
SYNTHESIS REPORT



Long Term Impacts of Investments in Soil and Land Rehabilitation Programmes



Table of Contents

Executive Summary	5
Background	7
Objective and Methodology	9
Description of Programmes under study	10
I. Ethiopia	10
II. Niger	11
III. Burkina Faso	12
IV. India	13
Socioeconomic Impacts	14
a. Increased Yields, Income and Household Productivity	14
b. Diversification of Income Generating Activities	15
c. Reinvestment of Earnings into Innovation, Education and Health	16
d. Reduced Pressures on Land and Rural Exodus	16
Effects on Regional Natural Resource Base	17
a. Improved Soil Health	17
b. Increased Water Availability	18
c. Compound Effects (Climate Change Mitigation and Adaptation)	18
Institutional Frameworks & Social Organization	19
a. Partnerships and Collaboration	19
b. Reinforcement of Local Governance Systems	19
c. Creation of Solid Sustainability Mechanisms	20
d. Empowerment of Disadvantaged Social Groups	20

Success Factors for SLM Programmes	22
I. Project Internal Mechanisms to Enable/Strengthen Impacts	22
a. Making Use of Local Institutions, Actors and Tools	22
b. Applying Long-Term Perspectives and Post-Project Mechanisms	23
c. Knowledge Management and Self-Evaluation Mechanisms	23
II. From Participation to Ownership	24
a. Adopting Effective and Context-Appropriate Approaches	24
b. Promoting Self-Help Initiatives	25
Challenges and Lessons (to be) Learned	26
I. Insufficient Baselines Lead to Disparate Efforts	26
II. Framework Conditions: Lack of Political Will, Coordination and Synergy	26
III. Absence of Post-Project Sustainability Mechanisms	27
IV. Participatory Approaches Lack Inclusivity	28
V. Lack of Adaptive Capacity / Flexibility	28
VI. Sustainability of Impacts (often) depends on External Financing	29
Recommendations for the Analysis of Long-Term Impacts	30

List of Acromyms

CC	Community Contracting
CO₂	Carbon dioxide
CWT	Community Watershed Teams
DED	German Development Service (now part of GIZ)
GERES	Groupement Européen de Restauration des Sols
GHG	Greenhouse Gas
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH</i>
GoBF	<i>Government of Burkina Faso</i>
GoI	<i>Government of India</i>
HPEDS	Himachal Pradesh Eco-Development Society
IGCEDP	Indo-German Changar Eco-Development Project
IGWDP	Indo-German Watershed Development Programme
KfW	German Development Bank
LUCOP	Lutte Contre la Pauvreté (Rural Poverty Reduction Programme in Niger)
MoA	Ministry of Agriculture
M&E	Monitoring and Evaluation
NABARD	National Bank for Agriculture and Rural Development
NGO	Non-Governmental Organization
NRM	Natural Resource Management
PATECORE	Projet d'aménagement des terroirs et conservation des ressources (Plateau Central)
PASP	Project for Integrated Protection of Agric., For. and Rangeland Resources
PDRT	Tahoua Rural Development Project
PMAE	Programme for Erosion Control Measures
PO	Peasant Organisations
PromAP	Promotion of Productive Agriculture Programme
SDG	Sustainable Development Goal
SLM	Sustainable Land Management
SLMP	Sustainable Land Management Programme
SOC	Soil Organic Carbon
SUN	Sustainable Utilization of National Resources for Improved Food Security
SWC	Soil and Water Conservation
UNCCD	United Nations Convention to Combat Desertification
UPNRM	Umbrella Programme for Natural Resource Management
VDC	Village Development Committee
WDF	Watershed Development Funds

Executive Summary

Healthy and productive soils form the basis for a productive agricultural system and are thus important for ensuring food security for an increasing population. Scaling up and sustaining the positive impacts of effective sustainable land management (SLM) practices, particularly such measures used for the purpose of soil and water conservation (SWC), remains an important objective in order to ensure that the nutritional needs of a growing population, especially in regions affected by climate change, can be met. This study aims to identify and analyze in particular the long term impacts of SLM interventions because a thorough understanding of these could be an important tool to better guide future interventions. Four individual country cases from Niger, India, Burkina Faso and Ethiopia were used to trace such long term impacts and to collect important lessons learned with regard to success factors and challenges of said interventions.

The present study synthesizes the primary findings of two country-specific case studies in India and Burkina Faso - based on literature review, project documentation, field visits and interviews with key stakeholders. The findings from the case studies conducted complement two already existing impact assessments from Ethiopia and Niger, which were used to draw additional conclusions for the present report. The review of past programmes enabled the identification of commonly-observed long-term impacts and challenges. The study also made use of supplemental literature on SLM interventions in these countries when such studies could be found.

In general, the long term impacts of SLM interventions can be considered from a socio-economic, natural resource or institutional framework perspective. Socio-economically, the long term impacts of SLM initiatives were found to positively affect household income and crop yields, in some cases, even many years after project activities had ended. Increased yields and incomes at the household level often enabled families to diversify their income generating activities and/or produce high-value market-produce. The earnings derived from higher crop yields and/or diversified production were often reinvested into other sectors such as health, education or general

wellbeing. Due to an increase in the surface area of cultivable land (via the rehabilitation of degraded surfaces) and through intensified production (via higher yields on treated lands), pressure on land resources can be reduced, and migration from degraded rural agricultural regions can be stemmed. From a natural resource perspective, SLM measures were shown to have far reaching benefits in terms of improving soil health and fostering biodiversity. Through specific SLM measures, such as stone bunds, weirs, and Nardi-Vallerani trenches, groundwater availability could generally be increased, an effect which facilitated water access to satisfy household water needs. SLM measures also have a variety of far reaching and less well-understood compound effects. SLM techniques play an important role in sequestering carbon, via direct carbon (C) storage into soils during photosynthesis and via the prevention of accelerated topsoil erosion (and thus C loss). The effects of a healthier natural resource base can also be felt in terms of household adaptation and resilience to climate change. With both improved yields and potentially diversified income sources, households are better equipped to face adverse effects of a changing climate (generally expressed as increased rainfall variability, e.g. Sahel, Ethiopia).

From an institutional framework perspective, beneficiaries of past SLM interventions who gained various skills constitute an important resource and knowledge pool related to SLM. Their enhanced capacities should be considered an important long-term impact of such interventions, since this knowledge and know-how can be used, theoretically, even without formal project activities. Moreover, due to the technical and arduous nature of most SLM measures implemented in such regions as the Sahel, a strong degree of organization was found to be necessary and often resulted in the creation (or reinforcement) of a strong and sustainable organizational base (via local governance systems) which has the potential to play important roles during subsequent interventions. Disadvantaged social groups, such as resource-poor households, women, and pastoralists can all benefit from the long-term effects of SLM (such as those mentioned above) when the intervention approach is context-appropriate. The identification of potential



Stone bunds delimiting field in Mouyoupin village (Burkina Faso) EKF Programme ©T. Jenisch

success factors is a difficult task due to the relative nature of project success. Post-project evaluations might miss out on important criteria for measuring overall success such as beneficiary self-evaluation, sustainability assessments, quality control etc.

Therefore, success factors are only listed when/if their effect was of particular importance or constituted a key factor for the success observed in several interventions. In particular, projects and programmes which created (or reinforced existing) local institutions tasked with planning, managing and carrying out project activities were found to be important actors and are still in existence and quite successful today. Making use of local and context-appropriate mechanisms to enable the transfer of know-how and information also proved to be an important success factor in many cases. Many SLM programmes had the most impacts when they intervened with a long-term perspective from the onset. This was done by ensuring that post-project phase-out mechanisms were in place for communities to effectively continue restoration efforts without outside support (self-help) and was achieved via the creation of development funds or by adopting “rolling approaches” of limited duration, which encouraged rapid and effective organization. In order for programmes to be considered successful, they must first be equipped with proper monitoring and evaluation (M&E) systems, which can be used to both assess the work achieved and qualify results. A major success factor identified from most studies was making use of participatory approaches, which encourages involvement and results in ownership amongst local beneficiaries of project activities. An effective participatory approach was considered the “foundation” for many of the positive impacts, especially in Niger. However, as discussed in previous research (see page 23), the quality of so-called “par-

ticipatory” approaches is not always ensured and the often *de-facto passive* role of beneficiaries can jeopardize the long-term sustainability of results and threatens the very idea of participation and ownership of programme activities.

The importance of conducting baseline studies was discussed, in order to ensure that subsequent evaluations of long-term impacts can be based on a comparative evaluation of several measurable indicators (such as yield, soil health, income). Moreover, a major challenge was identified with regard to unsuitable and changing political framework, since these external factors often play a major role in affecting the success of a programme. In many cases, SLM programmes were inadequately prepared to adapt to changing political conditions, such as decentralization (in West Africa) and these factors proved to be major obstacles to success. Suitable post-project continuity/sustainability mechanisms were often lacking, which contributed to community dependence on external assistance and to a decrease in/maintenance activities. Similarly, many programmes based their functioning on participatory approaches, by which the degree of true participation (i.e. degree to which certain groups directly benefit from project activities and achievements) is difficult to assess. Finally, the dependence of project activities on punctual – and unstable – external financing mechanisms was highlighted as a major challenge to the long-term success of SLM interventions. Due to these many challenges, the positive long-term impacts of many programmes remain unrealized and/or jeopardized. It is therefore critical for future long-term impact studies to address the factors contributing to limited or dampened success of some programmes.

Background

Soil is increasingly recognized within the international community as a central resource necessary for improving sustainable productivity, increasing agricultural production and thus achieving food security¹. Healthy and productive soils also provide a variety of other ecosystem services such as carbon sequestration², and storage of water and micronutrients needed to sustain healthy, productive crops³. Therefore, reducing wind and water erosion, improving soil health and fertility as well as sustainably making use of land resources have become central concerns with regard to attaining the Sustainable Development Goals (SDGs)⁴. Sustainable Land Management (SLM) and Soil and Water Conservation (SWC) measures thus play a central role in this context. Smallholder farmers often face difficulties in achieving adequate agricultural yields due to a wide range of unfavorable bio-agro-ecological and institutional conditions⁵. Destruction and degradation of land resources are con-

tributing factors to migration from rural areas; young people are especially prompted to leave agricultural regions in search of livelihoods in urban agglomerations^{6,7}. This phenomenon also contributes to international migration from areas subject to unfavorable conditions⁸. In Africa especially, increasing agricultural production has, to date, mainly been achieved by expanding the area under cultivation. The conversion of forests and grasslands to agricultural land and the degradation of existing agricultural areas are important sources of carbon dioxide (CO₂) emissions⁹ and represent the largest causes of biodiversity loss¹⁰. Scaling up SLM and intensification practices and technologies is therefore of utmost importance for food security, for ensuring sustainable productivity, to increase climate resilience of farmers, to protect the climate and biodiversity and to reverse detrimental migration patterns (rural exodus)¹¹.

¹In 2012, at the Rio+20 Conference, governments committed to strive for a land degradation neutral world. In 2013, the United Nations General Assembly Declared 2015 to be the International Year of Soils. Following the adoption of Agenda 2030, 110 countries have now committed to Land Degradation Neutrality Target-Setting under the UNCCD programme.

²Lal, R. (2004). Soil Carbon Sequestration Impacts on Global Climate Change and Food Security. *Science*, 304(5677), 1623–1627. <https://doi.org/10.1126/science.1097396>

³White, J.G. and Zasoski, R.J. (1999). Mapping soil micronutrients. *Field Crops Research*, 60 (1), pp. 11–26. ISSN 0378-4290. Retrieved from [http://dx.doi.org/10.1016/S0378-4290\(98\)00130-0](http://dx.doi.org/10.1016/S0378-4290(98)00130-0).

⁴Vlek PLG; Khamzina A; Tamene L. (eds.). 2017. Land degradation and the Sustainable Development Goals: Threats and potential remedies. CIAT Publication No. 440. International Center for Tropical Agriculture (CIAT), Nairobi, Kenya. 67 pages. Available at: <http://hdl.handle.net/10568/81313>

⁵Godfray, H.C.J., Beddington, J.R., Crute, I.R., Haddad, L., Lawrence, D., Muir, J.F., Pretty, J., Robinson, S., Thomas, S.M., Toulmin, C. (2010). Food Security: The Challenge of Feeding 9 Billion People. *Science*. 327 (5967), 812–818. [DOI: 10.1126/science.1185383]

⁶Reddy, V.R., Srigiri, S.R., Chiranjeevi, T., Kumar Rout, S.. Long-term Effects of German Development Cooperation in Soil Improvement and Sustainable Land & Water Management in India. Country Report. IASS. Forthcoming.

⁷Jenisch, T. and Ouédraogo, A. (2017). Les effets à long terme de la coopération allemande au développement dans le domaine de l'amélioration des sols et de la gestion durable des terres au Burkina Faso. Country Report. IASS. Forthcoming.

⁸United Nations Convention to Combat Desertification (UNCCD). (2014). Land Degradation Neutrality: Resilience at Local, National and Regional Levels. 24 pages. ISBN 978-92-950-43-77-0

⁹Intergovernmental Panel on Climate Change. (2000). Land Use, Land-Use Change, and Forestry: A Special Report of the Intergovernmental Panel On Climate Change. Summary for Policymakers. 30 pages. ISBN: 92-9169-114-3.

¹⁰Millennium Ecosystem Assessment (2005). Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC.

¹¹ELD Initiative & UNEP (2015). The Economics of Land Degradation in Africa: Benefits of Action Outweigh the Costs. Available from www.eld-initiative.org.

This study examines the potential long-term impacts of soil and land rehabilitation and conservation measures. It specifically focuses on the lessons learned and challenges experienced in past soil rehabilitation efforts. It demonstrates that an ecological, cultural and economic regeneration process can take place at the village level when context-appropriate and well-coordinated rehabilitation measures are undertaken with a long-term perspective that ensures perennity of achievements. Conceived in such a way, investments in sustainable soil rehabilitation initiatives become catalysts to achieving a whole sub-set of the Sustainable Development Goals (SDGs) that are now guiding development efforts at a global scale.

Development cooperation through multilateral and bilateral partnerships has long been committed to investing in soil rehabilitation and has been striving to achieve the necessary upscaling of SLM in order to improve soils – and thereby livelihoods, climate adaptation, mitigation and biodiversity protection – in rural areas of selected partner countries. Understanding the benefits and impacts generated by SLM programmes can form the basis for a comprehensive, knowledge-based development strategy that achieves multi-dimensional development goals through investing in soil rehabilitation and restoration initiatives on a long term basis.



Example of a community water tank installed during the Indo-German Changar Eco-Development Project (India). Such water storage structures proved successful in improving community well-being in regions affected by water scarcity. © S. Srigiri

Objective and Methodology

This study aims to analyze the medium- and long-term impacts of investments in SWC and SLM. Investing in soil conservation and rehabilitation does not always produce immediate economic and ecological results and requires ongoing maintenance measures in order for benefits to be reaped in full. Thorough analysis of long-term trends and effects of rehabilitation efforts provides an effective tool for better understanding and evaluating the real benefits of soil improvement interventions. For this purpose, the study looks at impacts in a multi-dimensional sense, meaning not only at impacts on soil health in the environmental sense but also at impacts in the socio-economic realm as well as in the area of structural change and institution-building. Moreover, the study discusses factors that may have enabled program success in this multidimensional sense.

To achieve these goals, this study reviewed past experiences with soil rehabilitation programmes in four countries: Ethiopia, Niger, Burkina Faso and India. The four countries have a history of long-standing soil and water conservation programmes run in collaboration between the government and other international partners. They have also benefited from several programmes in both technical and financial cooperation funded by Germany. The study draws on primary findings of four country-specific studies from Ethiopia, Niger, Burkina Faso and India within which the sustained long-term results of past SLM interventions were assessed based on the available literature, field visits and interviews with a variety of stakeholders involved in past and current projects.

In the context of the present report, country-specific case studies were conducted in Burkina Faso and India, in order to gain additional insights on the long-term impacts of SLM programmes. Each country also features a wide range of agro-ecosystems and has benefited from varied SLM intervention measures. Technical cooperation programmes supporting national governments in the field of natural resource rehabilitation and conservation have existed for over 20 years in all of these regions. The development of natural resource management-based (NRM) approaches which have focused on landscape rehabilitation through the introduction of SWC measures and alternative crop practices is a key feature of programme activities in these areas. Many of the field sites have benefited from various development programmes focusing on SLM over the years, some of which haven't been sufficiently coordinated among the different government and development organizations (see for example the cases of India and Burkina Faso) and so attribution of positive impacts to specific programmes or specific approaches should be handled with care. The absence of strong national policies for rural development sometimes contributed to such lack of coordination.

After drawing comparative conclusions from these four case studies, remaining knowledge gaps are identified in order to facilitate further comprehensive assessment of long-term impacts of current and future undertakings in the field of SLM. Taken together, the consistent findings of the four studies provide the basis for guided and well-informed decisions regarding future investments in SLM interventions.

Description of Programmes under study

I. Ethiopia¹²

Duration	GIZ-SUN: 2005 - 2009	GIZ-SLM: 2009 - present
Project Regions	Tigray, Amhara and Oromia	
Estimated rehabilitated area (ha)	~ 350,000	
Number of Beneficiaries (households)	~ 194,000	
Approach	Micro-watershed focusing on farmland/commons	
Implemented by	GIZ, Government of Ethiopia	

Both, German technical and financial cooperation programmes provide a broad range of SLM experiences improving rural livelihoods and ensuring that smallholder farmers reap the benefits of soil rehabilitation and conservation in strongly degraded and agriculture-based economic contexts in the four countries.

In 2008, the Ethiopian Government launched the multi-donor Sustainable Land Management Programme (SLMP) supported in part by the German Government through GIZ-SLM. The SLMP aims to transform degraded micro-watersheds into “productive and sustainable landscapes” by focusing on exploitation which can fulfil the social, economic and environmental needs of present and future generations. Micro-watersheds were selected according to specific criteria: severity of land degradation, topographic, agro-climatic and land-use features and the potential for ecological improvement and agricultural development and the region’s accessibility for supervision and monitoring. The SLMP approach is implemented in three phases:

1. An initiation phase consisting in planning and producing detailed background information on the watershed, consultation with all stakeholders, the identification/establishment of institutional mechanisms/systems, such as Community Watershed Teams (CWTs) and a distribution of roles for each stakeholder for implementation

2. An implementation phase consisting in an initial evaluation of the preceding phase, demonstration and application of technologies to rehabilitate degraded lands and increase productivity

3. An economic development phase consisting in stimulating value chains, value-generation packages and providing training on economic development interventions to upscale successful experiences. Under the SLMP, a wide range of measures are being implemented:

- a) Hillside development using physical and biological methods to rehabilitate degraded slopes
- b) Pasture development to improve the quality of communal grazing lands
- c) Farmland development using technologies with the potential for adaptation to climate change and mitigating greenhouse gases (GHGs)
- d) Homestead development by focusing on supplementary (income-generating) production around the house

The Sustainable Utilization of National Resources for Improved Food Security (SUN) programme benefited from the strong presence of decentralized governmental structures as well as a dense net of extension agents.

¹² This section summarizes the findings from GIZ (2015). GIZ Ethiopia: Lessons and Experiences in Sustainable Land Management. Country Report Ethiopia. GIZ.

II. Niger¹³

Duration	PDRT, PASP, PMAE/ LUCOP: 1991–2011	PromAP: 2011–present
Project Regions	Tahoua, Tillabéri, Ouallam, Tera, Filingué	
Estimated rehabilitated area (ha)	520,037	
Number of Beneficiaries (households)	690,000 people from more than 1,000 villages	
Approach	Village territories, micro-watersheds	
Implemented by	GIZ, KfW, DED, Government of Niger	

Since the 1980s, the Governments of Germany and Niger have collaborated on several programmes to combat desertification and land degradation in the semi-arid regions of Tillabéri, Ouallam, Filingué, Téra and Tahoua. These regions are subject to degradation of natural resources through irregular but high intensity rainfall, erosion, overgrazing and increasing population pressure. Project activities over the years followed a phased approach of 5 to 7 years in each village. In the initial phase, raising awareness and interest, supporting or creating village bodies and groups, demonstrating and planning out interventions were main activities. The second phase of project activities focused on actively rehabilitating selected areas within village territories and providing on-the-job trainings. During the final phase, responsibility was shifted to the villages to continue land rehabilitation activities with only punctual outside support. The program then became involved with the

villages only on a consultative basis when requested. Simple, low-cost methods were given priority to produce rapid and visible impacts. Local village bodies played a crucial role in mobilizing people to voluntarily invest time and effort into rehabilitation measures. An extension and advisory service featuring trainings provided by local extension agents along with self-evaluation allowed for the measures to be continuously improved. After start of decentralization, the new rural communities were progressively involved in the participatory planning processes. Over the program's lifetime, it underwent significant changes and was adjusted continually in order to improve approaches and efficiency, leading to overall positive results in the region.

¹³ This section summarizes the findings of Mamadou, A. et al. (2015). 25 Years of Soil Rehabilitation and Conservation in the Sahel Region. Country Report Niger. GIZ/KfW.

III. Burkina Faso¹⁴

Duration of GIZ/ KfW intervention	PATECORE/ PLT 1988–2006	EKF: 2013–present	ProSOL: 2015–2021
Project Regions	Central Plateau	South-West Region	Haut Bassins
Est. rehabilitated area (ha)	72,476*/97,940**	5,314+	6,139++
Beneficiaries (households)	N/A	N/A	
Approach style(s)	Individual fields	Landscape (sub-watershed)	Landscape (watershed)
Implemented by	GIZ, KfW, Government of Burkina Faso (GoBF)	GIZ, GoBF	GIZ, GoBF

* good cond.; ** tot. rehab. area (Particip GmbH 2005); + Jenisch, T. et al. (2017);
++ as of 06/2017 (Dr. Nill, GIZ)

German development cooperation in Burkina Faso has been active in erosion control and SLM for more than 30 years, most prominently through the PATECORE project (Territorial Management and Resource Conservation in the Central Plateau). As a consequence of the numerous lessons learned through earlier initiatives, such as the GERES program, the PATECORE project accompanied individual farmers directly with rehabilitating their fields (as opposed to the watershed approaches of earlier programmes). From the earliest phases of the project (1988–1997), its function was to provide support and reinforce ministerial technical service providers¹⁵ and local NGOs. The structure which enabled cooperation was organized in the following way and operated on three levels¹⁶:

1. Beneficiaries receiving services and support from partners and program
2. Partners (state technical services, NGOs, local associations) of the program
3. Technical cooperation (TC) which ensured ownership and implementation of the project.

Twenty years later, the EKF project focused on improving climate change adaptation capacities of affected populations in the South-West region of Burkina Faso. It intervenes in the region indicated on two levels: i) through physical and biological adaptation measures in the province of Ioba and ii) through capacity reinforcement initiatives in the 28 communes of the region. The EKF project follows a watershed approach, which allows to a certain degree to circumvent customary land tenure-related issues encountered in other projects¹⁷. A diagnostic study and topographic surveys help to determine most effective technologies. Technologies commonly applied include: stone bunds, composting, planting on anti-erosive structures, agroforestry, etc. Since 2015, ProSOL has been active in the region under BMZ's special initiative "One World - No Hunger" and operates mostly in the Hauts-Bassins region of the country. Its objective is to support partner countries with scaling up effective and proven SLM approaches for soil protection and rehabilitation and to improve the political framework while creating incentives for sustainable land use. Target groups are small-scale farmers affected by food insecurity and land degradation.

¹⁴ This section summarizes the findings of Jenisch, T. et al. (2017)

¹⁵ At the time government agricultural services still entertained a network of villages extension agents with the help of the World Bank training and visit programme.

¹⁶ Jenisch, T. et al. (2017) page 20

¹⁷ Koudougou, S. and Stiem, L. (ed.) (2017). La Gestion Durable des Terres au Burkina Faso: une analyse d'expériences de projets de dans le Houet, le Tuy et le Ioba. IASS Working Paper.

IV. India¹⁸

Duration of GIZ/ KfW intervention	IGWDP 1992 - 2005	IGCEDP: 1994 - 2006	UPNRM: 2006 - 2015
Project Regions	Maharashtra (Ahmadnagar District)	Changar Region, Himachal Pradesh	20 States and Union territories
Est. rehabilitated area (ha)	220,000	43,900	(unknown)
Beneficiaries	310,000 in 184 watersheds	130,000 in 593 villages	330,000+ in 280 projects
Approach style(s)	Landscape Watershed Development	Micro watershed, NRM and Village Development	Programme-based business model/NRM
Implemented by	NGOs, MoA, Govern- ment of Maharashtra	GIZ, Government of India (GoI)	NABARD, KfW, NGOs, PO, Coops

The Indo-German Watershed Development Program (IGWDP) was initiated in 1992 and is active in one of the regions of Maharashtra most affected by degradation (Ahmadnagar District). The district has poor soils, low crop productivity and yields and lacks drinking water. The program follows a watershed approach and operates in a “ridge to valley” manner in order to halt land degradation and improve the health of soils, natural resources and water. Its approach builds on consultation with individual farmers in the watershed to determine appropriate technical measures, creation of village watershed committees, creation of a maintenance fund and capacity building among others. Various NGOs were responsible for the implementation of the programme. The Ministry of Agriculture (MoA) and Government of Maharashtra were associated with the programme during its entire lifetime.

The Indo-German Changar Eco-Development Project (IGCEDP) was active in the Changar region of Himachal Pradesh and aimed to improve and diversify livelihoods. The Changar region suffers from severe land degradation, water scarcity and high rates of rural exodus. IGCEDP worked on mini-watersheds and proceeded in a participatory manner. Village development committees (VDCs) were formed to encourage participation amongst beneficiaries. The first phase of the project (1994–1999) promoted participatory planning and provided inputs to beneficiary communities (e.g. purely a “supplier” role). The second phase (from 1999 to 2004) recognized the importance and potential benefits of self-determination via autonomous planning/development of project activities. The program acknowledged that VDCs need to become self-reliant and villagers should contribute (time, money and resources) to the activities in order to foster true ownership and sustainable results¹⁹. Livestock development was an integral part of the

farming system and sustainable animal husbandry was encouraged as a way to curb further degradation. Self-help groups were promoted to produce income through wild local produce. Himachal Pradesh forest department was the main Government partner of the IGCEDP whereas a separate institution HPEDS (Himachal Pradesh Eco-Development Society) was responsible for programme execution and facilitation.

The Umbrella Programme for Natural Resource Management (UPNRM) aims to contribute to participatory, sustainable NRM-based livelihood policies and provision of financial instruments. The program primarily funds community-managed NRM-based livelihood projects in rural areas. UPNRM also supports partner agencies in project implementation for sustainable NRM. The UPNRM envisions a gradual shift from grant- to loan-based funding of NRM programmes to support pro-poor, multi-disciplinary and needs-based programmes. Business models have been introduced in rural regions with the effect of increasing incomes, strengthening value chains and conserving natural resources. The UPNRM also aims to i) encourage sustainable income generating activities (through returns on investments through loans) and ii) identify new synergies between private and public sector (PPP approach). Under the UPNRM, several activities and SLM technologies are promoted including SWC, tree plantation and horticulture, forestry, animal husbandry, climate change adaptation, etc. The main partners of the UPNRM are NABARD (National Bank for Agriculture and Rural Development) and the German Development Bank (KfW). NABARD facilitates implementation whereas KfW provides up to 95% of the loans. GIZ provides technical support and NGOs, cooperatives, producer organizations, banks, etc. are involved with implementation.

¹⁸ This section summarizes the findings from Reddy, V. R. et al. (2017)

¹⁹ Reddy, V. R. et al. pages 18–19

Socioeconomic Impacts

At the household level, an improved and restored farming system may require a complete reorganization of household activities and can significantly improve overall wellbeing and health. However, monitoring the socioeconomic impacts of SLM interventions of past decades has not received the attention it would merit. This is in part due to the relatively high monitoring costs compared to the total investment amount. Monitoring of project impacts usually focuses on estimating yield increases and groundwater recharge. More holistic/comprehensive monitoring systems (which include observing changes in SOC, nutrition/food security, institution-building, etc.) still need to be put to use more consistently and should be considered important indicators for programme activities. Most of the socio-economic impacts of SLM measures, aside from yield increases as measured during post-project evaluation phases, are difficult to quantify. Many improvements brought on by SLM measures, such as (income and nutritional) benefits at the farm level, increased carbon sequestration, groundwater recharging, biodiversity conservation and other ecological services cannot accurately be represented in quantitative terms – nor can they accurately be approximated in monetary terms – due to a variety of factors. Therefore, it remains difficult to illustrate the true socio-economic impacts of SLM investments. In light of the lack of - or limited access to - comprehensive and systematically collected data, this section provides qualitative evidence collected

through document research (project publications and data), field expeditions and interviews in the scope of both country-specific case studies (India and Burkina Faso) in addition to available quantitative assessments of long-term socio-economic impacts of SLM as found in previous studies for Niger and Ethiopia.

a. Increased Yields, Income and Household Productivity

In many of the programmes analyzed, a significant increase in yields was reported in the years following implementation of SLM measures and sometimes, in cases where post-implementation (quantitative/evaluative) assessments were conducted, increased yields could still be documented up to 15 years after completion of measures (e.g. in the Tillabéri region of Niger²⁰). Apart from SLM measures, total annual rainfall is of course an important factor influencing yields. With this in mind, by observing differences in yields during low-rainfall years (such as 2000 in Niger and Burkina Faso), the effect of fields treated with SWC techniques (stone and earth bunds) compared to untreated fields becomes most apparent. Generally, among the programmes studied in the context of this report, yields were shown to have increased from between 13% (for millet during PATECORE) up to 171% (millet and fodder estimated from IGWDP) in the years following programme implementation.

Country	Sample Period	Grains	Yield (Untreated)	Yield (SWC)	% Change
Niger ²¹	1996–2010	Millet	182 kg/ha	392 kg/ha	120
Burkina F. ²²	1999, 2000, 2005	Sorghum/Millet	576/551 kg/ha	774/620 kg/ha	34/13
India ²³	-	Millet/Fodder	-	-	21/171

Mean grain yields measured from sampled fields (for Niger/Burkina Faso: SWC = stone bunds)

²⁰ Mamadou, A. et al. (2015) page 22

²¹ Mamadou, A. et al. (2015) page 22

²² Particip GmbH. (2005) pages 15–16

²³ Reddy, V. R. et al. (2017) page 26

Increased yields are often associated to increases in household income, and they are important for ensuring food security. In Niger, a household income analysis²⁴ showed that income grew from 191 EUR to 298 EUR (increase of 56 %) during the implementation of water spreading weirs, and some households reported having enough food for up to 20 months (as compared to 12 months of food pre-project). In India²⁵, net farm income was reported to have increased nearly 123 % for the IGWDP. According to an opinion survey conducted by Ouedraogo et al. (2001) in 5 villages in Burkina Faso, farmers self-reported an increase in food security, with one village considering its food production to be “auto-sufficient” during years with adequate rainfall and “sufficient” in unfavorable years²⁶. However, higher yields in the years following the implementation of SWC measures did not necessarily increase food security amongst households, since in many cases, the regions were concomitantly faced with high regional demographic growth rates (e.g. in Niger and Burkina Faso). Therefore, in many cases, higher regional yields may have simply enabled the food needs of a larger population to be satisfied.

b. Diversification of Income Generating Activities

Surplus in produce (staples, cash crops) generated by SLM measures are destined to either be consumed or sold²⁷. In several cases, after project activities have been implemented and land has either been improved or rehabilitated through SLM techniques, farmers tend to cultivate high value crops due to improved

water availability (e.g. chickpeas and vegetables in Ethiopia) and can organize themselves to market such produce thereby increasing their income-levels. In Ethiopia and Burkina Faso, alternative crop production around the home was considered an important way for households to generate additional income.

A successful example from GIZ-Ethiopia has been the production of apples and enset (false bananas), whereby a farmer with 10 apple trees could generate an extra 6,000 ETB (ca. 230 EUR) per year. Enset production was introduced in drought-affected regions of Ethiopia by the SUN/SLMP and was taken up by many farmers thanks to a farmer-to-farmer approach, whereby influential farmers convinced others to produce the calorie-rich and nutritious crop, known in other regions of Ethiopia as the “anti-hunger tree”²⁸. The construction of water spreading weirs in Niger led to both an increase in cultivable surface areas but also to increased yields due to improved water availability. Increased production in this area during the rainy season is supplemented by increased yields of off-season crops (up to 30% increase) and farmers individually made use of 0.49 ha each to grow market garden crops during the dry season, compared to 0.15 ha per farmer before weir construction²⁹. In Burkina Faso, supplementary income (in conjunction with improved access to water) was often reported to have been invested in (small) ruminants, thereby increasing manure availability and serving as “security reserves” in case of adverse conditions³⁰. Although an increase in the number of animals on offer at the Yilou market (considered to give an indication on the

Rooftop Water Collection Systems for Irrigation (from Reddy, V. R. et al. 2017)

Prior to IGCEDP, soils were heavily degraded and rural exodus was prevalent in Bah village, located within the Chambri micro-watershed Himachal Pradesh, India. Additionally, the village suffered extreme water shortages. Through the IGCEDP, repairing or constructing springheads was undertaken and installing community water tanks was given priority. Additionally, farmers were encouraged to install rooftop water collection systems and store water in small tanks for irrigation. Because of increased vegetable production in the off-season, facilitated by the irrigation tanks, farmers were able to profit from their investments after just one year. Due to the plantations in the areas around the village spring water availability during the dry season was found to have increased. The availability of timber for use as fuel, fodder, wild fruits and other forest products has “increased substantially” and production of livestock and milk has improved by 25–50 % due to increased production of green fodder in community lands. Household income and wellbeing have generally improved.

²⁴ Mamadou, A. et al. (2015) page 24

²⁵ Reddy, V. R. et al. (2017) page 26

²⁶ Ouedraogo (2001) as cited in Particip GmbH. (2015) page 20

²⁷ Mamadou, A. et al. (2015) page 24

²⁸ GIZ (2015) page 109

²⁹ Mamadou, A. et al. (2015) page 24

³⁰ Particip GmbH. (2005) page 20

number of animals available in the PATECORE intervention region) was observed in the years leading up to 2005, the number of goats and sheep on offer at Yilou followed a decreasing trend during the period from 2005-2014³¹. Available livestock data, however, show an important increase in the number of small animals on offer daily at Yilou market (Bam) from 2005 to 2014 (for hens from 374 to 1133 per day; for guinea fowl from 218 to 473 per day)³². These observations may provide evidence that alternative income-generating activities (such as raising livestock) still remain an important part of the farming system even without the direct intervention of PATECORE programme activities.

c. Reinvestment of Earnings into Innovation, Education and Health

Once a household has reached an adequate level of production, which enables all members to be in a state of food security, surplus income (and produce) can theoretically be reinvested into other activities. Surplus income generated through increased yields in Ethiopia, Burkina Faso and India was often reinvested into health, education or was used to support alternative income generating activities (such as growing cash crops)³³. Because of an overall mastery of the production techniques for several market garden produce, increased crop diversification and the establishment of more direct market chains (farmer to trader), household income in Niger grew over the years³⁴. In India, economic benefits resulting from the successful IGWDP are still being reaped today, leading to the introduction of new crops, innovative cultivation methods (such as organic farming) and alternative income-generating livelihoods³⁵. With support for alternative technologies from the agricultural department, innovations such as vermicomposting are being taken up by households in villages who had benefited from IGWDP.

d. Reduced Pressures on Land and Rural Exodus

In Burkina Faso, it has been reported and confirmed via focus group discussions that the many benefits stemming from an increase in productivity due to SLM initiatives are considered an important factor contributing to reducing migration flows to towns or abroad (rural exodus). As shown in Burkina Faso, since 1968, land use has changed significantly in four villages of Bam, whereby an area of approximately 2,622 ha of degraded lands (such as eroded/barren lands) was measured in 2002 but had not been present in 1968³⁶. Land degradation is therefore an increasingly pressing issue in this region. Despite this observation, because of the benefits to farm productivity brought about by SWC measures, pressure on land resources could possibly be kept in check. Moreover, increasing yields on cultivated lands through the implementation of such measures further contributes to reducing pressure on land. Due to the limited capacity to increase arable land surfaces, rehabilitating degraded soils through the implementation of SWC and SLM initiatives remains an important way to address both the growing pressure on land resources and the growing regional food needs³⁷.

³¹ Ministère des ressources animales (2014). *Annuaire des statistiques de l'élevage*, MRA, page 136.

³² Ministère des ressources animales (2014), page 139.

³³ Particip GmbH. (2005) page 22

³⁴ Mamadou, A. et al. (2015) page 25

³⁵ Reddy, V. R. et al. (2017) page 24

³⁶ Sanou et al. (2003) as cited in Particip GmbH. (2005) page 25

³⁷ Particip GmbH. (2005) page 25

Effects on Regional Natural Resource Base

As a result of the various SLM programmes, a number of positive ecological impacts can still be observed today in all four countries. A rise in groundwater tables is among the most important impacts of successfully implemented measures and has been reported in nearly all programmes where SWC structures were constructed. The effects of SWC and SLM on the regional natural resource base have far reaching benefits, not only ecologically, but also socially. Furthermore, restored lands have the potential to mitigate further climate change, since soil organic carbon remains sequestered and its removal via erosive events can be prevented with appropriate conservation techniques^{38,39}.

a. Improved Soil Health

Rehabilitation of soil does not cease once a SWC structure is emplaced on degraded lands, but rather, an ecological, cultural and economic regeneration process begins from this point in time⁴⁰. After the structures are emplaced, a progressive regeneration of grasses, shrubs and trees occurs, transforming the once degraded farmland into a more productive agro-sylvo-pastoral system, providing food crops, fodder, wood (for fuel) and other secondary forest products⁴¹. In order to determine the density of trees growing after the construction of SWC structures, a 2005 survey in Burkina Faso performed a tree count along 13 km of stone bunds (emplaced between 1993 and 1997). This survey found that the number of trees, extrapolated over the entire restored area had increased from 30 to 49 trees/ha since 1999⁴². By regenerating the

vegetation on plateaus, downhill fields can be protected against further runoff erosion, as was reported in the Niger study. Furthermore, improved soil health generally leads to the reintroduction of several species of flora and fauna, increasing biodiversity in the affected region. In fact, in Niger, the collection of secondary products from trees and bushes became possible after the successful implementation of SWC structures (Nardi-Vallerani trenches, stone bunds and water spreading weirs). This was also observed in India, where communities having benefited from past interventions were found to be more resilient due to a strengthened natural resource base⁴³. Continued economic and ecological benefits have allowed farmers to diversify their production in some cases. In fact, the ecological benefits of watershed intervention have been reported to increase with time (e.g. in India's Dharewadi watershed). Interviews with farmers as well as yield surveys (such as in Burkina Faso's PATECORE) in the field have shown that improved soil conditions have enabled higher yields (of staple crops such as sorghum and cash crops such as onions). Soil fertility conditions were reported during an interview with a farmer (from Dharewadi watershed in India)⁴⁴ to have increased after the IGWDP partly due to the SWC measures implemented but also due to the increased use of poultry and livestock manure. These observations highlight the fact that improved soil conditions and increased natural resources can lead to a cascading effect of benefits including increased diversification of crops, better grazing and fodder availability and reduced overall runoff erosion from hillslopes.

³⁸ Cooper PJM, Cappiello S, Vermeulen SJ, Campbell BM, Zougmore R and Kinyangi J. (2013). Large scale implementation of adaptation and mitigation actions in agriculture. CCAFS Working Paper no. 50. CGIAR Research Program on Climate Change, Agriculture and Food Security (CAAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

³⁹ Lal, R. (2003). Soil erosion and the global carbon budget. *Environment International*, 29(4), pp. 437–450. [https://doi.org/10.1016/s0160-4120\(02\)00192-7](https://doi.org/10.1016/s0160-4120(02)00192-7)

⁴⁰ Particip GmbH. (2005) page 18

⁴¹ Particip GmbH. (2005) page 18

⁴² Particip GmbH. (2005) page 18

⁴³ Reddy, V. R. et al. (2017) page 24

⁴⁴ Reddy, V. R. et al. (2017) page 24

b. Increased Water Availability

Due to improved infiltration of rainwater caused by SLM measures that slow downslope runoff, the increased availability of water in intervention zones has often been reported as an important impact of such initiatives. In many cases, SWC measures such as stone bunds and weirs have enabled water tables to rise (e.g. average 9 m in Niger)⁴⁵ and have replenished once depleted wells in several villages (such as in the Plateau Central of Burkina Faso)⁴⁶. This important effect of SWC measures produces far-reaching benefits for the communities and environment in the vicinity of rehabilitated areas; in fact, women (who in Burkina Faso often carry out household responsibilities such as procuring water) benefit from easier access to sources of water and increased water tables were also reported to facilitate livestock watering and improved growth of ligneous vegetation.⁴⁷

c. Compound Effects (Climate Change Mitigation and Adaptation)

Though sufficient quantitative data on the compound effects of SLM interventions is lacking, it can be assumed that improved land management practices result in both higher yields due to increased water availability, but also due to their effect on increasing SOC/ micronutrient levels (e.g. by halting degradation processes which prevent their regeneration). Up to 50 % of fixed C during photosynthesis can be used by plants underground to promote the further development of roots, rhizosphere respiration or can be transferred

into the soil (SOC)⁴⁸. Improved and healthier soils combined with SWC measures also tend to allow a higher density of perennial species to grow (trees, shrubs, grasses) which can further contribute to increasing the stability of the top soil and preventing its loss to erosive events. Furthermore, at the farm level, improvements in the natural resource base brought on by SLM measures can result in more resilience to hardships brought on by changing climates (e.g. in the Sahel region, where rainfall-dependent agricultural systems are threatened by climate variability and extremes⁴⁹). As mentioned in previous sections (page 14), SLM measures are associated to increased yields (even many years after their construction) and their benefits are most apparent during times of below-average rainfall (e.g. 2000 in the Sahel) when millet (in Niger) and sorghum (in Burkina Faso) yields of treated fields exceeded those of untreated fields^{50,51}. These observations serve as important examples of the increased potential for farmers to become more resilient to climatic variability. SLM measures (in this regional context) can provide a certain degree of resilience and can be considered adaptation mechanisms. Moreover, SLM measures (such as water-spreading weirs) were associated to an increase in the cultivable area and in the area used to produce market garden crops⁵². Diversification of crops grown (staples and market produce) permitted households to increase their incomes and could, at the same time, serve as an important adaptation strategy, in that yield losses (due to climatic factors) may potentially be mitigated when a combination of several crops is grown.

Farmer Perspectives on Increased Water Availability (from Particip GmbH. 2005)

An opinion survey conducted in 2005 amongst 102 farmers in 24 villages spread across 3 provinces of Burkina Faso showed that 99 % of interviewees reported some degree of increased water availability in their village since the introduction of SWC measures such as bunds and weirs. In fact, when asked to characterize the degree of increased water availability from "small" to "large" increases, 46 % of interviewees reported a large increase and 45 % reported a considerable increase. Only 9 % self-reported a small increase in water availability.

⁴⁵ Bétifor (2010) as cited in Mamadou, A. et al. (2015) page 24

⁴⁶ Ouedraogo et al. (2001). as cited in Particip GmbH. (2005) page 19

⁴⁷ Particip GmbH. (2005) page 20

⁴⁸ Rees, R.M., Bingham, I.J., Baddeley, J.A., Watson, C.A. (2005), The role of plants and land management in sequestering soil carbon in temperate arable and grassland ecosystems. *Geoderma*, 128, Issues 1-2, Pages 130-154, ISSN 0016-7061, <https://doi.org/10.1016/j.geoderma.2004.12.020>. (<http://www.sciencedirect.com/science/article/pii/S0016706104003313>)

⁴⁹ Sultan, B., & Gaetani, M. (2016). Agriculture in West Africa in the Twenty-First Century: Climate Change and Impacts Scenarios, and Potential for Adaptation. *Frontiers in Plant Science*, 7, 1262. <http://doi.org/10.3389/fpls.2016.01262>

⁵⁰ Mamadou, A. et al. (2015) page 22

⁵¹ Particip GmbH. (2005) page 15

⁵² Mamadou, A. et al. (2015) page 24

Institutional Frameworks & Social Organization

One of the main objectives of development cooperation is to strengthen capacities at institutional, organizational and individual levels. Capacity development is partly achieved through the strengthening and/or establishment of organized interest groups (such as village watershed or development committees in India or Niger, farmers groups in Burkina Faso) as well as through technical trainings provided to intermediaries and beneficiaries. Sustaining long-term impacts of successful interventions depends on a combination of institutional and social organization and technical skills supported by an enabling and supportive institutional framework that prioritizes concerted, multi-donor investments in SLM. A study conducted in 2000 in 18 villages in Burkina Faso reported that implemented SWC measures were considered by respondents to be a key factor in village development and led to various improvements in terms of productivity, health and nutrition⁵³.

a. Partnerships and Collaboration

Many of the programmes analyzed in the four countries recognized the fundamental importance of community engagement and participatory (bottom-up) approaches. Partnership and collaboration among all stakeholders during decision-making and planning activities is thought to bring about long-term improvements to land and water resources⁵⁴ and livelihoods. Moreover, building upon local knowledge, collaborating directly with village-level institutions and building upon locally-embedded capacities (such as e.g. local extension agents providing extension/advisory services in Niger) enables context-specific adaptation of programme activities and contributes to the development of trustful relationships among farmers and community members⁵⁵, and can lead to generally high levels of participation during interventions.

Additionally, it was observed, on an individual level, that many people trained during the implementation

phase of different programmes remained active in soil rehabilitation and SLM-related activities years later⁵⁶. In India, in several cases, youth trained under the programme later moved to other regions as resource-persons due to the technical skills they acquired. The trainings provided by programmes therefore allowed participants to continue and strengthen their engagement in the field of SLM on an individual basis, resulting in overall strengthened capacities and improved technical skills at village/community levels. In the Tillaberi region of Niger, a 2008 survey amongst farmers concluded that up to 70% are convinced they have mastered most soil rehabilitation techniques⁵⁷. In fact, beneficiaries of past interventions who gained various skills constitute an important resource and knowledge pool related to SLM and should be considered an important long-term impact of such interventions, since this knowledge and know-how can be used on an individual basis even without formal project activities (e.g. via self-help initiatives/innovation).

b. Reinforcement of Local Governance Systems

Soil and water conservation programmes often base their entire intervention approaches on collaboration and partnerships with local level committees, which take on important roles such as planning, implementation and evaluation. Many of the local structures reinforced or newly established during the implementation phase were found to still be in operation many years after the end of programme activities⁵⁸. The creation of village-level (or regional) committees, farmer groups, women's groups responsible for planning, implementation and maintenance of programme activities has, in many cases, resulted in active and long-lasting participation⁵⁹ and has the potential to improve individual capacity for self-help. In the specific case of the IGWDP (India), even after more than 20 years, VWCs were found to be still functioning and have been actively

⁵³ Study by Neubert et al. (2000) as cited in Particip GmbH. (2005) page 23

⁵⁴ GIZ Ethiopia (2015) page 2

⁵⁵ Mamadou, A. et al. (2015) page 4

⁵⁶ In India: Reddy, V. R. et al. (2017) and Burkina Faso: Jenisch, T. et al. (2017) Burkina Faso

⁵⁷ Adamou and Karami. (2008) as cited in Mamadou, A. et al. (2015) page 26

⁵⁸ Reddy, V. R. et al. (2017) page 7

⁵⁹ Reddy, V. R. et al. (2017) page 22

responsible for both the management of the watershed development fund (through community contributions) and for the maintenance of SWC structures⁶⁰.

Moreover, due to the technical and arduous nature of most SWC measures implemented in such regions as the Sahel, a strong degree of organization was found to be necessary and often resulted in the creation (or reinforcement) of a strong and sustainable organizational base (via local governance systems) which have the potential to play important roles during subsequent interventions⁶¹. In fact, the Government of Burkina Faso in its third UNCCD National Report recognized that implementation of SLM measures often results in the creation of a strong social capital, which is translated by relatively widespread acquisition of technical knowledge and improved capacities at local levels⁶². Therefore, when participatory approaches are used from the beginning of an intervention, technical cooperation for SWC initiatives can lead to the creation or reinforcement of strong local governance structures and has the potential to kick start village development and provide the necessary know-how for individual self-help initiatives after project completion. Additionally, long after project completion, the know-how gained by project beneficiaries might allow for direct and continuous implementation of readily-available, context-specific soil rehabilitation techniques such as zaï planting pits, reforestation, assisted natural regeneration, mulching and manure. As result of the IGWDP, programme villages have not only been maintaining the SWC structures emplaced, but have also been in better positions to access other interventions through other programmes or departments⁶³.

c. Creation of Solid Sustainability Mechanisms

By adopting a rolling approach, which entails limiting project duration in a specific region to a period of several years before moving to the next, villages were found to be more motivated to want to implement a maximum

amount of rehabilitation measures⁶⁴. Moreover, the establishment of watershed/village development funds (e.g. IGWDP) financed through community contributions were destined to serve for maintaining SWC structures in the common lands and were reported to still be active with substantial balances today⁶⁵. The creation of watershed/village development funds has enabled not only an important accumulation of wealth (e.g. some villages have reached Rs. 2 M in funds), but these funds have also served to adopt “adopting business service models at the village level including input and output marketing, milk cooperatives, etc.”⁶⁶ Programmes which had, from the onset, clearly defined sustainability mechanisms and long-term strategies in place were thus the ones which, in the context of the present study, can be considered to have the most lasting and visible positive impacts (such as well-maintained structures, higher yields even many years later, etc.).

d. Empowerment of Disadvantaged Social Groups

SLM programmes have the potential to reach groups of beneficiaries that are otherwise not easy to access – but this impact is dependent on the particular approach style chosen by programmes. If, for example, programmes choose to only work with model farmers who already show the capability to implement technologies – because they have sufficient land and sufficiently secure tenure – the landless are excluded from project benefits, though they may be most in need. Similar observations hold true for pastoral or allochthon groups who often have rather insecure rights of tenure.

In many of the programmes which featured components of construction of SWC structures, women played an important role. While income-generating activities are traditionally taken on by men, women in the Sahel region are often responsible for the homestead, for taking care of their children and working on the farm (labor)⁶⁷. During the food for work phase of

⁶⁰ Reddy, V. R. et al. (2017) page 24

⁶¹ Particip GmbH. (2005) page 23

⁶² Government of Burkina Faso. (2004). *Troisième Rapport National du Burkina Faso sur la Mise en Œuvre de la Convention des Nations Unies sur la Lutte Contre la Désertification* page 22.

⁶³ Reddy, V. R. et al. (2017) page 24

⁶⁴ Mamadou, A. et al. (2015) page 30

⁶⁵ Reddy, V. R. et al. (2017) page 35

⁶⁶ Reddy, V. R. et al. (2017) page 35

⁶⁷ Mamadou, A. et al. (2015) page 12

the programme in Niger (up to 2000), women were estimated to have carried out 60–90 % of the work⁶⁸. Similarly, in Burkina Faso (PATECORE), women were important contributors to the rehabilitation efforts and construction of SWC structures⁶⁹. Women directly benefitted from SLM measures in several ways, most evidently due to the increased yields generated on their household and/or individual plots. Moreover, women benefitted from easier access to both water and firewood; both of these tasks generally falling within their tradition-imposed gender roles in the Sahel region.

Depending on the intervention approach used, beneficiaries could often be reached who would otherwise not have had access to programmes for a variety of reasons (e.g. tenure insecurity, pastoralist group, poverty). These segments of the population were therefore able to benefit to a certain degree from project activities due to appropriate approach mechanisms. However, not all disadvantaged groups were reached during programme activities, hence, targeting becomes a key success factor for SLM programmes to contribute to the empowerment of disadvantaged social groups.



Contour trench in common area during the dry season in IGWDP intervention region in India
© S. Srigiri

⁶⁸ Mamadou, A. et al. (2015) page 12

⁶⁹ Particip GmbH. (2005) page 22

Success Factors for SLM Programmes

I. Project Internal Mechanisms to Enable/Strengthen Impacts

a. Making Use of Local Institutions, Actors and Tools

An important observation among most programmes was the fact that local institutions and governance bodies, created at initial stages of interventions, were key actors enabling success of SLM efforts in the respective regions. This success was achieved due to the strength of local management bodies, which enabled both context-specific programme implementation as well as efficient and transparent evaluation systems. In many cases, programme success rested on the involvement of embedded actors (such as local extension agents) in Niger, Ethiopia and Burkina Faso. Because they were already part of the community, these actors proved to be crucial for accessing communities and for establishing direct contact with local beneficiaries⁷⁰. This was considered an important mechanism to build trust amongst beneficiaries and to enable further scaling-up of SLM interventions. In several examples, such as in India and Ethiopia, local bodies created early during programmes still remain active in SLM today, long after the official end of interventions. Moreover, instead of creating new institutions, later programmes were also able to make use of these existing, trained local institutions and organizations for their activities. Many of the local governance structures created or reinforced during programme activities constitute important potential partners for future interventions, since they have a degree of organization and have accumulated years of experience with SLM interventions. In the Indian case, local structures (such as the IGWDP's VDCs) are so effectively organized that they are able to access subsequent intervention programmes at the national or state level promoting e.g. vermicomposting and organic farming⁷¹. In Western Africa, however,

organizational capacity of many local institutions is not at optimal levels. Hence, in order to build on this success factor, more fundamental efforts at capacity building need to be put into place to strengthen local institutions and ensure their self-reliance.

By valorizing local knowledge and encouraging local agricultural (best) practices, programmes can adapt to regional contexts and can reach desired levels of rehabilitation. In Niger, this proved to be an essential component to the success of past initiatives. Simple methods adapted to local contexts were given prevalence and each community was in a position to better organize its labor and technical capacities⁷².

In several instances, achieving the desired levels of outreach and upscaling SLM interventions also rested on context-appropriate communication mechanisms to target potential new beneficiaries and to mobilize volunteers (for labor-intensive activities). In the Tillabéri region of Niger, through radio broadcasts, villagers were initially informed of the potential of SWC to increase the quality of their production base (i.e. soils). Thereafter, convincing and visible results of the interventions were sufficient to motivate other villages and had the effect of significantly scaling up activities. Using radio broadcasts for communication can be considered an important contributing factor to the success of upscaling SLM initiatives in both Niger and Burkina Faso because it made effective use of a communication resource that most households in rural Africa have access to and use on a daily basis to receive information⁷³.

In Ethiopia, farmers were found to be eager to test producing alternative crops once convinced of the benefits by another local farmer. In fact, in this social context, it was found that peer-to-peer transfer of innovations via farmer-to-farmer experience exchange visits was an effective method for scaling up some income-generating innovations, such as enset produc-

⁷⁰ Mamadou, A. et al. (2015) page 30

⁷¹ Reddy, V. R. et al. (2017) page 27

⁷² Mamadou, A. et al. (2015) page 30

⁷³ AFFRI (2011). Participatory Radio Campaigns and Food Security: How Radio Can Help Farmers Make Informed Decisions. <http://farmradio.wpengine.netdna-cdn.com/wp-content/uploads/farmradio-prcreport20111.pdf>

tion⁷⁴. Therefore, the use of context-specific mechanisms for ensuring communication and transfer of know-how and information can be considered an important success factor for several of the programmes analyzed within this study.

b. Applying Long-Term Perspectives and Post-Project Mechanisms

External support to degradation-affected areas is not unlimited in both time and financial resources and development cooperation programmes rarely plan out activities in specific regions lasting more than a few years⁷⁵. Without external support, however, it was found that many people would only do what they considered necessary on their lands, which often does not include the types of measures previously promoted by programmes⁷⁶. This is thought to be the result of overall lack of resources and lack of awareness surrounding the benefits (i.e. increased production and income) of SLM measures⁷⁷. Most SLM programmes assumed that best practices will continue to be adopted (through spontaneous and peer-to-peer uptake) even once external support is withdrawn⁷⁸. Experience shows, however, that long-term results-oriented and self-sustaining continuation of SLM practices remains a difficult aspect for the population. Large-scale restoration requires large-scale efforts, efficient mobilization and organization of the populations and important infrastructural and logistical measures. While rural populations can provide labor and local materials, they can generally not afford the expenses for transport and procurement of outside material⁷⁹. SLM programmes have the most impacts when they intervene with a long-term perspective from the onset. This is done by ensuring that post-project phase-out mechanisms are in place for communities to effectively continue restoration efforts without outside support (self-help). As seen in the case of Niger, by adopting a “rolling approach”, support in each intervention area was limited to a maximum of seven years, thereby encouraging villages to organize restoration efforts most effectively. Another successful example can be found in India IG-

WDP, where the creation of watershed development funds (WDFs) enabled villages to continue funding restoration efforts; in fact some funds are still active today and feature significant amounts⁸⁰. Moreover, programmes that established clear mechanisms for transferring responsibility and ownership to the men and women living in the affected regions were found to have been considered more successful in terms of long-term impacts (e.g. Niger’s PDRT/PASP/LUCOP).

c. Knowledge Management and Self-Evaluation Mechanisms

In order for programmes to be considered successful, they must first be equipped with proper monitoring and evaluation (M&E) systems, which can be used to both assess the work achieved and qualify results. M&E systems can exist on several different levels, as was demonstrated in Niger, where a transparent participatory monitoring system was set up (in addition to programme-internal M&E) for local people to assess and evaluate their own achievements, which could be compared to agreed-upon annual work plans⁸¹. On a programme level, multi-disciplinary evaluation mechanisms (including using geographic information systems, yield measurements, beneficiary surveys) can ensure that M&E systematically assesses program activities thoroughly. Annual impact reports of programme activities serve as important tools to guide future project activities, if such information is made available and can be effectively used. The long history of development cooperation in Niger led to the existence of a wealth of annual data (on the work achieved, and on yields) which can provide useful information for future interventions and constitutes an important long-term impact of the programme’s activities⁸². A strong data legacy (in part through the proper documenting of results obtained, of effects and of potential strategic changes) proved crucial for the programme in Niger to continue despite realignment of national political strategies, lack of coordination amongst partners and decreased funding⁸³.

⁷⁴ GIZ Ethiopia (2015) page 110

⁷⁵ GIZ Ethiopia (2015) page 127

⁷⁶ GIZ Ethiopia (2015) page 127

⁷⁷ GIZ Ethiopia (2015) page 127

⁷⁸ GIZ Ethiopia (2015) page 127

⁷⁹ Mamadou, A. et al. (2015) page 31

⁸⁰ Reddy, V. R. et al. (2017) page 7

⁸¹ Mamadou, A. et al. (2015) page 15

⁸² Mamadou, A. et al. (2015) page 15

⁸³ Mamadou, A. et al. (2015) page 31



Demonstration of a water-level gauge for determining elevation contours in the PATECORE village of Kolokoum. The technique learned more than 20 years ago is still used today © T. Jenisch

II. From Participation to Ownership

The formulation and implementation of participatory micro-watershed development and management plans are among the main achievements of the programmes in all four countries and serve as important mechanisms to achieve long-term impacts. Micro-watershed planning approaches replaced larger planning units during the 1990s and formed an important part in a more effective watershed development strategy. Participatory planning approaches facilitated stronger ownership and contributed to a clearer understanding of the roles of different stakeholders, which proved to be an important factor in sustaining SLM processes. Embedding those processes in an integrated land use and development planning approach with local conventions and relevant by-laws supporting a comprehensive SLM strategy on common lands was an important pillar of long-term implementation in many of the project areas.

The need for long-term strategies and support was equally highlighted to ensure that programme efforts are able to adapt to evolving political and economic trends and to allow for continuous investments in

SLM practices. Effective long-term strategies facilitated the buy-in of relevant (government) development partners, particularly in Ethiopia. This strongly calls for a concerted effort to closely align with national priorities and to coordinate support efforts among different development actors.

a. Adopting Effective and Context-Appropriate Approaches

A major success factor identified from most studies was making use of participatory approaches, which encourages involvement and results in ownership amongst local beneficiaries of project activities. An effective participatory approach was considered the “foundation” for many of the positive impacts, especially in Niger’s Tillabéri region⁸⁴. Through the creation (or reinforcement) of inclusive participatory management bodies which were tasked with planning, implementation and evaluation, widespread effects could be achieved in Niger whereby individual villages were responsible for the nature of interventions and for identifying priorities. However, as previous research has shown⁸⁵, the quality of so called “participatory” approaches is not always ensured and can become an obstacle to the long term sustainability of results. In Burkina Faso, based

⁸⁴ Mamadou, A. et al. (2015) page 30

⁸⁵ e.g. Koudougou, S. et al. (2017)

on a 2016 study of ten SLM projects or programmes, it was determined that the most common metric used to measure “participation” is the number of beneficiaries (present during trainings etc.), and furthermore, SLM programmes “often do not permit affected populations to be true partners with initiative and decisional powers”⁸⁶. Moreover, the passive role assigned to most project “beneficiaries or target populations” (as their name implies) perpetuates the notion that these people are the means to an end, but are not true owners of SLM action or efforts⁸⁷. When discussing the effectiveness of participatory approaches, it becomes necessary to stress that truly effective participation is one that allows all stakeholders to benefit from decision-making powers at all stages of a programme’s lifetime of intervention in a specific region. Some programme approaches, however, often cannot address the needs of everyone within a given region. This is especially the case of individual plot (*parcellaire*) approaches, which often require tenure security and sufficient resources (financial and labor) to implement SLM measures. Such approaches, though often resulting in improvements at the farm level (due to individual motivation and willingness to maintain the benefits over time) remain exclusive and of limited impact in terms of individuals benefiting from the intervention. Exclusivity of such interventions directly affects women (e.g. in Burkina Faso and Niger) and landless people (e.g. in India; pastoralists). Because of traditional societal gender roles, women in many regions do not own land, and, in some regions, do not partake in income-generating activities⁸⁸. Therefore, the programme in the Tillabéri region (Niger) developed a context-appropriate method in order to directly benefit women by establishing exclusive production sites for them (managed and planned directly by groups of women from specific villages)⁸⁹. The farming sites were divided and the women group was provided with funds to support the initial sowing of staples. This mechanism, however, required leasing the land and lease terms were often short (up to 4 years) and extending the lease was considered difficult⁹⁰. The programme in Niger appointed gender officers and launched other activities directly benefitting women, while encouraging them to participate in vil-

lage land committees (up to 30% of committee members were women at the end of the intervention)⁹¹.

b. Promoting Self-Help Initiatives

Transition from “food for work” towards unpaid (volunteer) work was considered a success factor in Niger, whereas in Burkina Faso and Ethiopia, paid labor was considered more effective for the construction of SWC structures and rehabilitation measures (gully rehabilitation). In Burkina Faso, a switch towards remunerated labor was motivated by interventions which were originally restricted to individual farms (via the programme’s *parcellaire* approach) thus exclusively accessible to wealthier farmers. Later interventions, such as EKF/ProSOL recognized the benefits of landscape (i.e. watershed) rehabilitation through volunteer or contractual labor. In Niger, “food for work” (discontinued in 2000) was found to reduce motivation and was considered unsustainable, with the programme relying solely on volunteer labor as of 2000 and nonetheless achieving continued restoration of degraded areas. This was partly the result of effectively organized local management bodies, through which volunteers could be mobilized to conduct the rehabilitation works and entire villages could be convinced of the benefits of SLM interventions via “visible and convincing results” which could be observed in many areas⁹². In Ethiopia, it was recognized that the empowerment of communities in order for them to be responsible for all aspects related to watershed development also included them being directly responsible for financial management⁹³. Community contracting (CC) was used so that the community itself, instead of simply being a source of labor, could be tasked with all stages of a specific task (from planning, execution and ownership) which was then remunerated according to its accomplishment⁹⁴. Beneficiaries valued CC because it serves as a “subsidy for self-help efforts” but its effectiveness was found to be dependent on clearly spelled-out expectations in terms of quantity and quality to avoid misunderstandings caused by rushed efforts to complete a task at the expense of quality⁹⁵.

⁸⁶ Koudougou, S. et al. (2017) page 25

⁸⁷ Koudougou, S. et al. (2017) page 25

⁸⁸ Mamadou, A. et al. (2015) page 11–12

⁸⁹ Mamadou, A. et al. (2015) page 12

⁹⁰ Mamadou, A. et al. (2015) page 12

⁹¹ Mamadou, A. et al. (2015) page 12

⁹² Mamadou, A. et al. (2015) page 30

⁹³ GIZ (2015) page 159

⁹⁴ GIZ (2015) page 160

⁹⁵ GIZ (2015) page 160

Challenges and Lessons (to be) Learned

This section highlights some of the challenges impacting the achievement of long-term positive impacts according to the respective country studies but also based on other available sources. In order to ensure the ethicality of development programmes and to ascertain their success, the following aspects should be considered for the planification of future SLM strategies, projects and/or programmes.

I. Insufficient Baselines Lead to Disparate Efforts

As evidenced by previous research into 10 SLM programmes in Burkina Faso⁹⁶, the overall approach of most of the SLM interventions in question were found to leave room for improvement in terms of coordination and context-appropriateness. Programmes intervening in similar regions were often not in cooperation/communication, thus leading to disconcerted efforts and limiting the effectiveness of SLM interventions⁹⁷. Often, due to time pressure, little stocktaking, in the form of thorough baseline analyses and research into local socio-agro-economic contexts is conducted at the outset of programmes, resulting in villages being “inundated with inappropriate technologies” and leading to subsequent programmes inadvertently “reinventing the wheel”⁹⁸. For this reason, conducting thorough and well-documented baseline studies in all potential intervention regions is critical. By identifying and understanding the “lessons learned” from past interventions, an effective, sustainable approach can be developed in collaboration with stakeholders. Moreover, the need for baselines is corroborated by the overall lack (or inaccessibility) of project data. Due to the lack and/or inaccessibility of data, analysis, including assessment of long-term impacts, takes on a qualitative nature at best and is of limited use for future interventions. Without capitalizing on lessons learned from past

interventions, programmes risk contributing to a vicious cycle of a “wait-and-see” mentality (French: *attentisme*) amongst local populations, who become reliant on external assistance due to the promotion of unsustainable and inadequate measures.

The creation of baseline studies, supplemented by better access to project data would provide an opportunity to effectively assess the relevance of project activities. In fact, as the study by Koudougou et al. (2017) in Burkina Faso points out, in many cases, programme evaluations assess the coherence between a project’s initial goals and its actual achievements, but rarely is the overall relevance of such interventions questioned. Why then do technically relevant and well-tested measures that have the potential to solve degradation issues not always produce sustainable results? As the authors suggest, a reason preventing widespread success lies in the ex-situ development of solutions, without a proper understanding of local contexts⁹⁹. For similar reasons, many of the programmes analyzed in the country-reports for this study had difficulty in achieving long-term sustainability of positive impacts.

II. Framework Conditions: Lack of Political Will, Coordination and Synergy

In many countries, NRM/SLM is not considered a pressing priority in national economic development strategies and policies due in part to limited funding availability but also due to other priorities being considered more pressing (such as road network development, social infrastructure, economic trade). Against such a background, the efforts of temporary programmes at ensuring lasting impacts of their interventions are often under threat. This challenge has become particularly severe since national agricultural

⁹⁶ Koudougou, S. et al. (2017) page 26

⁹⁷ Koudougou, S. et al. (2017) page 26

⁹⁸ Koudougou, S. et al. (2017) page 26

⁹⁹ Koudougou, S. et al. (2017) page 25

advisory services have become victims of neoliberal structural adjustment programs and have become virtually defunct in many developing countries. While these extension services, theoretically, are ideally positioned institutions to ensure shifts to more sustainable agricultural practices and to support the perennity of project achievements, in practice, they lack the staff, resources and capacities to live up to this aspiration. More nationally driven investment into these services is, as of now unlikely since the development policies of most countries are not according priority to the agricultural sector and rural transformation as such. Ethiopia, with its policy on agriculture-led growth, is a notable exception here. And at the same time, its national Sustainable Land Management program exemplifies how much can be achieved through concerted, government-led efforts in this field.

High development staff turnover as well as changing political strategies are often considered a limiting factor in sustaining efforts made towards institutional or organizational strengthening. Through the effective long-term strategy of Niger's LUCOP, programme activities were able to continue despite such changes, whereas in Burkina Faso, once PATECORE/PLB ended, rehabilitation activities were dramatically reduced in part due to insufficient coordination, changes in political framework conditions and a lack of reinforcement of local governmental bodies which, at the time, were at their initial stages of organization. The most successful examples when it comes to observing continued benefits and long-term impacts of programme interventions are to be found where local organizations/structures were strengthened and could feed into the hierarchy of established institutional bodies and were thus in a better position to influence relevant administrative processes. Nevertheless, at least within the context of development cooperation, a need for stronger coordination among programmes was observed e.g. in Burkina Faso. A lack of coordination was especially observed between NGO/third party programme implementers and governmental decentralized bodies, which are already present in many countries (such as in Burkina Faso) and are tasked with closely following and coordinating activities affecting different sectors but are often still in early stages of institution-building and hence, not fully equipped for this task¹⁰⁰. Moreover, coordination between different programmes is essential in order to ensure comple-

mentarities and synergies between different goals and objectives can best be exploited. A better coordination mechanism between projects and programmes in the same region can also contribute to reducing the perceived sense of disorganization in the region leading to several projects being criticized for often working on the same things and "reinventing the wheel"¹⁰¹. Clear and established roles for all stakeholders, including integrating the foreseen functions of governmental decentralized bodies into programme activities are essential to ensure both coordination and follow-up of activities. This strongly calls for concerted SLM policies and harmonized programmes that provide an overall framework for implementing measures. However, NRM/SLM is still not considered an urgent priority in national development strategies and policies due in part to limited funding but also due to other priorities being considered more pressing.

III. Absence of Post-Project Sustainability Mechanisms

Many SLM programmes face difficulties in establishing effective post-project sustainability mechanisms which often results in the abandonment and disuse of rehabilitation measures. In Niger, despite a generally successful long-term strategy, 32% of the 19 plateaus visited in 2015 were considered degenerated due to lack of continued maintenance¹⁰². In Burkina Faso, no clear assessment of post-project maintenance has been conducted as of yet, though it has been mentioned that (at least for PATECORE) project activities ceased rather "abruptly" once PATECORE withdrew from the region¹⁰³. This conclusion may potentially be supported by the observation of a generally decreasing number of small ruminants (goats, sheep) on offer at the Yilou market in the years following PATECORE¹⁰⁴. In India, however, especially in the case of the IGWDP, through the establishment of VWCs and funding mechanisms (VDFs) SWC structures such as farm bunds and check dams were found to be in "good condition" even after 20 years since their construction¹⁰⁵ providing evidence that the creation of such funds was an important factor to ensure long-term maintenance and overall sustainability of the initiatives.

¹⁰⁰ Koudougou, S. et al. (2017) page 26

¹⁰¹ Koudougou, S. et al. (2017) page 26

¹⁰² As of 2015; Mamadou, A. et al. (2015) page 23

¹⁰³ Jenisch, T. et al. (2017) page 23

¹⁰⁴ See : Table 6.03 in MRA (2014) page 136

¹⁰⁵ Reddy, V. R. et al. (2017) page 24



Lack of maintenance of a stone bund in Koumbia village, Burkina Faso ©T. Jenisch

IV. Participatory Approaches Lack Inclusivity

Though participatory approaches were often considered successful factors leading to the long-term success of various SLM interventions, the degree to which a program can be considered “participatory” varies. As mentioned by Koudougou et al. (2017), participation might be assessed purely quantitatively, whereby simple quotas related to the participation of specific demographic groups (e.g. women) govern the degree of participation. Thus, for a programme-specific activity (such as planning) to be considered participatory, the mere presence of certain people is required, but no guarantee as to their effective input/participation can be made. This observation is especially problematic for certain high-risk demographic groups, who suffer most from the negative effects of a changing climate on agricultural productivity. Therefore, when the participatory approach ineffectively addresses the challenges faced by certain demographic groups, they cannot effectively benefit from the positive impacts of various SLM measures and/or project activities. In this regard, relatively little is put into place to ensure that youth (in West Africa especially) participate at all stages during a programme’s

conception and implementation. Moreover, youth (especially young men) were often absent from the villages visited during the country-specific study in Burkina Faso and is consistent with general observations that young men often emigrate to other regions to find work.¹⁰⁶

V. Lack of Adaptive Capacity/ Flexibility

Similarly to the necessity for projects to develop long-term perspectives and post-project strategies to sustain rehabilitation efforts in intervention regions, they must also be adaptable and responsive. Since frequent changes in both (political) strategies and high (technical) staff turnover were reported as major challenges in some cases (e.g. Niger), programmes need to ensure adaptability in order to respond to changing conditions over time. A lack of adaptive management often results in rigid programmes that neither respond to local needs and context, nor can they adapt to changing conditions and external influences. Thus, when confronted with external changes, such as realignments of governmental policies or funding shortages, non-adaptive programmes may

¹⁰⁶ Jenisch, T. et al. (2017) pages 12 and 31

have difficulty completing their work in affected regions. Moreover, in some cases, a lack of flexibility leads to the promotion of unsustainable and/or inappropriately presumed techniques, which do not respond to local needs or are highly dependent on temporary external support (such as soil fertility techniques dependent on locally unavailable inputs). Moreover, many programmes base their evaluation mechanisms on an ex ante review of initial project goals and actual outcomes¹⁰⁷, leaving very little room for continuous self-evaluation and readjustment of programme activities during implementation. Of the many programmes analyzed, ProSOL (in Burkina Faso) seems to be the only one to feature a component of accompanying research¹⁰⁸, whereby a system of continuous self-evaluation and multi-stakeholder dialogue via well-defined feedback loops is allowing project activities to be informed and adapted while in progress.

VI. Sustainability of Impacts (often) depends on External Financing

Strong national ownership and leadership are key to any efforts in sustaining the impacts of successful soil rehabilitation and sustainable land management projects and programmes. Development partners in the different programmes in all four countries range from agricultural ministries and forest department to agricultural banks and implementing NGOs. The most sustained long-term impacts are observed where supported SLM measures are embedded in conducive policy frameworks with strong leadership by respective governmental agencies and external donors. A systematic approach to supporting government institutions combined with fostering community engagement and the promotion of suitable technologies has proven to be essential in order to sustain impacts in the long run. It has shown that areas where the implementing NGOs were still active and strongly involved in the communities benefited mostly from the gains of the initial programmes – local organizations thus becoming a core factor for sustainability. However, a lack of continuous investments in SLM by respective government agencies and their financial partners (i.e. external donors) jeopardizes the sustainability of achievements. Hence, the alignment with and support of relevant policies and their implementation on different levels are important elements of programme design to ensure the sustainability of achievements and impacts if governments are able to invest own funds (e.g. India or Ethiopia) or to attract and direct additional donor funding.

¹⁰⁷ Koudougou et al. (2017) page 25

¹⁰⁸ e.g. Stiem, L. (2016). Recherche accompagnante : Protection et réhabilitation des sols pour améliorer la sécurité. Conference Poster presented at: Global Soil Week. May 22–24 2017. Berlin (Germany)

Recommendations for the Analysis of Long-Term Impacts

The four country studies have shown that investments in soil rehabilitation measures and sustainable land management practices have the potential for sustained impacts and benefits on various levels. In order to fully capture long-term impacts of these investments it is important to assess a number of factors and to ensure that future study design fulfills certain requirements. In order to avoid that long-term impact studies become programme performance and/or sustainability evaluations, a number of key aspects should be addressed.

On site (project intervention zone) evaluations should concentrate on documentable and quantifiable measurements/evaluation of impacts, but should be supplemented with information that can be gathered via interviews with stakeholders (beneficiaries, extension agents, etc.). On-site evaluations should include (independent/non-partisan) assessment of the quality of SLM structures emplaced during specific projects. Determining if the structures remain intact and functional, in some cases many years after project activities, can provide a glimpse as to the factors that could have led to deterioration or lack of maintenance. Moreover, beneficiaries should be given the opportunity to provide their opinions on the specific interventions and if the impacts of certain practices are still felt (or if the techniques are still being practiced). In terms of social organization, determining if committees and/or user groups created during specific interventions are still active can provide information on what exactly farmers gain from the maintenance of such structures (even after project completion). For example, in India, an important finding of the study showed that VWCs were still actively maintaining SWC structures such as check dams, farm bunds and were managing development funds. Observations on-site should also include, when possible, appraisals of soil fertility (perhaps via random sampling and chemical analysis), groundwater levels and vegetation cover (i.e. trees – esp. young trees – per unit area). Additionally, once uniform criteria to assess the long term impacts is properly developed, the problems that arise from comparing various studies employing different methodologies can be avoided. Moreover, it could prove beneficial

to also assess neighboring regions (which had not benefited from interventions) according to the same criteria in order to both assess whether any (self-initiated) upscaling may have taken place and/or to use non-beneficiary regions as control sites for comparative purposes. Since beneficiaries and other actors involved in project activities are important information/knowledge holders, their opinions concerning the impacts of programmes should also be given a high degree of priority. In many cases, beneficiaries are in the best position to assess the potential benefits that might have resulted from specific measures (SLM techniques). Their motivations for abandoning or discontinuing certain practices can also provide important information concerning the limitations (or external constraints) of specific techniques.

In order to properly identify and assess long-term impacts of SLM interventions, it is necessary for baseline studies to be made available. Particularly, baseline data concerning hydrological conditions, biodiversity, soil fertility, and household socio-economics should be used to evaluate long-term impacts. This can only be achieved when baseline data is properly collected at the start of a project and included in subsequent project reporting/documentation. Relevant baseline data should be made available to all actors and stakeholders involved in order to ensure full transparency and accountability. Moreover, evaluation reports (such as those either conducted on behalf of project organizations or via independent third parties) should refer to baseline data and use such data in order to draw comparisons and document effects of the interventions. In this regard, due to the wealth of data and information collected in the context of the LUCOP programme in Niger, evaluation and assessment of impacts was greatly facilitated and the impacts of various SWC measures were often rigorously documented. Evaluation reports should also address the key lessons learned and failures of projects/programmes in order to avoid making the same mistake again. Moreover, facilitated access to project documentation and data would allow for more effective collaboration between and within various programmes operating in the same regions. This would greatly contribute to preventing the observed

phenomenon of programmes “reinventing the wheel” due to lack of coordination and thorough baseline analysis and/or stocktaking¹⁰⁹.

Regarding secondary sources of information and data, it becomes important to supplement existing documentation with other studies from the same region.

Moreover, in cases where several programmes intervened in the same area, documentation concerning potential cooperation should be used. In cases where post-project evaluation shows the existence of several programmes carrying out activities in the same region, but without a clearly defined cooperation mechanism, this finding should also be highlighted.

¹⁰⁹ Koudougou, S. et al. (2017) page 26

PUBLISHED BY

Institute of Advanced Sustainability Studies (IASS) e.V.

Berliner Straße 130
14467 Potsdam
Telefon: +49 331 28822-300
Fax: +49 331 28822-310
Mail: info(at)iass-potsdam.de

FUNDED BY

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
on behalf of Federal Ministry for Economic Cooperation and Development (BMZ)

2nd Version

PRINTED

October 2017

DESIGN AND LAYOUT

Sabine Zentek, Berlin

© Photo credits to the owner(s) as indicated.

AUTHORS

Anna Katharina Kramer (Global Soil Forum - IASS Potsdam)
Patrick Lanouette (Global Soil Forum - IASS Potsdam)

BASED ON ORIGINAL RESEARCH CONDUCTED BY

Dr. Thomas Jenisch and Dr. Abdoulaye Ouédraogo (Burkina Faso)
Dr. V. Ratna Reddy, Dr. Srinivasa Reddy Srigiri, T. Chiranjeevi and Sanjit Kumar Rout (India)

VALUABLE CONTRIBUTIONS PROVIDED BY

GIZ Sektorvorhaben Nachhaltige Landwirtschaft
GIZ Sektorvorhaben Bodenschutz, Desertifikation, Nachhaltiges Landmanagement
GIZ Globalvorhaben Bodenschutz und Bodenrehabilitierung für Ernährungssicherung
Global Soil Forum - Institute of Advanced Sustainability Studies
TMG - Thinktank for Sustainability, gGmbH

ALSO BASED ON FINDINGS FROM PREVIOUS COUNTRY-SPECIFIC CASE-STUDIES BY

Mamadou A. Goah Sani, Aboubacar Djido and Oudou Adamou (Niger)
GIZ Ethiopia Sustainable Land Management Programme (GIZ-SLM)

On behalf of



Federal Ministry
for Economic Cooperation
and Development

