D1.1.1: Guidelines for multi-actor platform building and roadmap in pilot areas

WP1.1 – User community requirements and multi-actor community platform

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Executive summary

The approach of multi-actor platform building is based on two basic assumptions - it is an open-ended and a context-dependent process. Therefore we propose it to be a combination of two interrelated types of activities. Regional Meetings are the backbone of the process and they are generically defined in the Grant Agreement Annex I (Description of Action). A mix of concrete methods of trust building among actors, on the other hand, shall be tailored to fit local conditions in each particular pilot area. The document provides a basic definition of a portfolio of methods for this purpose (snow-ball technique, "law of the neighbour", informal talk, semi-structured interviews, round-table discussions, brainstorming, focus groups, adaptive management). The Regional Managers/Teams shall select the elements that best fit into the specific pilot area context at any given time in the process.

Table of Contents

1 Purpose of the document

The purpose of this document is **to help FATIMA regional teams (and potentially others)** in their effort of fostering a strong collaborative multi-actor partnership/community with a sense of co-ownership and responsibility of/for FATIMA tools and services[1] and to create the enabling environment for implementation, market uptake, and sustainable financing. For this end, it provides the basic definitions, describes the main methodology, and lays out a tentative roadmap (to be adjusted along the way).

2 Objective and scope of the work

In line with the above, the main objective of Work package WP1.1 is **to foster a strong collaborative multi-actor community (in and beyond the pilot areas)** with a sense of co-ownership of and responsibility for FATIMA tools and to co-create the enabling environment for implementation, market uptake, and sustainable financing. Having this in mind, expected outcomes can be defined in terms of engaged/committed user community and an understanding of the value of FATIMA tools for sustainable agriculture as well as a vision for their sustainable use in all pilot areas and in the wider research, policy, and applications community.

This activity is aimed at **establishing the fundamental concepts and methods for** setting up, implementing and monitoring the participatory process that will be carried out in all pilot areas during the whole project lifetime. This means:

- Proposing concepts and methods to engage relevant actors: local/ regional stakeholders and the public, in order to identify key socio-economic, environmental, physical, political, and cultural drivers in pilot areas, along with practical response options. This will include physical meetings at the pilot sites (stakeholders workshops), access to the central ICT hub for the local/regional groups and as well the interaction of the FATIMA pilot communities, including support of the exchange of experiences and potential transfer of knowledge.

Combination of Regional Meetings with day-by-day communication of Regional Managers and Regional Teams with key actors will be the key modus operandi in the multi-actor community process in pilot areas. Its purpose is:

- To secure stakeholder involvement and empowerment in the project. This can be supported through a stakeholder advisory panel (SAP) in the pilot case with 3-5 key stakeholders, coordinated by a Regional Manager (representative of the FATIMA Partner from the pilot);

- to guide the Core Users and other stakeholders through the tasks of the project (providing information, training, and receiving feedback); and

- to develop a dialogue and foster linkages between the scientific community, policy-makers, managers, end-users and the general public within the context of the project, in order to ensure effective development and uptake of the project outcomes. All the activities will be performed in all

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[1] **FATIMA tools and services** *aim at helping the intensive farm sector optimize inputs (nutrients and water) and production. They consist of a modular technical system, based on a webGIS core hub (SPIDER) which is continuously fed with data/information from a wide range of sources (EO, in-field sensors, models, results of field sampling and trials, results from socio-economic surveys, etc).*

pilot areas, adapted however to fit local conditions *(details will be elaborated and decided continuously at Regional Meetings).*

FATIMA pilot areas:

COUNTRY	PILOT AREA	FOCUS	USERS
SPAIN	*La Mancha Oriental (Castilla-La Mancha)* Diminishing water levels in aquifer by groundwater abstraction Frequent drought conditions. Risk of water & soil contamination	webGIS; EO methodology; VRT upscaling; EO coupling with crop growth models; energy-water-food	ITAP (Extension & Advisory Service); Aliara (farm consulting); central government
ITALY	*Piana di Tarquinia (Lazio)* Italian intensive agriculture production area, groundwater pollution problems, identified as nitrates vulnerable zone from agricultural sources by the Lazio region. High energy costs of water pumping on irrigation network	EO-based VRT; soil organic matter restoration; energy-water-food	Farmers and their association (Consorzio di Bonifica Maremma Etrusca); Regional environment protection agency; Central government (INEA)
GREECE	*Thessaly* Declining depths of the aquifer due to lack of irrigation policies and water over-consumption; excessive fertilizer and pesticide inputs due to intensive agriculture; Declared as vulnerable region to groundwater nitrate pollution, in accordance to Directive 91/676/EE.	very-high-resolution VRT (in-field and EO)	Farmers; DIMITRA (incipient farm advisory service)
TURKEY	*Menemen (lower Gediz basin)* Increasing population pressures on water allocation & demand & increasing pollution. Frequent drought conditions. Risk of water & soil contamination Groundwater level and water quality problems due to intensive agriculture	VRT for small scale plots	Menemen Irrigation Association; Central government UTAEM

AUSTRIA	*Marchfeld* Regulation of surface water to provide aquifer recharge. Groundwater level and water quality problems due to intensive agriculture	EO-based VRT; upscaling practice	AGES (government agency); Farmers and cooperatives; Marchfeld Kanal authority
NETHERLANDS	*Dommel catchment (Brabant)* Surface water contamination by intensive agriculture and heavy application of fertilizer (>50% of land use is agriculture, mainly maize, potatoes, grassland)	EO-based VRT; trans-boundary	Regional Water Board De Dommel, in which both water managers and farmers collaborate
FRANCE	*Avignon* Increasing water scarcity and ground water contamination by intensive agriculture	EO coupling with crop growth models	Farmers and their associations; extension service Arvalis
CZECH REPUBLIC	*Dehtare* Groundwater contamination by intensive agriculture	WSN coupling; VRT upscaling	Zemědělské družstvo Kojčice (Agricultural Cooperative); SPV Pelhřimov, a.s.

Pilot areas and Regional Managers:

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TURKEY	*Dilek Kahraman dkahraman2000@yahoo.com*
AUSTRIA	*Heide Spiegel adelheid.spiegel@ages.at* *Francesco Vuolo francesco.vuolo@gmail.com*
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CZECH REPUBLIC	*Fučík Petr fucik.petr@vumop.cz*

3 Regional process of FATIMA

The **regional process of FATIMA implementation and evaluation** is organised in all pilot sites in close cooperation with the regional teams and the campaign plans in WP5. The level of detail and focus on specific themes varies across the individual pilot areas, see table below, where:

★ means active contribution in the development and implementation of basic features, details of which will be defined in WP frameworks;

? means that the applicability will be defined later in the project, based on the discussion at the Plenary meeting in Albacete, October 2015.

Details of the organisation of the regional process will be discussed end evaluated during the Regional Meetings of the FATIMA project, held in all pilot sites twice a year.

	basic SPIDER/EO	sensors	EO	models	field trials	in-field VRT	upscaling VRT	energy	socio-economic	policies	stakeholder process	comments
	WP2.1 & WP5	WP2.3	WP2.2	WP2.2	WP3.3	WP3.1	WP3.2	WP4.1	WP1.2	WP4.2	WP1.1 & WP5	
ES	✔	✔	★	★	✔	✔	★	✔	✔	★	★	
IT	✔	✔	★	★	★	?	✔	★	✔	✔	✔	
GR	✔	✔	★	-	✔	★	✔	✔	✔	✔	✔	
TR	✔	✔	✔	-	✔	?	✔	✔	✔	✔	✔	
AT	✔	✔	★	?	✔	?	✔	✔	✔	✔	✔	
CZ	✔	★	-	-	✔	✔	✔	✔	✔	✔	★	
NL	✔	-	-	-	-	-	-	✔	★	★	★	
FR	✔	✔	✔	★	✔	?	?	✔	✔	✔	✔	

During the Regional Meetings, the different techniques are used for the communications and close collaboration with stakeholders.

4 Participatory methodology basic definitions

Snow-ball technique:

The principle of this technique is to build the community step by step – starting with a limited number of respondents/engaged people, which is later gradually expanded. This technique works like chain referral. It is used in science as well as more generally. Expanding methods can be various. E.g. after communicating

with the initial stakeholder, the FATIMA team asks for assistance from them to help identify people with a similar trait of interest. The process of snowball sampling or community building is much like asking initial stakeholders /community members to nominate another person with the same trait. The project team then communicates with the nominated persons and continues in the same way until the obtaining sufficient size of community. Or one can as well use the "exempla trahunt" approach. In more popular terms, this is the "neighbors' law". Snowball sampling/community building may be then defined as a technique opening possibilities for an expanding web of contacts *(Faugier and Sargeant, 1997)[2]*.

Adaptive management:

Adaptive management involves knowledge accumulation through a process aimed at ensuring tight feedbacks between system change and decision makers *(Allen et al. 2011, Westgate et al. 2013)[3]* in a structured cycle of conceptualizing, doing, monitoring, reflecting, learning, and adapting*. Over time,
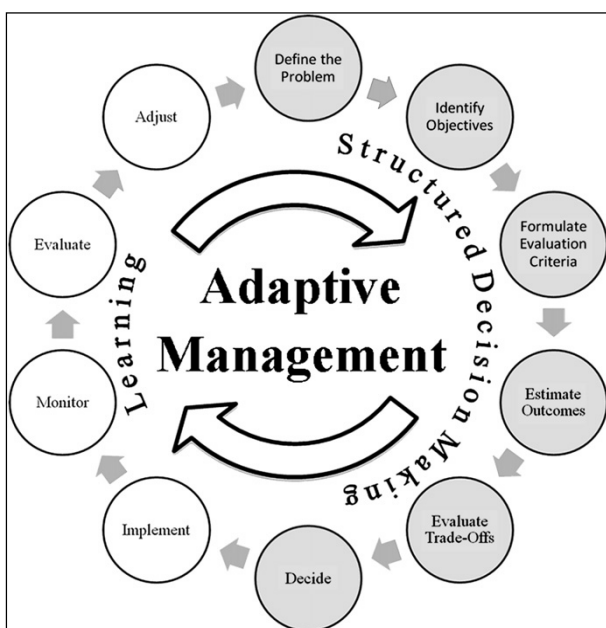
adaptive management has become a popular response to the challenges of complexity and the demands of a "shifting world". Although originally designed to incorporate continuous reflection, adjustment of management actions, and constant experimentation and repetition by managers *(Walters and Holling, 1990)[4]*, more recently the approach has been broadened to involve participation by those outside an organisation to broaden the knowledge base and reduce conflicts *(Rist et al., 2013)[5]*.

Adaptive management, often characterized as 'learning by doing', is a formal iterative process of resource management that acknowledges uncertainty and achieves management objectives by increasing system knowledge through a structured feedback process. As illustrated, integral to the adaptive management process is both a decision component and an opportunity to learn. Structured decision making (grey circles), a term often confused with adaptive management, is an organized and transparent approach to the decision process for identifying and evaluating alternatives and justifying complex decisions; however, structured decision making does not necessitate the iteration and consequential higher order learning (white circles) inherent in adaptive management. *(Allen et al., 2011)* [6]

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[2] *Faugier, J. and Sargeant, M. (1997): Sampling hard to reach populations. Journal of Advanced Nursery, 26(4), p. 790-797.*

[3] *Allen, C. R., Fontaine, J. J., Pope, K. L. and Garmestani, A. S. (2011): Adaptive management for a turbulent future. Journal of Environmental Management 92, p. 1339-1345.*

Westgate, M. J., Likens, G. E., and Lindenmayer, D. B. (2013): Adaptive management of biological systems: a review. Biological Conservation 158:128-139. http://dx.doi.org/10.1016/j.biocon.2012.08.016

[4] *Walters, C. J., and Holling, C. S. (1990): Large-scale management experiments and learning by doing. Ecology 71, p. 2060-2068. http:// dx.doi.org/10.2307/1938620*

[5] *Rist, L., Campbell, B. and Frost, P. (2013): Adaptive management: where are we now? Environmental Conservation 40, p. 5-18. http://dx. doi.org/10.1017/S0376892912000240*

[6] *Allen, C, R., A., Fontaine, J. J., Pope and K. L. Garmestani, A. S. (2011): Adaptive management for a turbulent future. Journal of Environmental Management 92, p. 1339-1345.*

Informal talk:

Informal talk is a conversation (dialogue) that has no specific format. However, it requires good relationship (if not friendship) to be established between the parties before the conversation itself takes place.

Semi structured interview:

The "interview" is generally considered an exploratory conversation *(Gillham, 2000; Ritchie and Lewis, 2003)*[7] and as such its effectiveness heavily depends on the communication skills of the interviewer *(Bryman, 2007)*[8]. The technique of semi structured is used to collect qualitative data by setting up a situation (the interview) that allows a respondent the time and scope to talk about his/her opinions on a particular subject. The focus of the interview is decided by the FATIMA team members and there will be areas they are interested in exploring. The objective is to understand the respondent's point of view rather than make generalisations about behaviour. It uses open-ended questions, some suggested by the interviewer ("Tell me about…") and some arise naturally during the interview ("You said a moment ago…can you tell me more?"). The interviewer tries to build a rapport with the respondent and the interview is like a conversation. Questions are asked when the interviewer feels it is appropriate to ask them. They may be prepared questions or questions that occur to the interviewer during the interview. The wording of questions will not necessarily be the same for all respondents.

Round table discussion:

Roundtables provide an opportunity for groups of practitioners to come together around a topic of interest to discuss and learn from each other *(Stenlev and Siemund, 2011)*[9]. A roundtable discussion allows extensive discussion and feedback for the presenter in a more informal way than a panel presentation or workshop. Presenters are usually referred to as "hosts" and only provide brief handouts (usually a one-page print-out of key points and possibly some questions) because the emphasis is on the discussion itself, rather than a formal presentation. The goal is to get everyone involved and participating in the discussion. The key point is to facilitate the discussion rather than direct. There are many different structures for roundtable discussions.

Bainstorming

Brainstorming is a creative group process for generating and developing ideas and solutions to problems. The generation of ideas or solutions is usually separated from their evaluation *(Osborn, 1953)*[10], to encourage participants to think laterally and contribute freely. In our case, participants may be drawn from the local community, potential users of the technology, consumers, designated experts or any combination of these. Sessions are usually led by a trained facilitator who may also be a FATIMA team member.

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[7] *Gillman, B. (2000): The research interview. London, CONTINUUM.*

Ritchie, J. and Lewis, J. (2003): Qualitative research practice: a guide for social science students and researchers. London, SAGE.

[8] *Bryman, A. (2004): Inteviewing in qualitative research. In: Social research methods (chapter 15), Oxford, Oxford University Press.*

[9] *Stenlev, J. and Siemund, P. (2011): Roundtable as cooperative learning technique. English Language and Linguistics, 18(1), p. 40-45.*

[10] *Osborn, A. F. (1953): Applied Imagination: principles and procedures of creative thinking. NY, Charles Sribner's Sons.*

Focus group

Focus groups have been described as a "carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment'' *(Krueger, 1994)[11]*. They combine elements of both interviewing and participant observation, and provide an opportunity to probe the participants' cognitive and emotional responses while also observing underlying group dynamics *(Vaughn et al., 1996)[12]*. Groups are typically composed of six to twelve homogeneous participants and a trained moderator.

5   Participatory process

5.1   Setting up and keeping in operation

The process of building of local multi-actor platform primarily builds on the concept coined by social interactionists which is called **"definition of the situation"** referring to the Thomas theorem[13]. It says, simply saying, that situation does not exist per se, but defined by its participants. As such this concept can be considered suitable general frame to deal with participation. This concept was used as a basis of research design called **"action research".** It aims to improve practice through the collaborative work of researchers and practitioners *(e.g. Rapoport, 1970)[14]*. Based on the assumption that social reality is socially constructed, it is an emergent process, largely controlled by local conditions *(Elden and Chisholm, 1993)[15]*. As such it combines theory and practice through change and reflection in an immediate problematic situation within mutually acceptable ethical framework. Action research is then an iterative process involving researchers and practitioners working together on a particular cycle of activities including problem diagnosis, action interventions and reflective learning *(Checkland and Scholes, 1990; Avison et al., 1999)[16]*. The same design can be found in managerial literature under the name **"adaptive management".** It is evident that both action research and adaptive management are well designed to gradually build a situation or to deal with an already existing one, rather than to prescribe the situation.

Within the above outlined frame it is legitimate to assume building of local/regional multi-actor platform to be an **iterative (revolving)**, **open-ended** and **context dependent** process*.*

Given these facts, there are three elements proposed to be applied in the process of fostering a strong collaborative multi-actor community:

• When identifying key stakeholders, **SNOW-BALL TECHNIQUE** is to be used.

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[11] *Krueger, R. A. (1994): Focus groups: A practical guide for applied research. Thousand Oaks CA, SAGE.*

[12] *Vaughn, S., Schumm, J. S. and Sinagub, J. (1996): Focus group interviews in education and psychology. London, SAGE.*

[13] *Merton R. K. (1995): The Thomas theorem and the Matthew effect. Social Forces 74 (2), p. 379 – 424.*

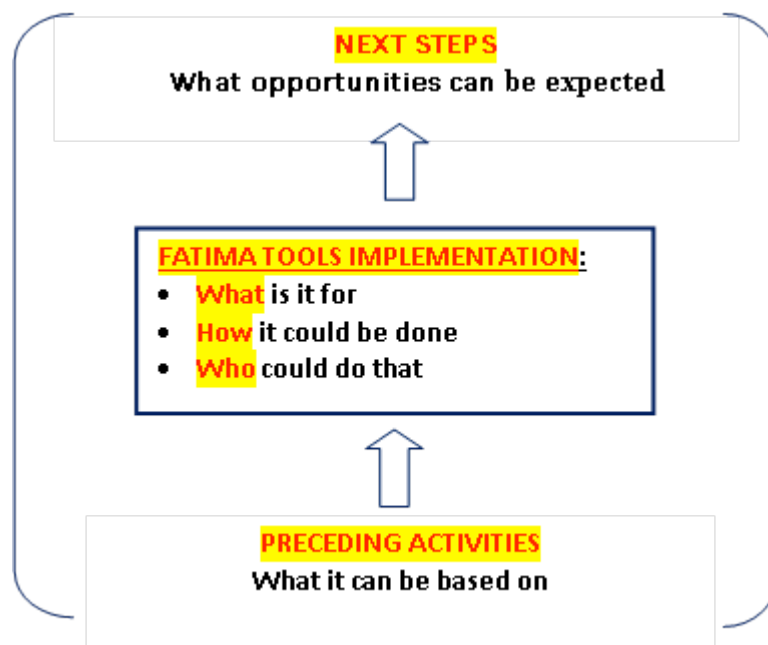[14] *Rapoport, R. N. (1970): Three Dilemas in Action Research. Human Relations, 23 (4), p. 499-513.*

[15] *Elden, M., Chisholm, R. F. (1993): Emerging varieties of action research: Introduction to the special issue. Human Relations 23 (4), p. 121-142.*

[16] *Checkland, P, Scholers, J. (1990): Soft system methodology in action. John Willey and Sons Publishers, Chichester. Avison, D., Lau, F., Meyers, M., Nielsen, P. A. (1999): Action Research. Communication of the ACM, 42 (1), p. 94-97*

- **ADAPTIVE MANAGEMENT** should be applied, which more adequately fits to grasp space and time variability of the participatory processes across localities than the blue-print one.

The **key role** in this process is supposed to be played by **Regional Manager** (and/or Regional Team) – the **"interface"** between the project ideas and local conditions. He/she will **develop locality-tailored participatory strategy** of multi-actor platform building (ways of addressing potential stakeholders, expanding of the community, communicating everyday issues, …..). The first draft of the detailed strategy will be outlined with the assistance of WP1 leader and coordination at the first Regional Meeting, and based on regular evaluation, gradually adjusted to fit to evolving situation in the pilot areas *(see below)*.

FATIMA objectives are considered pivotal in the process of multi-actor platform building. Therefore, the **presentation of FATIMA objectives and tools** to local stakeholders is an essential point to start the participatory process in the pilot areas. While forms of communication with stakeholders can vary, the subject of communication should be unifying –**local challenges and local interpretation/adaptation of generally defined FATIMA tools**. This inevitable step, in fact, can be considered starting point in local/regional multi-actor platform building. With the aim to interweave the newly coming information with local knowledge, the introductory information should combine time axis with factual content itself, as it is schematically suggested below:[17]

Articulation of the context is as important for multi-actor platform building as description of the technology itself. Contextualization of technology in fact means fitting it to local culture and attributing it with local values, all that being factors necessary for building a trust and hence increasing a chance

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[17] *This approach was successfully used within the EUREKA project STORAGE (Sustainable Tools for Goundwater Management Optimisation and Water Scarcity Mitigation) for communication with local communities in Patan, Nepal.*

that a sense of co-ownership of and responsibility for FATIMA tools among local stakeholders will gradually be developed. Given the structure of the presentation, the most efficient way of mediating the **introductory information** to local stakeholders is by **Regional Manager/Team.**

The **participatory process** in each pilot area will be **guided by the pertinent Regional Manager/Team** with assistance provided by WP1 leader and coordination. The process will be structured to follow the general design of adaptive management, having FATIMA objectives as pivot. It can be then adapted to **the following steps:**

o   Identify the local/regional issues to be addressed by local/regional FATIMA objectives *(and related, identify locality and stakeholders).*

o   Provide operational definition(s) of these issues as local FATIMA objectives.

o   Execute first campaign.

o   Evaluate the campaign (*and potentially modify the operational definition of the FATIMA objectives).*

o   Proceed to next round.

o   Etc.

Participative techniques should be used at any step mentioned above. The Regional Manager/Team has the task of choosing the most appropriate ones *(individually or after consultation with the WP1 leader and coordination).*

The participatory process is will be a combination of **TWO TYPES OF METHODS AND TECHNIQUES**:

o   **Regional Meetings.** Their purpose is to anchor the implementation and participatory evaluation of FATIMA tools and services in all pilot areas. They are to be held with a six months period. The **first Regional Meetings** cover 3 parts - regional team session, stakeholder session, and field visit. They will be organised by Regional Manager who proposes the agenda which has to reflect progress of the project activities in the pilot area.

The Regional team session shall clarify who does what (local SPIDER node, EO provider, stakeholders); go through pilot area tasks for each WP; train the Regional Manager in the SPIDER (he/she should interpret it to the stakeholders); Identify the stakeholders needs (initial assessment, to be iterated); check on available information/data layers needed for all Work packages.

The Stakeholder session shall inform stakeholders about FATIMA objectives, challenges of pilot area, current practices of input management, stakeholder profiles and requirements; introduce SPIDER and discuss the potential for its use; prioritize the challenges.

The **following meetings** will keep the same general structure *(regional team session, stakeholder session, and field visit).* Main attention, however, will be paid to:

➢ Evaluation of keeping track with particular steps of FATIMA implementation process in pilot areas (evaluation report will be produced by Regional Manager with assistance of WP1 leader identifying achievements, delays, bottlenecks, efficiency of participative methods used, ….).

➢ Based on the above, definition next steps (milestones being next Regional Meting or particular dates defined by the implementation steps)

o   For **"everyday routine"** there is broad array of methods and techniques available to choose from. The Regional team could "work" with individuals, such as e.g. *informal talks and (semi) structured*

interviews or they could address groups of people, such as e.g. round table discussions, brainstorming, focus groups, etc..

Application of a particular method or combination of methods should be then **adapted to the local context**, as the effectiveness, if not acceptance of particular methods, depends on concrete situation in the pilot area, e.g. on:

- ➢ Experience and knowledge of Regional Manager/Team *(experienced from previous projects vs newcomer; knowledgeable in social communication vs no experience in this field)*
- ➢ "Experience" of the local context *(involved in previous projects x locality newly addressed)*
- ➢ General culture of communication in the pilot area *(habits, traditions, …)*

Hence, the first approximation of the concrete combination of these "facultative" methods will be discussed and agreed upon at the first Regional Meeting, and subsequently evaluated as to their effectiveness in the FATIMA implementation process. The evaluation and possible modification of the portfolio of methods applied will be done regularly (Regional Meetings – see above) or, in "emergency" situation, ad-hoc.

All the methods used are supposed to play **triple role** – to provide a local knowledge to the FATIMA team, to inform local respondents/participants on the FATIMA project objectives, and to generate participatory process with the aim to create an engaged local community. Hence they can only by mastered by practicing – through the permanent process of learning by doing *(e.g. Lundvall, 1997; Drulák et al., 2008)[18].*

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[18] *Lundvall, B. Å. (1997): Information Technology in the Learning Economy. Communications & Strategies, 28, p. 117-192.*

Drulák, P., Kořan, M., Karlas, J., Beneš, V., Tulmets, E., Střítecký, V., Horký, O., Tomalová, E. and Braun, M. (2008): Ways to investigate a policy: qualitative methods in political science and international relations. Praha, PORTÁL (in Czech).

5.2   Monitoring and evaluation

As implementation of the FATIMA tools is based on cooperation with engaged multi-actor community, basic steps in the process of the FATIMA implementation in pilot areas could be used as reference points for evaluation of functioning of the multi-actor community:

Step 1.   Create interaction and joint-venture with stakeholders (getting to know each other, big WHY of collaboration, definition of stakeholders needs, drafting collaboration protocols/agreements).

Step 2.   Set up FATIMA tools/services ("prototype", adapted to pilot needs) (SPIDER node, EO provider, etc), following a joint implementation protocol.

Step 3.   Deliver FATIMA services from beginning to end of growing season to core stakeholders (those who have committed to collaborate), i.e. weekly or bi-weekly fertilization and irrigation recommendations.

Step 4.   Assist stakeholders in continuous evaluation of FATIMA services (vs their current practices).

Step 5.   Adjust/improve FATIMA services iteratively and derive conclusions (on tools, good practices, policies).