



LIFE14 CCA/GR/000389 - AgroClimaWater
Promoting water efficiency and supporting
the shift towards a climate resilient agriculture
in Mediterranean countries

EWS standard: a tool for agricultural adaptation to climate change

Action E5: Building adaptive capacity of agriculture in Mediterranean
towards climate change

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Introduction

European Water Stewardship (EWS) standard



The standard EWS produced by the European Water Partnership (EWP) is a tool for the improvement of water management in a variety of sectors, ranging from industry to agriculture. The implementation of such a tool could be especially helpful in areas threatened by climate change and its implications on water economy. EWS Standard is organized in 4 principles, 17 criteria and 46 indicators (major and minor).



The standard is based on three technical principles: a) water abstraction, b) water quality and c) High Conservation Value (HCV) areas, outlining the route to be followed and the specific requirements, related to each area and type of activity of the water users.



Each of the three principles starts with analysis of the current situation, followed by a risk analysis and concluding to specific actions that need to be taken in order to prevent or mitigate the risk. These actions are then incorporated in the overall strategy of the organization.

In agriculture, the effective implementation of EWS standard has to be coordinated by an organization who will take up the responsibility to mobilize the required resources. In order to be effective, it should be able to influence the majority of water users of the given activities in its area of responsibility. For example, a Farmers' Organization (F.OR.) or a municipal service can act in this way.

The fourth principle of the standard provides the requirements needed for establishing a "Water Management System" (WMS), for implementation in Agriculture (AWMS) in governance terms. Using this system as a tool, the organization can elaborate and develop its own Water Management Adaptation Strategy (WMAS) on the basis of the three principles of the standard.

Bronze, Silver and Gold certification enables visualization of performance and provides incentives for upgrading. Classification is achieved if the company/organization has achieved compliance with all indicators classified as major in addition to:

- **Bronze:** greater than 50% compliance with all indicators that are classified as minor.
- **Silver:** greater than 70% compliance with all indicators that are classified as minor.
- **Gold:** greater than 90% compliance with all indicators that are classified as minor.

LIFE AgroClimaWater: Objectives and approach

The project LIFE AgroClimaWater puts into practice the EWS standard of the EWP in agriculture for the development and implementation of water management systems and adaptation strategies to climate change, which include:

- Good agricultural practices at farm scale to enhance water efficiency and adaptability of perennial crops (olives, citrus fruits and peaches) to climate change.
- Governance actions to be implemented by the Farmers' Organization in order to achieve equitable and transparent water governance.
- Floods and droughts action plan to ensure preparation and response to environmental incidents caused by climate change.



The LIFE AgroClimaWater project's main objective is to promote water efficiency and support the shift towards climate resilient agriculture in Mediterranean countries through the development of water management adaptation strategies in three Farmers' Organizations in two areas in Crete, Greece (Platanias and Mirabello) and one in Basilicata, Italy (Metapontino). The key objectives are:

- Development and implementation of WMAS at Farmers' Organization level.
- Determination and application of agricultural practices that increase water efficiency in the cultivation of perennial crops.
- Establishment of pilot farms adapted to water scarcity.
- Building adaptive capacity of farmers and Farmers' Organizations to climate change: information, awareness and training.
- Informing and raising awareness of competitive water users regarding climate change impacts, on a sub-basin level.
- Dissemination of the proposed strategies to be implemented by farmers and Farmers' Organizations in the target areas and other areas facing similar climate challenges.
- Incorporation of the project's results in the European and national environmental, climate change and agricultural policy and legislation.

Objective of the present Guide

The present guide constitutes a tool of guidance to any professional working on farming, either as individual or under other operation/management schemes, on how to organize an AWMS conforming to the requirements set by the voluntary EWS standard. This guide provides the steps that should be followed to: a) evaluate the current water management practices followed so far and their impact environmental and socio-economic impact, b) establish a set of water efficient practices and a sustainable and adaptable water management scheme, thus increasing its potential to adapt to climate change.

The guide is organized as follows: First, the basic steps for EWS implementation are provided as well as a guideline for AWMS implementation according to the four core principles of the standard. Following, the development and implementation of the AWMS in the three Farmers' Organization participating in AgroClimaWater project is presented as case study and the lessons learnt during the project are shared.

Steps for an organization to implement EWS Standard as part of its policy

Step 1: Be sure you have defined as clearly as possible where and how far you wish and can go

Define your policy, taking account the level of control you have over the water use in the geographical scope you have determined in the basin, i.e. whether you assigned the task of decision making and implementing, or just a service provider-consultancy role. In the latter case, your policy must be balanced with your business expectations (see step 3). Make sure that organization's policy on water, its scope and objectives are well communicated and understood within the organization.

Step 2: Assign responsibilities for water in the organization

Assign the tasks below to different people within your organization (or multi-tasking may be preferred).

The tasks are as follows:

- **Person responsible for keeping up with legislation about water:** This person, hereafter referred to as 'RL', will need to follow up legislation to identify the points that are relevant with the organization's water management strategy. Also, to own and implement the defined procedure for monitoring the legal aspects and to record this monitoring in appropriate documents and records.
- **Person to be in contact with River Basin Committee:** This person, hereafter referred to as 'RB', is the person to be in contact with River Basin Committee and its activities.
- **Person in charge who ensures the implementation of the organization's Water-resources Management Strategy:** This person will have the role of **Water Steward**, for the organization, hereafter 'WS'. In this capacity, WS will be responsible for the quality system of the organization as regards water, including data collection, form filling etc. The first assignment for the WS is to obtain the EWS standard and the related documents, study carefully and assume responsibility for its implementation.

Step 3: Train, contract and register farmers and their water related

facilities *(Applicable only in instances, where not all water related facilities are under your direct control)*

If the implementation of your water policy depends upon the free choices of others, like in the case of a Farmers' Organization, you have to ensure that the farmers share your policy and wish to undertake any tasks you assign to them, *inter alia* to provide data of good quality, as well as to complete and assist you to satisfy the EWS standard in all its steps. Special attention should be given to make clear the expectations of farmers, e.g. about being certified for EWS. Thus, it is crucially important before signing the respective contract, to give the farmers (in session and/or privately, if needed) adequate training on all the aspects of EWS. Please ensure that there is no registered farmer who has not signed this training record.

Following, a contract should be compiled. Attention should be given in some details, e.g. if the farmer registers all his crops and parcels - encompassed in the boundary you defined as your scope in your policy -or only some of them. In the latter case, justification has to be provided for the exemptions.

Step 4: Preparation for addressing the EWS Principles: collection of historic data *(Optional)*

Before you start addressing in detail the technical principles and criteria of the standard, you may need to get a first idea on how far or how close the organization is, and accordingly to decide on the resources you might need, beyond the person you assigned as a Water Steward.

Historic data need to be collected to the largest possible extent e.g. for the last 5 years, by gathering generic information on the area and by interviewing the participating farmers. Bear in mind though, that people memory is not a document, thus past information is not always verifiable.

Step 5: Addressing the EWS Principles

(The EWS Principles are described in more detail in the following chapter)

Applying EWS in agriculture

In order to apply EWS in agriculture, the principles and the indicators (major/minor) proposed by the EWP need to be adapted, considering that they were developed to address the industrial sector. However, in agriculture there are several uncertainties that need to be included and many particularities resulting from the various practices implemented. In the frame of LIFE AgroClimaWater project, an Agricultural Water Management System (AWMS) is proposed addressing the following four principles and the corresponding criteria, which are based on the requirements of the EWS Standard.

1st principle: Achieve/maintain sustainable water abstraction in terms of water quantity

Water is precious! Losses have to be nullified.

The term “Sustainable” means that abstraction is minimized as much as possible, so as to ensure that it will continue to meet the water demands of nature, of crops and of humans in the long run. For irrigation, this can be achieved by determining carefully the sensitivity of the source and the crop water requirements, so as the irrigation will be provided to only as much as needed. Also, sustainability can be achieved through the proper maintenance of the irrigation networks in order to reduce as much as possible the leaks.

Which are the criteria needed to meet the 1st principle?

Criterion 1.1: The total and the net water abstraction shall be quantified and monitored by source.

Criterion 1.2: Impact of water abstraction and water discharge (quantity) shall be described and appropriately evaluated to the scale of the source, to the intensity of water management and to the uniqueness of the significantly affected sources.

Criterion 1.3: Actions taken to improve water efficiency, reduce water losses and mitigate detected and potential impacts of water abstraction shall be described and implemented. All actions should be integrated in the Water Management Strategy (Criteria 4.8).

2nd principle: Ensure the achievement and maintenance of good water status in terms of chemical quality and biological elements

It is not only a matter of water quantity, but also of quality!

Water has to be kept free of contaminants that could ‘poison’ it. The effect of such a ‘poisoning’ is the disturbance of populations of water-creatures dwelling the natural ecosystem. Unlike some industries or animal husbandry, crop agricultural activity under normal operation does not produce chemical discharges/effluents by default to the water

bodies, in the sense that chemicals as well as water, when used under good agricultural practice (G.A.P.) are meant to stay where applied. So, the driving assumption in dealing with the 2nd EWS principle is: *In crop agriculture, “effluents” may result only as failure of good agricultural practice (lost agrochemicals bear cost to the farmer too!) or by accident.*

Which are the criteria needed to meet the 2nd principle?

Criterion 2.1: Total inputs on site shall be disclosed and the total effluent quality shall be determined, monitored and documented.

Criterion 2.2: Impact on destinations that are affected by the production sites’ effluents shall be identified and described. Measures shall be set in place to mitigate these impacts.

Criterion 2.3: Actions taken to mitigate detected and potential impacts of water discharge shall be described and implemented. All actions should be integrated in the Water Management Strategy (Criteria 4.8).

3rd principle: Restore and preserve water cycle related High Conservation Value (HCV) areas

Sustainable Water Management restores and conserves the biodiversity.

HCVAs are areas (e.g. wetland, lake or riparian zones) whose management has a critical influence on:

- Globally, regionally or nationally significant concentrations of rare, threatened or endangered species.
- Rare, threatened or endangered ecosystems.
- The provision of basic services of nature in critical situations (e.g. watershed protection, erosion control).
- Meeting the basic needs of local communities (e.g. subsistence, health).
- Critical to local communities’ traditional cultural identity, i.e. areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

Which are the criteria needed to meet the 3rd principle?

Criterion 3.1: HCV areas in a 25km radius around the production site, water sources and points of discharge are identified and described.

Criterion 3.2: Impact on water status, ecological processes, and social values in HCV areas shall be identified and evaluated.

Criterion 3.3: Actions taken to mitigate detected and potential impacts of HCV areas shall be described and implemented. All actions should be integrated in the Water Management Strategy (Criteria 4.8).

4th principle: Achieve equitable and transparent water governance

Building an effective and efficient AWMS by your organization.

Here, again agriculture differs significantly from industry or other areas of economy, since land management is performed by a large number of small owners, as opposed to the 'one (or a few) man rule' in industry, or big estate farms. This makes agriculture the most challenging area for achieving goals related to areas as large as the water basins are. However, in the agricultural sector, the objective of development and implementation of an effective WMAS by the stakeholders-farmers in an area, in support of the state authorities responsible for the enforcement of water legislation, is of core significance.

EWS uses a system approach, i.e. it is not restrained to satisfying baseline requirements, but requires that the organizations strive for their continuous improvement, developing their goals, objectives and targets via instructions customized to the real needs of each land parcel. So, each organization defines its own strategy towards its goals, i.e. its own AWMS.

Which are the criteria needed to meet the 4th principle?

Criterion 4.1: The water management shall ensure compliance with all legal requirements linked to water use.

Criterion 4.2: Water management in the supply chain shall be evaluated long term. The purchase of products and material from water sustainable suppliers shall be achieved over time according to the possibilities of the organization.

Criterion 4.3: Water use shall be managed in an integrated approach taking the management of other resources into account.

Criterion 4.4: Efficiency of water consumption shall be increased by water recycling, higher water savings and reduction of water losses. Out of scope: Water in products and material for production (Criteria 4.2), storage on site and diffuse water losses.

Criterion 4.5: Sustainable Water Management shall be achieved by internal and external transparency and raising awareness.

Criterion 4.6: Continuous improvement of Sustainable Water Management shall be achieved on operational and River Basin level by implementation of Best Management Practices and by innovation and development on long term.

Criterion 4.7: Transparency on economic aspects of water management shall be ensured. Investments made for maintenance and improvement of the water management are fully reported.

Criterion 4.8: A water resources management strategy shall be available at the production site as it is a crucial tool to integrate all activities related to water use. It initiates and supports management decisions on water management performance and facilitates the public and internal transparency.

Case Study: Development and implementation of Agricultural Water Management System (AWMS)

The project LIFE AgroClimaWater puts into practice the EWS standard for the development and implementation of water management systems and adaptation strategies to climate change. The three Farmers' Organizations, which participate to the project are located in two areas in Crete, Greece (Platanias and Mirabello) and one in Basilicata, Italy (Metapontino). The common characteristic of all the three Farmers' Organizations is the fact that orchards are cultivated. Nevertheless, olives are the major crop in the two Farmers' Organizations in Crete, while fruit trees are dominating in Metapontino. Irrigation water for the two Farmers' Organizations in Crete is provided from groundwater, while for Metapontino, irrigation water is provided from surface waters through dams. From the three areas, Mirabello indicates the highest water scarcity.

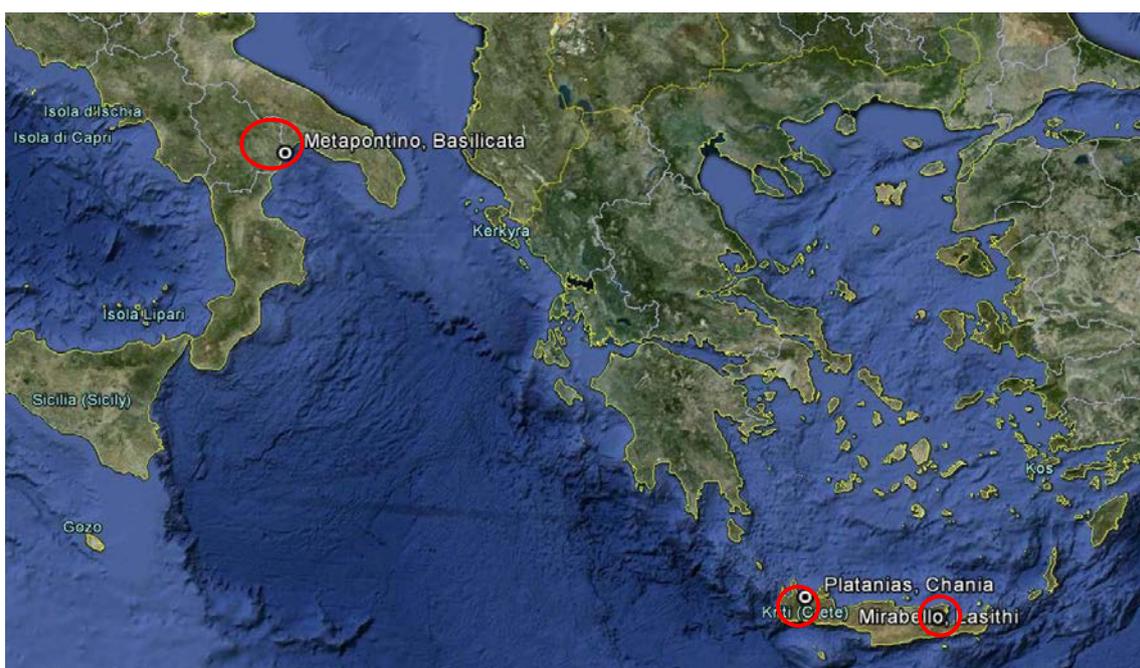


Figure 1. The Farmers' Organizations participating to the project LIFE AgroClimaWater

In order to monitor the implementation of the AWMS in the three Farmers' Organizations a series of customized forms were developed to be filled in and signed. This may not be required in all cases, since some Farmers' Organizations may have already adequate procedures in place, which cover the monitoring requirements. The developed forms consist of a series of documents and records, which are filled in by the three Farmers' Organizations monthly or, in some cases, annually. The Water Steward of each Farmers' Organization was trained in collecting all the necessary information by the farmers and recording it in the AWMS forms. This system was organized in order to evaluate the water

management practices and to monitor effectively the implementation of the strategy in each Farmers' Organization according to the principles and criteria of the AWMS.

During the first year of AgroClimaWater project, the proposed WMAS and its three Priority Axis (PA) were defined, consisting by several measures and sub measures, as follows:



Figure 2. Priority axis of the proposed WMAS

Governance, including the set of actions and measures implemented by the Farmers' Organizations management, is of crucial importance for a more effective implementation of the AWMS regarding water management. To this end, three departments were defined

in each Farmers' Organization and the responsibilities for water were assigned in the organization, as presented following.



Figure 3. Governance for agricultural water management

According to the WMAS, Governance Actions (GAs) were proposed to be implemented by the Farmers' Organizations in order to achieve equitable and transparent water governance. The Governance Actions, which were established as part of AWMS by the Farmers' Organizations, are the following:

1. Compliance with legal requirements related to water use.
2. Identification and monitoring of the interrelation of water with other resources.
3. Internal and external transparency and raising awareness on water topics.
4. Emergency preparedness and response plan addressing accidents, security incidents, emergency situations, disasters etc.
5. Accounting and reporting mechanisms to promote economic transparency.

For the efficient implementation of each of these Governance Actions, an action plan was developed after extensive discussion and consultation between the Farmers' Organizations and the involved scientific partners. Each action plan includes a set of actions that is proposed for each Governance Action, respectively, as well as the monitoring mechanisms that are used during their implementation. In order to achieve effective and realistic action plans, they were developed after consultation and discussion between the partners of the project.

Several training events were organized in the frame of the AgroClimaWater project, in order to enhance internal and external transparency. These events aim to inform the farmer- members of the Farmers' Organizations, with regard to the water management strategy and the measures adopted by the organization, as well as to raise awareness and train the farming community for the good agricultural practices for water use at farm and at area level.

Lessons learnt by LIFE AgroClimaWater

The main vision of AgroClimaWater project is the management of water in the agricultural sector in a way that ensures the protection of aquatic resources and associated ecosystems, agricultural production and balanced development in the pilot areas. To this end, the strategy (WMAS) implemented in the frame of AgroClimaWater has been developed following an evaluation of: (a) the current situation with regard to the management structure of the Farmers' Organizations, (b) the status of water resources in the pilot areas and (c) the agricultural practices applied to the orchards of the three study areas. The experience gathered through the pilot implementation of the proposed strategy (WMAS) in the three participating Farmers' Organizations indicated some critical points that could contribute to increase the effectiveness of implementation in other cases related to open field agriculture.

Applying the EWS in Farmers' Organization level is not always straightforward. One major outcome drawn from the pilot implementation of the EWS in the three Farmers' Organizations involved in AgroClimaWater project is that EWS implementation in such agricultural structures cannot be as straightforward as it is in industry, considering their multi-level management complexities. Farmers' cooperatives may include hundreds of members, the properties of whom may indicate significant spatial variation. Moreover, the water sources may be multiple and managed by a wide range of entities, either public or private.

The systematic monitoring and evaluation of WMAS implementation can increase implementation efficiency and save resources. The proposed strategy (WMAS) needs to be periodically monitored and evaluated, especially during the first steps of implementation. This will identify implementation gaps and errors and give the potential for prompt update when necessary. During the implementation of the WMAS in the three Farmers' Organizations there were some cases for which the monitoring mechanisms that were originally proposed were not sufficient to record all the required information. In such cases, the action plans were revised and new mechanisms were introduced. For example, after the 1st year's implementation, a gap between the farmers and the Farmers' Organizations with regard to communication of legal requirements and compliance was identified. Therefore, the corresponding action plan was updated by including a form targeted to the above.

Capitalize your previous experience on the implementation of other standards and consult the experts when needed. Farmers' Organizations experienced in the implementation of other standards such as Environmental Management Systems (EMS), AGRO or ISO standards etc. indicated higher potential in implementing the AWMS and therefore EWS standard. This is attributed to the fact that they are familiar with monitoring and evaluation their processes and keeping records of their activities. During the establishment and the first steps of the governance actions, all Farmers' Organizations needed substantial support from the scientific partners. Moreover, several meetings were organized between the

scientific partners of the project and the Farmers' Organizations in order to discuss the progress of implementation of governance actions and to ensure that all the requested information is included in the forms. These meetings facilitate the implementation of the governance action plans, as new suggestions are discussed, information is exchanged between the Farmers' Organizations and any dissemination actions by the WS are communicated.

Internal dissemination and transparency is of crucial importance for the efficient implementation of EWS. An important lesson learnt was that internal dissemination is crucial for the efficient implementation of the strategy, considering that all the members of a Farmers' Organization need to be informed on the strategy and the necessary actions that need to be implemented. Several dissemination activities need to take place, so that all the involved members are kept informed throughout the process. Also, regular communication is suggested between the WS and the members of the Farmers' Organization to enhance internal transparency of the strategy and to facilitate the monitoring process. Finally and when possible, the benefits from the implementation of the AWMS and subsequently EWS should be clearly connected to economic benefits or benefits related to crop yield. This is something asked by the farmers, but it cannot be straightforward in most cases.

Special attention to communication and dissemination related to climate extreme events. Since the frequency of climate extremes, such as floods, droughts, heat waves and frost events is increasing in the context of climate change, communicating the corresponding action plans before the critical period of each extreme was found to be an efficient way in order to increase their implementation potential. Moreover, organizing special events dedicated to climate extremes attracted both farmers and stakeholders.

Communication and cooperation with the local and/or regional authorities should be substantial. External dissemination activities were organized in order to communicate the strategy in the local authorities which can contribute to policy and governance aspects at a larger scale. Although there is communication between Farmers' Organizations and the local authorities, this communication could be more effective. This communication is mainly limited to information provided by the Farmers' Organization regarding the actions and practices that took place, without continuous and bi-directional feedback. This is an inherent problem of communication between the relevant actors and the agricultural sector and vice versa, which is reflected in the European Union's report on the implementation of the Water Framework Directive in Greece, according to which, despite the fact that the agricultural sector consumes 80% of the water used nationally, however, it was not actively involved in the development of the management plans. Thus, through the implementation of the current project, an attempt is made to change this mentality among the stakeholders. In any case, Farmers' Organizations should be investigate and identify their role with regard to water resources management in their basin and their potential contribution to water resources management targets should be clear in order to develop a robust cooperation with the relevant authorities.

In Italy, LIFE AgroClimaWater project contributed to support the creation of the “Water and irrigation Operational Group for Innovation” in Basilicata Region lead by the F.OR “AFI” and aimed to improve the capacity to bring innovation on irrigation strategy, technologies and water use from the research world to the companies. Regional GOI are linked to the Italian Rural Network (https://enrd.ec.europa.eu/networking/nrn-profiles/italian-rural-network_it) aims at supporting rural development policies and fostering a more efficient interaction and exchange of expertise between relevant stakeholders and institutions and those working and living in rural areas.

Why is AWMS valuable for the farmer?

It is clear from the present guide that AWMS uses a system approach, which is not restrained to satisfying baseline requirements. On the contrary, it requires that the organizations strive for their continuous improvement, developing their goals, objectives and targets via instructions customized to the real needs of each land parcel. In order to include policy making and goal setting, consultation, structures, roles and responsibilities, each organization defines its own strategy towards its goals and thus develops its own AWMS.

AWMS is valuable for organizations or companies wishing to incorporate responsible water resources' management practices into their financial activities and to make these actions publicly available to their clients with specific certification.

Developing an AWMS and certifying you're an organization with the EWS standard can offer several benefits. In more detail, some of the advantages of developing a strategy and obtaining the certification are:

- Upgrade product quality.
- Improve production by applying certification procedures.
- It is a powerful marketing tool for product promotion.
- It helps to enhance the image of the product and attracts consumers.
- It helps open up foreign markets.
- It helps increase profit.
- Increase product competitiveness over other non-certified products.

