for all the World and IFAD NENA ECA Regions (Below)



3.6 IFAD's Contribution to and Benefit from the Evidence

IFAD participated in generating evidence sources about knowledge management, interventions, and innovations across the world in three major ways. IFAD

i) funded the teams who developed the evidence,

ii) staff produced or co-produced the evidence sources

iii) influenced the content of the evidence source indirectly

Among the 2,339 sources studied in this evidence synthesis, IFAD funded 11 of them. Three of the sources were co-produced by IFAD staff and 13 of them IFAD work and learnings were presented. For the IFAD NENA and CEN region relevant sources, only 1 was funded by IFAD, 1 was authored and 3 mentioned IFAD's contributions. (Infographic 3-2)

Infographic 3-2: IFAD's Contribution to the Evidence - Overall (Upper Row) and in NENA and ECA Region (Lower Row)

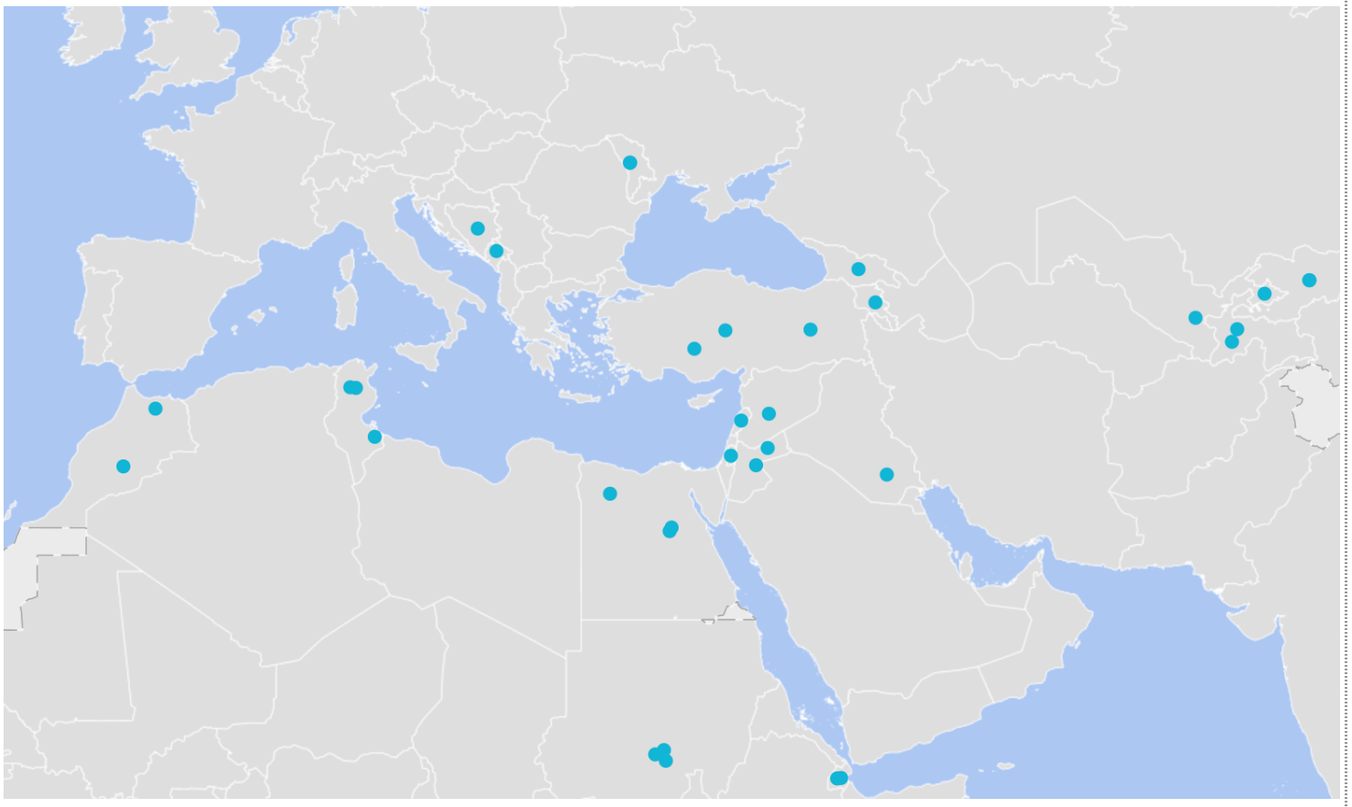
Table 3-10: IFAD Authored, Funded and Influenced Evidence Sources

1.	Garbero A.; Resce G.; Carneiro B., (2021), Spatial dynamics across food systems transformation in IFAD investments: a machine learning approach
2.	Sartas, M; Cummings, S; Garbero, A; Akramkhanov, A, (2021), A human machine hybrid approach for systematic reviews and maps in international development and social impact sectors
3.	Holtdirk, F; Mehnert, A; Weiss, M; Meyer, B; Watzl, C, (2020), Protocol for the Optimune trial: a randomized controlled trial evaluating a novel Internet intervention for breast cancer survivors
4.	Vermeulen S.J.; Aggarwal P.K.; Ainslie A.; Angelone C.; Campbell B.M.; Challinor A.J.; Hansen J.W.; Ingram J.S.I.; Jarvis A.; Kristjanson P.; Lau C.; Nelson G.C.; Thornton P.K.; Wollenberg E., (2012), Options for support to agriculture and food security under climate change
5.	Paresys, L; Saito, K; Dogliotti, S; Malezieux, E; Huat, J; Kropff, MJ; Rossing, WAH, (2018), Feeding the world while reducing farmer poverty? Analysis of rice relative yield and labour productivity gaps in two Beninese villages
6.	Moseley W.G., (2022), Development assistance and Boserupian intensification under geopolitical isolation: The political ecology of a crop-livestock integration project in Burundi
7.	Karanja L.; Gakuo S.; Kansiime M.; Romney D.; Mibei H.; Watiti J.; Sabula L.; Karanja D., (2020), Impacts and challenges of ICT based scale-up campaigns: Lessons learnt from the use of SMS to support maize farmers in the UPTAKE project, Tanzania
8.	Makate C.; Makate M.; Mango N.; Siziba S., (2019), Increasing resilience of smallholder farmers to climate change through multiple adoption of proven climate-smart agriculture innovations. Lessons from Southern Africa
9.	Ton G.; de Grip K.; Lançon F.; Onumah G.E.; Proctor F.J., (2014), Empowering Smallholder Farmers in Markets: Strengthening the advocacy capacities of national farmer organisations through collaborative research
10.	Upadhyay B.; Burra D.D.; Nguyen T.T.; Wyckhuys K.A.G., (2020), Caught off guard: folk knowledge proves deficient when addressing invasive pests in Asian cassava systems
11.	Bourne, M; Gassner, A; Makui, P; Muller, A; Muriuki, J, (2017), A network perspective filling a gap in assessment of agricultural advisory system performance
12.	Dougoud J.; Cock M.J.W.; Edgington S.; Kuhlmann U., (2018), A baseline study using Plantwise information to assess the contribution of extension services to the uptake of augmentative biological control in selected low- to lower- middle- income countries
13.	Unknown Author , (2015), Critical role of animal science research in food security and sustainability
14.	Buck L.; Scherr S.; Trujillo L.; Mecham J.; Fleming M., (2020), Using integrated landscape management to scale agroforestry: examples from Ecuador
15.	Bertin T.; Ann D.; Zacharie T.; Ebenezar A.; Alain T., (2012), Enhancing farmers access to quality planting materials through community-based seed and seedling systems: Experiences from the western highlands of cameroon
16.	Gupta, MC; Gupta, S, (2022), Strengthening community-led development of adaptive pathways to rural resilient infrastructure in Asia and the Pacific
17.	Dror I.; Cadilhon J.-J.; Schut M.; Misiko M.; Maheshwari S., (2015), Innovation Platforms for Agricultural Development: Evaluating the mature innovation platforms landscape
18.	de Roo, N; Almekinders, C; Leeuwis, C; Tefera, T, (2019), Scaling modern technology or scaling exclusion? The socio-political dynamics of accessing in malt barley innovation in two highland communities in Southern Ethiopia

4. Knowledge Management Evidence Outlook for IFAD NENA and CEN Countries

IFAD NENA and CEN region operates in 26 countries in North Africa, East Europe, West Asia and Central Asia. Currently, it is active in 5 countries in North Africa (Morocco, Tunisia, Egypt, Sudan and Djibouti), 3 countries in East Europe (Bosnia and Herzegovina, Montenegro, Moldova), 3 in South Eastern Europe and West Asia (Turkey, Georgia and Armenia), 5 in West Asia (Lebanon, Palestine, Jordan, Syria and Iraq) and 3 in Central Asia (Uzbekistan, Tajikistan and Kyrgyzstan). (Map 3-2)

Map 3-2: Current IFAD Interventions in NENA and CEN Regions (https://www.ifad.org/en/web/operations/regions/NEN)



14 IFAD NENA and CEN countries were referred by complete evidence sources, with coverage of all concepts of the g- ToC. Most of the 14 countries belong to the current operational countries. The 14 does not include 6 of the operational countries (Moldova, Montenegro, Jordan, Palestine, Lebanon, and Uzbekistan) but includes Somalia, which does not have any active IFAD project currently.

Each of the 14 countries has different referrals by the evidence sources, and the importance of knowledge management dimensions was also different. Therefore, the evidence synthesis has included country-specific outlooks presenting.

- Basic evidence source description specific to the country
- List of complete (key) sources informing about the g- ToC
- Semantic network analysis of the content of the complete sources
- Lessons provided by the complete sources specific to the country
- Evidence source inventory of country-specific complete evidence sources for each country

Knowledge Management Evidence Outlook

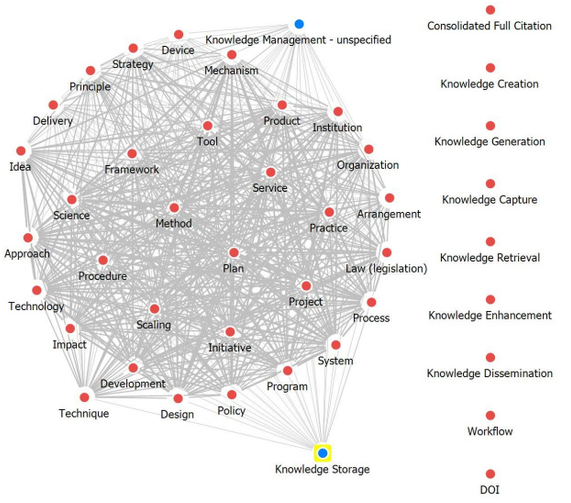
Algeria

Algeria was mentioned in 15 evidence sources. However, only two evidence sources provided general information about all dimensions and granular information about the contribution of knowledge management interventions aiming to improve the performance of agri-food innovations for impact. Both of these resources mentioned Algeria as one of the countries that can benefit from broader knowledge-sharing activities in setting up national agricultural programs. In Algeria, knowledge management and storage were considered a part of the g-ToC but they were not centrally important.

Key Sources

1. Cherry A.; Haselip J.; Ralphs G.; Wagner I.E., (2018), Africa-Europe research and innovation cooperation: Global challenges, bi-regional responses
2. Chakravarty A.; Whitbread A.; Gaur P.; Selvaraj A.; Mazumdar S.D.; Philroy J.; Durgalla P.; Mane H.; Sharma K.K., (2021), Benefitting Smallholder Farmers in Africa: Role of ICRISAT

Current Knowledge Management Situation in Algeria



Key Lessons:

1. Knowledge is necessary to achieve impact
2. Knowledge sharing led to establishing partnerships

Evidence Source Inventory of Country-specific Complete Evidence Sources for Algeria

Full text	2
journal	0
articles	1
books	1
book chapters	0
conference p.	0
reviews	0

K.management .	1
K.generation	0
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	1
design	2
development	2
delivery	1
scaling	2
impact	2

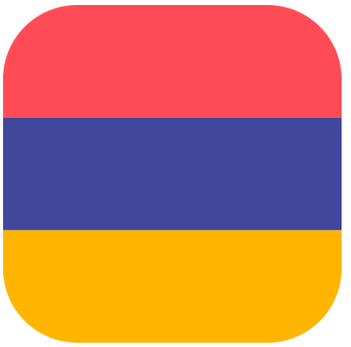
project	2
program	2
policy	2
initiative	2

method	2
strategy	2
framework	2
tool	1
product	2
service	1
device	2

technology	2
approach	1
procedure	2
principle	2
plan	2
technique	2
science	1

practice	2
mechanism	1
institution	2
organization	2
arrangement	2

law (legislation)	2
workflow	0
process	2
system	2



Knowledge Management Evidence Outlook

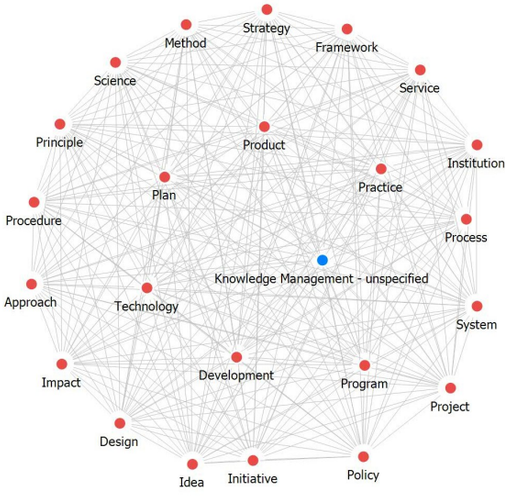
Armenia

Armenia was mentioned in 5 evidence sources, one of which provided general information about multiple perspectives on the contribution of knowledge management interventions aiming to improve the performance of agri-food innovations for impact. In the evidence resource, general knowledge management was a central theme and was discussed extensively. Evidence sources in Armenia did not include specific dimensions of knowledge management.

Key Sources

1. Oedl-Wieser, T; Dax, T; Fischer, M, (2017), A new approach for participative rural development in Georgia - reflecting transfer of knowledge and enhancing innovation in a non-European Union context

Current Knowledge Management Situation in Armenia



Key Lessons:

1. Rural development requires effective knowledge management
2. Policies need to consider local knowledge management systems
3. Knowledge management should be done at multiple governance scales

Evidence Source Inventory of Country-specific Complete Evidence Sources for Armenia

Full text	1
journal	1
articles	0
books	0
book chapters	0
conference p.	0
reviews	0

K.management .	1
K.generation	0
K.capture	0
K.storage	0
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	1
design	1
development	1
delivery	0
scaling	0
impact	1

project	1
program	1
policy	1
initiative	1

method	1
strategy	1
framework	1
tool	1
product	1
service	0
device	1

technology	1
approach	1
procedure	1
principle	0
plan	1
technique	1
science	0

practice	1
mechanism	0
institution	1
organization	0
arrangement	0

law (legislation)	0
workflow	0
process	1
system	1

Knowledge Management Evidence Outlook

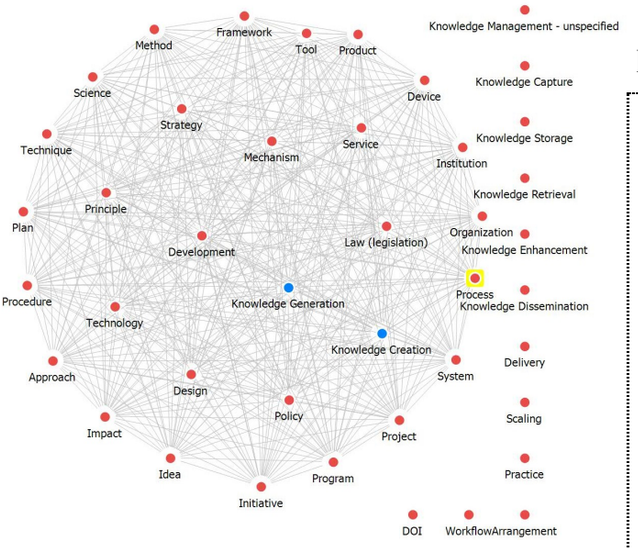
Bosnia and Herzegovina

Bosnia and Herzegovina was mentioned in 5 evidence sources. However, only one of them provided granular information about the contribution of knowledge management interventions to the performance of agri-food innovations for impact. The resource focused on multi-stakeholder dimensions of knowledge creation or generation. In Bosnia and Herzegovina, knowledge creation or generation was considered a part of the g-ToC and they had central to medium central weight.

Key Sources

1. Dettenhofer, M; Ondrejovic, M; Slavica, A; Kurtanjek, Z; Tapaloaga, D; Tapaloaga, PR; Pojskic, LK; Durmic-Pasic, A; Begovic, J; Nedovic, V; Dundar, M; Gartland, KMA; Miertus, S, (2019), Current state and prospects of biotechnology in Central and Eastern European countries. Part II: new and preaccession EU countries(CRO, RO, B&H, SRB)

Current Knowledge Management Situation in Bosnia



Key Lessons:

1. Multi-stakeholder action is necessary for effective creation or generation of knowledge

Evidence Source Inventory of Country-specific Complete Evidence Sources for Bosnia and Herzegovina

Full text	1
journal	0
articles	0
books	0
book chapters	0
conference p.	1
reviews	0

K.management .	0
K.generation	1
K.capture	0
K.storage	0
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	1
design	1
development	1
delivery	0
scaling	0
impact	1

project	1
program	1
policy	1
initiative	1

method	1
strategy	1
framework	1
tool	1
product	1
service	1
device	1

technology	1
approach	1
procedure	1
principle	1
plan	1
technique	1
science	1

practice	0
mechanism	1
institution	1
organization	1
arrangement	0

law (legislation)	1
workflow	0
process	1
system	1

Knowledge Management Evidence Outlook

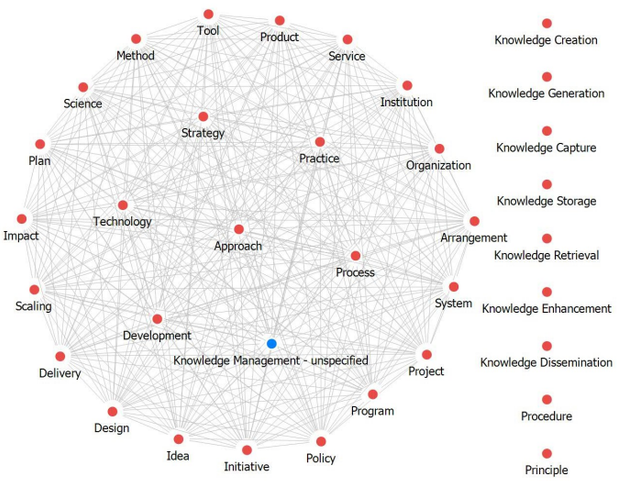
Djibouti

Djibouti was mentioned in 3 evidence sources, one of which provided details about the contribution of knowledge management interventions to the performance of agri-food innovations for impact. The resource focused on income and poverty implications of knowledge management in neighboring Ethiopia with referrals to Djibouti. In Djibouti, knowledge management was considered a part of the g-ToC with medium central importance.

Key Sources

1. Berhe K.; Puskur R.; Teka W.; Hoekstra D.; Tegegne A., (2010), Innovation in banana value chain development in metema district, Northwestern Ethiopia: Improving Productivity and Market Success (IPMS) project experiences

Current Knowledge Management Situation in Djibouti



Key Lessons:

1. Improved incomes and reduced poverty require knowledge management capabilities

Evidence Source Inventory of Country-specific Complete Evidence Sources for Djibouti

Full text	1
journal	0
articles	0
books	0
book chapters	1
conference p.	0
reviews	0

K.management .	1
K.generation	0
K.capture	0
K.storage	0
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	1
design	1
development	1
delivery	1
scaling	1
impact	1

project	1
program	1
policy	1
initiative	1

method	1
strategy	1
framework	0
tool	0
product	1
service	0
device	1

technology	1
approach	1
procedure	0
principle	1
plan	1
technique	1
science	0

practice	1
mechanism	0
institution	1
organization	1
arrangement	1

law (legislation)	0
workflow	0
process	1
system	1

Knowledge Management Evidence Outlook

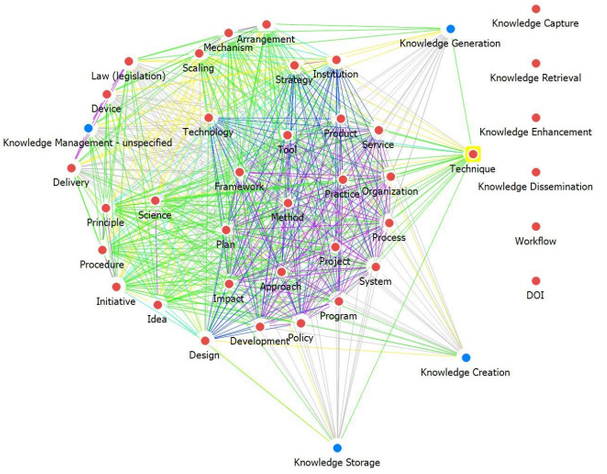
Egypt

Egypt was referred in 22 evidence sources, four of which provided granularity on the contribution of knowledge management interventions. Egypt was one of the relatively more studied areas in terms of knowledge management and agri-food innovations The resources focused on a variety of aspects, such as creation, generation and storage. However, in Egypt, knowledge management was considered a peripheral part of the g-ToC with low importance.

Key Sources

1. Kassem, HS; Ismail, H; Ghoneim, YA, (2022), Assessment of Institutional Linkages and Information Flow within the Agricultural Knowledge and Innovation: Case of Dakahlia Governorate, Egypt
2. Cherry A.; Haselip J.; Ralphs G.; Wagner I.E., (2018), Africa-Europe research and innovation cooperation: Global challenges, bi-regional responses
3. Cantele, M; Bal, P; Kompas, T; Hadjikakou, M; Wintle, B, (2021), Equilibrium Modeling for Environmental Science: Exploring the Nexus of Economic Systems and Environmental Change
4. Bertram D.; Chilla T.; Wilhelm C., (2021), Short value chains in food production: The role of spatial proximity for economic and land use dynamics

Current Knowledge Management Situation in Egypt



Key Lessons:

1. Traditional knowledge improves land management
2. Knowledge creation reduces cost of agriculture
3. Knowledge management is effective when combine with human process capabilities like facilitation.

Evidence Source Inventory of Country-specific Complete Evidence Sources for Egypt

Full text	4
journal	2
articles	1
books	0
book chapters	0
conference p.	1
reviews	0

K.management .	1
K.generation	1
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	2
design	3
development	4
delivery	1
scaling	2
impact	4

project	4
program	4
policy	4
initiative	2

method	3
strategy	4
framework	2
tool	2
product	4
service	2
device	2

technology	4
approach	3
procedure	4
principle	4
plan	4
technique	4
science	1

practice	4
mechanism	2
institution	3
organization	4
arrangement	2

law (legislation)	1
workflow	0
process	4
system	4

Knowledge Management Evidence Outlook

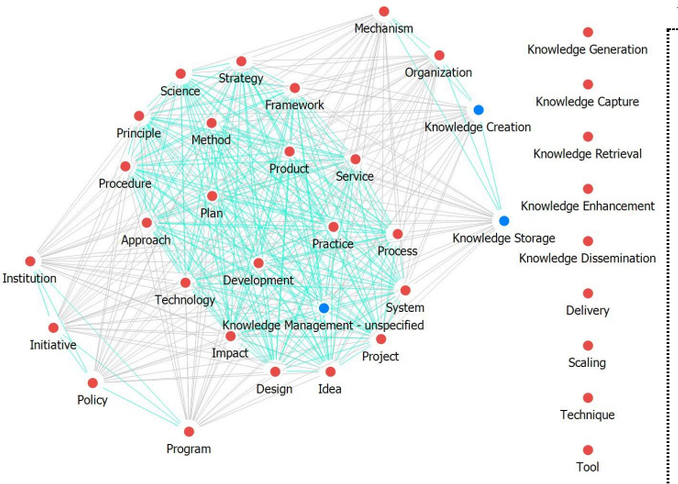
Georgia

Georgia was mentioned in 7 evidence sources. Two provided specifics on the contribution of knowledge management interventions to the agricultural and food innovation pipelines. The resources focused on a variety of aspects, such as creation, storage in addition to overall knowledge management. While knowledge management in general had medium-high importance, generation and storage was given less importance in these sources.

Key Sources

1. Oedl-Wieser, T; Dax, T; Fischer, M, (2017), A new approach for participative rural development in Georgia - reflecting transfer of knowledge and enhancing innovation in a non-European Union context
2. Brachos D.; Kostopoulos K.; Söderquist K.E.; Prastacos G., (2007), Knowledge effectiveness, social context and innovation

Current Knowledge Management Situation in Georgia



Key Lessons:

1. Knowledge storage solutions are very important parts of managing rural organizations
2. Knowledge management requires support from specific projects

Evidence Source Inventory of Country-specific Complete Evidence Sources for Georgia

Full text	2
journal	2
articles	0
books	0
book chapters	0
conference p.	0
reviews	0

K.management .	2
K.generation	0
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	2
design	2
development	2
delivery	0
scaling	0
impact	2

project	2
program	1
policy	1
initiative	1

method	2
strategy	2
framework	2
tool	2
product	2
service	0
device	2

technology	2
approach	2
procedure	2
principle	0
plan	2
technique	2
science	0

practice	2
mechanism	1
institution	1
organization	1
arrangement	0

law (legislation)	0
workflow	0
process	2
system	2

Knowledge Management Evidence Outlook

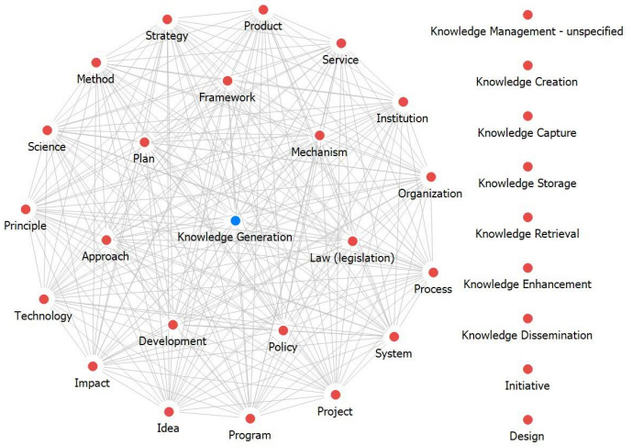
Kyrgyzstan

Kyrgyzstan was mentioned in 3 evidence sources. One provided details on the role of knowledge management interventions to the agricultural and food innovation pipelines. The resource only referred to knowledge management in general while comparing the empirical work done in Tajikistan. However, knowledge management was at the central stage of the discussions linking agri-food interventions to the overall lifestyle of innovations.

Key Sources

1. Breu T.; Maselli D.; Hurni H., (2005), Knowledge for sustainable development in the Tajik Pamir Mountains

Current Knowledge Management Situation in Kyrgyzstan



Key Lessons:

1. Systematic knowledge generation is instrumental in improving innovations that can change behaviours

Evidence Source Inventory of Country-specific Complete Evidence Sources for Krygyzstan

Full text	1
journal	1
articles	0
books	0
book chapters	0
conference p.	0
reviews	0

K.management .	0
K.generation	1
K.capture	0
K.storage	0
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	1
design	0
development	1
delivery	0
scaling	0
impact	1

project	1
program	1
policy	1
initiative	0

method	1
strategy	1
framework	0
tool	1
product	1
service	0
device	1

technology	1
approach	1
procedure	1
principle	0
plan	1
technique	1
science	0

practice	0
mechanism	1
institution	1
organization	1
arrangement	0

law (legislation)	1
workflow	0
process	1
system	1

Knowledge Management Evidence Outlook

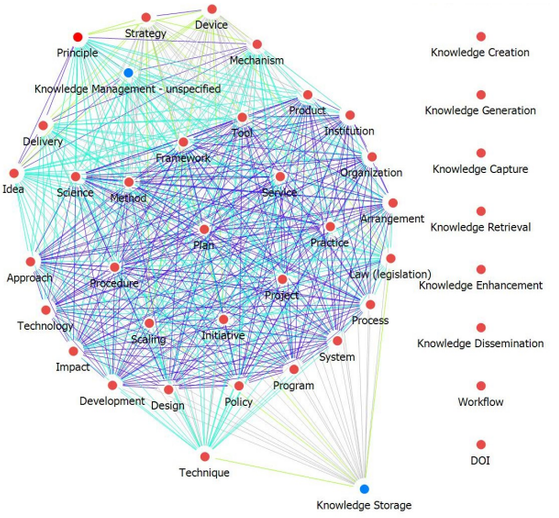
Morocco

Morocco was mentioned in 17 evidence sources, three of which detail the role of knowledge management interventions in the agricultural and food innovation pipelines. They referred to knowledge management in general and knowledge storage. While knowledge management was at the medium-low importance range in the resources, knowledge storage played a minor role.

Key Sources

1. Cherry A.; Haselip J.; Ralphs G.; Wagner I.E., (2018), Africa-Europe research and innovation cooperation: Global challenges, bi-regional responses
2. Chakravarty A.; Whitbread A.; Gaur P.; Selvaraj A.; Mazumdar S.D.; Philroy J.; Durgalla P.; Mane H.; Sharma K.K., (2021), Benefitting Smallholder Farmers in Africa: Rc of ICRISAT
3. Biswas A.K.; Seetharam K.E., (20 Achieving water security for Asia

Current Knowledge Management Situation in Morocco



Key Lessons:

1. Knowledge management is crucial for achieving large scale impact
2. Knowledge storage can be done in partnership with multiple research stakeholders

Evidence Source Inventory of Country-specific Complete Evidence Sources for Morocco

Full text	3
journal	1
articles	1
books	1
book chapters	0
conference p.	0
reviews	0

K.management .	2
K.generation	0
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	2
design	3
development	3
delivery	2
scaling	2
impact	3

project	3
program	3
policy	3
initiative	2

method	3
strategy	3
framework	3
tool	2
product	3
service	2
device	3

technology	3
approach	1
procedure	3
principle	3
plan	3
technique	3
science	1

practice	3
mechanism	2
institution	3
organization	3
arrangement	3

law (legislation)	2
workflow	0
process	3
system	3

Knowledge Management Evidence Outlook

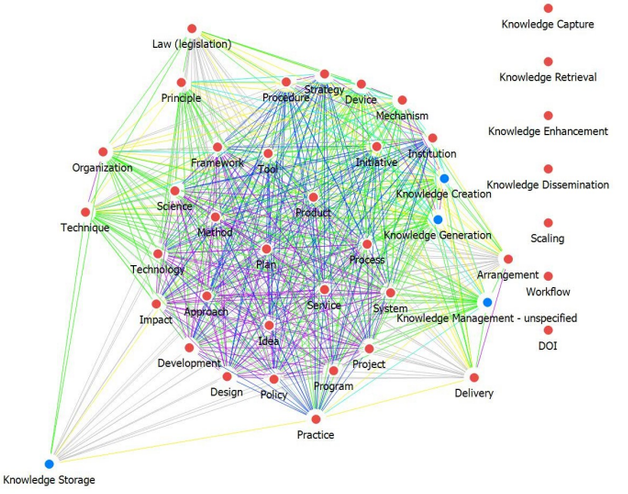
Romania

Romania was referred in 18 evidence sources. Four of them had granular information about the relevance of knowledge management interventions in the agricultural and food innovation pipelines. They referred to knowledge management in general, knowledge creation, generation, and storage. All four knowledge management dimensions played a minor role. Three of the four, creation, generation, and knowledge management in general were discussed in an integrated manner.

Key Sources

1. Oedl-Wieser, T; Dax, T; Fischer, M, (2017), A new approach for participative rural development in Georgia - reflecting transfer of knowledge and enhancing innovation in a non-European Union context
2. Dettenhofer, M; Ondrejovic, M; Slavica, A; Kurtanjek, Z; Tapaloaga, D; Tapaloaga, PR; Pojskic, LK; Durmic-Pasic, A; Begovic, J; Nedovic, V; Dundar, M; Gartland, KMA; Miertus, S, (2019), Current state and prospects of biotechnology in Central and Eastern European countries. Part II: new and preaccession EU countries(CRO, RO, B&H, SRB)
3. Cantele, M; Bal, P; Kompas, T; Hadjikakou, M; Wintle, B, (2021), Equilibrium Modeling for Environmental Science: Exploring the Nexus of Economic Systems and Environmental Change
4. Bostock, J; Seixas, S, (2015), Investing in the human capital of the aquatic food sector: AQUA-TNET and the road ahead

Current Knowledge Management Situation in Romania



Key Lessons:

1. Government investments in knowledge storage is crucial
2. Knowledge management benefits diver agricultural activities including aquaculture
3. Knowledge creation should be done at different scales

Evidence Source Inventory of Country-specific Complete Evidence Sources for Romania

Full text	4
journal	2
articles	0
books	0
book chapters	0
conference p.	2
reviews	0

K.management .	2
K.generation	2
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	4
design	4
development	4
delivery	1
scaling	0
impact	4

project	4
program	4
policy	4
initiative	3

method	4
strategy	4
framework	3
tool	2
product	4
service	2
device	4

technology	4
approach	3
procedure	4
principle	3
plan	4
technique	4
science	2

practice	3
mechanism	2
institution	3
organization	2
arrangement	1

law (legislation)	1
workflow	0
process	4
system	4

Knowledge Management Evidence Outlook

Somalia

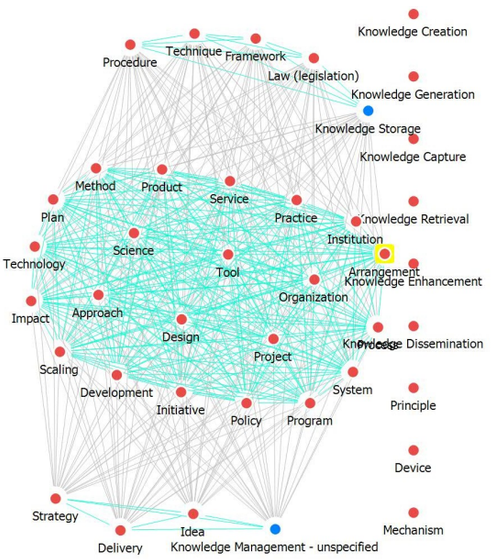
Somalia was referred to in three evidence sources, two of which had some specific information about the importance of knowledge management interventions in the agricultural and food innovation pipelines. Both were focused on neighboring countries but referred to the situation in Somalia. Knowledge management in general and storage, in particular, was referred to minor significance.

Key Sources

1. Chakravarty A.; Whitbread A.; Gaur P.; Selvaraj A.; Mazumdar S.D.; Philroy J.; Durgalla P.; Mane H.; Sharma K.K., (2021), Benefitting Smallholder Farmers in Africa: Role of ICRISAT

2. Berhe K.; Puskur R.; Teka W.; Hoekstra D.; Tegegne A., (2010), Innovation in banana value chain development in metema district, Northwestern Ethiopia: Improving Productivity and Market Success (IPMS) project experiences

Current Knowledge Management Situation in Somalia



Key Lessons:

1. Knowledge management practices can lead to important partnerships
2. Knowledge management capabilities including storage are important to sustain the income gains from the projects

Evidence Source Inventory of Country-specific Complete Evidence Sources for Somalia

Full text	2
journal	0
articles	0
books	1
book chapters	1
conference p.	0
reviews	0

K.management .	1
K.generation	0
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	1
design	2
development	2
delivery	1
scaling	2
impact	2

project	2
program	2
policy	2
initiative	2

method	2
strategy	2
framework	1
tool	0
product	2
service	1
device	2

technology	2
approach	1
procedure	1
principle	2
plan	2
technique	2
science	0

practice	2
mechanism	0
institution	2
organization	2
arrangement	2

law (legislation)	1
workflow	0
process	2
system	2

Knowledge Management Evidence Outlook

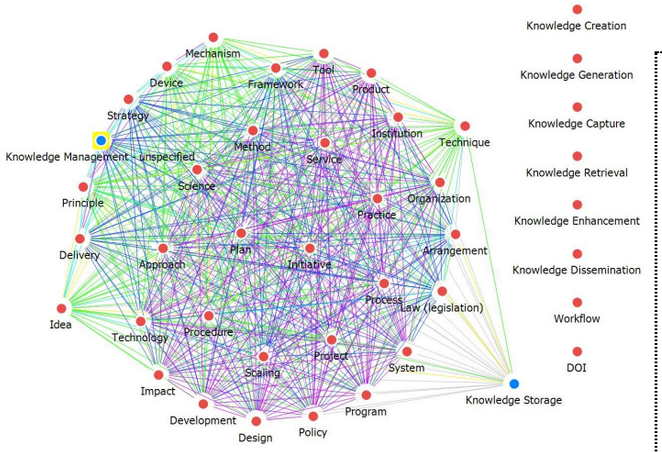
Sudan

Sudan was mentioned by 14 evidence sources, four of which had some specific information about the importance of knowledge management interventions in the agricultural and food innovation pipelines. They included knowledge management in general and knowledge storage in particular. Both general knowledge management and storage were minor importance dimensions and contributed separately to different discussions.

Key Sources

1. Cherry A.; Haselip J.; Ralphs G.; Wagner I.E., (2018), Africa-Europe research and innovation cooperation: Global challenges, bi-regional responses
2. Chakravarty A.; Whitbread A.; Gaur P.; Selvaraj A.; Mazumdar S.D.; Philroy J.; Durgalla P.; Mane H.; Sharma K.K., (2021), Benefitting Smallholder Farmers in Africa: Role of ICRISAT
3. Birke F.M.; Knierim A., (2020), ICT for agriculture extension: actor network theory for understanding the establishment of agricultural knowledge centers in South Wollo, Ethiopia
4. Berhe K.; Puskur R.; Teka W.; Hoekstra D.; Tegegne A., (2010), Innovation in banana value chain development in metema district, Northwestern Ethiopia: Improving Productivity and Market Success (IPMS) project experiences

Current Knowledge Management Situation in Sudan



Key Lessons:

1. Knowledge management is a participatory activity involving different stakeholders
2. ICT solutions in knowledge storage can make an important contribution to extension

Evidence Source Inventory of Country-specific Complete Evidence Sources for Sudan

Full text	4
journal	1
articles	1
books	1
book chapters	1
conference p.	0
reviews	0

K.management .	3
K.generation	0
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	2
design	4
development	4
delivery	3
scaling	3
impact	4

project	4
program	4
policy	4
initiative	4

method	4
strategy	4
framework	2
tool	2
product	4
service	2
device	4

technology	4
approach	3
procedure	3
principle	4
plan	4
technique	4
science	2

practice	4
mechanism	2
institution	4
organization	4
arrangement	3

law (legislation)	3
workflow	0
process	4
system	4

Knowledge Management Evidence Outlook

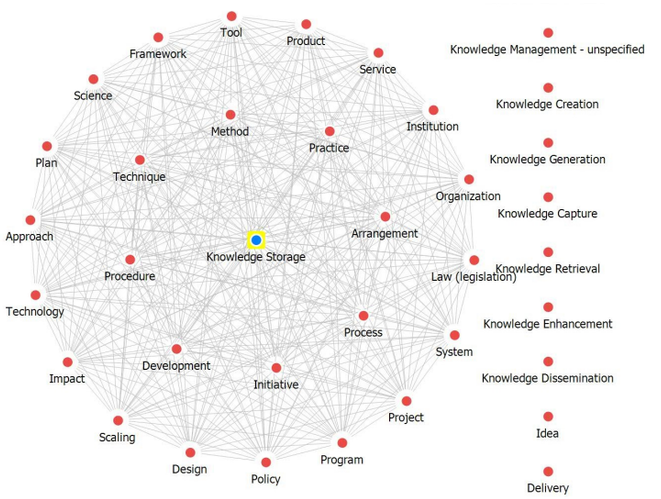
Syria

Syria was mentioned by 12 evidence sources, only one of which had some specific information about the importance of knowledge management interventions in the agricultural and food innovation pipelines, due to the difficulties of working in Syria. It included knowledge storage specifically. Storage was at a central role in the discussions.

Key Sources

1. Chakravarty A.; Whitbread A.; Gaur P.; Selvaraj A.; Mazumdar S.D.; Philroy J.; Durgalla P.; Mane H.; Sharma K.K., (2021), Benefitting Smallholder Farmers in Africa: Role of ICRISAT

Current Knowledge Management Situation in Syria



Key Lessons:

1. Knowledge storage is important for sustaining the gains from agricultural research.
2. Partnership is an important part of success in knowledge storage.

Evidence Source Inventory of Country-specific Complete Evidence Sources for Syria

Full text	1
journal	0
articles	0
books	1
book chapters	0
conference p.	0
reviews	0

K.management .	0
K.generation	0
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	0
design	1
development	1
delivery	0
scaling	1
impact	1

project	1
program	1
policy	1
initiative	1

method	1
strategy	1
framework	1
tool	0
product	1
service	1
device	1

technology	1
approach	0
procedure	1
principle	1
plan	1
technique	1
science	0

practice	1
mechanism	0
institution	1
organization	1
arrangement	1

law (legislation)	1
workflow	0
process	1
system	1

Knowledge Management Evidence Outlook

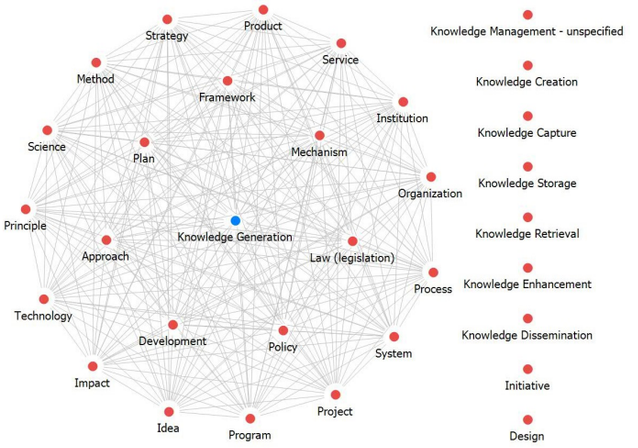
Tajikistan

Tajikistan was mentioned in 3 evidence sources. One provided details on the role of knowledge management interventions to the agricultural and food innovation pipelines. The resource only referred to knowledge management in general. However, knowledge management was at the central stage of the discussions linking agri-food interventions to the overall lifestyle of innovations.

Key Sources

1. Breu T.; Maselli D.; Hurni H., (2005), Knowledge for sustainable development in the Tajik Pamir Mountains

Current Knowledge Management Situation in Tajikistan



Key Lessons:

1. Systematic knowledge generation is crucial for sustainable development

Evidence Source Inventory of Country-specific Complete Evidence Sources for Tajikistan

Full text	1
journal	1
articles	0
books	0
book chapters	0
conference p.	0
reviews	0

K.management .	0
K.generation	1
K.capture	0
K.storage	0
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	1
design	0
development	1
delivery	0
scaling	0
impact	1

project	1
program	1
policy	1
initiative	0

method	1
strategy	1
framework	0
tool	1
product	1
service	0
device	1

technology	1
approach	1
procedure	1
principle	0
plan	1
technique	1
science	0

practice	0
mechanism	1
institution	1
organization	1
arrangement	0

law (legislation)	1
workflow	0
process	1
system	1

Knowledge Management Evidence Outlook

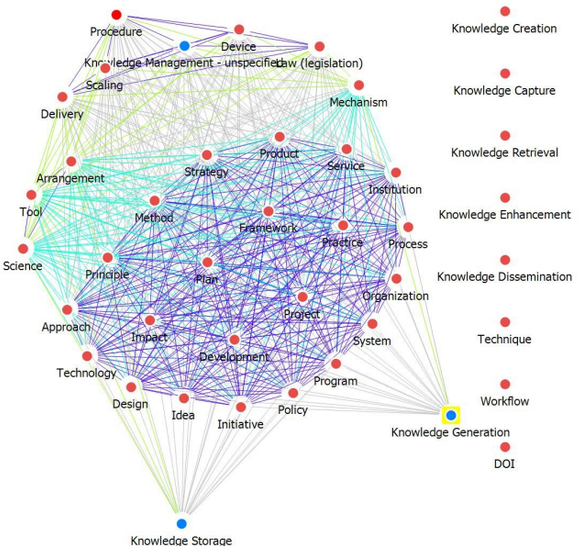
Tunisia

Tunisia was discussed in 17 evidence sources. Three of them had some specific information about the importance of knowledge management interventions in the agricultural and food innovation pipelines. They included various dimensions, e.g. knowledge management in general, and knowledge generation and storage specifically. All three knowledge dimensions were at the periphery and part of different discussions in the evidence sources.

Key Sources

1. Feo E.; Spanoghe P.; Berckmoes E.; Pascal E.; Mosquera-Losada R.; Opdebeeck A.; Burssens S., (2022), The multi-actor approach in thematic networks for agriculture and forestry innovation
2. Cherry A.; Haselip J.; Ralphs G.; Wagner I.E., (2018), Africa-Europe research and innovation cooperation: Global challenges, bi-regional responses
3. Araque-Padilla R.A.; Montero-Simo M.J., (2022), The Dynamics behind the Likelihood of Adopting Inclusive Agrarian Innovations in Disadvantaged Central American Communities

Current Knowledge Management Situation in Tunisia



Key Lessons:

1. Knowledge management processes have spillover benefits for the governance of agricultural interventions
2. Knowledge storage requires public investments

Evidence Source Inventory of Country-specific Complete Evidence Sources for Tunisia

Full text	3
journal	2
articles	1
books	0
book chapters	0
conference p.	0
reviews	0

K.management .	1
K.generation	1
K.capture	0
K.storage	1
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	3
design	3
development	3
delivery	1
scaling	1
impact	3

project	3
program	3
policy	3
initiative	3

method	3
strategy	3
framework	1
tool	3
product	3
service	0
device	2

technology	3
approach	3
procedure	3
principle	2
plan	3
technique	3
science	1

practice	3
mechanism	2
institution	3
organization	3
arrangement	2

law (legislation)	1
workflow	0
process	3
system	3

Knowledge Management Evidence Outlook

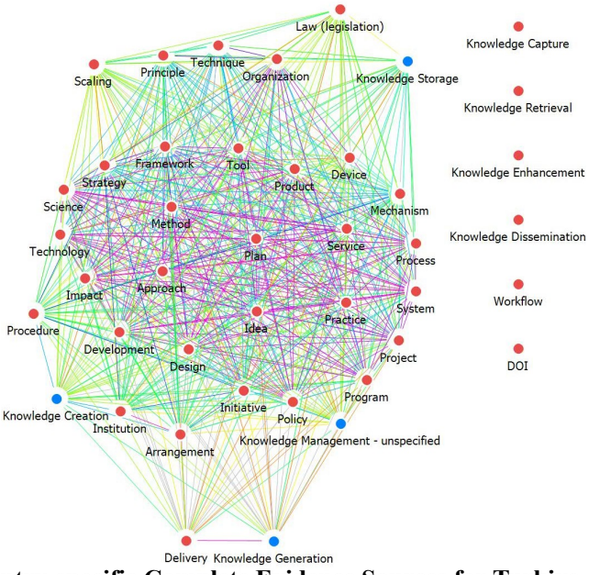
Turkiye

Turkiye had a very high number of evidence sources. 52 sources provided information about the role of knowledge management interventions in the agricultural and food innovation pipelines. They covered knowledge management in general and storage, creation, and generation in particular. All four knowledge dimensions were at the periphery. While creation and storage were part of different discussions, general knowledge management discussion and generation were done in an integrated manner.

Key Sources

1. Nazam, M; Hashim, M; Baig, SA; Abrar, M; Shabbir, R, (2020), Modeling the key barriers of knowledge management adoption in sustainable supply chain
2. Feo E.; Spanoghe P.; Berckmoes E.; Pascal E.; Mosquera-Losada R.; Opdebeeck A.; Burssens S., (2022), The multi-actor approach in thematic networks for agriculture and forestry innovation
3. Chaudhuri S.; Roy M.; McDonald L.M.; Emendack Y., (2021), Reflections on farmers' social networks: a means for sustainable agricultural development?
4. Cantele, M; Bal, P; Kompas, T; Hadjikakou, M; Wintle, B, (2021), Equilibrium Modeling for Environmental Science: Exploring the Nexus of Economic Systems and Environmental Change
5. Bruce T.J.A., (2016), The CROPROTECT project and wider opportunities to improve farm productivity through web-based knowledge exchange
6. Bostock, J; Seixas, S, (2015), Investing in the human capital of the aquatic food sector: AQUA-TNET and the road ahead

Current Knowledge Management Situation in Turkiye



Key Lessons:

1. Cultural knowledge can play an important role in creating food solutions especially culinary ones.
2. Knowledge management is a crucial part of sustainable agri-food supply change governance

Evidence Source Inventory of Country-specific Complete Evidence Sources for Turkiye

Full text	6
journal	3
articles	0
books	0
book chapters	0
conference p.	3
reviews	0

K.management .	2
K.generation	1
K.capture	0
K.storage	3
K.retrieval	0
K. enhancement	0
K. dissemination	0

ideation	5
design	6
development	6
delivery	1
scaling	2
impact	6

project	5
program	5
policy	6
initiative	4

method	6
strategy	6
framework	3
tool	4
product	6
service	4
device	6

technology	6
approach	4
procedure	5
principle	6
plan	6
technique	5
science	2

practice	6
mechanism	4
institution	3
organization	5
arrangement	3

law (legislation)	2
workflow	0
process	6
system	6

5. Summary and Recommendations

This evidence synthesis has processed more than 2000 sources using a state-of-art human-machine hybrid approach. More than 500 full-text resources, approximately 10.000 pages long text, provided a wealth of information about knowledge management interventions and their contribution to improving agricultural and food innovations under various geographical, impact, and temporal contexts. A full summary of this vast information requires more than a single report. However, the synthesis provides some exciting insights for what works better for knowledge management interventions and what should be the next steps the international impact ecosystem can follow to accelerate SDGs in North Africa, Near East, East Europe, Central Asia, and beyond.

Only a small share of the evidence sources provided enough granularity to program better interventions. In addition, existing information is mostly about general knowledge management rather than other operational aspects like capture, retrieval, enhancement, etc. Moreover, how different types of knowledge management interventions differ has not been sufficiently articulated. Although impacts were discussed intensely, how it happens through effective delivery and scaling processes is hardly articulated. Most of the existing evidence is at the level of continents and regions rather than at the country and sub-country levels. In most of cases, heterogeneous areas and countries bulked into a single group hindering the performance of knowledge management interventions significantly. In continents, the evidence available on different sub-regions varied significantly. Therefore,

> ***Actionable, context-specific knowledge management intelligence is a bottleneck for designing transformative delivery and scaling interventions required for impactful agriculture and food innovation systems***

Evidence sources informing about the role of knowledge management on SDG 1 (poverty) and 2 (hunger and food security) were much less than the average of all SDGs. Also, the number of IFAD-funded, authored and informed evidence sources were minimal. Nevertheless, evidence could inform all IFAD result management indicators except the government budget. Especially information on nutrition, the only IFAD indicator target that could not be achieved in recent years, had the largest evidence. In addition, there was no single complete evidence resource for Moldova among some 2300 analyzed by the synthesis. Morocco and Sudan were in the medium range when it came to the availability of the evidence. Therefore, the geographical focus of the IFAD regional SKiM project addressed a gap. Therefore,

> ***IFAD regional knowledge management efforts were crucial but insufficient in achieving the major poverty and hunger ambitions. It is necessary to increase investments in knowledge management.***

The evidence synthesis has also some natural follow-ups to design more effective and efficient knowledge management interventions that can fast-track impact. The first follow-up is to extend the scope of the evidence synthesis to technical reports and gray literature produced by IFAD and other key partners like CGIAR, FAO, Asian Development Bank, African Development Bank etc. Knowledge management is a practical discipline in which learning is captured also in non-scientific forms. The methods and tools developed for this evidence synthesis can reduce the time necessary to cover gray literature significantly. Also, synergies with existing toolkits of IFAD, like the ones developed by ATHENA, could further increase the gains for IFAD. Therefore,

> ***Extending the evidence synthesis by leveraging existing IFAD and partner tools can be a quick-win to design better-informed knowledge management interventions***.