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ORGANISING AND STRUCTURING GOALS AND INDICATORS EXTRACTED FROM MULTI-STAKEHOLDER DISCOURSE ON WATER SAVING

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SUMMARY - The communication is aimed at presenting main goals and indicators deliberated by a forum of two multi-stakeholder groups involved in an open discourse on water saving. The forum has also addressed linking agricultural water management to improving sustainable development in the Mediterranean. One of the main concerns is that multi-stakeholder groups tend to achieve consensus and deliver a disordered set of goals-indicators and scarcely aligned to the imperatives of sustainability. To overcome the problem, the use of existing tools can help the structuring of goals-indicators encompassing the integration of social, economic, environmental and institutional dimensions. In the same time it helps to align them within a common vision and perspective. In this view, the note intends to synthesize and structure the headings derived from multi-stakeholder mainstreaming on agricultural water saving goals and indicators.

Key words: water saving, sustainability, goals, indicators.

INTRODUCTION

Water Saving in Agriculture (WASA) is more and more emerging as a tool contributing to the sustainability of water resources in the Mediterranean. Even the European Commission has identified water saving as one of the main research priorities for the Mediterranean region (Bogliotti et al., 2003; Cordis-EU, 2000) urging the scientific community to deepen the relevant sector and develop goals and indicators, which are easy to be represented, understood and used by stakeholders, citizens and policy makers. Although it exists already a more or less systematic frame of goals and indicators of water resources management in the Mediterranean (IWMI, 2000), organising and systematising goals and indicators in water saving still need to be addressed.

The difficulties in developing a global consensus on water saving goals-indicators is mainly due to the physical and non-physical diversities characterising the Mediterranean region, the lack of communication among researchers and stakeholders of different Mediterranean countries, and the different perspectives held by users, planners and decision makers. All this, combined with the lack of using simple methods to organise goals and indicators disorderly, is delivered in – although participatory – multi-stakeholder discourses on the relevant theme. In addition, in order to make WASA a practical contribution to the sustainable development of the Mediterranean, goals-indicators need to be aligned with the main targets of sustainability, encompassing in their definition in the integration of the economic terminology of man-made, natural, social, human-institutional capitals (Serageldin, 1996) and their interlinks.

The existing literature provides us with different models to define the multi-dimension function of sustainability (Meppen, 2000) and connect it to goals and indicators. In particular, the Prism of Sustainability (PoS) of Valentin-Spangenberg - VS (Valentin and Spangenberg, 2000) is seen as a useful tool to derive and systematise sustainability goals-indicators deliberated by a multi-stakeholder group in any given sector at each dimension of sustainability (economic, social, environmental, institutional) and each 2-D interlink expressing the combination of one with each other. The paper intends to present the results of the four days debate on goals and indicators for WASA, undertaken at the Euro-Mediterranean Workshop of Sanliurfa (Turkey) on “Participatory Water Saving Management and Water Cultural Heritage”, sponsored by the EU funded project WASAMED (WAter SAving in MEDiterranean Agriculture).

WASAMED PROJECT: MAIN FEATURES

WASAMED is an example of project encompassing and integrating the concept of sustainable development of Mediterranean WASA with basic passwords for sustainability like knowledge sharing, participation, dialogue and communication (Bogliotti and Steduto, 2002). Its final aim is to provide a Logical Framework of priorities, goals and indicators to enhance sustainability of water resources management in the Mediterranean (Araus, 2004). WASAMED is a 48-month Thematic Network (ICA3-CT2002-10013; http://wasamed.iamb.it), granted in 2003 by the International Scientific Cooperation of the Directorate General of Research, European Commission, in the frame of the 5th Framework Programme. The Working Group of WASAMED includes more than 40 stakeholders representing all the Mediterranean countries and the different interests in agriculture: end-users, Water User Associations (WUAs), decision and policy makers, researchers and NGOs. One of the targets of the Working Group is seeking consensus on best options, goals and indicators for water saving in the region. In general, WASAMED aims at improving “multi-dimension” and “trans-sector” co-ordination of research carried out in the Mediterranean countries on the various methods of saving water in agriculture to contribute to the sustainable development of water resources management at local and regional level.

WASAMED addresses the impacts and interactions of several factors such as biota, soil, landscape, human activities, cultural resources, socio-economic, institutional and political on the sustainability and governance of agricultural water resources (Araus, 2004). Its overall methodological approach is organised in a quite comprehensive workplan, in which intra-sector interlinking are identified through a series of work packages: 1) water use efficiency and water productivity – WUE-WP, 2) irrigation system performance - ISP, 3) non-conventional water use – NCWU, 4) participatory water saving management and cultural heritage, PWSM&CH, 5) harmonisation and integration of water saving options, H&IWS (Bogliotti and Steduto, 2002).

SUSTAINABILITY AND PIM: MAJOR PROBLEMS TO BE ADDRESSED

Nowadays, seeking sustainability of human actions and policies in the sphere of water resources management is a common world-wide target, particularly in regions under limited water resources condition. In the Southern Mediterranean countries, the majority of water withdrawals are due to agriculture with a withdrawal rate of about 70% of the resource (Gleik, 1993; Sekler, 1999). In this region, the management of natural waters is mainly sought in the governance of irrigated waters. Throughout the decades, a large and growing number of participatory methodologies have been studied and developed to achieve effective management of irrigation systems and agricultural waters (Johnson, 1970; Ashby, 1996; Johnson et al., 2003).

The Participatory Irrigation Management (PIM) seems one of the most used options to enhance sustainability of agricultural water management, as it is based on the involvement of irrigation users and their empowerment at local scale in all aspects of irrigation management, from planning and design to financing, operation and maintenance (O&M), monitoring and evaluation. Participatory mechanisms are the elements of sustainability and could result important for the purpose of determining success in WASA. However, beside the PIM model used, what is important in the Mediterranean WASA is also the conceptualisation of a Logical Framework of goals and indicators that can lead WASA-self to be sustainable. Nevertheless, the process of PIM is often limited to the valorisation of aspects intrinsic to the irrigation sector (agriculture productivity, farmer income) and does not mediate with the larger societal concerns nor attempts to the multi-dimension integration. This is a strong constrain for the sector development, while the future of the agriculture world-wide is also very uncertain due to the emerging conflicts with other sectors producers (urban, industrial, tourism).

Most of PIM mechanisms, that were intended to further sustainability of water resources, have been developed on a limited actor based perspective. Although PIM intends to enhance sustainable development, its process is often designed in function of subjective concerns, considering irrigated agriculture sustainable when: a) farmer productivity is maintained on the long run without accounting the multiple interests that develop today in the rural areas; b) water resources are preserved for

agriculture without negotiating within the arena of multiple water use in rural areas; c) profitability of production and income of farmers is guaranteed (Dunlap et al, 1992).

In spite of the major technological advances in agricultural irrigation practices that contributed to consolidate agriculture as leader in production and competitive marketing in the Mediterranean, there has been a downside of the development of agricultural (and annexed water sector) as the conflict with expanding urbanisation strongly arises and the industrial model of agriculture production has been adopted (Von Wirén-Lehr, 2001). The downside can been seen in economic, environmental and social concerns. Accordingly, the collateral agricultural water management has developed more in the last decades along the track of weak sustainability as demonstrated by the slow but progressive declining of the rural society (Von Wirén-Lehr, 2001). Thus, reaching consensus on imperatives, priorities and indicators of PIM for WASA could contribute to create regional vision and cohesion and reciprocal alignment of future local and national strategies for water management in the Mediterranean.

Several scientists and organisations have attempted building of goals and indicators (Groenfeldt and Svendsen, 2000; Johnson et al., 2003). But in most cases goals and indicators are disordered. Goals and indicators development is a two-way process, as they are not only desired from policies but they should help to realise them (Valentin et al., 2000). Deliberation of policy and planning goals in an open discourse, without the use of a systematic procedure, likely brings to a disordered frame of goals and indicators not systematically addressing the main concerns of sustainability (Valentin et al., 2000). Therefore, the aim of the paper is to organise values, goals and indicators for sustainability in WASA, derived from an open dialogue established in among the stakeholders of WASAMED, with the use of the PoS of Valentin-Spangenberg (Valentin and Spangeneberg, 2000).

METHODOLOGY AND RESULTS

Two separate multi-stakeholders groups have undertaken the discussion on imperatives and priorities-goals[14] for PIM, as they have considered PIM as the most common process in the Mediterranean countries through which sustainable WASA can be pursued. Most of the stakeholders have even agreed to include WASA as one of the targets of PIM. The acronym PIM-WASA is used to synthesise the above concept. First of all it is important to remark that participants – through a series of national level discussions with citizens and farmers – have brought into the groups the results of a preliminary process of leitbilt[15] building, expressed by the identification of the main values and vision against which desires and wishes can be established excluding clear conflicting options: i) sustainable development of agriculture, ii) democracy and justice in water use, considering water also as a trans-boundary common good, iii) societal innovation and cultural heritage to enhance sustainable technology, iv) affirmation of subsidiarity principles, v) development of environmental awareness at all levels. These values have influenced the groups in the definition of goals and indicators. Nevertheless, the two groups did not deliver the same definitions and structure of goals. The consensus has been reached by building a comprehensive but disorderly structured frame of goals and indicators, which needed further structuring. Although goals and indicators have been defined in relation to the economic, social, environmental and institutional dimensions, some goals are the result of a more-or-less conscious attempt to provide indications of embedded interlinks - connecting PIM-WASA with interlinked dimensions - enhancing multi-dimensionality and integration. Indications provided by the groups have been also linked to interlinkages embedded in the multi-dimensional function of sustainability. Resulting goals do not address specifically only one dimension or one interlink but touch more dimensions in a balanced way. Multi-dimensional interlinkages have been left empty since the consensus on related embedded goals has not been achieved. The function of PoS has been used to systematise the outputs of the groups and to provide a first structured frame to facilitate group's deliberations foreseen in the future by the WASAMED workplan.

[14] Some or the group's participants have expressed the deliberation more in terms of priorities for WASA than with traditional headings of goals or indicators.

[15] It is call leitbilt the process that guides the group on the participatory approach to a consensus on "desire and possible" (Valentin and Spangenberg, 2000).

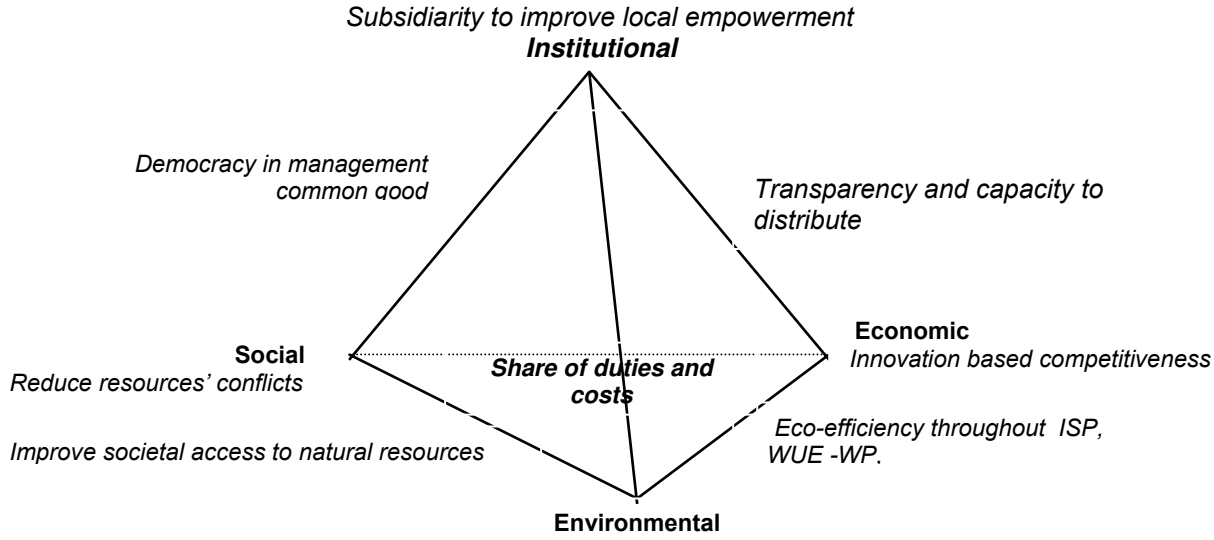

Fig. 1 – The imperatives for PIM-WASA are represented by the PoS. (Legend: the four dimensions are in bold; dimensions' and interlinks' imperatives are in Italic. The PoS structure is derived from Valentin and Spangenberg, 2000). For Valentin and Spangenberg sustainability falls within the volume of the prism.

For the purpose, the leitbilt has been used to generate common values to guide the alignment of goals and indicators with the main sustainability imperatives of VS. One of the main problem that could arise when using the definitions of VS's imperatives is that they can be unlikely understood by all expertises and stakeholders involved in the discourse. It is often a semantic problem rather than a content issue. However, in order to overcome potential mis-understanding and mis-interpretation of main sustainability imperatives and organise related goals and indicators accordingly, the imperatives of VS have been translated into imperatives holding definitions that can be easily accessible by stakeholders that wants to further the discussion on PIM-WASA in future WASAMED open discourses.

Table 1. Comparison between VS' imperatives of sustainability and PIM-WASA's imperatives, and connection to the dimensions of sustainability and 2D interlinks.

Dimensions and interlinks	*General Sustainability Imperatives* (source: Valentin and Spangenberg, 2000)	*PIM-WASA's imperatives*
Economic	Improve competitiveness	Innovation based competitiveness[16]
Social	Safeguard cohesion	Reduce resources' conflicts
Environmental	Limit throughout	Protection of resources to improve ecosystem quality
Institutional	Strengthen participation	Subsidiarity to improve local empowerment
Econ.-Environ.	Eco-efficiency	Eco-efficiency throughout ISP, WUE -WP[17], NCW
Econ.-Social	Burden sharing	Share of duties and costs
Econ.-Instit.	Justice	Transparency and capacity to distribute benefits of used resources
Social-Environ.	Access	Improve societal access to natural resources
Social-Instit.	Democracy	Democracy in management common good
Environ.-Instit.	Care	Caring actions[18]

[16] The concept of competitiveness should be clearly stated in terms of link to innovation. The innovation based competitiveness applied to any productive source leads to developing and introducing – within a relevant territorial context - products of high added social values, protecting cultural and physical resources by the erosion due to traditional market economy competitiveness (Storper, 1991).

[17] The imperative per-se does not fully respond to the Ethical values of sustainability as the higher motivation of the society for global sustainability should be rather sought in minimizing use of resources (Balakrishnan et al., 2003),. Nevertheless, traditional ISP-WUE-WP are still dominating the scene as many areas of the Southern Mediterranean struggle with food scarcity.

Table 2. Groups' deliberation: goals in the right column are connected to the PIM-WASA imperatives.

PIM-WASA's imperatives	**Priorities / goals for WASA**
Innovation based competitiveness	- Improved mechanisms of participatory innovation - Improved level of operation and maintenance - Improved skills of farmers and WUAs
Reduce resources' conflicts	-Improved security on water availability and allocation - Improved gender empowerment in agricultural water management
Protection of resources to improve ecosystem quality	- Improved actions to prevent environmental crisis (drainage, leaching, groundwater contamination)
Subsidiarity to improve local empowerment	- Improved laws regulating the constitution of WUAs - Improved water rights transfer by legal means - Capacity building at WUAs
Eco-efficiency throughout ISP, WUE -WP, NCWU	- Improved relevant knowledge[19] - Improved share and application of technology - Development of cultural heritage for technology transfer; - Efficient use of water - Improved resiliency of water yields
Share of duties and costs	- Improve use and allocation of resources - Improved transparency among farmers in WUAs, stakeholders and citizens
Transparency and capacity to distribute benefits of used resources	- Improved social benefits through WUAs -Improved credibility between farmers, institutions and WUAs - Improved agricultural market policies - Improved land tenancy
Improve societal access to natural resources	- Ensure minimum water allocation to farmer
Democracy in management common good	- Improved welfare - Diversity of different farmers living together using common waters; - Co-decision rights of farmers
Caring actions	- Improved monitoring of water and land - Improved and free information

Extreme care has been used to avoid drifting away of the new imperatives from the original significance given by VS. The new imperatives have been represented into the PoS for PIM-WASA (Fig. 1). Than, the sustainability function of Valentin-Spangenberg has been generalized into ten main imperatives for the sustainable management of water saving (Table 1). Goals deliberated by the working groups have been merged and connected to the ten imperatives of PIM-WASA (Table 2). Indicator's headings have been attached to most of the deliberated goals (Table 3). Further

[18] It represents the combination of dedication and action through coordinated legal regulation and organisations –individual's action. It is and anti-technocratic model emphasising values for sustainable development like limit's of societies caring capacity that have equal importance of those of nature's carrying capacity (Valentin et al., 2000).

[19] Referred to deepening the understanding of Environmental Space for water availability and material flow account for water productivity (Spangenberg, 2002).

improvement and quantification of goals and indicators has been left to the deepening of the WASAMED Network activities in the years 2005 and 2006.

Table 3. Organisation of PIM-WASA indicators (right column) by imperatives.

Priorities / goals for PIM-WASA	*Indicators' headings*
- Improved mechanisms of participatory innovation - Improved level of operation and maintenance - Improved skills of farmers and WUAs	- N. of farmers and stakeholders in relevant decision-making; N. of close-off options. - Incentives for investment - Money spent; N. of Technologies - N. of farmers trained and training courses
- Improved security on water availability and allocation - Improve gender empowerment in agricultural water management	- Farmer satisfaction - Number of women involved in Decision Making
- Improved action to prevent environmental crisis	- Money spent; N. of projects.
- Improved laws regulating the constitution of WUAs - Improve water rights transfer by legal means - Capacity building at WUAs	- N. of national laws - Political willingness - N. of updating events
- Improved relevant knowledge - Improved share of technology - Development of cultural heritage for technology transfer - Efficient use of water - Improved resiliency of water yields	- Money spent in research - N. of collective seminars - N. of farmer's advisoring - Reduced % water use / product - New water volumes available
- Improve allocation of resources - Improved transparency in farmers and WUAs	- Income distribution per decentile - N. of farmers in WUAs
- Improved social benefits through WUAs - Improved land tenancy	- Corruption rate; Share of taxes - % of ownership
- Ensure minimum water allocation to farmer	- Environmental-water health and security problems - N. of accesses to common water
- Improved variety of different farmers living together using common waters	- Resistance of farmer to change - Co-decision rights of high diversity of farmers - Efficiency of health care and social security
- Improved monitoring of water and land - Improved dissemination-information	- Money spent for testing - N. of info-points; freedom of information

DISCUSSION AND CONCLUSIONS

The use of a multi-dimension frame is proved to be useful for the systematic organisation of disordered goals and indicators deliberated in a multi-stakeholder discourse. The integration of the different dimensions of sustainability into a frame of multi-dimensional goals and indicators allows to regard perspectives of water saving management in a more balanced – although qualitative - way without the risk of oversimplification.

In this way the sustainable development of water saving can be described in more operational and appropriate terms than by using disorderly presented goals and aggregated indexes. The approach is easy to be communicated to a large variety of stakeholders and citizens just like mental models (Rosner, 1995; Meppen, 2000). The latter being an effective way to prompt decision and policy makers to understand basic principles, and overcome their resistance to understand complex socio-economic and ecological-environmental-hydrological models (Rosner, 1995).

The generalisation of the PoS of VS into a PoS for PIM-WASA will help systematising deliberation and participation of a broad number of stakeholders and societal groups in future WASAMED processes of furthering and refining sustainability goals and indicators in water saving. It helps to

strengthen the personal identity by providing the means for all stakeholders to exactly locate their objectives and discard the ones that do not find right location or are not correctly defined. Of course, we should expect each group deliberating different sets of goals and indicators. Although based on participation and leitbilt, the way to structure goals and indicators deliberated by each of the two working groups was different and only common denominators have been considered. Reciprocal alignment of different groups' deliberation can be partially controlled by the connection of goals and indicators to the field of the main imperatives of VS through the construction of specific PIM-WAS imperatives. In the future, consensus should be rather sought on societal values – or ethical criteria (De Paula and Cavalcanti, 2000) for sustainability of water saving management – to reciprocally align and harmonise goals-indicators deliberated by different groups and contexts.

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