



Participatory rehabilitation of dry-stone terraces (Christos Zoumidis)

Community-based maintenance and rehabilitation of agricultural terraces in mountain environments (Cyprus)

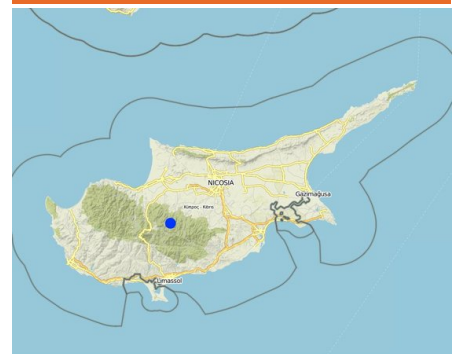
Κοινωνική συμμετοχή για συντήρηση και αποκατάσταση ορεινών γεωργικών αναβαθμίδων (Greek)

DESCRIPTION

Maintenance and rehabilitation of traditional dry-stone terrace walls for agricultural use, through science-society cooperation, community engagement and motivation, and assistance to land users.

Aims / objectives: The main objective of the approach is the restoration and rehabilitation of traditional dry-stone terraces in Mediterranean mountain environments. Large areas around mountain communities have been converted to agricultural terraces. The depopulation of these rural mountain communities and the high farming costs have led to the gradual reduction of farming activities. Consequently, many of the mountain terraces are no longer cultivated and dry-stone walls are not well maintained, causing a domino effect of collapsing terraces. Soil erosion by water has been identified as the main soil threat in degraded and poorly vegetated terraces. The approach has been developed by the Cyprus Institute research team and aims at motivating the mountain communities, land users/owners, local institutions and other interested stakeholders to better organise themselves and collaborate and join forces in maintaining these terraces. **Methods:** The approach is based on participatory principles. More precisely, the science-society cooperation approach is materialised through the organization of practical (hands-on) public events, where dry-stone experts guide the participants, land users/owners, local population, expats (families that have moved to the urban areas) and scientific stakeholders, in collectively maintaining collapsed and/or poorly maintained terraces. **All parties engaged in the implementation of the approach on voluntary basis.** **Stages of implementation:** A pool of local and external stakeholders was prepared by the research team using snowball sampling. Key stakeholders identified include community leaders, land users/owners, dry-stone experts, local institutions, agricultural extension services and farmer unions. Leaders of the three mountain communities agreed to co-organise with the research team one participatory terrace rehabilitation event in each community. Land users/owners, expats and other interested stakeholders (general public) were identified as the main target groups of these events. Each community identified dry-stone experts that were willing to work and lead the workshops on voluntary basis. Demonstration sites were selected by the research team, the community leaders and dry-stone experts, based on the extent of terrace degradation, accessibility/visibility of the site and feasibility criteria. Farmer unions and extension service officers were also engaged in the process. The events were advertised through social media, as well as with flyers and posters in central locations within the communities. During the events, information was provided by researchers and dry-stone experts to raise the awareness of participants on the environmental and cultural importance of dry-stone terraces. In addition, the learning-by-doing process was guided by experts who explained to the participants the best practices in reconstructing the collapsed terraced walls. Three public events were organized in the first year and a similar set of three events will be organized in the second year. Additional funds are being sought to continue these activities. The sustainability of communal terrace maintenance will also be discussed with the community leaders and active volunteers during the second year. **Role of stakeholders:** The research team conceptualised the approach. The organisation tasks for the participatory rehabilitation events were shared

LOCATION



Location: Northeast Pitsilia, Nicosia, Cyprus

Geo-reference of selected sites

• 33.04999, 34.96667

Initiation date: 2015

Year of termination: 2018

Type of Approach

traditional/ indigenous
 recent local initiative/ innovative project/ programme based

among the research team and the local communities. Expats (families that have moved to the urban areas) associations and farmer unions informed their members to join the events. Dry-stone experts had the leading role during the events, as the reconstruction of collapsed terrace walls was based on their guidance. Extension service officers provided information on available subsidy schemes. During the events all stakeholders, including land users/owners and other interested people, worked together to maintain the terraces. Other important information: The events attracted people beyond the stakeholders originally identified; the approach was adopted by other projects/communities in Cyprus.



Stakeholders restore collapsed dry-stone terrace walls following instructions given by experts. (Christos Zoumidis)



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APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims / objectives of the approach

The Approach focused mainly on SLM with other activities (terrace maintenance, hands-on training, community conservation, participatory approach, stakeholder engagement, awareness-raising)

- To strengthen science-society cooperation in solving land degradation issues in terraced mountain environments.
- To build capacity for planning, organisation and implementation of participatory soil conservation activities, eventually leading to sustainable local institutions that maintain traditional know-how and specialised in terrace maintenance.
- To improve joint learning activities between farmers, terrace experts and interested stakeholders.
- To rehabilitate abandoned and collapsed terraces, reduce soil erosion and maintain the production capacity of soils in Troodos Mountains.

The SLM Approach addressed the following problems: • Collapsing of dry-stone walls, surface run-off and loss of soil (erosion) in sloping land that has been accumulated behind the terrace walls

- Depopulation of mountain rural communities and land abandonment
- Loss of indigenous knowledge
- Weak institutional organisation and limited incentives (low economic returns) for terrace maintenance

Conditions enabling the implementation of the Technology/ ies applied under the Approach

Conditions hindering the implementation of the Technology/ ies applied under the Approach

social/ cultural/ religious norms and values : Land abandonment, rural depopulation, lack of motivation. Treatment through the SLM Approach: Organise frequent terrace maintenance events to stimulate interest, invite and engage expats to participate.

availability/ access to financial resources and services : Low economic return from terrace agriculture. Treatment through the SLM Approach: Engage, motivate and train volunteers through public terrace maintenance events.

institutional setting: There are no formal or informal institutions for terrace rehabilitation. Treatment through the SLM Approach: The sustainability of communal terrace maintenance will be discussed with the community leaders and active volunteers during the second year.

legal framework (land tenure, land and water use rights) : Terraced land is privately owned; no maintenance can be done without the approval of land owners. Demonstration sites are privately owned; the rehabilitation events on terraces were undertaken with the approval of land owners. Treatment through the SLM Approach: Community leaders request the approval of land owners.

knowledge about SLM, access to technical support : Loss of indigenous knowledge Treatment through the SLM Approach: The terrace events are led by terrace artisans (dry-stone experts) to practically demonstrate and pass the technical know-how to the next generation. Efforts were made to engage terrace experts from different communities.

workload, availability of manpower: Terrace maintenance is a laborious activity. Treatment through the SLM Approach: The public terrace maintenance events aim to build the capacity of a large group of people (volunteers) to engage in terrace maintenance.

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- Capacity building/ training
- Advisory service
- Institution strengthening (organizational development)
- Monitoring and evaluation
- Research

Capacity building/ training

Training was provided to the following stakeholders

- land users
- field staff/ advisers

Form of training

- on-the-job
- farmer-to-farmer
- demonstration areas
- public meetings
- courses

Subjects covered

How dry-stone terraces are restored and maintained (technique) and their importance in reducing soil erosion in mountain slopes (awareness).

Advisory service

Advisory service was provided

- on land users' fields
- at permanent centres

Name of method used for advisory service: Demonstration of terrace maintenance by experts; participation of land users and the general public; Key elements: Selection and preparation of collapsed terraces to be restored (terrace experts, researchers, community leaders), Demonstration and hands-on terrace maintenance workshops with the participation of land users and the general public; good and bad practices explained.; One agricultural extension service officer participated in these events, discussed the method with land users and SLM experts and provided information on available subsidies.

Advisory service is inadequate to ensure the continuation of land conservation activities; Extension services provide general directions on terrace maintenance and available subsidy schemes to interested land users; they are not sufficiently trained in dry-stone wall construction and they have insufficient human and financial resources.

Institution strengthening

Institutions have been strengthened / established

- no
- yes, a little
- yes, moderately
- yes, greatly

at the following level

- local
- regional
- national

Describe institution, roles and responsibilities, members, etc.

Type of support

- financial
- capacity building/ training
- equipment

Further details

One of the aims of the approach is to develop sustainable local institutions for terrace maintenance; this will be discussed with the community leaders and active volunteers during the second year.

Monitoring and evaluation

bio-physical aspects were regular monitored by project staff through measurements; indicators: Erosion rate (Sediment Traps) technical aspects were regular monitored by project staff through measurements; indicators: Terrace wall displacement (3D terrace model) no. of land users involved aspects were ad hoc monitored by project staff through measurements; indicators: No. of land users (attendance list) Number of non-land users involved aspects were ad hoc monitored by project staff through measurements; indicators: Number of non-land users involved There were no changes in the Approach as a result of monitoring and evaluation: Monitoring is at its early stage. There were no changes in the Technology as a result of monitoring and evaluation: Dry-stone terracing is a well-established indigenous technology for the mountain communities; the technical know-how however is gradually disappearing due to rural depopulation and land abandonment.

This documentation is intended to be used for monitoring and evaluation

Research

Research treated the following topics

- sociology
- economics / marketing
- ecology
- technology

By researchers: Monitoring and modelling soil erosion (PESERA model), monitoring the stability of dry-stone terrace walls (3D model) and participatory research.

Research was carried out on-farm

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component

- < 2,000
- 2,000-10,000
- 10,000-100,000
- 100,000-1,000,000
- > 1,000,000

Precise annual budget: n.a.

Approach costs were met by the following donors: private sector (Cost for snacks and drinks offered to the event's participants): 50.0%; local government (district, county, municipality, village etc) (Cost for preparing the site for restoration, stones.): 50.0%

The following services or incentives have been provided to land users

- Financial/ material support provided to land users
- Subsidies for specific inputs
- Credit
- Other incentives or instruments

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

	No	Yes, little	Yes, moderately	Yes, greatly
Did the Approach help land users to implement and maintain SLM Technologies? <i>Well maintained terraces improve drainage and minimise soil loss.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Did the Approach empower socially and economically disadvantaged groups? <i>No socially and economically disadvantaged groups were identified.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the Approach improve issues of land tenure/ user rights that hindered implementation of SLM Technologies? <i>Property rights was not an issue for the implementation of the approach. The problem is unlikely to be overcome in the near future. Property rights are not expected to become an issue for the implementation of the approach; stakeholders have been collaborating without raising such concerns.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did other land users / projects adopt the Approach? <i>The approach has been adopted by another project in Cyprus (Local Development Pilot Project for the Wine-villages of Limassol – LDPP); many participants express their interest in organizing similar events in other communities in Cyprus.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Main motivation of land users to implement SLM

- increased production
- increased profit(ability), improved cost-benefit-ratio
- reduced land degradation
- reduced risk of disasters
- reduced workload
- payments/ subsidies
- rules and regulations (fines)/ enforcement
- prestige, social pressure/ social cohesion
- affiliation to movement/ project/ group/ networks
- environmental consciousness
- customs and beliefs, morals
- enhanced SLM knowledge and skills
- aesthetic improvement
- conflict mitigation

Sustainability of Approach activities

Can the land users sustain what has been implemented through the Approach (without external support)?

- no
- yes
- uncertain

Local communities can potentially organise better themselves and with the collaboration of land users/owners and SLM experts, they can organise such community-based conservation events on an annual basis. Thus the approach can eventually be sustained without scientific (external) support.

CONCLUSIONS AND LESSONS LEARNT

Strengths

- Participation of people reduced the workload required to maintain terraces. (How to sustain/ enhance this strength: More frequent events are welcomed.) (land user's view)
- Community based conservation activities have contributed to better institutional organisation. (How to sustain/ enhance this strength: Engage more local stakeholders in future events.) (land user's view)
- Community conservation was insofar successful in maintaining selected demonstration sites. (How to sustain/ enhance this strength: Maintain the interest of stakeholders by organising similar events on an annual basis.) (compiler's or other key resource person's view)
- Capacity building activities increase the participation of stakeholders. (How to sustain/ enhance this strength: Continue the approach for further engagement.) (compiler's or other key resource person's view)

Weaknesses/ disadvantages/ risks → how to overcome

- Mountain farming is less cost-effective than in the plains. → *Motivate the younger generation to engage in part-time farming.* (land user's view)
- The approach cannot be implemented on bigger scale without economic incentives. → *Utilise available community/subsidy funds for small cash compensation to experts.* (land user's view)
- Small holdings and land fragmentation are constraints for cost-effective agriculture. → *Reconsideration of land consolidation schemes.* (land user's view)
- Aging of the dry-stone experts. → *Train young land users/owners on dry-stone terracing.* (compiler's or other key resource person's view)
- The community leaders tend to be more conservative than the SLM experts. → *Gradually convince them to think bigger.* (compiler's or other key resource person's view)

REFERENCES

Compiler

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Questionnaire created

Oct. 30, 2015

Last update

July 24, 2017

Resource persons

Christos Zoumides (c.zoumides@cyi.ac.cy) - SLM specialist
Adriana Burgemann - SLM specialist

Full description in the WOCAT database

https://qcat.wocat.net/en/wocat/approaches/view/approaches_2537/

Linked SLM data

WOCAT SLM Technology: Agricultural terraces with dry-stone walls
https://qcat.wocat.net/en/wocat/technologies/view/technologies_1702/

Documentation was facilitated by

Institution

- The Cyprus Institute (The Cyprus Institute) - Cyprus

Project

- Preventing and Remediating degradation of soils in Europe through Land Care (RECARE)

Key references

Links to relevant information which is available online