

Evaluation of remediation recommendations: Stakeholder Workshop 3

Guadalentín, Spain

1. Introduction

The Guadalentín study site suffers from severe land degradation problems caused by diverse processes such as soil erosion by water and tillage, salinization, overexploitation and contamination of aquifers, and forest fires. These processes are favoured by a combination of the Mediterranean climate, characterised by dry summers followed by intense autumn rainfall, an often steep topography with fragile soils on highly erodible lithologies. Moreover, initiated by political and socioeconomic changes, important land use changes have taken place over the last centuries, which have formed an important driver for further land degradation.

Land degradation processes in the Guadalentín have a range of local and regional impacts on crop productivity, reduced soil organic carbon content, loss of soil structure, water shortage and sedimentation of reservoirs. The main objective of Sustainable Land Management (SLM) measures in the Guadalentín as identified by DESIRE workshop participants is therefore to reduce soil and water loss and increase soil fertility.



Figure 1: Example of degraded land in the Guadalentín (photo: J. de Vente)

To fulfil this objective, during the first two DESIRE workshops in 2008, five SLM measures were selected to be implemented and tested in the field of the Alhagüeces farm. The following SLM strategies were selected by participants because they were conceived to be easy to implement, economically feasible and effective towards protection of soil and water resources:

- **Green manure in an ecological almond orchard:** In this technology, green manure, a mixture of barley and vetch (*Vicia sativa*) was seeded under almond trees in autumn and ploughed into the soil in spring. The green manure provides a continuous vegetation cover throughout the winter

protecting the soil from soil erosion. Besides, the vetch is a nitrogen fixating species and has a fertilizer effect on the soil.

- **Reduced tillage of an almond orchard:** In this technology, an almond orchard is ploughed only twice a year (spring and autumn) instead of the 3-5 times that are common in the region.
- **Traditional water harvesting (boquera):** This SLM measure aims to increase the available water for crops by diverting water during rainfall events from a nearby ephemeral stream (rambla) towards nearly flat terraces.
- **Straw mulch under almonds:** In this measure a straw mulch cover under almond canopy is applied to reduce evaporation losses from the soil.
- **Reduced tillage of a cereal field:** Here, a cereal field was ploughed maximum of 3 times in 2 years with a chisel plough. This is much less than under traditional tillage where fields are ploughed five times in two years of which once with a mouldboard plough.

This report presents a brief summary of the fourth DESIRE stakeholder workshop on SLM measures in the Guadalentín drainage basin, held the 28 of September 2011 in the village of Totana. This workshop is the direct continuation of three previous workshops which were described in previous reports (see www.desire-project.eu).

2. Priority remediation strategies

After presentation and discussion of monitoring results, the participants were asked to rank each of the five SLM measures according to the twelve evaluation criteria that were selected and used in previous workshops (Figure 2). Therefore, the participants were divided in three groups; farmers, administration + NGO's, and scientists. Each group made its own ranking per SLM for each criterion. By combining the scores for all criteria using a multi-criteria approach, an overall ranking of the monitored SLM was obtained per group. Ranks were compared between groups and an overall ranking was obtained by taking the average ranking of the three groups (Table 1). Although there were some small differences, all three groups very much agreed over the ranking.



Figure 2: Participants ranking SLM according to 12 evaluation criteria

Table 1 illustrates that the experimental results from DESIRE had an important effect on the stakeholders opinion about some of the measures as the ranking that was made before monitoring during the second workshop deviates from the ranking after monitoring. It must be emphasised however that stakeholders prefer a package of options rather than just 1 or 2 SLM measures. Not all measures can be used in all settings and therefore, a combination of these four options is suggested as best strategy towards SLM.

Table 1: Ranking of remediation options before and after field trials

Rank	Before field trials (workshop 2)	After field trials (workshop 4)
1	Traditional water harvesting (Boquera)	Green manure in Almonds orchards
2	Reduced tillage in Cereal and Almond fields	Reduced tillage in Cereal and Almond fields
3	Organic mulch to reduce water losses	Traditional water harvesting (Boquera)
4	Green manure in Almonds orchards	Organic mulch to reduce water losses

The main reasons for the ranking as commented by participants comes from the fact that the highest ranked options are effective (they reduce soil and water loss and increase or maintain farm income) and relatively simple and economically feasible to implement. Participants were also very positive about traditional water harvesting, but ranked it somewhat lower because it requires some initial costs, it cannot be applied in all fields, and it may have undesired effects downstream like reducing water availability to other fields. Most participants were not enthusiastic about straw mulch to reduce evaporation losses because the field trials demonstrated that this measure is relatively

expensive and did not increase the soils water content. It was stressed that other types of mulch may be effective and therefore this issue needs further research before the measure can be recommended for wider implementation.

PUNTO	ECONÓMICOS				SOCIO-CULTURALES				ECOLÓGICOS			
	Aumento producción	Aumento calidad producción	Reducción costes	Aumento agua disponible	Aumento conocimiento conservación suelo	Incremento capital agricultor como conservar medio rural	Reducción daños externos y riesgos	Aumento bienestar socio-cultural entre agricultores	Aumento cubierta vegetal suelo	Aumento agua útil	Incremento materia orgánica suelo	Disminución erosión
7			Labranza reducida almendra	Boqueras			Boqueras	Abonado verde	Abonado verde		Abonado verde	
6	Abonado verde	Abonado verde			Acolchado orgánico	Abonado verde	Boqueras	Labranza reducida almendra	Labranza reducida cereal	Boqueras		Abonado verde
5	Boqueras	Boqueras			Labranza reducida almendra	Labranza reducida cereal	Labranza reducida almendra			Abonado verde	Labranza reducida cereal	Labranza reducida cereal
4			Abonado verde	Abonado verde	Boqueras	Acolchado orgánico	Acolchado orgánico	Labranza reducida cereal	Boqueras	Labranza reducida cereal	Boqueras	Boqueras
3		Labranza reducida cereal	Labranza reducida heno	Boqueras	Acolchado orgánico			Acolchado orgánico		Acolchado orgánico		Boqueras
2	Labranza reducida cereal	Labranza reducida heno		Acolchado orgánico								
1	Acolchado orgánico	Acolchado orgánico								Acolchado orgánico		
0												

Figure 3: Example of a table used for ranking of SLM measures

3. How can we enable priority remediation options to be adopted?

In an extensive discussion and brainstorm session a long list of suggestions was made of recommended actions to enable adoption of priority SLM measures. These ideas were then classified in groups of similar ideas and participants voted for the groups or individual actions they most liked and expected to be most effective and realistic to have an impact (Figure 4).



Figure 4: Participants voting for actions to disseminate SLM measures and promote their wider adoption

The main groups of ideas about how selected SLM strategies can be best disseminated for uptake by land managers and policy-makers is given in the ranked list below:

1. **Training:** a) of technical representatives at farmers organizations , and b) at high-schools and universities to create awareness and put environmental sustainability higher on the agenda.
2. **Demonstration activities** in the field and development of a network of demonstration and experimental farms throughout the region
3. **Better cooperation and collaboration** between different institutes (i.e. researchers, administration and farmers organisations)
4. **Economic support** for implementation of SLM measures
5. **Lobby** and convince responsible policy makers
6. **Put higher economic and social value** on products that are produced in a sustainable manner
7. **Link payment of agricultural subsidies to implementation** of effective SLM measures
8. **More dissemination and publicity** for SLM measures through newsletters and websites

Part of these actions may very well be linked to the Rural Development Programmes. Currently, the first steps are made to develop the next RDP in which subsidies for soil and water conservation measures and good practice for agriculture will be described. A priority action is therefore to feed the DESIRE workshop results into this process. Furthermore, existing training activities from the regional ministries towards farmers and technicians of farmers' organisations may also benefit from these results.

Participants agree on the fact that the main obstacles for adopting the priority solutions are related to awareness, knowledge and a fear amongst farmers for economic costs related to any change in land management activities. Moreover, many farmers feel that anything they do to protect natural resources is not really valued by wider society. To overcome these challenges, there is therefore a high need for training and awareness building at various levels as reflected in the first action line.

Most participants indicated that optimal dissemination is achieved through field demonstration to farmers and technicians of farmers' organisations. Websites and folders are far less effective ways of communication. Further changes at a larger scale and with possible economic support can only be achieved through lobbying responsible policy makers.

4. Feedback from participants

Generally, participants valued the workshop and their experience in DESIRE very positively. Participants indicated they learned a lot from each other, from discussions and from the results of field trials. The interactive approach of workshops was considered effective to achieve interaction between participants, and was highly valued. However, all participants agreed that a higher participation of farmers is required and that to achieve this, a different approach may be needed

with meetings outside in the field and only for maximum half a day. See Table 2 for detailed answers to evaluation questions.

Table 2: Detailed answers to evaluation questions by workshop participants in Spain (where relevant, the number of responses is indicated in square brackets)

Evaluation Questions:
<p>1. What benefit did you have of participating in this workshop? (more than 1 option possible)</p> <p>[7] Learn from farmers [6] Learn from scientists [12] Learn from other participants [7] Learn about the results of field trials [5] Make new contacts [7] Better understand the land degradation problem [6] Better understand the solutions to and degradation [] Others:</p> <ul style="list-style-type: none"> - <i>You see simple and feasible solutions</i> - <i>Learn from participatory projects</i> - <i>Tolerance between the different sectors (stakeholders)</i>
<p>2. Did the monitoring results change your opinion over the evaluated SLM measures?</p> <p>Yes, because</p> <ul style="list-style-type: none"> - <i>Very tangible results were provided over solutions that are innovative</i> - <i>Good results were obtained</i> - <i>I was especially surprised by the result of mulching</i> - <i>I was not aware of the implications of each measure</i> - <i>Some measures gave surprising results, some performed as expected others did not</i> - <i>I was not yet aware of some of the ecological and economic impacts of some measures like green manure</i> - <i>You learn and value other measures</i> - <i>I learned that the mulch type as applied in this project did not give the expected results</i> - <i>Some measures were not as effective as we expected</i> <p>No, because:</p> <ul style="list-style-type: none"> - <i>I think I already expected these results</i> - <i>I agree with the results</i> - <i>The results are similar to what I expected</i>
<p>3. How do you value the interactive approach of this workshop?</p> <p>Good, because:</p> <ul style="list-style-type: none"> - <i>it is the best way to include all sectors, empathizing with others and getting better understanding of the other peoples opinion</i> - <i>Active participation was facilitated (3X)</i> - <i>It facilitates participants to express their opinion</i> - <i>Very enriching, mutual learning</i> - <i>It combines the opinion of scientists and farmers</i> - <i>I think this is the best available method to facilitate the active participation between scientists and administration</i>

- *It promotes participation, collaboration and helps to better understand*
- *It aims to integrate different stakeholder groups (farmers, administration, scientists)*
- *Exchange of experiences and generates ideas*
- *Everyone participated, it's very dynamic*

Regular, because: [no responses]

Poor, because: [no responses]

4. In your opinion, what is the best way to promote and disseminate the main messages that have come out of this workshop to a wider audience?

[] Newsletters and folders for farmers

[9] Field demonstrations

[11] Presentation and demonstration to farmers organisations

[8] Provide information to responsible politicians

[1] Provide a website with information

[] Others:

- *A regional network of experimental farms for demonstration*

- *Local radio and television*

- *Informative meetings (trainings) of short duration (a few hours) for farmers and technicians of farmers organisations*

5. Please, indicate in one line what you liked most and what you liked least of participating in the DESIRE workshops:

Most:

- *It was very interesting with a good communication of results*
- *Participation of all people present*
- *Participation of various agricultural sectors*
- *The possibility to start a debate over different subjects and that all opinions are valid independent of from who it originates*
- *Hear the opinion of various stakeholder groups and experience in participation*
- *The effectiveness of the tools that were used in the workshops*
- *The results of the experiments and the dynamical process of participation*
- *Multidisciplinary workshop*
- *Interaction between different stakeholder groups*
- *The results and experiences of technicians*
- *Very dynamic process*

Least:

- *More participation of farmers is needed (5x), which requires new strategies for participation*
- *The length of discourse of some of the participants that made us drift away from the main theme.*
- *The practical dissemination of results*
- *More participation of general public (people who do not work in the field) is needed*
- *Little time*
- *Too much information to deal with*

5. Next steps

The following actions are agreed upon for the coming months:

- Send Newsletter 3 with monitoring results to stakeholders after the workshop
- Send Workshop report to participants early November
- Representatives from CSIC will make an appointment with the DG of the regional ministry of Agriculture and of Environment to present and discuss DESIRE and workshop results
- Researchers will contact relevant programmes at universities to disseminate DESIRE results and ask more attention for sustainable development and possibilities for SLM in agriculture
- Organise field demonstration day when more results are available

Although the DESIRE project will finish early 2012, the field trials at the experimental farm 'Los Alhagüeces' will continue as part of a new research project funded by the Spanish Ministry of Science and Innovation. Therefore, the DESIRE research team compromise to do all possible to keep stakeholders informed and continue organizing meetings with those who are interested in order to continue improving and disseminating optimal SLM measures that help us maintaining or improving productivity and protecting our natural resources.