

Completion of a Success Story or an Opportunity Lost?

**An Evaluation of the Soil and Water
Conservation Programme in Arusha Region (SCAPA)**

**Thorsten Celandner
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and Environment**

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Sida Evaluation 03/13

**Department for Natural
Resources and Environment**

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All these resource persons, whose assistance has made this evaluation possible, are listed in Annex 7 of this report.

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Note:

This report and its content is the responsibility of the Evaluation Team only. Conclusions and views expressed in the report is that of the authors only and not necessarily shared by Sida or relevant Tanzanian authorities.

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Acronyms

ASDS	Agricultural Sector Development Strategy
CBO	Community Based Organisation
DALDO	District Agricultural Development Officer
DCT	District Coordination Team
DED	District Executive Director
DPSP	District Programme Support Project
DSCC	District Soil Conservation Committee
FBD	Forestry and Bee-keeping Division
HADO	Hifadhi Ardhi Dodoma
HASHI	Hifadhi Ardhi Shinyanga
HH	Head of Household
HPI	Heifer Project International
m.a.s.l.	meter above sea level
MAFS	Ministry of Agriculture and Food Security
MALDC	Ministry of Agriculture, Livestock development and Co-operatives
MNR	Ministry of Natural Resources
MoA	Ministry of Agriculture
MRALG	Ministry of Regional Administration and Local Government
NSWCP	National Soil and Water Conservation Programme
LAMP	Land Management and Environment Programme
LAHEP	Land Husbandry Extension Programme
LMNRP	Land Management and Natural Resources Programme
LUPS	Land Use Planning Section
LUP	Land Use Planning
NGO	Non Governmental Organisation
PCT	Programme Coordination Team
PM	Programme Manager
PRA	Participatory Rural Appraisal
RSCC	Regional Soil Conservation Committee
RSCU	Regional soil conservation Unit
RELMA	Regional Land Management Unit
SARI	Selian Agricultural Research Institute, Arusha
SCAPA	Soil conservation and Agro-forestry project in Arusha*
SCAPDO	Soil Conservation and Agroforestry Programme Development Organisation
SELADO	Sustainable Environmental and Land Management Development Organisation
SEK	Swedish Krona
Sida	Swedish International Development Agency
SUA	Sokoine University of Agriculture
TIPDO	Traditional irrigation Project Development Organization
TIP	Traditional Irrigation Project
ToT	Training of Trainers
TSH	Tanzanian Shilling
VSCC	Village Soil Conservation Committee
VEW	Village Extension Worker

* SCAPA is frequently referred to as a programme rather than a project. The Evaluation Team has tried to consistently use the term project instead, because referring to SCAPA as a programme is somewhat misleading

Executive Summary

The Soil and Water Conservation Project in Arusha Region was implemented in 1989–2000. The rationale for the project was to address serious land degradation problems around Mount Meru. The *entry points* was both technical in terms of developing skills in various land management techniques as well as how these techniques could be made an integral part of mainstream extension in agriculture, livestock management and forestry. SCAPA represented an alternative approach to address “land degradation” and “extension” compared to both previous and contemporary approaches in Tanzania at that time. The purposes of this post evaluation are to present a historical overview, an assessment of different aspects of the project and to provide useful conclusions and lessons for the future.

SCAPA was first launched as a small *pilot* project from 1989–1993, followed by an *expansion* and *implementation* phase from 1994–1996 and 1997–2000 respectively. The budget and the ambitions were expanded, particularly during the third phase. The first phase included Arumeru district only while Arusha district was added in the second phase. SCAPA was organised and managed as a *semi-autonomous project* first in relation to the Regional Administration and after the decentralisation reform in 1998 also in relation to the District Administration. The projects had their own budget and account and were in this sense independent from the local administration. The initial argument for this autonomy was the fear that local bureaucracy would slow down implementation. SCAPA was however integrated in the region/districts in that the annual plans and progress reports were presented to the local administration for co-ordination with their overall development efforts. The local administration also provided the staff for SCAPA.

While this autonomy might have been justified during the first phase, one can raise serious concerns with this arrangement, if the ambitions would have gone beyond the purpose and objectives of the second and third phase. Questions like *internalisation and the more ambitious institutionalisation were therefore never properly addressed*. This is part of an important weakness in the development co-operation between Sida and relevant Tanzanian authorities. While the issue of how to make use of SCAPA's experiences has been on the agenda from time to time, it was never reflected in the project documents of the second and third phase, nor in any of the Specific Agreements of which SCAPA has been part. The reason for this is unclear, but it seems as if there were never any proper appraisals made of the projects documents for the first and second phases, something that otherwise could have put SCAPA on a more ambitious “track” other than providing the benefits that came through implementation in the field. One can only speculate about the reasons behind this. The Evaluation Team has an impression of *a project that was never really owned* neither on the Tanzanian side at the central level, nor on the Swedish side. The funding and administration during the pilot phase came through RSCU/RELMA. While the project was formally transferred – in terms of funding and administration – to Sida in Dar Es Salaam for the remaining two phases, it appears as if the roles and responsibilities between Sida and RSCU/RELMA remained unclear.

SCAPA has, within the framework of the project documents, accomplished a lot and can from this point of view be regarded as a successful project. They have developed *multidisciplinary skills* among the extension staff and a capacity for how to integrate these disciplines into *meaningful extension messages*. This has been accomplished through a participatory approach at the village level. The work with *local institutional development* has been a particular strength of the project. In their approach, SCAPA was fundamentally different than the efforts to develop a national extension system during the 1990s, with questionable results. While praising SCAPA for their alternative extension approach, one should also remember that SCAPA had resources that the local extension service can never enjoy. So much more

important then to systematically address the issue of internalisation in order to make SCAPA a more relevant alternative for main stream extension.

The core land management technologies promoted in SCAPA such as *physical and biological measures* to arrest soil erosion, *improved crop management* and *technologies that reduce the susceptibility to land degradation* has been technically sound and appropriate in relation to the local farming practices. SCAPA has also been engaged in livestock management and water harvesting. While there are good examples of interventions that has been technically sound and appropriate also here, there are those that can be questioned. This is in particular the case for more *expensive technologies, which are out of reach for poor farmers* unless these are provided with heavy subsidies. The provision and the terms by which heifers (for dairy production) and water tanks has been introduced in the project can serve as examples.

The initiation of SCAPA came at an opportune time when the prevailing social-economic conditions in combination with land degradation required the local community to seek for alternatives to improve their livelihoods. The impact on *land productivity* has been positive. It was not possible to determine more precisely the improvement on *livelihood*, but it appeared from farmers' confessions and rough records kept, that it has been profitable to engage in the technological changes promoted through SCAPA. The project has addressed *gender* aspects systematically as well. The *environmental improvement* has been significant, although difficult to quantify. Perhaps the most important achievement by SCAPA is the *enhanced capacity* among the extension staff, who were involved in SCAPA from the district-, division-, ward- and village levels. These achievements also extend to the villagers and the local leadership. The *institutional development* at local level has in some villages been significant.

While *the management* in SCAPA has been capable on most accounts, the monitoring system could have been more developed and informative. This would have been an absolute necessity, if the issue of internalising SCAPA would have been properly addressed in the project documents. The potential to develop extension more systematically at district and regional level was however never explored. The possibilities to influence and to be influenced at the national level never materialised, although some attempts were made regarding land management. These shortcomings are partly due to the design of the project, but both the project management as well as the co-operating partners could have done *more*, done it *differently* and done it *earlier*.

The decision to terminate SCAPA came abruptly, only slightly more than one year after the project document for the third phase was approved. Perhaps due to the frustrations on both sides, a proper phasing out of SCAPA never occurred. There were a few different alternatives that could have been considered. Since the SCAPA offices in Arumeru and Arusha are still kept, there might still be an opportunity to address the "phasing out issues".

The report ends with a set of conclusions and lessons that the Evaluation Team think are useful, both *for the record*, but more important *for future development co-operation*. These are *thematic* and related to land management and extension and *managerial* both at the level of projects and at the level of development co-operation.

1 Introduction

1.1 Purpose and general context

Soil related constraints resulting in poor fertility and therefore poor agricultural productivity was and continues to be a major challenge in Tanzania. According to FAO/UNEP statistics “only 25 % of the soils in the country are free of major constraints”, suggesting that land management constraints, be it technical, institutional, social or just sheer lack of resources needs to be high on the development agenda also in the future. The fact that national crop production has not declined or even increased for some crops during the 90:ies conceal that this mainly results from expansion of cultivated land and by no means from higher productivity per unit area or per capita.

This ex post evaluation of the Soil Conservation and Agroforestry Project¹ in Arusha (SCAPA) aims at providing an overview and assessment of the project during its implementation period 1989-2000. This includes its geographical coverage, technologies applied, extension approach, organisational arrangement as well as the results and impact. This is the basis for learning from these experiences and could hopefully provide useful conclusions and guidance for the future. The purpose and related detailed information for the evaluation are provided in the Terms of Reference (ToR, see Annex 1)

The rationale and background for the initiation of the project was the serious land degradation that was clearly visible around Mount Meru close to Arusha Township in the 80s. The entry point was both technical in terms of developing skills in various land management techniques as well as how these techniques could be an integrated part of mainstream extension in agriculture, livestock management and forestry. There have also been expectations that the experiences of SCAPA should have had an influence beyond the actual project area including the national level.

1.2 To the reader of this report

The report begins, before going into the substance, with a brief presentation of the methods used in this evaluation. This is followed by an overview of the context in which SCAPA has functioned. Besides a presentation of the agro-ecological and geographical characteristics of the programme area, this also includes a general background of land management and extension in Tanzania, since this has been the two main “subjects”, where SCAPA has been active. Finally the major Sida policies and strategies of relevance for the programme – in view of the evaluation team – are briefly described.

For some of the chapters special annexes has been added, beyond those that presents the ToR, References and Persons met. This is both because the information provided are more detailed and not necessarily required in the main text for the observation and conclusion made, but also in attempt to reduce the number of pages in the main report. This refers primarily to Annex 3 on quantitative achievements and Annex 4 on common technologies in SCAPA. The team have however had some problem to gather a more complete set of statistics regarding the quantitative achievements as there were not a complete set of progress reports in SCAPA. Hence some of the figures in Annex 3 represents estimations by the Evaluation Team and should be read with some care. Annex 4 has been added since it proved to be difficult to go into too many details regarding the technologies on a limited number of pages. It was also added as it provides information for why certain technologies have a

¹ SCAPA is frequently referred to as a programme rather than a project. The Evaluation Team has tried to consistently use the term project instead, because referring to SCAPA as a programme is somewhat misleading.

particular impact and how some of them could be further improved, something that hopefully could be useful for any reader that are not familiar with the technical/biological aspects in land management.

While conclusion are made and some impacts are highlighted in the chapters that deals with *the Organisation and management, the Extension approach and the Technologies*, there is also a specific chapter regarding *Overall impacts* for a selected set of key issues. Specific *reflections, conclusions or lessons* are up until the last chapter imbedded in the main text with *letters in italics*. The final chapter on *Overall conclusions and useful lessons* bring attention to major findings and issues in special boxes. Some of these goes partly beyond the ToR. This has been added since the Evaluation Team felt that these issues are important for any assessment and analysis of the impact of a programme and the useful lesson this may provide.

Finally for the reader that never have sufficient time, the Executive Summary hopefully bring some sense and understanding of what SCAPA was all about including it's accomplishments and shortcomings. Together with the last chapter, the understanding of SCAPA will hopefully be further enhanced. The readers who wish a more in-depth understanding of the project and how and why the mission came to certain conclusions will have to read the full document.

2 Methods used in this evaluation

The team was composed of three persons that together covered different disciplines and aspects as required for this evaluation. The team spent several weeks in the programme area in February 2003 and compiled most of the draft report by early April after which it was circulated for comments to Sida and through them other relevant resource persons. After receiving these comments, the final draft was compiled in late April and early May.

In order to carry out this evaluation a number of different documents (project documents, progress reports, previous studies, pamphlets and manuals) has been studied and analysed. These are all listed in Annex 6. A number of meetings and interviews has been a significant part of the work as well. These meetings and interviews included

- different resource persons that have been directly involved in SCAPA,
- technical and administrative officers from different Tanzanian authorities both at national, regional and district levels,
- representatives of local research organisations,
- representatives of local NGOs and CBOs,
- politicians from district and local level institutions including representatives of villages,
- current and former programme officers from Sida that has been working with SCAPA,
- a fair number of farmers, both women and men,
- a team member from the evaluation of the pilot phase of SCAPA,
- present and former representatives of RELMA, and
- representatives of the consultant of the LAMP project.

These persons are all listed in Annex 7. The interviews and discussions has included both structured and open ended approaches and questions, depending on the subject or issue on the agenda as well as the context under which these meetings came about. The team made a number of field visits in the programme area as well, in order to solicit views about constraints and potentials in land management in general and SCAPA in particular. These field visits also offered opportunities to assess impact in general and the technologies applied in SCAPA.

Considerable efforts had to go into identifying and getting hold of relevant and important documents, in order to understand the development process and how SCAPA has been viewed by different actors over the years. Much of the literature review were made simultaneously with the field work of the mission, since a considerable amount of the documents had to be looked for at SCAPA's offices in Arusha and Arumeru district. This made the field visits and meetings somewhat less effective than if more of the literature review could have been done in advance. In spite of this constraint, the Evaluation Team believe that the combined efforts of studying a number different documents and the discussions held with various resource persons has been sufficient for this ex-post evaluation.

3 Background

3.1 The Project Area

3.1.1 Arumeru district

Arumeru district occupies the area around Mount Meru (4562 m.a.s.l) comprising of volcanic cone hills with steep and long dissected slopes which are almost flat at the lower parts of the foothills. Kaihura (1998) described the agro-ecological zones, based on differences in land use systems (governed by altitude and rainfall) on the eastern side (windward side), as summarized on Table 1. Most of the SCAPA project areas in Arumeru district were in the high and medium potential areas. The district occupies an area approximately 3000 square kilometres, with an estimated population of 321,835 people, which makes it one of the most densely populated districts in the country (Kaihura, 1998), with the high potential zones having the highest density.

Table 1. East Mount Meru Agro-ecological Zonation

Zone	Mean annual rainfall (mm)	Altitude (m.a.s.l)	Basic characteristics
High potential area	1000–1200	1200–1800	Forest montane, perennial crops dominant-mixed with annual crops, cattle under zero grazing
Medium potential area	900–1000	900–1220	Food crops grown in mixtures along valleys and slopes, cattle under zero grazing
Low potential area	500–700	800–900	Extensive grazing, food crop production

Source: Kaihura, F.B.S. (1998).

It is estimated that about 60% of the land in Arumeru district is under cultivation, 30% under grassland, and 10% under forest (natural and planted) cover. The majority of the farmers occupy small land holdings averaging 0.8 ha.

The dominant ethnic group in the district are the Wa-Meru with large populations of Wa-Arusha and Wa-Maasai as well. The Wa-Meru, who also occupy most of the high potential areas, practice mixed farming (crop and livestock production) in which the crop component is more prominent. In the highlands, perennial crops, coffee and banana, are the major cash crops but other crops such as maize, pyrethrum, potatoes, fruits and vegetables are grown. The low potential areas are generally marginal lands, which were used mostly for grazing by pastoralists until recently (mid 1990s) when food and income from livestock could no longer support the pastoral families. Hence, pastoral families started to incorporate food crop production into the farming system. Due to shortage of land in the middle and high altitude areas, other farmers have migrated to the low potential areas. The crops produced in the low potential areas are mostly short duration and/or drought tolerant crops such as maize, beans, pigeon peas, sunflower and wheat. Traditionally, two or more crops (mixed cropping) are normally grown on the same piece of land. For most of the district, there is one dependable growing season of 2.5–6 months, with the duration increasing as one move into the high potential areas. Short rains, which can last for two months, are received in some areas but these are unreliable.

The combination of volcanic soils², high population density and large livestock herds, especially in the low potential areas, makes Arumeru district prone to soil erosion. Before the establishment of SCAPA, 110,200 ha were described as moderately affected by soil erosion while 171,100 ha were described as severely affected by soil erosion (Mawenya and Kaihura, 1998).

3.1.2 Arusha district

Arusha district occupies an area approximately 9300 square kilometres with a population of 250,000 (1988 census) which translates into a population density of approximately 35 persons per square kilometre. The district essentially comprises of Arusha municipality on the foot hills of Mount Meru and is surrounded by Arumeru district on all sides. A small part of the district is urbanized while the southern and south western parts of the district are utilized for crop and livestock production.

Arusha district is mostly located in the medium to low potential areas, which have similar characteristics as those described for Arumeru district, but a larger part is in the low potential zone. The total annual rainfall in Arusha district is in the range of 350–600 mm with about 4–6 months of a dry period. Some parts of the district are associated with hills spilling over from Mount Meru and these normally receive relatively high rainfall while the plains which have low rainfall are used as rangelands with high livestock populations. The vegetation is mostly wooded grassland, bushed grassland and open grasslands. The soils of Arusha district, like those of Arumeru, are very fine, mainly of volcanic in origin. Even though the population density in Arusha is low, the unstable nature of the soil, the large herds of cattle and cultivation on sloping land have contributed greatly to soil erosion in the district.

The major ethnic groups are the Wa-Arusha and Wa-Maasai for whom livestock keeping is a cultural heritage. The lowlands were previously used mostly for cattle grazing, while current practice is mixed farming but largely livestock-based. The crops commonly grown in the medium potential areas include coffee, banana and round potatoes while in the low potential zones maize, beans, cowpeas, cassava, wheat, sweet potatoes, sunflower, what and pigeon peas are grown.

3.2 A background to land management and extension in Tanzania

A notable weakness in the previous land improvement interventions had been the tendency to divorce soil conservation from the general agricultural extension service. In particular, it is noted that during the colonial period most of the land use practices were enforced mainly through legislation on existing indigenous farming systems. Consequently they failed to take root, to the extent that soil conservation earned a bad reputation due to its coercive nature. And more seriously it poorly affected on the reputation of the general agricultural extension system and its personnel.

In response to the ever increasing threat of land degradation countrywide, the post-independence government came with several attempts to address the problem. However, the interventions were not specific to the needs of small scale farmers, but geared to large scale farms and massively degraded areas as targeted by HADO and HASHI projects, for example, during the 1970's and early 1980's. Meanwhile, this was also the period of frequent re-organisations of the extension services as well as experimentation of various extension approaches such as the "transformation approach (1962–1966)" which was characterized by focussing on large scale farms and over-mechanization. The approach was simultaneously implemented with the introduction of the "improvement approach" as part of egalitarian policies, tailored for small scale farmers but relying on a few contact farmers. The "commodity approach" between 1978 and 1983 (focus on coffee, tea, tobacco, etc), went parallel to the general extension system, bringing conflict in message delivery to the farmers. This approach was also

² These soils are particularly susceptible to both water and wind erosion.

criticized as being a “supply” rather than “demand” driven system. For that matter solutions to identified soil conservation problems were top-down.

During the last 10–15 years the nationwide extension approach has been – supported by projects such as NALERP (1989–1996) and later NAEP (II) (1996–2002) – based on a T&V system, which elsewhere in Africa has been proven to be less effective in addressing farmer identified problems partly due to its supply-driven approach. In other words, farmers were offered pre-packages extension doses, irrespective of the felt-needs and the flexibility of solutions required according to localities. In this case, land conservation technologies were offered without much dialogue with farmers who were most affected.

However, during the later years of NAEP II (from 2001) the thinking started to change in favour of a more farmer demand driven approach. The long-term plans under “Vision of Extension Service 2010”, for example, states that extension service in Tanzania should be “participatory, demand driven, carefully targeted, cost-effective, gender sensitive and provided in a collaborative and coordinated way...”. It also recognises the need to involve “various stakeholders including beneficiaries so as to enable the farming and pastoral communities to utilize available resources in an effective and sustainable manner in order to improve their incomes and overall standard of living”.

3.3 Sida policies and strategies

The overall goal of Swedish development co-operation is to raise the standard of living of poor people. The Swedish Parliament has adopted the following six specific objectives to achieve this overall goal:

- Economic growth
- Economic and political independence
- Economic and social equality
- Democratic development in society
- The long-term sustainable use of natural resources and protection of the environment
- Equality between men and women

These overall goal and objectives are reflected in Sida’s co-operation in natural resources management. Sida’s policy for agriculture illustrates this. It identifies among other issues “the decreasing soil fertility through over grazing, soil erosion and inappropriate farming methods”. The long term objective for Sida is “*to increase food security and the income for small holders*” through different support areas and among these means are the development and promotion of “sustainable methods and technologies”³.

Of relevance is also Sida’s emphasis on capacity building (or human resources development) as perhaps the most important mean of intervention. Sida’s specific policy on capacity development from 2001 states that the “*principle method is capacity and institutional development*”. This policy, although published in 2001 after SCAPA was phased out, has in general characterised Sida’s development co-operation also during the last decade, when the three SCAPA phases were implemented.

Sida’s country development strategies has since the mid 1990s, when they were introduced, been characterised by efforts to improve efficiency and effectiveness in development cooperation through increased concentration as well as increased sector co-ordination coupled with decentralisation to improve targeting in rural areas. The country strategy from 1997 is characterised by the partnership

³ Sida, (1999) Sustainable Agriculture – A Summary of Sida’s Experiences and Priorities. See also the Swedish version of Sida’s homepage, www.Sida.se.

established between United Republic of Tanzania and the Nordic Countries. The strategy emphasised democratic development, good governance, economic growth and on a somewhat more specific level: more effective public administration, strengthened education and research as well as sustainable rural development.

4 A brief review of SCAPA's different phases

The rationale for SCAPA were both the need to address serious land degradation problems in Arusha region and to do this with a different approach since previous attempts to introduce soil and water conservation for small scale farmers had failed. There were two important reasons for these failures. The first was related to the technologies as such as these were generally more adapted for large scale farms and therefore not suitable for the conditions in the programme area. The second reason was that the introduction and promotion of soil and water conservation had previously been done in isolation from agricultural extension (including livestock and forestry) and sometime with coercive unpopular methods. One could generalise and say that soil conservation was introduced without an understanding and recognition of the local context and the farming systems in a particular area.

SCAPA's operations can be divided into three phases: a pilot phase (1989–1992), the second phase (1993–96) and the third phase (1997–2000). There were contacts established already before the pilot phase between the Arusha regional authorities and the Nairobi based Regional Soil Conservation Unit (RSCU)⁴ in 1983/84. Initially RSCU supported awareness and training activities as well as study tours to Kenya over some years during the 1980s as well a high level soil conservation seminar organised by the regional authorities in 1985. On-farm trials were also established to assess the relevance and appropriateness of the various technical measures proposed.

These on-farm trials were sufficiently promising both in terms of their technical content as well as the approach to justify the initiation of the pilot project SCAPA (1989-1992) in Arumeru district of Arusha region. The sources of funding from Sida during this period came through RSCU and Sida's special environmental fund. Sida was at this time not prepared to fund SCAPA through the country frame, the argument being that this would have required an agreement with the Ministry of Agriculture and Cooperatives (MAC). This would have added a new ministry and a new sector to those Sida already were involved in. SCAPA was therefore on the “donor side” managed or administered by the RSCU and not by Sida during this phase. The actual expenditure was during the pilot phase limited to 1.35 MSEK. The first phase of SCAPA was evaluated in August 1992. The findings of this evaluation were by and large positive and it was recommended that the project should be expanded from a pilot project to a regular development project.

In the second phase (1993–96), SCAPA was expanded to include more villages and farmers. If we use the number of farmers as a proxy for the ambitions of the project, the target increased from 2250 farmers in the Pilot phase to 4620 farmers in the second phase. This phase also added Arusha district to the already involved Arumeru district. The planned budget allocation increased to 3.13 MSEK and the funds now came from the Country Frame, as SCAPA now was part of the “Environmental Sector and Land Management Programme”. SCAPA was administratively managed by Sida in Tanzania, although attempts were made to have it included under the management of the consulting company contracted for the Land Management Programme (LAMP). Sida and the Ministry of Agriculture and Cooperatives did not have an agreement during this phase, so SCAPA's focal point in a formal sense was with the Ministry of Natural Resources and Forestry and Bee Keeping Division.

No separate evaluation of the second phase preceded the third phase that began in 1997. This was to become the last phase since Sida phased out its support to the project after year 2000. A particular constraint the project had to struggle with was the changes in operational and organisational terms, resulting from the new decentralisation policy in Tanzania as from 1998. This altered some of the

⁴ Today called Regional Land Management Unit (RELMA). RSCU/RELMA is part of Sida, although with some autonomy.

assumptions on which the project document was based, when it was prepared in 1996, particularly regarding the project organisation. The third phase was planned with a budget frame of 13.54 MSEK as part of Sida's "Land Management and Natural Resource Management Programme". The target for the number of farmers to be reached increased at the same time to 11,200 (8000 for Arumeru district and 3200 for Arusha district). In addition SCAPA were expected to provide technical inputs in the districts of Babati, Kiteto, Simanjiro and Singida that were included in the Sida supported Land Management Programme (LAMP). The project was administratively managed both by the consulting company for LAMP and Sida.

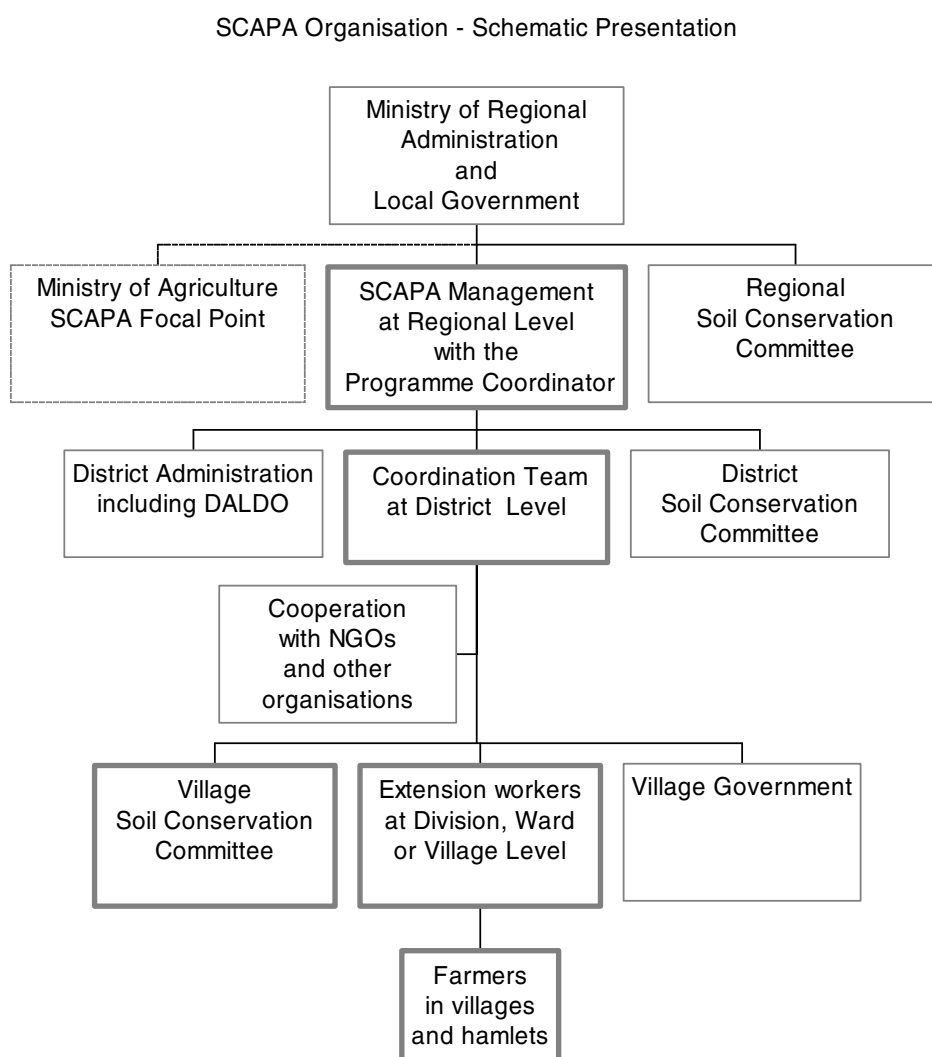
An assessment of objectives, outputs and activities for the three different phases reveals that while being similar (regarding the emphasis on production), there were also slight shifts in focus. The *objectives* of the first phase talk about the formulation of suitable integrated soil conservation extension packages for agriculture, livestock and forestry. The second phase, on the other hand emphasised on implementation to increase production, while the third emphasised on food security and increased income through utilisation of natural resources (Annex 2). The entry point for SCAPA was to reverse a serious trend of escalating land degradation by introducing improved land management practices. But contrary to previous efforts to introduce different soil and water conservation techniques as a "stand alone" extension message, *SCAPA made a point in integrating land management into agricultural/livestock/forestry extension*. In this sense SCAPA could be seen as a "mission" rather than "demand" driven project. SCAPA has, in view of the Evaluation Team, from this aspect been a successful project, something we will come back to later in this report. On *output level* the three phase's changes character to some extent, in that the first two phases had their emphases on physical targets while the third phase focussed more on improved skills and knowledge in the target groups. This however appears not to have translated into any major differences regarding the *activity level*, apart from the inclusion of awareness raising and training activities in land management for school teachers and pupils.

What is particularly notable is that none of the project documents addressed the issue of how SCAPA's achievements and approaches should be institutionalised or internalised at the regional and district levels, as a task in its own right. The question of how the experiences of SCAPA could be made use of at the national level was however on the agenda during the third phase. A special project – the District Programme Support Project (DPSP) – based in the Soil Conservation and Land Use Planning Section (SCLUPS) in the Ministry of Agriculture was prepared in 1996 and received support from Sida for less than two years after it was terminated due to lack of progress. The internalisation and the use of SCAPA's experiences is something we will come back to in different parts of this report.

5 Organisation and management in SCAPA

The main features of SCAPA's organizational arrangement during the third phase are summarized in Figure 1. The boxes with the bold frames represent the core implementation structure. Other boxes performed various support and guiding functions or formal administrative and supervisory roles. An example of the latter is MRALG (today PO-RALG) with whom Sida had their Specific Agreement during the third phase for the "Land Management and Natural Resource Management Programme". This also included SCAPA. During the second phase the Specific Agreement were with the Ministry of Natural Resources and the Forestry and Bee-keeping Division. To establish a meaningful and functional relation with MoA turned out to be problematic as explained elsewhere in this report (Section 8.7). In this sense the "box" with MoA as a focal point in figure 1, illustrates the intention rather than a functional relation with SCAPA. In 1998 the functions and mandates of SCAPA Regional Administration were drastically changed as part of the overall decentralization of several regional responsibilities to the districts. The organogram represents the project organisation after this decentralisation.

Figure 1. SCAPA organisation



The guiding or supporting institutions for project implementation included the Regional Soil Conservation Committee (RSCU), District Soil Conservation Committee (DSCU), while the Regional Programme Co-ordinator, the District Project Coordination Team (DCT) and the Village Soil Conservation Committee together with the local extension workers and the farmers were more directly involved in implementation. Both the District and Village Soil Conservation Committees (VSCC) worked and remained very instrumental in guiding the implementation of SCAPA activities at the district levels. The District Co-ordination Team (DCT) consisted of personnel from departments of agriculture, livestock and forestry of the District Administration and was appointed by DALDO. The local extension workers at division/ward/village level were involved in SCAPA, without being specifically appointed. The VSCC on the other hand were elected by the villagers as part of the initial steps in SCAPA's extension approach. In villages with larger areas, some sub-committees to represent hamlets (vitongoji) were also elected. These committees received support from the Village Government Authorities in enforcing agreed guidelines in proper land management practices. The committees composition included a minimum number of women members to ensure gender balance in decision-making and implementation.

SCAPA was before 1998 managed within the Regional Administration of Arusha. The Regional Co-ordination Unit performed most of the tasks that later were decentralised to Arumeru and Arusha District. This led to the establishment of the DCTs, with full autonomy to plan and execute their own activities. These changes were necessitated by the national decentralization process which saw the devolution of administrative functions from the regions to the district local authorities as part of the Local Government Reform Programme. The Regional Coordination Unit (RSCU) was however retained, after several considerations, at the Regional headquarters to help coordinate backstopping efforts by SCAPA personnel to other non-SCAPA areas. Another argued rationale was to help link the SCAPA districts with national and regional stakeholders, including RELMA, based in Nairobi. *This appears in view of the Evaluation Team as a somewhat "weak" argument.* Part of this coordination was effectively handled by the SCAPA districts through out the period and the links with RELMA could have been maintained both with the districts as well as with the MoA, where RELMA already have a contact person.

SCAPA enjoyed a high degree of autonomy in terms of management and administration, while being integrated in the regional and district administration. They had their own budget and account and were in this sense independent from the local administration. The initial argument⁵ for this autonomy was basically the fear that local bureaucracy would slow down implementation and progress in the programme. SCAPA was at the same time integrated in the development efforts of the region/districts as their annual plans of operation were presented and commented upon by the local administration and through the regular progress reports provided by SCAPA. This integration was an obvious consequence of the staff seconded from the district extension service to SCAPA. *While the argument for a separate management structure for SCAPA probably were well founded during the pilot phase, the Evaluation Team is less convinced that this was a sensible arrangement for the other phases.* With this conclusion, we question the design and not the management of the project for the second and third phase. Both phases were about awareness raising and capacity building in land management issues and implementation of technologies in the field. SCAPA achieved many of these ambitions. The issue of institutionalising SCAPA's experiences however, by developing district extension using SCAPA as a vehicle in the following phases were never addressed⁶, since this was not part of the project documents.

⁵ See for instance the Evaluation of SCAPA from 1992.

⁶ The evaluation from 1992 raised the issue of institutionalisation of SCAPA as well with considerations for the resource constraints in the district administration. This recommendation was however never pursued neither by SCAPA nor by the parties.

The Annual Plans of Operation were essentially target driven and this is also reflected in the monitoring and reporting system of the programme. The Evaluation Team's assessment is that SCAPA has provided reasonable reporting on activity and output level, but not in a more systematic way regarding the impact and efficiency in terms of e.g.

- reduced soil erosion or improved productivity,
- adoption rate of new technologies among farmers (preferably categorised),
- viability of local institutions notably the VSCC,
- costs for a limited number of key factors,
- etc.

This is not to suggest that a comprehensive overambitious monitoring system should have been in place, but we believe that with reasonable efforts *it should have been possible to provide more systematic information about some key aspects for analysis and assessment of impact*. Representatives of the programme have a general sense of the impact and can also in general terms describe these, but this is not a substitute for a more informative monitoring system.

6 The SCAPA Extension approach

As described in the previous chapter, SCAPA was implemented by multidisciplinary teams first from the region and later from the districts concerned. The representation of different disciplines for the two districts Arumeru and Arusha is illustrated in Table 2 below. As can be seen from the table, there was a predominance of livestock specialists with female outnumbering male personnel. The number of staff was less for Arusha, presumably as a reflection of less ambitious targets and a smaller budget than for Arumeru. Moreover Arusha did not have a forester or a water technician in its team. The reasons for these differences were however not clear to the mission. It may not have been an important issue, since team members were trained in other disciplines, i.e. after some time individual staff members were able to perform multidisciplinary extension tasks.

Table 2. SCAPA team's composition at the time of this evaluation (M – male, F – female)

Speciation	Arumeru District		Arusha District		Grand Total
	M	F	M	F	
Land use Planning	1		1 *	–	2
Livestock Production	–	3	1	2	6
Crop Production	1	3	–	1	5
Community Development	–	1	–	1	2
Water Technician	1	–			1
Forestry	2	–			2
Range Management	1 *				1
GRAND TOTAL	6	7	2	4	19

* Project Managers for respective districts

The extension teams were permanent and members replaced only when they left the district either on transfer or for some other reason. The Regional Programme Coordination Office and later – after the decentralisation in 1998 – the District Co-ordination Team for Arusha and Arumeru respectively, were responsible for planning and implementation of project activities. The team went regularly out for field activities, normally on four out of the five working days per week. The major tasks included:

- Training of VSCC members and farmers and other groups on various aspects of the SCAPA project components such as laying out of contours, raising and managing tree nurseries, growing of fodder legumes and grasses, livestock management, etc. (for more information on technologies see section 7);
- Organizing farmer study tours, exchange visits, farmer field days, etc;
- Raising awareness on soil and water conservation amongst politicians and other governmental officials;
- Preparation of training materials in the form of extension leaflets, posters and booklets; and
- Organising and implementing training of local extension workers.

The DALDO (Figure 1) is/was overall in charge of agricultural and livestock extension at the district level with responsibility for overseeing implementation of extension activities by extensionists at village, ward and division levels. In theory, this also included the extension activities conducted by SCAPA.

However, in practice, the SCAPA extension teams enjoyed a high degree of autonomy, as described in the Section 5. The role of DALDO was limited to nominating extension workers to work in SCAPA and receive progress reports for SCAPA activities for reporting to the district administration and to higher authorities at the regional level. At the village level SCAPA district extension teams worked together with the local village government and the local extension workers at the village, ward or division level. While the different soil conservation committees at different administrative levels were established for the benefit of the project, they had different functions. The RSCC and DSCC had an advisory or guiding role and were not involved in implementation. The VSCC on the other hand were crucial both for implementation and to ensure sustainability once the initial and more intensive interaction with the extension team from the district were over.

The initial aim during the pilot phase was to demonstrate the relevance of a holistic approach to extension where soil and water conservation and agroforestry were integrated with extension in crop and livestock production. In the second and third phase SCAPA was expanded to cover more farmers and villages as well as other target groups such as teachers and their pupils. Another salient feature of SCAPA was the participatory approach. The first “test” for SCAPA was to have their extension approach and technical package accepted and supported at the local level. *In both districts, a key factor was to involve the village government to ensure active participation in organizational and administrative matters at the village level.* The approach in the two districts differed slightly though. These are summarised in Figure 2 below.

Figure 2. Comparison of extension procedures in SCAPA

Procedures in extension in Arumeru district
• SCAPA extension team conducted an initial needs assessment through PRA in each village or project area. The findings from the PRA were used to assess the overall situation in order to determine the actual farming activities. The residents of the village were the main sources of information to ensure that the community's' thoughts and ideas were taken aboard; • Problems relating to soil and water conservation were identified and potential solutions were discussed and agreed upon between the SCAPA extension team, VEW and the local community; • In the event the SCAPA objectives were received positively, the SCAPA team mobilized the election of a 7–10 persons of both gender to serve in a VSCC as a focal point for land management activities and also to serve as the local body monitoring progress at the local village level; • Activities identified were implemented. The SCAPA extension staff played the role of facilitators by providing awareness/training exercises, simple equipment, planting material, laying out structures for soil and water conservation, etc., while the farmers themselves were responsible for actual implementation, e.g. constructing the contour bands, planting trees or livestock fodder, etc.; • The VEWs, who were offered regular technical training together with the SCAPA extension staff, provided the necessary backstopping in the villages assigned for their regular activities.

Procedures in extension in Arusha district

- At the beginning, target villages were identified and VEW from these villagers were trained to raise awareness on land management. This step was considered necessary to canvas for support and participation of VEWs in the target villages;
- Following the VEW training, meetings were held with village leaders at ward level, followed by meetings with village leaders at hamlet level. The VEW assisted with arrangements of such meetings. At these meetings, the SCAPA team discussed different land degradation problems of the village and what was needed to be done, and explained what the role of SCAPA and the role of farmers would be if farmers chose to accept to participate in land management activities;
- In the event the SCAPA objectives were received positively, the SCAPA team mobilized the election of a 7–10 persons of both gender to serve in a VSCC as a focal point for land management activities and also to serve as the local body monitoring progress at the local village level;
- The VSCC comprised the first group of farmers to receive training and study tours to raise awareness, invigorate interest and commitment;
- Activities that were implemented were those for which there was consensus with the farmer(s) which emphasis was put on joint planning, implementation and monitoring;
- The VSCC and the VEW continued layout and construction of contours on their own with supervision being provided by a member of the SCAPA extension team.

While both districts have had a combination of a mission driven as well as demand driven approach, we can see that the Arusha Team emphasised the “mission” approach more at the beginning, but paying due attention to stakeholder participation at subsequent stages. The evaluation team was also informed that as field activities gained popularity and became known in many other parts of both the Arumeru and Arusha, requests were made both from village governments as well as from individual farmers to have SCAPA activities extended to include their villages and/or farms. The range of activities for which SCAPA offered extension advice and regular monitoring during weekly visits included:

- Soil and water conservation through contour construction coupled with agricultural field operations following contours (ploughing, planting) as well,
- Planting of tree’s, shrubs or grasses or along the contours in crop fields (agro-forestry) and developments of woodlots to support other activities such as fuel supply and bee keeping,
- Agronomic practices (choice of crops, spacing, use of farm yard manures, irrigation practices, etc),
- Livestock husbandry (fodder grass and legume species, livestock housing (cow sheds) under zero grazing system, bio-gas technology, etc),
- Water harvesting structures, aquaculture and construction of improved stoves, and
- Organizing field days for farmers to visit with others and learn on techniques and progress made in soil and water conservation activities.

While the SCAPA extension teams adopted a participatory approach and involved the local administration, the mainstream extension methods and organisation was quite different. In 1989/90, the Ministry of Agriculture adopted the Training and Visit (T&V) system under the World Bank funded National Agricultural and Livestock Extension Project (NALEP). The principle under which T&V operated was to identify potential early adopters in a village and assign such farmers the responsibility of overseeing another 20–25 farmers. Under this system, extension workers received

training in a particular subject on a monthly basis. The extension worker then made regular visits to train the contact farmers who served as focal point for disseminating a well defined extension message brought in by the extension workers. The National Agricultural Extension Project Phase II (NAEP II), which succeeded NALEP in 1995/96 continued to use the T&V until 1999 when a mid-term review recommended a shift to both more participatory methodologies as well as the need to forge more effective linkages with research⁷. A serious weakness with this approach was that the farmers were offered pre-packaged extension doses on a particular subject usually on a monthly basis, irrespective of the felt-needs and the flexibility of solutions required according to localities. *In this sense SCAPA's extension approach has been fundamentally different from that of NALEP and NAEP, but as SCAPA was viewed more as a technical land management project by the cooperating partners (Sida and GoT) and indeed by the programme team itself, the opportunity to capitalize more systematically on SCAPA's experience as an extension project was never really pursued.*

A successful extension system is based on the strengths, skills and attitudes of its staff, and the infrastructure and resources available in order to execute different extension activities. The outcome of extension is also highly dependent on the perceptions, knowledge and experiences of the farmers and how the extension workers are able to relate to this. At village level the VEW worked in collaboration with the SCAPA extension teams. The evaluation team was not able to determine whether the difference in approach (as compared to NALEP and NAEP 2) created any conflicts, which either affected SCAPA or NALEP/NAEP negatively. However, the team noted, during visits made to some of the project sites that farmers still associated all extension services with SCAPA even though SCAPA ceased to actively function over two years back. The Evaluation Teams' assessment for this image of SCAPA is the combination of the approach itself and that the programme provided resources to enable e.g. the DCT, the VEW and the VSCC to perform their tasks. In NALEP/NAEP these resources have been scarcer. SCAPA also offered assistance to farmers which helped jump-start some of the activities. For example, SCAPA provided:

- Transport for the staff
- Field allowance for the staff
- Equipment such as the line levels for proper and design and lay out of the contours
- Tree seedlings
- Fodder grass (seeds, cuttings)

In both districts, the Evaluation Team noted that SCAPA activities expanded beyond the initial mixture of soil conservation/agroforestry (land management) and extension in agriculture and animal husbandry. There appears to be essentially two explanations for this.

First, some of the technologies were introduced as SCAPA in the second and third phase got more involved in "dryer" lowland areas, where seasonal water shortage can be a difficult problem. In response to this SCAPA has demonstrated different water harvesting technologies, some of which were heavily subsidised (Section 7.3). The second set of activities or technologies is more an indication of farmers and SCAPA staff being able to take advantage of other opportunities which came as spill overs from their involvement in the main components of SCAPA. For instance, the introduction of improved stoves reduced the pressure on fuel wood while tree planting created conducive environment for engaging in beekeeping. The involvement of SCAPA in these other activities, outside the major

⁷ The Team was informed that implementing the shift to participatory methodologies is in progress. Specific steps include a TOT organized in 2001 for two district- level extension workers/ district for 55 districts (out of 119 districts) followed by a training of the about 20 frontline staff (village/ward/division extension workers per district (1100 persons) for the same 55 districts. The principle behind the shift to participatory methodologies is to ensure farmers active participation at all stages (planning – implementation – monitoring and evaluation) while NAEP staff would play the role of facilitator.

mandate of the project, was partly made possible through collaboration with other NGOs and government departments operating in the two districts. The most important include the following:

6.1 Heifer Project International (HPI)

Heifer Project International is an NGO, which aims at promoting dairy production as a means of raising the income and nutrition of farmers in Arusha region and other areas. SCAPA collaborated with HPI to complement the activities of each other in the SCAPA project area. SCAPA was primarily involved in land management and introduced the growing of fodder grasses and legumes for stabilization of contour banks. To add value to the fodder, SCAPA collaborated with HPI and operated a loan system for in-calf heifers. As a pre-condition for a farmer to qualify for receipt of a heifer under the 'heifer loan system' operated by HPI, he/she had to be involved in soil conservation activities with evidence of having established fodder production on the farm. SCAPA and HPI selected and proposed to HPI farmers who qualified to receive in-calf heifer after having satisfied the basic requirements – i.e. having established contours and fodder. In this way, the prospect of qualifying for a loan of an in-calf heifer under this arrangement served as incentive for farmers in the SCAPA areas to be more vigilant in their soil conservation activities. Before this collaboration, HPI had to train farmers on the whole process from provision of heifers to management services and farmers were reluctant to grow fodder, which had no other added advantage. SCAPA has also provided heifers on their own as incentives to successful farmers. This is further analysed in Section 7.2 and 7.4.

6.2 Traditional Irrigation Project (TIP)

Traditional Irrigation Project was initiated in 1993/94 as a pilot project in seven districts in Tanzania. Arumeru was included in TIP activities in 1998. In 2000, TIP was transformed into an NGO – TIPDO (Traditional Irrigation Project Development Organization), which is represented by district, employed staff who implement activities in target areas. Collaboration between SCAPA and TIPDO is in assisting with the strengthening of traditional irrigation canals to assist farmers' access and use the water for irrigation of crops (food, cash and fodder crops etc.) and for domestic use. The Evaluation Team visited the farm of Mr Elisha Lomnyaki at Kimandolu village in Arusha district who uses irrigation (developed under TIP) to produce bananas, grass fodder and vegetables on his 0.75 acre farm.

6.3 Selian Agricultural Research Institute (SARI)

Selian Agricultural Research Institute is one of the seven zonal agricultural research centres in the country. SARI is the zonal centre for the Northern Zone which has collaborated with SCAPA since 1995. Within SARI, SCAPA collaborated particularly with the Special Programmes (soils, farming system, soil conservation, and agro-forestry) section on a range of activities. SARI staff who met with the evaluation team indicated that they use SCAPA project areas as study sites for farmer training on soil and water conservation and often invited SCAPA extension staff to training sessions and meetings organized at SARI. SARI staff members have also used SCAPA project sites to conduct various studies – at least two studies leading to MSc degrees (one in soils and another in livestock production) have been conducted in Arumeru district. SCAPA has on the other hand made use of the soil analysis services offered by the soil analytical laboratory at SARI. SCAPA has also received planting materials of fodder grasses and legumes for on farm trials and demonstrations (for more on these trials – see Section 7.2)

6.4 Overall assessment of the extension approach

SCAPA can be credited for having developed capacity for a multidisciplinary holistic extension approach at the district level. This however does not necessarily translate into changes in the district extension system. We should however not lose sight of the core objectives of the three phases of SCAPA, that in general terms was to improve production through the development of an extension package that combine land management with crop-, livestock- and forest- extension. In other words, SCAPA has never explicitly claimed to be a project that would change the extension system. This is important to remember when reading this section. The assessment here goes beyond the original project documents, both because the Evaluation Team believe that the question of internalisation should have been explicitly addressed in the project documents at least for the second and third phase – as we argue in Section 5.

In terms of quantitative achievements, SCAPA's own reporting provides an impressive number of activities related to SCAPA's focus on capacity building (see Annex 3). From the same annex one can also see that quantitative achievements in terms of physical structures and/or seedlings planted appears to be quite impressive⁸ as well. *As regards the more specific strengths of the extension approach the Evaluation Team would like to mention the following:*

- Frequent training sessions offered to the SCAPA extension teams and the local Extension Workers (VEW), which expanded their horizon and made extension workers more versatile and able to deal with a variety of expertise in addition to their original training,
- Frequent visits to project sites established trust between farmers and the SCAPA extension team,
- Activities were implemented by individual farmers on their land and the same farmers were used to inform and train other farmers as the programme expanded. This helped generate pride and ownership of successes achieved, and
- Creation of VSCC to serve as focal points meant that they could continue with the field activities even after SCAPA continued to the next village. At the time of this evaluation, individual farmers were still being assisted with alignment of contours by members of the VSCC.

However, *the Evaluation Team also noted weaknesses associated with the extension activities, some of which were related to the design of the project phases, while others were specific to the implementation of SCAPA.* These included the following:

- VSCC did not appear to have a systematic approach e.g. a long term work plan to guide their activities. The Evaluation Team asked for such plans in at least three of the villages visited. In none of these villages did the VSCC have a workplan.
- Most of the VEW, who were expected to assist the SCAPA extension teams with daily follow-up reside in Arusha municipality and not in the villages they are supposed to serve. The facilitation and extension support by VEW's has been severely curtailed since the termination of SCAPA, in the absence of the transport facilities⁹ in the programme.
- Lack of documentation (including photographs) to capture changes on selected sites as evidence of achievement of project activities, and
- Failure to integrate costs for execution of soil and water conservation activities into the district budget – as a result extension activities stopped as the funding to SCAPA ceased in December 2000.

⁸ Note that these achievements are based on an incomplete set of progress reports. The figures compiled therefore represents the magnitude rather than the precise quantitative achievements.

⁹ Most of the vehicle's are still somehow under the control of the district SCAPA office, but the lack of funds for maintenance and petrol limits the use.

The failure to address the last point above as part of internalisation at large and the importance of this issue can perhaps best be illustrated by the difference in resources available for SCAPA and the existing extension set up under DALDO. The annual budget allocation for Arumeru and Arusha in the last phase has been in the order of 150 MTSH (more in Arumeru and less in Arusha). The annual budget allocation for e.g. DALDO in Arumeru is not even 10% of this. In both cases the salaries are paid for by the Government. *While these budget allocations can not be compared as they stand without a lot more background information, they do provide sufficient food for thought to realise that any “phasing in” of SCAPA into the existing administration would have required special attention.*

An early and perhaps justified concern about the inefficiencies of the local administration (see e.g. the Evaluation from 1992) explains SCAPA's high degree of autonomy in terms of managing their own budget, planning and monitoring. The same evaluation also puts the issue of parallel structures and the need to assess what could be possible within the existing government system. The lack of attention – or rather the late attention in the third phase – for this recommendation is the most serious omission by the concerned actors i.e. Sida, MoA and MRALG as well as the SCAPA team and the district authorities. The Evaluation Team want to emphasise that we by no means suggest that all of SCAPA's extension methods could or even should have been internalised by the existing government organisations. The differences in resources between SCAPA and District extension as mentioned in the previous paragraph is one obvious issue. *So much more reason then for proper attention from the parties (Sida and GoT) to the recommendation by the previous evaluation as it had clear institutional and possibly also policy implications.*

6.4.1 Cost efficiency

Finally it could be of interest to see in what way the cost for a limited number of key indicators has developed over the three phases. As there never were any monitoring and reporting system developed that provided this kind of information and analysis, the Evaluation Team suggest three indicators as these represents activities and support in SCAPA that has been common through out the three phases. The key indicators selected are i/ training (cost/farmer); ii/ local interaction (cost/farmer); and iii/ input (cost/seedling). The cost estimates are based on the limited information available in terms of annual plans and budgets and/or progress reports and outcome. The figures are compiled in the table below. Any comparison should be applied with care as the main purpose with the table is rather to illustrate that some basic information can be used to provoke analysis and look for opportunities to improve cost efficiency.

Table 3. Cost efficiency for some key activities

Key indicator	Phase 1	Phase 2	Phase 3
1. training*	SEK 55/farmer	SEK 45/farmer	SEK 104/farmer
2. local interaction**	SEK 50/farmer	SEK 100/farmer	SEK 180/farmer
3. plant material***	SEK 0.3/seedling	SEK 0.3/seedling	SEK 0.25/seedling
*The figures only include operational costs for training (allocated or reported). The 1 st phase includes costs for training of extension workers. The actual cost for farmers should be lower. The 2 nd phase include cost for farmer and Village Soil Conservation Committee members. The 3 rd phase could be divided into different type of training as follows. i/ Study Tours SEK 152/farmer, ii/ Promotion Days SEK 75/farmer and iii/ Field Days SEK 38/farmer			
** The figures are based on budget allocations or expenditures for daily allowances and the achievements or targets for farmers involved in land management activities. These were: i/ 2700 farmers and SEK 140 000, ii/ 4600 farmers and SEK450 000 and iii/ 10 000 farmers and SEK 1 800 000 for the three phases			
*** The cost estimates for the 1 st phase is based on seedlings from project nurseries while the other phases are estimates for on-farm nurseries. The figures used are only operational costs including training and material.			

Source: Figures used are from the Evaluation report from 1992 and the Programme Documents for the 2nd and 3rd phase

The cost of training will mainly depend on changes in field allowances and possibly also transport and training material. Local interaction (visiting farmers) will be a reflection of changes in transport and field allowances for the extension staff, while cost for seedlings would depend on the material input and any fee or salaries paid for producing these seedlings. The question is whether the differences in costs are reasonable in relation to changes in inflation rates, field allowances, etc. But there might be other factors as well behind the differences. Most important is that the structure of the budgets and progress reports has not been consistent over the three phases. This requires that any comparison and analysis is made with care, something that the management in SCAPA would have been in a better position to do. *On a more general level we can ask if – after all adjustments have been made – the pilot phase still would appear as being more cost efficient than the other phases?*

Beyond the changes in DSA, transport costs etc, the Evaluation Team can only speculate and suggest some possible explanations other than that SCAPA over the years were actually less cost efficient;

- *The planning and reporting in SCAPA tend to see field visits as achievements* in their own right. The fact that these have to be budgeted for might be an explanation. But in the process one may forget that increasing costs e.g. per farmer may call for more careful planning and implementation of extension and perhaps even the overall extension approach.
- The increase may be due to *the relative increase of more expensive technologies* and demonstrations in phase 2 and 3 such as water harvesting technologies, pasture trials etc., which may have called for more intensive supervision.
- *A shift in geographical focus* from the high/medium potential areas during the pilot phase towards the more difficult low potential areas, may have called for more frequent field visits.

If we go beyond the objectives and the ambitions in the project documents, *the cost efficiency for “local” interaction and for training of farmers would have been crucial for any attempt to internalise SCAPAs experiences* in the district extension system. The available funds and resources were much more limited for the district than they were for SCAPA, particularly during the last phase. If possible, the visits or interactions with farmers should have been categorised e.g. by “first visits” and “repeat visits” or by categories that reflects the extension approach.

7 SCAPA and the technologies for improved land management

As there are no final progress reports for SCAPA, whether for each of the phases or for all the three phases together¹⁰, the achievements in quantitative terms for different soil and water conservation structures and various biological measures has to be compiled from different sources of information. These figures have been compiled in Annex 3. For the most significant ones¹¹, namely the establishment of “bunds” for soil conservation and distribution of plant material as part of improving land management, the achievements have been estimated by the Evaluation Team to be¹²:

- The total length of bunds established over the three phases amounts to approximately 1000 km¹³. Out of this approximately half were constructed during the first phase!.
- The number of seedlings planted as part of the agroforestry component is estimated by the mission to be in the order of 1 000 000–1 500 000.
- The quantity of plant material (mainly Napier grass) for stabilising bunds and gullies has also been very significant, but the only figure available is for the pilot phase, where it amounted to 150 tons

There are of course also other achievements in physical terms in e.g. establishment of nurseries and wood lots, gully control, water harvesting (tanks, jars and ponds), dry land farming, livestock management (grazing management, fodder multiplication, pasture trials, distribution of heifers etc.), and distribution of bee hives.

In this section we will look into some of these technologies more specifically and their impact in relation to land management, productivity and appropriateness for local condition. Among all the different technologies and extension support activities in SCAPA, the mission has made a selection of those that have clear implications for land management (productivity) or those that otherwise have been significant in SCAPA. These are (i) Physical and biological measures to improve land management including agroforestry, (ii) activities related to livestock management (cattle) and (iii) water harvesting.

7.1 Improving Land management

7.1.1 Physical and biological measures

The technologies promoted for improved land management in SCAPA has relied on a combination of physical structures and biological measures. Some of these technologies are presented and analysed in more detail in Annex 4. The detailed technical design or selection of species has varied according to local conditions in terms of soil, rainfall, slope and local farming practices.

Apart from cultivating on the contour (rather than up and down the slope) there are different kinds of physical structures (earth/stone bunds, terraces) or biological measures (grass strips, trash lines, strip cropping) that primarily aims at reducing the length and the gradient of a slope. This reduces the run

¹⁰ With the exception of Arusha district who have compiled a “Phasing Out Statement” for the 2nd and the 3rd phase.

¹¹ in terms of quantities and involvement of a substantial number of farmers.

¹² These estimations are based on a set of incomplete progress reports, which was what was made available to the mission. In other words these figures should be read with care. Moreover the estimates does not cover physical achievements by of other adopters whose successes are not captured by the project’s monitoring system.

¹³ The Evaluation Team estimates varies from 850 km to 1300 km. If SCAPA would have collected and organised their information on area covered in relation to the area in need of erosion control, their plans and progress reports would have provided for more useful information.

off and therefore also erosion (sheet and rill erosion). The physical structures can be either on the contour in which case the run off will be trapped by the bunds or constructed with a slight gradient to safely divert excess run off from the agricultural land. SCAPA has almost exclusively been working with earth bunds and to some extent grass strips on the contour. These are not as difficult to design and construct as graded contours. Moreover, bunds established with a gradient also require special measures to safely dispose excess run off down the slopes, normally through so called “water ways”. These waterways will – apart from being technically complicated to design and establish – cover a considerable amount of land. This will be inherently difficult where there is a lack of cultivated land as the case has been the project area. Terraces on the contour on the other hand also improve the soil moisture content and as long as these soils will not be water logged or increase the risk for land slides, this will enhance productivity. A salient feature has been that productive use has been made of almost all the earth bunds by planting fodder grass or legumes along/on the

Photo 1: Earth bund planted with Napier grass. Note that the cultivated land has been planted with pigeon pea. The pigeon pea which is nitrogen fixing is commonly used as cover crop for green manure and/or fodder.



A second group of measures includes those that affect the crop itself, since this can improve the protective cover from intensive rainfall. Examples in SCAPA are e.g. crop rotation, mixed cropping, mulching and the use of organic fertilisers (farm yard manure, compost, green manure etc.), much of which is part of extension in good crop management. From an erosion point of view, these measures can extend the time the land is covered by vegetation as well as the quality of the cover itself. Some of these measures are important in that they can improve the fertility of the soil e.g. by improving the organic matter content. If, in addition, leguminous plants are included in the system, the availability of nitrogen in the soil will be improved (Plate 1).

The third and last group of technologies are those that have an impact on the soil characteristic itself or its susceptibility to erosion. Intensive tillage may destroy soil aggregates or clods and therefore make the soil more vulnerable to erosion. Minimum tillage reduces the disturbance of the soil surface – from harvest to harvest – e.g. by leaving the crop residues after the harvest combined with limited land preparation. The most extreme case is with small holes for the seeds instead of preparing the seed bed with ploughing and harrowing). A special case is the so called sub soiling, which rather could be seen as a very comprehensive tillage or land preparation practice. The purpose is usually to break the formation of hard pans or compacted layers of the soil that otherwise reduce the infiltration of water and even impede the development of a sufficient root system for the crop.

In addition to these technologies it is sometimes necessary to protect farmer's land from excessive amount of overland flow entering the land. In these cases, it might be necessary to trap this water through a cut off drain, which should safely divert the water to a waterway (Annex 4). These are technically more difficult structures and the waterway in particular has the added disadvantage of requiring substantial amount of land. Fortunately, the topography, soil and rainfall in the SCAPA area have not called for these kinds of structures other than in exceptional cases. Cut off drains may also be required as part of addressing problems with gully formations.

The mission's assessment is – from a strictly technical point of view – that the technologies applied for these three main categories, has been sound and well motivated.

7.1.2 Agroforestry

Agroforestry is defined in SCAPA's own manual as “a land use system in which trees or shrubs are grown together with crops and/or livestock on the same piece of land”. Besides providing benefits to farmers in terms of fuel wood, poles, shade, fodder, food, live fencing, timber, resins, fruits etc. agroforestry can also contribute to improved land management. The trees and shrubs can be planted along the earth bunds or be part of a strip cropping system or grown in rotations with other crops. The trees and shrubs can also be raised in special wood lots, along the boundaries of the farm land or in home gardens.

Trees and shrubs can improve soil conditions and thus contribute to improved crop production when leaves and twigs decompose. This can be done systematically by using leaves and twigs as mulch directly on the cultivated land or as part of a compost that could be applied later on the land. Nitrogen fixing trees and shrubs can be used as organic fertilisers and reduce the need for nitrogen fertilisers. The additional fodder provided from trees can be particularly useful during the dry season. Moreover it provides indirectly for more cattle manure that can be used as fertiliser for the crops.

At the same time trees and shrubs can compete for water, soil nutrients and sometimes also light with the agricultural crops (Plate 2). In areas where user rights/land tenure is unclear, farmers may be reluctant to plant trees/shrubs. Livestock frequently destroy planted tree seedlings when free grazing is practised. In other words – any introduction of agroforestry require care, where the current farm practice and farmers potentials and constraints needs full consideration. The selection of species and how the seedlings should be produced and managed once these have been planted are critical issues. Some more details and technical considerations are provided in Annex 4.

Photo 2: In low potential areas the grass and the trees on the contours can compete with the crops. Pruning branches and the roots of the trees can improve the situation.



Agroforestry together with the use of different fodder grass and leguminous species has been an integral part of the technologies in SCAPA that – besides the more immediate and/or tangible benefits provided – also has been important components in improved land management practices. Common species are e.g. *Cajanus cajan*, *Leucena leucocephala*, *Sesbania sesban* and *Grevillea robusta* out of which the three first are potentially nitrogen fixing. Some of the seedlings are raised in “SCAPA” nurseries, while others originate from “on-farm” nurseries. *The mission’s assessment is that the agroforestry component – with few exceptions – has been technical sound as has the selection of various species.*

7.1.3 Impact on productivity

Soil and water conservation and agroforestry has in a sense been the core technologies (at least initially), which have been combined with other disciplines in agriculture extension. It is difficult to assess the impact of SCAPA in terms of changes in productivity and/or income generation, in the absence of base line data. In terms of their influence on productivity, the mission has relied both on the information provided by different farmers as well as the outcome of a research project recently completed in the area. Our assessment is indicative only and refers to yields per unit area of land.

It seems clear that SCAPA has had a significant impact on the yields of e.g. maize and beans. The figures mentioned by the farmers vary from 70% up to 500% (!) increase in yields. The most extreme increases illustrates the difference between an exceptionally poor year (e.g. due to pests or insufficient rains) with one harvest per year to an exceptionally good year where the number of harvests may have increased to two per year. Without being able to accurately account for these extremes, the mission believes that yield increases of anything between 50 up to 150% are not unlikely. One should however remember that this is the combined effect of different soil conservation measures (contour cultivation, earth bunds etc.) and biological measures (mulching, manure etc.) coupled with extension in crop production (new crop varieties, seeding time and short maturing varieties that sometime has allowed for two harvests per year etc.).

It could also be of interest to get some idea of the impact of soil and water conservation alone. A recent research from Sokoine University¹⁴ on farmers land with SCAPA extension support has

¹⁴ Ngatoluwa R. T. (2001), Impact of Soil Conservation Measures on the Properties and Productivity of Volcanic Soils on the Slopes of Mount Meru, Arusha, Tanzania (Unpublished)) MSc dissertation.

established that the yield of beans increased by approximately 37% for contour bunds or 49% for fanja juu bunds as compared to non-conserved land in the high potential areas and with 116% and 142 % respectively on a low potential area. The corresponding figures for above ground biomass were 67 % and 96% increase in the high altitude and 71 % and 99% in the medium altitude. Hence if these figures are used as indications of the impact of soil conservation only in the SCAPA programme area, one can assume that both the yield has increased (which bring immediate benefits to the farmer) as well as the biomass which provides better protection from heavy rainfall. This biomass is also useful as fodder and/or for compost/green manure.

As the farmers in SCAPA have benefited from soil conservation and also improved land management with mulching and manuring (from agroforestry) coupled with crop extension, the previous guesstimate by the mission of between 50 to 150% increase in yields does not seem unrealistic. While the conclusion is that SCAPA's core activities appears to have had a significant impact on the productivity of the land – a more thorough and systematic investigation would be required to assess the overall increase in productivity¹⁵, than what this mission can offer. Many of these practices also imply a more intensive use of land. Apart from the possible consequence for labour requirement, they may have implication for the soil fertility. Intensification offers possibilities but is also a threat to sustainable land management.

7.2 Livestock

Livestock is an integral part of the farming systems in the programme area. It is both part of the problem of land degradation, while at the same time offering opportunities for improving production and income at the farm level. Different aspects of livestock management were also included early in SCAPA. Overgrazing due to shortage of grazing land and inappropriate management can cause severe land degradation and also damage agriculture crops, tree seedlings etc. if not properly controlled (Plate 3).

In the high potential area most of the land is used for crop production, which necessitate special fodder production or purchase of fodder since the land available for grazing is limited or does not exist at all. As the high potential area is primarily in Arumeru district, which is close to Arusha town, quite a number of farmers keep one or a few dairy cows as there is a market for milk. SCAPA has provided extension support in various ways. The provision of plant material (most commonly cuttings of Napier grass) for planting on the contour bunds has served the dual purpose of stabilising the bunds and significantly contributing to fodder production on the farm. This has also resulted in an increase of farm yard manure, which has been applied as organic fertiliser on the crop land. In this sense the production of fodder has improved land management both directly and indirectly. A few farmers use the farm yard manure for bio gas production before the slurry is used as fertiliser. In addition to this SCAPA has provided extension support on other aspects of livestock management such animal health, design of cow sheds etc.

¹⁵ Including productivity in relation to labour and other resources and not only in relation to land.

Photo 3: Severely eroded land in foreground, due to insufficient grazing areas for livestock in the low potential area. Note the construction of contour bunds on the cultivated land in the background, initiated through SCAPA.



In the low potential area, livestock is more part of the problem or rather the excessive number of cattle in relation to limited areas of grazing land. This situation is in some areas further complicated by the migration from the over populated high potential area around Arusha township. From a strictly technical point of view, the standard approach to overgrazing is to develop alternative grazing management systems or other systems for feeding the animals. The mission saw a number of on farm pasture/fodder plant trials and demonstrations initiated by SCAPA. It was however difficult to assess these from a technical point of view in the absence of a more systematic approach with proper documentation, let alone social and economic considerations. The project could in this context have sought cooperation with research institutions such as the Selian Agricultural Research Institute. So while accepting the potential for some of these demonstrations from a land management point of view, *the mission is less convinced about how these demonstrations and trials were planned, managed and implemented and how they could be convincingly expanded.*

Another support provided by SCAPA is the provision of heifers either as rewards for successful “land management” farmers or to groups of successful farmers. The heifers may be justified as an investment in the high potential areas, particularly with the additional sources of fodder from the bunds coupled with the extension advice in live stock management through

SCAPA. *The mission does not however see the heifer as crucial for improving land management per se from a technical point view, let alone the question whether this is an appropriate kind of support (see Section 7.4).*

7.3 Water harvesting

Beside soil conservation techniques that also improve soil moisture conditions, like e.g. the contour bunds, there are also various micro catchment techniques (e.g. semi circular and eyebrow terraces), where the primary purpose is to prepare more favourable soil moisture conditions for tree planting. SCAPA has provided extension advice on these technologies particularly in “dry” low potential area. SCAPA has also added other more elaborate water harvesting techniques during the last phase. These include water -tanks, -jars and -ponds. While the tank and jars are made out of concrete, the pond is excavated on the ground (Plate 4). The tank and the jar are usually placed near the roof of a building

from which rainwater can be harvested and collected. For ponds, successful water harvesting depends on the surrounding topography and how surface run off can be diverted to a particular pond.

From a land management point of view, the contour bunds and the micro catchments are in principle technically sound interventions that should have a positive impact on the productivity. In previous sections we have provided assessment on productivity gains from soil conservation on cultivated land coupled with other extension support in crop management. The mission has not had sufficient information to come up with any quantitative assessments based on farmers' information and local research regarding the impact of micro catchments. *The other structures (the tank, jar and pond) are primarily for provision of water to the household. Their impact for land management and productivity are therefore less obvious even though some farmers claimed to have used some of the water for irrigating their gardens.*

Photo 4: A newly established water pond in the dry low potential area. The water is collected through a shallow diversion channel (in the foreground) and passing through a simple silt trap before entering the pond.



7.4 The appropriateness in relation to local farmers conditions

SCAPA has been working with a variety of technologies, which have had both direct as well as indirect impacts on land management as already concluded. Any new technology also needs to take the knowledge, experience and the resource constraint of the farmers and the local extension organisation into consideration. Closely related to this are also the local farming conditions and systems. A particular technology that either is (i) too complicated, (ii) too expensive to implement and maintain or (iii) technologies that deviate too much from local farming practices are less likely to take root and expand, regardless of how sound they might be from a strictly technical point of view. *One of the more obvious examples of adapting technologies to local experiences and knowledge is the simple and yet appropriate design and layout of contours on cultivated land*, where the spacing between grass strips, soil bunds and terraces is determined by a few alternative vertical intervals (VI) rather than having a complicated calculation as a function of e.g. slope gradient, soil depth, soil type, rainfall and the intended use of the land. Another example of avoiding complications has already been mentioned, namely the use of bunds and terraces on the contour rather than having graded bunds.

The same can be said about agroforestry and biological measures at large. *SCAPA has made use of a combination of local and exotic species that usually combine well in providing improvements in land management as well as tangible benefits to the farmers.* Trees and plants like *Sesbania sesban*, *Cajanus cajan*, *Grevillea robusta* and Napier grass can serve as examples¹⁶. In terms of technologies some of these species are easy to propagate and manage (direct seeding, cuttings etc), while others are complicated including special efforts to promote seed production, seed storage, seed treatment to improve germination, inoculation of micro-symbionts, transplanting of seedlings, root pruning etc. In this latter case the seedlings may have to be raised in special nurseries. SCAPA has apart from central nurseries relied on a combination of on-farm nurseries and other tree nursery operators. The farmers have produced seedlings for their own needs as well as for sale.

The technologies and extension support related to livestock with more immediate relevance for land management in the low potential areas were (apart from growing fodder on the bunds) rotational grazing, pasture trials, fodder multiplication, hay making and zero grazing. *Most of these technologies in SCAPA are demonstrations and one does not see the same “uptake” among farmers as in the high potential areas.* This can partly be due to the lack of resources required for some of these demonstrations (not enough land, expensive land preparation, need for fences etc) , but also that they make more sense for a livestock management system that is currently not in place (less cattle, controlled grazing and stall feeding). The major difficulty is the excess number of livestock units in parts of the low land areas. While recognising the need to reduce the number of cattle in some areas, SCAPA has purposely avoided the issue of destocking. Keeping large number of cattle has social and cultural values besides contributing to these farmer’s livelihoods. At the same time, the cattle are contributing to land degradation and thereby gradually reducing the productivity of the land and therefor the options available for the future to generate income from agriculture and animal husbandry. These include different issues that go beyond what a technical extension project like SCAPA can address. Questions related to land rights (individual as well as common property), migration and the social and cultural fabric that may have to change goes beyond the objectives of SCAPA as well as the mandate of the district extension organisation. This being said, the mission believes that SCAPA could have initiated discussion with relevant actors that besides the villagers themselves included the local administration and relevant authorities.

Another support provided by SCAPA is the provision of heifers either as rewards to individual farmers for successful “land management” or to groups of farmers. In the latter case, one farmer is selected to receive the heifer. The off springs are then gradually distributed to each of the farmers in the group. As the intention eventually is to have a dairy cow, bulls are not wanted. It follows therefore, that it may take considerable time before all the farmers in the group has received a cow, particularly if the group is large, as they tend to be in SCAPA (up to 18 farmers per group). In the low potential area there are the additional constraints of providing sufficient fodder during the dry season, insufficient veterinary support, and uncertain market possibilities for the milk. The mission questions this approach from a technical point of view¹⁷, but more important – the whole idea of providing this kind of support as an incentive. *Not only is this expensive, but it somehow defeats the original intention of SCAPA, namely to demonstrate that land management in combination with other disciplines can combine into convincing extension messages, without the provision of expensive incentives.*

Photo 5: Water jar constructed with support from SCAPA. Apart from being expensive to build, the

¹⁶ The Soil Conservation Manual developed in SCAPA lists altogether 43 different species of trees/shrubs/grass/herbs out of which at least 20 are exotics.

¹⁷ Another approach practised by HPI is to provide the first heifer as a loan. The first female calf is paid back and the second is passed on to another farmer and the following calves can be kept. From a strictly technical point of view this makes, according to the mission, more sense.

roof of the house has to be of a material that makes it feasible for water harvesting.



Besides the bunds and micro-catchments, SCAPA has – as mentioned earlier – also introduced more elaborate technologies for water harvesting like the tanks, jars and ponds. These structures have mainly been introduced to farmers in the medium and low potential areas and are provided with substantial subsidies from SCAPA (60% of total costs) to selected farmers.

These farmers may have performed well in land management and then it could be seen as a reward, but more common is that an influential farmer in the village will receive this support and host e.g. a water jar for training and demonstration purpose (Plate 5). The cost of these water harvesting structures are high ranging from 400 000 TSH (for a water jar) to 1 200 000 TSH (for a water tank) with the pond somewhere in between. The pond, however, has the advantage that most of the costs are for labour and therefore this structure stands a better chance of being adopted, since the labour possibly could be mobilised locally. *For the tank and the jar a substantial part of the cost is for material (concrete), making these alternatives less relevant for poor farmers.* The majority of farmers do not even have a sheet metal roof on their house, making jars and tanks irrelevant unless heavily subsidised or provided free of charge.

8 SCAPA and overall impact assessment

8.1 Farming systems

As a strategy SCAPA extension teams used soil conservation as an entry point. Due to increasing scarcity of land, both for crop production and also for livestock grazing, intensive production systems were seen as the logical means to alleviate food shortage and poverty. In this sense, the initiation of SCAPA activities in both districts came at an opportune time when the prevailing social-economic conditions in combination with land degradation required the local community to seek for alternatives to improve their livelihoods, including changes in the local farming systems. *Adoption of soil and water conservation technologies in SCAPA often went hand in hand with diversification and intensification, thus modifying or changing the local farming systems.* The introduction of more crop varieties and livestock breeds also called for the need to explore and exploit new market opportunities. It also meant that families had optional coping strategies to satisfy food and income needs. For example, some of the crop residues or grasses, which were hitherto regarded valueless, found new economic uses as livestock fodder for improved breeds or as mulching of crop land. The adoption of improved livestock breeds also changed the perceived social value of local breeds, as land had to be reallocated between the two types of breeds (local and improved).

This transition may take time however. For instance in the Wa-Maasai dominated villages, the Evaluation Team was informed that putting land under conservation was not taken very positively at first until some key members of the community started to adopt the technologies advocated by SCAPA with positive results. In Oloitushula village, one of the early adopters who is also the village chairman, has been able to produce a second crop of maize from his contoured farm, and continues to serve as an example for other villagers who were rather sceptical at first. There is no doubt that the success achieved by this Masaai elder will motivate many others to follow his example and conserve their land as well.

8.2 Gender aspects

The need to address gender aspects were realised early in SCAPA. The extension teams in SCAPA made specific reference to the Wa-Maasai culture, which prohibits the mixing of men and women in one sitting. This essentially limited opportunities for men and women in a village to jointly participate in the planning and implementation of SCAPA activities. The SCAPA extension teams have always had a high proportion of women staff (54% in Arumeru and 67% in Arusha) in the last phase (Table 2). This kind of staff mix worked in favour of SCAPA and has been important to ensure the involvement of women in different project activities. In addition, both teams had members with expertise in community development and in Arumeru, one additional member was specifically responsible for gender. *All SCAPA staff have been sensitised on gender issues and data from the project area was reported on the basis of gender des-aggregation.* Specific efforts to assess and document gender aspects in SCAPA activities include a presentation made in 1999 by a member of the SCAPA Arusha team on 'Gender development in soil and water conservation' in which the author justified the importance of gender sensitivity at all stages of soil and water conservation activities – from planning to implementation and monitoring. *An important outcome is that under the influence of the Land Management and Natural Resources Programme (LMNRP or LAMP), the SCAPA teams have developed a 12 step process on 'how to incorporate gender into soil and conservation' in the target communities.*

Common to all ethnic groups found in Arusha and Arumeru districts is that men are the heads of the household and usually occupy positions of leadership in the village. As such, men are entrusted with much of the decision making powers both at home and in the community. Within the Wa-Meru and Wa-Arusha, both men and women do farm work even though the man decides on what to plant - where, when and how. In the Wa-Maasai culture, however, men are more concerned with cattle herding and most of the farm work falls on the women, even though decision still remains the domain of men. *In some cases, however, the interventions through SCAPA activities have introduced changes in the division of labour between men and women.* One such task is fuel wood collection. Before the introduction of trees on the farm, women and children had to travel long distances searching for fuel wood. However, with the introduction of trees on the farm (agroforestry), men now have a role to play. They play a major role in the management of trees including pruning while the women then collect the pruned branches for use as firewood. The Evaluation Team was also informed that with the improvements made to the cow shed, Maasai and Meru men who previously shunned activities such as cleaning the shed now participate in this work. Such changes in attitude within the rural communities in Arumeru and Arusha are evidence of the changes in gender roles as a response to technologies promoted and supported through SCAPA.

8.3 Income and Poverty Reduction

Farmers proudly recounted how the adoption of various land and farm management technologies had improved the productivity of crops such as maize, banana, horticultural crops and fish ponds. Yields had increased by more than 50% in most of the farms visited by the Evaluation Team (Section 7.1.3). Livestock, especially dairy cows gave more milk per cow per day. They also said that the quality of products has improved, thus fetching better prices. It is obvious that such productivity-enhancing technologies also demand more labour and other technical inputs. *Attempts to obtain quantitative comparative analysis on the relative profitability of farm enterprises “with” and “without” improved technological packages were not fruitful.* First of all there has never been any base line established and maintained in SCAPA, Secondly, the monitoring and reporting in SCAPA does not easily lend itself to assessments of quantitative achievements other than number of farmers trained or length of contour bunds designed and constructed. *However, it appeared from farmers’ confessions and rough records kept, that it has been profitable to engage in these technological changes.*

The benefits from SCAPA were exemplified in different ways by the farmers in many aspects such as:

- Improved food security
- A more balanced diet by the families and less prone to diseases
- Buying labour-saving tools
- Improving the quality of housing (both exterior such as roofing, walls and furnishing)
- Affording to pay for better medical services
- Sending children to school

Another positive aspect from the increased incomes was the ability to pay tax obligations (Development Levy), which the district council should invest in public goods. In terms of poverty focus, the assumption has been that most of the farmers in the villages were poor i.e. SCAPA has not developed or practised a more elaborate poverty focus. *One should however remember that SCAPA has never claimed to have a specific poverty focus. The target group has been described as small scale farmers in all the three phases.*

Photo 6: This farmer claimed that the improvements in agriculture brought about by SCAPA had significantly contributed to their new house in the background.



8.4 Capacity building

Capacity building in a broad sense has been an important, if not the major undertaking in SCAPA since the initiation of the pilot phase. The evaluation of the pilot phase (Semu et al) commended SCAPA staff for having undertaken an ambitious awareness and training programme for farmers, extension workers as well as government officials and politicians. From reports made available to the evaluation team and discussions held with the farmers and members of VSCC as well as the district councillors and the district and regional administrations in Arusha, *it was evident that SCAPA had sustained the focus on capacity building in implementing the programme.*

SCAPA undertook capacity building at four main levels:

- Developing local capacity – transfer of technologies e.g. on contour layout, building of contour bunds, appropriate crop and livestock husbandry practices, etc. to a variety of focal groups such as the members of the VSCC and the farmers and other special groups such as women and school youths to ensure sustainability as the skills would remain with members of the communities who could then pass on the skills to others. The training also included special promotion days and local study tours to share field experiences and facilitate changes of attitudes regarding improved land management,
- Special workshops for government and political officials in order to raise awareness regarding the extent of the problems of land degradation and the need and benefits of soil conservation activities,
- Hosting and organising study tours for individuals and groups, from within and outside Tanzania to SCAPA project areas, and
- Training of SCAPA extension staff and other mainstream extension staff. This also included re-training in other disciplines in order to widen the scope of individual members within the team.

The targets set for training and achievements attained are summarized for the different phases in Annex 3.1 for Arusha, Annex 3.2 for Arumeru district and Annex 3.3 for the pilot phase. In the case of Arusha, where detailed data, des-aggregated by gender, was made available to the evaluation team, the achievements are in the order of 50% or more in most cases, in relation to the targets. *Though specific*

studies on adoption rates have not been conducted, the Evaluation Team was informed that the rate in Arusha is estimated at about 30% (Mkwizu, Personal Communication¹⁸) or put differently 60% in relation to the farmers trained.

Moreover in some of the villages visited the members of the VSCC told the team that they have continued to receive requests (after year 2000) from farmers within their villages as well as from neighbouring “non SCAPA” villages for assistance with the lay out of contours and consultation on strategies for soil and water conservation. *This is a very positive indication of capacities and skills at the village. Farmers are both interested and capable to continue with some of the soil and water conservation activities on their own. The achievements are, in these terms, commendable and promising.*

8.4.1 Production of extension material

To facilitate availability of reference material and for training of individuals and groups in the future, SCAPA staff prepared and produced a wide range of extension materials in the form of booklets, extension leaflets and posters, in the local Kiswahili language, on different topics (See Annex 3.4) mostly between 1998 and 2000. According to SCAPA staff, these materials have been distributed to stakeholders in the project areas and to visitors mainly from within the country, and to a certain extent also to neighbouring countries in Eastern Africa for use as reference materials. However, a distribution record was not available. *The evaluation team perused through many of them and generally found most of them to be relevant and easy to read and follow.*

8.5 Building and supporting institutions

As mentioned in other sections of this report, the issue of developing the formal local extension system (first the regional and later the district level) through a deliberate focussed effort never came about (addressed from different aspects in chapter 4, 5, 6). Attempts to use the experiences of SCAPA at national level were however made during the last phase. We will come back to this in Section 8.7 below. There are however examples of institutional development at the local level, where SCAPA has played a very significant role.

The establishment and capacity building of VSCC has in some villages ensured the existence of a core group of persons at village level, with a mandate from the local government to execute and supervise on soil and water conservation activities on their own within the village or together with the VEW. In some villages the VSCC has been trusted with a wider mandate e.g. in terms of monitoring environmental changes and to report these regularly to the village government. *Inspired by the involvement with SCAPA, there are also VSCC that have been officially registered as Community Based Organisation (CBO). Some NGOs has also been formed that continue to function to date – carrying out activities that extend some of the SCAPA activities and approaches.* Examples of such local institutions are summarized below:

- Community Action for Development, Economic and Environment Conservation Trust (CADECT)

CADECT is an NGO registered in 2000 ‘to assist and promote development activities by providing education and practical knowledge at the grassroots levels’. The membership for this NGO is drawn mainly from persons who were formerly employed as labourers in SCAPA central nurseries. Members of this NGO (8 female and 7 male) have received training on construction of improved stoves, water jars/tanks, and raising tree seedlings in nurseries. CADECT is currently working with three other groups in Arumeru, three groups in Arusha and one group in Monduli districts. They have through these groups distributed over 40,000 tree seedlings so far. The efforts of CADECT have also attracted the attention of the district authorities. In 2001, CADECT was awarded the 3rd prize of the World

¹⁸ Project Manager, SCAPA Arusha.

Environment Day for Arusha district. The NGO continues to work in close collaboration with SCAPA in the target areas.

- Kikundi cha Utunzaji Mazingira Olgilai (KUMO).

KUMO is a CBO with its focus on environmental conservation based at Olgilai village, in Arumeru district. Originally it was initiated as a VSCC to oversee SCAPA activities in the village. Following the winding up of SCAPA, the group, which is comprised, of five women and seven men transformed itself into a pressure group on environmental issues which also tackles issues related to HIV/AIDS. KUMO, which conducts its sensitization activities through cultural activities such as traditional dances and songs, is frequently called upon by the district authorities to participate in various events. At the village level, KUMO is credited for having influenced the development of bylaws for the protection of hilltops and water sources.

- Dawa za Kiasili Kikatiti (DAKIKI).

DAKIKI was established in 1991 as a non-governmental society (NGO) based at Kikatiti village in Arumeru district. The group engages in the preparation of herbal medicines and livestock drugs using raw materials obtained from local communities thus indirectly encouraging the communities to conserve bio-diversity (Plate 7). The founding members of DAKIKI received the first training from SCAPA, in 1992, on terracing, bee keeping and management of dairy cows (in collaboration with HPI). Between 1992–2000, members of DAKIKI (today 38 females and 2 males) received eight different short courses and have now taken over the training. The evaluation team was informed that DAKIKI, as of now, is serving as a centre for 28 other community groups from 5 villages originally involved in SCAPA activities. Through interventions by DAKIKI, there has been a multiplier effect from the training received resulting in the creation of part time self employment for approximately 300 people (Nyitti¹⁹ – personal communication). Members of DAKIKI currently maintain their own ‘forest’ from which they collect herbs. This NGO have received recognition far beyond the district boundary and collaborates with other organizations from Tanzania (e.g. WOODSTAR²⁰) Germany, Japan and Switzerland.

Photo 7: DAKIKI is a local NGO, which among other activities are growing plants that provide raw-material for medicine, pesticides, soap etc. The plate show some medical herbs that are being dried.



¹⁹ Coordinator of DAKIKI.

²⁰ Women in Development of Science and Technology in Agriculture.

8.6 Environmental impact

Land degradation is an environmental issue, so any project that aims at reversing this negative trend and to improve land management should in principle be desirable. Land degradation and soil erosion, have in rural areas clear implications for poverty e.g.

- directly through the loss of land and decreasing soil fertility, and
- indirectly through possible conflicts over diminishing resources, where the poor risks being further disadvantaged

Moreover it undermines the possibilities for future generations to maintain and improve their livelihood situation. But apart from these direct *in situ* effects, there are also serious *ex situ* effects. Erosion leads to excessive siltation of rivers, which in turn can shorten the life span of dams for hydropower or for irrigation. There are many other different causes for land degradation such as (i) salination of soils due to poor irrigation schemes, (ii) improper use of pesticides, (iii) acidification of soils etc., but these examples apply less for the SCAPA programme area.

Sustainable development implies that environmental considerations should be an integrated part of economic growth. If special efforts are not made to develop methods and institutionalise these, there is always a risk that the environment will be degraded as a consequence of unsustainable resource use. The means and methods to ensure that the consequences for the environment are considered include e.g.

- Environmental Impact Assessments
- Environmental monitoring
- Life cycle analysis
- Certification schemes
- Increasing the environmental awareness

One can hardly claim that “Environmental Impact Assessment” (EIA) has been applied in a systematic manner in SCAPA when the different phases were prepared. Indeed the rationale for the project has been to address an existing serious environmental problem, so the need for a comprehensive EIA was perhaps not seen as important. However, in project implementation, assessment of environmental impact has been part of the agenda in SCAPA’s awareness and training exercises with the different actors. *But then the impact has rather been assessed as the consequences if improved land management is not practiced,* and not the methods promoted in SCAPA. The Evaluation Team believes that this has, by and large, been a sensible approach. What is more of a problem is that there has not been any systematic “Environmental Monitoring” in SCAPA. Without arguing for a comprehensive “scientific” system, *there are simple techniques and participatory methods by which the environmental effects could have been better demonstrated and documented at least in qualitative terms.*

Any assessment of the environmental impact of SCAPA will have to limit itself to the technologies and methods applied and to what extent these have been beneficial or harmful to the environment. As the point of departure is to improve land management, virtually all technologies in SCAPA are either improving the environment (e.g. by arresting erosion) or neutral in terms of environmental impact. The technologies can of course be harmful, if the design and application are poor. The mission saw a few examples, but these were exceptions. In the discussions with the farmers and SCAPA staff, *everyone stressed the tremendous changes in the general landscape of the two districts, since SCAPA initiated their activities. Most of the hills were bare 15–20 years ago but are now covered with vegetation* (Plate 8). There are however part of the overall extension package in SCAPA as well as in mainstream extension that could have negative environmental consequences. New crop varieties may be more sensitive to pest and therefore require

more use of pesticides. A more intensive use of crop land may change the soil chemistry and deplete the soil of certain nutrients.

Photo 8: Developed bench terraces in farm of Mr Lomayan Kimasian Sarao in the high potential area of Arumeru district. Agroforestry is an integrated part of this farm with a variety of species such as bananas, *Grevillea robusta*, *Leucena* etc. This land was previously almost bare and heavily eroded during the rains.



8.7 Linkages with National Policy and Strategy processes

SCAPA's influence on national policies and strategies related to agriculture appears to have been minimal. There has essentially been two entry points, where more use could have been made of SCAPA's experience either (i) in terms of land management (with more of a focus on technical content and integration of different disciplines) or (ii) in terms of the extension approach (integrated extension support, institutional development at local level, capacity building). While there are obvious overlaps between these two entry points, the mission believe that the separation is strategically useful as it reflects organisational aspects at the central level in MoA and the influence of other donors in MoA.

In terms of land management the NSWCP drafted in 1992/93 and initiated in 1994/95 appeared as an obvious link for SCAPA to influence and perhaps be influenced by national policies and strategies. The mission's understanding is that this was on the agenda when RSCU/RELMA supported soil and water conservation in Arusha region. As in other countries such as Kenya and Uganda, these type of small pilot projects was first initiated locally and later adopted and used to formulate and implement a national land management programme. The discussion that proceeded the formulation of the DPSP in 1995 and Sida's support for this project (from 1996/97) can be viewed as an attempt to link SCAPA's as well as other land management projects with the development and implementation of a national programme.

The DPSP was managed by the Soil Conservation and Land Use Planning Section (SCLUPS). *This section was however at this time neither very capable nor at a significant organisational level within the MoA hierarchy to really be able to exercise any influence.* Although DPSP is not part of this evaluation, the information provided to this mission clearly suggests that the project was not very successful. The first step – to collect information from different land management projects – was only partially achieved. The intention to organise this into “useful” information through a data base was never accomplished and finally the exchange of information among relevant stakeholders and the subsequent training never

materialised. An attempt to place a Sida funded advisor at SCLUPS to support DPSP was for some reason not well received by the Ministry. *So the support for DPSP lasted for less than two years. Moreover when other solutions were explored e.g. to merge SCAPA with DPSP into LAHEP, MoA was not interested in providing counterpart funding.*

It seems as if the NSWCP has not yet become a significant national programme (almost 10 years after it was launched!), perhaps for lack of donor support and it's somewhat ambiguous position within MoA. This may explain why the NSWCP is surprisingly anonymous even today. For instance in a recent publication from MoA²¹ on the issue of declining soil fertility in Tanzania with obvious linkages for land management, the NSWCP is not even mentioned (!). Moreover the programme is not referred to in the Agriculture Development Strategy²² from late 2001. *So with the benefit of hindsight one can conclude that a national programme that is not very significant and once hosted in SCLUPS, the expectation that SCAPA and its experiences would exercise any influence at policy level appears as overly optimistic.*

The second alternative, where SCAPA could have played a more significant role at the national level was for the government extension system. *While SCAPA has been acknowledged by various stakeholders in extension delivery as among the projects that have pioneered participatory methodologies²³, it is surprisingly anonymous in other important documents such as the Agricultural Sector Development Strategy from 2001²⁴.* The mission has not come across any evidence where the MoA have capitalised on the experiences of SCAPA as an extension methods development programme. One wonders what prevented the positive lessons from SCAPA's approach in permeating and influencing the adoption of a "demand-driven integrated system" earlier on. One reason could be the lack of a common policy on the official extension approaches to be used, developed as a Tanzanian owned process. This is because ever since mid 1970's most of the extension service has been donor driven and funded. *In other words, if SCAPA should have influenced national extension policy, a more active engagement from Sida would have been required.* While much of what has characterised SCAPA's extension system may appear as obvious approaches today, we do not believe that this was the case in the early 90s, when the MoA was influenced by the WB funded NALEP and the arguments for the T&V system as the mainstream extension methodology.

²¹ Ley G. et al, (2002) Towards Integrated Soil Fertility Management in Tanzania, Ministry of Agriculture & Food Security, Division of Research and Development, and KIT Publishers in Netherlands.

²² ASDS does not even mention land management and declining fertility as an issue!

²³ Tanzania, U.R., 2002, Current Status of Agricultural Extension and the way Forward. A paper presented a workshop on the future of research and extension services at Sea Cliff Hotel, Dar Es Salaam. May 16–17, 2002.

²⁴ The ASDS mention FAO and IFAD participatory methods and WARD Facilitation Team approaches as extension approaches providing relevant experiences for the ASDS.

9 Perceptions and views about SCAPA

In discussions and meetings at village, district, regional and central level, basically all praised SCAPA. A few persons – also in SCAPA’s own team – also mentioned details where critical points were made but, by and large, SCAPA’s reputation is indeed positive. And yet the project is surprisingly invisible or ignored in processes and related documents that count. For outsiders like the Evaluation Team this is indeed confusing. But going back to the positive views expressed about SCAPA, this perhaps can best be demonstrated by quoting some of the statements made in meetings with different actors. These include

→ In meetings with representatives of MoA

- SCAPA is a reference project from which one could learn.
- SCAPA should not be limited to LAMP as is the case now. They are relevant for other regions of Tanzania as well.
- SCAPA weakness was perhaps the magnitude of activities included and that it was a small project.

→ In meetings with Regional representatives

- Remarkable achievements (50% in Arumeru and 45% in Arusha).
- Participatory, not top down as in mainstream extension.
- The “off springs” from SCAPA in terms of CBOs and NGOs illustrates SCAPA’s significance.
- SCAPA has been the victim of politics.
- SCAPA was not properly phased out. A grace period should have been agreed.
- Now SCAPA staff want to go back to their departments.

→ In meetings with District representatives

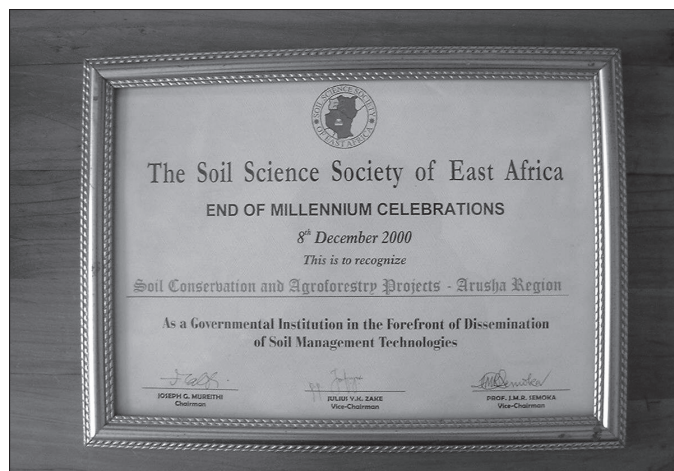
- SCAPA has almost covered the whole district with extension activities.
- SCAPA and capacity building at village level now function without extension staff.
- To stop SCAPA by Sida was a too sudden decision. We lacked an adequate plan to take over SCAPA.
- SCAPA is a landmark in Arumeru.
- Many visitors come to learn from other regions of Tanzania and other countries e.g. Malawi, Zimbabwe, Uganda, Sweden.

→ In meetings with Village representatives

- We are children of SCAPA.
- Before the slope was barren and without trees, now a lot of greenery thanks to SCAPA.
- First SCAPA trained a group of farmers, then the group trained other farmers. Now the group has registered as a CBO.
- Adoption among farmers takes time.

Finally we have the attention from other organisations. *A significant recognition of SCAPA is the certificate awarded from the East African Soil Science Society in late 2000. SCAPA is described as being in the forefront in the dissemination of soil management technologies (Plate 9).*

Photo 9: The East African Soil Science Society has expressed their appreciation of SCAPA through this recognition awarded in 2000.



10 The phasing out and attempts to make use of the experiences

The decisions by Sida to phase out SCAPA apparently came as a surprise. The third phase was prepared on the assumption by those who drafted the project document, that SCAPA would be followed by additional phases for up to 10 years. No reservations were made when the Project Document was approved and the Specific Agreement²⁵ signed one year before Sida in 1998 first announced their intention to phase out SCAPA²⁶. This intention was unexpected for the project. No plan for the phasing out of SCAPA was ever developed, partly and possibly because Sida did not argue the case clearly. It also seems as if SCAPA first didn't believe that the project was going to be phased out. This may explain much of the frustrations expressed in meetings with representatives both from the regional and district administration in Arusha as well as with the management of SCAPA. *There appears to have been a mixture of reasons behind Sida's position at this time e.g.*

- The lack of progress to link SCAPA with the national level (see section 8.7).
- The decentralisation in Tanzania in 1998 to transfer many of the regional functions to the district level and to strengthen the district councils added to the difficulties. The relevance for instance of being engaged at the national level e.g. by supporting a programme like NSWCP may have appeared as less obvious.
- SCAPA's organisation and management that to a considerable extent was a by-pass to the existing structure.
- SCAPA did not fit well with Sida's gradual changes in focus for development cooperation²⁷ between Sweden and Tanzania during the 90:ies as well as the means and methods for development cooperation²⁸.

As the option to continue SCAPA was not possible with Sida support anymore, the managers of SCAPA and their staff from both Arusha and Arumeru have been looking into the possibility to transfer SCAPA into an NGO²⁹. Different proposals and different names has been discussed such as SELADO and SCAPDO. Apart from identifying other funding arrangements, there are also formal difficulties. SCAPA staff is government employees and they would have to resign, if they want to continue as an NGO. Since there is obvious risks involved working for a new and not yet established NGO, as compared to being a government employee, the current SCAPA staffs hesitates. Another alternative being explored is whether a management team with a limited number of staff (2–3) and a Board of Trustees could constitute the NGO, while making use of the districts extension staff for the implementation as and when required. In this case the staff would continue to receive their salary from the government, while the NGO could pay the DSA and provide other facilities.

The SCAPA offices in the districts are still maintained and staffed, initially since funds not used in 2000 could be carried forward to 2001. SCAPA are also linked to the activities of the Local Management of Natural Resources Programme usually referred to as LAMP in that they could and have been engaged

²⁵ The Evaluation Team had no access to the Specific Agreement though, but from what we understand no mentioning about SCAPA and the future were made.

²⁶ First mentioned by Sida in the Agreed Minutes from September 1998.

²⁷ Area based programmes and support to the local administration (e.g. LAMP) and the more recent Lake Victoria Initiative

²⁸ From donor driven projects to partnership and Tanzanian priorities.

²⁹ The idea is partly inspired by the experiences of transforming some Dutch projects into NGOs such as e.g. the Traditional Irrigation Project Development Organisation.

as “local consultants” in the LAMP districts. The overall purpose of LAMP is to support the local government and administration at district and village level to address natural resources management issues. Linked to this is also the capacity of the district extension service. As regards the use of external services – such as SCAPA – the approach seems to be to allocate assignments on area basis³⁰ (e.g. a village or a catchment) to different organisations (like NGOs, universities/research institutions and government organisations). The assignment is usually to deliver a land management package including a number of training sessions for representatives of the local village administration and a selected number of farmers coupled with physical evidence of land management activities like contour bunds, planting of seedlings, sub-soiling etc. *Allowing for a somewhat premature assessment, the Evaluation Team wonders if this is the best way of making use of SCAPA and other organisations to enhance the capacity of the district.*

³⁰ Based on the information from the mission’s visit to Babati district.

11 Overall conclusions and useful lessons

There should be a number of conclusions and useful lessons from a project, which has been multidisciplinary and implemented for over 10 years. The more immediate ones are obvious and related to land management and extension approaches, which we will review in this section. The Evaluation Team also believes that there are useful experiences related to programme management and management of development co-operation at large. But we will begin with the overall context.

11.1 The bigger picture

Environmental decline continues to be a serious impediment for sustainable development at large. Land degradation is of particular significance for a country like Tanzania where so many are dependent on the natural resources. In a recent study issued by the Ministry of Agriculture, declining soil fertility is “identified as the fundamental agronomic cause for declining per capita food production in Africa”³¹. The same study suggests a number of strategies to address the issue in Tanzania. These are

- Provide farmers with a set of basic principles such as contour planting, hedgerows/grass strips, intercropping/rotations, improved organic matter management etc.
- Enable them to learn about a range of options appropriate to their area
- Knowledge and capacity to choose and experiment
- Enable them to put together productive and conservation effective household systems.

What strikes you are the similarities with SCAPA, although these strategies are proposed more than 13 years after SCAPA was initiated and some 15 years after RSCU began to co-operate with the regional administration in Arusha. The study, which on many technical aspects are very informative, mention four examples of participatory land management projects/programmes without making any reference to SCAPA. More striking though is that the study does not even mention the existence of the National Soil and Water Conservation Programme (NSWCP). The Evaluation Team selected this particular study not to criticise it, but rather as an example of what appear as more fundamental constraints in Tanzania, namely ...

- the lack of information exchange, and
- lack of co-ordination and co-operation

... between different Tanzanian organisations and programmes as well as between donor organisations. This is indeed nothing new as the awareness about these constraints has been there since some time, both on the Tanzanian side as well as in the donor community. The question is why it seems so difficult to address them. Moreover, the Evaluation Team wonders if the situation may deteriorate even more as a result of the decentralisation reform in the country. The role and mandates of central ministries and national policies and strategies are or will be ambiguous for some time to come. Donor assistance that facilitates *information exchange and co-operation* as well as *reforms and changes* at the central level seem to be well motivated.

³¹ Ley G. et al (2002) Towards Integrated Soil Fertility Management in Tanzania, Ministry of Agriculture and Food Security – Division of Research and Development, KIT Publishers.

CONCLUSION AND LESSON FOR THE FUTURE

The SCAPA “case” is an illustrative example that far more needs to be done regarding exchange of information and improving co-operation and co-ordination in development co-operation of all concerned actors. This is also the case within the Tanzanian government structure and within the donor community. With the decentralisation reform, this is more important than ever before.

It is – if we go back to the issue of land degradation – not only the study above that expresses concern about decreases in land productivity. Another example is the World Bank supported Soil Fertility Initiative (SFI) in Africa launched in Tanzania 1999, which in Tanzania initially was implemented as the Soil Fertility and Agriculture Intensification Project (SOFRAIP)³². ODI in their evaluation of Sida’s Country Strategy for 1997 – 2000, strongly recommends Sida to pay attention to the low productivity in agriculture practised by small holders and to natural resource management issues in general. Moreover they emphasise the need to pay attention at the policy level as well³³. Without the benefit of actually having read the study, it seems as if some of the decisions in Sida during the last years have run contradictory to these recommendations, among them the termination of SCAPA.

There has been, since independence, ten re-organisations of the public extension service in Tanzania³⁴ as well as promotion of different extension approaches. The most recent national extension system/ methods promoted by MoA has essentially been based on the Training and Visit System (T&V). The T&V has been supported through the World Bank funded NALEP in the early 90s, followed by NAEP II (Section 3.2.). The message conveyed by different informants to the mission was that neither of these two programmes has been particularly effective. When asking about NALEP and NAEP II in Arusha and Arumeru district some of the extension staff was hardly aware of the two programmes let alone their extension approach. There has also, during the same period, been a number of different donor funded extension projects. Most if not all of these have tended to work in isolation within a particular organisation in MoA or in a particular geographical area. SCAPA could be seen as one of them.

The tragedy of this is that while the mainstream extension system has continued with a system that under East African conditions³⁵ (as in some other parts of the world) was questioned years ago. SCAPA and most likely a number of these other projects have experimented with alternative extension approaches that the MoA at large and the World Bank for that matter seem to have been unaware of. Much of what now seems to be the approach suggested in e.g. PADEP³⁶, which is part of NAEP II, is similar to what SCAPA and presumably others already have/had considerable experiences in. A similar conclusion can be made regarding “extension” as for “land management”.

CONCLUSION AND LESSON FOR THE FUTURE

The co-operating partners in smaller projects, including the donors, have a special responsibility to provide information and provoke discussions when they have something to offer also when this might be beyond the immediate subject or theme of the project. A case in point has been the WB funded NALEP and NAEP II in support of the national extension system, where other project has had relevant experiences to offer years ago.

³² Now being reorganised to the Participatory Agricultural Development and Empowerment Project (PADEP) and funded through NAEP II.

³³ Sida (2000) Landstrategi Tanzania 1 januari – 31 december 2005.

³⁴ Dejene et al (1997) Land Degradation in Tanzania, World Bank Working Paper.

³⁵ See e.g. Moris J. R. and “Extension under East African Field Conditions”.

³⁶ With it’s emphasis on participation, local institutions and linkages with research etc.

11.2 SCAPA's mission and what the programme accomplished

There is always a danger that an evaluation that covers a long period of time may lose sight of the reasons for which a programme/project was first initiated. Through contextual changes and new trends in development co-operation, a particular project may be measured against standards for which it was never designed or adjusted to during implementation.

SCAPA was initiated for two basic reasons. First, there were articulated needs of addressing serious land degradation problems in Arusha region. These needs were not only expressed by the regional representatives but also by farmers. One of the former directors of the RSCU, who was involved in soil conservation training in Arusha before SCAPA was launched, has recalled for the Evaluation Team how they were approached by a Wa-Maasai chief, who convincingly expressed his serious concern over escalating land degradation and decreasing productivity. Secondly, there were also the previously failed efforts to introduce soil and water conservation technologies. These technologies were developed for large scale farms and not for small holders as in the programme area. Another weakness was that extension in soil and water conservation usually was divorced from mainstream extension in agriculture crop production. The RSCU had another and different alternative approach, which they had tried and developed mainly in Kenya. This was essentially the rationale for initiating the pilot phase of SCAPA. The programme were i.e. both demand driven (the need to address land degradation) and mission driven (to demonstrate that extension in land management require a multidisciplinary approach). Besides this SCAPA were also highly participatory (Section 4 and 6).

A strength with SCAPA has been that they, from the beginning, involved the local leadership – village governments – and through them established special VSCC. These committee's and the local village/ward extension workers has – after training and provision of some material by the programme – continued with land management activities on their own. Special efforts was made to discuss agree and if possible demonstrate (e.g. through local study tours) the linkages between land management and different activities in agriculture, live stock and forestry. If e.g. decline in agricultural productivity was the issue, then possible linkages to soil erosion, depletion of nutrients, insufficient soil moisture etc was explored. SCAPA has also been highly gender sensitive, both through the training at all levels and by having a truly mixed extension team of men and women in the districts. A special 12 step approach on 'how to incorporate gender into soil and water conservation' at village level has also been developed in co-operation with LAMP.

CONCLUSION AND LESSON FOR THE FUTURE

Assessed against the content of the project documents only of the three phases, SCAPA has by and large been a successful project. A particular strength, which was not specifically emphasised in the project documents, was SCAPA's approach to local institutional development.

Most of the interventions in SCAPA has been i/ technically sound in terms of addressing the issue ii/ appropriate in terms of fitting the local farming system and iii/ being possible to apply without having to rely too much on external advice and resources. There are however also technologies introduced that the Evaluation Team is less convinced about either because of the deficiencies in how they were performed (e.g. some of the fodder and pasture trials) or the terms on which "costly" technologies were provided (free of charge or heavily subsidised). Some of them were in practise irrelevant or out of reach for poor farmers (expensive land preparation, need for fences etc.) While the mission believes that subsidies from a principle point of view can be justified under certain circumstances, any introduction of subsidies that deviates too much from the mainstream extension system does not make much sense.

SCAPA has viewed some of these “subsidies”, e.g. the provision of water tanks or jars, as rewards or incentives for individuals or groups of farmers that has performed well. Not only is this expensive, but it somehow defeats the original intention of SCAPA, namely to demonstrate that land management in combination with other disciplines can combine into extension messages, that are sufficiently convincing on their own (Section 7.1.1, 7.1.2, 7.2, 7.3 and 7.4) .

If we look at productivity, the conclusion based on the information made available to us is that for SCAPA’s “main technologies” – contour bunds, agroforestry and crop extension – the combined effect on yields of agricultural crops is an increase in the order of 50–150%. In livestock, farmers also mentioned that the cows produced more milk as a result of more fodder. SCAPA has also contributed to diversification of income in different ways e.g. introduction of tree and plant species with medicinal qualities, bee keeping, etc. In this sense SCAPA has been successful, since productivity is mentioned in the objectives of all the three phases (Section 7.1.3, 8.1 and 8.3). A more precise assessment than this has not been possible for the Evaluation Team based on the limited information available.

Questions related to land rights (individual as well as common property), migration and the overall changing social and cultural fabric, go beyond the objectives of SCAPA. Nevertheless, this is part of the reality and a case in point is overgrazing resulting from the excessive number of cattle. In the low potential area this is a major cause for land degradation. SCAPA has not confronted this issue directly e.g. by pushing for a reduction in the number of cattle (Section 7.4 and 8.1). Instead they have demonstrated alternatives (contour farming, controlled grazing, stall feeding etc.). The Evaluation Teams conclusion is that this probably was a sensible strategy. The experiences of reducing livestock in other parts of Tanzania have demonstrated the need for a cautious approach. This being said, we also think that the programme could have initiated discussions with the village governments and the farmers themselves.

CONCLUSIONS AND LESSONS FOR THE FUTURE

The “core” land management technologies introduced mainly in the 1st phase has been technically sound and appropriate for the farmers. It seems clear that these technologies have had a positive impact on “land” productivity.

Some of the technologies introduced during the 2nd and 3rd phase were expensive and provided to selected farmers as incentives (subsidised). This partly defeated the purpose of the original intention of SCAPA, namely that extension packages/messages should be sufficiently convincing without having to depend on subsidies that only the project can afford.

SCAPA’s cautious approach for the need of reducing the number of cattle in the low potential area has by and large been sensible.

Even if SCAPA and the parties (Sida and GoT representatives) basically failed to address the issue of how the experiences of the programme could have been institutionalised in the “government” system, SCAPA has been more successful regarding local institutions. Many of the VSCC are still active although to a varying degree. The Evaluation Team was pleasantly surprised to note that in all villages visited, the VSCC still existed. Some of them had not met or performed any special activity for some time, but others were very pro-active and have taken on broader responsibilities than what was originally on their “SCAPA” agenda. The mission came across a few examples where the original VSCC now had developed and registered themselves as a Community Based Organisation (CBO) or as an NGO (Section 8.5).

A visible impact of SCAPA for those who live there or have seen the area 15- 20 years ago are the changes in the environment. Large areas that once were bare and degraded are today green and productive. This is particularly evident in the high and medium potential areas. This is what lies behind expressions about SCAPA as being “a land mark in the district” (Section 8.6).

CONCLUSION

The most visible achievements in the field are from the involvement in local institutional development and the positive changes in the landscape.

11.3 Programme management

Within the objectives and ambitions of SCAPA as these were expressed in the project documents, the management of SCAPA has on some aspects been good or even excellent but also less satisfactory on others. The planning and reporting routines and documents was said to have been acceptable by representatives from Sida and RELMA, although the Evaluation Team never managed to get a complete set of these “management” documents. The Project Documents for phase 2 and 3 are well structured and generally easy to read, but the Evaluation Team has not done any assessment beyond this e.g. in terms of relevance, content and the internal logic. The high spirit that seems to have characterised most of the staff in SCAPA is also a sign of good management. The people in SCAPA are convinced that they have done something good and worthwhile and the mission believes they are right. The efforts to maintain the legacy of SCAPA that has been going on since the programme was terminated by Sida are evidence of this “spirit”.

The weakest management aspect is the monitoring of the project. Monitoring in a more systematic sense has been limited. The existing monitoring system has basically been a reflection of the targets and quotas of the Annual Plans of Operation. Surprisingly enough this does not appear to have been an issue in any of the annual negotiations between Sida and relevant Tanzanian authorities. There are e.g. no systematic information available on;

- Adoption rate among farmers during and after SCAPA in at least a selected number of villages. As a consequence there were no systematic follow up in order to analyse why some farmers adopt, while others don't. This could have provided information that may have had implication for the technologies in SCAPA and how these were introduced.
- Productivity and income, which is mentioned in one way or the other in the objectives of all three phases. We have some information in this mission on productivity changes per area unit of land, but nothing in terms of productivity per labour unit. The consequences of SCAPA extension messages are usually that agriculture is intensified and diversified, which in itself implies the need for more labour. While this perhaps is beyond what one should expect from a relatively small project to address, it should have been possible to engage a research organisation e.g. by suggesting this as a topic for a theses.
- Environmental impact, something that should be obvious for a project that aims at addressing land degradation. Apart from a more systematic use of photos (before and after SCAPA interventions), there are also some simple cost effective techniques available to assess erosion that could have been part of a reasonably ambitious “participatory monitoring system”.

These are all examples that somehow are relevant for the objectives of the project documents of SCAPA.

CONCLUSIONS AND LESSONS FOR THE FUTURE

The human resource management within SCAPA has been satisfactory. The high spirit and commitment among the staff is a good indication of this. The formal management in terms of planning and reporting is said to have been satisfactory. A more informative and yet not too complicated monitoring system, would have been both useful and possible for some key aspects of SCAPA namely; i/ adoption rate among farmers, ii/ productivity and iii/ environmental impact.

Another management and monitoring aspect is the cost efficiency. In the absence of more detailed information and figures, the Evaluation Team calculated the cost of few selected activities for the three phases. As we haven't been able to compensate for inflation and changes in DSA etc., the figures in Table 3 in section 6.4.1 are more for illustration of what type of information that could have been used as proxies for analysis of cost efficiency. It is only the cost of producing seedlings that has been more or less maintained at the same level, presumable as a reflection of the increased use of local farm/village nurseries instead of central nurseries. The overall economy of scale that has been gradually more significant through the phases can also be an explanation.

In order for proper attention regarding "cost efficiency, the preparation of the project document would have required more involvement of the regional and district administration to begin with. The only involvement now has been that the districts have seconded staff to the SCAPA project co-ordination teams and that SCAPA has kept the district and region informed through their plans and regular progress reports. Moreover, had this been done perhaps SCAPA's links to the central "policy" level would have emerged automatically through the regional and district level. It is a bit surprising that a programme which addressed institutionalisation issues at local village level rather successfully never provoked questions as to how it could address the same issue at other levels as well. We can only speculate about the reasons. Perhaps SCAPA was too much seen as a technical land management project and since it were generally viewed as successful; they perhaps became the victims of their own success.

CONCLUSIONS AND LESSONS FOR THE FUTURE

A crucial aspect for any project is cost efficiency. Follow up of costs through a few selected key indicators provides guidance for the management and information for those who provide the resources. This has not been done in SCAPA and it is therefore difficult to have a final assessment on this issue.

For this to happen, the mission believe that more involvement would have been required both by the district and regional administration in the preparation of the project documents, but also in terms of providing resources other than nominating staff and providing office space for SCAPA. Attention for this would also have been required from Sida and their partners in co-operation over the years, especially if there would have been ambitions to internalise experiences and develop district extension.

11.4 Management of development co-operation

This evaluation has in many ways been full of contradictions. SCAPA still enjoys a good reputation and it is well known both inside and outside the two programme districts. Still it never was very visible in processes and fora that count, if the ambition was to influence policies, strategies, systems and organisations. The evaluation team has speculated about the underlying reasons for this. Our understanding is that SCAPA was not embraced and "welcomed" by Sida in Tanzania, since it did not fit well administratively with the focus of development co-operation at that time. It took some struggle

before it was accepted that SCAPA should be funded under the country frame as part of the “Environmental Sector and Land Management Sector Programme” (Annex 2) instead of relying on the RSCU. At the time when the second phase started, Sida had no prior relation to the MoA. The central focal point or the “competent authority” was the Ministry of Natural Resources, Forestry and Bee Keeping Division and not MoA. In the third phase, MoA were seen as a focal point and Sida supported the District Programme Support Project (DPSP), but the competent authority was first the PMO and later MRALG (for the Land Management and Natural Resource Management Programme under which SCAPA was funded). It also appears as if the responsibilities of Sida in Tanzania and RSCU/RELMA have been ambiguous after SCAPA came under the country frame.³⁷ SCAPA somehow was like an orphan in that there never was any sense of ownership at least not at the central level, neither by Sida nor by the Tanzanian side.

The evaluation team believes that there were shortcomings built into the project that were never fully addressed. Depending on your own bias you may – if you use the objectives of the project documents as a departure point – see a successful land management or a successful extension programme, when you are exposed to SCAPA at the district level. From the project documents we can see that SCAPA was initially about the need for demonstrating the rationale for an integrated multidisciplinary approach with the involvement and participation from the local level. This was later followed by an expansion phase mainly for implementation of as much as the resources (budget allocations) allowed for in terms of awareness raising, training and fieldwork. In other words, not much more was developed in terms of methodological approaches in extension – the case was already made during the pilot phase. Instead SCAPA added new technologies to their menu, partly in response to more attention for the “dry” low potential areas. While many of these are promising from a technical point of view, they are sometime too expensive for poor farmers, if not heavily subsidised. But more important, everyone involved appears to have lost sight of the real issue – how the experiences could have been internalised in mainstream public extension with or without donor resources. The Evaluation Team have not come across evidence of any appraisals of the project documents for the second and third phase. This may explain why the “real issue” were never really addressed.

CONCLUSIONS AND LESSONS FOR THE FUTURE

The lack of ownership at the central level resulted in a lack of engagement and commitment for SCAPA. On the Tanzanian side there were difficulties in finding a proper “focal point”, while Sida were occupied with the main programme in LAMP. The somewhat unclear roles and responsibilities of Sida and RSCU/RELMA may have contributed to this issue as well.

This left SCAPA to implement the project pretty much on their own. Within the limitations of the project documents, they were quite successful in doing this and therefore content with the situation.

This unfortunate combination resulted in circumstances where, the real issues in terms of developing extension more systematically – first at the district/regional levels and secondly how this could influence the national level – were never really addressed.

An appraisal might have highlighted these issues in time to provide necessary changes in SCAPA.

There were also contradictions and shortcomings as a result of the organisation of the project itself in relation to the national context. SCAPA was hosted at regional and district levels and staffed by their

³⁷ In our discussions with different resource person, the relation between RSCU/RELMA and Sida has been described in different ways, which have been difficult to interpret into one consistent message for this evaluation.

extension staff and it took considerable time before any central focal point emerged in more operational terms. When the formulation of the NSWCP was completed in 1993/94 in the MoA, the idea to link SCAPA with this national programme was seen as the obvious focal point, because of its technical focus on land management. Sida also had experiences from other East African countries of supporting field based land management projects as well as related national policy/strategy processes. The problem here, which may not have been evident at first, was that the NSWCP never were significant enough when it was launched and then it was managed by an organisational unit in MOA that neither were capable nor influential enough to make the NSWCP important (see Section 8.7)

The other possibility for a national focal point would have been to link SCAPA with extension, because of the emphasis on integration of and management in mainstream extension. This could have been problematic as well. Extension in Tanzania has been through many different phases since independence. Accepting these difficulties, the Evaluation Team believes that the experiences of SCAPA could (as probably other small extension-oriented projects in Tanzania) have offered an alternative or complementary experience to the “national” T&V approach supported through NALEP and NAEP II. Repeating our conclusion from elsewhere, this would have required changes after the pilot phase. Instead of physical expansion and the addition of new technologies, the focus should have been how SCAPA’s experiences could have been internalised and institutionalised first in the regional and later district extension service. These experiences should then have been shared with others at the central level. We believe that this have been an opportunity lost.

CONCLUSIONS AND LESSONS FOR THE FUTURE

SCAPA could be viewed both as a “land management” as well as an “extension” project. While this distinction is neither important nor relevant at the local level, it should have been important at the national level as a result of how the central ministries were organised.

The late attempts to link SCAPA with land management through the NSWCP and the DPSP, were perhaps a strategic mistake, regardless of the fact that DPSP never were a particularly successful project. SCAPA had the potential to offer something both through its extension approach as well as through its mission (combining land management with agricultural extension in a broad sense). This suggests that SCAPA’s central focal point should have been through “extension”, while developing strong relations with land management as well.

While the parties and SCAPA failed to pay proper and timely attention for how the experiences could have been internalised or institutionalised at the district/region to begin with and the national level there were also other circumstances that “worked against” SCAPA. The project became the victim of internal Tanzanian politics and the shifts in Sida’s focus for development co-operation all of which surfaced more or less at the same time. The decision to phase out SCAPA came very abruptly, slightly more than one year after the project document was approved. While the third phase was planned for three years, the implicit assumption in the project document was that it would continue through additional phases for up to 10 years. With this background it took some time to realise or understand that Sida was serious with their intention to terminate SCAPA. With reference to the “partnership agreement” between Tanzania and the Nordic countries from 1996 – which among other things says that support from the donors should have a final date and that there should be a plan for the phasing out of external support³⁸ – one could argue that SCAPA should have been extended for some time, if the partnership agreement apply for individual projects.

³⁸ Sida, 1996. Landstrategi för samarbete med Tanzania 1 January 1997 – 31 December 2001 (in English: Sida, 1996. Country strategy for co-operation with Tanzania 1 January 1997 – 31 December 2001).

While the Evaluation Team is not in position to neither question nor support Sida's decision to terminate SCAPA, we question the way it was done. Apart from what might apply for SCAPA in the "partnership agreement" mentioned above, we do not understand why SCAPA was denied a "grace period" to consolidate properly the experiences of a programme, whom so many seem to view as a success. Sida could have offered specific support to seriously look into the institutional constraints of adopting much of SCAPA's experiences at the district and local extension set up in Arumeru and Arusha after the decentralisation in 1998. Alternatively some support in SCAPA's attempts to transfer the programme into an NGO, could have been positively viewed, provided that the formal difficulties could be settled (section 10). There are examples in Tanzania of development co-operation projects that have been transferred to NGOs. The Dutch have managed to do this in at least three cases in the Arusha region (TIPDO, FAIDA BDS, FAIDA SEP), something that could have been studied more closely.

If none of these support alternatives would have been conceivable, Sida could have provided some assistance for a proper "consolidation phase". We do not believe that the linkages with the LAMP districts after SCAPA was terminated in 2000, is a sufficient substitute for this. A consolidation phase would have enabled for SCAPA themselves (staff, VSCC, farmers) to assess on their own terms their experiences (positive and negative) and documented them for others to learn from. During the same time different formal and logistical phasing out issues could have been addressed. As of today, the SCAPA team and the local district authorities claim that they haven't received any formal letter confirming the termination of SCAPA including the question of how to deal with the assets of the programme.

The irony is that not even, when it was decided to terminate SCAPA, has the parties really been able to systematically learn from a project like this as part of a more organised phasing out period. The opportunity may still be there though. Both districts still kept their SCAPA offices and some of the SCAPA staff at the time of the Evaluation Team's field visit in February.

CONCLUSIONS AND LESSONS FOR THE FUTURE

The decentralisation in Tanzania and subsequent political/institutional vacuum that followed immediately after, as well as Sida's shift in focus for development co-operation in the late 1990s and early 2000s added to the difficulties to internalise SCAPAs experiences more systematically.

The decision to terminate SCAPA came very abruptly and has caused considerable frustrations.

The mission thinks that a grace period should have been offered for a proper phasing out of SCAPA. There are, in terms of focus, different alternatives and purposes for a phasing out period that could have been considered.

The local administration hasn't received any clear information as how they should deal with logistical and formal issues such as the assets provided through SCAPA. Both districts still maintain their SCAPA offices and some of the SCAPA staff. This is an opportunity to still consider some of the different phasing out alternatives outlined in the text above.

Finally the Evaluation Team think that there are issues or topics where this particular project together with others could provide useful lessons for the future. While the idea of using pilot projects in different situations often appears attractive, the outcome of these projects varies considerably. There are different potential reasons for this e.g.:

- Pilot projects are sometimes launched to “buy” time, since the parties are not really ready to discuss and negotiate an agreement for a larger programme.
- A certain degree of “freedom” is usually required to test new technologies, systems, organisations, methods etc in pilot projects. This “freedom” is sometime used as an excuse for poorly negotiated (the parties may think that they share a common understanding for the rationale of the project, without necessarily being the case) and planned projects.
- Insufficient attention for a proper system of monitoring and evaluation dilutes the usefulness of a pilot project.
- Unclear roles and responsibilities between the parties regarding the results generated by a pilot project and the use of these.

The usefulness of pilot projects in a changing donor – recipient co-operation context (partnerships, sector programme support, area programme support, etc.), adds another dimension. A study to look into the issues of making pilot projects more relevant and useful could be useful. SCAPA together with a selected set of other pilot projects would provide useful insights in this regard.

CONCLUSIONS AND LESSONS FOR THE FUTURE

A study to look into the issues of making pilot projects more relevant and useful could provide useful lessons for the future.

Annex 1

Terms of Reference for a Post-evaluation of the Soil Conservation and Agroforestry Project Arusha (SCAPA)

1. Background

SCAPA was originally a pilot project initiated in 1989 in Arumeru and Arusha districts in Arusha Region, Tanzania by Sida's Regional Soil Conservation Unit (RSCU). The intention was to later scale-up and replicate the developed SCAPA technologies and approaches suitable for small-scale land-users, in a broader programme on Land Management in Tanzania. Since 1997 SCAPA has provided technical services to the four so called Land Management Programme (LAMP)-districts in Babati, Kiteto, Simanjiro and Singida. Through RSCU – from 1998 the Regional Land Management Unit (RELMA) – SCAPA has also over the years offered training services to organisations and individuals from several countries in the region.

SCAPA was aimed at bringing together extension staff in forestry, crops, livestock and community development with the objective of increasing the agricultural production by introducing soil conservation/land management and agroforestry into the farming systems. The project fell administratively under the Ministry of Agriculture in Arumeru district in Arusha region. Within the Sida administration RCSU was the technical counterpart as well as the unit responsible for channelling of resources and monitoring up to 1993. From 1997 Sida has funded SCAPA via the Land Management and Natural Resources Programme (LMNRP) in Tanzania.

In order to understand the project it is necessary to refer to activities initiated as early as 1983/84 when contacts were established between the SIDA-supported RSCU and the Arusha regional authorities. RSCU invited professionals in the agriculture and forestry sectors from Arusha region to attend courses in Kenya, which also included study tours. Over the years leading up to the start of the programme a number of courses, seminars and study tours were arranged by RSCU, very much in order to facilitate a professional dialogue between the regional/district officials and experienced Kenya officers. In 1986 a consultancy study in the Arusha and Kilimanjaro regions recommended improved training at various levels, organisation of seminars/workshops for administrative staff, initiation of on-farm trials to study the appropriateness (physical as well as cultural) and measures proposed, provision of simple equipment to field staff and fellowships for researchers. RSCU continued to assist in-service training, initiated field trials to test methodologies and provided simple field equipment and handouts. SCAPA has also hosted Conservation Tillage demonstrations as part of a regional co-operation via RELMA (RSCU).

The Sida funding of SCAPA was terminated in December 2000, though SCAPA has continued to render consultancy services to the LAMP districts and other districts to date. Other SCAPA collaborators apart from the Sida supported district land management programme has been: District Rural Development Programmes (Monduli, Mbulu, Tarime), Heifer Project International – Tanzania, World Vision International – Tanzania, Traditional Irrigation Project. Others include CADET, CAMARTEC, SIIP, Tree Planting Project – HMTV, Olmotonyi Forestry Training Institute and Selian Agricultural Research Institute.

2. Objectives

Following the termination of the Swedish funding to SCAPA, there is a need for an end-of-project evaluation, in order for the Tanzanian authorities and Sida to be able to learn from the more than 10 years of investments in land management development work, and draw conclusions for the future.

3. Scope of Work

The evaluation shall provide an all-round description of the project during its implementation period 1989–2000, its geographical coverage, technical inputs, extension approach, administrative set-up, results and impact. The purpose of the descriptive part is to give general information and background for the analysis.

3.1. Techniques

The evaluation shall:

- Assess the impact of the structural and biological measures on soil erosion and land productivity,
- Assess the technologies applied by the project in relation to the farmers' technical knowledge, experience and farming conditions,
- Analyse the linkage between the technical activities in the project,
- Assess the costs and benefits of the project at farm and district level,
- Assess the sustainability of the technologies.

3.2. Extension

The evaluation shall assess the extension approach in terms of:

- Relevance of the extension messages for the local farming system,
- Demonstration and adoption of new technologies,
- Training of field staff and farmers,
- Mobilising interest and active participation among farmers (including the role and functioning of land management committees),
- Facilitating farmer-extension worker dialogue,
- Facilitating co-operation between different actors at the district level.

In addition, the evaluation shall assess the SCAPA extension approach in comparison with the national extension approach.

3.3. Organisation

The evaluation shall:

- Assess the relations between the project and the development administration in the district/region at large,
- Assess the merits and demerits of the project administrative arrangements,
- Assess the financial administration over the programme period, amounts divided between Sida and Tanzania,
- Assess the reporting system and its impact and relevance.

The evaluation shall also:

- List trained people/groups disaggregated by category and gender,
- Describe any follow up made of trained people/organisations,
- Analyse any studies made (technical and/or socio-economic) in areas of intervention (geographical or subject matter) before and after training,
- Assess project impact in terms of improved livelihoods or increased yields – to be looked into via a few defined indicators. It is important to note that SCAPA during later years carried out activities in land management in high, average and low potential areas,
- Assess the impact of external training in Tanzania as well as in the region,
- Analyse available printed and IT-information,
- Discuss potential partners/collaborators in Government, NGOs and commercial land management companies.

Finally, the evaluation shall assess and analyse:

- Is there any impact by SCAPA on the agricultural policy in Tanzania?
- What are the views of the Tanzanian authorities of the SCAPA experiences?
- Is there a need for SCAPA-like activities in this area in the future – have the training activities been efficient?

If there is a need:

- Are there any plans for extrapolation of the SCAPA achievements both from national (Central Government) and local (regional/district) level perspectives?

4. Method of Work, Time Frame & Reporting

Methodology

The evaluation shall be carried out through analysis of available programme/project documents and other documents deemed necessary by the team. Interviews shall be carried out with, but not necessarily be limited to, representatives of the target groups in the field, officials from the project, district and regional and national representatives for the Ministry of Agriculture as well as Presidents Office Regional Administration and Local Government (PORALG), RELMA, relevant CBOs and NGOs e.g. KAMAMMA, CADECT, HPI, DAKIKA, etc.

The evaluation shall be carried out based on a gender perspective, i.e. analysis made and findings presented shall consider both involvement of women as well as men and the impact and consequences for men and women and their respective roles and responsibilities.

The evaluation shall include an assessment and analysis of the project for:

- a) how environment impact assessment has been applied and mainstreamed into the work,
- b) how poverty reduction has been defined and mainstreamed into the work.

Consultants

The evaluation team shall consist of three persons, or two persons as a minimum covering:

- Socio-economy
- Land Management expertise
- Evaluation analysis

One of the team members shall act as Team Leader, one of the persons should preferably know Sida thoroughly, and at least one person should be a national Tanzanian expert, preferably with regional experiences.

Time Frame

The evaluation shall be carried out in four weeks in the field, and two more weeks will be allocated for analysis and report writing.

The field work shall start in January 2003, and a draft report shall be submitted to the Embassy of Sweden/Sida before the beginning of March 2003. A final report shall be presented within two weeks after comments have been submitted from EoS/Sida. The final report should not exceed 30 pages excluding annexes. An executive summary of maximum two pages shall be included.

Relevant Background Material

- SCAPA Programme and Action Plan and budget 1998/99
- Annual Physical and Financial Reports
- Land Management and Environment Programme 1996–1999, March 6, 1996
- Other reports, i.e. publications, etc.
- Training materials

General overview of the three phases of SCAPA

Objectives	Administration *
Phase 1 1989–1993 1. To increase agricult. production through improved soil conservation measures – on a sustainable basis – on small scale farms – in high & medium pot areas 2. To formulate a suitable integrated s.c. extension package for agricult., livestock and forestry 3. To reach these objectives emphasis should be on low cost conservation techniques e.g. use of mainly cultural and biological measures	1. Arusha Regional Administration 2. Sida's environmental fund. 3. 1 350 000 SEK 4. The project administered through RSCU (RELMA)
Phase 2 1994–1996 1. To improve and increase agricultural, livestock and forestry production on sustainable basis through implementation of soil and water conservation and agroforestry activities on small scale farms 2. to increase awareness of land degradation problems and build technical capacity to effectively deal with them in Arusha region, through training in soil and water conservation and agroforestry	1. Ministry of Natural Resources, Forest and Bee Keeping Division 2. Sida's country frame, Environmental Sector and Land Management Sector Programme 3. 3 130 000 SEK 4. Swedish Embassy
Phase 3 1997–2000 Increased food security/production and farm income of small holders through sustainable utilisation of natural resources Improved land husbandry practices adopted by small scale farmers	1. Prime Ministers Office and Ministry of Regional Administration and Local Government 2. Sida's country frame, Land Management and Natural Resource Management Programme 3. 13 540 000 SEK 4. Swedish Embassy and the Consulting company for LAMP

* Legend

1. Tanzanian signatory (This refers to the competent authority in a technical sense. The country frame agreements always involves the Ministry of Finance as well.)
2. Source of Sida fund
3. Sida funding
4. Donor administration

Overview of some quantitative achievements

Annex 3

Annex 3.1 Cumulative targets and levels of implementation for Arusha district: 1993–2000

Annex 1a. TRAINING SESSIONS (Number of persons and percent achievement)

FARMERS						VSCC AND LOCAL LEADERS						SCHOOLS						SPECIAL GROUPS*						EXTENSION STAFF					
TARGET			ACTUAL			TARGET			ACTUAL			TARGET			ACTUAL			TARGET			ACTUAL			TARGET			ACTUAL		
M	F		M	F		M	F		M	F		M	F		M	F		M	F		M	F		M	F				
2725	2019		1565	1236		722	401	556	262	653	662	645	681	73	199	51	139	88	125	62	8								
% achievement**			57.4	61.2		-	-	77	65.3	-	-	98.8	102.9	-	-	69.9	69.8	-	-	70.5	69.6								

* Councilors, policy makers, etc.

Annex 1c. LAND MANAGEMENT ACTIVITIES

FIELD WORK (laying out contour bands, etc)		FIELD VISITS (follow ups)				GULLY CONTROL	
		SESSIONS MADE BY SCAPA TEAM		FARMERS CONTACTED		SITES	
ACTUAL NO. OF FARMERS WITH CONTOURS	LENGTH OF CONTOUR (m)	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
961	218,626	3,600	1721	9,600	4,577	7	3
% achievement		-	47.8	-	50.6	-	42.9

Annex 1d. AGROFORESTRY ACTIVITIES

NO. TREE NURSERY OPERATORS		NO. CENTRAL NURSERIES		NO. ON-FARM TREE NURSERIES		NO. OF WOODLOTS ESTABLISHED		CATCHMENT PLANTING (No. of sites)	
EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL
24	31	8	8	62	34	15	8	14	2
% achievement	129.6	-	100.0	-	54.8	-	53.3	-	4.3

Annex 1e. WATER HARVESTING STRUCTURES AND RELATED ACTIVITIES

CONCRETE TANKS		CONCRETE JARS		WATER PONDS		NO. PERSONS WITH FISH PONDS	
TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
9	6	9	2	12	6	25	19
% achievement	66.7	-	22.2	-	50.0	-	76.0

Annex 1.f NUMBER OF FARMERS PRACTICING DRYLAND FARMING AND PRODUCTIVITY TRIALS

DRYLAND FARMING		NO. OF FARMERS PARTICIPATING IN PRODUCTIVITY TRIALS	
TARGET	ACTUAL	TARGET	ACTUAL
32	31	16	6
% achievement	96.9	-	37.5

Annex 1g. LIVESTOCK PRODUCTION AND RELATED ACTIVITIES

GRAZING MANAGEMENT		FODDER MULTIPLICATION UNITS		PASTURE TRIALS (Number of sites)		UNITS OF HEIFERS PURCHASED		VETERINARY KITS/SERVICE AVAILABLE	
TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
18	13	62	24	78	112	33	13	1	1
% achievement	72.2	-	38.7	-	143.6	-	39.4	-	100.0

Annex 1h. STREAMLINING GENDER INTO SCAPA ACTIVITIES

NO. PERSONS SENSITIZED ON GENDER ISSUES		EXTERNAL COLLABORATION (attendance to meetings, seminars, workshops)		NO. WOMEN REACHED FOR PROMOTION OF WOMEN GROUPS	
TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
408	309	55	48	302	223
% achievement	75.7	-	87.3	-	73.8

Source: SCAPA: Phasing Out Statement, Arusha District, Tanzania. November, 2000

Annex 3.2 Cumulative targets and levels of implementation for Arumeru district: 1993–2000

Note! It was never satisfactory clarified whether these achievements covered this period. The figures could also represent 1997–2000!!

Number of programme areas reached = 115;

Total number of farmers reached in different interventions = 16,493 (11,432M:5061F)

Annex 3.2a. TRAINING SESSIONS (Number of persons and percent achievement)

FARMERS				VSCC & LOCAL LEADERS				SCHOOLS				SPECIAL GROUPS*				EXTENSION STAFF			
TARGET	ACTUAL		TARGET	ACTUAL		TARGET	TARGET	ACTUAL		TARGET	TARGET	ACTUAL		TARGET	TARGET	ACTUAL		TARGET	TARGET
	M	F		M	F			M	F			M	F			M	F		
	2178	938						961	944			12	11			66	40		
Total (actual Achievement)	3116		N/A	N/A		N/A	N/A	1905		N/A	N/A	23		N/A	N/A	106			
% achievement**																			

NOTE: The key below applies to the whole of Appendix 2.

*Councillors, teachers; N/A = Data not made available; ** Level of achievement was not determined as the targets set were not indicated.

Annex 3.2b. STUDY TOURS (Number of persons involved)

FARMERS				VSCC & LOCAL LEADERS				SCHOOLS				SPECIAL GROUPS				EXTENSION STAFF			
TARGET	ACTUAL		TARGET	ACTUAL		TARGET	TARGET	ACTUAL		TARGET	TARGET	ACTUAL		TARGET	TARGET	ACTUAL		TARGET	TARGET
	M	F		M	F			M	F			M	F			M	F		
	878	864		334	262							12	6			17	24		
Total (actual Achievement)	1742		N/A	596		N/A	N/A	N/A		N/A	N/A	18		N/A	N/A	41			
% achievement**																			

NB: Study tour to SCAPA: Actual = 1009 (748M :261W)

Annex 3.2c. LAND MANAGEMENT ACTIVITIES

FIELD WORK		FIELD VISITS				GULLY CONTROL	
		SESSIONS MADE BY SCAPA TEAM		FARMERS CONTACTED		NO. OF SITES	
ACTUAL NO. OF FARMERS INVOLVED	LENGTH OF CONTOUR (m)	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
NA	202,651	N/A	243	N/A	9453 (5589F:3864M)	N/A	18
% achievement**							

Annex 3.2d. AGROFORESTRY ACTIVITIES

NO. TREE SEEDLINGS RAISED AND DISTRIBUTED		NO. CENTRAL NURSERIES		NO. ON-FARM TREE NURSERIES		NO. OF WOODLOTS ESTABLISHED		NUMBER OF FAMILIES WHICH RECEIVED BEEHIVES	
EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL
	762,362	N/A	N/A	N/A	N/A	N/A	N/A	N/A	44 (one each)
% achievement**									

Annex 3.2e. WATER HARVESTING STRUCTURES AND RELATED ACTIVITIES

CONCRETE TANKS		CONCRETE JARS		WATER PONDS CONSTRUCTED		NO. PERSONS WITH FISH PONDS	
TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
	5	N/A	5	N/A	19	N/A	N/A
% achievement**							

Annex 3.2f. NUMBER OF FARMERS PRACTICING DRYLAND FARMING AND PRODUCTIVITY TRIALS

DRYLAND FARMING	NO. OF FARMERS PARTICIPATING IN PRODUCTIVITY TRIALS
No information available	No information available

Annex 3.2g. LIVESTOCK PRODUCTION AND RELATED ACTIVITIES

GRAZING MANAGEMENT	FODDER MULTIPLICATION UNITS	PASTURE TRIALS	UNITS OF HEIFERS PURCHASED	VETERINARY KITS/SERVICE AVAILABLE
No information available	No information available	No information available	No information available	No information available

Annex 3.2h. STREAMLINING GENDER INTO SCAPA ACTIVITIES

BASELINE INFORMATION	EXTERNAL COLLABORATION	PROMOTION OF WOMEN GROUPS
No information available	No information available	No information available

Source: Data summarized from cumulative achievement summarized in SCAPA Quaterly Physical and financial Report, July - September, 2000 Tanzania. Ministry of Agriculture and Cooperatives.

Annex 3.3 Cumulative targets and levels of implementation for Arumeru district: 1989–1992

Number of programme areas reached = 35;

Appendix 3.3a. TRAINING SESSIONS (78 sessions) - Number of persons

FARMERS		VSCC & LOCAL LEADERS		SCHOOLS		SPECIAL GROUPS*		EXTENSION STAFF	
TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
	3000								250
% achievement**									

Appendix 3.3b. STUDY TOURS (Number of persons involved)

FARMERS		VSCC & LOCAL LEADERS		SCHOOLS		SPECIAL GROUPS		EXTENSION STAFF	
TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
	1800							N/A	41
% achievement***									

NB: Study tour to SCAPA: Actual = 1009 (748M :261W)

Appendix 3.3c. LAND MANAGEMENT ACTIVITIES

FIELD WORK		FIELD VISITS				GULLY CONTROL	
		SESSIONS MADE BY SCAPA TEAM		FARMERS CONTACTED		NO. OF SITES	
ACTUAL NO. OF FARMERS INVOLVED	LENGTH OF CONTOUR (m)	TARGET	ACTUAL	TARGET	ACTUAL	TARGET	ACTUAL
	~ 500 km						
% achievement**							

Appendix 3.3d. AGROFORESTRY ACTIVITIES

NO. TREE SEEDLINGS RAISED AND DISTRIBUTED		NO. CENTRAL NURSERIES		NO. ON-FARM TREE NURSERIES		NO. OF WOODLOTS ESTABLISHED		NUMBER OF FAMILIES WHICH RECEIVED BEEHIVES	
EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL	EST.	ACTUAL
	273 000				20				
% achievement**									

Source: Semu E. et al (1992) Evaluation of Soil Conservation and Agroforestry Programme - Arusha (SCAPA) in Tanzania

Annex 3.4

Booklets, extension leaflets and posters produced in SCAPA in Kiswahili

1. Maendeleo ya Jinsia – (Gender development)
2. Jinsia na Mazingira – (Gender and the Environment)
3. Hifadhi ya Mazingira – (Environmental preservation)
4. Kilimo cha Kucha –
5. Hifadhi ya Maji ya Mvua – (Rainwater Preservation)
6. Makorongo – (Gullies)
7. Namna ya Kutumia ‘Line Level’ – (How to Use a Line level)
8. Uandaaji wa Mbegu za Miti Kabla ya Kusia – (Preparation of Tree Seeds Prior to Sowing)
9. Utengenezaji wa Hei (Hay) – (Hay Making)
10. Upandikizaji wa Miti ya Kilimo Mseto – (Transplanting Agroforestry Tree-seedlings)
11. Kupima Makingo kwa Kutumia ‘Line Level’ – (Measuring Contours Using a Line Level)
12. Jinsi ya Kuzuia Makorongo – (Gully Prevention)
13. Uvunaji, Matumizi na Hifadhi ya Maji ya Mvua – (Rainwater Harvesting, Preservation and Use)
14. Mbinu Bora za Kilimo Kwenye Maeneo Yenye Mvua Haba – (Improved Farming Practices in Low Rainfall Areas)
15. Mabanda ya Ng’ombe wa Maziwa – (Dairy Cow Sheds)
16. Utengenezaji wa Sailegi (silage) – (Silage Making)
17. Utunzaji na uvunaji wa Miti ya *Calleandra*, *Sesbania* na *Lukina* – (Management and Harvesting of *Calleandra*, *Sesbania* and *Leucina* spp)
18. Kilimo Bora Katika Hifadhi ya Ardhi – (Improved Agronomic Practices on Preserved Land)
19. Kilimo Mara Dufu – Double cropping
20. Ufugaji Huria – (Livestock Keeping Under Free Range)
21. Majiko Sanifu – (Improved Stoves)
22. Miche ya Matunda – (Fruit Tree Seedlings)
23. Uoteshaji wa Miti ya Matunda – (Growing Fruit Trees)
24. Magonjwa ya Ng’ombe – (Cattle Diseases)
25. Ng’ombe wa Maziwa – (Dairy Cattle)
26. Ukamuaji Sahihi – (Appropriate Milking)
27. Kuzuia Magonjwa – (Disease Prevention)
28. Kugundua Dosari kwa Mnyama Anayefugwa – (Detecting Problems in Domestic Livestock)

Annex 4

Common land management technologies in SCAPA and their primary impact on land management³⁹

The technologies promoted for improved land management in SCAPA has relied on a combination of physical structures and biological measures. The details have varied according to the specific local conditions in terms of soil, rainfall, slope and local farming practices. In the following a brief overview and technical assessment is made on four categories of technical interventions namely; i/ Soil conservation on agricultural land; ii/ Control of overland flow; iii/ Agroforestry; and iv/ Water harvesting and management.

Degradation on agricultural land

The Universal Soil Loss Equation (USLE), capture the essence of appropriate soil and water conservation on land exposed to water erosion (rainfall/runoff). USLE has been questioned when it has been applied as a tool for detailed soil conservation measures as well as for overall land management strategies, for which it was/is basically intended⁴⁰. This being said, the Evaluation Team believe that USLE provides a useful conceptual framework for assessing improved land management practices, for those technologies that has constituted a significant part – in quantitative terms – of the extension, training and support provided by SCAPA. The USLE formula reads

$A = R \times K \times LS \times C \times P$, where

A is the soil loss in tons, volume or soil depth per unit area and year.

R is rainfall or rather a measure of it's erosivity as a function of rainfall amount and intensity.

K is the erodibility of the soil as a function of primarily soil texture/structure.

LS is the length and gradient the surface (length and gradient of any slope).

C is the crop management factor (the time and quality of crop cover as opposed to bare land)

P is the support practice factor or the conservation practise e.g. contour ploughing, earth bunds, grass strips etc. as opposed to ploughing up and down the slope.

The soil and water conservation technologies in SCAPA that are applicable in USLE address the following principle aspects:

1. *Surface erosion*

- Technologies that reduce run off and associated sheet and rill erosion: earth bunds, grass strips, strip cropping, contour cultivation etc.
- Technologies that reduce the impact of the rainfall on the soil surface: crop rotation, mixed cropping, mulching, organic fertilisers, inorganic fertilisers etc.
- Technologies that reduces the soil surface sensitivity to erosion from the impact of rainfall.

2. *Poor soil fertility*

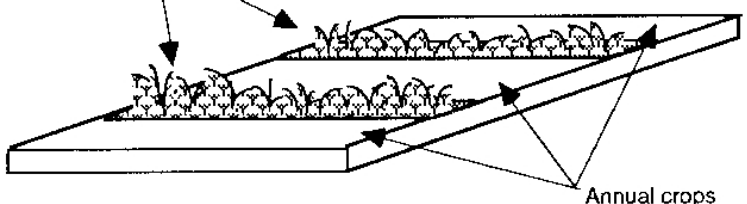
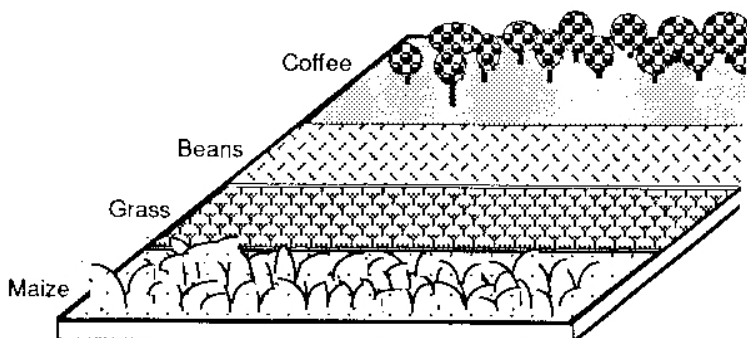
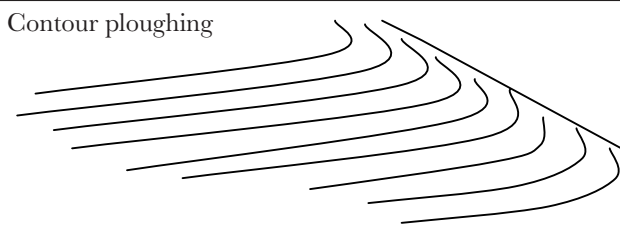
- Technologies that maintain or improve soil nutrient status: agroforestry with nitrogen fixing plants, mulching and application of manure and/or chemical fertilisers, management of crop residues etc.
- Soil moisture availability: contour cultivation, mulching etc.

The table below provides an overview of common practices in SCAPA and their principle impact on soil and water conservation.

³⁹ Many of the illustrations here are from SCAPA's own manual on soil and water conservation.

⁴⁰ USLE has a narrow focus on degradation in physical terms (erosion in terms of soil loss per unit area over time) and does not in a strict sense say anything about other aspects of degradation such as wind erosion, depletion of nutrients, changes in soil characteristics (changes in soil structure, acidification, development of hard pans etc.).

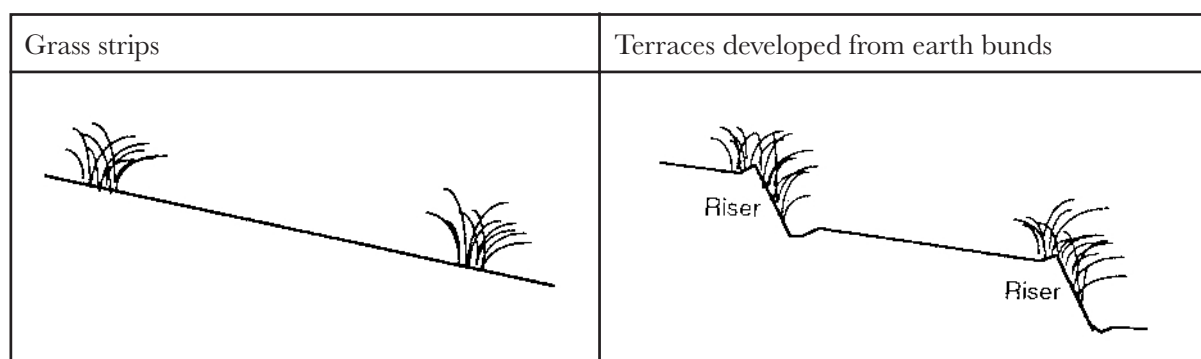
Land management technologies on agricultural land and their principle impact

Technologies applied in SCAPA		Impact in USLE
Earth bunds, grass strips on the contour 		Reduces immediately the length of the slope. The soil that will build up behind the bund will gradually reduce the slope factor as well. On steeper slopes a bench terrace will gradually develop. In USLE it is the LS and the P factor that is affected. In figure 1 below a terraces and grass strips are schematically illustrated
Strip cropping, SALT⁴¹ (agroforestry) 		Reduces the length of the slope. The mixture of perennial and annual crops reduces area of bare soil exposed to erosive rain. Eventually a slight reduction in slope may occur as well but to a lesser extent than for constructed earth bunds. The impact on USLE is complex and includes the L, S and P factor. Need to be assessed for each crop. The C factor will obviously be more significant for grass and coffee than for the annual crops. This could also be seen as a special application of agroforestry (see section below).
Contour ploughing 		Reduces the amount and the speed of the run off. In USLE it is the P factor that is influenced. The reference value for the P factor ploughing up and down the slope i.e. the worst possible alternative from erosion aspects.
Crop rotation, mixed cropping,	Extends the time the land is covered by vegetation as well as the quality of this cover. In USLE it is the C factor	
Fertiliser organic fertilisers, inorganic fertilisers etc.	Improves the quality of the crop and biomass production and therefore the soil cover. In USLE it will be the C factor and indirectly the K factor*	
Mulching, Crop residues, application of composts, green manure	Improves the quality of the crop and enhance the formation of clods in fine textured soils In USLE it will be both the C and in theory the K factor*	
Minimum tillage Land preparation with small holes for the seeds instead of ploughing and harrowing	Reduces the disturbance of the soil surface. In USLE it will be the K factor	

* In the application of the USLE, the K factor is determined for different types of soils and is therefore a fixed value. In practice one could argue that any practices that increase the organic content will promote the formation of soil aggregates or clods in fine textured soils, something that will make these soils less vulnerable to erosion.

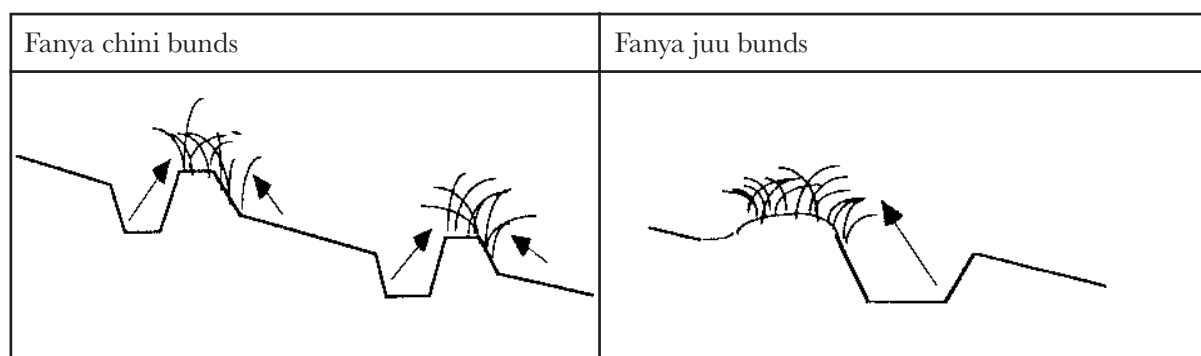
⁴¹ SALT or Sloping Agricultural Land Technology was developed together with farmers in the Philippines. This is essentially very similar to strip cropping as it is presented in the SCAPA Soil Conservation Manual.

Figure 1



The terraces are normally the result of an earth bund that gradually silts up. Hence the terrace develops progressively over time through the erosion that takes place between the bunds (figure 1). The bunds themselves are either constructed by throwing the soil down hill (fanya chini) – which has been the preferred option among the farmers in Arusha and Arumeru district – or uphill (fanya juu). These two techniques are illustrated in figure below.

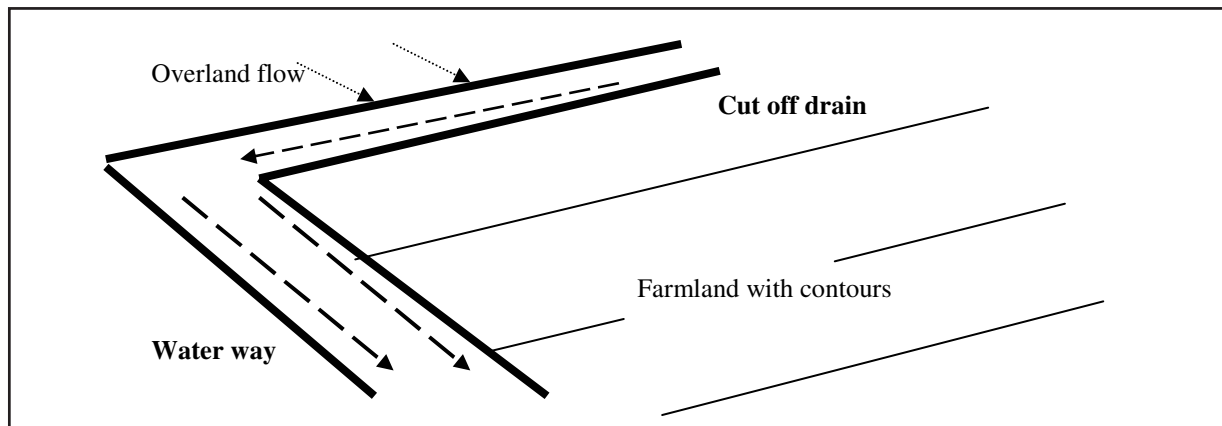
Figure 2



Overland flow and concentrated flows of water

Apart from the run off that may be generated on the agricultural land itself, run off or “overland flow” may enter from outside the farm land and cause considerable erosion. Moreover any conservation measures on the land such as contour bunds, mulching etc. can be destroyed or washed away. The common practice is to divert the overland flow away through the construction of a cut off drain. This is in principle a fairly deep ditch constructed with a slight gradient. From a technical point of view the issues are to construct a drain that can accommodate the overland flow of water – which can be substantial – and to safely dispose this down the slope. For the latter a special water way may have to be established. This in turn requires a fair area of land and on steeper slopes special measures to reduce the speed of the water, which otherwise can cause erosion (Figure 3).

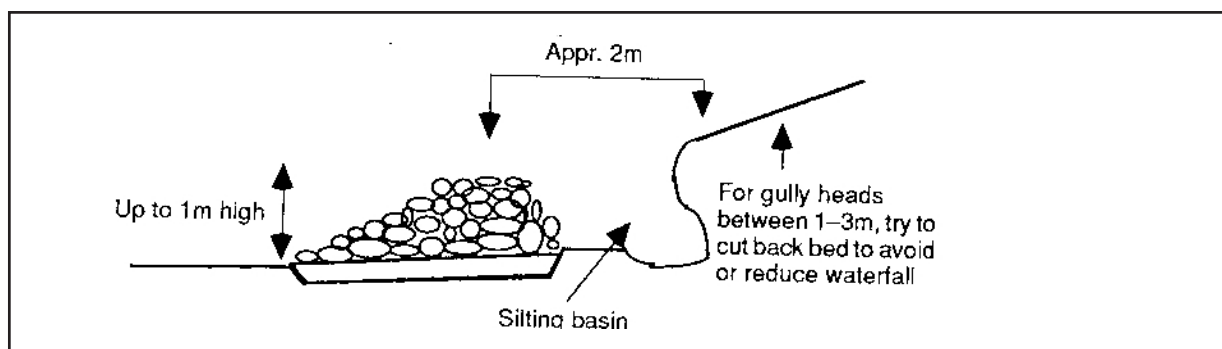
Figure 3



Cut off drains can also be used to address problems with gully erosion by diverting water away from the gully head that otherwise will eat it's way up the slope. In case the flow of water is limited and somewhat concentrated, the cut off drains could be smaller than for protection of larger areas of agricultural land. The Evaluation Team only came across a few cut off drains and not in connection agricultural land. These drains were properly designed and constructed and appeared to have contributed to the stabilisation of the gullies.

The cut off drain is usually combined with other measures for stabilising and reclaiming a gully. These includes construction like check dams (Figure 4), stabilising the gully head and the sides with plantations (Napier grass has been used extensively by SCAPA for this purpose) and levelling of the sides and/or the gully head to make them less steep, in order to reduce the erosion caused by water entering the gully. Since gully reclamation is expensive (in terms of labour input) one need to be selective and reclaim some gullies, while others may only need to be stabilised to prevent further expansion of the gully. In SCAPA the technologies used for different situations and application of these technologies has by and large been satisfactory and successful, judging from what the mission was exposed in the field.

Figure 4: Cross section through a check-dam made of stones



Agroforestry

Apart from soil and water conservation, agroforestry has been the other cornerstone of SCAPA that has been integrated with general extension in agriculture and animal husbandry. While agroforestry⁴² commonly are integrated with improved land management at large (see e.g. strip cropping in Table 1), there are also special requirements normally associated with good agroforestry practices. Most important are the selection of species and how these are integrated with other land uses. The trees or shrubs should not compete excessively with other crops, but rather enhance productivity. This is one major reason for why nitrogen fixing species are so popular. Out of the 30 species listed in SCAPA's manual on soil conservation and agroforestry, one third are potentially nitrogen fixing. Trees and shrubs can also be beneficial through other form of symbiosis like e.g. with mycorrhiza by which nutrients are more efficiently utilised and particularly if this is from deeper layers of the soil.

The management all the way from raising the seedlings, managing the trees/shrubs and the utilisation is also important. This implies that the management can both be more intensive as well as the need for being integrated with the management of other aspects of the farming system. This includes how and when harvest of wood (stem or branches), leaves, fruits, bark, resin etc. should be made for a variety of purposes. Moreover special considerations may be required in order to minimise any possible competition like e.g. pruning of branches to allow more light for the annual crops or root pruning to minimise competition for water or nutrients. The latter appeared to be the problem in one site in the dry low potential area visited by the mission. The maize developed poorly close to the bunds where the trees had been planted. Apart from wider spacing between the trees, this was a case when root pruning could have been justified (see Photo 2 in the main text).

Another aspect of agroforestry in “practice” that does not always get the attention required is that there might be a need to inoculate the seeds with special micro-symbionts. The right and most effective type of rhizobium (or any other type of nitrogen fixing bacteria) may not be present in the soil to form active nitrogen fixing root nodules, if for instance exotic species are used. The nodulation can sometimes be tested by checking the roots of a seedling for the presence of active nodules. If one cut through the nodule the colour should be slightly pink. The mission tested a few seedlings without any conclusive result. The nodules were either missing or few and very small. They appeared not to be active⁴³. This is not to suggest that this is a general problem in SCAPA since many of the species are indigenous, but it reveals that a more active follow up could have been done in the project.

Water harvesting and management

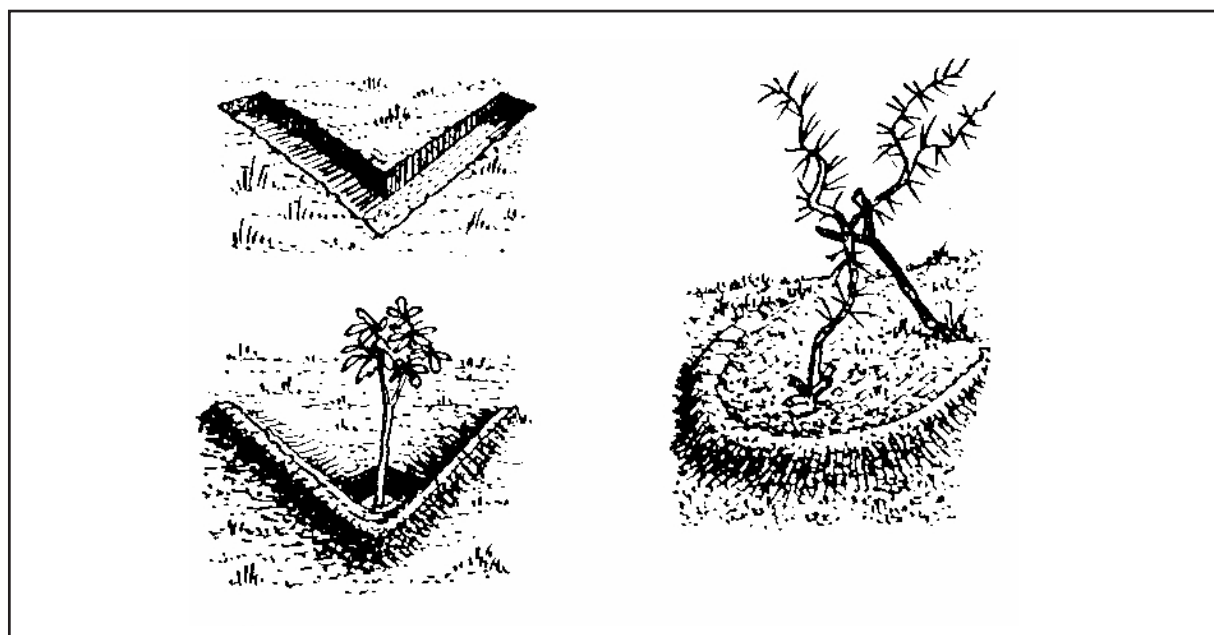
Beside soil conservation techniques that also improve soil moisture conditions, like e.g. the contour bunds, there are also various micro catchment techniques (e.g. semi-circular and eyebrow terraces), where the primary purpose is to prepare more favourable soil moisture conditions for tree planting. SCAPA has provided extension advice on these technologies particularly in “dry” low potential area. The principle issues for all these types of micro catchments are to trap and divert run off to the place where the plant/tree seedling grows. The more specific design depends on slope and the soil characteristics of the site. Examples of micro catchments are schematically illustrated in Figure 5. From a land management point of view, the micro catchments are in principle technically sound interventions that should have a positive impact on the survival and growth of plants.

⁴² Agroforestry are often defined as a system where trees and shrubs are integrated with other types of land use. This integration can be both spatial and temporal.

⁴³ There is also a seasonally regarding nitrogen fixation and the presence of active nodules.

When water is scarce it is equally important to reduce wastage through evaporation and transpiration. This could be done by providing mulch around the plant(s) in the eyebrow or semi-circular terrace. The mission did not see any example of this on the terraces demonstrated, although we were told that this is being applied. Another possibility to enhance survival of the seedlings during the dry season is to partly defoliate them before planting them. This is not suitable for all species and needs to be adapted somewhat differently for those species where this is possible. This appears not to have been tried in SCAPA.

Figure 5



SCAPA has also added other more elaborate water harvesting techniques during the last phase. These include water -tanks, -jars and -ponds. While the tank and jars are made out of concrete, the pond is excavated on the ground. The tank and the jar are usually placed near the roof of a building from which rainwater can be harvested and collected. For ponds, successful water harvesting depends on the surrounding topography and how surface run off can be diverted to a particular pond. These structures are primarily for provision of water to the household. Their impact for land management and productivity are therefor less obvious.

Annex 5

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Annex 6

List of persons consulted

Persons	Positions
Mrs Adeline Shayo	Livestock specialist, SCAPA extension team, Arusha
Mrs Agnes Ngokiwa	Farmer, Mkonoo village, Arusha
Ms Agnes S Rite	Crop specialist, SCAPA extension team, Arumeru
Mrs Agnes Algoiva	Farmer and member of VSCC, Mkongo village, Arusha
Mrs Aichi Kitalyi	Animal Husbandry Advisor, RELMA
Mrs Apsama. H. Lauwo	Livestock specialist, SCAPA extension team, Arusha district
Mr Arne Eriksson	Former advisor to SCAPA
Mr Callyst Kavishe	LAMP District Advisor – Babait, ORGUT
Mrs Catherine Cornelio	Farmer, Baraa village, Arusha
Mr Charles Lyamchai	Director, Seilan Agriculture Research Centre
Mr Christopher N. Leua	Regional Natural Resource Management Advisor, RAS, Arusha
Mrs Consesa Zaidi	Community development specialist, SCAPA extension team, Arumeru
Mr D. M. Ragaugila	DALDO, Arumeru district
Mr Elisha Lomnyaki	Farmer, Kimandalu village, Arusha
Mr Erik Skoglund	Senior Programme Officer, Sida – Stockholm
Mr Ernest Clauge	Farmer and VSCC member, Kimandoln village, Arusha
Mrs Evelyne Sumari	Farmer, Nambala village, Arumeru
Mr Fares E. Mahuha	Research Department, MoAF
Mr Gasper Urio	Land use specialist, SCAPA extension team, Arumeru
Mr Gathiru Kimaru	Soil Conservation Advisor, RELMA
Mr Hamisia Kidungwe	Water engineer, SCAPA extension team, Arumeru
Mrs Happiness Phillip	Crop specialist, SCAPA extension team, Arusha
Mrs Jane Kibbassa	Programme Officer, Sida – Dar Es Salaam
Mr Joachim Mmasi	Secretary, CADECT
Mrs Joan Lekei	Livestock specialist, SCAPA extension team, Arumeru
Mr John Lekawo	Farmer, Mlimani village, Arusha
Mr Jonas Mollel	Farmer, Kikokwaru-B village, Arusha
Mr Joseph Mkwizu	SCAPA District Coordinator, Arusha
Mr Josiya Lewanga	Farmer, Kimandolu, Kitiengare sub-village, Arusha
Mr Julius Fanuel	Animal science, SCAPA extension team, Arumeru
Mr Justin Kirani	Farmer, Oldomjukumur village, Arusha
Mr L. Ngigwana	Regional Livestock Advisor, RAS, Arusha
Mr Laiser Lekau	Farmer, Mlimani village, Arusha
Mr Lennart Bondesson	Senior Programme Officer, Sida – Stockholm

Mr Leonard Mawenya	Regional Agriculture Advisor, RAS, Manyara Region (former Regional Coordinator in SCAPA)
Mr Likigelie Lembesa	Farmer and member of VSCC, Nadosoito village, Arusha
Dr Lill Lundgren	Senior Programme Officer, Scandia Consult, Stockholm
Mr Lokisa	Traditional Irrigation Project, Arusha
Mr Lomayani K. Sarao	Farmer and VSCC member, Arumeru
Mr Lucas Laimeli	Farmer, Oloitushula village, Arumeru
Mr Lukas Laimer	Chairman Village Council, Oloitushula village
Ms Magdalena Lewanga, Youth	Farmer, Kitiengare sub-village, Arusha
Ms Magdalene Leuany	Farmers daughter, Kimandoln village, Arusha
Mrs Margaretha Sundgren	Programme Officer, Sida – Stockholm
Mr Maroufo	Village Soil Conservation Committee, Babati Village
Mrs Martina Tesya	Farmer in Babati
Mrs Mary Lucas	Crop specialist, SCAPA extension team, Arumeru
Mrs Mary Mgema	Ministry of Agriculture and Food Security, Extension Department
Mr Mbogo Futakamba	Assistant Director, Irrigation and Technical Department, MoAF
Mrs Neema Lesian	Farmer, Nadosoito South village, Arusha
Mrs Neema Ndarvoi	Farmer
Mr Nyitti	Coordinator in DAKIKA, Kikatiti village
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