World Vision

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Talensi Farmer-Managed Natural Regeneration Project, Ghana

Social Return on Investment Report

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Talensi Farmer-Managed Natural Regeneration Project in Ghana

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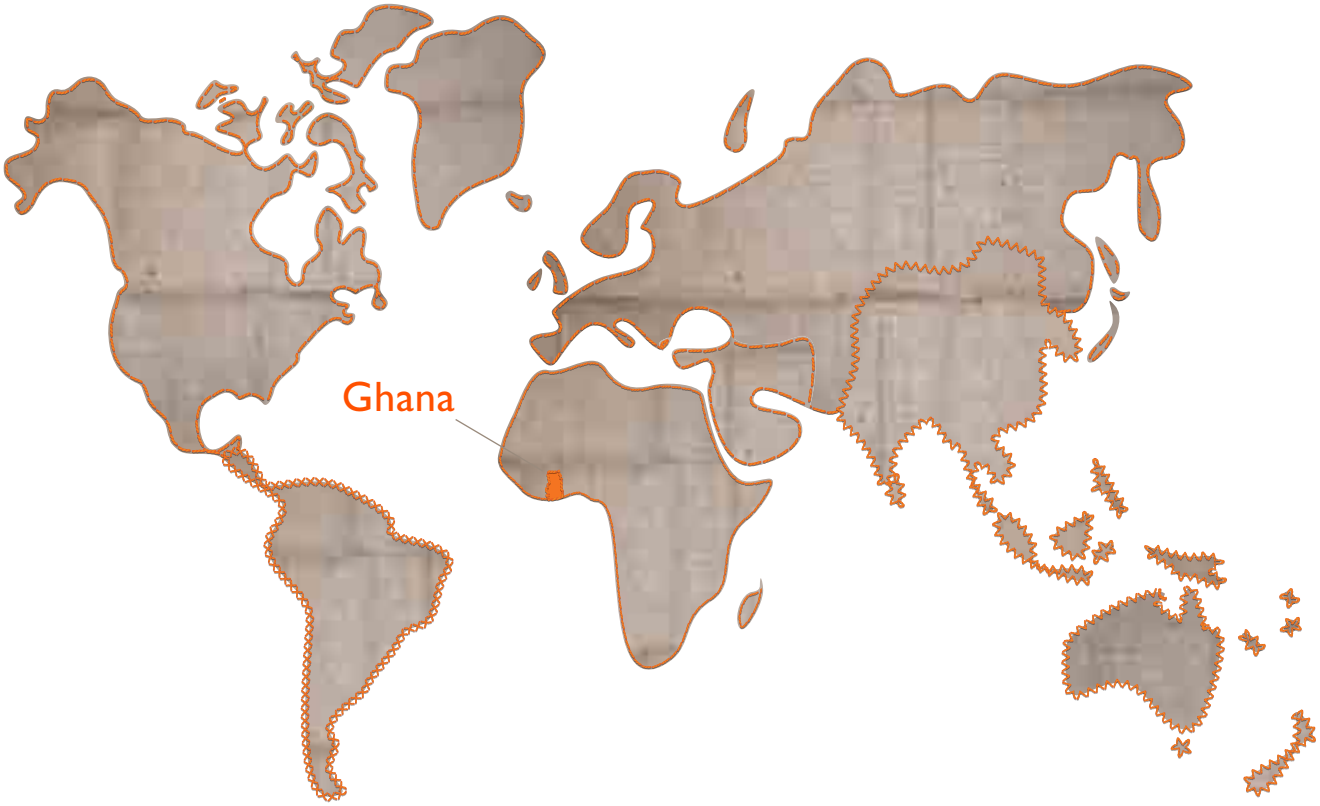

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Acronyms and Definitions

Acronyms

AusAID	Australian (Government) Agency for International Development
FMNR	Farmer-managed natural regeneration
GH¢	Ghanaian cedi: the national currency of Ghana (worth US$0.53 at time of data collection: July 2012. Source: www.xe.com)
SROI	Social return on investment

Definitions

Area Development Program	World Vision's default management structure for long-term community development programs.
Community commons	Outcomes that cannot be assigned to individual households and are therefore enjoyed by all members of the community collectively.
Comparison group	The cohort of households who took part in the household survey but live outside the project area and were not involved in project activities.
Discount rate	In relation to calculating net present value of anticipated income or benefits, the discount rate is an interest rate to account for the time value of money, ie, money available in the future is worth less than money today.
Lead farmer/farmer-managed natural regeneration farmers	A resident of one of the nine project communities who was selected by their chief and community to undergo intensive training by the project and became a member of his or her community's farmer-managed natural regeneration group.
"Neighbour" farmer or household	A farmer or household resident in one of the nine project communities who has not received intensive training by the project and is not a member of a farmer-managed natural regeneration group.
Net present value	This concept assumes a future anticipated benefit is worth less to a stakeholder than the same benefit experienced in the present. The evaluation used a discount rate of 8.9 percent per annum, which is Ghana's predicted inflation rate for 2012-2017.
Theory of change map	A visual representation of how an intervention's hypothetical or actual sequence of early and intermediate accomplishments lead to long-term outcomes.

Affirmation

Except as acknowledged by the references to other authors and publications, the evaluation described herein consists of our own work, to describe and advance learning as part of the requirements of World Vision's design, monitoring and evaluation learning system.

Primary quantitative and qualitative data collected throughout the evaluation process remain the property of the communities and families described in this document. Information and data must be used only with the consent of the community. Where contact for permission is not feasible, World Vision Australia or World Vision Ghana may represent their interests as their proxies.

Peter Weston and Reaksmey Hong

Executive summary

The Talensi Farmer-Managed Natural Regeneration (FMNR) Project has been instrumental in securing the livelihoods of subsistence farming households in the semi-arid north of Ghana. Over recent decades, people in this zone have been experiencing increasingly erratic rainfall, declining forest cover and an associated loss of indigenous biodiversity and soil fertility. The region has also experienced high population growth that has reduced the size of household land.

The Talensi FMNR Project was a three-year collaboration between World Vision Australia and World Vision Ghana aiming to rebuild household resilience among vulnerable communities in Talensi District in the Upper East Region of Ghana[1]. The project focused on nine communities in Talensi containing a population of approximately 12,000 people in 1,472 households.

To reverse deterioration of soil fertility and the natural resource base, the project focused on restoring multi-purpose indigenous trees to farmland and community-managed forests. It did this by promoting adoption of FMNR and complementary sustainable agriculture techniques.

To test the utility of promoting FMNR in food security and climate change adaptation projects, this evaluation applied a social return on investment (SROI) approach to identify what project outcomes created the most value in the lives of the project's key stakeholders.

Secondly, the SROI approach applied proxy financial values to these outcomes, enabling the evaluation to interpret the project's value for money. This approach is somewhat different to measuring outcomes against pre-determined target indicators.

By piloting an SROI study, this report also provides opportunity to reflect on the applicability of SROI as an evaluation approach for World Vision projects and the wider international development community in Australia.

Data collection used a mixed methods approach, drawing on the following methods:

- focus group discussions
- key informant interviews
- quantitative household survey
- field surveillance
- revealed preference

The study calculated that, after accounting for discounting factors, World Vision's investment of funds, staff and technical input generated in the target communities a SROI ratio of 6:1 by year three (end of the project). The study also calculated that the project will generate a ratio of 17:1 by year seven (four years after project closure) and 43:1 by year 13 (10 years after project closure).

For World Vision Australia's investment of Ghanaian Cedi (GH¢) 608,928 (US$323,816), the net present value that will be created by the project between 2009 and 2016 is estimated at GH¢10,304,000 (US$5,500,000). A sensitivity analysis found that the SROI ratios are robust when individual variables are adjusted.

A summary of outcomes for the nine participating rural communities is represented in Table 1. A more detailed breakdown of outcomes can be found on page 18.

Figure 1: Project location on map of Ghana (Source: University of Texas)

Key achievements by the end of the project:

- 574 households (37 percent of all households) adopted the FMNR approach
- 157 households adopted fuel-efficient stoves (90 were distributed by the project and the remainder were spontaneous adoptions)
- All nine communities established natural resource management regulations
- 94 percent of FMNR adopters reported an increase in soil fertility (against 26 percent among the comparison group)
- 66 percent of FMNR adopters reported improvement in soil erosion (against 17 percent in the comparison group)
- 46 percent observed that the FMNR practices have generated more wild fruits and food (fruits, nuts, rabbits and partridges)

Table 1: High level summary of outcome categories and their aggregated values identified by the study

Stakeholder	Outcome category	Value after three years (end of project) in GH¢	Forecast value after seven years (four years after project) in GH¢	Forecast value after 13 years (10 years after project) in GH¢	Percentage of total value per stakeholder group (after seven years)
Lead farmers' households (n=180 households)	Increased household resources and income	252,000	671,000	1,309,000	72%
	Improved health	48,000	144,000	281,000	15%
	Psychosocial	66,000	123,000	237,000	13%
	Total	**366,000**	**938,000**	**1,826,000**	**100%**
Neighbouring households (n=1,292 households)	Increased household resources and income	1,354,000	2,425,000	4,852,000	82%
	Improved health	142,000	393,000	703,000	13%
	Psychosocial	65,000	151,000	209,000	5%
	Total	**1,561,000**	**2,969,000**	**5,764,000**	**100%**
Community commons/ public goods (n=1,472)	Economic	1,607,000	6,512,000	16,216,821	84%
	Psychosocial	217,000	651,000	1,302,000	8%
	(Global) environmental	83,000	640,000	2,009,000	8%
	Total	**1,907,000**	**7,803,000**	**19,527,821**	**100%**
Raw total of value created (GH¢)		3,834,000	11,710,000	27,118,821	
Net present value		=US$2m	10,304,000 GH¢ =US$5.5m	26,123,000 GH¢ =US$13.9	

US$1 = 2.1GH¢; GH¢1 = US$0.53[2]

Lead farmers were those who received the most intensive training and support by the project to become the principle trainers and motivators of change in the communities. In general, lead farmer households experienced higher returns from the project than their neighbours. However, due to their lower numbers (180 lead farmer households versus 1,292 neighbouring households) the net value of outcomes for lead farmer households appears lower in the above table.

For both lead farmer households and neighbouring households in the project area, the greatest source of value generated by the project was the increase in asset value in the form of tree stocks and livestock. The next highest value was the increase in consumption and/or sale of "wild" resources such as fruit, timber, thatch, bush meat and traditional medicines.

Improved farm yields and improved nutrition were the next most significant sources of value created by the project. Also of high benefit were the psychosocial impacts of greater social cooperation, leadership development within the community, and a more comfortable and aesthetically appealing social and work environment.

Based on the above values created and SROI ratios, the project's FMNR foundation demonstrates good value for money as a community development initiative among subsistence dryland communities. A comparison of Talensi FMNR against 12 other SROI studies of international development, social change or environmental projects indicates that Talensi FMNR is in the top quartile of both short-term and long-term social returns.

1. Introduction

This report shares findings on the value created in participating communities by World Vision's Talensi FMNR Project. The project took place in nine communities in the Talensi District, Upper East Region, in the semi-arid north of Ghana, covering 1,472 households.

By applying SROI analysis, this report calculates the project's value for money by articulating the social, economic and environmental values created by the project, as expressed by members of farming households. The report is a tool to:

1. summarise project impact and the magnitude of individual outcomes;
2. evidence the utility of the FMNR approach and complementary techniques; and
3. demonstrate the potential of applying SROI to international community development projects.

This report is an adjunct to the detailed Talensi end-of-project evaluation report. Readers seeking a comprehensive understanding of the project and its evaluation findings should read both reports as a two-volume set.

World Vision Australia is trialling SROI as an additional evaluation tool to quantify complex project outcomes into succinct and meaningful messages. SROI was specifically selected as a tool for interpreting value for money because:

- the SROI approach is backed by a well-established professional network;
- the methods, analysis and results can be externally validated;
- SROI creates a compelling story and credible evidence of change; and
- SROI compels evaluators and their audience to explicitly value non-economic outcomes that are important to human development but may otherwise be under-valued due to the absence of market value.

Basic steps of FMNR

(adapted from Rinaudo, 2007)

"Farmer-managed natural regeneration involves selecting and pruning stems regenerating from stumps of previously felled, but still living trees. Sustainability is a key feature of the program which requires very little investment by either government or non-government organisations (NGOs) to keep it going."

1. FMNR depends on the existence of living tree stumps in the fields.

2. Healthy, straight stems are selected and pruned for improved growth. The unwanted stems are removed.

3. Much more can be gained by selecting and pruning the best five or so stems.
   In this way, when a farmer wants wood some mature stems can be harvested and the rest left to continue growing.

Figure 2: Basic steps of FMNR

2. Project background

"FMNR is the systematic regeneration and management of pre-existing stumps and root systems to restore degraded barren land to farmland and forests. The chosen tree stumps or root stocks are managed by periodically harvesting the less viable or undesirable stems and branches. Well-established root systems ensure plant survival and rapid growth, even during the dry season"[3].

World Vision Australia first promoted the FMNR approach in Ethiopia the early 2000s. Based on its effectiveness, World Vision Australia has now incorporated it into rural livelihood projects across 12 countries.

World Vision Ghana and World Vision Australia implemented the Talensi FMNR Project in the semi-arid north of Ghana over a three-year period, commencing in July 2009. Project activities effectively started in October 2009 and ended on 30 June 2012. The project and this evaluation were financed by a mix of funding from the Australian (Government) Agency for International Development (AusAID) and private donations from Australians.

World Vision Ghana's pre-project assessment and the baseline survey in 2010 found that challenges in the Talensi community included farming methods and natural resource exploitation that caused loss of soil fertility, declining yields and the elimination of tree cover and associated biodiversity/natural resources.

Trees were harvested using methods that destroy the tree to obtain fuel wood, charcoal and construction poles. Dry season bushfires and field burning were preventing natural and assisted restoration and recovery of tree growth, grass and animal habitat. These destructive fires discouraged the planting of productive trees, as did a traditional belief that to grow a tree was tantamount to defying nature and would result in death. This belief was successfully overturned during the course of the project.

To reverse deteriorating soil fertility and natural resources, the project promoted community mobilisation around FMNR to restore multi-purpose trees to rural landscapes.

FMNR was applied in two forms:

- trees were regrown on farmers' crop and pastoral fields; and
- tree regrowth was protected and pruned in community-managed FMNR forests, where tree densities were much higher than in crop fields.

The project also promoted complementary sustainable agriculture and income-generating techniques such as anti-erosion techniques; bulk composting; field mulching; suppression of bushfires and field burning; livestock management; fuel-efficient wood stoves; group income-generating activities, such as starting honey beehives and using ox plough traction; and the formation of savings groups.

In each of the nine communities, chiefs and community assemblies selected 10 men and 10 women to form their community's FMNR group. The groups were intensively trained in FMNR practices, such as integrating trees with annual crops, shrub pruning and sustainable firewood collection.

An important aspect of the project approach was its consistent and frequent support for the roles of the lead farmers and village chiefs in mobilising their community members, assisting them to strengthen community structures and building consensus around the management of natural resources and bushfire supression.

Project summary

Location: Talensi District, Upper East Region, Ghana, West Africa.

Project goal: To improve the livelihoods of the people of the Talensi Area Development Program communities.

Project outcome: Farmers adopt sound natural resource management practices.

Outputs:

1. Farmers' knowledge of FMNR increased
2. Community structures strengthened for natural resource management

Project expenditure US$323,816 (GH¢608,928).

Funders: AusAID and private donations from the people of Australia, via World Vision Australia.

Value of in-kind contribution from community: Approximately GH¢170,880 or US$90,871 (see Section 4: Project inputs for calculation).

Direct participants: 180 lead farmers were intensively engaged (90 women, 90 men) and an additional 940 farmers attended some form of training.

Total beneficiaries: The nine communities of the project area consist of 1,472 households, containing approximately 12,000 inhabitants.

Figure 3: Summary of project information

Image 1: Community-managed FMNR site in Yameriga: at baseline and end-of-project

Summary of project achievements

The end-of-project evaluation found that, as a result of the project, the communities had restored 161 hectares of new community-managed forest using FMNR. These forests are now nurtured by the community FMNR groups and protected by community by-laws to regulate the harvesting of surplus wood, grasses and other resources.

The managed forests now contain around 568,580 trees. Of these, around 377,000 can be counted as additional due to the project, with an average density of 2,343 trees per hectare (compared to a baseline of around 10 trees per hectare).

After FMNR was established in community-managed forest sites, it was then promoted for adoption in farmer fields to integrate tree production with crop and livestock production. By the end of the project, 37 percent of all households (547 households) had adopted FMNR into their fields, covering 336 hectares, with an average density of around 57 trees per hectare. This equates to an additional 19,000 trees on crop lands.

Focus groups consistently estimated that, before the project, even the trees that still remained in the area would have disappeared within five or six years. Therefore, the mature trees in the landscape can also be considered avoided deforestation.

Annual site surveys and community accounts indicate that the increase in natural tree coverage increased overall vegetative and animal biodiversity, which increased access to resources and improved incomes and liveability.

Aside from natural tree regeneration, the project also inspired the planting of over 40,000 productive tree seedlings. Once the analysis factors in the "deadweight" (what would probably have been planted without the project) and seedling survival rates, it is estimated that 23,000 additional live fruit trees are now growing in the project area as a direct result of the project.

The suppression of bushfires and field burning further enhanced the natural regeneration that took place. The project facilitated the formation of community volunteer fire brigades, who have been active in mobilising their communities to quash bushfires threatening their lands.

In the project area, 42 percent of all FMNR lead farmers and 10 percent of neighbour households have learned and adopted the improved bulk compost method. Testament to the method's effectiveness in improving soil fertility and coverage is that 94 to 95 percent of all those who learned the technique went on to apply it to their farmlands.

These behavioural and land management changes have contributed to the impacts calculated with SROI and are reported in the following sections.

Key outputs achieved by the end of the project

FMNR adoption:

- 180 lead farmers (90 women and 90 men) trained in and adopted FMNR and related natural resource management techniques, and trained others in community
- 574 households (37 percent of all households) adopted the FMNR approach
- 157 households (11 percent of all households) adopted fuel-efficient stoves (90 were distributed by he project and the remainder were spontaneous adoptions/purchases)
- All nine communities established and enforced new regulations for landscape management and tree cutting

Landscape regeneration:

- 161 hectares under new forest cover with average tree densities of 2,343 per hectare (from a baseline of five per hectare)
- 336 hectares of farmland under FMNR management with average tree densities of 57 per hectare (from a baseline of five per hectare)
- 19,000 additional indigenous FMNR trees on farmland by July 2012
- 377,000 additional indigenous FMNR trees in forest areas by July 2012
- 94 percent of FMNR adopters reported an increase in soil fertility (against 26 percent among the comparison group), with 75 percent of adopters reporting high increases (against only six percent among the comparison group)

Image 2: Tongo-Beo village: Lead FMNR group women in front of several copses after two years of FMNR regrowth

- 66 percent of FMNR adopters reported an improvement in soil erosion (against 17 percent in the comparison group), with 47 percent of adopters reporting "a lot" of improvement (against eight percent of the comparison group)
- 46 percent of all respondents observed that the FMNR practices have generated more wild fruits and food (fruits, nuts, rabbits and partridges), while only 4.5 percent believed the wild food would increase without FMNR

3. Methodology

Social return on investment

SROI is an innovative approach used to measure and account for value created by an intervention or a policy. "It places a monetary value on the social impact (the benefit) of an activity, and compares this with the cost incurred in creating that benefit. While this is a feature of any cost-benefit analysis, SROI is specifically tailored to the analysis of social purpose activities"[4].

The SROI approach is founded on social accounting and cost-benefit analysis. It expresses material project outcomes as equivalent monetary values so that they can be compared with the cost of inputs (in-cash and in-kind).

An SROI analysis generates a benefit to cost ratio for organisations to communicate the value-add of their projects to external stakeholders.

An SROI ratio of 1:1 means that for every dollar (or Ghanaian cedi) invested in a project, one dollar of benefit has been created for the project's stakeholders. A ratio of 2:1 means that two dollars of value was created for every dollar invested.

Beyond this ratio, the SROI analysis constructs a story of qualitative and quantitative change among a project's main stakeholders.

The study followed the following SROI steps.

A. Establish scope and identify stakeholders
B. Map outcomes
C. Evidence the outcomes and give them a value
D. Establish impact
E. Calculate the SROI
F. Reporting, using and embedding

A. Establish scope and identify stakeholders

Prior to data collection, the lead evaluator studied the project objectives to determine which stakeholders were the principal beneficiaries. The primary stakeholders were defined as farming households in the nine participating communities.

These farming households were further divided into three sub-groups: 180 lead (FMNR) farmer households, the remaining 1,292 households in the targeted villages (neighbouring farmers' households) and the whole community as an indivisible collective.

Lead (FMNR) farmer households were primary project partners and benefited, therefore, from intensive training, organisational formation and farm production support. They also gained the most direct benefit from the surplus resources generated from the FMNR forest sites they managed. The project trained lead FMNR farmers to act as key transformational development agents to influence neighbouring farmers' knowledge, attitudes and practices.

Neighbouring farmer households in the project area mainly benefited from learning or imitating many of the practices introduced by the project. Several also received direct training, but none received any material equipping from the project.

"Community commons" was created as a third category for public goods that could not readily be assigned to individual households. These goods relate to the improved comfort and aesthetic quality of the villages and landscape, climate change mitigation benefits and collectively owned natural assets.

A comparison (control) group was also surveyed. Data collected from this cohort represented the counterfactual or "deadweight" for the SROI calculations. This cohort was a random sample of households in communities within the Talensi District, but outside the project area and not participating in project activities. These communities were in the same geo-climatic and local economic zone as project communities, had the same ethnicity and benefited from other World Vision Area Development Program activities.

The Talensi FMNR Project implementation involved a number of supporting stakeholders at different levels who received benefits that were not calculated as part of the SROI. They were construed as supportive rather than target beneficiaries, and most were contracted by the project. Therefore, their involvement is reflected in the value of inputs, rather than outcomes. The following stakeholders provided support.

- AusAID provided majority funding for the project.
- The Ministry of Food and Agriculture provided advice, coordination and monitoring support.
- The National Disaster Management Organisation educated communities in FMNR and contributed an assistant evaluator and translator to the evaluation.
- The Information Services Department mobilised communities for meetings and education.
- Ghana's National Fire Service provided technical supervision of fire drills and training of volunteer fire brigades.
- The Community Development and Advocacy Centre organised training programs for FMNR communities.
- World Vision Ghana and the Talensi Area Development Program oversaw and facilitated all implementation of project activities.
- World Vision Australia provided technical and funding support.

B. Map outcomes

Prior to data collection, the objectives expressed in the project design were re-ordered into a theory of change map that was used to guide the formation of data collection tools. After data collection, the map was revised and refined to reflect the experience of the project stakeholders, rather than the project objectives.

C. Evidence the outcomes and give them a value

Data collection took place using the following qualitative and quantitative methods.

Focus group discussions formed the core method to identify important project outcomes and generate proxy financial values for the benefits. This was achieved by facilitating discussion about the value of benefits described in comparison to other economic goods and services available in the local economy, such as labour costs or goods that might generate a similar benefit to the household. Values provided were based on participants' experiences of changes and their predictions about continuing and future impacts.
Focus discussion groups comprised:

- five female focus groups (55 women)
- five male focus groups (59 men)
- two mixed gender focus groups (10 girls and 10 boys)

Image 3: Focus groups in Yindure (top), Wakii (centre) and Tongo-Beo (bottom)

Key informant interviews were held with people in key positions in the community to gain deeper understanding of changes, stakeholder participation and different perspectives they may have.

The evaluation team interviewed:

- two officers of the Ministry of Food and Agriculture
- one community chief and Tindana (traditional land custodian)
- one secretary of an FMNR group
- one FMNR group treasurer
- the chief researcher from the National Forestry
- Research Institute
- key World Vision Ghana personnel

A quantitative household survey sampled 400 households. They comprised:

- 104 lead farmer households
- 154 neighbour households in the target villages
- 142 non-target community households (comparison households)

Lead farmers were selected because of their direct participation in the project. Neighbouring farmers and comparison group farmers were selected using transects originating from the approximate centre of the community. Each enumerator was assigned a different compass bearing and, radiating outwards, sampled each home they encountered in that line until their quota was filled.

The survey included several open-ended questions that could record a diverse range of potential responses. Although this made analysis more difficult and time-consuming, it effectively captured stakeholders' perceptions of important factors, rather than simply testing the project logic and attainment of targets.

The survey was instrumental in quantifying the percentage of each stakeholder group that perceived outcomes identified in the qualitative data. It also highlighted some outcomes that were extensively valued across the community, but not raised or explored in the qualitative interviews.

An annual tree surveillance of community-managed FMNR forests was conducted each year for three years by the Ghanaian National Forest Research Institute. The survey measured tree densities, tree heights and girth and species/biodiversity counts in four FMNR reforestation sites.

To calculate tree densities in farmer fields (as opposed to FMNR community forest sites), the household survey asked each of the 400 households' respondents to report the area of fields managed by that household and the number of trees regrown.

The baseline evaluation recorded a lot of data on tree types in target communities but did not report on tree densities. Baseline photography taken at sites selected for community-managed forests was therefore used to estimate baseline densities.

Revealed preference techniques were used for instances when proxy financial indicators for some important outcomes were not obtained from community stakeholders. Usually this was due to the time limitation of each focus group, or because the evaluator had not appreciated the extent of the impact until after the data collection period.

Estimated valuations were based on prices of related market-traded goods[5] that generate a similar benefit to that described by the stakeholders. With no opportunity to interview community stakeholders again, the best available matches were sought to fit the context of Talensi communities and reported as selected proxies in the impact calculations.

D. Establish impact

Once each material outcome was identified and mapped in the revised theory of change, the value of each outcome was mapped for each stakeholder group to generate SROI impact calculation maps.

Discounting factors

To avoid the risk of over-claiming, discounting factors were added to the calculations of each impact to reduce or constrain the values of individual social returns.

For example, a deadweight of two percent was deducted from the value of increased household access to wild resources (for construction or food), based on testimonies of access by the comparison (non-project) sample. The value was also reduced by a rounded 10 percent for attribution, because one of the nine communities had already started protecting some land for regeneration.

The relevance and magnitude of each discounting factor was judged separately for each outcome, rather than using blanket percentages.

The discounting factors applied to each impact are as follows.

Deadweight: What probably would have happened anyway, if the project did not take place? In most cases, deadweight values were drawn from data gathered from the comparison group. Deadweights ranged from 0-10 percent. For example, the evaluation survey found that 6.8 percent of the comparison group reported increased availability/access to natural construction materials such as timber poles and roofing thatch, compared to 23 percent for the households in the project area. Thus, 6.8 percentage points of the benefit were "written off" as deadweight.

Displacement: Were any negative outcomes transferred outside the project area? While no informants said that trees were being cut in the nearby forest instead of the local community, the children's focus group discussions suggested that some women were still spending a lot of time collecting firewood, implying that they were leaving the village environment. Thus a speculative 50 percent displacement effect was added to the "avoided deforestation" outcome.

Attribution: Who else was responsible for the changes taking place? Based on responses from focus group discussions and key informant interviews, overall attribution rates range from 0-20 percent. The project served as a catalyst for new practices and protocols that did not exist before the project.

One of the participating communities already had a forest reserve area. While the project extended this community's forest reserves and on-farm agroforestry, clearly the community already possessed leadership in natural conservation. Therefore, several outcomes were allocated a rounded 10 percent attribution.

Drop-off: What is the future annual risk of participants abandoning the practices or losing their benefits? Drop-off discounts were 0, 10 or 20 percent. On the whole, values were low, due in part to the high value of the benefits described by participants, the institutionalisation of changed practices and the short period of forecasting returns four years post project.

Reviewing similar FMNR agroforestry initiatives actually revealed that a "negative drop-off" is more likely (effectively meaning a continual increase of tree cover over time). That is, more and more households and farms are likely to copy the practices and experience the benefits over time. To represent this, the drop-off rate for "tree numbers" was set to zero, and an additional 16.2 percent was added to each farmer stakeholder category per year for six years after project closure. This figure was based on the estimated annual rate of increase over 20 years from FMNR's introduction in Niger[6].

Duration: How long are the outcomes likely to last? Past FMNR projects undertaken by World Vision and academic literature about FMNR were reviewed to find precedents for likely durations. Outcomes from similar FMNR projects in Ethiopia and Niger suggest that, once farmers and communities adopt FMNR and many other profitable natural resource management practices, they do not abandon them.

However, to remain conservative, this study's "base case" factored in continuation of outcomes for only four years after the project ended. Nevertheless, a 10-year post-project scenario is also presented.

Furthermore, although the project ran for three years, SROI analysis counted benefits accruing in years two and three of project implementation only. This reflects the assumption that little benefit would have been experienced in the first year.

Discount rate: Discounting the value of future returns. This "recognises that people generally prefer to receive money today rather than tomorrow because there is a risk or because there is an opportunity cost"[7] associated with deferred returns. Forecasted values were discounted at a rate of 8.9 percent per annum, which is Ghana's predicted inflation rate for 2012-2017[8]. Given the week-to-week and year-to-year subsistence needs of households in northern Ghana, this high rate is a fair reflection of farmers' need to prioritise short-term results over long-term benefits.

E. Calculate the SROI

After all material impacts had been mapped, the values were aggregated into a single total value and divided by the total cost of project inputs to arrive at an SROI ratio.

This project is a community development project, expected to have benefits that continue beyond the project lifetime. Social returns were calculated for three time periods:

1. value created by the project immediately after the closure of project activities (year three);
2. value forecast four years after the project (year seven), assuming no additional inputs (considered for this report as the "base case");
3. value forecast 10 years after the project (year 13).

4. Project investment

The total value of investment into the Talensi-FMNR project from 1 July 2009 to 30 September 2012 was GH¢779,808 (US$414,686).

This is broken down in the table below.

Value of in-kind contribution from community: Approximately GH¢170,880 (US$90,871). Each lead farmer contributed an average of 78 volunteer days per year – some for two years, some for three years – and 315 community members contributed time as fire brigade volunteers. This time was valued in terms of the district's average adult labourer's daily wage of GH¢4.

Land use opportunity cost was assumed to be zero, as any alternative land use opportunity was already subtracted by using neighbouring non-project communities as the counter-factual "deadweight".

5. Theory of change

In effect, the SROI theory of change attempts to explain change as perceived by the target community of the project, rather than present the hypothesis behind the project design.

The evaluation data was carefully studied to identify the changes and their interrelations for each stakeholder group. The outcomes selected for calculation represent outcomes that are often the culmination of earlier contributing outcomes. Lead FMNR farmers and neighbouring households gained similar types of benefits, though often experienced in different magnitudes.

A descriptive theory of change is represented on the following page.

Table 2: Project inputs (costs)

Contribution	Expenditure: GH¢	Conversion: US$ (GH¢1 = US$0.53)[9]
Funds from AusAID and private donations from the Australian public		
- For project implementation	576,163	306,392
- For World Vision Australia technical and monitoring support	32,765	17,424
In-kind commitment of time by the volunteer FMNR lead farmers and volunteer fire brigades in the project communities	170,880	90,871
Total	**779,808**	**414,687**

Table 3: Table representation of the Talensi project's theory of change

Stakeholders	Key interventions (of project)	Community-reported outcomes - impacts
Lead farmers' households	- Facilitated lead farmer group selection and organisation - Trained lead farmers in FMNR, composting and bushfire management - Facilitated community agreements - Introduced FMNR practice on forest sites and farmland - Introduced compost fertiliser practice - Livestock assets and management skills - Saving and traction service (lead farmers only) - Provided fuel-efficient stoves - Bushfire management and volunteer brigades - Staged demonstrations and mobilised participation	**1. Increased income and consumables:** - Increased wild resources to sell for cash - Improved access to wild resources for construction and household use - Improved access to wild foods led to savings and purchase substitution - Increased locally available forage and shade led to improved livestock asset value and increased livestock numbers - Increased soil fertility and yield - Access to bullocks led to reduced expenditure on traction services - Shift in culture towards (group) savings may lead to better resilience - Adopted fuel-efficient stoves led to increased time savings - More conducive context for establishing new fruit tree plantations - Increased household assets in the form of increased FMNR tree stocks on farmland **2. Improved health condition:** - Improved respiratory health due to fuel-efficient stoves - Reduced accidental burns due to fuel-efficient stoves - Improved household health due to improved (additional) foods **3. Psychosocial benefits:** - Increased optimism towards the future - Enhanced status and public participation by lead farmers, especially women - Increased unity and collaboration between community members
Neighbouring households	- Provided opportunity to learn and adopt FMNR and other natural resource management practices from lead farmer groups and World Vision - Provided opportunity to join fire brigades	
Community commons	- Conducted orientation and negotiation with chiefs - Conducted community consultation - Facilitated community consensus on new by-laws	**1. Psychosocial benefits:** - Change in attitude toward natural regeneration and productive tree-planting due to successful experimentation and elimination of annual fires - Shadier, more comfortable micro-climate, reduced heat stress and more aesthetically appealing environment **2. Environmental benefits:** - Atmospheric carbon sequestered through re forestation has global atmospheric benefit - Reduced carbon emissions through fuel-efficient stoves has global atmospheric benefit (added by evaluator, not community) - Increased community assets in the form of in creased tree stocks in FMNR forest sites

6. Impacts and value creation

Social return on investment: the base case – forecast net present value by year seven (four years after project)

A total investment of GH¢608,928 (US$323,816) over three years by World Vision, plus GH¢170,880 (US$90,871) worth of volunteer time by lead farmers, is forecast to create GH¢10,304,000 (US$5,500,000) of net present value between 2010 and 2016. That is, every GH¢1 invested by World Vision into the Talensi FMNR Project is forecast to generate GH¢17 in social, environmental and economic return over the latter two years of the project plus the four years following the project.

Thus, the SROI analysis revealed a ratio of 17:1, based on the investment by World Vision. If the analysis factors into costs the value of time invested by lead farmers and fire volunteers, the ratio becomes 13:1.

Social return on investment by the end of the project

The social return on investment already accrued by the end of the project (excluding future benefits) was a ratio of 6:1. If the analysis factors into costs the value of time invested by lead farmers and fire volunteers, the ratio becomes 5:1.

Social return on investment: forecast net present value by year 13 (10 years after project)

FMNR and other sustainable agriculture techniques are promoted as having a long-term beneficial effect on managed landscapes. Therefore, the impacts of the project along with their discounting factors were re-calculated to a duration of 10 years after project closure. At year 13, the net present value forecasted by World Vision's investment is GH¢26,123,000 (US$13,891,000), resulting in an SROI ratio of 43:1. If the analysis factors into costs the value of time invested by lead farmers and fire volunteers, the ratio becomes 34:1.

7. Summary of value creation indicators

The following table lists the material outcomes stated by each community stakeholder group. Each is the end outcome of a string of cascading outcomes. Many were interrelated but still need to be valued as discrete outcomes.

In lead, neighbour and community commons stakeholder groups, the greatest change generated was an increase in the value of assets in the form of trees and livestock.

The next highest value was generated by an increase in access to and/or sale of consumable "wild" resources such as fruit, timber, thatch, bush meat and traditional medicines.

After these, improved farm yields and improved nutrition were the next most significant sources of value created by the project.

The findings highlight that although FMNR is often introduced on the grounds of improving arable soils and crop production, these gains were secondary to the value of natural assets and availability of consumables enhanced by FMNR.

Image 4: Yameriga village: Firewood is bundled next to one-year-old regrowth in FMNR forest

Image 5: Shia village: Shea nuts harvested for processing into butter

Image 6: Wakii village: Goats benefit from perennial grass supply due to FMNR sites and elimination of burning

Image 7: Yameriga village: Guineea fowl roost within FMNR sites

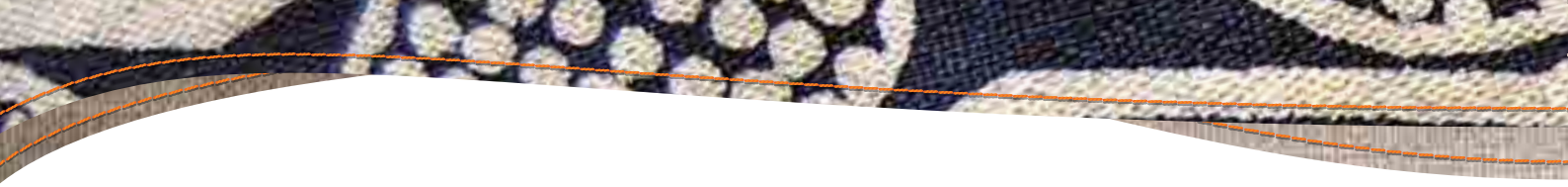

Table 4: Values

Stakeholder	Outcomes or benefits	Individual outcomes	Year three: end-of-project value in GH¢	Year seven: four years after project close (before discounting for net present value)	Percentage of total value per stakeholder group
Lead farmers' households (n=180 households)	Increased household resources and income	: wild resources for cash, utilisation, and purchase substitution	60,000	179,000	19%
		: improved livestock and economic tree assets	151,000	354,000	38%
		: increased soil fertility and crop yield	15000	75,000	8%
		: savings on traction expenditure, small loans and fuel-efficient stoves	26,000	63,000	7%
	Improved health	: improved respiratory health due to fuel-efficient stoves	5,000	14,000	1.5%
		: reduced accidental burns due to fuel-efficient stoves	200	500	0.1%
		: improved health due to improved food accessibility	43,000	130,000	14%
	Psychosocial	: increased optimism towards future	4,000	8,000	1%
		: enhanced leadership roles (especially for women) and community solidarity	62,000	115,000	12%
		Total	**366,200**	**938,500**	**100%**
Neighbouring households (n=1292)	Increased household resources and income	: wild resources for cash, utilisation and purchase substitution	271,000	494,000	16%
		: improved livestock and economic tree assets	1,016,000	1,613,000	54%
		: increased soil fertility and crop yield	31,000	221,000	9%
		: savings on traction expenditure and fuel-efficient stoves	35,000	97,000	4%
	Improved health	: improved respiratory health due to fuel-efficient stoves	71,000	181,000	6%
		: reduced accidental burns due to fuel-efficient stoves	1,000	2,000	0.1%
		: improved health due to improved food accessibility	70,000	210,000	7%
	Psychological	: increased optimism towards future	18,000	46,000	1.5%
		: enhanced leadership roles and community unity	47,000	105,000	4%
		Total	**1,560,000**	**2,969,000**	**100%**
Community commons (n=1472)	Economic	: tree stock assets for community	1,607,000	6,512,000	84%
	Psychological	: change in attitudes toward environmental protection	58,000	174,000	2%
		: more beautiful and comfortable existence	159,000	477,000	6%
	(Global) environmental	: reduction in carbon dioxide through fuel-efficient stoves	8,000	21,000	0.2%
		: carbon dioxide sequestration through reforestation	75,000	619,000	8%
		Total	**1,907,000**	**7,803,000**	**100%**
		Grand total of value created (2012 GH¢)	3,833,200 (US$ 2m)	11,710,500 =10,304,000 (US$ 5.5m) net present value	
		World Vision investment (GH¢)	609,000 (US$ 323,816)	609,000 (US$ 323,816)	
		SROI ratio	6:1	17:1	

GH¢1 = US$0.53 at time of evaluation[10]

Net present value of forecast value creation used the inflation rate of 8.9 percent as the discount rate.

Forecasts considered the benefits of future years plus end-of-project value.

8. Sensitivity analysis

Despite rigorous data collection, analysis and calculation, the SROI ratio is still an estimate of true value to the participant community and is thus prone to error. The sensitivity analysis explored how robust the SROI ratio is by adjusting variables in the calculation to establish how much change would reduce the ratio of return to 1:1. "In general the greater the change that you need to make in order for the SROI to become £1 for every £1 invested, the more likely it is that the result is not sensitive"[11].

The sensitivity analysis plays a similar role in SROI as identifying a range of uncertainty in economic measures.

Assumptions that were tested and reported in this sensitivity analysis relate to:

1. duration
2. discounting factors of deadweight, attribution and drop-off
3. the value of timber in the local market
4. the value of carbon sequestration
5. the exclusion of certain outcomes

Duration effect

The minimum duration calculated was the end-of-project social return. As stated above, the "immediate" social return on World Vision's investment was 6:1. So even if all forecasting assumptions are false, the minimum possible SROI is 6:1, or 5:1 if the analysis includes the value of community members' in-kind contribution of volunteer time.

The other end of the continuum is the 13-year scenario (which FMNR advocates would argue is really a mid-point scenario[12]). Ten years after the end of the project, the aggregate SROI forecast becomes 43:1, ie, for the US$323,816 invested through World Vision, the social return accumulated by year 13 will be US$13,892,000 in net present value.

Table 5: Summary of the project's SROI ratio under different duration scenarios

Duration of benefit	SROI ratio
Outcomes at the end of year three (end of the project)	6:1
Outcomes by year seven (four years after the project ends)	17:1
Outcomes by year 13 (10 years after the project ends)	43:1

Sensitivity of discounting factors

Deadweight or displacement or attribution, across the board, would have to be increased to around 85 percent for the end-of-project SROI ratio to drop to a 1:1 return. This clearly indicates that the social return is robust.

The most sensitive variables over the long-term scenario are the drop-off rate and the value of young tree timber (in the form of construction poles for rafters). Yet, even using very prejudicial values, long-term social returns remain robust. The following table demonstrates that if benefits drop off at an annual rate of 20 percent per year, the SROI by year 13 drops from 43:1 to 21:1. If the value of each regrown tree is assumed to be US$1 instead of US$2.1, the SROI by year 13 becomes 30:1.

Sensitivity of selection of outcomes

Removing certain social returns has different impacts on the SROI ratio.

Some may question the inclusion of the climate change mitigation benefit, which results from regrowing trees and reducing carbon emissions through the use of fuel-efficient stoves. The evaluators recognise that some may consider the benefit to the project's target community too indirect, or that double-counting has taken place by recording the latent value of the trees as assets as well as the climate change mitigation benefit of carbon sequestered by the same trees.

Regarding the former question, project participants referred to the positive feeling or value of their trees creating a healthier atmosphere. Moreover, an objective reduction of atmospheric carbon is also a legitimate "commons" benefit.

Table 6: Effect on the SROI ratio of adjusting various discounting factors and unit values

Adjusted variable	Adjusted scenario at year three (end of project)	Adjusted scenario at year seven	Adjusted scenario at year 13
Default scenario	**6:1**	**17:1**	**43:1**
Increase all deadweight values from between 2% and 10% to:			
20%	5:1	14:1	35:1
50%	3.3:1	9:1	22:1
80%	1.3:1	3.5:1	9:1
Increase all attribution values from between 0% and 20% to:			
20% across the board	5:1	14:1	36:1
50%	3.4:1	9:1	22:1
80%	1.3:1	3.6:1	9:1
Increase all drop-off values from between 0% and 20% to:			
10%	6:1	15:1	29:1
20%	6:1	13:1	21:1
30%	6:1	12:1	16:1
Reduce the unit value of carbon per tone from US$12 to US$4	6:1	16:1	42:1
Adjust the unit value of young trees from US$2.1 to:			
US$1	5:1	12:1	30:1
US$6	11:1	34:1	92:1

Regarding the latter question, the presence of the managed trees produces two distinct benefits: the physical sequestration of atmospheric carbon and the assurance or security for householders that they can monetise the asset in times of need, which can be regrown afterwards.

However, for those who remain critical of this approach, removing the proxy value of the captured carbon and emission reductions lowers the base case SROI to 16:1 and the immediate (end-of-project) SROI remains unchanged at 6:1.

The single most valuable project outcome was the latent value of timber stored in trees on household farms and communal reforestation plots. If needed, land users could "monetise" the value of these trees by cutting and selling the timber, which thus represents an insurance buffer or quasi savings account. The value of each tree was conservatively estimated at GH¢4 per tree (US$2.1) in line with the local market for rafters for hut construction.

Removing the market value of timber stocks in the FMNR regrowth from the SROI calculation has the most dramatic effect on the overall social return. Counting only the value of atmospheric carbon sequestration (while still recognising the contribution of trees to soil improvement, non-timber tree products, animal habitat and so on) changes the base case SROI to a ratio of 7:1.

In reality, in most FMNR regimes, farmers harvest and monetise some trees each year, while still increasing the overall stock by regenerating replacement and additional stumps into trees. The value of this is already accounted for under the category of "improved access to wild resources for construction and household use".

If, in the extreme, SROI calculation combines the removal of atmospheric carbon reduction and the value of the tree stocks, the base case ratio becomes 6:1 and the immediate (end-of-project) return becomes 3:1. Even with these large omissions, the immediate and forecast SROI ratios are still positive.

In conclusion, regardless of the extent to which the discounting factors or value propositions of major components are reinterpreted, the SROI of this project remains robust. Furthermore, the ultimate long-term legacy of the project has greater potential value than the "base case" SROI of 17:1.

Table 7: Effect on the SROI ratio of removing atmospheric carbon and/or timber values from the value of outcomes

Outcome adjustment	Adjusted ratio
Base scenario (year seven)	17:1
Sensitivity 1 Exclusion of the value of climate change mitigation benefits	16:1
Sensitivity 2 Exclusion of the value of timber stored in the additional trees on farms and managed forests	7:1
Sensitivity 1 + 2 Exclusion of the value of climate change mitigation benefits and timber stored in trees	6:1

9. Comparing the project's SROI with other projects in the development sector

Using SROI as the single filter for making decisions on project funding is insufficient. To do so ignores variable dynamics such as the "start-up cost" of innovating and developing promising practices, which are similar to the up-front costs of research and development in product development. Favouring projects that achieve higher SROI ratios also ignores the likelihood of higher costs associated with working in the most marginalised locations and communities. Vulnerable communities in these contexts are precisely the populations humanitarian agencies are mandated to assist.

Furthermore, according to Social Ventures Australia Consulting, "the application of the SROI principles requires judgements to be made in areas where there are few definitive answers or standards to use"[13]. The treatment of valuing and discounting and spirit of conservatism in calculations means that some practitioners will under-claim more than others. The SROI ratio is just one aspect of the community's and the project's story of change.

Given the above, "it is misleading to compare the efficiency or effectiveness of organisations based on the SROI ratio: it is critical to understand the model, the story of change, and the judgements that underpin the SROI ratio before a comparison could be made"[14].

Image 8: Wakii FMR group members selecting and pruning regrowth at the project initiation

Table 8: Comparison of the project's SROI against related SROI study results

Talensi FMNR

Location and project	Analytical approach	Immediate return	Long-term forecast
Northern Ghana: FMNR	SROI	6:1	17:1 (by year seven)
			43:1 (by year 13)

International development

Location and project	Analytical approach	Immediate return	Long-term forecast
India: HIV/AIDS care[15]	SROI	6:1	N/A
Kenya: Agroforestry[16]	SROI	N/A	26:1 (over 20 years)
Kenya: Sustainable agriculture[17]	SROI	Inconclusive	Inconclusive
Senegal: Sustainable agriculture[18]	SROI	N/A	47:1 (over 15 years)

Social change

Location and project	Analytical approach	Immediate return	Long-term forecast
Sydney, Australia: Farmer-to-consumer connections[19]	SROI	N/A	8:1 (five year duration)
Brisbane, Australia: Farmer-to-consumer connections[20]	SROI	N/A	17:1 (five year duration)
North Ayrshire, Scotland: Community Arts[21]	SROI	8:1	N/A
Italy: Social return on education expenditure[22]	Expenditure versus average wages	N/A	4:1 (42 year duration)
England: Vulnerable family intervention[23]	SROI	4:1	N/A

Environmental investment

Location and project	Analytical approach	Immediate return	Long-term forecast
Finland: No till versus conventional tillage[24]	Comparative study	Inconclusive	Inconclusive
Germany: Improving building energy efficiency[25]	SROI/stein model of public revenue	Positive	N/A
Canada: Investing in green roofs[26]	Social cost-benefit	Positive	Positive

However, some level of comparison still provides value in interpreting what dynamics might surround a given project and its contribution, and how the results broadly sit relative to related development themes. The results of a literature search for SROI reports on projects with thematic similarities are presented in Table 8, presented under the themes of "international community development", "social change" and "environmental investment". 12 relevant studies were identified and reviewed.

The comparison table shows that, in general, projects are reported as either short-term-focused projects with immediate (end-of-project) return on investment or perceived as long-term community development reported only as long-term forecasts (10 or more years from project intervention). Rather than reporting a final ratio, some projects instead present narrative descriptions or disaggregated results for different project outcomes.

The Talensi FMNR Project's ratio sits comfortably alongside the reported returns of both short-term and long-term projects. The immediate and forecasted returns are among the higher returns of international development projects and much higher than those generated by projects in industrialised countries.

10. Considerations and limitations

In understanding and interpreting this project's SROI analysis and ratio, a number of important factors must be considered.

- The Talensi FMNR Project was a pilot intervention in a location where many of the promoted agricultural and forestry techniques were contrary to previous practices. Yet, World Vision had been conducting an Area Development Program in these communities for some years. The communities' lengthy experience of World Vision enabled change to take place relatively rapidly. Project investment may need to be higher or take longer in newly targeted locations.
- Some important project impacts were mentioned by stakeholders but not included in the SROI calculation. This was due to lack of data or no identifiable proxy value. These positive impacts include:
    - the reduction in time required by boys to herd cattle, which gave them more freedom to attend classes or engage in recreational activities;
    - the reduction in time required by women to collect firewood, which gave them more opportunity to participate in educational activities and attend to their families' health;
    - the protective effect of trees in reducing damaging wind speeds and storm impacts; and
    - the protective effect of trees in fields attracting predator species that prey on crop pests (including insect-eating birds, lizards, toads and frogs, spiders and praying mantises).
- A negative impact that was not incorporated into "project costs" was increased fear of snake bites while pruning shrubs into FMNR trees. This concern was raised by nine percent of lead FMNR farmers, but did not appear to result in changed behaviour.
- SROI ratios should not be compared between organisations unless there is a clear understanding of the organisations' approach, measurement framework, geographical location and stage of development.
- The potential for bias in value estimation by the evaluators was considered. To minimise this risk, most values used in this analysis were sourced primarily from interviewed farmers' testimonies. Where revealed preference was used, proxies may not reflect real market values in Talensi society but represent the best available fit. Furthermore, rigorous external consultation with SROI specialists (Social Ventures Australia Consulting) likely challenged potential areas of bias in calculations.

Image 9: Yameriga: In year 1, World Vision staff demonstrate the FMNR pruning technique

11. Conclusion

The net effect of World Vision's investment into Talensi FMNR is a significant contribution to household wellbeing and livelihood security in this semi-arid and impoverished zone of Ghana. After accounting for discounting factors, the impact of World Vision's investment is an SROI ratio of:

- 6:1 by the end of the project
- 17:1 by year seven (four years after project end)
- 43:1 by year 13 (10 years after project closure)

A comparison of the project's SROI ratios against other SROI studies of international development, social change and environmental projects indicates that the Talensi FMNR Project is in the top quartile of both short-term and long-term social returns.

A sensitivity analysis of Talensi FMNR's SROI ratios found that the three time period ratios (end-of-project, year seven and year 13) are quite robust to changes in individual discounting factors. The most sensitive variable is the value of timber stored in the young trees introduced into managed landscapes via FMNR. However, with an applied market value of US$2 per tree (GH¢4), the model is already conservative and a lower price is unrealistic.

Outcomes generating the most social value to key stakeholders relate to (in order of magnitude of contribution):

- increased household and communal assets in the form of trees and livestock
- increased household consumables sourced from natural resources
- increased incomes from agriculture
- improved health
- psychosocial benefits
- climate change mitigation (carbon sequestration)

These outcomes result from a combination of FMNR-related outputs. Stakeholders restored trees to managed landscapes, suppressed field burning and bushfires, implemented complementary soil fertility and anti-erosion techniques, and established community regulations and organisations to ensure the institutionalisation of these practices.

FMNR is often promoted for its ability to provide rural communities with timber and improve arable soils. In this study, FMNR's contribution to livestock health, psychosocial wellbeing and household access to "wild" consumables such as indigenous fruits, traditional remedies, bush meat and construction materials (thatching and rafters) also created significant value. Yet, because these benefits are not easily measured in economic terms, they may have been invisible or under-valued in previous studies of FMNR compared to more tangible outcomes such as provision of firewood, soil improvement and crop protection.

Image 10: Wakii village: Lead group members shelter from the sun in the community-managed FMNR forest site

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Image 11: Yameriga farmer shows off FMNR regrowth beside his field

Image 12: Yameriga FMNR members and World Vision staff pruning in year 1

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