



Erosion protection by fencing and reduction of grazing and trampling pressure, Ehen. (Hanns Kirchmeir)

Community-based approach in Erosion Control (Azerbaijan)

Ismayilly district, Ehen community

DESCRIPTION

The unsustainable use of pastures and forest areas leads to erosion, degradation, desertification and loss of biodiversity in high mountain areas of the South Caucasus. In the village Ehen in the Ismayilli district in Azerbaijan, a community-based approach for erosion control was developed in a participative way. Together with village stakeholders, different measures were developed to stop erosive processes, flooding and to rehabilitate vegetation cover.

The Ministry of Ecology and Natural Resources of Azerbaijan together with the Deutsche Gesellschaft fuer Zusammenarbeit (GIZ) selected integrated erosion control as a priority in their cooperation and the district Ismayilli was chosen for the implementation of pilot activities.

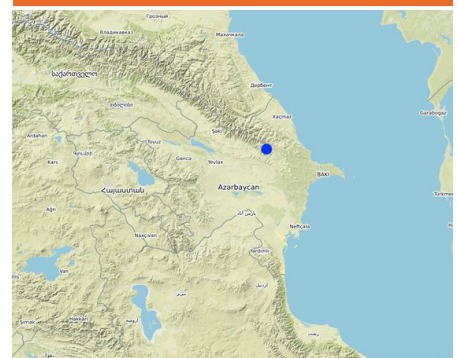
The district Ismayilli covers an area of about 2.158 km². Approximately 31% of the territory is covered with forest. Pasture lands on slopes are particularly exposed to vegetation degradation due to overgrazing. The loss of a closed vegetation cover on mountain slopes can lead to severe soil erosion due to surface water runoff. The project team together with the district administration decided to set the focus on the village Ehen near Lahic.

The approach chosen for integrated erosion control in Ehen was a community-based approach. Together with stakeholders, the most severe erosion sites were identified, and a list of priorities was developed. In cooperation with international experts, different technologies and practices were developed to stop erosion processes. Several preconditions for the development of a number of practices were set: The technologies should be cost-effective and affordable for the villagers, and the villagers should be able to use them without the use of external technicians. In order to achieve this, particular emphasis was placed on the application of bio-engineering measures. Measures were applied on degraded pasture lands and erosion gullies in the pilot community at the south slope of the Great Caucasus.

As a first step, the implementation sites were determined through joint field visits by village representatives and experts ('Screening mission'). In the first phase the GIZ-team and the SLM-experts have been introduced to the village community. In this phase, the national GIZ project coordinator had the major role to create a basis of respect and trust to enable a positive atmosphere for an open minded discussion. The driving factors of deforestation and overgrazing were discussed in the field, and the potential intervention sites were marked with colour spray and wooden poles in the field. The marking in the field instead of only working with printed maps was very important for the recognition, discussion and acceptance of the sites by all villagers. There was a gap of several weeks between marking and implementation, which provided enough time for internal discussion about the site selection and the adaptation of boundaries.

Nine degraded pastures and forest land sites were selected by the village stakeholders together with the SLM specialists. Four sites are located above the village with the risk of increasing rockfall and flooding by surface water runoff. Five sites are located below the village and were selected to ensure the productivity of the land. For providing tree seedlings, a local tree nursery was established near the school (10th site). One site was selected to combine effects by establishing a hazelnut plantation to stop erosion,

LOCATION



Location: District Ismayilli, Ehen village, Azerbaijan

Geo-reference of selected sites

- 48.41683, 40.85267

Initiation date: 2015

Year of termination: 2018

Type of Approach

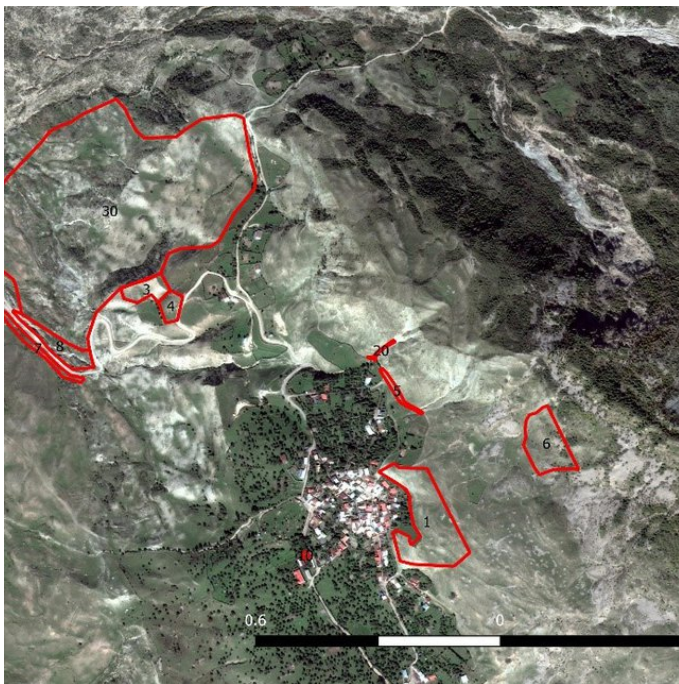
- traditional/ indigenous
- recent local initiative/ innovative
- project/ programme based

increase vegetation cover and provide an income generation opportunity. Two sites with gully erosion were selected: a site above the village with the risk of flooding into the village and a site below the village along the road with a high risk of road damage if the deepening process continues (detailed instructions on measures can be found at the internet links attached).

Regular meetings took place between the traditional administrative community board, the GIZ-project team and the SLM experts to discuss the implementation process and to evaluate together the results. The availability of local resources was taken into consideration to adapt technologies to fit the local needs. New ideas, locally available materials and technologies have been integrated into the implementation process by the local stakeholders.

The implementation of the measures was done mainly by the local village people and local experts. The SLM experts provided 'hands-on-training' and all materials that were not available in the village as well external experts were financed by the project.

Another essential aspect is the sustainable use of well-managed meadows by different stakeholders (beekeepers, wild herb collectors, orchard owners and others) in the community. This includes the agreement (rule) of the community to share the protected pastures and to consider the needs of all interest groups. The decision of the profit sharing is taken by the traditional administrative community board. A further factor was the establishment of a tree nursery, which led to an increased motivation to plant additional trees (especially fruit trees) in the community.



Mapped sites in Ehen. The village was assessed in the screening mission in May 2014 and was subject of several further field missions. Ehen acts as a demonstration site for the other villages, as many different measures were implemented here. (Hanns Kirchmeir)



Construction of a pile wall on a steep slope in the village of Goydan (Hanns Kirchmeir)

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims / objectives of the approach

Develop erosion control measures that can be implemented by village population without significant investment. The measures are addressed to rehabilitate vegetation on eroded sites and to slow down water speed and erosive energy where gullies already exist. This should help protect roads and other infrastructure as well as stop soil loss and increase overall productivity.

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

- **Social/ cultural/ religious norms and values:** Local population tend to save resources such as forest and pasture surrounding their village. Residents, especially women collect wild plants to use in daily life. Furthermore, selling collected wild plants in the market, residents earn income.
- **Availability/ access to financial resources and services:** Most of the activities (fencing, willow fascines, pilewalls, gabion or wooden check dams) only need small-scale financial investments. Only the drip irrigation system for the hazelnut orchard needed significant external investment, and the return of the investment cannot be expected before 10 years. Such an investment would have been impossible for the village community without external support.
- **Institutional setting:** The Community Management Group was established at the early stage of the project.
- **Collaboration/ coordination of actors:** Pilot activities are implemented in cooperation with local decision makers and communities. The active involvement of the village people in the implementation works was a hands-on training.
- **Policies:** The Azerbaijan policy to establish more than 2000ha of hazelnut orchard in the district of Ismayilli supports the decision to establish hazelnut orchards on eroded sites as a control measure.
- **Land governance (decision-making, implementation and enforcement):** Pilot sites are located in municipality land. Community members and local authority decided the border of pilot sites.
- **Knowledge about SLM, access to technical support:** Residents have some initial knowledge of sustainable land management. Implementing pilot activities their information is developed.
- **Markets (to purchase inputs, sell products) and prices:** Collected wild plants are sold in the market located next to Ehen village.
- **Workload, availability of manpower:** The manpower is available in the village

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

- **Legal framework (land tenure, land and water use rights):** The forest's legal protection does not allow timber or poles to be taken from the forest for the construction of pile walls or wooden check dams. The poles had to be imported and transferred to the village. A balanced sustainable forest management would enable village people to make use of the local timber and would encourage people to establish forest areas.

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?	Specify stakeholders	Describe roles of stakeholders
local land users/ local communities	Livestock farmers, shepherds, smallholder farms and women that were loosely organised.	Selection of sites for intervention, providing labour during implementation of measure, local hay residuals provided by farmers for testing the measure, maintenance of drip irrigation and electric fence of the hazelnut orchards.
SLM specialists/ agricultural advisers	International and national specialists have been integrated.	The SLM specialist elaborated in close cooperation with the local stakeholders the implementation concept.
researchers	Researcher from the Agrarian University in Ganja.	
local government	Ministry of Ecology and Natural Resources, Ismayilli District Administration	Numerous pilot activities (test and demonstrate the most appropriate actions and raise awareness of the community on the long-term socio- economic and environmental benefits of the pilot actions) have been implemented In cooperation with local government in Ehen municipality.

Involvement of local land users/ local communities in the different phases of the Approach



The selection of Ismayilli district was done at Ministry level. The selection of the villages was done with district administration and experts assessment of erosion problems.

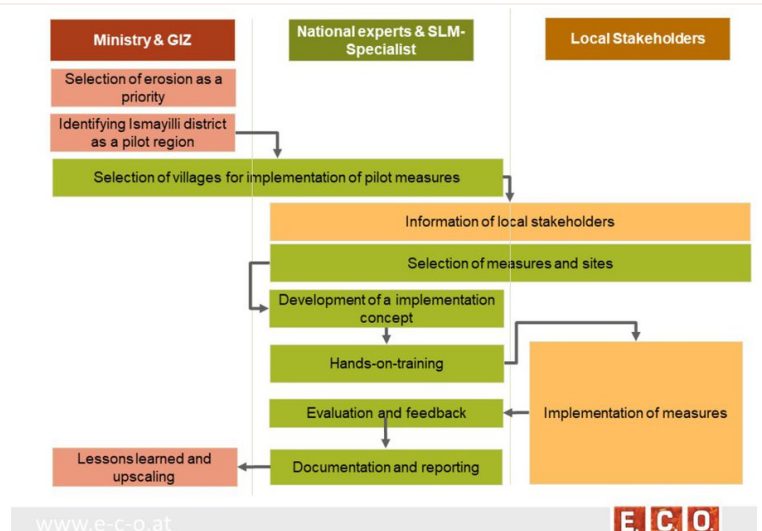
The site selection was done with local village stakeholders. The technical planning was done by external experts. Four additional municipalities were assessed for hazelnut plantations where local land users provided data.

Local stakeholders trained on bioengineering measures. The following measures were applied during hands-on training: 1. Wooden check-dam. 2. Gabion check-dam. 3. Willow-fascines. 4. Electric-Fencing. 5.Pile walls. 6.Drip irrigation system.

An external monitoring team (project team) did the monitoring in a participative way. The observations and monitoring results were discussed with the village stakeholders.

Flow chart

This flow chart gives an overview on the different roles of project participants (Ministry and GIZ, the national experts and SLM specialists as well as the local stakeholders) and the actions implemented by them jointly or separately.



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E C O

Decision-making on the selection of SLM Technology

Decisions were taken by

- land users alone (self-initiative)
- mainly land users, supported by SLM specialists
- all relevant actors, as part of a participatory approach
- mainly SLM specialists, following consultation with land users
- SLM specialists alone
- politicians/ leaders

Decisions were made based on

- evaluation of well-documented SLM knowledge (evidence-based decision-making)
- research findings
- personal experience and opinions (undocumented)

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

Construction of willow fascines, pill walls, wooden check dams, gabion check dams, tree planting, fence construction (electric fence, mesh wire fence), construction and maintenance of drip irrigation system.

Advisory service

Advisory service was provided

- on land users' fields
- at permanent centres

The field trip provided advice and training on afforestation and tree species selection.

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.

The implementation capacity of line ministries, their subordinate bodies and of training institutions regarding the management of biodiversity and ecosystem services is improved. The regional exchange on sustainable management of biodiversity and ecosystem services is improved.

Type of support

- financial
- capacity building/ training
- equipment

Further details

Capacities in project planning, implementation and monitoring have been developed. Awareness raising on erosion-caused land degradation and effective, cost-efficient erosion control measures have been applied.

Monitoring and evaluation

In 2018, monitoring was carried out on the implemented measures in order to assess if additional interventions would be required or if measures had been damaged. Permanent monitoring plots have been established to assess the rehabilitation of vegetation.

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: 100.0

In the framework of the GIZ-program "Integrated Biodiversity Management, South Caucasus" (2015-2019), implemented on behalf of the German Federal Ministry of Economic Cooperation and Development (BMZ), the amount covers: fencing, electric fencing, hay, pile walls, afforestation, wooden check dams, gabion check dams, other materials and labour on the sites of Ehen.

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

Financial/ material support provided to land users

Land users were provided materials for erosion control measures and tree nursery. The timber for the pile walls, the mesh wire fence and the electric fencing material as well as tanks for rain water collection (for the tree nursery) and irrigation equipment was provided. The local stakeholders provided man power for the maintenance of fences and irrigation system and maintaining the tree nursery for free. Workpower for setting up infrastructures like gabions or check dams was paid.

labour Only the construction of technical infrastructure (fence, check dams, irrigation system) was paid. Maintenance work was not paid.	partly financed fully financed	<input type="checkbox"/> <input checked="" type="checkbox"/>
tree nursery Equipment (fence, water tanks, irrigation system, tools) have been financed. Seeds have been provided by locals.		<input type="checkbox"/> <input checked="" type="checkbox"/>
construction: wood Timber for pile walls was bought and provided, branches for willow fence and fascines was contributed by locals.		<input checked="" type="checkbox"/> <input type="checkbox"/>
Labour by land users was		
<input type="checkbox"/> voluntary		
<input type="checkbox"/> food-for-work		
<input type="checkbox"/> paid in cash		
<input checked="" type="checkbox"/> rewarded with other material support		

Other incentives or instruments

For the implementation of the pilot measures in Ehen, material and payment for labour was provided. There have been some follow up activities in neighboring villages where only the material was provided, as the work was done voluntarily.

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

Did the Approach empower local land users, improve stakeholder participation? The application of easy-to-use measures for erosion control enabled local land users to arrange land management and erosion control measures by themselves without relying on significant external support. The pilot actions in the village Ehen are used as a showcase for the neighbouring villages.	No Yes, little Yes, moderately Yes, greatly	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
Did the Approach help land users to implement and maintain SLM Technologies? As a result of the on-the-job training, most of the activities (fencing, pile walls, hay mulch application, wooden and gabion check dams) can now be implemented by the local village stakeholders without external support.		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
Did the Approach mobilize/ improve access to financial resources for SLM implementation? International funds were accessible for the village community and other international donors funded measures in the same village.		<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
Did the Approach improve knowledge and capacities of land users to implement SLM? The involvement of local stakeholders in all stages of planning, site selection and implementation improved capacity and knowledge. It was very important that the work was done mainly by local village people and not by external companies.		<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
Did the Approach improve knowledge and capacities of other stakeholders? University experts and district-level technicians participated in the planning and implementation. They can act as knowledge hubs.		<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Did the Approach mitigate conflicts?		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Did the Approach lead to improved food security/ improved nutrition?		<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Did the Approach improve access to markets?		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Did the Approach lead to employment, income opportunities? Villagers have reported that the improved vegetation in the fenced areas led to significantly higher honey harvest and herb collection for marketing on the bazaar of Lahic village.		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
Protection from natural hazards All gabions at the sites in Ehen are functioning well and show the impact of the gully deepening and the wash out at the lower (downhill) end of the gabion. Reduced water speed and the stabilised river bed helped to save the road.		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" 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

- Sustainability of Approach activities**
- Can the land users sustain what has been implemented through the Approach (without external support)?
- no
 - yes
 - uncertain
- Local stakeholders trained on building and applying measures. The measures (fencing, pile walls, wooden and gabion check dams) are low-cost and can easily be replicated by village stakeholders. Only the drip irrigation system and electric fencing for the hazelnut orchard needs high investment and might not be up-scaled without external support.

- ✓ enhanced SLM knowledge and skills
- aesthetic improvement
- conflict mitigation

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- The integration of local stakeholders in the selection of measures and sites helped to address the most 'urgent' problems from the villagers view.
- It was important to have visual results from the work in a short time. Especially the reduction of flooding was a very positive result as well as the increased number of flowering plants which led to an increase of honey and tea production, which created additional income. Some of the trained techniques have been already transferred by villagers to neighbouring communities.
- Most of the beneficiaries see the hazelnut plantation area as a potential source of income in the future and at the same time as a useful measurement for rehabilitation of the biodiversity and measure against erosion. Land users see the implementation of the measures on the site as contribution to the future tourism perspective of the village.
- The pilot measure is cost-efficient and affordable for local people. It has a positive ratio of cost/benefit.

Strengths: compiler's or other key resource person's view

- Measures are easily implemented and materials (mesh wire, willows, seedlings) are available locally.
- The measures are showing significant impacts in a short time. The rehabilitation of vegetation and the gathering of sediments halting gully deepening is already visible in the first year after implementation.
- As there is still enough pasture land available and the areas of intervention have been implemented on degraded land, there was no major conflict with shepherds and farmers.

Weaknesses/ disadvantages/ risks: land user's view → how to overcome

- Low capacity of the municipality was limiting to the management of the drip irrigation and the electric fence. → Handing over the hazelnut orchard to a private cooperative could increase ownership and personal involvement of local stakeholders in orchard maintenance. A long-term business plan and financing model needs to be developed if the approach is to be up-scaled.
- Current electric fence of hazelnut plantation is not efficient in protecting area from free roaming animals. It also reflects on the inefficiency of the overseer's working time, as he spends entire working hours on the controlling the fence which reduces his time on spending on the additional activities like controlling plant growth and irrigation system. → Changing electrical fence to the ordinary mesh fence or wire fence.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view → how to overcome

- Because of a general ban on forest management, the timber used for pile walls and wooden check dams cannot be extracted from the local forest. → Timber and logs have to be bought from foreign markets. An adaptation of laws on the legal extraction of local timber for certain purpose would be helpful.
- Hazel needs more than 750 mm annual precipitation. Humidity above 60% in June and July is beneficial. A strong wind is a danger for young trees. Ehen has 500-700mm precipitation and significant summer drought. → A drip irrigation system was applied to overcome summer drought in the first couple of years until seedlings have established a sufficient root system to access water from deeper soil layers.
- The electric fencing and the drip irrigation for the hazelnut plantation and fruit tree plantations above the village need expensive investment and specific skills for mounting and maintenance. → Project investment was used for pilot measures as a demonstration site. The hazelnut orchard can show a positive return on investment within 10-15 years if managed well.

REFERENCES

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Resource persons

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Full description in the WOCAT database

https://qcat.wocat.net/en/wocat/approaches/view/approaches_5571/

Linked SLM data

Technologies: Sustainable land management using controlled gullying

https://qcat.wocat.net/en/wocat/technologies/view/technologies_1684/

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Reviewer

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Key references

- Planning meetings, site visit and stakeholder meeting, Hanns Kirchmeir, Azerbaijan 2017.: Report based on field visits
- Hazelnut plantations on eroded sites in Ismayilli, Hanns Kirchmeir, 2017: Concept based on surveys and field visits

Links to relevant information which is available online

- Synthesis Report on Erosion control measures 2014-2017: <https://biodivers-southcaucasus.org/uploads/files/5b8655b3db452.pdf>
- Handbook on Integrated Erosion Control: http://116.203.245.69/uploads/files/IEC%20Handbook_EN.pdf