SUSTAINABLE COMMUNITY DEVELOPMENT:
CASE STUDIES FROM INDIA AND KENYA

By:

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A Thesis

Submitted in partial fulfillment of the requirements of the degree

MASTER OF SCIENCE
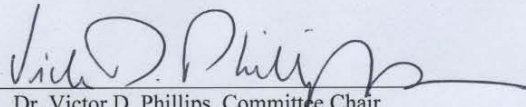
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NATURAL RESOURCE MANAGEMENT

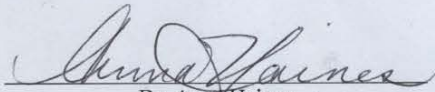**College of Natural Resources**

UNIVERSITY OF WISCONSIN

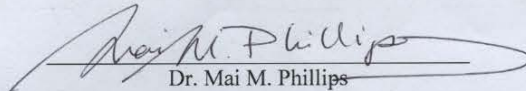**Stevens Point, Wisconsin**

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ABSTRACT

A sustainable community can be defined as a community that implements projects aimed at long-term management of natural resources for ecological health, economic growth geared towards supporting basic needs, and social equity. Sustainable community development projects in rural areas of developing countries often begin with efforts towards better ecosystem management and poverty alleviation. This is a result of the fact that environmental degradation has reduced people's capacity to even meet their most basic needs, which are met through the use of surrounding natural resources. This research project investigates two cases of sustainable community development in Sanjadi-ka-badia, India and Nyumbani Village, Kenya to understand how these initiatives have met the needs of community members and contributed to the development of a sustainable community. A qualitative analysis of data collected in interviews, direct-observations, documents and rapid resource assessments was used to write the descriptive case studies.

Major findings from the Sanjadi-ka-badia case study indicate that the project was successful to a degree in terms of helping community members meet basic needs and initiating a move towards sustainability. The project, a collaborative effort between the community, local *panchayat* government, and Foundation for Ecological Security, restored fodder production on a common grazing land plot, which dramatically helped the community improve the major economic and subsistence activity of animal husbandry. The conduit for this success was the development of locally accepted institutions to guide behavior, specifically regulations on the common grazing land plot to reduce overgrazing and encroachment. The process of creating institutions also extended to other areas of

community life, helping the community create more social cohesion by including women and members of lower castes in decision-making processes and developing incentives for universal primary education. The Foundation for Ecological Security project in Sanjadi-ka-badia allowed a community that was struggling to take the first steps towards sustainability by focusing on specific activities that were meaningful to the community, generating incentives for collective action and implementing work that could be managed by community members after the project's conclusion.

The major findings from the Nyumbani Village case study indicate that it is making headway in achieving its specific goals. Operated by a Catholic organization, Children of God Relief Institute, Nyumbani Village is a fusion of humanitarian relief for the 'lost generation' of HIV/AIDS victims and principles of sustainability. Currently, Nyumbani Village is providing basic needs and education to approximately 300 Kenyans who existed previously at the brink of despair and destitution. Also, members of the surrounding community have been given the opportunity to receive employment and skills for microenterprise and dryland farming, which are notable achievements. In terms of sustainability, Nyumbani Village has made significant early steps and is pioneering how to merge sustainability with its other goals related to humanitarian relief.

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To my fellow graduate students and friends, thanks for the laughs, the support and the memories. I wish you all luck and am eternally happy that the world has you in it. In particular I would like to thank: Fran Blanchard, Sara Brewster, Ali Cordie, Susan Ermer, Jenna Gatzke, Emily Hill, Elena Krieger, Angie Lemar, Martha Lippert, Daphne Mayes, Stefanie Miller, Scott Reilly, Nicholas Syano and Sarah Windjue.

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Finally, I dedicate this thesis to my mother, Annie Wood, who will always be in my heart and in whose path I will always follow even as I carve my own.

vii

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Appendix One: Results from Sanjadi-ka-badia

Appendix Two: Results from Nyumbani Village

Appendix Three: Notes on Rapid Resource Assessment Methodology

CHAPTER ONE: INTRODUCTION

Importance of the Study

"Think globally, act locally"

Today's global society is one in which citizens of all nations are deeply connected. Direct and indirect networks among peoples of the world have been enhanced by technological advances, wide venues of communication, free-market economics, trade flows, and access to transportation. However, the globalization of networks has also resulted in often unequal distributions of wealth and power, as well as over-exploitation of global natural resources. It has been argued that, in order for future generations of both human and non-human species to persist, current generations of humans must change the practices that have resulted in degradation of human and ecological systems (WCED, 1987).

Sustainable development is an approach that aims to secure a better future for current generations, and those to come, by countering the misuse of natural resources and reducing disparities in wealth distribution and social equity. The most widely accepted definition of the term was developed during the 1987 World Commission on Environment and Development: "humanity has the ability to make development sustainable- to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Sustainability is comprised of interdependent ecological, economic, and social factors (Agyeman & Angus, 2003; ICLEI, 2002a; James & Lahti, 2004; and Roseland, Cureton, & Wornell, 1998), all of which must receive equal consideration in the implementation of sustainable development initiatives. The importance of these three elements is widely accepted,

however, there is divergence of opinion on how to achieve sustainability, especially the appropriate level of governance to carry out sustainable development initiatives. Many initiatives have been top-down, macro-level efforts by national governments and international institutions. However, there is currently a predominant push to make sustainability local (FAO, 2006; Phillips, 2008b; and UNCED, 1992). It is argued that macro-level efforts often negate the rights of local communities, disallowing them the autonomy to govern themselves towards sustainability (e.g. Armstrong & Stratford, 2004) and that natural resources can be managed more effectively by the people who derive direct livelihood from them (Agrawal & Gibson, 2001; Alcorn, 1993; and Kijtewachakul, Shivakoti, & Webb, 2004).

Efforts towards local-level sustainability in developed countries differ from those in developing countries (Redclift, 1993), especially in rural impoverished areas. In developing countries rural populations often depend on their surrounding natural resources for subsistence and livelihood, and many of these areas suffer from environmental degradation, which causes a large impact on humans as well as the health of native ecosystems (MEA, 2005). The causes of environmental degradation are many, including exploitation of natural resources by outside actors and social inequity. When a community's source of livelihood is degraded, its capacity to provide sustenance is greatly diminished, as well as its potential to maintain that capacity for future generation, even if demand levels remain constant. Therefore, local-level sustainable development in developing countries must address the most basic needs, often related to natural resource management, in order to implement a sustainable vision for the future. The concept of sustainability ultimately incorporates the long-term temporal capacity dimension to

development, and its relations to all of the ecological, economic, and social factors that limit or promote it.

This study investigates how local-level efforts at sustainability have been implemented in two communities: Sanjadi-ka-badia, India and Nyumbani Village, Kenya. In order to protect the resources that impoverished areas depend upon, community members often adopt sustainable development initiatives with the assistance of external actors, as is the case in both of these communities. The goal of this study is to evaluate how initiatives taken by these communities and organizations have met the needs of the community members and have contributed to the development of sustainable communities. The synthesis of information gathered in this study will aid the two communities in evaluating current practices and deciding future action. The study will also add to a wider body of research regarding local-level sustainable development initiatives.

This study is a project related to a United States Department of Agriculture-Natural Resources Conservation Service grant awarded to the Global Environmental Management Education Center (GEM) at the University of Wisconsin-Stevens Point. The deliverables in this grant include case studies of sustainable community development in developing countries. The two communities included in this study, Nyumbani, Kenya and Sanjadi-ka-badia, India were selected by GEM because of their promise as models for lessons to be learned in local-level sustainability and due to strong existing GEM relationships with non-governmental organizations working with the communities: Children of God Relief Institute (COGRI) in Kenya and the Foundation for Ecological Security (FES) in India.

Research Statement

The purpose of this research is to develop two case studies of local-level sustainable development initiatives in Sanjadi-ka-badia, India and Nyumbani Village, Kenya to evaluate how these initiatives have addressed the needs of community members and are contributing to the development of sustainable communities.

Research Objectives

Literature Review
1. Present the predominant themes in the literature regarding local-level sustainable development initiatives in developing countries and develop a conceptual framework of local sustainability.

Project History

Needs Assessment
2. Identify the needs of each community prior to initiation of the project.
3. Identify what needs were prioritized by each community.

Actions Taken by the Respective Communities/Non-Governmental Organizations
4. Describe what planning and work initiatives have been implemented to meet prioritized needs of each community.
5. Determine if and how the initiatives taken by each community meet the prioritized needs of the community members.
6. Identify the achievements and challenges of implementing the initiatives to meet the needs of each community.
7. Identify what assessment techniques have been undertaken in each community by either external or internal actors related to actions taken towards sustainability.

Current Status
8. Identify what are the current needs of each community.

Assessment of Actions
9. Describe how the actions taken by the respective communities are contributing to the development of sustainable communities.

CHAPTER TWO: LITERATURE REVIEW

Introduction

The goal of this study is to develop two case studies of sustainable community development initiatives in Sanjadi-ka-badia (SKB), India and Nyumbani Village (NV), Kenya to evaluate how these initiatives have addressed the needs of community members and have contributed to the development of a sustainable community. As a literature review for this study, this chapter presents "theoretical perspectives and previous research findings regarding the problem at hand" (Leedy & Ormrod, 2005). As such, a conceptual framework for sustainable community development in SKB and NV is created by describing the broad concept of sustainable development and discussing ecological, economic and social attributes of local sustainability initiatives in developing countries. The attributes comprising the conceptual framework are used as a means of describing how each community has made steps towards sustainability.

Sustainable Development: History and Overview of the Concept

Sustainability and sustainable development have been popular topics of discussion on global, regional, national and community levels for over two decades. The World Commission on Environment and Development's release of *Our Common Future*[1] in 1987 is often cited as the catalyst to the recent trends in sustainable development discourse (e.g., Agyeman & Angus, 2003; Kates, Parris & Leiserowitz, 2005; Redclift, 1993). In addition to acknowledging the over-use of natural resources on a global scale (Roseland, Cureton, & Wornell, 1998), *Our Common Future* proposed a definition for sustainable development that is widely used: "humanity has the ability to make

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[1] commonly referred to as the Brundtland Commission report

development sustainable- to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987).

Although this definition is commonly cited, it is also inherently vague[2], which has led to divergent interpretations and approaches to achieving the goal of a more sustainable global society (Bell & Morse, 1999; Kates et al., 2005; McCool & Moisey, 2001; and Roseland et al., 1998). Some authors have argued that the vagueness of the definition may lead to unsustainable growth where economic or political interests supersede ecological and social well-being (Parris & Kates, 2003; and Redclift, 1993). There is also exceptional divergence of opinion on what the definition means for developed versus developing countries (Redclift, 1993; and Nagpal, 1995), though some authors argue that developed and developing countries have similar problems but the degree and intensity of the issues differ significantly (Robinson, 2004, cited in Rist, Chidambaranathan, Escobar, Weismann, & Zimmerman, 2007). The ambiguity of sustainable development has also led to different ways of measuring sustainability through indicators, which can vary depending on the user's idea of what development should occur and what should be sustained (Bell & Morse, 1999; and Parris & Kates, 2003).

Although the vagueness of the definition is an issue, it also allows flexibility for application in myriad contexts (Kates, Clark, Corell, Hall, Jaeger, Lowe, McCarthy, Schellnhuber, Bolin, Dickson, Faucheux, Gallopin, Grübler, Huntley, Jäger, Jodha, Kasperson, Mabogunje, Matson, Mooney, Moore III., O'Riordan, & Svedlin, 2001), which allows groups to adapt themselves according to their own initiatives and resources.

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[2] In the full report of *Our Common Future* the definition of sustainable development is actually much more extensive; authors generally do not cite the entire picture this report presents, which might dispel some of the arguments of its inherent vagueness and applicability (Kates et al., 2005).

Additionally, the Brundtland Commission definition can be thought of as a broad philosophical approach rather than a recipe for sustainability (James & Lahti, 2004). That being said, it is important to note that a distinction should be made between "weak sustainability" and "strong sustainability", where in the former the costs of obtaining sustainability are often considered too high (essentially a cost-benefit analysis) and economics supersede true efforts to attain the latter, which promotes ecological or social sustainability without shying away from initial high costs (Bell & Morse, 1999). Weak sustainability also assumes that resources depleted over time can be substituted by others, which is countered by strong sustainability, which assumes that natural capital cannot suffer a net loss (Agyeman, Bullard, & Evans, 2002).

There is a common theme in the literature that sustainable development encompasses three broad, yet interdependent elements: ecological integrity, social equity, and economic opportunity (e.g., Agyeman & Angus, 2003; James & Lahti, 2004; Roseland et al., 1998). Each element is comprised of multiple factors that contribute to sustainability (Table 2). Ecological integrity ensures that the environment is able to regenerate, support biodiversity, and continue to perform ecological functions essential for ecosystem health. Social equity includes themes such as gender and indigenous rights, access to resources, and participation in decision making processes. Lastly, the economic aspects of sustainability allow people to sustain livelihoods and meet the basic needs (air, food, shelter, clothing, and water) of life for themselves and their families. As such, economic aspects are really a means to an end, which is a more socially equitable and environmentally sound world (Agyeman et al., 2002). The interconnectedness of these three elements is stressed in the literature, especially the fact that environmental

7

health and degradation are often directly connected to economic and social disparities (Agyeman et al., 2002; and Thrupp, 1993).

Although the literature stresses the three-pronged framework for sustainability, there is divergence of opinion on how to achieve sustainability, especially the appropriate level of governance to carry out sustainable development initiatives (Yanarella & Levine, 1992, cited in Bridger & Luloff, 2001). Many initiatives have been top-down, macro-level efforts by national governments and international organizations. However, there is currently a predominant push to make sustainability local (FAO, 2006; Gurung, 2006; and Phillips, Miskowiak & Stoll, 2007). It is argued that macro-level efforts often negate the rights of local communities, disallowing them the autonomy to govern themselves towards sustainability (Armstrong & Stratford, 2004). Additionally, some studies have shown that natural resources can be managed more effectively by the people who derive direct livelihood from them, rather than by a centralized government agency or non-governmental organizations (NGOs) (Agrawal & Gibson, 2001; Alcorn, 1993; Kijtewachakul, Shivakoti, & Webb, 2004; and Thomas-Slayter, 1992).

One of the most cited sources of support for local-level sustainable development came from what is a macro-level institution: the United Nations (UN). The promotion of local-level sustainability has evolved over the latter half of the 20th century, especially after the Brundtland Commission report (WCED, 1987) and the UN Conference on Environment and Development in 1992 (Roseland et al., 1998). This conference, commonly referred to as the "Rio Summit" (because it was held in Rio de Janiero, Brazil), resulted in the development of an agenda for global sustainable development, *Agenda 21*, which stresses the necessity of local involvement in sustainability. The

definition for *Agenda 21* was established as "a participatory, multi-stakeholder process to achieve the goals of *Agenda 21* at the local level through the preparation and implementation of a long-term, strategic plan that addresses priority local sustainable development concerns" (ICLEI, 2002, page 5). The strategies laid out in this document stress that local involvement, especially that of local authorities, is crucial for sustainable development:

> "Because so many of the problems and solutions being addressed by *Agenda 21* have their roots in local activities, the participation and cooperation of local authorities will be a determining factor in fulfilling its objectives. Local authorities construct, operate, and maintain economic, social, and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and subnational environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development." (Chapter 28, UNCED, 1992)

Although *Agenda 21* promotes local-level sustainability, it is noteworthy that it also emphasizes collaboration between international, national, regional, and local governments, as well as the importance of non-governmental organizations in implementing sustainable development (UNCED, 1992).

Sustainability is not an end state, but a process. The ultimate goal is an equitable society that acts in ways that do not exceed the Earth's capacity to support human and non-human life. Working towards this goal is a multi-stakeholder process that involves players at various levels of government and throughout disciplines. This thesis is concerned with efforts at the local level.

Efforts towards sustainability at the community level

The International Council on Local Environment Initiatives (ICLEI) defines a sustainable community as a community "that maintains the integrity of its natural

9

resources over the long term, promotes a prosperous economy, and hosts a vibrant, equitable society" (ICLEI, 2002). Sustainable community development is an important part of global sustainable development initiatives at the local level and has been implemented and supported in a number of ways.

There are many cases of communities that have made attempts towards sustainability and have valuable lessons to be learned from their experience. Some communities have opted for the use of frameworks such as The Natural Step (James & Lahti, 2004), or SEED (Taylor-Ide & Taylor, 2002). Other communities have joined national and global networks, such as the Sustainable Communities Network (Concern, 2002) and the Global Ecovillage Movement (Trainer, 2000) that provide a venue for discourse on sustainable community development.

Sustainable communities have been supported by larger institutions such as the UN as a legitimate solution to global sustainability. The UN itself has initiated pilot initiatives for sustainable communities in the Millennium Villages Project, a joint project with the Earth Institute at Columbia University. The UN and the Earth Institute chose twelve impoverished communities in sub-Saharan Africa to explore how external funding and logistical and technical support can help pull small, rural communities out of the poverty trap (Earth Institute, 2005). The project began in Sauri, a small village in Kenya, in 2004 and will provide support and funds to this and the remaining eleven villages for five years. The Millennium Villages Project has been criticized as being unsustainable even in its nascent stages (Rich, 2007), but its success as a local-level sustainable development initiative remains to be seen and lessons learned from the

project could have implications on how aid is administered to impoverished areas in the future (Buse, Ludi & Vigneri, 2008).

Attempts at sustainability have spanned the globe and are present in both developed and developing countries. Often, communities begin with one aspect of sustainability, such as cultural preservation, solid waste management, Permaculture, energy, or bio-gas. Expansion of efforts often follows success in one area. Examples of communities that have initiated sustainability measures are listed in Table 1 below.

Table 1. Examples of Communities Making Efforts Towards Sustainability

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
1. Curitiba	Brazil	1982[3]	1.6 Million (Urban)	City wide planning and development	City and national funding; impetus comes from local government[4]	Began with transportation; increased open space; skills building and employment[5]; encourage local empowerment; address poverty rather than hide it
2. Gaviotas	Colombia	1979	200	Sustainable living; appropriate technology	Various, University of Bogotá, UN	Use of appropriate technology and appropriate plants for habitat[6]
3. Negros Occidental (province)	Philippines	1990-1995	2.1 million in the province[7] (Rural/ urban)	Comprehensive poverty alleviation	Heavy in human and financial resources from outside- may prove difficult to replicate	Involvement from multiple scales of government, NGOs, & grassroots organizations; occurred within context of political stability; support from higher levels of government[8]
4. Grand Shandu Eco-Village System	China	1988	In 1988- 3211 (Rural)	Local level sustainable development using principles of economics and ecology	Local and national funding (Ecological Demonstrative Rebuilding for Sustainable Settlements national scheme)	Planning; focus on diversifying economic activities; infrastructure; dealing with local development issues[9]

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[3] The "date established" refers to the date when an already established community made a commitment to sustainability or when a new eco-village was created.
[4] Taylor-Ide & Taylor, 2002.
[5] Sustainable Communities Network, 1996.
[6] Weisman, 1998.
[7] Philippines National Statistics Office, 2002.
[8] Cox, 1998.
[9] Hu & Wang, 1998.

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
5. Millennium Villages (12)	Sub-Saharan Africa	2004	Reaching about 400,000 people in 12 villages and outlying regions[10]	Poverty reduction and experiments to guide development and aid for future work	Joint project with UNDP and Earth Institute at Columbia University. Contributing $300,000 per year for 5 years[11]	Empowerment a key factor. Using practical solutions that fit into local culture. Lessons are to be determined.
6. CAMPFIRE	Zimbabwe	1989	Approx. 51,000 people reached throughout the country[12]	Local management of wildlife resources	International and national financial assistance	External factors can limit success of local governance of natural resources; however, if communities continue to benefit from wildlife conservation, they will continue practices.[13]
7. Findhorn	Scotland	1985	320	Sustainable living	Findhorn Foundation seeks financial assistance from donors	Education for visitors, links between spiritual, ecological, social and economic domains;[14]
8. Annapolis, MD	USA	1993	About 36,000	Establish goals based upon the needs and desires of citizens	Grants, funding from private and public entities	Helps to have diverse group of people; engage local government; seek advice from experts.[15]

[10] Earth Institute, 2009.
[11] Millennium Project, 2006.
[12] Metcalf, 1993
[13] Balint & Mashinya, 2008.
[14] Findhorn Foundation, 2008.
[15] Sustainable Communities Network, 1997.

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
9. Earthaven	Asheville, NC, USA	1994	60	"to create and to sustain beyond our lifetimes a learning community village, by gaining the skills, cultivating the attitudes and sharing with the public the resources for a holistic, regenerative culture"	Non-income sharing community, members lease or build houses; annual fees; annual community service requirements; grants; donations; sale of electricity generated on-site	Permaculture; allowing residents to pursue individual interests as long as they fit within mission of village[16]
10. Wongsanit Ashram	Thailand	1985	About 40	"to develop and promote an alternative lifestyle that is grounded in Dharma, cultural diversity, and environmental sustainability"	Various partnerships with universities, fees for workshops[17]	Participatory process crucial for community living. Changes and improvements to infrastructure to be sustainable. [18]
11. Austin, TX	USA	Late 1980s	Over 656,000	To be carbon neutral by 2020 because this encompasses most issues related to sustainability	Line items in city budget	Need department committed to sustainability that can train other departments. One person does not make city sustainable; it has to have top-down support and bottom-up education[19]

[16] Earthaven Ecovillage, 2008.
[17] Sulak-Sivaraksa, 2009.
[18] Wongasanit Ashram, personal communication, January 27, 2009.
[19] F. Blood, personal communication, January 27, 2009.

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
12. Ökodorf Sieben Linden	Poppau, Germany	1997	115	" to provide a model for a future way of life, in which work, leisure, economy, ecology, urban and rural culture can find a balance"	Community members pay; sell items in shop.	Offering diversity of living communities of which people can choose. [20]
13. Los Angeles Eco-Village	CA, USA	1993	55	"demonstrate the processes for creating a healthy neighborhood ecologically, socially, and economically"[21]	Residents pay low rents; Bought building by receiving loans from donors[22]	Model for transitioning to sustainability in urban setting; Education and outreach. Engaging in policy for green buildings, etc.[23]
14. Kibbutz Lotan	Arava Valley, Isreal	1983	130 (+ 20-40 volunteers)	Core values: ecology, "I-thou", right livelihood, renewing Judaism, equality, economic cooperation, home and community, repairing the world.	Fundraising; acts as a non-profit.	Working like business; community above all; action; outreach and education[24]

[20] Okodorf, 2008.
[21] LAEV, 2009.
[22] Arkin, 2005.
[23] Assadourian, 2008.
[24] Kibbutz Lotan, 2005.

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
15.Keimblatt Okodorf	Austria	2002	By 2020, 150-300 residents	A focus on spirituality, culture, economic well-being, environment and social equity	Grants, volunteer hours by "key members" donations, membership fees and economic activities when the village has capacity.	Long-term thinking and visioning, with measurable objectives in short-term. Using multiple resources for funding and information. [25]
16. Keruu Ecovillage	Finland	1997	25	"In the end we hope to be a human settlement which is ecologically, economically, culturally and spiritually sustainable"	Self-sustaining through agriculture and renewable energy. Hotel accommodations; courses offered for sustainable living	Dividing land uses for specific purposes, voluntary work for residents, preserving cultural heritage[26]
17. Munksogard	Roskilde, Denmark	2000	225	"to create a development that integrates environmentally friendly technologies and practices in the construction of the houses…and to establish a strong community"	Some houses are privately-owned, others are rented and remainder are owned cooperatively by residents. There are various economic activities: gift shop, vegetable sales, bicycle repair, etc.	Various types of housing; residents manage all aspects of village; associations deal with various issues (e.g., waste management); technical working groups (e.g., for snow removal). [27]

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[25] Keimblatt Okodorf, 2005.
[26] Keruu Ecovillage, 2009.
[27] Munksogard, 2009.

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
18. Solheimar	Iceland	1930	100	"to create a self-sustainable community, or ecovillage, created by people whose focus is on cultivating the individual and the environment at the same time"	Various fund raising activities including, forestry, gardens & gift shop. Companies work with community on their land.	Claims to be oldest ecovillage of its kind worldwide. Sustainable business practices in collaboration with companies. [28]
19. Svanholm	Denmark	1978	100	"basis…of common ideals concerning ecology, income-sharing, communal living and self-government"	Residents put 80% percent of their salaries into common pool as well as any other available capital. Other resources come from dairy and forestry activities and shop	Respect for each other's individuality; having local economy but remaining involved in "outside"; allowing members flexibility to do what they want within reason[29]
20. The Village	Cloughjor-dan, Ireland	2004	About 130 homes	Commitment to ecological, economic and social sustainability	People buy houses in which to live; some employees, CSA, grants from EU, government of Ireland and other sources	It is projected that people will move in 2009. Interesting aspect is development of "Eco-charter", with quantifiable objectives for sustainability. [30]
21. Ecovillage Torri Superiore	Italy	1989	20 permanent residents	Restoration of medieval village using ecological principles	Guest house; various funders	Communal decision-making. [31]

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[28] Solheimar, 2009.
[29] Svanholm, 2008.
[30] The Village, 2009.
[31] Torri Superiore, 2009.

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
22.Auroville	India	1968	Up to 50,000	To realize human unity…and sustainable living	Residents pay for houses to be built and make donations; international grants; money generated from business on site	Gained support of Government of India and UNESCO. [32]
23. Crystal Waters Ecovillage	Australia	1987	200	Clean air, water and soil (thus food) ; Freedom of spiritual belief ; To work towards guarantee of meaningful activity for all ; To create place for healthy play and safe recreation ; Active social interaction ; Healthy shelter	Residents buy houses, various economic activities support community	"learned how little you need to change your life in a Westernized country to make a very positive impact on the environment" [33]
24. Otamatea Ecovillage	New Zealand	1997	20	Permaculture, preservation of native ecosystems, to be model of sustainability	Members pay for their own lots, beef cattle production, in-kind contributions	"community hours" (in-kind contribution of hours to community projects); land owners sign agreements to live there; community decision-making; [34]

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[32] Auroville, 2009.
[33] Crystal Waters Ecovillage, 2009.
[34] Otamatea Ecovillage, 2009.

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
25. Cleveland Ecovillage	Ohio, USA	2004	444,313[35] (2006 estimate)	Urban regeneration with ecological design[36]	Collaborative project between EcoCity Cleveland and Detroit Shoreway Community Development Organization (DSCDO)	Affordable housing; emphasis on transit; [37]
26. Ecovillage at Ithaca	NY, USA	1991	30 homes	"Alternative model for suburban living which provides a satisfying, healthy, socially rich lifestyle, while minimizing ecological impacts"	Rent or buy homes, fees, loans, donations	CSA, communal living, Education of surrounding community, [38]
27. Ecovillage	Loudon County, VA, USA	2001	28 homes	"to restore nature and expand human potential by creating a lifestyle that nurtures the human spirit and offers hope for future generations"	Construct homes and buy lots, work parties.	LEED certified buildings; education and outreach to visitors to promote ecovillage principles; found that decision by consensus did not work, use approach called "sociocracy" [39]

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[35] United States Census Bureau, 2009.
[36] EcoCity Cleveland, 2009.
[37] Global Ecovillage Network, 2009
[38] Ecovillage at Ithaca, 2009.
[39] Ecovillage, 2009.

Eco-Village or Eco-municipality	Location	Date established	Number of Inhabitants	Mission and Priorities	Funding & Support	Lessons Learned
28. Dublin	Ireland	2008	500,000	Engaging city officials in projects towards sustainability	City funds	Use of The Natural Step Framework (James & Lahti, 2004) for sustainability; development of action plans and vision, beginning with flagship projects[40]
29. Overtornea	Sweden	Mid-1980s	600[41]	To create development that would keep inhabitants from moving, reduce ecological impacts	Local citizens and government involved in decision-making;	Economic recession in 1980 caused villagers to rethink their town; "widespread community participation" in study circles where desire development was discussed and acted upon; fossil fuel independency step by step (e.g., began with municipal buildings)
30. Kalix	Sweden	Late 1990s	18 villages, 350 people	"strengthen economic and social self-sufficiency in ways that were also ecologically sound"	All villages raised funds to hire resident to head 18-village association, Ovre Bygd; community fund raisers, cooperative businesses	More power in numbers (e.g., all 18 villages formed one group); creating place where people can earn livelihood instead of having to migrate for work

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[40] The Natural Step, 2009.
[41] James & Lahti, 2004.

Attributes of Local Sustainable Development Initiatives in Developing Countries

There is a wide base of literature regarding local-level sustainability efforts in developing countries, especially in regards to community natural resource management, integrated poverty and conservation initiatives, extractive reserves, ecotourism (Agrawal & Redford, 2006) and sustainable communities. All of these approaches attempt to merge ecological, economic, and social interests, though they are implemented in different ways. The literature reveals that most projects in developing countries are geared towards environmental restoration and poverty alleviation (e.g., Agrawal & Gibson, 1999; Berkes & Seixas, 2004; or Western & Wright, 1994). This is a result of the fact that people in these areas depend directly on natural resources as sources of subsistence and livelihood and because environmental degradation impedes their ability to meet their basic needs (MEA, 2005).

Deciding what constitutes as sustainability is an issue that has given rise to an abundant amount of literature regarding its measurement (Bell & Morse, 1999; and Pagdee, Kim & Daugherty, 2006). Indicators and measurement tools for sustainability at the local level are highly variable depending on the user and context and exhibit many inconsistencies (Bell & Morse, 1999; and Parris & Kates, 2003). For example, the ICLEI report[42] to the UN Earth Summit in Johannesburg (ICLEI, 2002) developed criteria for a community to be considered an *Agenda 21* sustainable community. The criteria included eight categories, of which communities must be committed to undertaking:

1. must include a participatory process with local citizens
2. must include a consensus on a vision for a sustainable future
3. must address economic, social, and ecological needs together
4. must establish a multi-stakeholder group to oversee process
5. must prepare an action plan

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[42] The number of *Agenda 21* communities that met the criteria was 6,416 (ICLEI, 2002).

6. action plan must include concrete long-term targets
7. must establish indicators to monitor progress
8. must establish a monitoring and reporting framework (ICLEI, 2002)

While the ICLEI indicators were used to develop an initial report to the UN at the Johannesburg Summit in 2002, they are also limited in what they can reveal about a community's place along the sustainability continuum.

Developing a list of ecological, economic and social indicators may help the communities strengthen the overall project and may signal a more comprehensive picture of what is happening (Bell & Morse, 1999). Data availability in the two communities studied does not allow the development of numerical sustainability progress indicators. The projects were not designed with relevant data gathering from the onset, thus not allowing the establishment of baselines and definition of relevant indicators. To overcome this limitation, this study uses indicators derived from literature on sustainability initiatives as a checklist for sustainability. Using the state of the communities at the beginning of the project as a reference, this study researches how the projects have helped meet needs of community members and have shown commitment to sustainability in their current states. This list of attributes may aid communities in focusing efforts towards sustainability by providing a framework of enduring guidelines.

The proceeding sections of this chapter highlight the ecological, economic and social attributes of local-level sustainable development initiatives that have been important factors in the implementation and longevity of projects in developing countries. The information in this section is derived from literature regarding sustainability indicators, community natural resource management, ecotourism, and sustainable communities and is summarized in Table 2 at the end of this section.

<u>Ecological factors</u>

The environment, with its myriad species and abiotic factors and interacting functions, provides humans with what they need to survive. Environmental degradation reduces people's ability to live healthy and prosperous lives as well as impedes the continuation of non-human species that share the planet with humans (MEA, 2005). How communities manage and develop their surrounding natural resources is a key factor in the success of sustainable development projects, especially for communities that depend on those resources for direct livelihood and subsistence. There are several aspects of natural resource management that are important elements to achieving ecological goals in sustainable development projects at the local level.

Biodiversity conservation

Biodiversity is defined as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (UNEP, 1992). Biodiversity has allowed for the development of humans through exploitation of various species and the niches they play in ecosystems (MEA, 2005). For example, myriad species and the habitats in which they are found are responsible for many medicines and a loss in biodiversity reduces the amount of plant or animal derived medicines available for discovery. Additionally, the intrinsic and aesthetic values of biodiversity to ecosystem function as the basis of life, economy, and spirituality are important factors which must be considered. Anthropogenic environmental degradation threatens the status of biodiversity, and the potential for further development from it (MEA, 2005). Biodiversity also has inherent

value aside from the benefits humans have derived from it and losing species may have remarkable linear and non-linear impacts on entire ecosystems that cannot be predicted.

Conservation of native biodiversity is a common aspect of local-level sustainable development projects (Kellert, Mehta, Ebbin, & Lichtenfeld, 2000; Pagdee, et al., 2006; Parris & Kates, 2003; and Western & Wright, 1994). The indigenous species of an area are often important to native peoples for consumption, medicinal properties or other cultural values. Biodiversity preservation may also have positive economic impacts for communities. Preservation of fauna, for example, has been crucial for communities that depend on ecotourism as a source of income generation. A study from Kenya in the early 1980s argues that ecotourism was more economically beneficial to locals than hunting large game species and thus helped to preserve those species (Thresher, 1981). Studies on great apes in Uganda have also contended that ecotourism can have a positive effect on conservation of this species because its protection provides an economic resource for local people (Litchfield, 2001).

Sustainable use of resources

Closely related to biodiversity conservation, the sustainable use of natural resources is a common theme in local level sustainable development literature. Although communities depend on surrounding resources, over-exploitation often results in extinction, which transfers into loss of a species as well as the economic or social benefits it once created. Some examples of the sustainable (or unsustainable) use of natural resources in the literature are communities' use of bush meat and non-timber forest products (NTFPs) (Kellert et al., 2000; Murali, Murthy, & Ravindranath, 2006; Pagdee et al., 2006; and Smith, Chhetri, & Regmi, 2003). In some cases where sustainable

harvesting has taken place, the threats to a species' existence and its benefits to humans have been abated. Community forest projects in Mexico, for example, have created institutions to regulate extraction of timber and/or NTFPs, which demonstrates long-term thinking used to preserve economically important species for the future (Castillo & Toledo, 2000). Sustainable extraction regulations also help to lessen the chance of exploitation by certain user groups over others (e.g., Smith et al., 2003).

Environmental awareness and stewardship

Environmental awareness and stewardship, or knowledge about ecological health and the will to preserve it, is an important way to engage community members in the management of natural resources and to create a connection to place (d'Entreves, 1992, quoted in Davidson, 2003). Ultimately, creating environmental awareness and stewardship may serve to reinforce the relationship between quality of life and participation in maintaining environmental health (Young, 1997).

Restoration of degraded resources

The Earth's ability to support human and non-human life is compromised by environmental degradation, which is a result of both ultimate and proximate factors (Diamond, 2005). Although ultimate factors of environmental degradation, such as national policy, agriculture subsidies or globalization cannot be undermined, proximate factors may be more readily addressed by local communities. Proximate factors are the actual physical processes that lead to degradation, such as cutting a tree, building a road, or constructing too many wells in a given area (Diamond, 2005, Pagdee et al., 2006; Redclift, 1993; and Thrupp, 1993). In addressing proximate factors sustainable use is a

major consideration, as is improvement of the condition of the resource (e.g., allowing positive succession) (Pagdee et al., 2006).

Preservation of ecosystem function and services

Protection or simulation of ecosystem functioning is an important aspect of sustainability projects because it keeps ecosystems that people depend upon healthy (MEA, 2005). Abiotic functions of ecosystems maintain biotic life and the diversity found therein. Changes in ecosystem function may alter the make-up of native biological communities. An example of this is the exclusion of fire from systems that have evolved with natural fire maintenance (e.g., long leaf pine (*Pinus palustris)* and wiregrass (*Aristida stricta*) ecosystems in the southeastern United States), which has resulted in less biologically diverse ecosystems.

Ecosystems also provide various "services" that are economically and socially beneficial to humans. Examples of ecosystems services are nutrient cycling, provision of food and water, climate regulation, aesthetics and recreation (MEA, 2005). Preserving these support systems by maintaining ecological function, preserving native biodiversity, and reducing degradation are key aspects of sustainability that should be recognized and implemented by communities (Parris & Kates, 2003; and Roseland et al., 1996).

Economic factors

Economic activities allow people to meet their basic needs and improve their quality of life. In rural areas of developing countries economic activities are often limited and can be at the whims of the international market. It is important for communities to act within the existing economic climate and adjust to change while also continuing to provide local economic services needed by community members. New

economic reality based on sustainability and living within nature's means and limits is being re-defined in the 21st century.

Poverty reduction

Many communities in developing countries are plagued with systematic poverty, which impedes sustainability because it does not allow for long-term thinking or planning, nor does it allow for much investment in the future. Poverty reduction is viewed as one of the most important aspects of sustainability projects in the developing world and is often the primary goal (Agrawal & Redford, 2006; Berkes & Seixas, 2004; Parris & Kates, 2003; and Smith et al., 2003). Components of poverty reduction goals are the sustained provision of basic needs such as food, water, air, shelter and clothing (Nagpal, 1995 ; Parris & Kates, 2003; and Smith et al., 2003) and secure employment opportunities or livelihood options to ensure basic needs provision (Pagdee et al., 2006; Rocky Mountain Institute, 2003; and Smith et al., 2003). Although the causes of poverty vary- especially in terms of degree- identifying and addressing the ecological, economic and social factors that create poverty traps is an essential task for sustainability projects in developing countries.

Economic diversity

Economic diversity is an important aspect of sustainability for a number of reasons (Bridger & Luloff, 1999; and Davidson, 2003). A community that relies upon only one activity is subject to economic disaster if that activity should fail or deteriorate. Maintaining diversity in economic activities is a way to buffer fluctuations in markets and reduce a community's vulnerability to economic decline. It is also an incentive to

keep young people in a community rather than making them seek work elsewhere (Davidson, 2003).

Access to markets

Having access to local, regional, national and even international markets is an important aspect of economic sustainability. Local self-reliance, which means emphasizing local markets, helps communities establish a buffer between their local economies and the fluctuations in larger markets (Bridger & Luloff, 1999). Access to markets is highly related to infrastructure and transportation, so it is even more important for rural communities to create local economies that do not require shipping to regions far away. However, using resources to move goods and services to larger markets is also economically important and communities that have access to regional markets are at an advantage because their products reach a wider demand base (Barbier, 2000). Communities that have access to Fair Trade markets are at even more of an advantage because more money goes directly to the producer through co-ops.

Social factors

The social factors involved in sustainability projects are perhaps the most important considerations, yet they often pose the most challenging problems in keeping a project alive and ultimately to a community's success or failure in sustainability. In order for a local community group to maintain efforts towards sustainability several social factors must be considered including: education, information sharing, capacity building, community ownership, support from multiple levels of government, participatory decision-making processes, development of institutions, secure land tenure, development

of a community vision, action plan and evaluation techniques, and equitable distribution of project benefits.

Education, interdisciplinary information-sharing and capacity building

Providing education to community members in both formal and informal settings is key to sustainability (Kellert et al., 2000) because it helps to develop an understanding of why the project is important and aids in giving the community ideas as to how it may accomplish its various goals. Formal education is a critical aspect of any community and is seen widely by people in rural communities in the developing world as a means of reducing poverty (Nagpal, 1995). Informal education between outside and internal actors is critical to sustainability projects because it involves engaging community members (often adults) who will be actors in projects. Informal education can take place in the form of participatory rural appraisals (Chambers, 1994), action education and other forums for learning (Fagan, 1996). Learning that is applicable to local contexts is especially pertinent to sustainable community development and can be facilitated in informal settings (Fagan, 1996). Also, local indigenous knowledge provides a reservoir of place-based knowledge pertinent to sustainability that is too often overlooked by rural development projects practitioners of the past (Phillips, 2008b).

An aspect critical to education for sustainability is the ability of internal and external actors to share information generated from various disciplines and sources. Many sustainable development projects occurring at the local-level are not limited to the internal resources (or interests) of a community or group (Mitchell, 2001) and a positive interaction between external actors and a community can reinforce these efforts. Clear communication between actors is an ingredient of any project involving multiple groups.

A study by Rist et al. (2007), for example, argues that management of natural resources is strongly affected by ways in which external and internal actors relate to each other. Information sharing between local groups, government, NGOs, research institutions can help communities learn new research from multiple fields and merge it with local or indigenous culture and knowledge (Burns, Audouin & Weaver, 2006; Castillo & Toledo, 2000; Kellert et al, 2000; Kijtewachakul et al., 2004; Redclift, 1993; Rist et al., 2007; Rocky Mountain Institute, 2003; Taylor-Ide & Taylor, 2002; and Thrupp, 1993). Many authors argue that an interdisciplinary approach to sustainable development is the best way to ensure that projects are indeed meeting ecological, economic and social goals (Berkes, 2004; Berkes & Seixas, 2004; Chan, Ranganathan, Boggs, Chan, Ehrlich, Haff, Heller, Al-Khafaji, & Macmynowski, 2007; Fagan, 1996; and Kellert et al., 2000). There is evidence of this in studies from the relatively new field of sustainability science, which aims to create pathways of information sharing between disciplines and to communities to reinforce sustainability projects (Burns et al., 2006; Kates et al., 2001; and Manual-Navarrete, Slocombe & Mitchell, 2006). It is also especially important for local authorities to be involved in sharing information with the community and provide access to information from other sources (Agyeman, Morris & Bishop, 1996).

Capacity building is one of the key factors in maintenance of sustainable development initiatives at the local level (Castillo & Toledo, 2000; Davidson, 2003; Fagan, 1996; McCarthy, 2005; Phillips et al., 2007; Spangenberg, McGinley & Tschida, 2004; and Tucker, 2000). Developing capacity in the local community allows them to be agents of change and provides them with skills to continue what has been initiated (UNDP, 2008). Capacity building can also be empowering, giving community members

the confidence to sustain their work (Berkes & Seixas, 2004).   The adoption of alternative techniques learned through capacity building exercises may also aid in more sustainable use of natural resources (Thrupp, 1993).

Community ownership

Community ownership of the project and its benefits is an important factor in sustainability, especially when there is involvement by external actors (Bridger, 2001; and Wiggins, Markfo & Anchirinah, 2004).   A community's commitment to sustainability may be hampered if there is a perception that the process does not belong to them (Wiggins et al., 2004). If community members have a stake in the project it makes the idea of sustainability concrete rather than an abstract concept contrived by external actors and driven by foreign ideology (Bridger, 2001). Ownership is also related to high levels of mutual trust that benefits will be shared equitably among community members (Pandey & Yadama, 1990).

 Support from multiple levels of government

Although this thesis is focused on sustainable community development projects occurring at the local level, it is important to recognize that local governments and groups do not act independently of the larger governmental structures on national and international levels (Agrawal & Gibson, 1999; and Berkes, 2004). This makes support from higher levels of government a critical aspect of projects because they can act as a brace to support long-term commitments (Rydin & Holman, 2004; Taylor and Taylor-Ide, 2002; and Wint, 2000). On the other hand, lack of support from higher levels of government may seriously undermine a project's success (Armstrong & Stratford, 2004). The first level of governance that is crucial is the local level, especially if projects are not

managed by local authorities (Armstrong & Stratford, 2004; and ICLEI, 2002), because it serves as a conduit to and from higher levels. The local government must be able to relay information and make connections to larger political structures in order to make sure the community's voice is heard at higher levels (Agrawal & Gibson, 1999). Of course, it is important that local officials do so without individual interests in mind, which undermines the community as a whole (Davidson, 2003).

Participatory decision-making process

Highly related to community ownership, projects that involve a participatory decision-making process may be more successful in the long run because they may garner more support from the community than projects that are initiated by the national government or international NGOs (Armstrong & Stratford, 2004; Dorm-Adzobu, Ampadu-Agyei & Veit, 1991; Horochowski & Moisey, 2001; Mitchell, 2001; and Thrupp, 1993). A participatory decision-making process may mobilize citizens into action (Agyeman & Angus, 2003; and Shutkin, 2000, quoted in Agyeman & Angus, 2003), especially if the process is transparent (Smith et al., 2003). One study found that many people from developing countries viewed a democratic decision-making process as a key to sustainability (Nagpal, 1995).

It is argued that involvement from local communities in decision-making processes is crucial because their exclusion, particularly in relation to top-down natural resource management, has resulted in conflict (Chan et al., 2006) or increased poverty and environmental degradation (Hogg, 1987). Projects initiated from above have failed largely in part because they introduced new and unknown management methods that locals did not value or understand (Berkes, 2004; and Redclift, 1993). Local involvement

helps community members place value in the project because they have had a stake in developing it. As cases in Africa have shown (Thresher, 1981; and Litchfield, 2001), if the protection of natural resources is proven to have value for locals, then they may be more willing to manage natural resources in a sustainable manner. If locals participate in the project then they are also likely to articulate the problems affecting them, which may not be clearly understood by outsiders (Fagan, 1996). Locals may need outside help to get a project running, but this should not undermine their decision making processes (King & Stewart 1996; and Walsh, Jamrozy & Burr 2001) and, instead, outside groups can serve to empower local groups (Seymour, 1994).

Development of local institutions

The development of local institutions that govern behavior is viewed as one of the most important aspects of sustainable development at the local level (Agrawal & Gibson, 1999; Berkes, 2004; Barton Bray, Merino-Perez, Negreros-Castillo, Segura-Warnholtz, Torres-Rojo, Vester, 2003; Castillo & Toledo, 2000; Kidane-Mariam, 2003; Leach, Mearns, & Scoones, 1999; Murali et al., 2006; Pagdee et al., 2006; and Pandey & Yadama, 1990; and Tucker, 2000). The creation of local institutions that are accepted by the community can help in the decision-making process, reduce vagrancy, and provide a transparent view of the process from both internal and external viewpoints (Barton Bray et al., 2003; Castillo & Toledo, 2000; Tucker, 2000; and UNCED, 1992). Many authors have emphasized that the absence of strong local institutions is one of the most limiting factors a project may face (e.g., Agrawal & Gibson, 1999; Berkes, 2004; Leach et al., 1999, Pagdee et al., 2006; and Pandey & Yadama, 1990). A focus on institution

development helps to unite people from disparate groups that make up a community, which may not necessarily be cohesive in and of itself (Agrawal & Gibson, 1999).

Institutions that are created through a participatory decision-making process are only helpful if they are developed, accepted, and enforced by the community as a whole. This is especially evident in community-based natural resource management projects (Pagdee et al., 2006), but also in the conduct that governs social and political interactions within groups (Agrawal & Gibson, 1999; and Berger, 2003).

A focus on institutions at higher levels of government is also important because weak institutions at those levels may reduce a project's sustainability even if there are strong institutions at the local level (Berkes & Seixas, 2004). The impact external actors can have on local-level sustainability efforts is complicated and in many cases, may make or break any initiatives a local community attempts (ICLEI, 2002). In many cases, local level institutions in many developing countries have been eroded in the colonial and post-colonial eras because of a predominant push for centralized government (Kidane-Mariam, 2003; Leach et al., 1999; and Wiggins et al., 2004), so the need for reinforcement exists at all levels. Regional or national attempts towards sustainability must take into account local institutions that govern behavior and adjust accordingly (Berkes, 2004).

Secure land tenure

Secure land tenure in the form or legal or informal institutions that define ownership and use rights is also a critical aspect of sustainability projects at the local level (Barton Bray et al., 2003; Castillo & Toledo, 2000; Kidane-Mariam, 2003; Tucker, 2000; and Romano, 2007). In Mexico, for example, the success of sustainable

community forest management projects is highly related to secure land tenure of local communities (Barton Bray et al., 2003; Castillo & Toledo, 2000; and Tucker, 2000). Studies from Africa have also shown that secure land tenure plays a large role in sustainable management of natural resources such as soil (Barbier, 2000; Kabubo-Mariara, Mwabu, & Kimuyu, 2006; Opondo, 2000; and Romano, 2007).

In post-colonial developing countries land tenure is an issue because areas formerly inhabited or managed by local and indigenous groups has been changed drastically, with land tenure being moved either into private hands or centrally managed areas. This has made the question of redefining property rights a huge issue in these countries (Kidane-Mariam, 2003; and Romano, 2007). Often, marginalized groups have been relegated to less productive land (Thrupp, 1993) and local people resist involvement with the government in fear that their ownership or access to land would be changed (Mortimer & Tiffen, 1994). In order for communities to initiate sustainable development projects on either private or common land, they must be ensured that the land will not be taken away from them; otherwise, their commitment to long-term management is severely compromised.

Community vision, action plan and evaluation techniques

As with many projects, there must be a vision for what the community wishes the future to look like (Davidson, 2003; and Rocky Mountain Institute, 2003) and a road map to get there (ICLEI, 2002; and Rocky Mountain Institute, 2003). Having a vision with an action plan consisting of goals, objectives and benchmarks to work towards the vision is a critical aspect of any venture because it allows for measurement of success. This is especially important in sustainable development projects because it is argued that

economic interests may supersede social and environmental ones and an action plan may help reduce overemphasis on economic goals (Bell & Morse, 1999; and Kates, 2005). Literature related to ecotourism projects, for example, calls for significant planning, which the absence of may serve to reduce overall success (Epler Wood, 2002; and McCool & Moisey, 2001). Additionally, having a community vision and action plan gives the community something concrete to work towards, with outlined objectives to get there. Evaluation is also a key factor in meeting project goals and working towards a vision and is often measured through the use of progress indicators (ICLEI, 2002; and Rocky Mountain Institute, 2003).

Equitable distribution of benefits

A community's commitment to sustainability may persist only if benefits are felt throughout the community (Pagdee et al., 2006). Often, one group may secure more economic gain from a project, leaving the poorest groups in the same financial situation they found themselves prior to the inception of the project (Agrawal & Gibson, 1999; Berger, 2003; Kellert et al., 2000; Mitchell, 2001; Murali et al., 2006, and Pagdee et al., 2006). If this situation occurs, then the project may be met with diminished morale and result in a lack of participation by marginalized groups (Horochowski & Moisey, 2001; Kellert et al., 2000; and Wiggins et al., 2004). This is especially important to consider in developing countries where the most marginalized groups are often the poorest.

On the other hand, equitable distribution of benefits to users may facilitate more sustainable use of resources because all parties have an equal stake in protecting them (Pagdee et al., 2006; Murali et al., 2006; Tucker, 2000). The development of institutions to regulate behavior is an important factor in resource use (Agrawal & Gibson, 1999;

Berkes, 2004; Barton Bray et al., 2003; Castillo & Toledo, 2000; Kidane-Mariam, 2003; Leach et al., 1999; Murali et al., 2006; Pagdee et al., 2006; Pandey & Yadama, 1990; and Tucker, 2000) and may be a precursor to equitable distribution of benefits because it may provide a system of checks and balances to ensure that one group or individual does not take advantage of the community's efforts and that distribution of benefits is equitable without marginalization of user groups.

Sustainability Attributes Checklist

Sustainability attributes

Literature regarding locally initiated sustainability projects reveals that success in meeting goals is dependent on many factors (Kellert et al., 2000; and Pagdee et al., 2006). For many cases in developing countries, program success is often evaluated based upon poverty alleviation, social equity and protection of biodiversity (Agrawal & Redford, 2006; Berkes & Sexias, 2004; and Pagdee et al., 2006), but results are highly varied due to situational factors of each case (Berkes & Sexias, 2004; and Kellert et al., 2000).

The global, national and regional economic context within which a community is situated may significantly impact a project's success. This is particularly true if the project is depending on external sources of funding for seed money or other additional financial support. Volatile markets, especially in the recent and continuing global recession, are affecting the global economy and have trickled down into nearly every sector and community. Social situations, including the heterogeneity of a community, power structures, individual interests, gender relations, and instances of conflict also affect a community's commitment and ability to carry out sustainability projects.

The natural resources surrounding a community are also factors in the success of sustainability projects. A community in Kenya, for example, that is able to develop an ecotourism project centered around large felines may be more likely to succeed than another community which does not have these animals in their immediate surroundings. Water resources and the infrastructure to retain and purify water for irrigation, drinking, and household use greatly impacts a community's ability to abate poverty (ICLEI, 2002), especially in dryland regions (characterized by arid, semi-arid and desert habitats). The

type of surrounding forest, for example, dictates opportunities for fuelwood, fodder, non-timber forest products, which can be used both for subsistence and economic gain (Pagdee et al., 2006). The proximity of natural resources that meet the needs of community members is a huge factor in how the community is able to develop, though some communities have been able to use technological advances to optimize resources in seemingly barren areas (Weismann, 1998).

The differing contexts within which communities are found can make the transferability of sustainable development successes and failures implemented in one context difficult to achieve in other contexts (Agrawal & Redford, 2006). However, there are certain aspects that are commonly found in the literature and a focus on these attributes may be beneficial if adapted to the local context by local actors working with outside actors. This chapter identified factors important to sustainability that are important to consider in order to avoid over-emphasis one or a few elements (e.g., economic gains over social equity or ecological health). The attributes generated in this literature review may serve as a guide for communities for developing indicators for sustainability if they so choose. The elements are listed in Table 2 below.

Table 2. Ecological, economic and social attributes important to sustainable community development

Ecological	Economic	Social (Sociopolitical)
Biodiversity conservation[43]	Poverty reduction[44] A. Secure livelihood[45] B. Provision of basic needs[46]	Education[47] A. Access to information and sharing of information between internal and external actors[48] B. Interdisciplinary approach inclusive of scientific, indigenous, traditional and cultural (etc.) knowledge[49] C. Capacity building[50]
Sustainable use of resources[51]	Economic diversity[52]	Community ownership[53]
Environmental awareness and stewardship[54]	Access to markets[55]	Political support from local, regional and national governments[56]
Restoration of degraded resources[57]		Inclusive democratic decision-making process[58]
Preservation of ecosystem function and services[59]		Institution development[60]

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[43] Barton Bray et al., 2003; Berkes & Seixas, 2003; Kellert et al., 2000 ; Pagdee et al., 2007; Smith et a l., 2003 ; and Western & Wright, 1994

[44] Berkes & Seixas, 2004; Parris & Kates, 2003; and Smith et al., 2003

[45] Pagdee et al., 2006; Rocky Mountain Institute, 2003; and Smith et al., 2003.

[46] Nagpal, 1995 ; Parris & Kates, 2003;and Smith et al., 2003.

[47] Agyeman et al., 1996; Fagan, 1996 ; Kellert et al., 2000 ; and Nagpal, 1995.

[48] Agyeman et al., 1996 ; Burns et al., 2006 ; Castillo & Toledo, 2000 ; Fagan, 1996; Kates et al., 2001 ; Kellert et al., 2000 ; Manual-Navarrete et al., 2006 ; Redclift, 1993 ; Rist et al., 2007 ; and Thrupp, 1993.

[49] Alcorn, 1993; Berkes, 2004; Berkes & Seixas, 2004; Burns et al., 2006; Castillo & Toledo, 2000; Chan et al., 2007; Fagan, 1996; Horochowski & Moisey, 2001; Kellert et al., 2000; Kijtewachakul et al., 2004; Manual-Navarrete et al., 2006; Nagpal, 1995; Redclift, 1993; Rist et al., 2007; Rocky Mountain Institute, 2003; and Taylor-Ide & Taylor, 2002.

[50] Berkes & Seixas, 2004 ; Castillo & Toledo, 2000; Davidson, 2003; Fagan, 1996; McCarthy, 2005; Thrupp, 1993 ; Tucker, 2000, and UNDP, 2008.

[51] Barton Bray et al., 2003; Bridger & Luloff, 1999; James & Lahti, 2004 ; Kellert et al., 2000; Smith et al., 2003; and Murali et al., 2006.

[52] Bridger & Luloff, 1999; and Davidson, 2003.

[53] Bridger, 2001; Pandey, 1990; and Wiggins, 2004.

[54] Agyeman & Angus, 2003; Davidson, 2001; and Nagpal, 1995.

[55] Barbier, 2000; and Bridger & Luloff, 1999.

[56] Agrawal & Gibson, 1999; Armstrong & Stratford, 2004; Berkes, 2004; Berkes & Seixas, 2004; Davidson, 2003; Rydin & Holman, 2004; Taylor-Ide & Taylor, 2002; Wint, 2000.

[57] Smith et al., 2003.

[58] Agyeman & Angus, 2003; Armstrong & Stratford, 2004; Berkes, 2004; Dorm-Adzobu et al., 1991; Fagan, 1996; Horochowski & Moisey, 2001; Mitchell, 2001; Nagpal, 1995; Seymour, 1994; Smith et al., 2003; Thrupp, 1995.

[59] MEA, 2005; Parris & Kates, 2003; and Roseland, 1998.

[60] Agrawal and Gibson, 1999; Berkes & Seixas, 2004; Dorm-Adzobu et al., 1991; Junkin, 2007; Kellert et al., 2000; Kidane-Mariam, 2003; Leach et al., 1999; Romano, 2007; and Smith et al., 2003.

Ecological	Economic	Social (Sociopolitical)
		Secure land tenure[61]
		Action Plan with an accepted community vision[62]
		Evaluation techniques[63]
		Equitable distribution of benefits[64]

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[61] Barbier, 2000; Barton-Bray, et al., 2003;Castillo, & Toledo, 2000; Kabubo-Mariara et al., 2006; Kidane-Mariam, 2003; Mortimer & Tiffen, 1994; Opondo, 2000; Romano, 2007; Thrupp, 1995; Tucker, 2000; and Romano, 2007.

[62] Davidson, 2003; ICLEI, 2002a; Junkin, 2007; Pandey & Yadama, 1990; and Rocky Mountain Institute, 2003.

[63] ICLEI, 2002a; and Rocky Mountain Institute, 2003.

[64] Agrawal & Gibson, 1999; Berger, 2003; Horochowski & Moisey, 2001; Kellert et al. 2000; Mitchell, 2001; Murali et al., 2006, Pagdee et al., 2007 ; and Wiggins et al., 2004;

CHAPTER THREE: METHODOLOGY

Research Goals and Objectives

The goal of this study is to evaluate two sustainable community initiatives to determine how they have met the needs of community members (Objectives 2-8) and have contributed to the development of a sustainable community (Objective 9). The objectives of this goal are lumped into the following categories: Literature Review, Project History and Assessment of Actions (See Chapter One, Objectives).

General Methodological Approach

In order to meet the objectives of this study the researcher used methods based upon case study research, qualitative analysis and rapid resource assessment. This research is descriptive in nature. These methods are described in the following sections of this chapter.

Case studies

Case studies are a form of research used primarily in the social sciences and are selected when the study proposes "how" or "why" questions about the topic at hand, the researcher has little control over events, and the study is investigating contemporary phenomenon in the context of events in the real world (Eisenhardt, 1989; Stake, 2006; and Yin, 2003). Case studies are generally used to test theory, generate theory or to describe phenomena (Eisenhardt, 1989). There are intrinsic case studies, which compile information that informs the individual case, and instrumental (or "extrinsic", as it is referred to in this study) case studies, which inform a larger and more general phenomenon (Stake, 1988; and Stake, 2006). The questions posed in this descriptive

study meet the criteria for case study research. This study investigates *how* local-level sustainable development initiatives have been implemented by the communities of Sanjadi-ka-badia and Nyumbani Village, *how* they are (or are not) meeting the immediate and long-term needs of community members, *how* the initiatives have contributed to the development of a sustainable community. The researcher does not have control over the events in the study (i.e., initiatives taken by the communities are not controllable by the primary researcher). Finally, this study investigates the approaches taken by the two communities and assesses how these approaches are contemporarily affecting humans and the surrounding environment, with implications for future management of human and natural systems. As such, it is both an intrinsic and extrinsic study.

In order to develop case studies of each community the researcher used several sources of evidence. Case study research, like other forms of research, requires a number of sources in order to triangulate data, which adds to the internal and external validity of a study (Yin, 2003). Unpublished documents were collected before and during the researcher's time in each community. These documents were used in to describe actions taken towards sustainability prior to the researcher's time in the respective community, to provide background information and support information collected with other research methods. The second source of evidence used by the researcher was a structured interview conducted with community members, community leaders, and staff of the NGOs (FES and COGRI) working with the respective community. The third source of evidence used was direct observational data, which was collected during time spent in the villages from May-August, 2008. Additionally, the researcher conducted one or more

Rapid Resource Assessment (RRA) exercises in each village. The interview transcripts, RRA reports and observation data are found in Appendices of this thesis.

<u>Rapid resource assessment</u>

The RRA exercise was developed by GEM Director Victor Phillips (Phillips, 2008a) and has been used in different applications internationally in GEM applied research, capacity building and outreach efforts to empower local communities to move towards sustainability (e.g., Spangenberg et al., 2004; and Phillips et al., 2007). The RRA process is described in Appendix Three, Notes on Rapid Resource Management Methodology (Phillips, 2008a). In this study the RRA serves as a way to assess what are the current assets or resources of the community and how much each of those resources needs to be further enhanced in order to move towards sustainability and meet needs of community members (Objective Eight) and serve as an additional method in evaluating what needs were met either by the FES or COGRI project (Objective Five). This process is also useful as a tool to guide community action through the community's own internal analysis of needs and resources. The RRA results in a visual depiction of relative strengths and weaknesses in a "spider web" illustration of local capacity as determined by local citizens (e.g., Appendix Three). The complete RRA findings are found in the results Appendices (Appendix One, Results from Sanjadi-ka-badia and Appendix Two, Results from Nyumbani Village) and within the case studies for each community.

Methodology in Sanjadi-ka-badia

<u>Interviews</u>

The researcher conducted interviews with three types of respondents: community members, community leaders and FES staff (see Interviews from Sanjadi-ka-badia

Village section in Appendix One). This took place during five weeks of field research in Sanjadi-ka-badia (SKB) in May and June of 2008. The researcher conducted these interviews with the help of a FES staff translator(s). All of the interview questions were translated into the local dialect of Rajasthani used in rural parts of Bhilwara district. Prior to conducting the interview, the researcher made sure that the translator understood the questions and how to conduct the interviews in order to maintain consistency throughout the process. In cases where the interviewee spoke English, the researcher interviewed the interviewee directly.

Each interviewee signed a consent form that described the research and gave the researcher permission to use information gathered in the interview in the overall study. At the beginning of the interview the translator explained why the researcher was conducting the study and why they were being asked to participate. After receiving verbal consent, the interview was conducted. The translator and researcher decided to have the interviewees sign, or give thumbprints for those who could not write, the form after the interview was completed, so the interviewee knew more about the study and was comfortable signing the consent form (this was a recommendation by FES staff).

Interviews with community members

The researcher used techniques of convenience, snowball and purposeful sampling. Convenience sampling is interviewing people because they are available at the time (Auerbach & Silverstein, 2003). Snowball sampling is a technique in which an interviewee recommends another person who is either available at the time or was involved in the subject at hand (Auerbach & Silverstein, 2003; and Patton, 2002). Purposeful sampling is selecting interviewees because they have a specific set of

characteristics (Patton, 2002). To receive a representative sample of the community, interviewees were selected based upon their caste, age (18 and above), gender, and whether they were present in the village at the time of the FES project, whether they were a *panchayat* member (for a description of the *panchayat* system, see Chapter Four) and if they were one of the FES staff members that worked directly with the project at SKB.

There are three castes in the community: Gujjar, Balai, and Lohar[65]. There is only one Lohar family in the community and, at the time of a census in 2001, the community was about two-thirds Gujjar. Sanjadi-ka-badia is a community of 63 households. Five men and five women from Gujjar and Balai castes and one family member from the Lohar caste were interviewed, for a total of 23 respondents in 22 interviews, or approximately 35[66] percent of the community households. Community members were asked questions regarding their pre-project, current, and future needs, perception of the FES project, and vision for the village's future (transcriptions of all interviews can be found in Appendix One, Interviews from Sanjadi-ka-badia village).

Interviews with community leaders and FES staff

Community leader interviewees were selected using purposeful sampling techniques because of their present or former status as either *panchayat* members or community leaders. FES staff members were chosen using purposeful techniques based upon their involvement in the project. The researcher asked questions related to the project initiated in the community (transcriptions can be found in Appendix One, Interviews from Sanjadi-ka-badia Village). Two FES employees, one former community leader and three *panchayat* members were interviewed.

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[65] Explanation of Castes is found within the Sanjadi-ka-badia case study.
[66] One of these interviews, code SCI3, consisted of two interviewees from the same family. As such, the percentage of community members (35) was calculated using 22 interviews.

<u>Direct-observational data</u>

Observational data were recorded by the researcher during visits to the community, which totaled eight individual visits of no less than three hours per visit. During this time the researcher visited homes and toured around the village, including the site of a new water well currently under construction at the closest river and the Common Grazing Lands (CGL) plots within the Chitamba *panchayat* that were a part of FES work in the region. Conversations with FES staff recorded in a journal were also used as observation data. These data were helpful in providing context for understanding the local conditions as a glimpse into community culture and landscape, which contributed to reflective insights of the researcher presented in the SKB case study. The data also clarified information about FES and the work it conducts in India. These transcribed observational data are found in Appendix One, Observations of Sanjadi-ka-badia.

<u>Documents</u>

Documents were gathered from the FES regional and team offices located in Bhilwara town. These documents (most of which are unpublished) included:

1.) Map of the Chitamba panchayat conducted during a participatory rural appraisal (PRA)[67];
2.) PRA needs assessment conducted in 1999 with Sanjadi-ka-badia village members;
3.) Excel spreadsheet of community baseline data collected by another NGO;
4.) Maps of the area created by FES staff;
5.) Basic village information compiled by FES staff;
6.) Ecological monitoring reports of areas within and outside the Sanjadi-ka-badia CGL plot;
7.) Report authored by the FES regional cell leader (Joshie, Kalam, Chaturvedi, Rastogi, 2008);
8.) FES annual report (FES, 2007);
9.) Ecological Profile of Bhilwara completed by FES (FES, 2008).

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[67] The PRA method was described by Robert Chambers (Chambers, 1992; and Chambers, 1994) and is widely used in developing countries as an initial assessment tool (e.g., Temu & Due, 2000; and Zanetell, & Knuth, 2002).

The RRA for Sanjadi-ka-badia was attempted by the researcher and three translators on 20 June, 2008. The process was explained to the translators prior to the RRA with SKB villagers and questions were translated from English to Hindi. With the advice of the FES staff, the researcher decided to conduct the RRA in two sessions divided by gender. The reason for this was that the FES staff did not feel that the women would actively participate if the men were present. The women had a difficult time understanding the process and ended up leaving because they said they had work to do. The second RRA with the men was also incomplete. The process was initiated up to step three (Sparring) because there was a breach in understanding and people were beginning to become disengaged by the process. The date of this inadequate RRA fell at the end of the researcher's time in India, so FES agreed to conduct a more thorough RRA after the monsoons ended and people were more available to do the RRA. FES conducted the RRA with community members in one group of 18 participants on 29 August, 2008. This information is found in Appendix One, Rapid Resource Assessment Results.

Methodology in Nyumbani Village

Interviews

The researcher conducted interviews with three types of respondents: grandparents living in Nyumbani Village (NV), members of outlying communities working for NV, community leaders in the surrounding districts, NV staff, and two outside consultants (see interview questionnaire in Appendix Two, Interviews from Nyumbani Village). This took place during five weeks of field research at NV during July and August of 2008. The researcher conducted these interviews with the help of a

NV staff translator. All of the interview questions were translated into Kikamba, the local language. Prior to conducting the interview, the researcher made sure that the translator understood the questions and how to conduct the interviews in order to maintain consistency throughout the process. In cases where the interviewee spoke English, the researcher interviewed the interviewee directly.

Prior to the interview, the translator explained the consent form, which was translated into Kikamba, and received verbal consent to conduct the interview. After the interview the participant signed or thumb-printed the form, which indicated their consent to be included in the study.

Community member interviews

The community member interviews were conducted with grandparents living in NV and members of the outside communities working with NV, using the same or very similar sets of questions for each. Convenience, snow-ball and purposeful sampling techniques were used to select people for the interviews. Grandparents were selected using convenience and purposeful sampling and ultimately two grandfathers and eight grandmothers were interviewed (comprising 34 percent of grandparents living in NV at the time). Interviewees who were outside community members were selected using snowballing and purposeful techniques. These interviewees were recommended by NV staff and had been working with NV as more than casual day laborers (so they were familiar with the village and projects implemented there). Eight outside community members were interviewed in seven interviews (13 percent of 59 workers). Both the grandparents and the outside community members were asked questions about the NV

project, how it is or is not meeting needs, what issues exist, etc. (see Appendix Two, Interviews from Nyumbani Village).

Interviews with community leaders and Nyumbani Village staff

Interviews were conducted during July and early August, 2008 with community leaders of the district in which NV is located and the district located nearby the village (Kwa Vonza and Kwa Matonga, respectively). Four community leaders were interviewed in two interviews. Interviews with ten NV staff were conducted to represent the different departments (e.g., home care, sustainability, polytechnic school, primary school, clinic) of the village. Two interviews with outside consultants were conducted. (see all interview results in Appendix Two, Interviews from Nyumbani Village).

Direct-observational data

Observations of NV were made by the researcher during five weeks spent in the village. During this time, the researcher stayed in the guest house, spent time working in the homes of the families living in the village and worked with the staff on various projects. Insights gained from these daily observations helped in preparing the NV case study. Conversations with staff, workers and NV volunteers that were documented in a journal were also included as observational data. These data can be found in Appendix Two, Observations of Nyumbani Village.

Documents

Documents were collected by the researcher during and before the stay at NV and in COGRI headquarters in Nairobi. These unpublished documents include:

  1.) Quarterly reports;
  2.) COGRI strategic plan;
  3.) Reports from the home care, school and sustainability departments.
  4.) Sustainability Strategic Plan developed in 2003 by Woodlands Trust.

5.) Power Point Presentation given to donors by COGRI staff.

<u>Rapid resource assessment</u>

Three RRAs were conducted with three groups at NV: COGRI staff assigned to NV, grandparents, and the Organic Outgrowers Group (a group of outside villagers working in NV). The RRA with staff was conducted by the researcher in two sessions on 28 and 30 July. The grandparent RRA was conducted on 24 July with the assistance of two translators who were coached on the process prior to the activity. The Organic Outgrowers Group RRA was conducted in two sessions on 18 and 24 July with the help of two translators who were also coached on the process prior to the sessions. All of the RRAs can be found in Appendix Two, Rapid Resource Assessment Results.

Analysis of Qualitative Data

This research is a qualitative study aimed at describing and analyzing a contemporary phenomenon: sustainable communities. Qualitative studies are hypothesis-generating, which "involves analyzing and interpreting texts and interviews in order to discover meaningful patterns descriptive of a particular phenomenon" (Auerbach & Silverstein, 2003). This research generates hypotheses about each case study (intrinsic hypotheses) and how they inform sustainable community development as a whole (extrinsic hypotheses) (described in Chapter Six: Discussion).

The researcher uses an open-coding technique to analyze qualitative information gathered in the study. Open coding is a process used to systematically categorize, build relationships, and explain phenomena through systematic coding of raw qualitative data (Auerbach & Silverstein, 2003; Strauss & Corbin, 1998; and Taylor, & Bogdan, 1998). The open-coding process involved a series of steps: formation of propositions,

categorization of propositions and development of themes. The process of developing propositions, categories and themes is discussed in the following sections.

<u>Formation of propositions</u>

In this study the researcher divided the interviews into three interviewee groupings: community members, community leaders, and staff members of the NGOs working with each community. All interviews were analyzed for propositions separately by grouping because the set of questions differed. After choosing the richest interview (the interview that provided the most information for Objectives 2-8), the researcher went through each objective to find direct, quoted answers specific to that objective. These answers became "propositions", or the initial form of the data analysis taken directly from interview quotes. The wording of the propositions was not changed by the researcher. The first answer to the objective became "Proposition 1" and new propositions (proposition 2 and so on) were added as new responses were mentioned. After all of the answers for Objective Two were recorded in the first interview, the researcher went on to the next objective, numbering propositions consecutively from the previous objective. After finishing all objectives for the first interview, the researcher went on to the next interview, adding new propositions when necessary and marking when respondents mentioned an already established proposition. Propositions that were identical, similar to, or served to inform other propositions were put together in graphs with the number of times a proposition was reinforced and in which interviews (See Appendices One and Two for graphs). This process was conducted for all interviews.

Development of categories and themes from the interviews

After the initial proposition phase, the researcher combined propositions into categories in order to understand the dynamics of the raw data and how responses relate to each other. The researcher then sorted the data in different ways in order to identify emerging clusters of responses and build themes reinforced by the generated categories. Conclusions were generated for each objective using the developed themes or categories and compared to other sources of data, such as direct observations, documents, RRAs or data from other objectives (e.g., data from Objective Eight informed conclusions drawn in Objective Five). Other sources of information are cited in the conclusions for each objective and un-cited information comes from the analyzed interview data. All of this information (i.e., the propositions, categories and conclusions for each objective) are found in the community's respective Appendix in the section titled, "Results Categorized by Objective".

How the case studies were written

Information in the case studies came directly from interviews, documents, RRAs and/or direct observations. All of the information is not directly cited in the case study chapters to reduce complexity for the reader, but is cited in the conclusion sections of the sections titled "Results Categorized by Objective" in Appendices One and Two. Direct and summarized quotes were cited, giving the Appendix and interview code.

CHAPTER FOUR: SANJADI-KA-BADIA CASE STUDY

Case Study Overview

The case of Sanjadi-ka-badia (SKB), or "agricultural place where people live" as it translates in Rajasthani, is one where, prior to the project initiated by Foundation for Ecological Security (FES), community members experienced difficulty meeting basic daily needs because of reduced capacity for the primary subsistence and livelihood activities of animal husbandry and agriculture. The collaborative project between FES and SKB primarily served primarily to restore fodder production, which reinforced the economic activity of animal husbandry and reduced migration in search of fodder during the dry season. Ecological restoration and development of institutions to regulate behavior were the primary methods used to restore fodder availability. Institutions also served to empower women and lower castes, whose involvement created a sense of unity and reflects a move towards inclusive decision-making for collective good. Additionally, institutions created incentives for universal education, which will undoubtedly affect the community in the future. The fact that these institutions remain intact four full years after the project's completion signals that there is mid-term retention of institutions to guide behavior towards collective good.

However, there are many other issues the community still faces that were simply not within the scope of the FES project, such as lack of employment, lack of infrastructure, lack of education, lack of health care services and limited access to outside information. When asked about their current situation, one interviewee said, "*they are managing but it is very difficult*" (Appendix One, SCI11). While the FES project served to meet some of the needs of SKB, it certainly could not and did not meet all of the needs

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the community had prior to the project and that currently still exist currently. As one community member noted, *"FES is helping them solve problems to a certain degree"* (Appendix One, SLI2).

In terms of sustainability, the FES project made significant steps by increasing viability of a major livelihood source, animal husbandry, which assisted in basic needs provision, the first step towards sustainability. Economic status of SKB remains tenuous because of limited employment opportunities, low access to markets and lack of infrastructure to support economic activity. Ecological considerations were also addressed by the FES project, though restoration was limited to the common grazing lands plot. The process and work implemented in the plot was, however, comprehensive and may serve as a model for the community to conduct restoration and sustainable use practices on other sites. The most impressive aspects of sustainability that the FES project addressed were social inequity and a lack of institutions to regulate and guide collective behavior. The development of institutions served as an umbrella for fostering many of the other attributes such as education (especially for girls), inclusive decision-making processes, secure land tenure, political support from local government and community ownership. The development of these institutions was a catalytic event that helped the community step beyond their comfort level to ensure a more equitable society. FES also helped to bring more information and new ideas to the community, which is fairly geographically isolated, and did so in ways that aligned with local culture. Overall, the FES project contributed to social development because it helped to bring about a more cohesive social unit that could make decisions for its collective well-being through institutions that remain after FES finished the five-year project.

Site Description

SKB is located in Bhilwara District of Rajasthan State in northwestern India (Figure 1).

Figure 1. Rajasthan, India (National Portal of India, 2008)

The community is approximately 70 kilometers northwest from the district head, Bhilwara Town (Figure 2). It is one of five communities falling under the jurisdiction of the Chitamba *panchayat*[68], located in Chitamba Village, which is located approximately five kilometers from SKB. The population of SKB at the time of the most recent census (2001) was 393 people in 73 households. There are three castes in the village: Gujjar, Lohar and Balai. All of these are considered backward castes[69]. Balais are considered as a Scheduled Caste[70], whereas Lohar and Gujjar are considered as Other Backward Castes. All of these castes receive reservations for political seats in local, regional and national positions and for some government jobs. The community encompasses an area of about 183 hectares[71].

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[68] The *panchayat* system is explained with more detail in the next section.
[69] There are four tiers of castes in India. The first two are considered as forward, or upper castes, and the latter two considered as backward, or lower castes.
[70] Scheduled Castes and Tribes are Dalit, or Untouchables, the lowest castes within the fourth tier of the 2nd backward caste.
[71] 1 hectare = 2.47 acres

LOCATION MAP OF CHITAMBA VILLAGE

Chitamba panchayat
and Sanjadi-ka-badia

Bhilwara
Town

Map created by Chiranjit Guha, FES

Kilometers
0 5 10   20   30   40
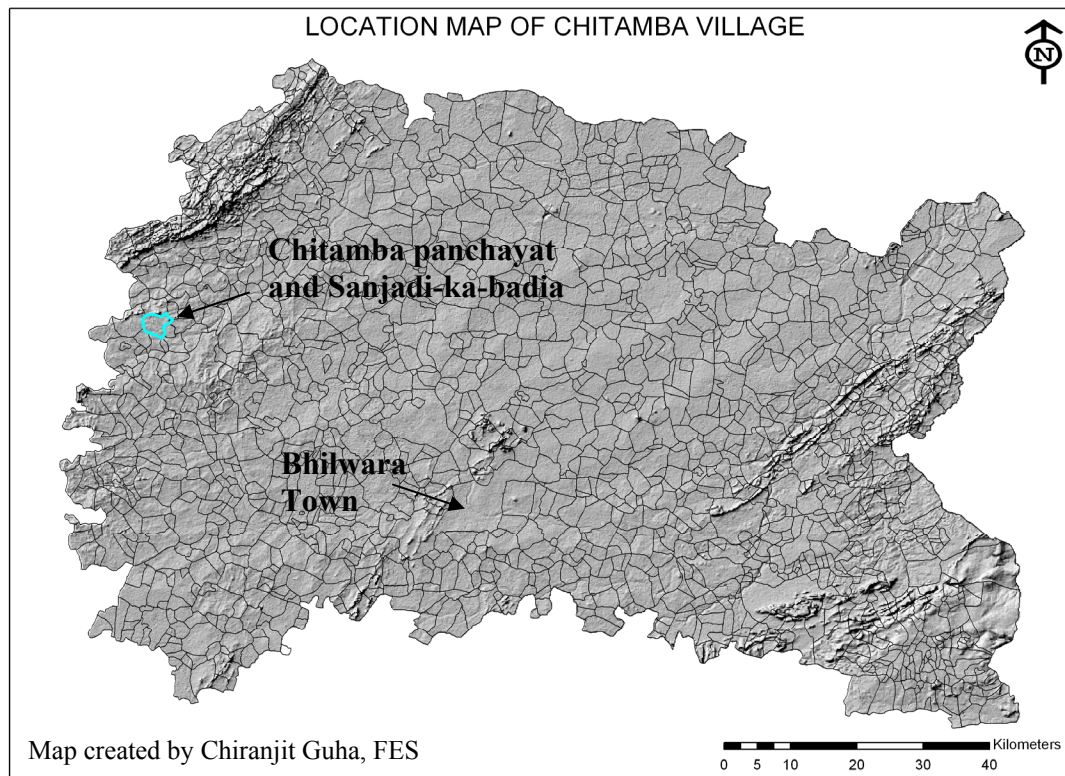
Figure 2. Location of Sanjadi-ka-badia village, Bhilwara District, Rajasthan, India.

Infrastructure and social services are lacking in the immediate area. A primary
school is the only education facility in the community. There is a middle school in
Chitamba Village and a secondary education facility about 10-15 kilometers from the
village. There are no formal medical facilities in the community but a Mother and Child
Welfare Center is located about 10-15 kilometers away. During the dry season (about
mid-March-July) water is primarily provided by communal hand pumps; during the wet
season (August-December) water is available in taps, hand pumps and wells. There is a
paved road connecting the village to Chitamba and to Bhilwara Town. A railway station
is approximately 12 kilometers from the community. Banking facilities are located in
Chitamba. There are no developed economic activities in the community (e.g.,

community store or industry). The majority of the villagers gain subsistence through agriculture and animal husbandry and livelihood through the sale of crops and milk or through daily wage labor. Most women are involved currently in the National Rural Employment Guarantee Act (NREGA) program, a national government program that pays villagers to conduct development work (such as road building) in their own communities and is administered by the local *panchayat*.

There is no forest within the community's jurisdictional boundaries, but some trees and shrubs can be found sporadically, including *Acacia nilotica, A. leucophloea, Prosopis cineraria, P. juliflora, Azadirachta indica, Balanites aegyptiaca, Capparis decidua, C. horrida, Rhus msorensis, Zizyphus numularia,* and *Crotolaria burhhia*. Common grazing lands (CGL) are about 102 hectares. The community has access to these common lands, which are managed by the Chitamba *panchayat* for grazing livestock such as goats, sheep, cattle and buffalo (Figure 3). Most of the private land outside of the CGL is used for agriculture and commonly grown crops are maize, groundnuts, sesame, wheat, mustard, barley and pulses. The climate of SKB and the Bhilwara District is semi-arid. Agricultural systems and other man-made systems are the predominant type of the landscape mosaic (FES, 2008). The district's propensity for drought is high, although generally the southern region receives more precipitation than the northern part, unfortunately which is where SKB is found (FES, 2008).

Figure 3. Sheep and goats graze in a Common Grazing Land plot in Sanjadi-ka-badia, India. Photo/Lindsey Wood.

Panchayati Raj System of Local Governance

The *panchayati raj institution* (PRI) system of local governance in India is an important factor of local-level sustainable development initiatives in the country and is a key element of the project in SKB. This type of political system was common prior to colonization of the subcontinent by the English, who effectively dismantled such arrangements and gave power to a centralized government (Kaushik, 2005). The PRI is a system of rural local governance with three ascending tiers: *Gram panchayats*, *Mandal* or *Panchayati Samitis,* and *Zilla parishads* (Kaushik, 2005). *Gram panchayats* (hereafter referred to as *panchayat*), being the lowest level of the Indian political structure, are local bodies of five people who are elected to oversee the affairs of the communities within the

jurisdiction[72] of the *panchayat* and act as liaisons to higher levels of government. The *panchayats* elect a leader, referred to as a *sarpanch*, with the collective group called a *panch*. The *panchayat* is the level of government associated with the FES project in SKB.

India's development in the post-colonial era has ultimately reverted back to the PRI system. After independence from Great Britain, decentralization became a key part of the country's internal development policy. Although the country attempted to reinstate PRI directly after independence in 1947, it was not legally codified in national legislation until the 1990's. It started to gain momentum as a social movement in the 1980's, which was largely in response to a mostly ineffective top-down development scheme that rarely met its goals, especially in rural areas of the country (Choudhury, 2004; and Kaushik, 2005). The PRI system, though largely stamped out, was still in practice in some rural areas, and provided an existing framework for the process of renewed decentralization (Kaushik, 2005). The 73rd Amendment reintroduced the historical PRI system, bringing it into law, and was adopted by all states in the country by 1994. The primary goals of the amendment are social justice and economic development with reinforcement of local government to facilitate both (Kaushik, 2005). The strength and relative success of *panchayats* varies throughout the country (Joshie, Kalam, Chaturvedi, & Rastogi, 2008).

In SKB, the *Gram panchayat* was a key element in the sustainability project. The initiative was primarily focused on the CGL, so the community needed the support and permission of the *panchayat* to reach its goals. In particular, the credibility, effective leadership and trustworthiness of the *sarpanch* had a lot to do with SKB's ability to implement the project (S. Joshie, personal communication, June 4, 2008).

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[72] The *panchayat's* jurisdiction depends on proximity between villages or hamlets.

Foundation for Ecological Security Project in Sanjadi-ka-badia

Project details

In SKB the sustainability project was initiated by a NGO, Foundation for Ecological Security (FES), in collaboration with the community members and local *panchayat*. FES was legally constituted in 2001, though it worked as a part of a government agency (The National Dairy Development Board) for several years prior to becoming a NGO. FES works throughout India and primarily focuses on two thematic areas: forests and tribal livelihoods, and commons[73] and rural livelihoods (FES, 2007). The mission of FES is to "strengthen, revive, or restore, where necessary, the process of ecological succession and the conservation of land, forest, and water resources in the country" (FES, 2007, page 2). A summary of FES's scope of work comes from its 2007 Annual Report: "the central character of the efforts lies in the intertwining principles of nature conservation and local self governance, aimed at accelerating ecological restoration, as well as improving the living conditions of the poor" (FES, 2007, page 3). As this case study shows, the work FES completed in SKB is evidence of its ability to meet goals of ecological health and poverty reduction.

FES initiated contact with SKB and the Chitamba *panchayat* in 1998 to determine if it was feasible to do work on the CGL managed by the local *panchayat* (Appendix One, SLI1). FES chose to do work in the Chitamba *panchayat* and SKB because of the presence of CGL to implement restoration work, interest by the communities and *panchayat*, and the severity of environmental degradation and poverty in the region. In SKB, the CGL is a vital part of the community, especially for families with little or no

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[73] Commons are tracts of land owned by the people of India and have different distinctions (e.g., common grazing lands, forest lands, revenue wastelands)

private land for grazing livestock. The CGL in SKB is used for grazing goats, sheep, cattle and buffalo and some fuelwood extraction. Official work with the community began in 1999 with a five-year work plan from 1999-2003.

Prior to the initiation of the FES sustainable livelihoods and ecological restoration project, citizens of SKB had a very difficult time meeting their daily basic needs. The primary causes of this situation were the setting in a dryland climate and anthropogenic degradation of natural resources used for livelihoods and subsistence. Other factors were underlying this issue, such as a lack of accepted institutions to reduce overgrazing on the CGL: "*(there) were no institutions to guide behavior on the land under the* panchayat" (Appendix One, SLI1). The degradation of vegetation on the CGL and surrounding private lands served to increase water scarcity in an area already prone to drought, which further impacted agriculture, water availability for household use and fodder production. Migration to other regions in search of fodder during the dry season was also a major issue for many, especially those in the lowest caste (Balai), who own less land. The poor economic state of the area affected people further because they did not have an outlet to turn to as their capacity to earn a living through animal husbandry and agriculture was diminished: "*before there was not any form of employment and they would often have to do wage labor in other areas*" (Appendix One, SCI3). Additionally, a lack in social services (e.g., higher levels of school and medical services), social equity (lack on involvement in decision-making from women and lower castes, high rates of child marriages, and low school enrollment for girls) and infrastructure (i.e., roads, electricity and structures for water management and distribution) resulted in an overall situation of

low development. For a visual depiction of the relationship between the underlying factors that resulted in SKB's difficulty in meeting basic needs, see Figure 4.
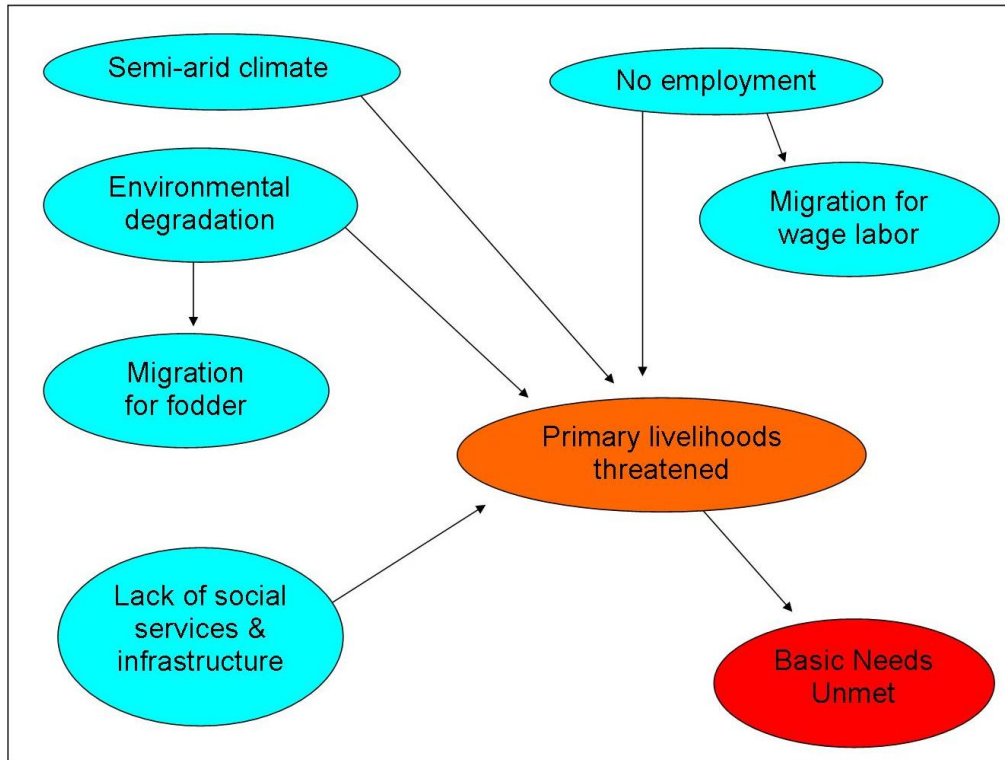
Figure 4. Factors contributing to low development in Sanjadi-ka-badia, India prior to a project by Foundation For Ecological Security.

In 1999 FES conducted a needs analysis with SKB[74] community members and prioritized the following as important needs or issues to be addressed: water (quantity and infrastructure); low agricultural outputs; poor animal husbandry techniques; lack of education opportunities; fodder scarcity; lack of medical facilities; lack of employment opportunities; droughts; and the need for more information on government schemes. It was not within the scope of FES' work to address all of these issues (e.g., medical facilities or education), so it focused the project on work it was qualified to do. Given the

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[74] FES was working not only with SKB, but all of the hamlets that fall under the jurisdiction of the Chitamba *panchayat*. However, staff worked with each of the hamlets individually to meet the varying needs of all five communities while also reinforcing relationships within the *panchayat*.

expertise of FES in ecological restoration and institution development, the project was focused primarily on issues related to the community's ability to meet livelihoods, natural resource restoration, employment, fodder and water. In interviews with the community members, respondents most commonly mentioned fodder and water as major issues and, as one community member commented, "*everything was linked to fodder and water*" (Appendix One, SCI4).

In order to address the prioritized needs (livelihoods and employment, natural resource development, fodder production and water retention) of the SKB community, FES initiated programs related to natural resource restoration and development of institutions to regulate behavior on the CLG plot and within the community. All of the actions taken were decided upon in community meetings and required significant planning and commitment by the community to do the work. It was noted by respondents that community participation was high throughout the 5-year project. The work can be categorized into the following: engaging the community and planning, natural resource restoration and institution development.

Engaging the community and planning

Beginning work with SKB took significant planning and patience on behalf of FES. The work completed by another NGO, *Mangra Mewar Vikas Sanstha*[75], prior to FES's involvement was a crucial aspect in FES's work with the village because it began the process of building trust between the community and an outside organization (Joshie et al., 2008). One interviewee provided a synopsis of this process:

> "*Some resistance was met at the beginning of the project because people who owned private lands near the common grazing lands thought they would be able to move into those lands and lay a claim to them for their own purposes. People*

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[75] This NGO was working on developing patches of land for fodder production.

also thought the NGO (Mangra Mewar Vikas Sanstha) may try to sell the land. There were a lot of rumors about what was going on. They had a meeting to clarify what they wanted to do. This led to an increased interest in the project from about 10 people to more than 40." (Appendix One, SLI4)

Another interviewee flushed out more of the process: "*initially the community thought that FES was trying to take their land, so FES took them on a field trip to Ajmer to see the work they'd done there and talk to villagers; after this they were motivated to have FES help them."* (Appendix One, SLI5).

The process of building trust took about a year after the initial contact in 1998, and SKB and FES began formal work in 1999. The first year (1999) was spent deciding what work was needed to meet the villagers' needs (e.g., conducting the 1999 Needs Analysis and Participatory Rural Appraisals (PRA){Chambers, 1992; Chambers 1994} to assess and map resources); having community meetings; meeting with leaders of the Chitamba *panchayat*; developing committees, including a women's management committee that acted like a self-help group; coming up with a conservation agenda and a five-year work plan; and building knowledge and capacity of the community members, especially for management of the CGL.

Natural resource restoration

In order to restore the CGL, FES engaged the community members in a number of capacity building and physical work activities. Fodder production, soil conservation and groundwater recharge were primary goals for physical work on the CGL (Joshie, et al., 2008). FES paid villagers to perform physical labor to improve their CGL, so the community members were able to earn income while preserving the commons. FES brought in saplings for plantation development, which were planted and maintained by the community. Check dams, ditches and contours were constructed to conserve water

and soil. A living fence, consisting of thorny *babul* (*Acacia* spp.) shrubs, was constructed around the CGL plot to clearly demarcate its area and provide an easier way to guard it against encroachment from other communities as well as to deter misuse by SKB community members. Capacity building workshops to manage natural resources were also conducted, as well as development of knowledge and understanding of ecological processes, such as rain cycles. In order to make the information culturally appropriate, FES conducted "*puppet shows (and) cultural programs that showed their connection with the land and the necessity of managing natural resources well*" (Appendix One, SLI1).

Institution development

The FES project also focused on the development and strengthening of local institutions, especially in relation to sustainable governance of natural resource management. FES did this by helping the villagers specify rules and regulations, creating a democratic forum for decision-making, encouraging transparent and accountable fiscal management, and supporting participation of women and lower castes (Joshie et al., 2008). The Chitamba *panchayat* and informal village institutions called *Charagah Vikas Samiti*s (CVS) were the primary conduits for these activities. The process served to legitimize the *panchayat*'s authority within the area and establish trust between villagers and their elected officials (Joshi et al., 2008).

The CVS groups formed in each hamlet aided the Chitamba *panchayat* in managing CGL lands while also giving villagers the ability to make collective decisions about the land that provides them with their livelihood (Joshie et al., 2008). It was decided that although the *panchayat* is responsible for only 450 households, the smaller CVS institutions could manage the physical work and oversight more effectively. The

CVS groups became an integral part of the FES project because they had the legal authority and support of the *panchayat* to manage the CGL, but also transitioned the community into being responsible for management of public natural resources. Similarly, other CVS were formed to manage additional issues and a federation of CVS was created to report to the *panchayat*. The federation proved a useful forum to discuss village issues and bring them to the *panchayat* if they could not be resolved within the community.

Developing institutions to protect the CGL was a crucial element because they wanted to maintain the physical work completed in its restoration. SKB adopted rotational grazing schedules that coincided with natural cycles, primarily the wet monsoon season, to reduce or eliminate overgrazing on the CGL plot and to allow regeneration of grasses, shrubs and trees (Figure 5).

Figure 5. Restored Common Grazing Lands plot in Sanjadi-ka-badia, India. Photo/Lindsey Wood.

Each year the schedule is reviewed based upon the state of the plot and may be altered if the community decides it needs to have less grazing or if more grazing may be permitted. Each family pays a fee depending on the size of the livestock (e.g., grazing buffalo and cattle is more costly than sheep or goats) and the size of the herd, which was decided by the community. The money earned goes into the "*ora* system", which is another institution created to protect the CGL. In the *ora* system, one family from the community guards the plot for one week, ensuring no encroachment, and is paid for their time. After a week another family takes over, so that responsibility is assigned to each family in the community.

Improving the status of women and lower castes was also targeted in the development of institutions, primarily by making sure both had a place in decision-making. For example, women and lower castes were previously not allowed to sit on the *Hatai*, the sacred community space for decision-making, but SKB went against cultural tradition and allowed them to sit on the *Hatai*. Incentives for education of both sexes were also created to encourage education of youth. Girls' enrollment in school was very low, so the village decided to impose fines on families that did not send their children to school. The fine for not sending girls is about 1200 rupees and the fine for not sending boys is lower (they are required to buy a bag of grain to feed the pigeons, which are highly regarded by the community).

Impacts of the FES project on Sanjadi-ka-badia

Overall, the interviews revealed that most respondents were satisfied with the FES project, and that it did in fact help them meet previously unmet needs and resolve some issues. For example, in 17 out of 22 interviews with community members, respondents

mentioned that the project was either beneficial to them or successful (Appendix One, page 39). As far as meeting the project's intended goals, data indicate that water retention, fodder production, livelihoods and employment and natural resource restoration were improved to a certain degree. The following sections describe how the FES project met or did not meet those goals.

Water retention

The need to increase water retention for household and agricultural use was addressed by the FES project, and responses indicated that many of the interviewees felt that the project did serve this need. Restoration of the CGL helped reduce local desertification and improve rainwater penetration within its boundaries. Respondents noted that groundwater recharge, overall water availability, and supply for irrigation increased: "*ditches and contours helped bring water for irrigation and livestock*" (Appendix One, SCI18).

However, the respondents' positive attitudes towards the project's water retention goals did not encapsulate the entire situation. The interview and RRA results (Figure 7) show that water is an issue that still needs to be addressed. People mentioned that there was more water in wells, which signals that the project helped restore groundwater levels, but a study to compare previous levels relative to rainfall was not conducted, so this information may be mostly anecdotal and could be related to other factors. Water retention will remain an issue, especially if overgrazing, removal of vegetation and soil loss continue on private lands, or if the CGL should become degraded once again. The community is currently building a well at the nearby river, but infrastructure for transporting and saving water largely does not exist. Unfortunately, the dependence on

the highly variable monsoons makes the village subject to climatic vagaries that only serve to confound the water scarcity issues they face. That being true, it can be argued that water issues were addressed to a degree by the CGL restoration and could continue to be improved if land restoration on private lands is implemented.

Fodder production

Nearly all of the respondents mentioned that fodder had increased as a result of the FES project. This resulted in less migration in search of fodder and the ability to have more livestock: "*they see less migration so they know that it has been successful*" (Appendix One, SCI3). People also noted better milk production from their livestock. It is clear from photographs that the CGL is producing fodder (Figure 5 above), whereas surrounding private lands lack vegetation (Figure 6 below).

Figure 6. Private lands surrounding Common Grazing Lands plot in Sanjadi-ka-badia, India. Photo/Lindsey Wood.

A biodiversity inventory completed by FES also confirmed the presence of more fodder-producing species after the project's completion. This study found that tree

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biomass (11.7 t/ha) was significantly higher in the plot than on surrounding private lands (1.02 t/ha). Shrub biomass was also higher in the CGL plot (5.10 t/ha) than on the surrounding private lands (3.66 t/ha). The use of the *ora* system, rotational grazing methods, and the living-fence boundary are no doubt the reason for the continued presence of fodder for livestock. One community member, for example, commented "*there is no longer encroachment on the CGL because of the boundaries*" (Appendix One, SCI13).

Livelihoods and employment

Respondents noted that livelihoods and employment were improved by the FES project: "*the project also gave them employment which helped bring money into their homes*" (Appendix One, SCI8). During the time of the FES project, villagers were able to secure employment and earn money for the work they completed on the CGL. This resulted in an increase in household income and ability to pay off some debts. The ability to use the plot for fodder also reduced the need to buy fodder elsewhere and resulted in less migration, which was a strain on income. Agricultural outputs also increased, which had an effect on this income-generating and subsistence activity.

Although community members were paid by FES during the project, they are still currently without viable employment opportunities. Many women are involved in the National Rural Employment Guarantee Act (NREGA program), but this governmental program could end pending federal legislation and only guarantees 100 days of work per year. This was evident in the interviews, where, in 11 out of 28 interviews, respondents mentioned that employment is still needed. Additionally, participants in the RRA

completed on 29 August 2008 (Figure 7) decided that a stable source of income was a priority for the village.

Natural resource restoration

The need to improve conditions of surrounding natural resources was addressed by the FES project, most notably on the CGL plot. In one interview it was stated that: "*(You) couldn't see plants before, now they are all around*" (Appendix One, SLI3). Rotational grazing methods have increased the amount of greenery and placed less anthropogenic stress on that area. FES staff mentioned that the project helped reverse retrograde succession and restore nutrient flows and the food chain. It was also noted that there are now more wildlife using the plot.

However, natural resource restoration is limited to the CGL and large areas of degraded land remain outside its borders (e.g., Figure 6 above). Studies conducted by FES on the CGL showed that higher biomass, higher soil moisture and more biodiversity are possible if the community members initiate restoration. Hopefully, the new knowledge and skills gained by the community will be used to restore private lands to increase their productivity for human use and ecological health. Interviews with FES and *panchayat* members indicate that they believe SKB villagers did make significant connections between livelihood and environmental health: "*people had the realization that managing the environment is helpful to them and are starting to apply the same concepts on their private lands*" (Appendix One, SLI2). Another *panchayat* member explained how, through active participation, community members were able to understand how natural resource management can be implemented to their benefit:

> *"During construction of the ditches (and) bunds, people had a hard time*
> *with the techniques, especially that FES wanted them to measure the size*

of the ditches…this is because before they had been employed by the government on projects but had no monitoring and no ownership. They had to show them that the size of the ditches did matter and that the act of measuring the size was directly affecting them" (Appendix One, SLI2)

Additional FES project achievements

The development of a relationship between FES and the community was noted as a significant achievement by community members, *panchayat* leaders and FES staff because mistrust of an outside organization was the greatest challenge they faced in the beginning and yet they were able to overcome it with time.   Many community members felt that the FES project helped to develop a sense of unity that was absent previously.

A very substantial benefit mentioned in the interviews was the improvement of women's status and increased women's involvement in decision-making.   Women's empowerment was evident not only in the fact that girls were increasingly being sent to school, but also that women felt as though they were given importance and could work as a unified group.   One interviewee commented: "*women were given importance…now when there is a meeting, women participate*" (Appendix One, SLI2).   The improved status of women that occurred is impressive because "*it is the only village in the FES project area where women were allowed to sit*" (Appendix One, SLI4) on the *Hatai.*

<u>Current needs and issues in Sanjadi-ka-badia</u>

An investigation of SKB's current needs is helpful in determining whether the FES project met its goals and contributed to meeting the basic needs of community members. These data confirm what was discussed in the previous section and highlight some other facets of the community's experience towards development. Many of the community's current needs are related to the need for economic opportunities; a lack in social services, particularly in terms of education; health services; infrastructure for

water, transportation, and electricity; and the need for more connection to the outside for information and development assistance. The RRA (Figure 7) provides a visual description of the community's current assets and which ones need to be developed to move towards sustainability. The economic status of the community remains an issue because employment opportunities are scarce. The federal government's NREGA program is an exception of this, but anecdotal information indicated that payment of wages in this program are sometimes delayed and, because it is a program funded by the government, there is no long-term guarantee that it will continue. In the RRA and interviews respondents mentioned that economic development is a high priority.
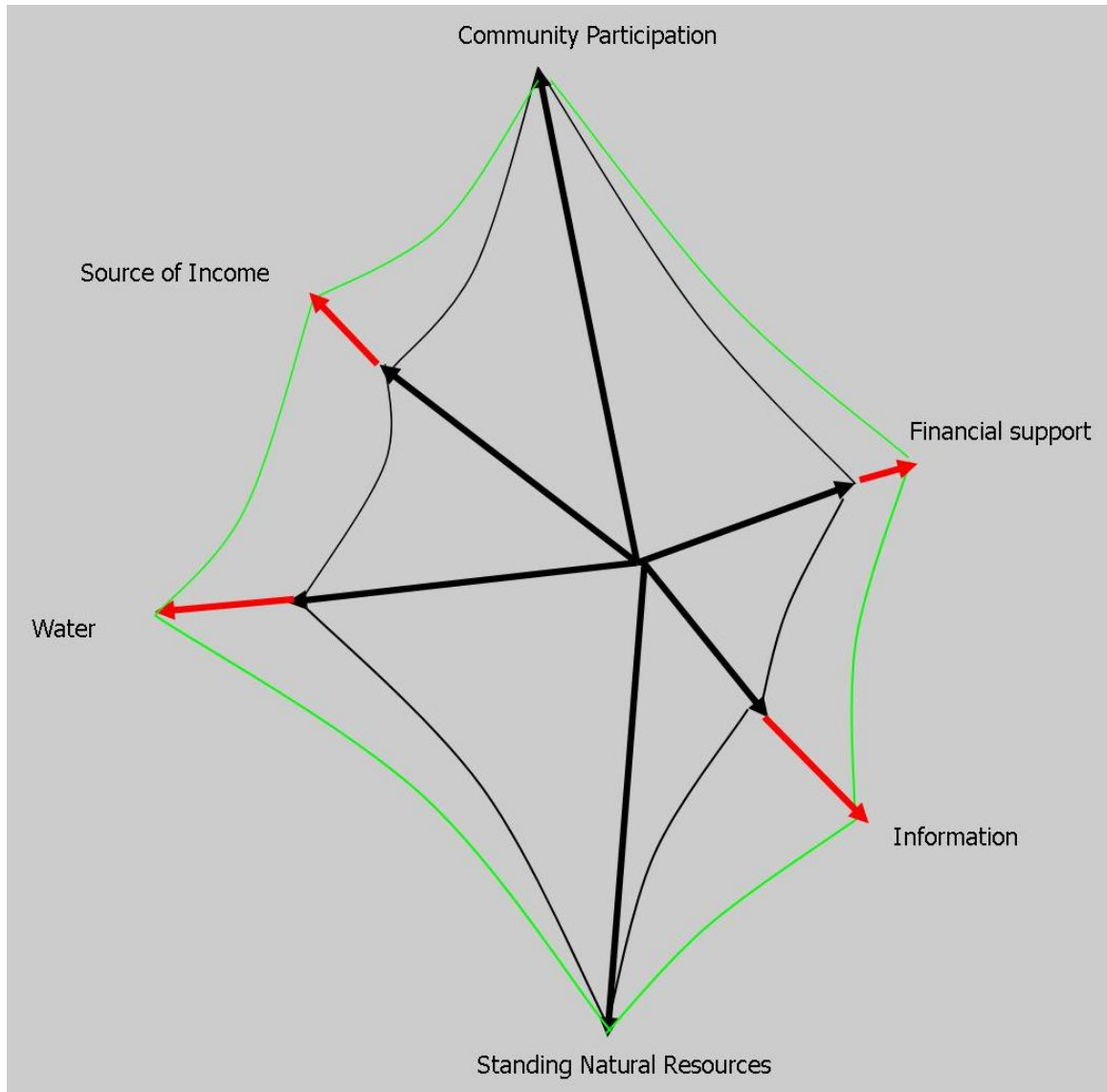
Figure 7. Rapid Resource Assessment results from Sanjadi-ka-badia, India, 29 August 2008.

Water continues to be an issue in spite of the FES project (i.e., in 19 out of 28 interviews it was mentioned as a current issue). As one respondent noted, "*the future is about water*" (Appendix One, SCI1). Another interviewee said: *"(our) major needs are related to water because most of (our) problems are related to water scarcity*" (Appendix One, SCI9). A lack of water infrastructure is also a significant setback.   Natural environmental factors related to water scarcity are a compounding factor. Managing land

for water retention is critical on private lands, as well as improving water retention, through contoured swales and ditches on the CGL.

SKB's location and lack of development also limits access to new information about topics such as agriculture, government assistance programs, or hygiene. Therefore, gaining new access to information was considered a main priority for the community.

Discussion of Sustainability Attributes

Objective 9 of this study is to determine to what extent the actions taken have contributed to the development of a sustainable community. Attributes of sustainability were created in Chapter Two and are used to discuss SKB's efforts towards sustainability.

Ecological attributes

Biodiversity conservation

Even though biodiversity conservation was not a primary goal of the FES project, the CGL restoration work contributed to biodiversity conservation in several ways. For example, after the FES project, more wildlife species and an increase in vegetation diversity were recorded within the plot (Appendix One, SLI1).

Determining whether the project has increased biodiversity conservation is difficult to discern with the available information. Without pre- and post- biodiversity surveys, it cannot be concluded that the project made significant impact on biodiversity conservation. However, the plantation programs to restore vegetation are tangible results that are preserving those species, whereas if the project had not been conducted, the plot would probably not be able to support them.

Sustainable use of natural resources

The institutions created in the FES project helped to ensure more sustainable use of natural resources, at least for vegetation within the CGL plot. This is primarily because the amount of grazing is limited and done on a rotational basis. Community members are taking inventory of the plot and gauging whether it is being overgrazed, so there has been a development in capacity to manage vegetation resources in a more sustainable manner. The project made a significant contribution in developing awareness that using resources sustainably in the CGL is to their advantage in the long run. Whether this will extend to other natural resources, such as water and private land resource management, is yet to be seen.

Environmental awareness and stewardship

The FES project enhanced understanding of the relationship between ecosystem health and livelihoods, which represents a key step in environmental awareness and stewardship. The management of the CGL that continues even three years after the project's completion manifests that SKB community members are committed to ecological health, at least within the plot. As one community member said, *"after FES came, the village still looks after the plants that were planted in the plantation program"* (Appendix One, SCI17). The capacity building that took place during the project helped to increase knowledge of ecological systems and develop the skills to manage them. If restoration of private lands happens in the future, there is an even stronger argument that the FES project helped to increase environmental awareness and stewardship.

Restoration of degraded resources

The restoration work completed on the CGL plot helped to reverse severe environmental degradation. This included revegetation of trees, shrubs and grasses and soil and water conservation mechanisms. After the project it was noted that there was a significant increase in vegetation (as seen in Figure 5), a reversal of retrograde succession and restoration of some ecological functions such as nutrient flows.

Preservation of ecosystem function and services

The restoration of the CGL plot helped to preserve ecosystem function and services within that area. Revegetation of the plot slowed the process of desertification, which will allow for more penetration of rainwater into the soil to replenish groundwater. Constructed ditches and contours also aided in soil and water conservation.

Economic attributes

Poverty reduction

In terms of reducing poverty, the FES project helped to a degree. During the project SKB community members were able to earn an income, which helped them meet basic needs and pay off some debts. The renewed availability of fodder may have stimulated local economic activity of animal husbandry, so with more production community members may be able to earn more income. The fact that they do not have to migrate for fodder any longer is a significant improvement that affects household income. Increased availability of water in wells also helps agriculture, which may aid in reducing poverty.

Without statistics to show poverty levels before and after the project it is difficult to determine whether it significantly impacted poverty. However, the fact that

respondents mentioned basic needs as the primary issues before the project and, when asked about needs existing after the project, were more focused on social services may indicate that the community has made a positive step towards improving the economic status of its members.

Secure livelihood

A lack of secure livelihood options remains a challenge for SKB community members. The women are currently involved in the NREGA project, which may or may not continue in the future and is only good for 100 days of work per financial period (Ministry of Rural Development, 2009). Most families are involved in agriculture, which is dependent on the variable monsoons (water) and animal husbandry (fodder). Restoration of degraded resources is crucial for agriculture and animal husbandry, as the FES project demonstrated. There are no formal economic activities in the community, which means that people may still have to migrate for wage labor. All of these factors signal that livelihood provision remains a tenuous issue for SKB.

Provision of basic needs

The FES project did help increase community members' ability to meet basic needs, at least in the perception of community members. For example, community members mentioned basic needs less when asked about their current needs than they did when asked about them prior to the project. Water remains the most critical issue because it affects food security and livelihood on a daily basis. As with poverty reduction and secure livelihoods, the status of the community's ability to meet basic needs is dependent on these and other factors.

Economic diversity

There was no evidence gathered that showed the FES project increased diversity in economic activities. It did strengthen existing activities of animal husbandry and agriculture.

Access to markets

There was no evidence gathered to show the FES project affected access to markets.

<u>Social attributes</u>

Education

Non-formal education about natural resource management was a key component in the FES project. This helped to increase awareness about the environment and knowledge of ecological processes. For example, in several interviews, community members explained the rain cycle and how vegetation plays a role in it (Appendix One, SCI12; SCI14). FES was able to provide this knowledge through plays and puppet shows, which fit into the culture and made the information accessible and appropriate for the setting and audience.

Although the project did not target formal education, the increase in girls' school attendance as a result of institutions created during the project is very significant. The community's self-imposed fines for not sending girls or boys to school are the reason for this. FES's presence also helped to expand the villagers' perceptions of what women can achieve. In one interview, it was mentioned that women who came from FES to the community were a big influence because the villagers were able to see that women could benefit from education:

> *"Education of girls (was a) big problem because people didn't see the benefit of educating girls. But, when women from FES or other areas*

would come, he would say, look at these women, they are here because they are educated. People began to see that was a good thing and started sending girls to school" (Appendix One, SLI4).

In the interviews, improvements in education of community members and development of a secondary school were mentioned numerous times as important needs for the community. As one interviewee commented, "*(they) need education for the future*" (Appendix One, SCI1) and it is evident that community members see education as a necessary component for the community's development because it was one of the most cited current issues. Attributing a direct connection between the project and the perception that education is important is not possible with the data collected, but it is notable that there exists such a strong emphasis on education from a majority of interviewees.

Unfortunately, there is currently only a primary school in the village. Some families will not send girls to Chitamba for middle school, much less to the secondary school which is even further away. Until the government or another entity helps to provide either transportation or a new facility, many residents will not receive a comprehensive education.

Access to information

The mere presence of FES in the community increased access to information about agriculture, animal husbandry, accounting, ecology and the need for institutions to regulate behavior. The project also strengthened the community's relationship with the Chitamba *panchayat*, which provides information about government programs. In the RRA, participants regarded access to new information as a key (and current) issue for the community. A continuation of the relationship between SKB, the *panchayat*, FES and

other entities will help to provide the community with new information about how they can further develop.

Interdisciplinary attributes

The FES project merged science with indigenous knowledge to make information appropriate for the audience. The ability of FES staff, some of them from the immediate region, to develop and share information in forms that were readily understandable was probably a key factor in the positive relationship between the NGO and the community. Although FES is most proficient in ecological restoration and institution development, they were able to use community resources, such as teachers (Appendix One, SLI4) and *panchayat* members, to aid in accounting or governance.

Capacity building

Capacity building for natural resource management was a significant goal of the FES project. Work on the CGL was completed almost entirely by the community. They learned the importance of measuring ditches for soil and water conservation (Appendix One, SLI2) and applied the knowledge. They began to understand the importance of grazing schedules and how to tell if a section was being overgrazed and adjust the schedules accordingly. Community members also developed skills to participate in decision-making that affects them individually and as a whole.

Community ownership

Several sources of information indicate that community ownership of the FES project exists. The process of work was driven by needs articulated by the community, that is, local citizen stakeholders participated actively and felt strong ownership from the very beginning. In all of the interviews with community leaders and FES staff it was

mentioned that the community was very involved throughout the duration of the project, and there was no indication that participation waned near the end of the five years. The inclusion of women and lower castes is probably a significant factor in levels of participation and overall community ownership. This served to increase the amount of participation and create a more holistic program of work that benefited the majority of the community, including the marginal groups. Community ownership is also shown in the community's defense of the project when it was criticized. For example, when accused of corruption, the community took it upon themselves to prove their innocence, and it ended up they did more work than were paid to do (Joshie et al, 2008; and Appendix One, SLI4). Additionally, it is clear that FES empowered the community to develop according to its own culture and worked within the accepted local governing bodies.

Political support from government

The local *panchayat* was involved in all phases of the FES project and continues to work with FES in the region. The support given to the CVS groups formed to manage the CGL plot by the *panchayat* indicates that it was able to efficiently devolve natural resource management in a way that benefited SKB greatly. The project did not try to change existing laws and acted within the framework of the political system, which probably enhanced the *panchayat*'s willingness to work with FES. Support from the *sarpaunch*, a widely respected figure and leader, is another important factor that indicates a positive relationship with local political leaders and government.

Inclusive democratic decision-making process

Decisions in the community are made on the sacred *Hatai*, which was off-limits to women and lower castes prior to the project. FES encouraged them to step beyond their

comfort levels by allowing women and lower castes to sit, which resulted in a more inclusive and more equitable decision-making process. As a result, "*it is the only village in the FES project area where women are allowed to sit*" (Appendix One, SLI4). It is also noteworthy that one of the most effective leaders in the village throughout the project was a Dalit woman.

Institution development

The development of institutions to affect positive behavioral change was one of the primary ways FES worked to meet its goals. For example, new locally developed agreements served to reduce overgrazing on the CGL, to incur fines to parents who do not send their children to school, and to encourage a decision-making process that is inclusive of marginalized groups such as women and lower castes. Because these institutional steps were created by the community, it may be more likely for the residents to follow them in the long run. The project also helped to reinforce the *panchayat* by involving the community directly in its affairs (e.g., managing the CGL) through the CVS groups. These informal institutional groups are still being used to manage the CGL and for other purposes such as women's issues.

Secure land tenure

Secure land tenure is a clearly defined set of land ownership and/or access to user rights on a particular piece of land. In terms of ownership, the CGL is owned by the people of India and managed by the Chitamba *panchayat*. Unless laws change to restructure commons throughout the country, this will remain true. User rights on the CGL are not as clearly defined, but SKB and the other hamlets in the Chitamba *panchayat* have developed policies and institutions that regulate user rights for the benefit

of the whole community (Joshie et al., 2008). The boundary and *ora* system have reduced encroachment from other communities so that the institutions created by SKB are not nullified by outsiders taking advantage of their work. Unfortunately, there may be pressure from other communities if they too do not restore their commons. SKB and FES have been trying to work with other communities to ensure that this does not happen. SKB is a role model for CGL restoration and the benefits of managing land collectively may be transferred to other areas.

Action plan with an accepted community vision

The community does not have a comprehensive, written action plan. There are plans for two projects involving water infrastructure: a well that was under construction in summer 2008 (Figure 8) and the *Nabhad Project*, a watershed-scale project that was written by FES and is funded by the government.

Figure 8. Well under construction near Sanjadi-ka-badia, India. Photo/Lindsey Wood.

When asked about a vision for the future, community leaders and FES staff commented that the vision was a dairy (Appendix One, SLI2 & SLI6) or the well at the river (Appendix One, SLI2; SLI3; SLI6 & SLI4). One respondent said they did not have a shared vision (Appendix One, SLI1). When community members were asked what they would like to see in the future the most common responses were more education (higher levels in the school and/or more people educated) and infrastructure for water and roads (Appendix One, page 50). The RRA results are in line with the responses in the interviews (Figure 7) because they show water as a priority.   Overall, community members are concerned with water and education even if they have not developed a formal plan or vision to deal with these concerns.

Evaluation techniques

Most of the evaluation techniques for the FES project were informal. The primary way the project was evaluated was by FES staff or local citizens through regular community meetings. For the ecological component of the project, FES measured success by the presence of foliage and other types of natural resource management monitoring such as soil moisture and biomass measurement. Participation throughout the five-year period also served as an indicator of meeting goals, particularly related to participation in decision-making by women and lower-castes and labor contributions, especially when the villagers were found working in the plot even when they were not paid by FES. The transparency of the payment system helped confirm that there was not corruption.   Other indicators that showed success were a reduction in the amount of money spent on funeral feasts, higher enrollment of girls in school, lower rates of child marriages and less migration for fodder.

Evaluation of the FES project was challenging because specific objectives and results were not available for the researcher to review, and baseline information on water, fodder, biodiversity and other environmental, social and economic parameters before the project was minimal (primarily demographic and economic status of the community members), and a post-project survey was not completed.   In spite of visible changes (e.g., more trees in the post-treatment plot) and qualitative information (e.g., interview responses such as "*fodder is now available*"), definitive evaluation of the FES project remains a challenge without measurable quantitative figures that represent a change in the community's state.

Equitable distribution of benefits

Information to conclude that there was equitable distribution of benefits was not gathered.   However, there are several gobbets of information that indicate equitable distribution of project benefits.   It was not mentioned in any of the interviews that one group benefited more than the other, which is significant to show an overall feeling of approval in how benefits were distributed.   The inclusion of women and lower castes is an indicator that benefits were being received throughout the community.   The transparency of the payment system was mentioned by one interviewee as an evaluation tool (Appendix One, SLI1) to determine if corruption was present, which it appears it was not.   The institutions developed for the CGL for grazing ensure that community members pay per head and size of the animal, so there is an equitable charge for each user.

CHAPTER FIVE: NYUMBANI VILLAGE CASE STUDY

Case Study Overview

Nyumbani Village (NV), or "home" as it translates from Kiswahili, is a visionary humanitarian relief effort to bridge the gap left by the "lost generation" of HIV/AIDS victims. By reconstituting social family structure, education, and health care of related or unrelated grandparents and children, and engaging neighbors in collaborative microenterprise income generation, NV strives for sustainability. The most notable achievement of NV is the provision of basic needs of the villagers and education for the children, which were previously mere dreams before they came to NV. The sense of hope that has been created is quite remarkable. For example, when speaking of the orphans, one NV staff member commented, "*you can tell a difference between the ones that have been here for a short time and those who've been here for longer, they are usually happier*" (Appendix Two, NVS10). Although there are challenges associated with village life, NV has given the villagers hope, which is the beginning of restoring the ability to look towards the future. This case study explores where the NV project is on its pathway to meeting its community's needs sustainably. The village has provided the neighboring communities with opportunities to reduce poverty and improve knowledge of and access to sustainable livelihood options, as well as skills that can be transferred to their own farms, families and regions. Also, the village has established a place for local orphans who were left without care and were unable to receive support from their neighbors due to the overall poverty of the region. As with the NV villagers, there is a new sense of hope in the surrounding community.

NV has made significant early steps in ecological, economic and social realms, which may eventually serve as a model for others trying to merge community life with sustainability principles. Founded in 2005, NV is still adapting to a steep learning curve and pioneering how to merge sustainability with its other goals related to humanitarian relief.

Site Description

Located in south-central Kenya, NV is about 120 kilometers east of Nairobi in the Kitui District (Figure 9) in the Kwa Vonza municipality.

Figure 9. Location of Nyumbani Village in Kitui District, Kenya.

The primary ethnic group of the NV area is the Kamba tribe, a subtribe of the Bantu ethnicity. Traditional subsistence and livelihood activities in the area are farming (maize, millet, sorghum, sweet potatoes, cassava, pigeon peas and sugar cane as subsistence crops

and coffee, cotton, sisal and tobacco as cash crops) and animal husbandry (cattle, goats and sheep) (Kabwegyere & Mbula, 1979). Currently, most people are engaged in daily wage labor and the sale of subsistence crops, cash crops, charcoal and/or fuelwood. Infrastructure and social services are lacking in the immediate area, though NV is now offering some limited services and has contributed to on-site infrastructure development.

All of Kitui District is considered as semi-arid or arid drylands. Average annual rainfall can range from 450 to 760 millimeters (Kigomo, 1992). There are typically two rainy seasons (October-November and March-May) that provide reprieve from the harsh dry seasons. The dry periods can be particularly harsh, especially when a severe drought occurs, usually around every five years, which significantly complicates the primary economic and subsistence activities of agriculture and animal husbandry (Opere, Awuor, Kooke, & Omoto, 2004). Increased human populations and resulting environmental degradation have placed a strain on food production as well as ecological function and resources (Kigomo, 1992).

Nyumbani Village Project

Nyumbani Village is being operated by a Nairobi-based Catholic organization, Children of God Relief Institute (COGRI). The mission of COGRI is "*to provide quality comprehensive care and support to HIV infected and affected children, families and communities in a sustainable manner*" (COGRI Strategic Plan). Currently, NV is managed by COGRI staff, though it is hoped that one day the village may be run by a council of elders from the Kamba tribe. Staff at the time of field research (summer 2008) included an off-site village manager, sustainability manager, home care manager, teachers at the primary school and polytechnic school, farm manager, social worker,

counselor, clinic nurses and practitioners, and administrative assistants. Major funding for the project comes from a grant administered by the United States Agency for International Development (USAID).

The main goal of NV is "*to be a self-sustaining community to serve orphans and elders who have been left behind by the 'lost generation' of the AIDS pandemic*" (Nyumbani, 2008). The major tenets of the village are to meet the basic needs of all villagers and provide an education for the orphans. Two sub-goals of the village are to operate the village using principles of social, ecological and economic sustainability and to help the surrounding communities develop sources of sustainable livelihoods.

COGRI chose to create NV in the Kwa Vonza municipality because it is one of the areas most afflicted with extremely low levels of development and a high rate of HIV/AIDS. COGRI staff works with the surrounding municipalities, churches and other NGOs to identify grandparents and children who are eligible to live in the village. In order to be eligible to live in the village, the villager must be Kamba, destitute and a member of the 'lost generation'[76]. The first villagers arrived in the village in November 2006.

Currently the village has 30 grandparents and over 300 orphans. The ultimate vision is to house 1,000 orphans and 100 grandparents. The "families" consist of one grandparent and no more than 10 children who may or may not be blood related (Figure 10). Living in a house with no running water, a composting toilet, bunk beds, dining table and a few chairs, the families share responsibilities for cooking, gathering water (supplied in nearby spigots) and fuelwood (gathered on-site), taking care of the home and

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[76] "lost generation" refers to the children and parents of AIDS victims, who have often been left out of the Global struggle to address and end the HIV/AIDS pandemic.

raising the young children. Cooking is done outside with the use of fuel-efficient open

stoves (jikos) or make-shift bricks that support pots over an open fire.

Figure 10. Children proudly display their dinner at Nyumbani Village, Kenya. Photo/Lindsey Wood.

Details of Nyumbani Village project

Formal education for the children

A primary school was built on the village property to provide an education for the

orphans living in the village. The school is funded in large part by the Hotcourse

Foundation[77] and currently is not public, but is recognized by the government.   When they are ready, children are sent to secondary schools in surrounding areas.

Polytechnic school

The polytechnic school serves as a vocational alternative to secondary school where the children can build skills in garment making, fashion design, carpentry and construction.   Opened in 2008, the school is also open to children from the surrounding communities, so they too have a chance to build skills for the future. Products created by the students will be sold in local and regional markets to generate income for the village's activities. Items created in the polytechnic school woodworking and textile shop classes will also provide the villagers with items they need, such as furniture or clothing. The polytechnic school is planning for future material needs by planting trees to be harvested for timber and processed on-site in value added products, such as furniture.

Capacity building

Capacity building of the villagers and the neighboring community has been an integral part of the village's activities up to this point. A goal for the children is to develop skills for the future, especially in dryland farming techniques, so they will be able to provide for themselves when they leave the village. The grandparents have participated in workshops about sustainable living (e.g., using eco-toilets, organic farming, composting, or greywater harvesting,) and health (hygiene, disease transmission, and HIV/AIDS).

Most of the capacity building, however, has been related to the surrounding community. Members of the neighboring community are engaged in wage labor in

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[77] The HotCourses Foundation was founded in 2004 by a British Member of Parliament and strives to provide education for NV children as well as children in the Kibera slum of Nairobi (Hotcourses Foundation, 2009).

93

different aspects of village life, so these people are able to build skills in specific areas such as organic farming in drylands (including permaculture, intercropping, composting, biopesticides, drip irrigation, and mulching), waste management, water conservation (e.g., construction of sand dams and shallow wells), silviculture, apiculture, renewable energy production, brick-making, building construction and livestock management. Outside community members had preexisting knowledge about animal husbandry and farming in drylands, but NV has been able to offer new techniques that are based upon principles of sustainability. Many of these skills have been transferred to work in their own homes and villages, which helps to extend this knowledge to people who are not directly involved with NV.

Farming

Farming is a major part of life in NV and throughout the Kitui District. NV has implemented various farming schemes to meet the needs of villagers and provide income to support the village, all of which are implemented using organic and Permaculture methods such as composting, biopesticide application (e.g., use of *Azadirachta indica*), intercropping, agroforestry and garden polyculture, water harvesting and drip irrigation. The main farm (Figure 11) produces kale, spinach, carrots, maize, cow peas, moringa, beets, okra and cilantro for consumption by the villagers and for sale outside the village in local farmers' markets and high-end urban shops in Nairobi to generate income. The grandparents, for example, pick up baskets of fresh vegetables grown in the main farms on Tuesday and Friday, much like a basket scheme or community-supported-agriculture style farm. These baskets include vegetables and greens that are highly nutritious, adding to the traditionally starch-heavy diet of the Akamba. The main farm is comprised of 12.5

acres of drip-fed agriculture and 33 acres of rain-fed agricultural plots. The drip-fed

sections are supplied with water pumped with solar panels from shallow wells and with

water from a bore hole pumped using a diesel generator.

Figure 11. Main Farm Two at Nyumbani Village, Kenya. Photo/Hilary Meyer.

The second farming scheme used in the village is the perimeter *shamba*[78] (PS)

system, and is comprised of all of the land on the perimeter of the 1,000 acres, divided

into 240 lots that measure 15 by 70 meters. This system was devised by COGRI staff and

an outside consultant with The Woodlands Trust to provide a permeable boundary for the

village that would protect it from encroachment but also keep it open to the outside

villages. All of the village families and some members of the outside community have

access to this land for farming and they have the option of selling the crops back to NV or

consuming them at home. Approximately 160 of the 342 outside residents who are

allowed access are using their leased plots and 11 of the grandparents are using the PS

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[78] Shamba means farm in Kiswahili.

actively. Most of the PS are far from the shallow wells constructed at the river or the bore holes, so users rely on seasonal rains to grow crops or use oxen-driven carts to carry water to the plots.

The third farming approach at NV is the home garden system, which is used for each village family at their homes. The idea behind this strategy was for the families to start producing most of their own food so they do not have to rely upon the main farm, which would allow crops produced there to be sold for village funds. The home gardens began in summer of 2008 and are maintained by the grandparents and children. These gardens are approximately 25 meters by 20 meters and are used to cultivate kale, spinach and maize. A greywater system is being devised to water the gardens and villagers have been encouraged to compost organic waste to add nutrients to their gardens.

Livestock unit

Infrastructure to house cattle, chickens and goats was constructed and has been in use since the first villagers arrived. The cattle and goats provide some milk for the villagers and it is hoped that they will eventually generate income. Families with HIV positive children receive eggs from the village chickens.   The village would also like to sell eggs and chickens to markets in Nairobi or elsewhere as an income-generating activity. The village owns two oxen that are used to haul water and other materials throughout the village. Fodder for the ungulates comes from the restored riparian areas.

Agroprocessing unit

The agroprocessing unit (AU) is directly related to the village's farming and animal husbandry strategies. The AU was constructed to process crops and, in some cases, to create value-added products to sell.   The main objectives of the AU are to

develop local markets for the outside community and generate income for the village. Currently, staff members from COGRI and Global Environmental Management Education Center (GEM) are working in the AU to create a local market between the outside community and the village for honey. The outside villagers supply the honey, which the village purchases, packages, and sells in high-end niche markets in Nairobi (Figure 12).

Figure 12. Honey supplied by villagers from communities surrounding Nyumbani Village, Kenya being sold in an organic shop in Nairobi. Photo/Joanna Bietka.

Processing of biofuels from castor (*Ricinus communis*) and possibly jatropha (*Jatropha* spp.) grown on site or purchased from the outside villagers will also occur in the AU when proper equipment is acquired and supply is sufficient.

Waste management

Management of waste created by the village is a major aspect of village life that requires constant attention for health and hygiene. Each home and most of the buildings have composting toilets that separate solid and liquid human waste, which are collected

and composted for use in the various agroforestry projects. Five outside villagers are employed to work in this unit, aptly named the humanure unit. Composting of organic waste is encouraged and is used in the farming and agroforestry projects. Most other trash is burned in shallow pits.

Agroforestry and tree plantations

Fuelwood is a major source of energy for the village, primarily for cooking on open stoves. *Leucaena leucocephala*, a commonly used, fast-growing legume has dual benefits of fixing nitrogen and providing a quick source of fuelwood. Approximately five acres have been planted in *L. leucocephala* at NV. Coppicing techniques for *L. leucocephala* are very effective because shoots grow quickly and will produce for about five years before new trees must be planted and the cycle starts over again. The villagers consume about 40 kilograms of fuelwood per week and children are responsible for collection.

A more long-term project is the establishment of a *Melia volkinsii* woodlot, which was cultivated in summer of 2008 and covers 47 acres. This fast-growing indigenous species is known to be highly valued for timber and termite resistance (Kigomo, 1992). *M. volkinsii* is a "*very promising prospect for income generation, especially if they want to break free from donors and to give them more self-reliance*" (Appendix Two, NVS9). It will take some time for the woodlot to produce trees that can be harvested, but it may serve as a significant source of income once that time comes.

Other plantation development and tree planting have occurred on the village property. Species with special value, such as neem (*Azadirachta indica*), *Croton megalocarpus*, and *Eucalyptus spp.* have been planted to provide various services for the

village. Native species (primarily *Acacia* spp.) have been planted for restoration of degraded areas, serving to help maintain hydrological and nutrient cycles that were previously disrupted from anthropogenic environmental degradation. Plantation development was initially focused on riparian areas (8 acres) but there are now efforts to afforest much of the 1,000 acres, which was deforested almost completely before it became NV. The village is also working with outside villagers to establish seed sources for tree species because procurement of seeds and seedlings is difficult and costly. In this scheme, outside villagers are given seeds and then they may sell the seedlings back to the village when it attains a height of one foot or plant them on their own property for seed production, fodder or fuelwood. This would hopefully provide a new livelihood option for outside villagers.

Water conservation and infrastructure

Water is a crucial component of this dryland community, where the primary economic activities rely directly upon water catchment and infrastructure to supply it to various sites. The first actions by the NV Sustainability Department in 2004 were restoring vegetation to the riparian zone to increase groundwater penetration of rainfall and constructing sand dams in the river bed to increase water recharge and to decrease loss of sediment downstream. The concrete structures allow the river to flow but slow the velocity and block sediment from moving downstream. The sediments are retained on the upstream side of the dam and can be harvested for the farm, as well as provide a water sink for recharge and improved availability of water during the dry season. Shallow wells were created around the sand dams to irrigate the main farm and plantations. A bore hole was excavated to provide potable drinking water to the villagers.

Diesel and solar generators provide energy to pump water uphill from the river to other parts of the village. Many of these activities were completed with the outside community providing labor and local sources of materials were used when possible.

Clinic

A village medical clinic was built to care for the villagers, in particular the special needs of the few HIV positive children, and to provide some limited healthcare services for the nearby communities. The villagers do not pay for visits and may receive counseling and workshops on health. Outside villagers have access to free consultations and a cost-share program for any additional treatments or medicines the clinic has available. The clinic has two beds and currently serves an average of 250 patients per month.

Energy production

A reliable, readily available and affordable source of energy is an important need at NV. The village is striving to become self-sufficient in using only renewable energy sources (solar and biomass) available on site. Some of the water pumps are solar-generated and they add panels as funds allow. The development of biofuels is a major activity, with castor and jatropha as the primary species targeted for oil production. This activity would ideally provide for the village's energy needs as well as provide a local market for outside community members who supply the seeds for pressing in the AU.

Impacts of Nyumbani Village on the villagers and outside community

Assessment of Nyumbani Village project goals

The primary goals of the NV project are meeting the basic needs of the villagers, providing the children with an education, and helping the outside community sustain

livelihoods (generating income and conducting activities in an eco-village type setting are really a means to an end rather than a need to be addressed). The following sections describe the achievements and challenges of meeting these goals.

1. Meeting the needs of the villagers

In interviews with the grandparents all of respondents indicated that NV was meeting their basic needs (Appendix Two, page 62). The village has given them access to water, food, shelter, clothing, health services, psychological support and fuelwood. As one grandparent stated, "*before (she) didn't have hope that they would have a good future but now (she) does*" (Appendix Two, NVI1). The grandparents have also been able to earn extra income by selling baskets and wood carvings to volunteers and other visitors who come to NV.

Although the grandparents were very positive about their situations in the village, other data indicate that some of their needs are being partially met. Several grandparents mentioned that clothing and shoes are often lacking, especially for girls. Another issue is a shortage in food, which was mentioned by more than half grandparents. The reason for this is two-fold. First, the vegetables produced in the main farm, perimeter *shambas* and home gardens are currently not producing enough food to feed all of the villagers. As a result, significant portions of food, such rice, potatoes, flour, maize, tomatoes and some pulses, are purchased by the village and rationed to the villagers. The global food crisis, which is represented by high costs and less supply, has made provisioning of these extra food items difficult.

In spite of trying to engage the villagers in farming in the home gardens and perimeter *shambas*, COGRI staff mentioned that the grandparents and children are not as

involved in food production as they would like for them to be. A disconnect between the villagers and staff regarding expectations seems to exist and the grandparents do not understand that NV cannot provide for all of their food needs. For example, one staff member commented: "*(the grandparents and children) are given food from the main farm so they don't see the need (to grown their own food). It is contradictory because the staff is telling (the grandparents and children that) they need to produce their own food but then they receive a food basket twice a week (from the main farm). (The staff) need(s) more knowledge of what to give (the grandparents and children) and what they should produce on their own*" (Appendix Two, NVS4). Another staff member noted, "*In the beginning (the COGRI staff) did not outline exactly what they wanted (the grandparents and children) to do and now it is difficult to change*" (Appendix Two, NVS10). There is reliance on COGRI to provide for them because that is the precedent they began with, which is counter to the sustainability of the village. This dependence is exemplified in the following statement from a grandparent: "*they [grandparents] used to get 4 kilograms of rice and now they get 2 kilograms and it isn't enough*" (Appendix Two, NVI1). This will become an even greater challenge as COGRI continues to add villagers and one staff member worried that: "*the sustainability program has not even been able to feed the families they have so far…what will happen when there are more children?*" (Appendix Two, NVS11).

Food production is directly tied to water, which will continue to be an issue for the village's overall ability to meet the villagers' needs. Unfortunately, the region is at an extreme disadvantage because of the climate and somewhat reliable five-year droughts

and sporadic yearly droughts. In a RRA (Figure 13) grandparents agreed that water was
the most important factor because it impacts agriculture.
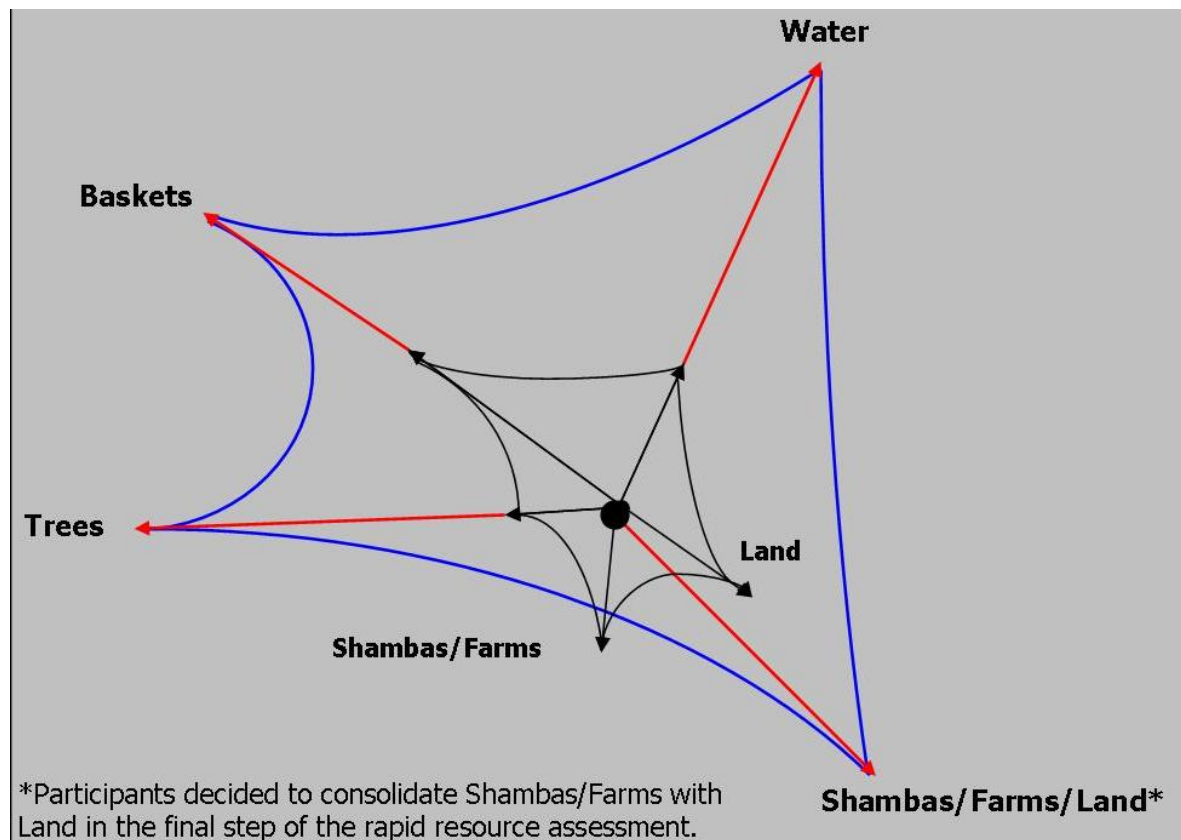
Figure 13. Rapid Resource Assessment results with resident grandparents at Nyumbani Village, Kenya, 24 July 2008.

In spite of these details, it does seem that the grandparents have indicated that
overall their basic needs are being met at the village.   There is certainly a need for more
food, but factors somewhat beyond their control are limiting food production. Overall,
the fact that their lives have greatly improved as a result of NV was exhibited time and
again in the interviews: "*(she) is not struggling like before, (the) kids are getting an
education and looking towards the future*" (Appendix Two, NVI1); "*(she) can now meet
the needs that she was trying so hard before to meet but could not…they now have food,
clothing and can now bathe with soap*" (Appendix Two, NVI4).

2. Providing the children with an education

The children are all receiving a formal education, whether it is in the primary school, polytechnic school or a secondary school located elsewhere. However, there is concern that the children are too involved with school and are not gaining necessary life skills for the harsh realities they will certainly face when they leave the village. As one grandparent mentioned, '*the children are not getting exposed to what they will face when they leave the village…here they are just given water and firewood, but outside they will have to travel long distances in search of both; the same with farming*' (NVI5). This is reinforced by comments made in interviews with the community leaders and NV staff: "*there is no work to help the kids build lives after they leave the village…they need to contribute to the development of the children…they need exposure*" (NVS9). Although NV can provide the children with a formal education, the life skills needed to live in a region with a semi-arid climate, little available land and few job opportunities are viewed to be lacking in their education.

3. Helping the outside community sustain livelihoods

The NV project is helping the outside community sustain livelihoods in various ways and the interviews indicate that the outside community has benefitted greatly from NV's presence. The project has provided them with direct employment, which has allowed them to provide for their children and pay school fees to receive an education. Currently, NV is employing 59 people in various aspects of the village's activities. As one interviewee commented, "*people are happy because it is easier to raise their families*" (Appendix Two, NVO7). The project has also helped them develop capacity and acquire "*skills to help themselves*" (Appendix Two, NVO1) in many areas, such as

organic farming, brick-making, and construction of wells, check dams, and houses. The potential for creating local markets could also prove very beneficial in the long-term. The microenterprise activities, such as apiculture, mushroom growing, seedling provision, and biofuels, developed by GEM and the Woodlands Trust are helping to create a market where the outsiders provide necessary goods for the village, which it can then add value to and sell for a profit to both the village and the outsiders.

NV presents a great opportunity for the outside villages to earn livelihoods and provide for their families. One COGRI staff member mentioned that NV is providing an opportunity that no one else can: *"they are dependent on the knowledge that NV can bring to them"* (Appendix Two, NVS12). Truly, NV is offering new opportunities for the people who are employed there, which is a step in helping them bring themselves out of poverty. Yet, the outside villagers still have many needs and face issues associated with the overall lack of development in the area. In an RRA (Figure 14) for example, the outside community members agreed that livelihood options are in need of significant development to reach their full potential.

The process of learning how best to work with the surrounding community has been a difficult one for NV. Initially, they were paying the villagers a daily wage, but this proved to be too expensive and work results were often slow to be realized. The outside villagers, on the other hand, mentioned that wages were low and that work was not always a guarantee even if they travel from far away to offer their labor. Currently, NV is trying to devise a system where the surrounding community members are paid for a product (e.g., honey), so that incentives to produce are present and the village is not strained by the high costs of labor.
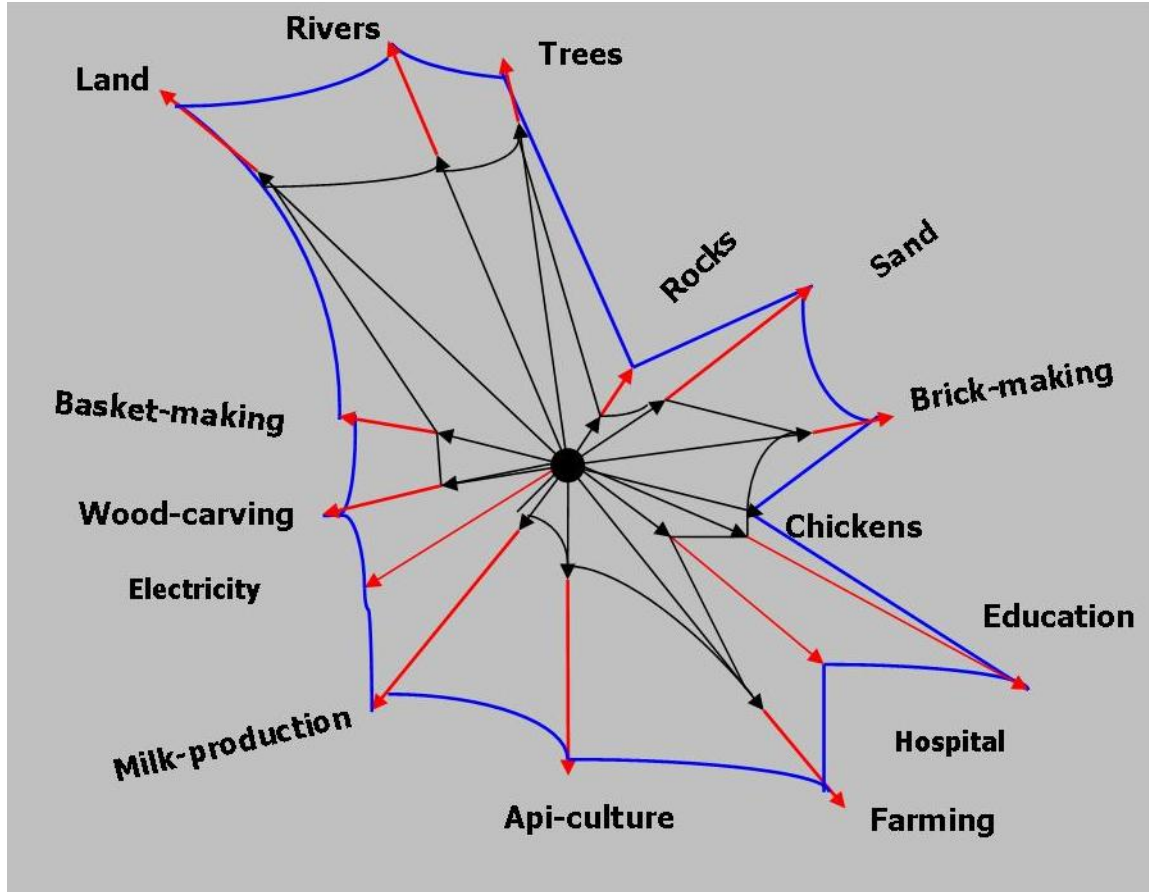
Figure 14. Rapid Resource Assessment results with outside community members who live near Nyumbani Village, Kenya 18 and 24 July, 2008.

Current needs and issues at Nyumbani Village

Nyumbani Village villagers

The grandparents did not mention that their basic needs were not being met or that the children were not receiving an education, so there is strong evidence that they feel NV is meeting these identified needs and project goals. However, frequent mention of food shortage and need for more farms (highlighted in both the interviews and the RRA) show that food security is lacking. The RRA results (Figure 13) depict the need to

106

increase water resources, which highlights that fact that water is a limiting factor for food production.

The grandparents also see the need for more money-making opportunities. Although baskets and wood carvings have brought some income, they do not provide a steady source because they only make money if sold. The earned income from these activities helps the grandparents buy things they need or pay for transportation to their home villages, but is not sufficient for them to buy extra items the children may need. The village supplies most items for the children, such as clothing, but this is lacking and puts a further strain on the household income brought in by the grandparents: "*(she) has to make kiondo[79] money go further*" (Appendix Two, NVI4).

Outside villagers working with Nyumbani Village

The needs of the outside villagers reflect an overall low level of development in the region, which affects livelihoods and other aspects of social and domestic life. In a RRA, outside villagers focused primarily on improving economic opportunities (Figure 14). All of the primary income generating activities (apiculture, sand, farming, milk production, chickens, brick-making, rocks, basket-weaving and wood carving) are limited because they rely upon local ecosystem services, which are extremely reduced because of environmental degradation and a harsh climate. Knowledge and education are also limiting factors for development of economic activities. Food production is especially difficult because they "*have to depend on rains*" (Appendix Two, NVO3).

Those who have been fortunate to work with NV have been trained in various skills, but they are only a small portion of the population living outside the village: "*the majority of people in the community still do not have work in spite of NV being here*"

[79] Basket

(Appendix Two, NVO7). Isolation from regional markets impacts the economic state as well because the nearest villages, KwaVonza and KwaMatonga, are many kilometers away for most people and do not provide a significant market anyway. Many people cannot pay for school fees because they simply do not have the money. The poverty then becomes cyclical because children are not able to break free from the situation in which their parents exist. Interviews and the RRA (Figure 14) also indicate a lack of infrastructure and social services as priorities. Education in particular is viewed as a major step in moving towards sustainability.

Needs identified by Children of God Relief Institute Staff

Most of the issues NV is now dealing with are related to institutional factors and "growing pains" associated with conducting a new type of project in a new setting with people who are living in abject poverty. Institutional issues can be readily seen in the RRA that was conducted with COGRI staff below (Figure 15).

Key

1 Capacity building for staff
2 Willingness to change
3 Sustainable labor source
4 Cultural unity
5 Time to meet goals
6 Communication
7 Village Institution
8 Knowledge exchange
9 Interest to change
10 Morals
11 Available labor source
12 Land
13 Water
14 Self-help groups
15 Renewable energy
    sources
16 Livestock
17 Vegetation
18 Assessment of local
    resources
19 Local governance

Figure 15. Rapid Resource Assessment results with staff members from Children of God Relief Institute who work at Nyumbani Village, Kenya, 28 and 30 July, 2008.

108

Communication was viewed as the most crucial step in moving towards sustainability, yet staff articulated that this was the most lacking. Meeting NV's goals is compromised by a lack of communication between the staff, the villagers and the outside villagers: *"there are many gaps between the staff and the villagers and things are often left uncompleted"* (Appendix Two, NVS2). The unmet expectation of the villagers to produce more of their own food is also viewed as a result of poor communication: *"they need to create more understanding of NV's goals"* (Appendix Two, NVS11). The misunderstanding of what sustainability means has also created confusion along those same lines:

> *"the grandparents don't understand the concept of sustainability and think that it means that they will have to do everything and they came here because they were told that they would have their basic needs met and the children's education provided. They are scared that they will have to sustain the village themselves. The outside villagers think that if the village is sustainable then they won't be able to work there anymore."* (Appendix Two, NVS2)

A lack of communication between COGRI field staff and the Nairobi office was also articulated in the RRA and interviews. Some staff mentioned that decision-making is all top-down and that these decisions are often made without knowledge of what is happening on the ground in the village: *"people and staff are not involved at all in the decision-making process of the village- it's all top down management"* (Appendix Two, NVS1). This has led to confusion of NV's goals: *"there are…confusing policies that are developed elsewhere and not completely understood even though they are to be implemented"* (Appendix Two, NVS2). Adding new orphans, for example, is an issue because currently the village is not able to fully support the ones who are there: *"(have not) been able to feed the families they have so far, so what will happen when there are*

more children" (Appendix Two, NVS11). These examples show disconnect between what is going on in the village and decisions that are made in Nairobi.

Reaching the goal of sustainability has been an ongoing challenge for the village. Maintaining organic status is difficult. For example, when the chickens caught a disease that could not be treated organically, they had to receive permission to use anti-biotics or face losing all of the birds. The up-front operating costs have been high. Energy costs are particularly draining because they have not yet set up the biofuels processing center and have limited access to solar energy technologies. Having to pay for diesel significantly offsets any money coming into the village: "*they can grow food in the dryland but they need to do it without diesel because they will never make money if they have to pay for petrol*" (Appendix Two, NVS9). Making sure that the budget is not in deficit is a significant challenge that has placed COGRI under pressure: "*they need to cut costs, and be business focused and do evaluations based on results*" (Appendix Two, NVS9). Some of the departments (Sustainability and the Polytechnic School) have not been meeting their budgets (Appendix Two, NVS8; NVS1), which is a major issue. However, these departments are essential to the longevity of the village because they are the only viable options for earning revenue needed for self-sufficiency.

Discussion of Sustainability Attributes

This section describes each of the attributes of sustainability identified in Chapter Two. NV has made significant steps in each of the three sustainability attributes (ecological, economic, and social attributes), but there are some areas where attention could be focused.

<u>Ecological attributes</u>

Biodiversity conservation

Conservation of biodiversity is evident in places NV, especially in the restored riparian zone, which "*now has many natives and some exotics*" (Appendix Two, NVS7). However, without biological surveys, it is difficult to assess an increase in biodiversity on the entire 1,000 acres. That being true, the fact that much of the land is no longer subject to overgrazing and deforestation as it was before signals that biodiversity loss may be less of an issue that before NV settled there and one respondent noted, "*some species that were thought to be extirpated have come back*". (Appendix Two, NVS10). It is also important to recognize that some introduced exotic species (e.g., *L. leucocephala* and *A. indica*) are known to be invasive and must be monitored carefully so as to not displace native vegetation.

Sustainable use of natural resources

NV is operating under the auspices of organic farming and Permaculture, which attempt to use natural resources in a way that does not impede their use in the future. These techniques are especially beneficial in the conservation of soil, which is a vital part of NV community life. Using fuelwood species, such as *L. leucocephala*, that are easily coppiced and have other helpful qualities is another example of NV's approach towards sustainable use of natural resources. The production of renewable energy sources (i.e., when they are able to fully utilize them) will also exhibit a break from non-renewable and polluting resources for energy and this was viewed as a major priority in the staff RRA (Figure 15).   Water conservation and catchment techniques are also helping to restore water resources for use in the future.

Environmental awareness and stewardship

NV is trying to create a sense of environmental awareness and stewardship both among the villagers and in the neighboring community. COGRI staff mentioned that the outside community, for example, "*(is) getting exposure; before it was very closed and now it is opening up to a degree and they are receiving training that changes their perspectives*" (Appendix Two, NVS11). Although knowledge exchange about environmental services has occurred, there is still little evidence that it has directly influenced environmental stewardship in the short-term. The outside villagers mentioned that they are using farming techniques learned from NV, which is very significant, but a more long-term assessment would help to make this argument in the future.

Restoration of degraded resources

Restoration has occurred on the 1,000 acre site as a result of direct human intervention and cessation of anthropogenic sources of environmental degradation. The riparian area is the most obvious example of successful restoration on the site, which has resulted in improved water quantity during the dry season. Protection of the land has also aided in restoring the site, which was previously "*heavily overgrazed and degraded from people felling trees for charcoal*" (Appendix Two, NVO2).

Preservation of ecosystem function and services

The most notable preservation of ecosystem function and services at NV is the improvement of hydrological and nutrient regimes. The increased vegetation in the riparian area and throughout the 1,000 acres has reduced local desertification and aided in groundwater recharge. Nutrient cycling has also been preserved through Permaculture and organic farming practices as well as vegetation restoration. Long-term studies

comparing past, current and future data for soil and hydrological processes would provide a more reliable argument towards preservation of these functions.

<u>Economic attributes</u>

Poverty reduction

Poverty reduction is certainly a primary aim of the NV project and one in which it has been making headway. The orphans and grandparents have been able to escape their previous situations of poverty just by being at NV and, overall, their basic needs are currently being met. The outside community has also been able to earn income and skills to help them get out of poverty, though they face a more tenuous situation because of the depth of poverty and factors that create it in the entire region. The economic opportunities created or being created at NV may also serve to reduce poverty to a degree in the area. Comparative studies of household income would help to clarify how much the project is serving to reduce poverty and may indicate the impact of its presence, especially for the outside communities.

Secure livelihood

The grandparents are able to earn some income from basket and woodcarving sales, but this is not a guarantee because it depends on volunteers to purchase them and other markets the COGRI staff members can arrange. Most grandparents still have land in the areas where they came from, and it has been proposed that they could plant castor to sell to the village: "*the 29 grandparents own a lot of land where they could plant castor or develop in other ways*" (Appendix Two, NVS1). Grandparents expressed the need to "*earn more income and not have to rely on the office as much as they do now*"

113

(Appendix Two, NVI4). Developing a more secure form of livelihood may be a good project for them to pursue in the future.

The outside community has been able to work for NV, but this is on a daily basis and not a completely secure form of livelihood. For example, one interviewee noted, "*sometimes they come to work and there isn't any work available for them*" (Appendix Two, NVO7). NV is also currently evaluating how to deal with the outside laborers because the expense to pay them has, in some cases, been higher than the returns: "*they need to solve the labor problem…they have a deficit every year*" (Appendix Two, NVS9). Developing an opportunity for the outside community to provide raw products to the agroprocessing center (e.g., honey, castor seeds) may be a significant conduit to secure livelihood because it would benefit both the village and the producers by creating local markets.

Provision of basic needs

Overall the basic needs of the villagers are being met, though with some concern about food production, which is difficult given the semi-arid climate and global food shortages.   Devoting more land to agriculture on the 1,000 acres, increasing water catchment (i.e., via groundwater, rainwater and greywater systems) and creating incentives for the villagers to farm may be a viable option to help stave off food shortages.

The employment opportunities provided to the outside community by NV have helped them meet basic needs for themselves and their families. This primarily includes buying food and being able pay school fees. The village has also helped them build capacity to cultivate crops for consumption and sale in ways that are more appropriate to

114

the dryland habitat.   In short, the village can help the outside villagers help themselves to meet their basic needs.

Economic diversity

The village is attempting several income-producing agroforestry and polyculture programs, such as honey, *M. volkinsii* and value-added vegetable products. The livestock unit, polytechnic school and essential oils factory are also aimed at generating funds for the village. Developing local markets and a market in urban areas has been the focus of the GEM Sustainable Agroforestry Program, which works with the outside community as producers and various restaurants and retail stores in Nairobi as consumers (Figure 16). The village requires more development of each activity, but it clearly has worked towards developing a number of diverse economic activities.

Access to markets

As mentioned previously, the GEM Sustainable Agroforestry Program has been working to develop local and regional markets for goods produced in the village and on surrounding lands. Transport may be an issue, especially if certain items require special transport vehicles, and it would be in the village's interest to avoid products that need it.

Social attributes

Education

As mentioned in previous sections, the children are able to receive a formal education at NV. Non-formal education in life skills and sustainability principles appears to be lacking and there is concern that the children will need to prepare themselves in such areas and cannot currently do so because they spend too much time in school: "*they*

just want to get them an education…they are not gaining any skills otherwise" (Appendix

Two, NVS9).

Figure 16. John Sheffy of Global Environmental Management Education Center demonstrates how to grow mushrooms to a group of community members who live on the outskirts of Nyumbani Village, Kenya. Photo/Lindsey Wood.

The outside villagers are receiving non-formal education in agroforestry, organic farming, Permaculture, waste management, construction and water management. Adolescents are also able to attend the polytechnic school, which provides vocational training in woodworking and textiles. Money earned from employment in the village has allowed some outside villagers to pay school fees for their children.

Access to information

NV is connected to a number of universities and other external agencies that can provide it with various types of information. The intern program with Kenyan universities and the Kenyan Institute of Organic Farming, for example, helps channel the flow of information into and out of the village. However, some employees feel that access to information about farming is lacking: "*they don't have books (or) reliable internet to gain information on management techniques*" (Appendix Two, NVS10). Access to medical information is also an issue: "*medicine is a field that is always changing and they are very isolated; they don't always have access to new information and techniques*" (Appendix Two, NVS3). The village does have internet, but access is limited to a few computers and is only available when the generator is turned on during a few hours each work day.

Interdisciplinary attributes

COGRI staff members claimed to have worked with the outside community to identify "*indigenous knowledge*" about farming in the area and have worked with the grandparents in identification of useful crops (Appendix Two, NVS10). The connections made with universities and other agencies have brought in scientific and practical knowledge about crop management, biofuels and other aspects of village life. The village is trying to merge ecological and humanitarian interests, so an interdisciplinary approach is a necessary tool to meet their goals and objectives. However, it is difficult to assess to what degree activities have been interdisciplinary because the staff, both in interviews and in the RRA, were concerned that decisions are being made from top rather than through an interdisciplinary approach.

Capacity building

Capacity building has been a significant focus of the village activities up to this point. Primarily, COGRI staff members have worked with the outside community to provide employment opportunities that help them gain skills in particular areas such as organic farming, waste management, animal husbandry, well construction, building construction, sand-dam construction and tree management. The staff members have also tried to build capacity with the villagers to help manage the village using sustainable practices.

Community ownership

Community ownership of the NV project is difficult to assess because it is still in its early stages of development. There is a feeling that the villagers are starting to exhibit a "*sense of belonging*" and ownership over the project (Appendix Two, NVS2). The outside villagers also expressed commitment towards the village: "*ownership in caring for the children is growing*" (Appendix Two, NVS11).

Management of the village has, to date, been primarily the task of COGRI staff members, with limited involvement in decision-making from the villagers or outside community. There is concern that they have lost touch with the outside community: "*NV is really losing the connections with the outside community…they need to go back to the chiefs*" (Appendix Two, NVS1). An initial vision was for the village to be managed by a council of elders from the surrounding areas, but so far this has not been implemented. It is questionable to what degree community ownership exists because NV is teetering between being an institution and a community.

Political support from government

Understanding the relationship between NV and the surrounding municipal governments is challenging because the relationship has changed as new staff have come to work at NV. Therefore, people interviewed in 2008 may not have known or understood the complexities that existed. However, interviews with the outside community leaders indicate that they support the village, but would like to be more involved. A Kwa Vonza municipal government official, for example, noted their support of the village, but that it is not included in "*shaping its future*" (Appendix Two, NVL1). The Kwa Matonga municipal government, which is located directly east of the village and is closer in distance than Kwa Vonza, also mentioned their relationship with NV: "*they would like to be more involved…they don't have communication*" (Appendix Two, NVL2). Additionally, the staff prioritized local governance as a key step towards sustainability in the RRA (Figure 15).

Inclusive democratic decision-making process

Inclusive decision-making processes are not always present in the village's activities. The grandparents were involved in deciding economic activities (baskets and wood carvings) they wanted to pursue, as well as developing the idea for the home gardens. However, their involvement in decision-making is limited, especially related to the direction of the village's future. The outside community is "*not involved in decision-making*" (Appendix Two, NVS12). Overall, there is a sense that "*people and staff are not involved at all in the decision-making process of the village- it is all top-down management*" (Appendix Two, NVS1).

Institution development

There are few indicators that institution development has occurred at NV. It has not been a focus of the project and it is clear that expectations of both the villagers and the outside community are confused and not clearly defined. Creating rules and regulations that are accepted by the community to regulate behavior is a missing component of NV activities.

Secure land tenure

The village owns and manages 1,000 acres. Use rights of the property are still being developed. The perimeter *shamba* system, for example, is an attempt to allow leasing rights to outside villagers to grow crops and create a secure but permeable boundary around the village.

Action plan with an accepted community vision

Each department in the village (e.g., homecare, sustainability, clinic, primary school and polytechnic school) develops its own objectives. While COGRI may or may not have a comprehensive action plan for the village, from interviews with the COGRI staff it is apparent that all staff are not aware of one (Appendix Two, page 95). The staff appear to have very different opinions about planning and objective setting. This communication gap may be an important area to address in the future.

Evaluation techniques

The interview results show that use of evaluation techniques in the village is inconsistent. Some respondents said that they do not have evaluation tools. The inconsistency seems to lie in evaluation of the village as a whole versus intra-departmental evaluations, which are present. However, each department seems to use

different techniques, for example, the clinic evaluates based upon whether they are meeting their budget, whereas the home care department comes up with measureable objectives. Respondents mentioned that evaluation is often on a project basis. For example, the sustainability department communicated with outside consultants for evaluation ecological restoration in the riparian areas.

Equitable distribution of benefits

Data gathered do not indicate sufficient information to qualitatively assess equitable distribution of benefits.

CHAPTER SIX: DISCUSSION

Discussion of Needs Analysis

This thesis has described the experiences of two small, rural communities that are making efforts to improve the lives of inhabitants and invest in sustainable actions that will help secure a better future for future generations. Both communities were faced with poverty, the case of NV being more extreme than that of SKB (because SKB community members have easier access to commons and because the NV villagers' situations prior to coming to NV were extremely dire). Addressing poverty and meeting basic needs is often the first step in development and sustainability projects in developing countries (Agrawal & Redford, 2006; Berkes & Seixas, 2004; Parris & Kates, 2003; and Smith et al., 2003) because it can hopefully change a situation of short-term thinking to one where the future is considered and actions reflect more long-term approaches. The following sections describe how SKB and NV have made steps towards meeting the basic needs of community members to plant the seeds for long-term sustainability.

<u>Sanjadi-ka-badia</u>

SKB community members meet their basic needs in these ways: subsistence and income from agriculture and animal husbandry, as well as supplemental income from wage labor to pay for children's education and to buy additional food or other necessities. Prior to the FES project, animal husbandry and agriculture were at the mercy of a degraded natural resource base, a result of interconnected natural and anthropogenic factors. The CGL plot, an essential livelihood source for many, was overused and under-regulated. As people began searching for other ways to feed their families, they were

met with an economy that could not provide a steady source of employment. In sum, the degradation of ecosystem services and limited economic opportunities resulted in a community whose members were unable to meet their daily basic needs.

FES works to help the rural poor develop livelihoods by restoring the ecological functions and services that support rural life. In SKB, FES worked with the community to improve the CGL's capacity to produce fodder for livestock by implementing physical methods of revegetation, soil and water conservation and institutional mechanisms to deter encroachment and improve productivity. In the words of one community member, "*everything was linked to fodder and water*" (Appendix One, SCI4). FES succeeded in restoring fodder production on the CGL, which also reduced local desertification within the plot. This reduced migration for fodder during the dry season and allowed some lee-way for community members to apply time and resources to other activities, such as developing a water well and improving agricultural production.

FES helped SKB help itself to meet its basic needs. By focusing on one element of the village's livelihood, it was able to open the door to progression towards other goals. SKB, however, is still faced with a challenging and tenuous environment that makes meeting basic needs an on-going challenge and priority. This is due to natural environmental conditions associated with living in a semi-arid dryland and the overall condition of low human development in the area. The improved state that FES and SKB have created will continue if the community maintains the CGL and extends similar activities to other areas used by community members. The continued confidence of the *panchayat* is a critical element that could potentially change in the future if and when new members are elected. Another element to consider is the influence of regional,

national and global processes that impede the ability to secure livelihood. Because the latter is inevitable, it is crucial for SKB to work towards local self-sufficiency to provide food, water, clothing and shelter as it has learned to do as a result of the FES capacity-building project. Now, hope and know-how exist in SKB to hopefully achieve this end.

Nyumbani Village

NV is addressing the needs of Akamba people in Kitui District in several ways. It is working towards providing basic needs for members of the lost generation and a formal education for the orphans. The reconstituted family structure attempts to provide a nurturing environment and social fabric in which healing and hope may grow. The children's education will help their chances of obtaining a job or going on to higher education and therefore increasing their chances at a secure livelihood. NV is also helping the outlying communities work towards sustainable livelihoods by providing employment for nearly 60 people and building capacity in much needed areas, such as dryland farming and water conservation. These are notable steps in improving the lives and meeting basic daily needs of Akamba people.

NV is offering these people a rare chance to secure better lives, but the situation in Kitui, and elsewhere in Kenya and throughout Sub-Saharan Africa, remains difficult. For example, inadequate sanitary waste treatment contributes to disease. Extremely harsh environmental factors severely threaten food and water security, with rapid rates of population growth compounding this factor greatly. The economic development of Kitui is still marginal and the local economy cannot currently offer jobs to all that need them, even if they are qualified or have a formal degree. These are factors that affect all Kenyans and will continue to affect the orphans, grandparents and outside villagers in

spite of the fact that NV is an island of hope transforming despair into hope for some Akamba.

Discussion of Community-level Sustainability

In addition to discussing how projects in NV and SKB have contributed to basic needs provision, this study also investigates a move towards sustainability. Deciding what constitutes and indicates sustainability is a difficult task. In Chapter Two of this thesis, the researcher compiled a list of attributes (Table 2) that have been deemed important by other researchers and practitioners in their investigations of rural community projects in developing countries. Developing a list of quantifiable ecological, economic and social indicators may help communities strengthen their efforts and may signal a more comprehensive approach to development (Bell & Morse, 1999). Although this research study was not designed to generate quantifiable indicators for each community, a primary goal was to alert the communities to factors that may be important for sustainability and to create a framework for developing their own indicators based on each attribute. Additionally, sustainability is not an end state or a concrete "place", it is a continuum, or a fluctuating process in which communities undertake. The following sections highlight ways in which each community has contributed to lessons learned in sustainability and recommendations they may want to consider when deciding future action.

It is also important to mention the fact that community sustainability does not exist in a vacuum. Regional, national and global forces shape even the most rural communities in developing countries. Rice production in Bangladesh affects supply to Nyumbani Village. Monetary policies created by the World Bank change economic

situations for SKB community members. The recent and continuing global food and economic crises affect everyone in myriad explicit and implicit ways. So, what is a small community in a rural dryland habitat to do? It is important here to mention the concept of resilience, which is explained as a community's ability to buffer external forces that limit the foundations of sustainability (e.g., Berkes, 2002; and Olsson, Folke & Berkes, 2004). Resilience also implies that a community can maintain sustainability in the long-term. The forces against sustainability may seem insurmountable, but community sustainability allows people to take small, simple sustainable steps (Phillips, 2006) when and where they can (e.g., by securing local food production and reducing local environmental degradation).

<u>Sanjadi-ka-badia</u>

Sustainability is not a term that exists in Hindi language, much less so in the local Rajasthani dialect spoken by SKB inhabitants. The focus of the FES project was seemingly focused only on sustainable livelihoods. However, the case study reveals that all aspects of sustainability-ecological, economic and social- were addressed by the FES project. The case of SKB shows that it does not matter what term is used to indicate sustainability as long as elements of the three-pronged framework exist.

Achievements in sustainability in Sanjadi-ka-badia

SKB exhibits many facets of the ecological, economic and social attributes reported in Chapter Two. The most significant achievements appear in the social realm and, from these, SKB has many lessons to share. These elements are perhaps the most crucial because although the environment and our human economies support human development, it is the relationships humans create, or social capital, that dictate whether

steps towards sustainability will be taken. Other researchers have found similar results when discussing the importance of social capital in collective action projects. For example, Rydin & Pennington (2000) argue that social capital can aid in sustainable management of natural resources if it allows the individual to receive direct benefits of collective action. To a similar effect, Agrawal & Gibson (2001) argue that a focus on identifying common interests may be an effective way to engage groups in collective natural resource management. SKB developed a sense of unity through the FES project that allowed them to implement work that would serve to address collective interests and restore communal property.

SKB highlights the importance of the development of community-generated institutions that guide behavior towards collective good. These institutions have helped stave off the 'tragedy of the commons' that existed in the SKB CGL in 1999 when the FES project began. They have also allowed a space for inclusive decision-making, which has empowered women and lower castes. Not surprisingly, these institutions continue four years after the official project was completed because the community understands the importance and benefits that are associated with accepted institutions, which indicates retention of this aspect of sustainability, at least in the mid-term.

Perhaps the most valuable lesson to be learned from SKB is the process of community ownership that FES was able to foster. Sustainability cannot occur if there is not an accepted path for a community to take. Through the development of a strong sense of commitment to improve the CGL, FES facilitated empowerment to show SKB that it can help itself. In turn, this helped the community see the connection between their health, their livelihood and the health of the natural world. FES acted within

existing political and cultural parameters, but encouraged the community to stretch beyond its comfort level to create a more inclusive society. FES provided financial and technical support in a way that promoted community participation in actions that were tangible and meaningful to the community members. As a result, SKB inhabitants have retained the knowledge and skills learned in the five-year project and are using them to help implement projects (such as the water well) of their own choosing. They now know that, although outside NGOs and government can help them, they have the power to move ahead towards a brighter, more sustainable future. The ultimate lesson, then, is for external development actors to be aware that even poorly developed communities have the ability to self-start and that the process must be their own. Developing local pride, 'can-do' attitudes, and ownership of planning and action are behavioral changes that are helping SKB citizens move a little further along the sustainability continuum.

Recommendations for Sanjadi-ka-badia

Through the FES project, SKB has embarked on a collective journey to secure a more sustainable future. The following are considerations for SKB that may help it move even further along the continuum of sustainability:

1. Retain the accepted community institutions developed in the FES project and adapt them as the community deems fit. The researcher visited the CGL plot four years after the FES project finished and it was still providing fodder for many SKB residents. This has occurred because of the institutions they created to protect the CGL from encroachment and environmental degradation. These institutions are clearly an effective way for the village to operate because they are accepted and relevant. The retention of this process may be an important step for future action.

2. Retain the enhancement of community life using the step-by-step process. Taking small, efficient steps towards community goals is a way for SKB to address other issues without becoming overwhelmed with too many tasks at once. As one community member mentioned, they can "*do small but good things (and) do them well*" (Appendix One, SCI1). Taking small, meaningful steps has also been an experience of some of other communities highlighted in the Literature Review (e.g., Austin, Texas; Curitiba, Brazil; Grand Shandu, China; Cleveland, Ohio; Overtornea, Sweden have all taken a step-by-step approach that has been helpful for them in spite of their differing social, economic and ecological contexts) that has produced positive results.

3. Restore ecological health of private lands. The other major recommendation for SKB is to make serious efforts to restore degraded private lands. Currently, the CGL is a small island of restored environmental health and services, but it cannot provide all that the community needs. The CGL was restored with very little project costs (e.g., ditches dug with trenches, rocks moved to create sand dams, and vegetation planting), which means that similar activities could occur on private lands. The community could develop an institution for local work parties, such as the highly effective *mwethya* system common in the Machakos District of Kenya (Barbier, 2000; Mortimer & Tiffen, 1994; and Thomas-Slayter, 1992). The *mwethya* concept is one where community members get together on someone's land to do work and the owner provides food for the group. In Machakos, a highly celebrated example of soil conservation via terracing, the *mwethya* has been an effective way to accomplish work on private lands, create a sense of social cohesion, and restore degraded ecosystem services (Barbier, 2000; Mortimer & Tiffen, 1994; and Thomas-Slayter, 1992). Because strong communal ties and an understanding for the need

for natural resource management already exist in SKB as a result of the FES project, developing work parties may be a cost-effective way for the community to continue on its journey towards sustainability.

4. Quantify the amount of livestock per hectare that is permissible on the CGL in a semi-arid habitat to reduce future possibilities of overgrazing. Although SKB has made significant steps in developing institutions for grazing on the CGL, the improved availablity of fodder may encourage people to buy more livestock, which would place further pressure on the plot. FES has worked with the community to explain the need to have fewer, more productive livestock, but it is unclear whether the community fully grasps this concept of "carrying capacity" and the impact that more livestock may have on the plot's productivity.

<u>Nyumbani Village</u>

NV is a project that is attempting to merge many aspects of sustainability all in one package. They are experiencing some growing pains in their attempt to do so, but the efforts made so far are quite honorable and hold immense promise to bring a local community closer to sustainability in the future.

Achievements in sustainability at Nyumbani Village

Perhaps NV's greatest achievement is that it may someday prove to be an international model for sustainable living under specific circumstances. Although NV is geared towards alleviating the problems associated with HIV/AIDS, it also exemplifies taking courageous steps towards sustainability from which other communities may learn. In many ways, NV is a meeting of the minds. It is merging social and health services with business and ecologically-sound practices as a social and ecological experiment

testing out new methods. It has evolved with interdisciplinary input from people in various fields and cultures. It will be a primary example of applying new techniques for dryland farming- an essential contribution in Sub-Saharan Africa. Essentially, it is the researcher's belief that NV is an island of hope in a harsh desert; one that holds great promise as a social, environmental and economic experiment to bloom and grow.

Recommendations

The following are recommendations for NV that have emerged as a result of this research (not ranked in order of importance).

1. Keep lines of communication open. There was significant evidence to show that communication, or lack thereof, is a limiting factor at NV. This apparent gap exists between all interested parties (COGRI staff, villagers, outside villagers, outside political leaders). Perhaps the absence of a residential manager at NV (none was present at the time of the field research in 2008) contributed to the break-downs in communication that were evident in data from interviews, RRAs and the researcher's own observations. Opening communication will help to solve some of the problems associated with expectations of the grandparents and orphans in terms of their roles in village life; integration of the Sustainability, Home Care and Education programs; and interactions with the outside community for clear understanding of what is expected of them and what NV can offer them. Communication is a key aspect of participatory decision-making, which at the time of the field research in Summer 2008, was viewed by COGRI staff, surrounding community members and leaders, and the grandparents, as lacking. When viewed in terms of participatory decision-making, opening the lines of

communication may positively influence community ownership of the NV project, which is a key aspect in development projects that wish to extend beyond the time direct donor funding is received.

2. Scale back or slow down and focus. It seems as though NV is trying to do too many things at once and it is challenged to perform activities without or below capacity. For example, providing water and food is the number one priority, but so many aspects of these activities are being clouded because too few staff are charged with overseeing too many activities. In contrast, SKB was focused on its highest priority resource (fodder) was able to use that experience to extend into other areas. Although other communities have varying economic, social and ecological contexts from that of NV, many of them (e.g., Austin, Texas; Curitiba, Brazil; Grand Shandu, China; Cleveland, Ohio; Overtornea, Sweden) discussed in this report started with one aspect they wanted to pursue, which was achieved successfully and manifests the importance of focusing on small, manageable projects that foster a deep understanding and capacity to extend new-found knowledge to other areas (e.g., Phillips, 2006).

3. Manage like a business venture. For the ultimate success of NV, it needs to make money to provide for the orphans, grandparents and staff, as well as jobs for the outlying community partners. It cannot afford to lose money, as COGRI staff are very well aware. In order for the village to persist beyond the external funding it has so far received, it must limit the development of a "culture of dependency", both between COGRI and external funders, and between the NV villagers and the NV staff/COGRI.

- With the villagers. Engaging and empowering the villagers in taking ownership through their daily lives in the NV experiment is vital. This may be accomplished by having them grow more of their own food in the perimeter shambas (which would then require more water infrastructure in those areas so they are not dependent on rain-fed agriculture); raising their own goats (with grazing regulations- this is key) or chickens; planting and caring for trees; managing domestic household wastes; responsible use of on-site water and energy; and participating in microenterprise ventures. Producing food storage units for crops that can be preserved is also a way to save in times of abundance and reduce the need to buy in times of less production. This is also true of fodder storage for livestock. Contributions by the villagers for food and other provisions may ultimately lead to limiting the need for external funding to support their basic needs and village life.

- With the outside community. NV is not a rich neighbor, especially in the early formative years in which it is dependent on external grants and donations. It seems as though the outside community is beginning to understand this, and by cooperatively working together both communities can benefit. Currently, however, NV cannot afford the labor costs of employing the outside community in the way it has up to this point. NV needs to provide (in the words of one interviewee) "*opportunities for self-employment*" (Appendix Two, NVS9) where community members are paid for work on a commission basis, not on an hourly or daily basis. This

has been attempted with both crops and tree seedlings and is being attempted in the agroprocessing unit with castor and honey. Unfortunately, the outside villagers need more help to get started than just the capacity NV has been providing. A micro-financing option for community loans may be a viable solution to this problem. If NV could provide some start-up money (i.e., through some form of low-interest loan), then outside villagers could possibly buy the equipment they need to produce items that NV can then purchase.

- o As an institution. Figuring out ways to spend less money by merging activities of the various departments when possible may be a significant way to save money. Also, interview and observational data show that NV is pressured to add new villagers but that it cannot support them financially yet. Scaling back to reinforce existing resources and develop them to accommodate more villagers may be a necessary step to ensure financial stability.

4. Develop leadership skills to empower the inside and outside community. NV offers a significant opportunity for new skills that could be transferred to other families in the region. If newly trained outside villagers could conduct workshops on their new-found technical knowledge, it would serve as a way to extend sustainable livelihoods to those not in direct contact with NV. They could use their own farms as demonstration sites to show the benefits of their work.

5. More water conservation strategies. Water often mentioned as the most limiting factor at NV given its dryland habitat. Water is essential for farming, silviculture

and other village activities. Capacity to conserve and transport water is needed (and is also contingent on developing renewable energy sources to pump it from groundwater sources) as well as reducing loss of vegetation cover.

6. Life skills for children. This was also a major concern for some of the grandparents and COGRI staff members. NV offers children a wonderful opportunity in formal education, but some people feel that they are not developing sufficient life skills, such as growing food, gathering firewood and water, constructing homes, tending livestock, managing money, and learning a trade for an income. A sustainability education program can be developed to address these important skill sets via hands-on practical experience that also allows them to contribute to daily life at the village. Major components of such a program may include basic skills such as organic farming using permaculture techniques (composting, intercropping, spot farming, et cetera), water conservation strategies, building energy efficient stoves, tree management for ecosystem health and fuelwood and leading up to skills in other areas, such as money management, entrepreneurial skills, and land management.

An interesting educational experience for NV children would be to extend their new-found sustainability knowledge gained in a sustainability education program to outside children by putting on workshops and teaching Akamba who will face similar problems. Research regarding health promotion strategies, for example, shows that peer-based education can be very effective (Turner & Shepard, 1999). Investigations of youth programs in the United States have also elicited arguments that youth can generate meaningful learning experiences when

initiated by older role models (Dubas & Snyder, 1993). Such a program would also give NV children a meaningful community service project that encourages connection to place (Sobel, 2005). Additionally, sustainability education is a growing international movement (Cloud, 2005; McKeown, 2002; and UNESCO, 2009) and NV could become a model for implementing wide-scale sustainability education.

7. Strategic planning for the village. NV needs to connect the three main programs (sustainability, home care and education) and make meaningful connections with other initiatives (polytechnic school and clinic). A lack of coordination of these primary three programs at NV causes a disconnect between and among staff. Although a comprehensive strategic plan with measurable objectives may exist, there is strong evidence that NV working in the field are not aware of it and do not use it.

8. Quantify energy needs. The need to develop reliable renewable energy infrastructure was a significant component of data from the staff RRA, observations and the interviews. Energy is a key to sustainability and NV has been very successful in quantifying fuelwood needs and planting accordingly with species (e.g., *L. luecocephala*) that can meet the demand, but this needs to extend to other energy needs as well. Relying upon diesel is not economically viable for pumping water and running the generator, so developing solar and biofuel options are key elements to not only financial success, but also sustainability.

Extrinsic hypotheses and implications for other communities

Regardless of their presence in a developing or developed country, communities do not exist in a vacuum unaffected by external forces. The notion of resilience to major shock and change is an important consideration in sustainable community projects. This research, especially the case of SKB, manifests that *small steps towards sustainability that increase resilience are a key element*. In SKB, the community developed accepted institutions that have stood the test of time in the mid-term, which has alleviated difficulties in animal husbandry and helped the community move towards other aspects of development, such as education, health and water conservation and infrastructure.

Another important consideration this research shows is *the importance of community ownership* in development projects where an external actor is a key component, or driver of the project, which is another indicator of resiliency. There is a contrast between NV and SKB in terms of the level of community ownership the project created. In SKB, FES acted more as a facilitator to the community's growth, which helped to develop strong community commitment to the project. COGRI initially sought to create community ownership in the original vision of the village and a revitalization of community ownership may be a key aspect for the community to become resilient once external funding sources and other forms of technological and logistical support wane.

Suggestions for future research

- o The development, implementation and evaluation of a sustainability education program for NV orphans and perhaps for NV grandparents and outside villagers.

- The development of measurable, quantifiable objectives for sustainability attributes that include a set of indicators for each attribute (e.g., sustainable use of natural resources → water quality→ various water quality indicators (BOD, fecal coliforms, etc.) that can then be applied in a local setting and monitored over time.
- The importance of community ownership in the longevity of development projects that have been implemented by an external actor.

Study Limitations

- Identifying where a given community exists on a sustainability continuum without a set of criteria poses a difficult task. This study was not designed to measure sustainability quantitatively, but did offer qualitative observations about each community's level of sustainability.
- Translation was an issue, especially in India. The translator did not speak the local language and the translator surely "summed up" what was said. Getting direct quotations was improbable given the task at hand, so the interview transcriptions reflect this. There may have also been a lack of candid answers from respondents who were being interviewed because the translator was a staff member of FES or COGRI. They may not have wanted to express negative attitudes and opinions about the respective project or organization.
- Understanding a culture different from one's own is always a demanding and complex task and the researcher may have missed important aspects of the communities that can only be informed by knowing and understanding cultural

o In the NV case study, interview data was collected with staff who worked at the village in summer, 2008. NV has experienced a high rate of staff turnover before and after that time. Some of the opinions and views expressed in these interviews may not reflect the big picture of NV's process to meet its goals because these staff were not aware of what has happened.

o In the NV case study, the number of outside community members was low- only 13 percent of workers at NV- so more interviews may have captured a more representative sample.

o Case study research is generally performed over a longer period of time than what was available for this project (Punch, 1998).

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Definitions

Agenda 21: "a participatory, multi-stakeholder process to achieve the goals of *Agenda 21* at the local level through the preparation and implementation of a long-term, strategic plan that addresses priority local sustainable development concerns (ICLEI, 2001, page 5)".

Case study research: a form of research used primarily in the social sciences and are selected when the study proposes "how" or "why" questions about the topic at hand, the researcher has little control over events, and the study is investigating contemporary phenomenon in the context of events in the real world (Yin, 2003).

Foundation for Ecological Security: (FES) a non-profit organization located in India. Mission statement: "*to strengthen, revive, or restore, where necessary, the process of ecological succession and the conservation of land, forest, and water resources in the country*" (FES, 2007).

External actors: institutions, agencies, both state and nongovernmental that interact with local communities and individuals

Internal actors: institutions, and groups living in a community that interact with each other and with external actors.

Global Environmental Management Education Center: (GEM) a non-profit organization housed in the College of Natural Resources at the University of Wisconsin-Stevens Point. The mission of GEM is: "pioneering and applying practical learning methods and technology to solve natural resource problems by linking faculty, students, and citizens worldwide"(GEM, 2009).

Institutions: the rules, regulations, and norms that govern behavior
Local-level sustainable development: sustainable development initiated at local levels, with or without financial, technical, or logistical support from external actors.
Nyumbani Village, Kenya: Operated by the Children of God Relief Institute. The mission of the village is: *"to be a self-sustaining community to serve orphans and elders who have been left behind by the 'lost generation' of the AIDS pandemic"* (Nyumbani, 2008).
Panchayat: a local governing body in Indian villages consisting of five village elders (Kaushik, 2005).
Participatory rural appraisal: "a family of approaches and methods to enable rural people to share, enhance, and analyze their knowledge of life and conditions, to plan and to act" (Chambers, 1994, page 953).
Sustainable development: meeting the needs of current generations without compromising the ability of future generations to do the same (WCED 1987).
Three-pronged framework: A framework for sustainability that includes ecological, social and economic goals (Roseland et al. 1998).

Abbreviations

AU: agroprocessing unit in NV
CGL: Common Grazing Lands in India
COGRI: Children of God Relief Institute, Kenya
FES: Foundation for Ecological Security, India
GEM: Global Environmental Management Education Center
ICLEI: International Council for Local Environment Initiatives
NGO: non-governmental organization
NTFP: non-timber forest product
NREGA: National Rural Employment Guarantee Act, India
NV: Nyumbani Village, Kenya, operated by COGRI
PRI: *panchayati raj* institution system of local governance, India
PRA: participatory rural appraisal
PS: perimeter *shamba* system in NV
RRA: rapid resource assessment
SKB: Sanjadi-ka-badia Village, India
UN: United Nations
UNCED: United Nations Commission on Environment and Development
UNDP: United Nations Development Program
USAID: United States Agency for International Development

APPENDIX ONE: RESULTS FROM SANJADI-KA-BADIA

Outline

    I. Interviews from Sanjadi-ka-badia village
        a. Community Member Interviews
        b. Interviews with FES Staff and Community Leaders
   II. Results Categorized by Objective
 III. Rapid Resource Assessment Results
 IV. Observations of Sanjadi-ka-badia

Interviews from Sanjadi-ka-badia Village

<u>Community Member Interviews</u>

Interviewee Code: SCI1
Title: community member of Sanjadi-ka-badia
Interviewers: Iva, Joshi, Lindsey
Time/Date: 4 June 2008 130-230PM
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.
It has been 8 years since initiation of work. Were working with another organization first (magar mewar) and then contacted FES staff. Fodder, water, and encroachment were the largest issues. Water also related to low productivity in agriculture, now enough water in wells for irrigation and other uses. Related problems with fodder to water as well. Connects issues to water
2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
SKB was one of the first plots developed and other villages also wanted to work with FES when they found that they weren't trying to take their land. They saw what happened in Chitamba and the problems they had there- after the problems were solved it made it easier for other villages to do projects. Building trust with an outside organization (securing land tenure). FES put in plantations, fencing of area to stop encroachment, check dams and anicuts (small structures built to conserve) for water conservation.
After the project they got employment (economic); leaves for goats and sheep and fodder for larger animals (economic, ecological). Wells were recharged (social, economic, ecological). The biggest benefit was that the land was no longer encroached (socio-political). Feels that the project has fulfilled all their needs and very successful.
3. What are the current and long term needs for you and your family?
"The future is about water". Education and employment.
4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

The NREGA (National Rural Employment Guarantee Act) project is helping to meet long term needs because it is providing employment and helping them for the future. The program is very well planned because it is building roads, clearing water courses to water harvesting structures and to help develop water resources. The project is helping develop a good water source.
Need education for future. His needs are met, but children need to be able to build better lives for themselves. Before there was no school but they contacted a MP to establish a school up to class 5. Now have initiative that all kids go to school. If girls are not sent then the family pays a 1100 rupee penalty. For boys a bag of grain for the pigeons.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

School up to eighth class then kids can go on to Chitamba for the rest. Wants everyone to be educated and do small but good things, do them well. Livestock small herd but very productive; stop wasting money on feasts. Have had Village discussions about education and reservations (to be scheduled caste). If they have education then they wont need reservations.

Interviewee Code: SCI2
Interviewers: Iva, Lindsey
Date/Time: 6 June 2008 12 pm
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective).

Needed water and fodder.

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Plantation program within the plot; wells; check dams; contours within the plot for irrigation of plants. The project has increased fodder; they now have it for their animals. Before the project, during times of no rainfall there was no water for irrigation and no water for fodder plants. Sees program as very successful. Economic benefits: got employment from FES; Social: women were given importance, now when there is a meeting women participate. Also the development of institutions to make children go to school.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

3a- education; medical facilities; water (wants tube wells); long term needs- proper education for children to build a better future. Address water scarcity.
3b-wants greenery all over not just in the plot; water

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

FES is helping them solve problems to a certain degree.
Water- After the FES project wanted a village well to bring water from the river to the villagers- currently underway. Saved/pooled money to do so.
Education- institutions for people to send kids to school, especially girls. Up to class 5.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Women's group to mobilize the community; women should form self-help groups. Save money from work to add to village's boundaries.

Interviewee Code: SCI3
Interviewers: Iva, Lindsey
Date/Time: 6 June 2008 12 pm
Title: (two) community members of Sanjadi-ka-badia, from same family
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

No water before FES project; no greenery; no fodder; no medical facility- had to go to Chitamba or to Bhilwara for serious injury. Education- but 5th class school developed by the government around the same time as when FES came.

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Check dams; contours; nadi (digging ditches to conserve water) which solved the water problem, Plantation program brought greenery and fodder for animals; cattle trenches created a boundary around the plot. Every evening one family goes and guards the plot, called the "ora system". They benefited from the programs. During the rainy season they close the plots and can open them for irrigation of the plantation. Ecological benefits- now there are plants. Couldn't see plants before, now they are all around. Economic benefits- they received employment through FES. Social benefits- brought unity to the village; a women's Self-help group was formed to think about future plans; they opened a bank account and can now get loans if someone needs it.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Currently- the family needs employment, food security; education for children
For the village- education-better school facility at least to the 8th class; medical facility; veterinarian for animals.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Future plans- they encourage students to study and go to school instead of working or doing other things.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Would like to see cement or brick houses with furniture instead of clay. Proper infrastructure; medical facilities; more wells for irrigation especially during times of scarcity. Electricity at the water wells to pump water so they don't have to travel far during the middle of the day like they currently do.

Interviewee Code: SCI4
Interviewers: Iva, Lindsey
Date/Time: 6 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Water and fodder, everything was linked to water and fodder; no employment

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Check dams; contours; pits used as water harvesting structures built- solved water problem. Plantation building helped solve fodder problem. After FES came many things improved and they benefited a lot. No longer had to migrate far away for fodder any more. Economic benefits- received employment. Social- created unity and women were given more importance through the SHG and were involved in planning, FES helped them do this. Feels that the FES program was very successful.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Water scarcity- he wants that to change so he can do more agriculture. Education for kids wants to have up to 8th or even 10th class. Wants improved medical facilities in the village. Proper infrastructure.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

He goes to work in his fields every day so his kids can go to school and get a good education. His son has finished class 8 and he wants him to continue,

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Better water facilities; education; medical facility; proper infrastructure.

Interviewee Code: SCI5
Interviewers: Iva, Lindsey
Date/Time: 6 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Water; boundaries for private land; fodder

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

FES formed a women's group, organized meetings, put in a plantation. The problem of fodder is being solved. The water problem is being solved by the check dams and contours. The ditches that were dug for water harvesting is also helping. The benefits of these actions- economic- got employment and fodder for animals; social- unity among women; ecological- now there are plants, there were not any before.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

3a- wants electricity in her home

3b-medical facility; Education for children; wants a school up to age 10- can't send girls to Chitamba because it is not socially appropriate. Pipe lines for water; infrastructure- mainly roads.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

She has filled out the requisite forms for electricity but has not yet received it. She is working hard so her kids can go to school and not have to work.

5. What would you like to see happen in the community for the future?
    (Circumstances/Perspective/Opinion)
School up to class 10; hospital. Wants a sarpanch in the village and a panchayat system in the village.

Interviewee Code: SCI6
Interviewers: Iva, Lindsey
Date/Time: 10 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES?
    (Circumstances/Perspective). This question will be modified in order to allow the participant
    to provide a historical context of the needs prior to the project's implementation.
Water, fodder, and no employment.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe
    successes or failures of efforts to address these issues (Opinion).
*Feels that the program was successful. Fodder and water problems were solved. Fencing the 50
hectare grazing land plot really helped because they developed regulations on grazing (none
during the monsoon). Now FES is helping them on the remaining 1300 hectares of the village to
do soil and water conservation. Water in the wells has increased because of this.*
3. What are the current and long term needs for you and your family? What are the needs of the
    community as a whole?
*Currently- More food grains; shelter; money for marriages and family functions; water. Future
needs-he has children and they need education to help them get better jobs and improve the lives
of the whole family and to benefit marriages.*
The most necessary thing for the community is water for both drinking and irrigation. .
4. What has been done to address these current and long term needs?
    (Circumstances/Perspective)? Please describe successes or failures of efforts to address these
    issues (Opinion).
*Water- they are digging the well at the river but they are still not sure when it will be complete.
Have been talking to government officials to help solve the problem.*
*Education- he works hard to help his family and provide education. He feels as though he is able
to meet family's needs.*
5. What would you like to see happen in the community for the future?
    (Circumstances/Perspective/Opinion)
*Better infrastructure- roads and access to transportation; hospital in the village so they don't
have to travel for medical care; higher grade level in the school.*

Interviewee Code: SCI7
Interviewers: Iva, Lindsey
Date/Time: 10 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES?
    (Circumstances/Perspective). This question will be modified in order to allow the participant
    to provide a historical context of the needs prior to the project's implementation.
Fodder, lack of plants led to migrating for livestock. Water.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe
    successes or failures of efforts to address these issues (Opinion).

Water- anicuts, contours, check dams helped bring more water into their wells. The plantation program brought greenery and increased fodder. FES also provided awareness, e.g. to keep fewer, more productive animals rather than more less productive ones. Also, the program gave them employment and brought money into the village. Feels it was successful because it benefited them a lot.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Employment for more money; shelter.
Village needs- electricity, water, a village doctor; and a higher level in the school.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Family needs- she works with the NREGA to make money. Before she would work in Chitamba for about 50 Rs a day, but with the NREGA she makes 70-100 Rs (depending on the type of labor). It is difficult to survive because they don't have a lot of land or money to sustain them.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Railway to Bhilwara.

Interviewee Code: SCI8
Interviewers: Iva, Lindsey
Date/Time: 10 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Water- they wanted something to help them conserve more.

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

FES helped them construct ditches, check-dams, which helped fill their wells. This enabled them to have more water for irrigation to grow grains. The project also gave them employment which helped bring money into their homes. Feels that FES has really helped them sustain their lives.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Primarily employment and higher level of education in the school because it is difficult to send the children to Chitamba.
Village needs- water and infrastructure to being water to them easily. Roads improvement.
Future needs- improve housing conditions so they can be more hygienic, Food and education.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

She works hard to provide for her family- cleaning to improve hygiene and working in the fields.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Water storage facilities and an improved environment for the village to make it more hygienic. Proper infrastructure. Higher level in the school.

Interviewee Code: SCI9
Interviewers: Iva, Lindsey
Date/Time: 10 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.
Water, fodder for cattle; boundaries around private land to prevent encroachment.
At the time he wanted a plantation for fodder and fruit trees.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
Plantations- brought fodder. The trees planted around the CGL demarcated the boundary. Feels that the program was successful.
3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?
Major needs are related to water because most of their problems are related to water scarcity.
Future needs- shelter, food, education; clothing.
4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
Could not answer this one.
5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)
The village needs water infrastructure- pipelines and tube wells- to help to village.

Interviewee Code: SCI10
Interviewers: Iva, Lindsey
Date/Time: 10 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.
Water and ability to conserve it.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
FES helped them dig ditches. Plantations helped them have more fodder. Employment brought money to the family. Thinks the program was successful.
3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?
Water for irrigation to make agriculture better so they can have more food.
There isn't any employment and the villagers have to migrate to find it.
(She had to leave so we were unable to finish asking her questions.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion). N/A

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion) N/A

Interviewee Code: SCI11
Interviewers: Iva, Lindsey
Date/Time: 10 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.
No fodder for cattle. It was very difficult to manage.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
The plantation program helped solve the fodder problem. FES also planted the type of trees that their cattle needed. The increased fodder has increased milk production. The FES work has helped them a lot.
3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?
Money; need employment opportunities. They often have to leave the village to get wages and they must also grow food. They are managing but it is very difficult.
Village needs- organizations helped them, she would like them to keep coming to help them develop and fulfill basic needs. She sees the organizations as being able to provide them with employment- it's very sad when people have to leave to look for work. Fodder and water. More hand pumps for water.
4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
She works hard to meet their needs and sometimes has to travel. Doesn't want her children to suffer so she works hard.
5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)
More ditches and pumps for water to provide easier access to their houses.

Interviewee Code: SCI12
Interviewers: Iva, Lindsey
Date/Time: 10 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.
Water and trees. Said that trees bring rain, rain helps trees grow so they have more fodder for cattle, the rain then helps them do more agriculture.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
They were able to make money and helped improve fodder availability. Project successful.
3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

They have to go out to work during the day when it's really hot. They need better education. Village needs- employment. No one in the village is rich so they all have to work.

4.   What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

She is helping to give her kids a good education. Receives food from the Mother/Infant care center. Works for wages.

5.   What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Better roads, and access to transportation, education, hygiene,

Interviewee Code: SCI13
Interviewers: Iva, Lindsey
Date/Time: 12 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1.   What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Water and fodder.

2.   What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Plantation program helped grow fodder for livestock. Contours/ditches helped conserve water. Check dams helped to fill wells. The CGL plots for grasses- a town meeting was held and they agreed upon a rate to graze livestock in those plots larger animals had to pay more and the money went to pay the family that guards at night in the ora system. Has been beneficial to them. There is no longer encroachment on the CGL because of the boundaries. Social benefits- unity in the village.

3.   What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Basic needs for family are food, shelter and clothes.
Village needs- to re-dig the contours because they have filled up with soil. Need more water.

4.   What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

She works hard as a daily laborer and with the livestock.

5.   What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Village- houses to be made of concrete and brick; education for all of her children.

Interviewee Code: SCI14
Interviewers: Iva, Lindsey
Date/Time: 12 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1.   What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Fodder and water. Didn't have good fodder for goats.

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

FES helped them solve the fodder problem through the plantation program. Contours, check dams, helped with water conservation. Work was beneficial to them. They no longer have to migrate to feed their livestock. The boundary helped them establish grazing schedules. More water for irrigation now.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Family needs- employment, food, money, food security during the dry season- grain outputs are less now that there is a drought.
Future needs- doesn't know what will happen in the future.
Village needs-electricity; rise above below poverty line.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Working in the NREGA program.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Better road infrastructure; better housing.

Interviewee Code: SCI15
Interviewers: Iva, Lindsey
Date/Time: 12 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Had to migrate to feed livestock. Water/fodder

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

FES helped them build contours, check dams to help with water problem. Fodder problem solved. Bunds created a boundary to reduce encroachment. Grazing regulations helping reduce overgrazing and solving migration problems.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Family needs are food, shelter. Food security especially during the dry season- then they have to work as wage laborers to earn money to buy food. Education for grandchildren. Better milk production in livestock.
Village- water, electricity, hospital, hygiene.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

NREGA, but they have only been paid once after 7 weeks of work. Milk for consumption- not enough to sell. Hard work.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Better roads; better housing.

Interviewee Code: SCI16
Interviewers: Iva, Lindsey
Date/Time: 12 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Water and fodder. Had to migrate but this caused a lot of problems with the people who lived in the areas to which they went.

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Contours and check dams. Plantations with babul plants that serve as a boundary. Work beneficial to them. The grazing regulations helping to provide fodder. Unity in the community; they can now discuss village problems. There are now trees.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Current needs- doesn't have any now.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Works hard to help family meet their own needs.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Water.

Interviewee Code: SCI17
Interviewers: Iva, Lindsey
Date/Time: 12 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Fodder and water

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

After FES came the village still looks after the plants that were planted in the plantation program. Check dams and contours. Work has been beneficial to them. Grasses planted along the contours are especially beneficial and nutritious for livestock.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Family needs- shelter, food, water, marriage, milk, employment.

Village needs- water, better livestock to increase milk production; better ag. Practices. Social benefits- the community can now meet together to discuss issues. Unity. More greenery than before.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

He works in the fields and as a laborer.
5. What would you like to see happen in the community for the future?
    (Circumstances/Perspective/Opinion)
Better housing. Television and entertainment. Better roads.

Interviewee Code: SCI18
Interviewers: Iva, Lindsey
Date/Time: 12 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES?
    (Circumstances/Perspective). This question will be modified in order to allow the participant
    to provide a historical context of the needs prior to the project's implementation.
Fodder and water.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe
    successes or failures of efforts to address these issues (Opinion).
*Plantations helped bring fodder. Ditches and contours helped bring water for irrigation and
livestock. Beneficial. Water and fodder were improved. No longer have to migrate.*
3. What are the current and long term needs for you and your family? What are the needs of the
    community as a whole?
Food
4. What has been done to address these current and long term needs?
    (Circumstances/Perspective)? Please describe successes or failures of efforts to address these
    issues (Opinion).
Thinks FES will provide them with what they need.
5. What would you like to see happen in the community for the future?
    (Circumstances/Perspective/Opinion)
Up to God.

Interviewee Code: SCI19
Interviewers: Iva, Lindsey
Date/Time: 12 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES?
    (Circumstances/Perspective). This question will be modified in order to allow the participant
    to provide a historical context of the needs prior to the project's implementation.
Fodder scarcity so had to migrate.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe
    successes or failures of efforts to address these issues (Opinion).
*Contours, bunds, ditches. Plantations helped fodder problem. Successful, especially because of
the grazing regulations grasses planted on contours beneficial as well. Get fuelwood from dead
trees that were planted.*
3. What are the current and long term needs for you and your family? What are the needs of the
    community as a whole?
Food, shelter, grains, ration cards for public distribution centers.
Village needs- roads and water

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Works hard.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Health care, electricity, better houses, education.

Interviewee Code: SCI21
Interviewers: Iva, Lindsey
Date/Time: 16 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Fodder resulting in migration.

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

FES helped them solve the fodder problem by planting Acacia spp., other species. Contours, check dams for water conservation. Cattle trenches. Very successful. The regulations they made have helped with the fodder problem as well. Social- village had a platform to make decisions together. SHG for women. Unity. Economic- employment.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?

Water for agriculture.
Village- water infrastructure.

4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Brings water from wells, work as laborers, and in agriculture.

5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Water infrastructure and electricity to pump water from the wells. Roads.

Interviewee Code: SCI21
Interviewers: Iva, Lindsey
Date/Time: 17 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.

Fodder scarcity, water scarcity, had to migrate for fodder.

2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).

Plantations brought fodder. Ditches, contours, check dams helped with water conservation. Boundary around the plot reduced encroachment. The grazing regulations helped preserve fodder. Successful. Was not there during the whole program. She knows that there are now more

plants than before. Thinks the program brought unity in the village and collective decision-making.

3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?
Family- food, shelter, clothes.
Village- more water and water infrastructure. Need more storage capacity.
4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
NREGA.
5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)
Nabhad watershed project. Project works on water infrastructure and storage.

Interviewee Code: SCI22
Interviewers: Iva, Lindsey
Date/Time: 17 June 2008
Title: community member of Sanjadi-ka-badia
Questions asked: needs

1. What were the largest issues in the community prior to initiation of the project by FES? (Circumstances/Perspective). This question will be modified in order to allow the participant to provide a historical context of the needs prior to the project's implementation.
Fodder, water. Migration for fodder.
2. What has been done to address these issues (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
To a certain degree these problems have been solved. Plantation and boundary development has helped with fodder availability. The ora system also helps them protect the plot. The regulations are very helpful. Check dams and ditches have helped the wells have more water. More foliage. Employment received. SHG for women. Unity in the village.
3. What are the current and long term needs for you and your family? What are the needs of the community as a whole?
Food, milk, grains, masala, fodder,
Village- employment, especially during the dry season. Doctor.
4. What has been done to address these current and long term needs? (Circumstances/Perspective)? Please describe successes or failures of efforts to address these issues (Opinion).
Grow crops during the rainy season. Daily labor. Animal husbandry. See excess crops for money.
5. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)
More forums for women, a town account to give loans when people need them and save in the mean time. Higher education.

Interviews with FES Staff and Community Leaders

Interviewee Code: SLI1
Interviewers: Iva, Lindsey, Vaibhav
Date: 13 June 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs identified?

In 1997 they went to SKB to see what work was needed. Met with the panchayat members and locals to get secondary data. They first met the village leaders and identified problems and existing natural resources. After community discussions they felt they needed to work on natural resource development and the best way to do this was through the development of a strong local institution. Did PRAs in the village (need analysis, plot mapping). After the need analysis they discussed the most important needs- especially degradation of natural resources, scarcity of fuelwood and fodder, continued depletion of the groundwater table, top soil erosion, break in nutrient cycles, retrograde succession process. After, they decided that these were the major factors affecting the community's ability to meet their livelihoods. FES felt that a conservation agenda and institution development were the way to solve those problems.

Prior to the project the institutions in the village were mixed. There was a strong women leader who acted as community sarpanch at the time. She pushed the women to act and to engage in decision-making. At the same time there was an overall lack in participation in the village, especially in relation to management of the common grazing lands. No institutions to guide behavior on the land under the panchayat. They were only thinking about themselves in their use of the land. There was a lack of accountability and no written by-laws for the community. There were many child marriages and very few girls went to school. There was also a lot of money wasted on funeral feasts which are costly.

The economic condition of the village was also very poor. The drought was more harsh on alternate years, which resulted in crop failure and poor animal husbandry due to the resulting lack of fodder. There were no employment opportunities in the village so there was a lot of migration for wage labor and fodder grazing.

The process of FES work there- after the needs analysis phase was finished they did household surveys, stayed in the village to build a rapport with the villagers and understand each other. After one year they were ready to begin work. They organized the institution (?) built capacity (through puppet shows, cultural programs that showed their connection with the land and the necessity of managing natural resources well); developed a 5 year plan (which included their needs and the work to meet those needs, budget, culpability, a monitoring system, money distribution program for work) ; developed Management and Land Use Committee, Farmers Induction Program, Women's Orientation Program; technical trainings on account management and biophysical processes. The panchayat was always involved in this process.

2. What is the level of community involvement in these efforts?
All community members were involved.
3. What evaluation techniques have been used to assess these efforts?
Village meetings every Monday in which they would monitor participation, monitoring of natural resources, revision of by-laws when necessary, the transparency of the payment system, how many girls were registered in the school, rate of child marriages, the amount of money spent on feasts. Contributions to labor from community members. Level of participation in the decision making process especially from poorer castes and women.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?
   - *Initially there was a lack of trust, the villagers thought that FES would take their land. But after they had seen work that FES did on other lands and established a relationship there was trust.*
   - *Small ruminant grazing in the initial phases of the project, villagers thought it would be okay to graze them on the new growth but they had to establish rules against this. They adopted rotational grazing methods and even owners with more animals were satisfied.*
   - *Some people resisted a strong women's participation in the public sphere. But slowly the village accepted women's participation.*

5. What are the successes of these efforts (ecological, social, economic)?

Ecological successes- now in a positive succession. Food chain and nutrient flows restored in the plots, more wildlife within the plot. Community is more aware of what a healthy landscape should look like.

Economic- increase in household income through the direct employment. They are more able to establish linkages between the environment and their livelihood. Increased fodder and fuelwood.

Social- they have become a strong cohesive unit. Progressive leadership to make the village go in the right direction. More awareness about child marriage and education for girls. More sensitive to gender. Stop in human migration for fodder. Lower castes now more involved.

6. What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Health, hygiene, education, FES cannot be involved in these levels, other organizations must be.

7. What are future plans for your work in this community? Is there a specific plan that has been developed?

Continue to provide support to the village institutions, to create links between the village, its institutions, the panchayat, and other agencies. Another project in the watershed in which SKB lies is being initiated. They have developed the work plan but are not providing the money. Work on private lands to increase production and teach about impact of animal husbandry. Analyzing strengths and weaknesses and available resources. Possibility of adding horticultural species as an additional means of sustainable livelihoods, especially during drought conditions.

8. Has the community developed a shared vision for the future?

N/A

Interviewee Code: SLI2
Interviewers: Iva, Lindsey, Vaibhav
Date: 16 June 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs identified?

History- FES approached the Chitamba village to ask them what work would be helpful for them on the revenue wastelands within their area. They then met with SKB villagers to see what their needs were because the main livelihood in the village is animal husbandry, most of their problems were related to fodder, as well as low agriculture output. There was a lot of migration

due to fodder scarcity. They involved the community in meetings and to motivate them they took them to see examples of work. Formed a Women's Management Committee,
Kesi bai and the women in the group would go to other villages to share their experiences and motivate other communities to work with FES.
Capacity building workshops on: how to cut plants for fodder, soil and water conservation.
2.   What is the level of community involvement in these efforts?
The whole community was involved but the major role was played by the women's group. The women have been most active in mobilizing the whole community.
3.   What evaluation techniques have been used to assess these efforts?
Monitoring of soil and water table; presence of more foliage and plants; village meetings and group discussions; visits to the site to talk to villagers and see how work was progressing. People could see the benefits of the work.
4.   What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?
people were scared that FES would steal their land and people are dependent on the common lands so they were very reluctant to begin work with FES. 2) during construction of the ditches, bunds, people had a hard time with the techniques, especially that FES wanted them to measure the size of the ditches. He feels this is because before they had been employed by the government on projects but had no monitoring and no ownership. They had to show them that the size of the ditches did matter and that the act of measuring the size was directly affecting them.
5.   What are the successes of these efforts (ecological, social, economic)?
Social- unity in the village, collective decision making, girls are now sent to school, reduced spending on death feasts and less drug use during the feasts. Fuel wood availability from the dead trees.
Economic- they received direct employment and were able to use this money to pay off debts, fodder helped reduce migration and the need to buy fodder, people could keep more livestock because of the increase in fodder.
Ecological- more foliage, people had the realization that managing the environment is helpful to them and are starting to apply the same concepts on their private lands. Groundwater recharge. Less cutting, more efficient grazing.
6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future?
No proper links between the village and other development agencies. Need someone to speak for the village. Water scarcity. No stable source of income. Little access to higher education, especially for girls.
7.   What are future plans for your work in this community? Is there a specific plan that has been developed?
Nabhad project is the current plan, after this they will work on creating a dairy to have access to markets in Bhilwara.
8.   Has the community developed a shared vision for the future?
The dairy.

Interviewee Code: SLI3
Interviewers: Iva, Lindsey
Date/Time: 17 June 2008
Questions: actions

1.   Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs identified?

No boundaries, soil erosion was prolific so all nutrients were lost and the soil quality was very poor. Fodder scarcity. FES helped the community build boundaries, develop the ora system for grazing regulations. The communities don't have to take fodder from private lands or other sources any longer. Before there was not any form of employment, and they would often have to do wage labor in other areas.

2. What is the level of community involvement in these efforts?
Very involved. Meetings were held at least once a month and more frequently as problems arose. Each year they determine the grazing regulations and make decisions based upon the fodder availability that year.

3. What evaluation techniques have been used to assess these efforts?
They see less migration so they know that it has been successful.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?
Initially people thought their land would be stolen and they had to meet many times to show the villagers that it was going to be a good project for them. It took a long time but eventually the community accepted the project and wanted to do it.

5. What are the successes of these efforts (ecological, social, economic)?
Now there is fodder. The grazing regulations are very helpful. They can use more than one plot if one gets too depleted. They have a platform to make decisions. Unity in the village. Economic benefits- employment, and the money earned helped them develop.

6. What are other issues that exist which are currently unaddressed, but may become a concern in the future?
Water conservation, especially for private farms. Redig contours. Build anicuts.

7. What are future plans for your work in this community? Is there a specific plan that has been developed?
Small hospital in Chitamba. A boundary for the village.

8. Has the community developed a shared vision for the future? N/A

Interviewee Code: SLI4
Time/Date: 4 June 2008 11AM-1PM
Interviewers: Joshi, Lindsey, Iva
Questions asked: Actions taken

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will identify what the biggest issues of this community are and how the project has addressed these issues {ecological, social, and economic issues}). What were the issues of the community prior to initiation of the project? How were needs identified?
The village saw work that was done in other villages on grazing lands and thought it would be a good project for the area as well because the village was facing issues related to a lack of fodder; migration to other areas to graze livestock, drought, scarcity of water, which also led to poor agricultural outputs. People who depended on agriculture were also having to depend more on wage labor and were migrating to do so.
Grazing is open in all plots. Plots are available to all villages in the panchayat but villagers generally use the one closest to their own village. But in times of acute scarcity they will close down a plot and rotate which plots can be grazed. (developing institutions)
He could not remember the prioritization process that was done in 1999.
Employment was targeted first. The Grazing Lands Development increased fodder production, which he related to employment because people didn't have to migrate or buy fodder from outside. Water for agriculture also.

2. What is the level of community involvement in these efforts?

Actively participating in the work- paid by FES for fence and trench digging, plantation creation. Very active participation. Started having meetings after day's work finished so all people could attend and didn't have a reason not to go. Had some help from teachers and outsiders for accounting, but they by and large managed it all. At first women did not participate and then they were allowed to sit on the Hatai. Now it is the only village in the FES project area where women are allowed to sit. (I spoke with Goshi about this later- this is due to one of the villages sarpaunchs being a very strong leader and was female)

3. What evaluation techniques have been used to assess these efforts?

He visits all sites weekly, gets reports from panchayat members, holds meetings to discuss the projects. He has created capacity with the other villagers so they know exactly what he does as the sarpaunch and so he is not the only person with authority; established good relationships, has been sarpaunch for 25 years unopposed.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Some resistance was met at the beginning of the project because people who owned private lands near the common grazing lands thought they would be able to move into those lands and lay a claim to them for their own purposes. People also thought that the NGO (not FES, but another NGO started the work) may try to sell the land. There were a lot of rumors about what was going on. They had a meeting to clarify what they wanted to do. This led to an increased interest in the project from about 10 people to more than 40. When people were ready to start the plot in Chitamba the issue was protection of the area. Decided to have regulations- person cutting fodder for animals would give 50% to the panchayat and keep the other 50%. The money generated by this was used to hire a watchman. People owning private lands adjacent to the plot were not convinced, he had to put his foot down and the watchman had to guard day and night until the opponent groups accepted that the plot was going to stay.

2ⁿᵈ conflict in Sanjadi-ka-badia. Village accused (by a village headman in Chitamba) of corruption- getting more money than they worked for. Held a village meeting; about 70 women showed up, which was a lot more than before. Women took the man out to the plot to measure the trenches dug, a FES staff member tried to mitigate but the women told him that they didn't need his help. They resolved the matter themselves and showed that they actually did more work than they were paid for.

Encroachment on plots from other villages was a problem, resolved this issue by meeting with villages. Had to bring in revenue officials to solve the conflict and establish the village boundaries. The open discussion with other villagers and the government helped solve the conflict.

5. What are the successes of these efforts?

The initial conflicts proved to be a unifying process for the community. The conflicts were internal and no external help was needed to mitigate the problems. They were able to solve the conflicts on their own, which they are very proud of doing. They were able to move similar work to the other grazing lands within the panchayat's jurisdiction. People accepted the project as beneficial and they were able to get buy in from the community. The plot is a source of groundwater recharge. The water levels in the wells have risen even though they have received less rainfall than before. Social benefits- less migration to other areas for grazing and wage labor seeking; unity in the villages; ability to make collective decisions. Education of girls-big problem before because people didn't see the benefit of educating girls. But, when women from FES or other areas would come, he would say, look at these women, they are here because they are educated. People began to see that it was a good thing and started sending girls to school; most finish up to 2ⁿᵈ class and 10-20% move on to higher levels. In the Hatai- previsouly women and lowere castes were not able to sit on the Hatai to make village decisions, but now in Sanjadi-ka-badia women do participate in village decision-making. Ecological- visible benefits- before the project there were no trees or grasses- now there are. Economic- do not have to buy trees and

fodder from outside the village for both small and large animals. Milk production is higher because the animals get more nutritious fodder when they graze on greens rather than in the stall. They don't know about the quality of the milk because they don't have a dairy cooperative. Conflict resolution created unity.

6. What are other issues that exist that are currently unaddressed, but may become a concern in the future?

Water is the main problem. Would like a dam to bring water to the villagers.

7. What are future plans for your work in this community?

More water conservation, improve current structures, continue work in plots.

Interviewee Code: SLI5
Interviewers: Iva, Lindsey; FES field staff
Date/Time: 6 June 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will identify what the biggest issues of this community are and how the project has addressed these issues {ecological, social, and economic issues}). What were the issues of the community prior to initiation of the project? How were needs identified?

The main problem was lack of fodder which led to migration to far off places (e.g. Madhya Pradesh). The second problem was the scarcity of water. FES came to the village to motivate them through various meetings to show that the work would aid in the village's development. Encroachment on the commons was also a problem.

2. What is the level of community involvement in these efforts?

Very involved. Community meetings held to guide actions.

3. What evaluation techniques have been used to assess these efforts?

Through community meetings and the Federation Pariyarnjanchtna manch (People's environmental awareness federation) meetings (which is also helping other villages to start similar work). Through these meetings they could see that the community was appreciative and that the actions taken were successful.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Initially the community thought that FES was trying to take their land, so FES took them on a field trip to Ajmer to see the work they'd done there and talk to villagers; after this they were motivated to have FES help them.

Encroachment on the commons was also an issue but the women's group approached the tehsil leader to demarcate the boundaries and this stopped the encroachment.

5. What are the successes of these efforts (ecological, social, economic)?

Ecological- before there weren't any plants; the plantation brought greenery.

Social- women were allowed to sit on the Hatai, as were all castes. The community came together to have meetings.

Economic- FES employed the community members for the work. Fodder increased which made milk production rise. Agriculture outputs also rose because there was more water in the wells for irrigation.

Received training from FES on animal husbandry- e.g. keep less animals but of better breeds that are more productive.

6. What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Better education facilities and improve animal husbandry- keeping better breeds may help them economically because they will produce more milk. Put more manure on fields to increase agriculture outputs; proper medical facilities.

7. What are future plans for your work in this community? Is there a specific plan that has been developed?

The well is the biggest plan, also want to start work on private lands to improve them.

8. Has the community developed a shared vision for the future?

Didn't really understand this question- the shared vision is the well.

Interviewee Code: SLI6
Interviewers: Iva, Lindsey
Date/Time: 17 June 2008
Questions: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs identified?

No trees or fodder. People had to migrate. They created boundaries around the plot and planted grasses. They keep the plots closed during the monsoon season. Encroachment on lands also a problem. They had meetings and developed societies to make decisions. Grazing regulations were put into place, decide grazing rates, decide whether an area should be closed after livestock are in it, and guards protect the plots.

2. What is the level of community involvement in these efforts?

The communities form societies. One person from each caste is chosen and then that person chooses 2-3 more people to join the committee. Decisions are made collectively in these groups.

3. What evaluation techniques have been used to assess these efforts?

Through the level of community participation in the meetings they can tell how the project is going. They do a free work day every 7 days, which shows that they are committed to the project even if they don't get wages for that day.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Difficulties in convincing the community that they would not steal the land from them.
Different ways of thinking, they had to work very hard to build confidence and trust.

5. What are the successes of these efforts (ecological, social, economic)?

No longer encroached.
Ecological- Now there is foliage where there was not before. Groundwater levels have been raised. Trees have been planted. Described the hydrology cycle and feels that there is more rain now that there are more trees.
Social-the villages are interacting to create mutual agreements about development.
Economic- employment has helped them to move forward and helped reduce poverty and improve living standards.

6. What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Need to work on private lands to help farmers improve water retention.

7. What are future plans for your work in this community? Is there a specific plan that has been developed?

The Nabhad project, they have formed a larger society from all of the villages within the panchayat to deal with the watershed development project. Within the project they will do boundaries and contours, check dams, SHGs, and plantations.
16 % of the work will be done by in-kind contributions. After this project they will work on infrastructure development especially roads.
A dairy to bring employment and give loans and other support to the villages.

8. Has the community developed a shared vision for the future?

The watershed project.

Results Categorized by Objective-Sanjadi-ka-badia

Objective 2: Identify the needs of each community prior to initiation of the project.

The interviewees answered the question in terms of needs, but also understood the term "needs" as issues that affected the community as a whole.

Propositions

Community Member Interviews (22 interviews, 23 interviewees)

Need or Issue	Additional responses	Number of Responses	Interview Codes
"fodder…(one of)largest issue(s)" (scarcity)	*Researcher note-most respondents mentioned "fodder" or "lack of fodder" directly.* SCI12- "no trees…(no rain, no fodder)"	20/22	SCI1 ; SCI2 ; SCI3 ; SCI4 ; SCI5 ; SCI6 ; SCI7 ; SCI9 ; SCI11 ; SCI12 ; SCI13 ; SCI14 ; SCI15 ; SCI16 ; SCI17 ; SCI18 ; SCI19 ; SCI20 ; SCI21 ; SCI22
"water …(one of)largest issue(s)" (scarcity)	*Researcher note- most respondents mentioned "water" or "lack of water"*	19/22	SCI1 ; SCI2 ; SCI3 ; SCI4 ; SCI5 ; SCI6 ; SCI7 ; SCI8 ; SCI9 ; SCI10 ; SCI12 ; SCI13 ; SCI14 ; SCI15 ; SCI16 ; SCI17 ; SCI18 ; SCI21 ; SCI22
"lack of plants (fodder) led to migrating for livestock"	"had to migrate to feed livestock"; "had to migrate"; "fodder scarcity so had to migrate"; "fodder resulting in migration"; "had to migrate for fodder"; "migration for fodder"	7/22	SCI7 ; SCI15 ; SCI16 ; SCI19 ; SCI20 ; SCI21 ; SCI22 *(Researcher note-all respondents from Balai caste)*
"no employment"	"	2/22	SCI4; SCI6
"(no) boundaries for private land"	"boundaries around private land to prevent encroachment"	2/22	SCI5; SCI9
"water and ability to conserve it"	"wanted something to help them conserve more"	2/22	SCI10; SCI8
"encroachment" (on CGL)		1/22	SCI1

"(lack of) water…related to low productivity in agriculture"		1/22	SCI1
"no medical facility"		1/22	SCI3
"no greenery"	"(no) trees"	2/22	SCI3: SCI12
"trees bring rain …rain helps..do more agriculture" (explaining break in water cycling)		1/22	SCI12
"migrate…caused a lot of problems with the people who lived in the areas to which they went"		1/22	SCI16
"everything was linked to fodder and water"		1/22	SCI4

Community Leader and FES Staff Interviews (6 interviews, 6 interviewees)

Need or Issue	Additional Responses	Number of Responses	Interview Codes
"degradation of natural resources"		1/6	SLI1
"scarcity of fuelwood"		1/6	SLI1
"scarcity of…fodder"	"main livelihood…is animal husbandry, most of problems related to fodder"; "fodder scarcity"; "lack of fodder"; "main problem was lack of fodder"; "no trees or fodder"	6/6	SLI1; SLI2; SLI3; SLI4; SLI5; SLI6
"continued depletion of groundwater table"		1/6	SLI1
"top soil erosion"	"soil erosion prolific so all nutrients were lost and & the soil quality was very poor"	2/6	SLI1; SLI3

Need or Issue	Additional Responses	Number of Responses	Interview Codes
"break in nutrient cycles"	"soil erosion prolific so all nutrients were lost and & the soil quality was very poor"	2/6	SLI1; SLI3
"retrograde succession"		1/6	SLI1
"(environmental degradation) affecting the community's inability to meet livelihoods"		1/6	SLI1
"lack in participation in village"		1/6	SLI1
"no institutions to guide behavior on (CGL)"		1/6	SLI1
"lack of accountability"		1/6	SLI1
"no written by-laws"		1/6	SLI1
"few girls went to school"		1/6	SLI1
"many child marriages"		1/6	SLI1
"lot of money wasted on funeral feasts"		1/6	SLI1
"economic condition…poor"		1/6	SLI1
"droughts"	"drought, scarcity of water"	3/6	SLI1; SLI4; SLI5
"droughts…resulted in crop failure"	"drought, scarcity of water…let to poor agricultural output"; "scarcity of water"	3/6	SLI1; SLI4; SLI5
"droughts…resulted in poor animal husbandry due to resulting lack of fodder"		1/6	SLI1
"no employment… so there was a lot of migration for wage labor"	"not any form of employment…have to wage labor in other areas";	2/6	SLI1; SLI3;
"low agriculture output"	"poor agricultural output"	2/6	SLI2; SLI4
"no boundaries"	"encroachment on the commons"; "encroachment on lands"	3/6	SLI3; SLI5; SLI6

Need or Issue	Additional Responses	Number of Responses	Interview Codes
"no employment… so there was a lot of migration for…fodder grazing"	"lot of migration due to fodder scarcity"; "migration to other areas to graze livestock"; "lack of fodder…led to migration to far off places"; "no trees or fodder.people had to migrate"	5/6	SLI1; SLI2; SLI4; SLI5; SLI6
"people who depended on agriculture were also having to depend more on wage labor and were migrating to do so"		1/6	SLI4

Categorization of Objective Two Results

   The propositions mentioned in the tables above are needs the community had or issues they were facing prior to the FES project. The propositions were put into one or more of three categories depending on whether the proposition was related to ecological, economic or social factors. The data were then placed into subcategories depending on how the propositions were related to each other.

1.Ecological

   The needs or issues that fall under the category of ecological factors were put into two main themes: degradation of natural resources and drought. These themes are related to anthropogenic factors (degradation of natural resources) and natural environmental factors (drought).

Degradation of natural resources
- "break in nutrient cycles"
- "no greenery"
  - "scarcity of fuelwood"
  - "scarcity of fodder"
  - "trees bring rain …rain helps…do more agriculture" (explaining break in water cycling)
  - "continued depletion of groundwater table"
  - "topsoil erosion"
  - "retrograde succession"
  - "low agricultural output"
- "Droughts and water scarcity"
  - "droughts…resulted in crop failure"
  - "continued depletion of groundwater table"
  - "water and ability to conserve it"

- o "trees bring rain …rain helps…do more agriculture" (explaining break in water cycling)

Many of the problems associated with the community's issues and needs were directly related to the degraded condition of the surrounding natural resources. SKB community members depend directly on natural resources for subsistence and livelihood activities, comprised almost solely of agriculture and animal husbandry, so they were impacted greatly by the reduced capacity of the land to provide ecosystem services. This is evident from the interviews because scarcity of fodder and water were commonly cited as major issues for the entire community. Interviews with FES staff highlight some of the more technical forms of environmental degradation that impacted the community's ability to meet their needs, such as top-soil erosion, retrograde succession, breaks in nutrient cycling and groundwater depletion.

The underlying reasons for natural resource degradation are both anthropogenic and natural and are directly connected. The water scarcity issue is an example of this. Situated in a semi-arid dryland, SKB village is at a natural climactic disadvantage in terms of water availability, with severe droughts occurring every couple of years. However, human-caused environmental degradation (primarily the removal of vegetation caused by agriculture, overgrazing of fodder and fuelwood extraction) significantly exacerbated the problem of water scarcity and resulted in desertification and less recharge to the aquifer through compacted, bare soil. Groundwater is the primary source of water for household and agricultural use in the community, so as the aquifer was depleted, wells became increasingly less productive, especially during the dry season. Water scarcity served as a compounding factor towards fodder scarcity, which affected livestock health and production. Low outputs of agricultural plots is also an effect of water scarcity and lack of soil conservation measures. In sum, processes of environmental degradation resulted in reducing the productivity of the land in numerous ways.

2.Economic Factors

The economic condition of the community was another issue/need of the community prior to the FES project. The propositions were placed into three categories: environmental factors that impacted the economic activities of animal husbandry and agriculture; lack of employment opportunities; and mismanagement of money.
- Environmental Factors that Impacted Economic Activities ["(environmental degradation) affecting the community's inability to meet livelihoods"]
    - o "everything was linked to fodder and water"
    - o Animal Husbandry
        - ▪ "lack of fodder"
            - • Lack of fodder leading to migration
                - • "migrate…caused a lot of problems with the people who lived in the areas to which they went"
                - • "lack of plants (fodder) led to migrating for livestock"
        - ▪ "droughts…resulted in poor animal husbandry due to resulting lack of fodder"
        - ▪ "lack of water"
        - ▪ "water and ability to conserve it"
    - o Agriculture

- "people who depended on agriculture were also having to depend more on wage labor and were migrating to do so"
- "droughts…resulted in crop failure"
- "(lack of) water…related to low productivity in agriculture"
- "water and ability to conserve it"
- "top soil erosion"
- "break in nutrient cycles"
- "low agriculture output"
  - "economic condition…poor"
  - Lack of employment opportunities ["no employment"]
    - "no employment… so there was a lot of migration for…fodder grazing"
    - "no employment… so there was a lot of migration for wage labor"
  - Mismanagement of Money
    - "lot of money wasted on funeral feasts"

As mentioned above, the primary economic activities in the community are agriculture and animal husbandry. The reduced benefits of these activities due to environmental degradation forced community members to look for other ways to meet their needs. The fact that no other employment opportunities existed in the community made it difficult for SKB community members to secure money to buy food or fodder, so they had to go outside of the immediate area in search of work, which was not always available and not necessarily lucrative enough to provide them with financial security. Many men were forced to migrate with livestock in search of fodder since it was unavailable in SKB area. Migration for work or for fodder caused social and economic problems at home as well as in the areas where they were forced to migrate and most likely negatively impacted the environments in those regions as well. A lot of money was also spent on feasts for funerals, which was viewed by some respondents as wasteful.

3.Social Factors

Social issues that affected community members' ability to meet needs can be categorized into two themes: a lack of institutions to regulate and guide behavior; and a lack of social services and infrastructure.

- Lack of Institutions to Regulate and Guide Behavior
  - "(no) boundaries for private land"
  - "no boundaries" (encroachment on CGL)
  - "no institutions to guide behavior on (CGL)"
  - "many child marriages"
  - "few girls went to school"
  - "lack of participation in village"
  - "no written by-laws"
  - "lack of accountability"
- Lack of Social Services and Infrastructure
  - "no medical facility"
  - "water and ability to conserve it"

The data show that there were also sociopolitical issues associated with SKB's issues. A lack of local institutions, much less accepted written by-laws, to govern behavior resulted in encroachment on CGL and overgrazing of fodder resources. Community members were not involved in making decisions that affected their ability to earn sustainable livelihoods and there was a lack of accountability for those who did participate. Other social factors indicate misdistribution of social equity, such as the fact that few girls were attending school and that child marriages were common. SKB's access to social services and infrastructure was also limited, especially related to health care and water infrastructure.

Discussion of Objective Two Results

Documents collected from FES and the 1999 Needs Analysis confirm what the interviewees mentioned. In the Needs Analysis, the community cited the following as needs: water (for drinking, irrigation, and livestock); agriculture (low productivity); animal husbandry (poor quality animals, fodder scarcity); education; health and health facilities; employment opportunities; drought; and information on government schemes. A paper written by FES also indicate degradation of the CGL, lack of participation of women and lower castes and lack of leadership as issues affecting the needs of SKB (Joshie, et al., 2008). The researcher also witnessed the poor economic condition, lack of social services and extremely harsh environmental conditions of the area.

Prior to the initiation of the FES sustainable livelihoods and ecological restoration project, citizens of SKB had a very difficult time meeting their daily basic needs. The primary causes of this situation were degradation of natural resources used for livelihoods and subsistence, a poor economic state, lack of institutions and lack of social services and infrastructure. All of these forces are deeply connected, especially the relationship between environmental health and livelihoods. Lack of regulation made it easy for environmental degradation to occur, specifically overgrazing, which in turn affected water and fodder quantity and subsequently reduced their ability to meet livelihoods.

Objective Three: Identify what needs were prioritized by each community.

Propositions

Community Leader and FES Staff Interviews

Prioritized Need	Additional Responses	Number of Responses	Interview Codes
"(address" major factors affecting the community's abilities to meet their livelihoods"		1/6	SLI1
"felt they needed to work on natural resource development"		1/6	SLI1
"employment was targeted first"		1/6	SLI4

Prioritized Need	Additional Responses	Number of Responses	Interview Codes
"fodder" (scarcity)		1/6	SLI4
"water"		1/6	SLI4

Objective Three Narrative of Results

   The interviews with community leaders and FES show that ability to secure livelihood, development of natural resources, employment, fodder production and water retention were the needs prioritized in the FES project.

Discussion of Objective Three

   In 1999 FES conducted a needs analysis with SKB community members that prioritized the following as important needs and issues that needed to be to be addressed: water (quantity and infrastructure); low agricultural outputs; poor animal husbandry techniques; lack of education opportunities; fodder scarcity; lack of medical facilities; lack of employment opportunities; droughts; and the need for more information on government schemes. It is not within the scope of FES' work to address all of these issues, so it focused the project on work it was prepared to do. Given the expertise of FES in ecological restoration and institution development, the project was primarily focused on meeting needs by reinforcing the *panchayat* institution, developing local informal institutions within SKB, increasing fodder production and restoring water conservation (Joshie et al., Undated). In the interviews respondents mentioned the following as prioritized needs in the project: issues related to the community's ability to meet needs, natural resource development, employment, fodder and water.

Objective Four: Describe what planning and work initiatives have been implemented to meet the prioritized needs by each community.

Propositions

Community Member Interviews (22 interviews, 23 interviewees)

Action	Additional Responses	Number of Responses	Interview Codes
"put in plantations"	SCI2-"plantation program within the plot"; "plantation program"; "plantation building"; "put in a plantation"; "plantation program"; "plantations" ; ""; "plantation program"; ""; ""; ""; "plantations"; ""; "planting Acacia, other species"; "plantations"; "plantation…development"	18/22	SCI1; SCI2; SCI3; SCI4; SCI5; SCI7; SCI9; SCI10; SCI11; SCI13; SCI14; SCI16 ; SCI17 ; SCI18; SCI19 ; SCI20 ; SCI21 ;SCI22

Action	Additional Responses	Number of Responses	Interview Codes
"fencing of (CGL) area to stop encroachment"	"cattle trenches created boundary around the plot"; "fencing the 50 hectare land plot"; "trees planted around CGL demarcated the boundary"; "boundary"; "created a boundary to reduce encroachment"; "cattle trenches"; "boundary around plot"; "boundary development"	11/22	SCI1; SCI3; SCI6; SCI 9; SCI13; SCI14; SCI15; SCI16; SCI20; SCI21; SCI22
"check dams"	*Researcher note- all respondents mentioned same words, "check dams"*	15/22	SCI1 ; SCI2 ; SCI3 ; SCI4 ; SCI5 ; SCI7 ; SCI8 ; SCI13 ; SCI14 ; SCI15 ; SCI16 ; SCI17 ; SCI20 ; SCI21 ; SCI22
"contours within the plot"	"; "*nadi*(ditches to conserve water); "contours…pits"; "contours"; "anicuts, contours"; "FES helped them construct ditches"; "dig ditches"; "contours, ditches"; "contours"; "; "; "ditches and contours"; "contours, bunds, ditches"; "contours"; "ditches, contours"; "ditches"	17/22	SCI2 ; SCI3 ; SCI4 ; SCI5 ; SCI7 ; SCI8 ; SCI10 ; SCI13 ; SCI14 ; SCI15 ; SCI16 ; SCI18 ; SCI19 ; SCI20 ; SCI21, SCI22
"initiative that all kids go to school…penalty"	"institutions for people to send kids to school, especially girls"	2/22	SCI1 ; SCI2
"ora system (for guarding CGL)"	"money went to pay the family that guards at night in the ora system"; "ora system…protects plot"	3/22	SCI3; SCI13; SCI22
"(rotational grazing) during the rainy season they close the plots"	"developed regulations on grazing"; "agreed upon a rate to graze livestock in those plots"; "grazing schedules"; "grazing regulations"; "; "; "the regulations"; "grazing regulations"; "regulations"	10/22	SCI3 ; SCI6 ; SCI13 ; SCI14 ; SCI15 ; SCI16 ; SCI19 ; SCI20 ; SCI21 ; SCI22

Action	Additional Responses	Number of Responses	Interview Codes
"a women's self-help group was formed"	"self-help group"; "formed a women's group"; "self-help group from women"; "	5/22	SCI3 ; SCI4 ; SCI5 ; SCI20 ; SCI22
"opened a bank account (for community)"		1/22	SCI3
"organized meetings"	"town meeting"; "discuss village problems"; "community…discuss issues"; "platform to make decisions together"; "collective decision-making"	6/22	SCI5 ; SCI13 ; SCI16 ; SCI17 ; SCI20 ; SCI21
"FES also provided awareness (information)"		1/22	SCI7
"program gave employment"	"employment" ; "; "; "employment received"	5/22	SCI7 ; SCI8 ; SCI10 ; SCI20 ;SCI22

Community Leaders and FES Staff Interviews (6 interviews, 6 participants)

Action	Additional Responses	Number of Responses	Interview Codes
"see what work was needed"		1/6	SLI1
"met with the panchayat members and locals"	"approached the Chitamba village"; "(*sarpanch*'s quotes);	3/6	SLI1; SLI2; SLI4
"identified problems"	"FES approached…to ask them what work would be helpful"; "fodder…migration…water"	3/6	SLI1; SLI2; SLI4
"identified…existing natural resources"		1/6	SLI1
"community discussions"	"involved the community in meetings"; "started having meeting's after day's work"; "various meetings"; "meetings"	5/6	SLI1; SLI2; SLI4; SLI5; SLI6
"did PRAs…needs analysis"		1/6	SLI1
"discussed most important needs"		1/6	SLI1

"conservation agenda"		1/6	SLI1
"institution development"	"regulations"	2/6	SLI1; SLI4
"did household surveys"		1/6	SLI1
"stayed in the village to build rapport with villagers"	"took them to see examples of work"; "FES took them on a field trip to Ajmer to see work (trust building)"	3/6	SLI1; SLI2; SLI5
"after one year ready to begin work"		1/6	SLI1
"built capacity (through puppet shows, cultural programs, that showed their connection with the land)"; "technical trainings on accounting and biophysical processes"	"capacity building workshops how to cut plants for fodder, soil and water conservation"; "some help from teachers and outside consultants"; "received training from FES on animal husbandry"	4/6	SLI1; SLI2; SLI4; SLI5
"developed a 5 year plan (which included their needs and work to meet those needs, budget, culpability, a monitoring system, money distribution program for work)"		1/6	SLI1
"developed (committees) Management and Land Use Committee, Farmers Induction Program, Women's Orientation Program)"	"Women's Management Committee"; "Federation"; "communities form societies…one person from each caste is chosen and then that person chooses 2-3 more people to join committees"	4/6	SLI1; SLI2; SLI5; SLI6
"panchayat always involved"		1/6	SLI1
"FES helped community build boundaries"	"protection of the area"; "created boundaries around the plot"	3/6	SLI3; SLI4; SLI6
"develop the ora system for grazing"	"regulations…cutting fodder";	3/6	SLI3; SLI4; SLI6
"women's participate in village decision-making"	"women…community came together to have meetings"	2/6	SLI4; SLI5

"fodder production"	"plantation"; "planted grasses"	3/6	SLI4, SLI5; SLI6
"trenches"		1/6	SLI4

Categorization of Propositions
- Engaging the community and planning
    - "after one year ready to begin work"
    - "discussed most important needs"
        - "did household surveys"
        - "did PRAs…needs analysis"
        - "identified problems"
        - "see what work was needed"
    - "stayed in the village to build rapport with villagers"
    - "community discussions"
        - "panchayat always involved"
        - "met with the panchayat members and locals"
        - "organized meetings"
    - "developed (committees)"
        - "a women's self-help group was formed"
    - developed a 5 year plan"
        - "conservation agenda"
    - "built capacity"
        - "FES also provided awareness (information)"
    - "program gave employment"
    - "opened a bank account (for community)"
- Natural resource development
    - "identified…existing natural resources"
    - Water and soil conservation
        - "check dams"
        - "trenches"
        - "contours within the plot"
    - "plantations"
        - "(rotational grazing) during the rainy season they close the plots"
        - "fodder production"
        - "ora system (for guarding CGL)"
    - "FES helped community build boundaries"
        - "fencing of (CGL) area to stop encroachment"
- "Institution development"
    - "women's participate in village decision-making"
    - "develop the ora system for grazing"
    - "initiative that all kids go to school…penalty"

Objective Four Narrative of Results

In order to address the prioritized needs (livelihoods and employment, natural resource development, fodder production and water retention) of the SKB community, FES initiated programs related to natural resource restoration and development of

institutions to regulate behavior on the CLG plot and within the community. All of the actions taken were decided upon in community meetings and required significant planning and commitment by the community to do the work. The work can be categorized into the following: engaging the community and planning, natural resource development and institution development.

1.Engaging the Community and Planning

Beginning work with SKB took significant planning and patience on behalf of FES. There was initial mistrust of an outside organization, primarily that FES would take control over the CGL plot they depend upon for their livestock. It took a while to build rapport with the villagers and physical work did not begin until a year after the initial contact. The first year was spent deciding what work was needed to meet the villagers' needs (e.g., conducting the 1999 Needs Analysis and Participatory Rural Appraisals to assess and map resources); having community meetings; meeting with leaders of the Chitamba *panchayat*; developing committees, including a women's management committee that acted like a self-help group; coming up with a conservation agenda and a five-year work plan; and building knowledge and capacity of the community members, especially in management of the CGL.

2.Natural Resource Development

FES paid villagers to do work on the CGL for fodder production, water retention and soil conservation (interviews and Joshie et al., 2008). FES brought in saplings for plantation development, which were planted and maintained by the community. Check dams, ditches and contours were constructed to conserve water and soil. A living fence boundary was constructed around the CGL plot to clearly demarcate its area and provide an easier way to guard it against encroachment from other communities as well as to deter misuse by SKB community members. Capacity building workshops to manage natural resources were also conducted, as well as development of knowledge and understanding of ecological processes, such as rain cycles. These workshops were conducted using culturally appropriate methods, such as puppet shows (Researcher observation).

3.Institution Development

The development of institutions to guide behavior was a big part of FES's interaction with SKB. The *panchayat* system of local governance was a conduit for developing institutions and FES acted within this existing structure to both reinforce it and expand its scope. Protecting the CGL was a crucial element because it is one of the main sources of livelihood for the community. SKB adopted a series of rotational grazing schedules that coincided with natural cycles, namely the monsoon season, to reduce or eliminate overgrazing on the CGL plot. Each year the schedule is reviewed based upon the state of the plot and may be altered if the community decides that it needs to have less grazing or if more grazing may be permitted. Each family pays a fee depending on the size of the livestock (e.g., buffalo and cattle grazing is more costly than sheep or goats, Researcher observation) and the size of the herd, which was decided by the community. The money earned goes into the "*ora* system", which is another institution created to protect the CGL. The *ora* system is where one family from the

community guards the plot for one week, ensuring that there is not encroachment, and is paid for their time. After a week another family takes over, so that responsibility is assigned to each family in the community.

Improving the stance of women was also targeted in the development of institutions, primarily by making sure that women had a place in decision-making. Women were previously not allowed to sit on the *Hatai*, the sacred community space for decision-making, but SKB went against cultural tradition and allowed women to sit on the *Hatai*, as well as allowing lower castes to sit. Incentives for education of both sexes was another institution developed which has empowered women and lower castes. Girls' enrollment in school was very low, so the village decided to incur fines to families that did not send their kids to school. The fine for not sending girls is about 1200 rupees and the fine for not sending boys is lower (they are required to buy a bag of grain to feed the pigeons, which are highly regarded by the community).

Discussion of Objective Four Results

All of these activities were done with the majority of the community participating in the decision-making and implementation of the process. It is clear that FES empowered the community to develop itself according to its own culture. There was a focus on engaging women and lower castes, which were previously uninvolved in community decisions (Joshie et al., 2008). This served to increase the amount of participation and create a more holistic program of work that did benefited the majority of the community, including the marginal groups.

One of the major aspects of the FES project that was mentioned, though with little depth, in the interviews and was documented in Joshie et al., (2008) was the development of informal institutions within the community. This is important to mention because of the governmental structure that places SKB under the jurisdiction of the Chitamba *panchayat*, which is responsible for four other villages, and could not necessarily manage the CGL by itself. FES worked with the *panchayat* to form groups, *Charagah Vikas Samiti*s (CVS), that had the authority and support of the *panchayat* to manage the CGL. The *panchayat*'s acceptance of the CVS allowed the SKB villagers autonomy to make decisions about their CGL while allowing the *panchayat* to oversee work to ensure proper management to reduce overgrazing and encroachment. Other CVS were formed to manage additional issues, and a federation of CVS was created to report to the *panchayat*. The federation proved a good forum to discuss village issues and bring them to the *panchayat* if they could not be resolved within the community.

Objective Five: Determine if and how the initiatives taken by each community meet the prioritized needs of the community members.

Propositions

These data were categorized using the prioritized needs from Objective 3 (livelihoods and employment, natural resource development, fodder production and water retention). Any other data related to benefits, needs met, or achievements were placed under Objective 6a.

Community Member Interviews (22 interviews, 23 interviewees)

Prioritized Need	Need/Issue Addressed	Additional Responses	Number of Responses	Interview Code
Water Retention	"wells were recharged"	"before the project, during times of no rainfall there was no water for irrigation and no water for fodder plants"; "check dams, contours, nadi…solved water problem"; "solved water problem"; "water problem being solved"; "water problems solved"; "helped bring more water into their wells"; "helped fill their wells"; "helped conserve water"; "helped with water conservation"; "help with water problem"; "ditches and contours helped bring water"	15/22	SCI1; SCI2; SCI3; SCI4; SCI5 ; SCI6 ; SCI7 ; SCI8 ; SCI13 ; SCI14 ; SCI15 ; SCI18 ; SCI20 ; SCI21 ; SCI22
	"more water for irrigation to grow grains"	"more water for irrigation now"	2/22	SCI8; SCI14
Fodder Production	"got…leaves for goats & sheep & fodder for large animals"	"project has increased fodder"; "brought greenery & fodder for animals"; "helped solve fodder problem"; "problem of fodder is being solved"; "fodder…problems were solved"; "increased fodder"; "plantations brought fodder"; "more fodder"; "helped solve the fodder problem"; "helped improve fodder availability"; "helped grow fodder"; "helped solve fodder problem"; "fodder problem solved"; "grazing regulations helping to provide fodder"; "grasses…especially beneficial"; "helped bring fodder"; "; "; "helped preserve fodder"; "helped with fodder availability"	21/22	SCI1;SCI2; SCI3;SCI4; SCI5; SCI6;SCI7; SCI9; SCI10; SCI11; SCI12 SCI13 ; SCI14 ; SCI15 ; SCI16 ; SCI17 ; SCI18 ; SCI19 ; SCI20 ; SCI21 ; SCI22

Prioritized Need	Need/Issue Addressed	Additional Responses	Number of Responses	Interview Code
	"land no longer encroached"	"guards the plot"; "no longer encroachment on the CGL"; "reduce encroachment"; "grazing regulations"; "regulations have helped with the fodder problem"; "grazing regulations"; "regulations very helpful"	7/22	SCI1 ; SCI3 ; SCI13 ; SCI15 ; SCI19; SCI20 ; SCI22
	"fencing… has helped… developed regulations on grazing"	"trees planted around CGL demarcated the boundary"; "boundaries"; "bunds"; "babul plants serve as a boundary"; "boundary around the plot reduced encroachment"	6/22	SCI6; SCI9; SCI13; SCI15; SCI16; SCI21
	"no longer had to migrate far away for fodder"	"no longer have to migrate"; "solving migration problems"; "no longer have to migrate"	4/22	SCI4; SCI14; SCI15; SCI18
	"increased fodder has increased milk production"		1/22	SCI11
Livelihoods and employment	"got employment"	"got employment from FES"; " received employment"; "; "got employment"; "gave them employment"; "; "employment"; "; ";	10/22	SCI1; SCI2; SCI3; SCI4; SCI5; SCI7; SCI8; SCI10; SCI20; SCI22
	"brought money to the village"	"helped bring money into their homes"; "brought money to the family"; "able to make money"	4/22	SCI7; SCI8; SCI10;SCI12
Natural resource restoration	"now there are plants, there were not any before"	"brought greenery"; "there are now trees"; "village still looks after the plants"; "planting"; "more foliage";	7/22	SCI3 ; SCI5 ; SCI7 ; SCI16 ; SCI17 ; SCI20 ; SCI22

Prioritized Need	Need/Issue Addressed	Additional Responses	Number of Responses	Interview Code
Very successful, meeting needs	"very successful"	"; "they benefitted from the programs"; "FES program was very successful"; "program was successful"; "benefitted them a lot"; "FES has really helped them sustain their lives"; "program was successful" ; "; "work has helped them a lot"; "project successful"; "has been beneficial"; "work was beneficial to them"; "; "; "successful"; "very successful"; "successful"	17/22	SCI1; SCI2; SCI3; SCI4; SCI6 ; SCI7 ; SCI8 ; SCI9 ; SCI10 ; SCI11 ; SCI12 ; SCI13 ; SCI14 ; SCI17 ; SCI19 ; SCI21; SCI20

Community Leaders and FES Staff (6 interviews, 6 interviewees)

Prioritized Need	Need/Issue Addressed	Additional Responses	Number of Responses	Interview Code
Water Retention	"groundwater recharge"	"plot is a source of groundwater recharge"; "more water in wells"; "groundwater levels have been raised"	4/6	SLI2; SLI4; SLI5; SLI6
Fodder Production	"increased fodder"	"increase in fodder"; "now there is fodder"; "do no have to buy"; "fodder increased"	5/6	SLI1; SLI2; SLI3; SLI4; SLI5
	"stop in human migration for fodder"	"fodder helped reduce migration"; "less migration to other areas for grazing and wage labor"	3/6	SLI1; SLI2; SLI4
	"people could keep more livestock"		1/6	SLI2
	"reduce…need to buy fodder"	"do not have to buy…fodder"	2/6	SLI2; SLI4
	"don't have to take fodder from private lands"	"	2/6	SLI3; SLI5
	"milk production higher"	"fodder increased which made milk production rise"	2/6	SLI4; SLI5

Prioritized Need	Need/Issue Addressed	Additional Responses	Number of Responses	Interview Code
Livelihoods and employment	"received direct employment"	"before there was not any form of employment"; "FES employed the community"; "employment has helped them to move forward"	4/6	SLI2; SLI3; SLI5; SLI6
	"increase in household income"	"employment…reduce poverty and improve living standards"	2/6	SLI1; SLI6
	"agricultural outputs also rose"		1/6	SLI5
	"reduce…need to buy fodder"	"do not have to buy…fodder	2/6	SLI2; SLI4
Natural resource development	"positive succession"	"now there is foliage where there was not before"	2/6	SLI1; SLI6
	"food chain and nutrient flows restored in the plots"		1/6	SLI1
	"more wildlife in plot"		1/6	SLI1
	"adopted rotational grazing methods"	"more efficient grazing"; "grazing regulations are very helpful"	3/6	SLI1; SLI2; SLI3

Categorization of results

Water retention
- "groundwater recharge"
- "wells were recharged"
    - "more water for irrigation to grow grains"
Fodder production
- "increased fodder"
- "don't have to take fodder from private lands"
- "land no longer encroached"
- "fencing…has helped…developed regulations on grazing"
- "stop in human migration for fodder"
    - "no longer had to migrate far away for fodder"
- "people could keep more livestock"

- "reduce…need to buy fodder"
- "milk production higher"

Livelihoods and Employment
- "received direct employment"/ "got employment"
    - "brought money to the village"
    - "increase in household income"
- "agricultural outputs also rose"
    - "more water for irrigation to grow grains"
- "reduce…need to buy fodder"

Natural resource development
- "adopted rotational grazing methods"
- "more wildlife in plot"
- "food chain and nutrient flows restored in the plots"
- "positive succession"
    - "now there are plants, there were not any before"

Objective Five Narrative of Results

In addition to addressing prioritized needs, community members often stated that they felt the project was very successful in meeting their needs.

1.Water retention

The need to increase water retention for household and agricultural use was addressed by the FES project and responses indicate that many of the interviewees felt that the project did serve this need. Groundwater recharge was increased and overall water availability and supply for irrigation increased as well.

2.Fodder production

Nearly all of the respondents mentioned that fodder had increased as a result of the FES project. This resulted in less migration in search of fodder and the ability to have more livestock. Encroachment on the CGL stopped as a result of the *ora system* and rotational grazing methods, which helped to maintain the work done in the plot by the villagers. People also noted better milk production from their livestock.

3.Livelihoods and employment

Respondents noted that livelihoods and employment were improved the FES project. During the time of the FES project, villagers were able to secure employment and earn money for the work they did on the CGL. This resulted in an increase in household income. The ability to use the plot for fodder also reduced the need to buy fodder from elsewhere. Agricultural outputs also increased, which has an effect on this income-generating and subsistence activity.

4.Natural resource development

The need to improve conditions of SKB's surrounding natural resources was addressed by the project, most notably on the CGL plot. FES staff mentioned that the project helped reverse retrograde succession and restored nutrient flows and the food chain. It was also noted that there are more wildlife using the plot now. Rotational

grazing methods have increased the amount of greenery and placed less anthropogenic stress on that area.

Discussion of Objective Five Results

The interviews show that most of the respondents were overall happy with the FES project and that it did in fact help them meet previously unmet needs and resolve some issues. The availability of fodder was mentioned the most, and it is clear from photographs that the CGL is producing fodder whereas surrounding private lands continue to be overgrazed. A study completed by FES confirmed the presence of more fodder producing species after project completion. This study found that tree biomass (11.7 t/ha) was significantly higher in the plot than on surrounding private lands (1.02 t/ha). Shrub biomass was also higher in the CGL plot (5.10 t/ha) than on the surrounding private lands (3.66 t/ha). The use of the *ora* system, rotational grazing methods and the boundary are no doubt the reason for the continued presence of fodder for livestock.

However, when one looks at answers to other questions, it is evident that the needs of the community members were met partially, or were met during the time of the project but did not continue after. As one respondent mentioned during an interview, "their needs have been met to a degree". Although respondents seemed to be happy with the FES project, it certainly did not solve all of their problems.

This is true in the case of employment, because although community members were paid by FES during the project, they are still without employment opportunities now (although many women are working with the National Rural Employment Guarantee Act, which is a federal program that pays villagers for development work. However, people responded that sometimes they go unpaid for many weeks and that work is not always guaranteed). This was evident in responses to Objective 8, where 10/22 interviewees mentioned that employment is needed. Participants in the RRA completed on 29 August 2008 decided that a stable source of income was a priority for the village.

Water retention will remain an issue, especially if overgrazing, removal of vegetation and soil loss continue on private lands. The community is currently building a well at the nearby river, but infrastructure for transporting and saving water does not exist. The RRA results show that water is an issue that still needs to be addressed. Unfortunately, the dependence on the highly variable monsoons makes the village subject to climactic conditions that only serve to confound the water scarcity issues they face. People mentioned that there was more water in wells, which signals that the project helped restore groundwater levels, but a study to compare previous levels relative to rainfall was not conducted, so this information may be mostly anecdotal.

Natural resource development was addressed in the project, but all of the physical work and plantation development occurred on the CGL, which is very significant, but large areas of degraded land remain outside its borders. Studies conducted by FES showed that higher biomass, higher soil moisture and more biodiversity are possible. Hopefully the new knowledge and skills gained by the community will be used to restore private lands to increase their productivity for human use and ecological health.

Objective Six-A: Identify the **achievements** and challenges of implementing the initiatives to meet the needs of community members.

Propositions

Community Members (22 interviews, 23 interviewees)

Achievement	Additional Responses	Number of Responses	Interview Code
"women were given importance"	"women's self-help group"; women were given more importance through the SHG"; SHG for women"	4/22	SCI2;SCI3; SCI4; SCI20
"can get loans"		1/22	SCI3
"get fuelwood from dead trees"		1/22	SCI19
"building trust with an outside organization"		1/22	SCI1
"brought unity to the village"	"created unity"; "unity in the village"; "unity in the community, they can now discuss village problems"; "village had a platform to make decisions together…unity"; "brought unity in the village and collective decision-making"; "unity in the village"	8/22	SCI3; SCI4; SCI13 ; SCI16; SCI20; SCI21; SCI22
"unity among women"		1/22	SCI5
"FES provided awareness (capacity)"		1/22	SCI7
"development of institutions to make children go to school"		1/22	SCI2

Community Leaders and FES Staff (6 interviews, 6 interviewees)

Achievement	Additional Responses	Number of Responses	Interview Code
"established relationship, there was trust (between community and FES)"	"people accepted the project as beneficial and they were able to get buy-in from the community"	2/6	SLI1; SLI4

Achievement	Additional Responses	Number of Responses	Interview Code
"village accepted women's participation"	"women were allowed to sit on the Hatai"	2/6	SLI1; SLI5
"more aware of what a healthy landscape should look like"		1/6	SLI1
"more able to establish linkages between the environment and their livelihood"	"people had the realization that managing the environment is helpful to them"	2/6	SLI1; SLI2
"increased…fuelwood"	"fuelwood availability from dead trees"	2/6	SLI1; SLI2
"have become a strong cohesive unit"	"unity in the village"; ";	3/6	SLI1; SLI2; SLI3
"progressive leadership (developed)"	"created capacity…so they know what he does as sarpanch and so he is not the only person with authority"	2/6	SLI1; SLI4
"more awareness about child marriages"		1/6	SLI1
"more…education for girls"	"girls are now sent to school"	3/6	SLI1; SLI2; SLI4
"more sensitive to gender"	"before women… were not able to sit on the Hatai…women do participate in decision-making"	2/6	SLI1; SLI4
"lower castes now more involved"	"before…lower castes were not able to sit on the Hatai"; "allowed to sit on the Hatai…as were all castes"	3/6	SLI1; SLI4; SLI5

Achievement	Additional Responses	Number of Responses	Interview Code
"collective decision-making"	"platform to make decisions"; "ability to make collective decisions"; "community came together to have meetings"; "villages are interacting to create mutual agreements about development"	5/6	SLI2; SLI3; SLI4; SLI5; SLI6
"conflict (resolution)"		1/6	SLI4

Categorization of Results

Ecological
- "more aware of what a healthy landscape should look like"

Economic
- "increased…fuelwood"
- "more able to establish linkages between the environment and their livelihood"
- "FES provided awareness (capacity)"
- "can get loans"

Social
- "have become a strong cohesive unit"
  - "unity among women"
  - "collective decision-making"
    - "lower castes now more involved"
- "more sensitive to gender"
  - "women were given importance"
  - "village accepted women's participation"
  - "more…education for girls"
- "conflict (resolution)"
- "more awareness about child marriages"
- "progressive leadership (developed)"
- "building trust with an outside organization"
  - "established relationship, there was trust (between community and FES)"
- "development of institutions to make children go to school"
  - "more…education for girls"

Objective Six-A Narrative of Results

In addition to helping meet prioritized needs of SKB community members, the FES project had other achievements and benefits, primarily social ones. These data are categorized into ecological, economic and social benefits.

1.Ecological

The primary ecological benefits are more associated to how the community relates to the environment rather than the physical health of it. The community became more aware of what a healthy landscape for their area should look like and was able to may a connection between making a livelihood and the health of the environment.

2.Economic

Some economic benefits of the FES project mentioned in the interviews were the ability to get loans through the use of a community bank account and the provision of fuelwood from the CGL plot so it did not have to be purchased.

3.Social

Most of the additional benefits noted by respondents fall into the social realm. The development of a relationship between FES and the community was noted as a big achievement because mistrust of an outside organization was the greatest challenge they faced in the beginning and yet they were able to overcome it with time. Another big benefit that was mentioned in several ways was women's involvement and status. Women's empowerment is evident not only in the fact that girls were increasingly being sent to school, but also that women felt as though they were given importance and could work as a unified group. Developing a sense of unity throughout the community was also expressed numerous times. Other achievements mentioned were: conflict resolution skills; collective decision-making; more involvement by lower castes; more awareness about child marriages; development of progressive leadership; and more awareness of issues.

Discussion of Objective Six-A Results

The FES project had additional benefits and achievements beyond their work to meet prioritized needs. Most of the notable achievements are in the social realm, because the process of work helped to create more unity in the village and encourage more participation from marginalized groups. The trust gained between FES and SKB will hopefully allow it to work with other development organizations in the future, and perhaps even with outside groups wanting to increase economic activities in the area. Although these "fringe" benefits were not necessarily a part of the projects' prioritized work, they certainly are notable in terms of building a more equitable community that works together to solve problems.

Objective Six-B: Identify the achievements and **challenges** of implementing the initiatives to meet the needs of community members.

Propositions

Community members (22 interviews, 23 interviewees)

Challenges	Additional Responses	Number of Responses	Interview Code
"building trust with an		1/22	SCI1

outside organization"			
"to a certain degree problems have been solved"	"FES is helping them solve problems to a certain degree"	2/22	SCI22; SCI2

Community Leaders and FES Staff (6 interviews, 6 interviewees)

Challenges	Additional Responses	Number of Responses	Interview Code
"initially there was a lack of trust"	"people were scared that FES would steal their land…so they were very reluctant to being work with FES"; "had to meet many times to show the villagers that it was going to be a good project for them"; "some resistance was met at the beginning…lot of rumors"; "initially the community thought that FES was trying to take their land"; "difficulties in convincing the community that they would not steal the land from them"	6/6	SLI1; SLI2; SLI3; SLI4; SLI5; SLI6
"(working through) grazing schedules"		1/6	SLI1
"some people resisted a strong women's participation"		1/6	SLI1
"people had a hard time with the techniques (for restoration of CGL)"		1/6	SLI2
(fear that private land owners would take common grazing lands)		1/6	SLI4
"village accused of corruption"		1/6	SLI4
"encroachment on plots from other villages"	"encroachment on the commons"	2/6	SLI4; SLI5
"(merging) different ways of thinking"		1/6	SLI6

Categorization of results

(Researcher note- results were not categorized because of the small number of propositions.)

Objective Six-B Narrative of Results

All of the challenges associated with the project in SKB dealt with the human dimension. Community members did not articulate many challenges, though there was a mention of difficulties in building trust, which was also cited by all of the community leaders and FES staff respondents. One community member mentioned that although their needs were addressed by the FES project, they were met only to a certain degree and that more work is needed. Some of the challenges mentioned in the interviews were: figuring out the appropriate grazing schedule; overcoming resistance to women's participation; making sure that people were trained effectively to do the work on the CGL plot; overcoming the fear that private land owners would take over the CGL; an accusation of corruption; encroachment on the restored CGL plot from other villages; and merging different ways of thinking.

Discussion of Objective Six-B Results

The challenges associated with the project seem to be ones that were overcome with time. The building of trust issue is an example of this. FES had to ensure that the community knew their intentions and did so by taking SKB community members to other project areas so they could talk with people who were working with FES in similar situations. Several meetings between the community and FES also helped to build trust between the two parties. Changing cultural attitudes towards women and lower castes was also a significant challenge, but the fact that both are now allowed to sit on the *Hatai* and make decisions shows that progressive steps were made (Joshie et al., 2008). The accusation of corruption was also a significant challenge that the community overcame. An outsider accused the community of not completing the work they billed to FES, but the accuser was forced to renege his accusations when it was proved that the community had actually done more work than they were paid to do (Joshie et al., 2008).

Challenges that were not addressed were not mentioned. In fact, community members were hesitant to mention challenges in general; this may have been in reluctance to complain about the project to an interviewer and a translator that was a new FES employee (Researcher observation).

Objective Seven: Identify what assessment techniques have been undertaken in each community by either external or internal actors related to actions taken towards sustainability.

Propositions

Community Leaders and FES Staff (6 interviews, 6 interviewees)

Assessment Techniques	Additional Responses	Number of Responses	Interview Code
"village meetings"	"village meetings and group discussions"; "meetings after day's work"; "community meetings"; "meetings"	5/6	SLI1; SLI2; SLI4; SLI5; SLI6
"monitor participation"		1/6	SLI1
"monitoring of natural resources"	"monitoring of soil and water table, presence of more foliage and plants"	2/6	SLI1; SLI2
"revision of by-laws when necessary"		1/6	SLI1
"transparency of payment system"		1/6	SLI1
"how many girls were registered in school"		1/6	SLI1
"rate of child marriages"		1/6	SLI1
"amount of money spent on funeral feasts"		1/6	SLI1
"contributions to labor from community members"		1/6	SLI1
"level of participation in decision-making processes, especially from poorer castes and women"	"through the level of community participation"	2/6	SLI1; SLI6
"less migration"		1/6	SLI3
"they do a free work day every 7 days, which shows that they are committed to the project even if they don't get wages for that day"		1/6	SLI6
"people could see benefits of the work"	"visits sites weekly (to see work)"	2/6	SLI2; SLI4
"through these meetings they could see that the community was appreciative"		1/6	SLI5

Objective Seven Narrative of Results

Most of the evaluation techniques for the project were informal. The primary way the project was evaluated was through regular community meetings. Participation throughout the five year period also served as an indicator of meeting goals, particularly related to participation in decision-making by women and lower-castes and labor contributions, especially when the villagers were found working in the plot even when they were not paid by FES. For the ecological component of the project, FES measured success by the presence of foliage and other types of natural resource management monitoring such as soil moisture and biomass measurement. The transparency of the payment system helped show that there was not corruption. Other indicators that showed success were a reduction in the amount of money spent on funeral feasts, higher enrollment of girls in school, lower rates of child marriages and less migration for fodder. Visible measurements, such as the state of natural resources, community participation and visible benefits were also indicators of the project's success.

Discussion of Objective Seven Results

The evaluation component of the FES project throughout its five-year tenure and after its completion was sufficient to show success in terms of fodder production and natural resource restoration within the CGL plot. However, the absence of measurable objectives makes a thorough evaluation and estimation of success difficult. Baseline information was collected by another organization, but this was more related to community demographics rather than information that would indicate improvement in topics such as household income or debt repayment as a result of the project. The use of measurable objectives may be helpful in future projects and for the community as it continues towards development (Researcher's observations)

Objective Eight: Identify what are the current needs of community members.

Propositions

In the interviews, respondents were asked about current and future needs. These needs were merged into one and put in the table below. Responses refer to overall village needs or desires for the future state of the village. Cases where respondents mentioned basic needs in general (i.e., food, shelter, water, clothing) were not put into this category.

Community members (22 interviews, 23 interviewees)

Current Needs	Additional comments	Number of Responses	Interview Code
"education"	", ", ", ", ", ", ", ", ", ", ", ; , ; , ; , ; , ; , ; , ; , ; , ; , ;	12/22	SCI1, SCI2; SCI3; SCI4; SCI5 ; SCI6; SCI7 ; SCI8 ; SCI12 ; SCI13; SCI15; SCI19

Current Needs	Additional comments	Number of Responses	Interview Code
"school up to eighth class"	"better school facility at least up to the 8th class"; "up to 8th or even 10th class"; "school up to age 10"; "higher grade in the school"; "higher level of education in the school"; "higher education";	7/22	SCI1; SCI3; SCI4; SCI5; SCI6; SCI8; SCI22
"employment"	"; "; "; "; "employment opportunities"; "employment"; "; "; "employment especially during the dry season"	10/22	SCI1; SCI3; SCI7; SCI8; SCI10 ; SCI11 ; SCI12 ; SCI14 ; SCI17 ; SCI22
"tube wells" (water infrastructure)	"more wells for irrigation…electricity at the water wells"; "better water facilities"; "pipe lines for water"; "digging a well"; "infrastructure to bring water to them easily"; "village needs water infrastructure"; "more hand pumps for water"; water infrastructure and electricity to pump wells"; "water infrastructure"	10/22	SCI2;SCI3; SCI4; SCI5; SCI6; SCI8; SCI 11; SCI9; SCI20 ; SCI21
"medical facilities"	"; "; "; "hospital in the village"; "village doctor"; "hospital"; "health care";	8/22	SCI2; SCI3; SCI4; SCI5; SCI6; SCI15; SCI19; SCI22
" food security"	"food security during the dry season"; "food security especially during the dry season"; "better agricultural practices"; "food"; ";	7/22	SCI3; SCI14; SCI15; SCI17 ; SCI19 ; SCI21 ; SCI22
"veterinarian"		1/22	SCI3

Current Needs	Additional comments	Number of Responses	Interview Code
"proper (transportation) infrastructure"	"infrastructure-mainly roads"; "better infrastructure-roads"; "railway"; "roads improvement"; "better roads and access to transportation"; better road infrastructure"; "better roads"; "; "roads"; ";	11/22	SCI4; SCI5; SCI6; SCI7; SCI8; SCI19; SCI12; SCI14; SCI15; SCI17; SCI20
"more food grains"	"grains";	3/22	SCI6; SCI19; SCI22
"money"	"; ";	3/22	SCI6; SCI11; SCI14
"water"	"address water scarcity"; "water scarcity"; "the most necessary thing for the community is water"; "water"; "; "major needs are related to water because most of their problems are related to water scarcity"; "water for irrigation"; "water"; "more water"; "water"; "; "; "; "water for agriculture"; "more water";	16/22	SCI1; SCI2; SCI4; SCI6; SCI7; SCI8; SCI9; SCI10 ; SCI11 ; SCI13 ; SCI15; SCI17 ; SCI19 ; SCI20 ; SCI21; SCI16
"electricity" (in village)	"; "; ";	3/22	SCI7; SCI14; SCI15; SCI19;
"organizations to help them"		1/22	SCI11
"fodder"	"greenery all over not just in the plot"	2/22	SCI11; SCI2;
"re-dig contours"		1/22	SCI13
"rise above poverty line"		1/22	SCI14
"better milk production"	"better livestock to increase milk production"	2/22	SCI15; SCI17
"hygiene"	"more hygienic"; "hygiene"	3/22	SCI15; SCI8; SCI12
"(better housing) cement or brick houses with furniture instead of clay"	"improve housing conditions"; "houses to be made of concrete and brick"; "better housing"; "; "; "better houses";	7/22	SCI3; SCI8; SCI13; SCI14; SCI15; SCI17; SCI19

Current Needs	Additional comments	Number of Responses	Interview Code
"a town account to give loans to give when people need them and save in the mean time"		1/22	SCI22
"sarpanch in the village"		1/22	SCI5
"ration cards"		1/22	SCI19
"more forums for women"		1/22	SCI22

Community Leaders and FES Staff

Current Needs	Additional Needs	Number of Responses	Interview Code
"health"		1/6	SLI1
"hygiene"		1/6	SLI1
"education"	"little access to higher education, especially for girls"; "better education facilities"	3/6	SLI1; SLI2; SLI5
"no proper links between village and development agencies"		1/6	SLI2
"someone to speak for the village"		1/6	SLI2
"(address) water scarcity"	"water is the main problem"; "watershed development"	3/6	SLI2; SLI4; SLI6
"stable source of income"		1/6	SLI2
"education, especially for girls"		1/6	SLI2
"water conservation"	"would like a dam"; "well is the vision"; "watershed project"	4/6	SLI3; SLI4; SLI5; SLI6
"re-dig contours, build anicuts"		1/6	SLI3
"improve animal husbandry"		1/6	SLI5
"water conservation, especially for private farms"	"need to work on private lands to help farmers improve water retention"	3/6	SLI3; SLI5; SLI6
"increase agricultural outputs"		1/6	SLI5
"proper medical facilities"		1/6	SLI5

Categorization of propositions

Lack in social services and infrastructure
- "electricity" (in village)
- "proper (transportation) infrastructure"
- "proper medical facilities"/ "medical facilities"
  - "health"
  - "hygiene"
- "tube wells" (water infrastructure) /"water conservation"
- "education"
  - "school up to eighth class"
  - "education, especially for girls"
- "a town account to give loans to give when people need them and save in the mean time"
- "(better housing) cement or brick houses with furniture instead of clay"

Livelihood insecurity
- "water"
- water conservation, especially for private farms"
- "stable source of income"
  - "employment"
  - "rise above poverty line"
  - "money"
- " food security"
  - "increase agricultural outputs"
  - "more food grains"
- "improve animal husbandry"
  - "better milk production"
  - "fodder"
  - "veterinarian"

Information
- "improve animal husbandry"
- "organizations to help them"
  - "no proper links between village and development agencies"

Natural resource management
- "re-dig contours, build anicuts"
  - "re-dig contours"
- "(address) water scarcity"

Leadership
- "sarpanch in the village"
- "someone to speak for the village"

"more forums for women"

"ration cards"

Objective Eight Narrative of Interview Results

Many of the community's overall current needs are related to a lack in social services, particularly in terms of education; infrastructure for water, transportation, and electricity; leadership; natural resource management; and more connection to the outside for information and development assistance. A lack in local employment opportunities is also an issue which affects overall development and complicates the need to rise above the poverty line. The community needs information related to agricultural and animal husbandry techniques to improve output and efficiency. Access to more food grains was also mentioned as a need to improve agriculture. Restoration on private lands is needed to help improve environmental quality, restore vegetation and provide sustainable livelihoods. Interviewees also would like a leader to represent the village and more representation of women. Improvements in hygiene and housing are also viewed as needs for development. Some other needs mentioned were: ration cards, more money and loans for the village account and a veterinarian.

Water remains an issue in spite of the FES project (i.e. 19 out of 28 respondents mentioned it). A lack of water infrastructure is also a significant setback. Natural environmental factors related to water scarcity were also noted. Work on the CGL plot, especially maintenance of contours, is needed to continue water retention from that site.

Discussion of Objective Eight Interview Results

Most of the current needs of the community are related to development (e.g. education, health services, better infrastructure), which, unfortunately, would require significant financial and technical support from the government or a NGO or financial inputs from the community itself. The lack of employment opportunities in the community would make it difficult for community members to contribute too much money. Given the development of institutions and increased participation and unity created by the FES project, the community would have the ability to do similar work towards natural resource restoration on private lands, electing a leader, and involving women to a higher degree. The fact that the FES project helped create a positive, empowering atmosphere would hopefully provide impetus for SKB to do what is within their means and to seek help from the government or elsewhere when possible (researcher's observation). The current well-building project is evidence that they are doing such things. The community provided 1 lakh (one lakh equals 100,000 rupees) and was given 4 lakhs from the government as a cost-share program. The community applied for this after the project and is hopeful that it will ease some of the water scarcity issues (researcher discussion with FES staff).

Rapid Resource Assessment Results

The RRA for SKB was conducted on 29 August 2008 by FES staff. The diagrams below show the spider-web formation and the full RRA report is located in this Appendix. The villagers agreed that levels of participation and protection of standing natural resources were their greatest assets. A source of income, water availability and infrastructure, financial support (for development projects) and information were lower in terms of assets and were also those that they wanted to expand, with information and water being the highest priorities.

Discussion of Rapid Resource Assessment Results

        The RRA confirmed that water is still a major issue that must be addressed, especially because their livelihood heavily depends on it. The status of their natural resources is deemed adequate in terms of the CGL plot, but private lands, which comprise most of the community's area, are not mentioned, which is unfortunate. However, it was mentioned in the interviews that restoration needed to be focused on private lands, so hopefully awareness of this issue will spread and the community will be able to use the knowledge and skills gained from working on the CGL project.   The institutions built and levels of community participation were also viewed as major assets, which also confirms information gathered in the interviews and documents.

        The fact that many of the needs articulated in Objective Two were not mentioned in the RRA is significant, especially that fodder is not viewed as such a major issue. The adoption of the *ora* system and rotational grazing were again noted as the reasons for this improvement. Maintaining the work they did during the project was also mentioned, which shows commitment to continuing the project and hints at its overall value to the community. Issues that still exist, such as income insecurity and access to and from the outside community, were not explicitly addressed by the project and therefore cannot be associated with its success.

Community Participation
Protecting the existing resources and putting in efforts for developing newer ones.

Source of Income
Main dependence is on agriculture, which in further dependent on monsoon. Erratic monsoon is leading the community to other options of livelihood in which migration is prominent.

Financial support
For infrastructure development, roads, hospital, school, roof on hatai, shade in graveyards etc.

Water
Villagers have constructed water trough for livestock. Need is felt to construct anicuts and undergo SWC activities

Information
Better agriculture practices, better animal husbandry practices and breed improvement.

Standing Natural Resource
Institutions formed have adopted rules reached by common consensus of the community for sustainable management practices.

Community Participation

Source of Income

Financial support

Water

Information

Standing Natural Resource

Discussion of Objective Eight Results

Many of the community's current needs are related to a lack in social services, particularly in terms of education; health services; infrastructure for water, transportation, and electricity; and the need for more connection to the outside for information and development assistance.

The economic status of the community remains an issue because economic opportunities are scarce. The NREGA program is an exception of this, but anecdotal information indicated that payment of wages in this program are sometimes delayed and, because it is a program funded by the government, there is no long-term guarantee that it will continue. In the RRA and interviews respondents mentioned that economic development is a high priority.

Water continues to an issue in spite of the FES project (i.e., 19 out of 28 respondents mentioned it as a current issue). A lack of water infrastructure is also a significant setback. Natural environmental factors related to water scarcity were also noted. Work on the CGL plot, especially maintenance of contours, is needed to continue water retention from that site. The RRA confirmed that water is a main priority for the village, as is infrastructure for transporting and conserving it.

SKB's location and lack of development also puts it in a situation where it has limited access to new information about topics such as agriculture, government assistance programs, or hygiene. Therefore, gaining new access to information was considered a main priority for the community.

The fact that fodder was not mentioned in either the interviews or the RRA is significant because it indicates the FES project succeeded in this aspect. The adoption of the *ora* system and rotational grazing were again noted as the reasons for this improvement. Maintaining the work they did during the project was also mentioned, which shows commitment to continuing the project and hints at its overall value to the community. Restoring private lands was mentioned in the interviews, though not to a large degree and was not mentioned in the RRA. This could be because respondents were replying to questions about community needs, and private land does not fit into this category, though restoration of private lands would certainly positively impact the community as a whole.

Objective Nine Results from Sanjadi-ka-badia Interviews

Question: What would you like to see happen in the future?

Community Members (22 interviews, 23 interviewees)

Desired state	Additional responses	Number of Respondents	Respondent Codes
"women should form self-help groups"	"more forums for women"	2/22	SCI2; SCI22
"town account"		1/22	SCI22
"education"	"education"; "school up to class 10"; "higher grade level"; "higher level in the school"; "education"; "education for all of her children"; "education"; "higher education"	9/22	SCI1; SCI4; SCI5; SCI6; SCI8; SCI12; SCI13; SCI19; SCI22
"save money from work to add to village's boundaries"		1/22	SCI2
"cement or brick houses"	"houses to be made of concrete and brick"; "better housing" "better housing"; "better houses"	6/22	SCI3; SCI13; SCI14; SCI15; SCI17; SCI19
"proper infrastructure"	"proper infrastructure";" railway"; "proper infrastructure"; "better roads"; "better road infrastructure"; "better roads"; "better roads"; "roads"	9/22	SCI3; SCI4; SCI6; SCI8; SCI12; SCI14; SCI15; SCI17; SCI20
"medical facilities"	"medical facility"; "health care"	4/22	SCI3; SCI4; SCI6; SCI19
"more wells for irrigation"	"better water facilities"; "water storage facilities"; "water infrastructure"; "more ditches and pumps for water"; "water infrastructure"; "Nabhad watershed project"	7/22	SCI3; SCI4; SCI8; SCI9; SCI11; SCI20; SCI21

Desired state	Additional responses	Number of Respondents	Respondent Codes
"sarpanch in the village"		1/22	SCI5
"access to transportation";	"railway to Bhilwara"; "access to transportation"	3/22	SCI6; SCI7; SCI12

Question: Has the community developed a shared vision for the future?

FES Staff and Community Leaders (6 interviews, 6 interviewees)

Yes	
Project	**Respondent Codes**
"dairy"	SLI2; SLI6
"well at river" ; "more water infrastructure"; "shared vision is the well"	SLI2; SLI6; SLI4

No
SLI1

Question: Does the community have an action plan?

For the well (SLI2)
For the Nabhad Project (SLI1;SLI6)

Rapid Resource Assessment Results- Sanjadi-ka-badia

Rapid Resource Assessment; Sanjadi ka Badiya;29th August, 2008

The exercise was conducted at work site of NREGA, where a group was present and organized for a meeting after completion of the work.

Step 1:

We started with discussions on ongoing NREGA activities in Sanjadi ka Badiya and other neighboring village. Some of the community members asked about Lindsay, where she is right now.

List of the things they like best in their community:

- Unity among the villagers
- Village forum
- Participation of women
- Plot developed with help of FES
- Animal Husbandry

Step 2:

When asked about sustainability broadly the response that came up are as follows:

- Economic security
- Protection of standing resources
- Water both drinking and agriculture
- Better health
- Unity of village

Step 3:

Economic Security: The basic occupation as source of livelihood of the villagers is agriculture, which continues to be largely dependent on the monsoons. Animal husbandry, migration and the ongoing works of government and other departments are other sources of income.

Protection of standing resources: Since 1998 the joint efforts of the community and the project has led to regeneration and development of two plots, which they are using, on rotational basis. The community has very well imbibed the traditional mechanism to ensure sustainability of resource. These aspects are being visible in their traditional protection system (ora), rotational grazing practices.

Water both drinking and agriculture: As stated above agriculture is largely dependent on the monsoons, which affects the crops during low rainfall years. The only source of drinking water is from hand pumps, which are sometimes non-functional and women have to travel a large distance for fetching water. Maintenance and construction of new water storage structure will help in minimizing the drinking water problem of livestock and will help in recharging the groundwater.

Better health: The nearest hospital is in Bhilwara and in critical situations they have to travel further.

Unity of village: A *aam sabha*[1] is called of all constituent hamlets on the day of *ammawasya*[2] at the common meeting place of the village called *hathai*. All the processes of planning review, payments and decision are taken in front of the village community to maintain transparency in terms of decision making and other village development issues and problems are discussed during the meeting.

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[1] General Meeting

[2] No moon day

Community Participation
Protecting the existing resources and putting in efforts for developing newer ones.

Source of Income
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For infrastructure development, roads, hospital, school, roof on hatai, shade in graveyards etc.

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Villagers have constructed water trough for livestock. Need is felt to construct anicuts and undergo SWC activities

Information
Better agriculture practices, better animal husbandry practices and breed improvement.

Standing Natural Resource
Institutions formed have adopted rules reached by common consensus of the community for sustainable management practices.

Community Participation

Source of Income

Financial support

Water

Information

Standing Natural Resource

Observations of Sanjadi-ka-badia

1. Sanitation- no access to improved sanitation. Hygiene- livestock shit in the areas where people live. People using the bathroom anywhere.
2. want to have better housing- but making bricks depletes the fertility of the soil, how can they build better houses with local materials that are more sustainable than brick or concrete
3. Indoor cook stoves that use fuel wood- many women and children have nasty coughs.
4. NREGA program- how is this sustainable if they don't earn enough to get ahead and if it is a short term program. No other employment opportunities in the village, if they have to earn money then they are forced into the unskilled labor force and have to migrate in most cases.
5. how will digging a well result in other problems? Depletion of groundwater- has FES done an analysis of this for the Nabard project? What other options exist for water conservation on the surface.
6. rain catchment in barrels or some other medium?
7. families going into debt to pay dowries
8. girls and boys are betrothed at a very young age.
9. *from interview with Kesibai- Extra question- How she came to be sarpanch of the hamlet- there was an election in the community and she represents the Congress Party, opposed by the BJP(Bharatia Janta Part-y Indian People's Party) and she won it. When she was sarpanch she participated in all community activities. She formed a women's group and she acted as leader of the group. She approached SS Singh of FES and he motivated her to bring FES to help the community.*
10. Notes on how FES works as an organization: trying to establish land tenure rights and figuring out how the project will provide for livelihood in long term. In order to do this need to get the panchayats to accept responsibility. Form groups to work on common lands; formation of groups depends on what they want to restore or what type of common lands they have (e.g., revenue wastelands, common grazing lands, forest, etc.). many of these lands are not important to the government but are crucial to the rural poor for livelihoods. FES formed in 2001 with the National Dairy Development Board. FES has 10 teams in 6 states.
11. In Bhilwara District- check dams have been major type of work. Developing Tree Growers Cooperatives (TGC). Strengthening local institutions. Leasing government land to TGC to restore local communities' source of livelihood and ecological health. Working on revitalizing the connections between man and nature. Reducing migration to other areas for money, fodder, etc.
12. FES pays villagers to do work.
13. Conversation with Suprat- in Bhilwara issues are mostly related to lack of water and fodder during the dry season. It is difficult to work there without full approval of the communities because they are very socially bonded. They are rural agrarian societies dependent on surrounding natural resources. If the families depend solely on wages for food they get into trouble; they need land to cultivate for sale and subsistence. This is especially true when they are forced to sell subsistence crops to pay off debts. In these villages maintaining institutions is what can help sustainability. Institutions

have been degraded in the colonial and post-colonial eras, which has lead to natural resource degradation. The panchayat's role was nominal because expectations were not clearly defined even though they were codified in national and state law.

14. reasons for land degradation in Rajasthan- mining, overgrazing, over-cultivation, deforestation, pollution/industrial waste. The foothills of the Aravalli Range are a priority because they have high biodiversity and are highly degraded.

15. In Rajasthan FES has three team offices and 1 regional office. They are currently working on 9 projects encompassing about 31,567 hectares. It is a patriarchal society so they work with women separately.

16. Steps in FES' work: 1. bring people together; 2. articulate together; 3. decide and act together; 4. build confidence in the process; 5. have a say in what matters; 6. institution building.

17. Common lands are the space for the poor and are therefore dependent on the government because it manages and owns those lands. Commons can then become a platform for collective action towards landscape level conservation. They must take into account all of the factors in the landscape that affect sustainable livelihoods. Ecological restoration efforts- soil conservation, mineral cycles, hydrological regimes, biodiversity, biomass, water conservation. Ways to accomplish this- institution development.

18. Communities in Bhilwara are dependent on rain-fed agriculture.

19. In Bhilwara- brick making has had a significant impact on natural resources because they are taking away needed nutrients for agriculture. The government has stopped the industry but it still continues in some parts and many areas had already been degraded prior to cessation of the industry.

20. *Butea monosperma* was the climax tree species but is almost non-existent now because it was used for gum and fuelwood. *Acacia nilotica* is a commonly used fuelwood tree species. There are about 4 other Acacia species used for fodder and fuelwood.

21. In SKB- began work in 1999 with a PRA and Needs analysis. Finished in 2003 (?). Water main issue based upon needs articulated in 1999.

22. Panchayat system: all elected. Three levels: Zilla parishad (district level); Panchayat samiti (block level) and Gram panchayat (village level. We are working with the Gram panchayat. 5 elected leaders (called a *paunch*), out of those a leader (*sarpaunch*) is elected.

23. Very involved in the project from the beginning; key person, very supportive of project and women and FES work. Working on a well at the river to provide drinking water for the village- 2 lakhs from the village, 5 lakhs from the government.

24. The well at the river is funded by a branch of the federal government Rajya Sabha and they have a contact with Sabash Bagardia at the agency.

APPENDIX TWO: RESULTS FROM NYUMBANI VILLAGE

Outline

    I. Interviews from Nyumbani Village
        a. Interviews with Grandparents Living in Nyumbani Village
        b. Interviews with Outside Community Workers
        c. Interviews with NV Staff and Outside Leaders
    II. Results Categorized by Objective
    III. Rapid Resource Assessment Results
        a. RRA with Grandparents
        b. RRA with Organic Outgrowers Group
        c. RRA with COGRI Staff
    IV. Observations of Nyumbani Village

Interviews from Nyumbani Village

<u>Interviews with Grandparents Living in Nyumbani Village</u>

Interviewee: NVI1
Interviewers: Lindsey; Alice
Date: 22 July, 2008
Questions asked: community member needs

    1. What were your circumstances before you came to Nyumbani Village?
She was initially living well with her daughter but then her daughter passed and she had to look after the five children. She had to find casual work to provide for them but this was impossible because sometimes she couldn't find work. A sister from a nearby church was helping with clothing and food, but not all the time so she still had to find work. She moved to another place where her children bought her some land near NV and she was able to come here after she presented her case.
    2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?
NV has been a big help. The kids' basic needs are being met and other things they had to go without before like soap or lotion they now have. Before she didn't have hope that they would have a good future but now she does. She is not struggling like before, kids are getting education and looking towards the future.
Challenges are less- she can get help in the office and people listen to her; she receives help in bringing up her children; with the kids there are more good things than bad ones. She has no real challenges to speak of since she came to NV.
Social- she is in a place where people have similar circumstances and backgrounds so they can support one another to deal with problems. NV provides an atmosphere to express their feelings and emotions as they live together in a community.
Economic- selling baskets they are able to make and sell them. They can then get things that help them support themselves. The perimeter shambas also help them get extra food.
Ecological- access to firewood and water- she doesn't have to travel a long distance to get either.

3. What are the current issues of your family that are problematic?

Teenagers- there are behavioral issues and they often don't complete their chores.

4. What is happening to help you address these issues?

She has to keep after them to get them to do their work.

5. What are the needs of your children for the future?

Land issues- the orphans are getting an education but they have no land and therefore nowhere to settle after they leave the village. The boys especially will have a hard time because of this. They need to know how to compete in the job market because even with education it is very difficult. Being here at NV will not solve all of their problems because she knows kids from her village who have gotten an education but still cannot find a job; as orphans they don't have anyone to help them after.

6. What is happening to help you address these needs of your children?

She doesn't know unless NV can help.

7. What are the issues of the Nyumbani Village community as a whole?

Food shortage because the supplies have been reduced. They used to get 4kgs of rice now they get 2kgs and it isn't enough.

8. What has been done to address the issues of the village?

They are discussing the issue in meetings and need to figure out what to do.

9. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

It's a difficult question; she would like to see more perimeter shambas so they can provide more food for their families and help solve the food shortage and so they do not have to go to the stores. They need a better way of being sustainable and being given more shambas would help a lot.

Interviewee: NVI2
Interviewers: Lindsey; Alice; Mercy
Date: 23 July 2008
Questions asked: community member needs

1. What were your circumstances before you came to Nyumbani Village?

He had to take care of his grandchildren after his wife and daughter died and someone told them about Nyumbani. He used to sell eggs to earn some income but the children's basic needs were not being met.

2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

Here is able to meet the basic needs of his grandchildren; they have access to water, education, food, clothing. He likes farming and is glad that he has been able to use land there to plant. Challenges- doesn't feel that there have been any thus far.
Social- living together, people have been able to integrate well because everyone came there for a common goal to raise the children and give them an education.
Economic- he makes carved wood products to sell (e.g. spoons, handles for jimbes).
Ecological- does not have to travel far for water and now he has a shamba where he can plant.

3. What are the current issues of your family?

Things getting lost.

4. What is happening to help you address these issues?

He keeps it to himself and doesn't do anything about it.

5. What are the needs of your children for the future?

Further education but he doesn't know how this will be possible- if he has to pay or the office does.
    6.   What is happening to help you address these needs of your children?
The office should provide for as far as they can go; he is not sure if they will help the kids find a job because it has only promised to give them an education. the office should provide people for as far as they can go.
    7.   What are the issues of the Nyumbani Village community as a whole?
Bigger farms to enable them to plant enough food for their families.
    8.   What has been done to address the issues of the village?
They should be given bigger farms because the home gardens are too small and they cannot plant enough to feed themselves.
    9.   What would you like to see happen in the community for the future?
        (Circumstances/Perspective/Opinion)
Bee hives for the families in the village.

Interviewee: NVI3
Interviewers: Lindsey; Alice; Mercy
Date: 22 July 2008
Questions asked: community member needs

    1.   What were your circumstances before you came to Nyumbani Village?
He was living a normal life with his wife but his daughter died and his other children were not providing for his two grandchildren so he took them in and it was very hard to make them comfortable. Their needs were not being met.
    2.   How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?
he continues to do carvings as he did prior to coming to NV; he also had a small shamba. Now the kids are getting an education and their basic needs are being met. He now sees a difference and a bright future for the children. He wants to go back to his own shamba when the kids are finished so he can be independent again. NV has been a privilege for him and they have done great things that he did not expect which has helped him move forward in life.
Social- the environment is good for the children because they can adapt together- they speak the same language and come from the same culture. They also have similar stories so they can get a lot of support from each other.
Challenges- shortage of food; there is not as much as before
Economic/Ecological- he is able to get trees for carving; he is getting a source of income from the environment that he did not before.
    3.   What are the current issues of your family that are problematic?
The blending issue is very difficult; they have to share and live together as a family but it is very hard because they kids come from different home backgrounds.
    4.   What is happening to help you address these issues?
As time has passed he keeps talking to them and it is working better.
    5.   What are the needs of your children for the future?
Major need is education and to settle down after they have been educated so they can live back in their communities and hopefully be able to solve their own problems.
    6.   What is happening to help you address these needs of your children?
NV needs to make future plans to help them because the grandparents cannot help them in the way that NV can.
    7.   What are the issues of the Nyumbani Village community as a whole?

Greatest challenge for all of them is the teenage crisis and even though they can go to the staff it is a daily struggle.
    8.   What has been done to address the issues of the village?
But at least they can talk about it together and help each other through the issues.
    9.   What would you like to see happen in the community for the future?
        (Circumstances/Perspective/Opinion)
A registered group to address issues would help. Also for NV to help kids after they leave here to choose colleges etc.

Interviewee: NVI4
Interviewers: Lindsey; Alice; Mercy
Date: 22 July, 2008
Questions asked: community member needs

    1.   What were your circumstances before you came to Nyumbani Village?
When the parents of her grandchildren died she had to take care of the children and had to do casual labor to provide for them but she was not always able to get work and actually meeting their basic needs was very difficult.
    2.   How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?
A very big burden has been lifted. The children are able to get a good education and she can now meet the needs that she was trying so hard before to meet but could not. They now have food, clothing, and can now bathe with soap.
Challenges- even with all of the help she has received the biggest challenge is the blending. Each child is older so they know that they are not blood relatives so they don't always listen to her. It has taken a long time to establish themselves as a family.
Also- with the grandparents, even though they are all in the Kamba tradition they come from different areas so there is some division among them and they aren't always learning from each other as they could.
Social- even with the division they come together to help with family problems by giving advice. Last year she had a marriage in the village and everyone contributed in the event, so it shows that even though they are divided they are still helping each other. They can often rely upon each other to solve problems without having to go to the office.
Economic-the basket making gives her money to go home and provide some things for her family there. She can also get money from the office for transportation beyond Kwa Vonza.
Ecological- it is easier to get water and firewood so they don't have to go long distances to fetch either of these. The home gardens and perimeter shambas provide them with some extra food.
    3.   What are the current issues of your family that are problematic?
The girls are growing and have special needs. They are not provided with enough underwear or congas, which they need because there are boys they are not related to in the home. She has to make kiondo money go further because of this.
    4.   What is happening to help you address these issues?
She sells baskets; she goes to the office to communicate these issues, especially when she doesn't sell a kiondo.
    5.   What are the needs of your children for the future?
The children need to go to secondary school and will need supplies for this.
    6.   What is happening to help you address these needs of your children?
The office needs to prepare now for this.
    7.   What are the issues of the Nyumbani Village community as a whole?

Food shortage- she was away and came back to not enough food and she asked her neighbors but they didn't have food either.

    8.   What has been done to address the issues of the village?

They used to get more food and there would be extra, so they are trying to figure out what is the right amount (the new nutritionist is trying to see how much each family needs to sustain themselves).

    9.   What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

For her own family she would like to have her own farm to provide food for her family. She wants to see all of the grandparents doing something more than just the baskets so they can earn more income and not have to rely on the office as much as they do now. More social integration to mobilize themselves and make improvements in the village.

Interviewee: NVI5
Interviewers: Lindsey; Alice; Mercy
Date: 23 July 2008
Questions asked: community member needs

    1.   What were your circumstances before you came to Nyumbani Village?

After her husband passed away it was very difficult. She had to raise the children and it was hard and she could not meet their needs- she was only able to grow and sell vegetables. Her own children didn't want her to stay on her husband's land so she came here.

    2.   How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV has instilled a lot of hope. Before the kids were not going to school or getting enough food. Now she can sleep because they have food and education but it will still be a challenge because they will need a place after they finish school here.
She has not faced any real challenges since she came here, there have been so many benefits.
Social- the grandparents can share their experiences and give each other advice.
Economic- the small gardens and basket making allow them to earn some income.
Ecological- does not have to struggle to get water and they can use the shambas to plant vegetables for consumption.

    3.   What are the current issues of your family that are problematic?

Food shortage.

    4.   What is happening to help you address these issues?

They share between themselves. She encourages her children to talk about their problems so they can solve them together.

    5.   What are the needs of your children for the future?

Education and resources to receive a higher education

    6.   What is happening to help you address these needs of your children?

School is currently helping them prepare.

    7.   What are the issues of the Nyumbani Village community as a whole?

The children are not getting exposed to what they will face when they have to leave the village. For example here they are just given water and firewood, but outside they will have to travel long distances in search of both; the same with farming.

    8.   What has been done to address the issues of the village?

The grandparents have a lot of knowledge and are trying to prepare their children for what life will be like after NV. They are trying to bring the kids closer to the grandkids; to make them study; give them responsibility; address issues as they arise.

9. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Education- for all of the orphans to receive it. A secondary school.

Interviewee: NVI6
Interviewers: Lindsey; Alice; Mercy
Date: 22 July 2008
Questions asked: community member needs

1. What were your circumstances before you came to Nyumbani Village?

When her children died the children were living alone for a while but they could not manage so she took them in. she didn't have enough to provide for their basic needs; she could only provide shelter. Sometimes they could not attend school because she didn't have the money to pay school fees. They often did not have enough food.

2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV has lifted a huge burden. The kids are getting a better education and have food, they have enough school supplies. Their basic needs are being met.
Challenges -the food shortage
Social- the grandparents get along very well so the living arrangement is a good one.
Economic- by making baskets they can earn money to buy clothing, for example she can buy clothing for herself and her family at home.
Ecological- they have been able to raise some vegetables in the perimeter shamba even though there hasn't been any rain.

3. What are the current issues of your family that are problematic?

No major issues except the normal ones associated with raising children.

4. What is happening to help you address these issues?

She has to speak with them.

5. What are the needs of your children for the future?

Especially the girls- they will need more clothes, underwear and other special care because of their feminine needs.

6. What is happening to help you address these needs of your children?

The office needs to prepare for these issues before they happen.

7. What are the issues of the Nyumbani Village community as a whole?

Food shortage. The grandparents don't have a formal group in which they can address issues, earn more income. They need to come together as a group more.

8. What has been done to address the issues of the village?

The grandparents depend a lot on the office an will continue to do so unless they form a group; in time the grandparents may be neglected by the office because it will only provide for the children unless they work to help themselves.

9. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

She would like to see higher education for the kids. More harmony between the staff, grandparents, and children so they can work together for this goal.

Interviewee: NVI7
Interviewers: Lindsey; Alice; Mercy
Date: 16 July 2008
Questions asked: community member needs
    1.   What were your circumstances before you came to Nyumbani Village?
Used to live with her husband who is still in her village. She took care of her grandchildren by farming and digging trenches to earn money. She received some help from a church in the form of clothing and school supplies. She was not able to send kids to secondary school because she couldn't pay the school fees. She came looking for NV to get help.
    2.   How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?
Now she is able to educate grandkids. She can meet their basic needs without requiring too much outside help. She is also able to go to her home and check on her other children.
Challenges- she came with 4 of her own grandchildren but has added 5 more. Initially it was very difficult to blend the two families. It is a slow process but it is getting better.
Social benefits- has been able to receive emotional/social/psychological help from the other grandmothers. Sometimes they even share food. She only arrived in March but she was given help from the other grandmothers to buy supplies to make baskets.
Economic- baskets.
Ecological-ability to cultivate farms. Eco-toilets, she had never used one before but had seen them and knows they are helpful to keep a sanitary environment.
    3.   What are the current issues of your family that are problematic?
Children getting sick
    4.   What is happening to help you address these issues?
She takes them to the clinic.
    5.   What are the needs of your children for the future?
Further education after primary school and provision of books and fees.
    6.   What is happening to help you address these needs of your children?
NV should take care of that for them.
    7.   What are the issues of the Nyumbani Village community as a whole?
Food supply is often lacking. Transportation.
    8.   What has been done to address the issues of the village?
Food- goes to NV but they tell them to make use of what they have been given.
    9.   What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)
Would like to see the children prospering and using their education to make a better life for themselves. This is also up to the children to make the effort in school.

Interviewee: NVI8
Interviewers: Lindsey; Alice; Mercy
Date: 16 July 2008
Questions asked: community member needs

    1.   What were your circumstances before you came to Nyumbani Village?
She and her husband were living a normal life because her husband was working they were meeting their basic needs. When her daughter passed away they took over care of her grandchildren but her husband got very sick and lost his sight. They sold their property to pay for his medical bills and could no longer meet their needs or give the children an education. They were very desperate.

2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

There has been a big change from how it was before because now her grandchildren can go to school and their basic needs are being met.

Challenges- when she first came it was very challenging to get the new kids to adjust to her ways and rules. She came in with one kid and got 9 more. But they have been able to adjust. She is comfortable here.

Social- other grandmothers have helped her when she needed it- for example she went home and didn't sell any baskets so when she came back the others let her borrow supplies to make baskets. She feels like a part of a group because they help each other. In the community they have a forum to discuss issues and come up with solutions. There is a lot of support. Being able to have a garden also helps here sustain her family. There is a lot of peace in the village.

Economic- baskets

Ecological/Environmental- n/a

3. What are the current issues of your family that are problematic?

Lack of supplies, eg. Not enough basins or dishes.

4. What is happening to help you address these issues?

They talk to the NV staff to get help with these issues.

5. What are the needs of your children for the future?

For the girls, they need congas to follow the Kamba traditions

6. What is happening to help you address these needs of your children?

They need to have supplies of congas before the girls are of age so they can just get them from the office when it is time.

7. What are the issues of the Nyumbani Village community as a whole?

Raising the children.

8. What has been done to address the issues of the village?

They have to talk with the children and they share ideas amongst the grandmothers to do so.

9. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Would like to see a secondary school so they can cut costs that they currently have to incur to send them away to secondary school. Then they could provide more in the homes. Want to see kids prospering and getting a higher education.

Interviewee: NVI9
Interviewers: Lindsey; Alice; Mercy
Date: 16 July 2008
Questions asked: community member needs

1. What were your circumstances before you came to Nyumbani Village?

Used to live with her children and each family took care of themselves even though they lived in a homestead type of setting. when her children died, she had to care for the grandkids but she wasn't really able to do it.

2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV has helped her meet the basic needs of her children and provide clothing for them. Before they struggled to meet their basic needs- especially providing enough food and education.

Challenges- there haven't been many challenges even with the blending issue.

Social- place to meet with the other grandmothers and a sense of community
Economic- baskets
Ecological- N/A

3. What are the current issues of your family that are problematic?

Supplies are often low- especially for food, soap and clothing.

4. What is happening to help you address these issues?

When supplies are low they go and talk to the staff to help them resolve their issues.

5. What are the needs of your children for the future?

The children are of varying ages and they cannot share clothing or shoes. They will need new clothes in the future because they will grow at different rates. Need a different approach to raising each child. Donations often do not fit.

6. What is happening to help you address these needs of your children?

Need to buy clothing and shoes in preparation for the kids' growth.

What are the issues of the Nyumbani Village community as a whole?

Food supply, often she doesn't have enough rice and will go to her neighbor- she often finds that they don't have enough either.

7. What has been done to address the issues of the village?

When there is a shortage they approach the relevant people and are told that they have to make what they are given last.

8. What would you like to see happen in the community for the future?
(Circumstances/Perspective/Opinion)

Wants a bigger farm to feed kids so that they can manage themselves.

Interviewee: NVI10
Interviewers: Lindsey; Alice; Mercy
Date:16 July 2008
Questions asked: community member needs

1. What were your circumstances before you came to Nyumbani Village?

She used to live with her children. she was in charge of taking care of the grandchildren's education. Her daughter separated from her husband and moved to Nairobi to get work but died. She sold her land to provide education for her grandkids and she was the only one left to care for them. The government came to tell them about NV and then they came here.

2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV has done a lot for them. She used to have a very hard time buying supplies for school and looking for food. She had to work all of the time. But this burden has been lifted because their basic needs are now met and the kids can go to school. The provision of basic needs and education has helped a lot. The children also have soap and toothpaste- they never had these before. Challenges- the blending issue is a big one because they don't know the kids' backgrounds and the kids often have a deep separation. Getting them to live together in one house is difficult. Basic needs are being met.

Social- each grandparent can meet the basic needs of their families and they respect each other's space (the grandparents) so they have a good community relationship. She can see a bright future for her kids. Even though she is aging she can see that they are getting an education that will help them get a career; before they didn't have a lot of direction but now they do.

Economic- the sale of baskets has helped her buy clothing and others things that are not provided. She is also able to visit her other children and give them support if they need it.

Ecological- N/A

3. What are the current issues of your family that are problematic?

Getting all of them to live together well. Disciplining the children is very hard.

4. What is happening to help you address these issues?

The grandmothers work together to solve problems and discuss their issues. She manages the supplies they get so that they are distributed equally so kids do not fight over them. When the kids are in charge of cooking she only gives them a certain amount.

5. What are the needs of your children for the future?

Many kids are preteen, they will need special attention in the near future.

6. What is happening to help you address these needs of your children?

She is trying to talk with them to address issues they will face in adolescence.

7. What are the issues of the Nyumbani Village community as a whole?

N/A

8. What has been done to address the issues of the village?

N/A

9. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

Grainery to mill corn. For kids to prosper and live well once they leave.

Interviews with Outside Community Members Working with Nyumbani Village

Interviewee: NVO1
Interviewers: Lindsey; Nancy
Date: 29 July 2008
Questions asked: community member needs

1. For Shamba villagers- What were the largest issues in the community prior to initiation of the project by Nyumbani Village? (Circumstances/Perspective).

The lack of water caused a lot of problems related to farming- they were not able to farm or raise tree seedlings. The orphans were also a big problem and were not being cared for. There were not any SHGs or CBOs (community based organizations) so they were very unorganized. Lack of roads and transportation; lack of employment.

2. How has the development of NV helped to address issues in your community (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

His community per se has not been helped, but they have acquired skills to help themselves. The skills he has learned in making wells have been used to dig wells in his own community, which have helped them with issues of farming related to water. With the wells they are able to grow vegetables to sell and consume. Another organization CCF has helped with his community more. NV has provided employment and he has gained skills to teach others.

Challenges- when NV came it brought good and bad things. Sometimes, even though they can build wells, there is a scarcity of materials. There is also a poor procurement system for materials he needs- they are ordered but do not come for a long time Some people have stolen from the children. Often their payment is delayed, sometimes up to 2/3 months, which has made people steal from the village because they don't have any food or money. The people in charge don't send documents on time and he isn't given a copy of the work documentation so he has no way to account for his time.

Ecological- the area was a desert but now more water is available because of the sand dams and access they have gained through wells. Vegetables & trees- many community members are now growing them at home because NV has taught them how to do so.
Social- in relation to the orphans a big burden has been lifted. People have learned how to construct homes and how to make bricks. They have gained skills in composting and organic farming, which is good for poor people who cannot afford to buy chemicals but still need to provide food. NV has built a church, which is promoting moral values.
Economic- vegetables can be sold, as well as trees. He has earned money to provide for his children.

3. What are the current issues of your family?

Sickness; land scarcity; lack of markets.

4. What is happening to help you address these issues?

Sickness-they have to travel to Kitui
Land- they use intercropping techniques to maximize the outputs
Markets- can only sell a few and the rest of the produce goes to waste.

5. What are the needs of your children for the future?

Education- they need to go beyond secondary; land on which to settle; good parent to instill responsibility etc. they need to learn business skills

6. What is happening to help you address these needs of your children?

He is sending his kids to school, teaching them business as well. He only has 2.5 acres, which wont be enough for his kids; he gives them education and skills so they can help themselves.

7. What are the needs of the community as a whole?

Poor leadership- corruption and no accountability to stop the corruption. Electricity- they have to generate 35,000Ks to bring it but they don't have the money. Water- masinga water only goes to the schools and they don't have the money to pay for infrastructure; there is also sickness associated with poor water quality. Alcoholism in the region has also increased poverty. A lot of theft.

8. What has been done to address the needs of the village?

Poor leadership- they can't do anything about it because they would be banished from the community. They get relief food through the village leaders, but they often don't get what they are supposed to but if they complain then they get even less the next time.
Electricity- nothing
Water- they have to buy pure water.
Health- lacking in the community.
Alcohol- until the sale of it is illegal they cannot do anything.

9. What would you like to see happen in the community for the future?
   (Circumstances/Perspective/Opinion)

Need more training in farming so they can be self-sufficient. Better transportation system. Education and capacity building in animal husbandry so they can earn money, which can help them develop in other areas, e.g. planting fruit trees. Reduction in corruption.

Interviewee: NVO2
Interviewers: Lindsey; Nancy
Date: 17 July 2008
Questions asked: community member needs

1. What were your circumstances before you came to Nyumbani Village?

The land that is now NV was heavily overgrazed and degraded from people felling trees for charcoal; they would do this illegally because the land was not theirs and they did not have permission to use it. They had many problems just meeting the basic needs of their families. They didn't have food, clothing, or enough money for school fees and uniforms.

2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV helped them by creating job opportunities and enabled them to help their families and children.

Challenges- most of the families are not educated and they have a hard time understanding what they are doing with NV, especially the sustainability part. It is hard to implement what the concept is.

Ecological benefits- they have learned how to plant and manage trees; now there is more water throughout the year which helps them grow crops in times when they could not before.

Social- learned how to live together as a community- there is change in the community and they are learning from each other and outsiders.

Economic- employment and securing livelihoods; they have been educated in crop management and can practice those techniques at home.

3. What are the current issues of your family that are problematic?

Often they are not able to finish schooling; shortage of jobs. Dryland habitat makes it difficult to raise crops.

4. What is happening to help you address these issues?

To some degree the government is helping his family; about ¼ of their problems are solved by the government with school supplies and maintenance of the school. NV is also helping address those issues.

5. What are the needs of your children for the future?

Education, land will be subdivided and they will need jobs to provide for themselves.

6. What is happening to help you address these needs of your children?

For now he is working hard to keep two jobs and the government is helping send his kids to (primary) school.

7. What are the issues of the Nyumbani Village community as a whole?

Same problems of food security, dry habitat farming, lack of employment.

8. What has been done to address the issues of the village?

Did not ask this question because he fused questions 3 and 7.

9. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

That the community will improve; already it is changing because of NV. In ten years they would like to be able to sustain themselves.

Interviewee: NVO3
Interviewers: Lindsey; Nancy
Date:28 July 2008
Questions asked: community member needs

1. For Shamba villagers- What were the largest issues in the community prior to initiation of the project by Nyumbani Village? (Circumstances/Perspective).

Lack of jobs; crops were often destroyed by animals that hid in the thick brush because the land was uncleared; lack of water, especially in the riverbeds; food scarcity; lack of transport; lack of knowledge about farming practices.

2. How has the development of NV helped to address issues in your community (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV has employed many people; sand dams have helped increase the amount of water available; they have learned about new ways of irrigation and sometimes they can get transport in times of emergencies.

Challenges- bad payment- low wages that do not provide enough for their families; the village is very far to reach from their homes and there is not any transportation for them; in the farm monkeys are stealing the crops. Snakes are a problem at night.

Social- more knowledge about farming, tree planting- there has been a reduction in charcoal production and burning because less trees are being felled (?)(ecological). People are more able to provide for their families the money they earn allows them to buy food.

Economic- wages; he has learned about castor and has planted on his farm to sell to NV for a profit

Ecological- increased soil fertility because of use of manure and compost; no longer using chemicals to fight off garden pests; the use of organic farming techniques.

    3.   What are the current issues of your family that are problematic?

Health, lack of health care; lack of a nearby church; food scarcity, getting clothing; availability of water.

    4.   What is happening to help you address these issues?

Food-they have to depend on rains and crop storage; for water quality they just have to boil it; church- they don't go. Clothing, can only buy from month to month, one thing for one family member; medical- they go to Kwavonza or to the NV clinic.

    5.   What are the needs of your children for the future?

enough food for the family, a place to pray; enough water and wells.

    6.   What is happening to help you address these needs of your children?

They have improved farming techniques and can sell plants as well as consume them. He is planting vegetables and fruits to improve their nutrition.

    7.   What are the needs of the community as a whole?

Lack of a church; water scarcity; food scarcity

    8.   What has been done to address the needs of the village?

They have groups that dig wells at rivers. Food- they get help from the government (e/g in the "Work for Food" program, the government pays you for the work you do on your own farm). Church- some people just travel far to go.

    9.   What would you like to see happen in the community for the future?
        (Circumstances/Perspective/Opinion)

Roads, health centers, churches, more greenery.

Interviewee: NVO4
Interviewers: Lindsey/ Nancy
Date: 25 July 2008
Questions asked: community member needs

    1.   What were your circumstances before you came to Nyumbani Village?

M- lack of employment; There was also scarcity of water. There was a lot of insecurity because the brush on the land that is now NV was very thick and people could easily steal livestock and hide them there; lack of transportation and roads.

    2.   How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

M- NV has helped bring money to send his kids to school. He was able to buy land to settle here. The sand dams have helped to conserve water, which can provide water for the livestock. More security. The improved roads have helped, especially when people are sick. Before they didn't

know how to use compost but now they have learned and are using the methods at their farms at home.
W- he is able to make money to help send his sister to school. They have earned skills in milking and growing crops using organic methods.
Challenges- they don't see any; they are comfortable

    3.   What are the current issues of your family that are problematic?

M- famine because they do not have enough rains or water to produce crops, water scarcity is a big issue,
W- getting education for the children

    4.   What is happening to help you address these issues?

M- they have to fetch water with donkeys from a long distance away
W- sometimes the government gives money for education; he grows vegetables at home to help feed the family and has a perimeter shamba as well.

    5.   What are the needs of your children for the future?

W- education, fodder for livestock,
M- land on which to settle, peace

    6.   What is happening to help you address these needs of your children?

W- he buys goats and cows
M- bought land for his children to have when he dies.

    7.   What are the issues of the community as a whole?

W- livestock; lack of education
M-water

    8.   What has been done to address the issues of the village?

M- they have dug a shallow well
W- education, the community has a Harambee, where they pool money to help pay for education; the community also comes together to provide food.

    9.   What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

W- more water; more vehicles for transport, shopping center, nearby hospital
M- hospital nearby, more schools.

Interviewee: NVO5
Interviewers: Lindsey
Date: 15 July 2008
Questions asked: needs

    1.   For Shamba villagers- What were the largest issues in the community prior to initiation of the project by Nyumbani Village? (Circumstances/Perspective).

Before they did not have a place to work. Before the road infrastructure was lacking and it was difficult to get to Kwa Vonza. Many children did not have parents and they had to care for them. There was no medical facility.

    2.   How has the development of NV helped to address issues in your community (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV gave them a place to work. The development of NV brought more roads to the area. The clinic makes it easier for them. There have been many benefits.
Ecological- Now they can plant vegetables to give to the children.
Social-They outside children may get a place to go to school and learn skills. They have developed groups to work on sustainability and to work together.

Economic- they can now earn wages and they have earned skills they can use in other areas, the polytechnic also is helping to give kids the opportunity to learn skills.
Challenges- access to tools to finish their work. They don't have appropriate gloves, and the ones they do have wear out quickly. They don't have uniforms and sometimes they are in places where it is dangerous to work because of thorns. The eco-center (humanure) does not have a roof so it can cause problems when it rains.

3. What are the current issues of your family that are problematic?

Lack of roads. No medical facilities close to where she lives (about a two hour walk away). Education

4. What is happening to help you address these issues?

N/A

5. What are the needs of your children for the future?

Education, health and health care.

6. What is happening to help you address these needs of your children?

Difficult at this time, schools are very far away and they can't send the young ones so far. The medical facilities are also very far away.

7. What are the needs of the community as a whole? I asked her about her own community, not NV.

They need more employment opportunities, without money it is hard to survive. Transportation is lacking.

8. What has been done to address the needs of the village? N/A

9. What would you like to see happen in the community for the future? (Circumstances/Perspective/Opinion)

IN her village she would like to see more road infrastructure, and a closer medical clinic.

Interviewee: NVO6
Interviewers: Lindsey
Date: 21 July 2008
Questions asked: community member needs

1. What were your circumstances before you came to Nyumbani Village?

In this area there was no work and no way to get money. There was no water and roads were very bad.

2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV has helped with the water and roads issues. They have been provided with employment, they have learned new ways of crop management. .
Challenges- making people work hard to address problems in the area and in the jobs they do receive.
Ecological- in the main farm they have learned new methods for food production for a longer time; the new crops they have introduced are doing better in this area.
Social- perimeter shambas help them satisfy their basic needs; the community has gained more knowledge about crops, animal husbandry, and composting. The ability to get medical care at the clinic.
Economic- the ability to grow vegetables for consumption and sale. Their families are living better because they have money to buy food, clothing.

3. What are the current issues of your family that are problematic?

Finding good drinking water and food security.

4. What is happening to help you address these issues?

Trying to reduce problems by using the perimeter shambas for consumption and sale. They need more bore holes for water.

    5. What are the needs of your children for the future?

they need to improve so they can live easier lives than they are now.

    6. What is happening to help you address these needs of your children?

New methods of agriculture and better education and teachers.

    7. What are the issues of the Nyumbani Village community as a whole?

Roads are poor and there is no access to transportation. No nearby medical centers. And lack of education opportunities.

    8. What has been done to address the issues of the village?

Medical-perhaps a mobile clinic and a dispensary, but this has not happened so far.
Roads-nothing is being done, but the road from Kwa Vonza is slowly being repaired.
Education- the system of teaching has been changed so they get better teachers.

    9. What would you like to see happen in the community for the future?
       (Circumstances/Perspective/Opinion)

Need to reduce the lack of food by having more crop productivity. More employment opportunities; better roads and access to transportation.

Interviewee: NVO7
Interviewers: Lindsey
Date: 21 July 2008
Questions asked: community member needs

    1. What were your circumstances before you came to Nyumbani Village?

Life was very hard because they lacked money, brining up their children was very hard, the whole community was only relying upon rain to raise their vegetables.

    2. How has the development of NV helped to address issues in you faced prior to coming to Nyumbani Village (Circumstances/Perspective)? Please describe successes or failures of the efforts to address these issues (Opinion). What are the ecological benefits? What are the social benefits? What are the economic benefits?

NV is helping people very much with wages, for example when the buildings were being constructed. People have been very uplifted by this.
Challenges- delay of payment, they don't break for tea only for lunch; he doesn't have protective gear or a place to wash and change clothes; people lack tools to do work that NV asks them to do. He doesn't know what they are going to do about the humanure and urea because he has recently been told that they cannot use them to grow crops and have to use them for other plants. Sometimes they come to work and there isn't any work available for them.
Ecological benefits- waste management.
Social- people are happy because it is easier to raise their families. It is better to have something than nothing.
Economic- employment, they are able to sustain their families with food and clothing and are able to pay school fees.

    3. What are the current problems of your family?

N/A

    4. What is happening to help you address these issues?

N/A

    5. What are the needs of your children for the future?

Food, clothing, soap, lotion

    6. What is happening to help you address these needs of your children?

Preparing for the future- the children need to be educated so they can meet their needs in the future.

7. What are the issues of the Nyumbani Village community as a whole?
Water- they have to travel a long way to get it.
Many people don't have enough food and the price of food is rising. There often isn't enough money to clothe their families. Prices of goods are also rising- there are not any shops that offer cheaper prices- people who make a lot more pay the same price. The majority of people in the community still do not have work in spite of NV being here.

8. What has been done to address the issues of the village?
Most people burn and sell charcoal to make money. People who are involved in NV are helped a lot. People also sell firewood. Some people in nearby communities make ropes to earn money. They don't get any help from the government. Sometimes the children are forced to graze cattle for other people in order to earn money, often they are very young like 10/11 years old.

9. What would you like to see happen in the community for the future?
   (Circumstances/Perspective/Opinion)
For example, when the government does population censuses, they don't ask who is working and who is not and then the taxes are the same for MPs who earn so much more money. He would like to see a more realistic view of the unemployment rate.

Interviews with NV Staff and Outside Community Leaders

Interviewee: NVS1
Interviewers: Lindsey
Date(s): 7 and 10 July and 3 August 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified? *Everything has to be done with the NV orphans and grandparents in mind.*
   A. **Agro-processing Center** (AC)- *"heart of the village". The idea behind this unit is to develop economic activities, energy for village needs, market for local surrounding villagers, for the benefit of both the NV villagers and the surrounding communities. They are using the polytechnic to help the center develop value-added processes. There isn't a market in the area that is well developed, they are hoping to do so with the AC so that locals have a market to bring their products. They will process dairy, crops, seeds, honey, castor and other oil seeds. Energy is a huge issue- people don't have access so they have to create energy manually. Electricity is very expensive and not an option for many people. Looking for renewables as the option- primarily Jatropha and castor bean. GEM has been helpful with getting things started, bought beehives, and John is working on creating markets to sell villagers' honey and to build capacity with villagers.*
      - *Challenges:*
      - *Successes: it is still trying to get going so it is difficult to say.*
   B. **Polytechnic** *manages some trees around the building for use in the future. Helping with the value-added products in the AC.*
      - *Challenges: not as involved in this activity…asked for me to check with others.*
      - *Successes:*
   C. **Essential Oils Factory-** *Father Dag knew that the village would need another source of income apart from the garden, so essential oils is a high-priced export. However,*

they had to halt production because of the post-election violence- an area where they received their products was affected by the violence (find a local source, or produce their own?). currently they have to use a diesel powered generator and would like to convert to biofuels generated on the farm. This is Sister Mary's project

- *Challenges: not currently in use because they don't have the raw materials (note-all of the equipment is exposed to the weather and is uncared for at this time). Expenses are higher than the income it generates- the transport of materials/gas/labor is very expensive.*
- *Successes: they have done some production in the past prior to the violence in the post-election period.*

D. **Capacity building of NV children**- *the school has developed clubs to help teach them sustainability, farming techniques, water conservation. Grandparents- they give workshops during the day while the children are at school for water conservation, farming, cooking, fuel efficiency. This transfers to the children because they learn daily activities they can do in their homes. Also have the grandparents work with outside villagers, e.g. in the main farm, to transfer knowledge they have gained as well.*

- *Challenges: the orientation at the beginning of their stays there was insufficient-there is no packet of information or protocol about sustainability so they don't understand it. The expectations were too high for them to participate in sustainability projects for themselves and they didn't set out the expectations in the beginning. For example, the kids were told that they were coming to NV to get an education, and now they want them to farm but they kids don't want to. He doesn't see a lot of activities that actually get the kids outside learning about sustainability or changing their ways of thinking and acting. They need exposure to other people in the area...they are isolated and only focused on school.*
- *Successes: N/A*

E. **Riparian Zone**- *have planted native riparian trees, as well as some neem, maintaining the groundcover, which has also increased in the zone. Outside villages have been involved because they provide seeds, they have gotten them to pick seeds for planting, NV tests the viability, and then the villagers have access to the nursery to cultivate the seeds, they are paid when the trees reach one foot. The villagers perception of trees is generally related to charcoal, they are trying to build capacity and change the mindset so they see trees in other ways as well. (Ecological, social, and economic successes).*

- *Challenges: water quantity is still lacking- they need to either construct more sand dams or raise the ones they currently have but they do not have the resources to do so now.*
- *Successes: see above...feels good about the diversity- it is one of the only tangible and visible things that the community outside has done and is a big success.*

F. **Water conservation and infrastructure**- *sand dams created on the river to serve as groundwater recharge and prevent sediment erosion. water is the biggest factor in the village. Fodder is now available in the riparian zones because they can reach groundwater resources. At each sand dam they have constructed a shallow well with a solar pump that feeds the water to storage tanks which then use gravity to feed drip irrigation system to the farm. There is also a bore hole which is pumped for consumption by the village. Have to use a diesel pump, would like to switch to biofuels.*

- *Challenges: people waste a lot of water and are not committed to water conservation (NVillagers specifically). The infrastructure is very poor, as is the quality. Lack of trained people to fix and solve problems related to water.*
- *Successes: see above. There is a lot of availability and they are trying to build capacity and are working on constructing a grey water system in all of the clusters.*

G. **Plantations**- *selection of plants that are useful to the village. Neem, for example, has medicinal qualities, also it's leaves can be ground into a flour, which is crucial in dry-lands where cereal production is difficult. The plant also has use as a biopesticide. Croton megalocarpus- nitrogen fixing, seeds have high oil content. Seeds are also good chicken feed. Eucalyptus- arboriculture. Melia volkinsii*

- *Challenges: watering the seedlings, pests such as termites and overgrazing by goats.*
- *Successes: tbd?*

H. **Seed Orchard**- *see riparian zone section above. Deforestation is a big issue on the perimeter and all around the area. They need to establish trees here because they may not exist in the future.*
Challenges: They would like to involve the community in propagation at NV and propagate outside as well, but now there is no money in the community on the outside.
Successes- community involvement is good now but in the future could pose a problem because the outside seed source is unreliable.

I. **Perimeter shamba**- *the size of the village and farm make it hard to manage, so instead of building a fence, which could have isolated the village, they decided to incorporate the surrounding community to give them ownership and access to land for crops and to serve as a boundary against encroachment. They engaged willing community members, gave them seeds, land and water. They sign a one-year lease. The number of shambas is growing. It has benefited the community members. He does not see a lot of encroachment on the farm either. It is challenging to get the land prepared in time. The farmers are asked to sell back excess vegetables to the village, which can minimize food security risks. They now have about 65 active members and provided a shallow well and allowed them to move so cultivation is easier. Challenges- the people who have been leased plots do not plan well, primarily because it is a lower priority for them in relation to their activities at home and their own gardens. They often plant too late and cannot get a good crop to harvest because of this- dependent on rain-fed agriculture. The people are not reliable because they are living in poverty and their first priority is to make money for their families.*

J. **Livestock**- *they have capacity for 20 cattle. They have been given free consultancy by Land-o-Lakes. they started out with 5 cows that were pregnant and got 3 calves out of them. They selected a Fresian-boran cross per recommendation by Land-o-Lakes. fresians are better milk producers but boran is a locally adapted breed. They use AI and are focusing on keeping the Fresian breeds more. Now have 9 cows and three bulls- will sell bulls. A challenge is that they don't have the right facilities. They have decided to focus more on dairy goats because they take less fodder and their milk is more nutritious. They are getting help from World-Wide Sires and Farm Africa for advice on breeding stock and procedure. Ideally they would like to give does to the families and only keep the bucks in the facility. Would like to have families consume what they need and then sell excess to the agro-processing unit to make value-added products to sell. It is difficult to maintain the organic status; fodder is an issue (they currently get fodder from the riparian zone). Operating costs are quite high.*

Benefits- sho-shos are giving compost to livestock to eat. They are also beginning to make the connection between milk production and nutrition for the livestock. Labor and resources are also difficult to organize and do not exactly have the right equipment. Use of ox cart is very helpful;. Limited by labor.

K. **Composting Unit**- *humanure and livestock. Can't use humanure on any edible crop. Only use for tree planting. It is challenging to get people to separate waste (organic versus non) and to take it to the right place. Waste management in the village is lacking a lot and they don't even have a policy on it. They are starting to get an idea of how to compost but they have to change their culture to do so; much more could be composted. They need to work on capacity building and composting.*

L. **Chickens**- *they want the families to have their own eggs. Many of the families came with chickens so they didn't even need to give them any. They ended up just giving them eggs so the population would multiply, but the population has gotten a disease and has gone down. Families are now consuming the eggs instead of letting them hatch. Would like to just have an incubator and give chicks to people so they can have their own eggs and maintain the population. They don't' want to supply chickens or eggs.*

M. **Apiculture-** *GEM project- provide them with hives so they can sell back to the agro-processing unit and create a market for their products.*

Challenges- human resources, people do not have the skills right now to manage, even the staff. He is having to handle this on his own with Phillip. There is a lot of potential for this project but they just need the capacity to make it work. The demand is for the new hives with pure honey but the culture there is to use logs and traditional methods, but this type of honey does not sell.

One of the main priorities is to do more in the homes to instill responsibility. Want to teach them skills to practice sustainability when they leave, especially the children. For example, with the home gardens, they don't know if they will fully accept it. It is behind but taking shape. Other areas are also practicing sustainability, for example the polytechnic and the clinic.

2. What is the level of community involvement in these efforts?

Outside community- Engaging the outside community was very difficult in the beginning. The outside community is very important to the village. The outside villagers perception of NV is changing, they no longer see it as the rich neighbor. They can now see that NV can benefit them. They are more self-motivated than before, he has seen an improvement in the responsibility the villagers feel. Short-term thinking of the surrounding villagers, they want immediate results or cash, don't conserve trees at all. Need to change the mindset. Overgrazing is also a big issue. Historically, external agencies have come to do projects, especially on government lands, but with no local input and no incentive to manage sustainably when the funding leaves. People will illegally extract fuelwood or wood for charcoal.

NV- Less difficult to engage them because they are living in the village. It is also difficult to engage the villagers to some degree because of their age being school age children and grandparents. Getting the NV villagers to be responsible is really challenging. Also getting them to make the systems connection- i.e. they need to plant seed oil plants to provide energy to pump water, have to maintain trees to restore groundwater, etc.

3. What evaluation techniques have been used to assess these efforts?

Very informal and not well developed. They do not have any evaluation tools. People are not currently evaluating the village, they need an independent consultant to assess finances. GEM is

really the only organization that has been helping with evaluation- John has done some exercises with the staff but beyond that, nothing is being done.

Staff evaluation- thinks they have a wonderful staff. Because a lot of them are Kamba they have a cultural advantage in the area. Every 3 months they look at the budget against the work plan. Mostly they have met their goals in the sustainability department, but not for the whole village. In his department everyone does a 3 month performance evaluation. In the village the departments function independently.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Engaging outside communities and NV villagers, getting them to be responsible. Cultural forces that do not include conservation measures. Essential oil extraction plant supply. Dependence on diesel for water pumps. There is a big problem because people/staff are not involved at all in the decision-making process of the village- it is all top-down management.

5. What are the successes of these efforts (ecological, social, economic)? *See above*

6. What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Overgrazing and deforestation in the adjacent areas. How to get the kids trained in other life skills. All of the efforts currently are geared towards formal education. They are not receiving training in farming, livestock management. NV is really losing the connections with the outside community- this is a huge issue and NV needs to go back to the chiefs. They need to assess their resources and work accordingly- there is a lot of donor pressure to add villagers and housing, but they cannot handle it at this point with the resources they now have.

7. What are future plans for your work in this community? Is there a specific plan that has been developed?

They are trying to make sure that the villagers have a sustainable life and to instill the kids with skills to continue to do so when they leave the village. They are encouraging them to work on the land they own, they need to help create options for them when they leave and develop skills for life. There is a lot of opportunity for the families to earn money off of their land, the 29 grandparents own a lot of land where they could plant castor or develop in other ways. People need to think beyond their life there.

Specific plan- had one but had to change and are currently developing a new one. They were supposed to be sustainable by 2011 but want to add 5 years and need to create a more detailed plan of action to do so.

8. Has the community developed a shared vision for the future?

They are not actively involved, they need to be. The future is compromised because they are not involved. The outside community is looking ahead in small groups but the inside villagers are just living from day to day.

Interviewee: NVS2
Interviewers: Lindsey
Date: 1 August 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

Perimeter shambas- the grandparents are preparing them with the children. They prepared the land in April and planted even though rainfall was low. They are able to grow some vegetables for themselves, which contributes to the sustainability of the village. They are also doing this in the home gardens- all families have been planting skuma, spinach and other vegetables to help

meet nutrition requirements and to supplement what they buy. The baskets- they do not have a sufficient market and want to sell more to generate money for the household. They would also like to give each family a goat for them to milk and get manure for compost. The grandparents are also trying to work with the development of a gray water system to water their home gardens. Needs identified- in the village they visit the homes to see where there are gaps, for example- food supply, cleanliness, chores. They use observation to see what is needed. They also do informal interviews with the villagers, often in a group setting. the reports the grandparents give to the staff helps them identify and solve problems.

With the outside community they have barazas, for which the chief notifies them. They go to listen to the community members to see where problems are. With the orphans a committee brings needy cases to them and they start the process of bringing them to NV- they often meet with the District Children's officers, other NGOs, churches to identify needy cases.

2.   What is the level of community involvement in these efforts?

Sho-shos- average involvement, often because they are resistant to change- it takes a lot to engage them and train them. For example the blending issue is very difficult and they often do not want to discipline the kids. Many are just not able to manage because of their age or other disabilities.

Kids- more involved, for example in the wood lots and fuel wood collecting. Their participation in the village activities is good- they are learning about farming in the home gardens and how to plant trees. They are getting them interested in sustainability. They are ambitious and energetic. Outside- average= they are offered labor and the chance to participate in village activities. They provide a lot of support for the village and they are exchanging knowledge.

3.   What evaluation techniques have been used to assess these efforts?

Monthly reports used to assess work completed, where they need to go back, move forward. They share with the other departments in staff meetings.

4.   What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

So many challenges especially with communication. The concept of sustainability is not fully understood and there is a lot of argument between all of the players, also a lot of disorganization which affects performance. There are many gaps between the staff and the villagers and things are often left uncompleted. There are also confusing policies that are developed elsewhere and not completely understood even though they are to be implemented. They also don't know what to do when the kids exit the village this isn't being addressed.

5.   What are the successes of these efforts (ecological, social, economic)?

Kids are performing well in school and work well with the teachers; attendance is high. Use of locally available resources for example water, fuelwood, vegetation- these have helped generate income (reduce poverty). Many people are beginning to see NV as their home and want to see it flourish- especially with the villagers there is a sense of belonging. They staff and villagers are learning from each other.

6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Working in the local community- no professionalism or SOP to work with them. They need protocols for how the staff is to act and stick to these. At the end of the day they achieve very little because they have unclear objectives- they have the objectives (ie getting the kids an education) but no clear path to meet them. There is not a lot of follow- up on the cases of the villagers. The kids are always in school so they cannot come to counseling. Transportation- they can't get out to visit families in the surrounding community. If each department could have a vehicle it would be easier. There is a lack in staff, they don't have enough people to meet their goals and they are often very overwhelmed. The grandparents don't understand the concept of sustainability and think that it means that they will have to do everything and they came here because they were told that they would have their basic needs met and the children's education provided. They are

scared that they will have to sustain the village themselves. The outside villagers think that if the village is sustainable then they wont be able to work there anymore.

7.   What are future plans for your work in this community? Is there a specific plan that has been developed?

Work plan- just work from week to week- they don't have a long term strategic plan.

8.   Has the community developed a shared vision for the future?

No there is a lot of disconnection as to where the village should go- the disconnect is between the villagers, the staff and the outside community.

Interviewee: NVS3
Interviewers: Lindsey
Date: 9 July 2008
Questions asked: actions

1.   Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

The clinic is currently donor funded. They have to rely on the government for supply of essential drugs. Staff, grandmothers, children currently do not pay for services; outside villagers do a cost sharing program, they pay only for drugs not services. They have been open for 1.5 years and want to earn money in the long-term. There are no other clinics in the area. The nearest hospital is in Kitui- but there is no transportation. Comprehensive HIV care is difficult without a lab. They could charge if they had a lab. Would like to start maternity services and vaccinations (which are provided by the government). Would like ambulance services to the nearest hospital.
they have received outside help from other medical facilities. They also engage local leaders, for example in the churches to create awareness about the clinic.
they are trying to cut costs by teaching preventative care.

2.   What is the level of community involvement in these efforts?

the approach is community participation. They have a group of grandmothers they teach hygiene so they can teach others in return and disseminate information on HIV prevention. The cost share program makes health care more available to the outside community

3.   What evaluation techniques have been used to assess these efforts?

use medical records, increasing numbers can show efforts are successful
questionnaire for patients, also visitors make comparisons between the clinic and others. if they are meeting their budget
inventory reports are also indicators and serve as policing of drugs.

4.   What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Level of awareness, community members don't know that they want to be self-sustaining, they don't' understand that they are currently donor funded and wont be funded forever. Clients think it's for free.
the population's lack of education which reduces their level of understanding how NV works. For example, the need to use deworming drugs or eco-toilets. The grandmothers are very old and slow in taking in information, they cannot understand why they need to adhere to drug schedules or why they shouldn't overcook food. Poverty in the surrounding area. No secure means of transportation. Communication-medicine is a field that is always changing and they are very isolated; they don't always have access to new information and techniques. The environment is semi-arid. Electricity- there is no way to preserve medicines in a refrigerator. The children have also been traumatized and it takes time to address their needs. The grandmothers need more physical activity to maintain their health.

5. What are the successes of these efforts (ecological, social, economic)?

Environmental- easier access to the facility for disabled people, beautification of the area around the clinic so it's a nicer place to visit. They have an incinerator to deal with waste. Encouraging clients to plant trees. Trying to get people not to kill snakes so the mouse population will be controlled. Also teaching the importance of cleanliness in the home to reduce pests; prevent communicable diseases; and practice good hygiene. They do follow-ups to the homes to see if people are following the advice.

Social- positive change in the community, especially in relation to perceptions of HIV/AIDS. People have equal access to the clinic regardless of their education levels.

kids are seeing that they can live together. Providing access to medical care. They offer individual and group counseling for villagers as well as the staff. Having many sports helps the children get their energy out.

Economic- haven't had time to really see the economic benefits; the best they can do is to maintain accountability. They are seeing growth in the number of clients and would like to be self-sustaining in the future.

6. What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Electricity is a big problem for them. They have space for a lab but no other components. There are a lot of things that need to be addressed.

They can get drugs from the government but need to prove they have the capacity to manage them.

7. What are future plans for your work in this community? Is there a specific plan that has been developed?

Vision- have the clinic be self-sustaining so it can contribute to the village's welfare- more patients, more services, more involvement from the government. Have a medicinal garden. Lab. Maternity and infant care. More outreach services for HIV/AIDS prevention. Ambulance services. A fridge to store vaccines, which are free from the government.

8. Has the community developed a shared vision for the future?

N/A

Interviewee:NVS4
Interviewers: Lindsey
9 July 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

The village was built on the concept of sustainability. Home care works with the sustainability department, for example, with the home gardens so the families can produce their own food. They have given them demonstrations on how to maintain the gardens and every family has been given a garden. The lack of rain is a challenge. Some families also have chickens for egg consumption. Self-sustenance is a goal after they have been provided with basic needs (shelter, water). The sho-shos have been invited to work in the main garden so they can take part in activities. Before they came to NV, the grandmothers and orphans were destitute, orphaned and many lacked shelter, had to drop out of school and other families had to provide for them, many of them had psychological trauma. Food scarcity.

NV was also conceived to work jointly with outside community in order to give them ownership over the village. All buildings have been constructed with the outside community providing labor.

They have had to mobilize the community to work with NV, they have also taken children from the surrounding areas.

Needs were prioritized by first meeting their most basic needs. Have meetings with grandmothers to see what they want to do. They decided on an income generating activity, basket-weaving, the staff has helped them to market their products, many of which have been purchased by volunteers who come here. The home gardens were also conceived by the grandmothers expressing a need. They also have meetings about the perimeter shambas. The same with the outside villagers. Grandmothers come up with solutions to meet their needs. The outgrowers group has articulated what their needs are.

2.   What is the level of community involvement in these efforts?

Grandmothers- high level of involvement, especially because all of the ideas are channeled through them. They allow them to be proactive.

Outside community- high level, very involved, perhaps even more when the village is managed by a council of village elders, which was the initial plan.

3.   What evaluation techniques have been used to assess these efforts?

For each project they have evaluations. Involve grandmothers in meetings to stay on track with their needs. Come up with measurable objectives and discuss as a staff.

4.   What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Some of the grandmothers don't want to have their own gardens. They are given food from the main farm so they don't see the need. It is contradictory because the staff is telling them they need to produce their own food but then they receive a food basket twice a week. They need more knowledge of what to give them and what they should produce on their own.

Capacity of the grandparents to understand issues of organic farming, Some cannot work because they are old and can't manage the gardens, they need to encourage the children to participate.

Age- the grandparents are traditionally lenient with grandkids and now they have to be the authority.

5.   What are the successes of these efforts (ecological, social, economic)?

Ecological- organic methods of farming. The community members are also learning the techniques; also learning the benefits of afforestation. There is a transfer of knowledge from the village to the outside community. Being an eco-village helps introduce the concept of sustainability.

Social- Now they have access to more love and shelter. Living in the community reduces the stigmas associated with HIV/AIDS. Now can go to school. They can also provide food, many families would only eat once a day, maybe twice. The polytechnic also helps provide opportunity to the surrounding communities. Unity within the sho-shos- before they were mainly on their own but now they have a community to help them. The outside community is also building a relationship with NV. Have alerted the staff when things were stolen. They have been able to transfer knowledge and do capacity building exercises and been able to have ownership over the village.

Economic- providing jobs to outside community. Helping livelihoods.

6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Power supply, solar is expensive.

Sho-sho involvement in the home gardens. The concept of sustainability is still being understood, and especially since things have been provided to them.

7.   What are future plans for your work in this community? Is there a specific plan that has been developed?

Spend less on food because families can provide for themselves. For the sho-shos to be more dependent, want a balance between what they give them and what the sho-shos provide. They have individual work plans for each staff. They do reports every two weeks.

8.   Has the community developed a shared vision for the future?

NV has it's own vision of working towards sustainability. They work on future planning with the sho-shos when they meet with them.

Interviewee: NVS5
Interviewers: Lindsey
Date: 11 July 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

Helping the children to solve their own problems so they can handle them on their own in order to move forward. They give support with psychological issues.

2.   What is the level of community involvement in these efforts?

Not a lot of help- the community has no idea about counseling. They must work closely with the grandmothers to identify problems.

3.   What evaluation techniques have been used to assess these efforts?

Progress reports, you can see progress in the client after a few sessions.

4.   What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

The blended family is an issue because most of the kids are past the formative stages and they know they are not blood related. Teenagers are a big challenge. The grandmothers spend a lot of time with them but do not always alert them to problems until they have gone too far. The amount of children (200+) is difficult to deal with. There are only two of them in the staff to deal with them.

5.   What are the successes of these efforts (ecological, social, economic)?

Being able to provide emotional support to the kids.

6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Some children outside of the village need help but they do not have access to counseling.

7.   What are future plans for your work in this community? Is there a specific plan that has been developed?

Part of the plan to have a voluntary counseling and testing center and to help the outside community as well. Would like for the counseling services to expand because she is the only one at this point. Home care does not have a specific work plan.

8.   Has the community developed a shared vision for the future?

Yes the grandmothers play a big role, they have a lot of knowledge. She doesn't know about the outside community.

Interviewee: NVS6
Interviewers: Lindsey
Date: 14 July 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

History of the school- public school. Started in May 2007 with 47 students and 5 teachers at Standard 1-4. now they have 10 teachers and 224 students.
They have environmental clubs that plant trees. (had a very basic idea of sustainability-only related it to environmental surroundings). Some of the classes are geared towards sustainability especially science and hygiene, which teaches them to care for their surroundings.

2. What is the level of community involvement in these efforts?

They are involved with the outside community in sports and other activities, the Sho-shos play the role of parents so they have to interact with them a lot as well. They identify and try to solve problems together.

3. What evaluation techniques have been used to assess these efforts?

Education department requires 4 exams per subject per term (three terms). They compare the school to neighboring schools and have a common exam for 43 schools in the region. Teachers are evaluated using continual assessment tests.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Many, some children come from a difficult background and a poor education so they have to go back in school even though they are older. Sexual problems. Language barriers, some kids have a difficult time adjusting to their new environments. There have been some drop-outs.

5. What are the successes of these efforts (ecological, social, economic)?

Ecological- they have planted trees.
Social-children's attitudes have changed and they are learning new morals and better social behaviors.
Economic-activities and skills will eventually bring money to the area. For example, they hope to offer computer courses that would bring money into the school. Trees planted may bring money from fuel and timber sales.

What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Need to expand to accommodate more children and teachers. Need a well equipped computer room.

6. What are future plans for your work in this community? Is there a specific plan that has been developed?

Have a strategic 2 year plan. Would like to involve outside community children more as well.

7. Has the community developed a shared vision for the future?

All activities are geared toward the children; need to integrate with the outside community more to involve them.

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?
Came to help NV get started with woodlots using appropriate techniques in dryland habitats. Father Dag had visited one of their other sites where permaculture and agroforestry were being used and he like the idea and wanted them to come to NV. Their first role was to restore the riparian zone. It now has many natives and some exotics. Used spot-farming techniques by having the wage laborers plant vegetables around the trees so they could be watered at the same time. They then established other woodlots. They wanted the outside villagers to be incorporated into the village so they established the perimeter shamba system; the shambas would also provide food for the village if the farmers had excess they could sell it to NV, and to provide protection to the village as well but to keep the boundary permeable. "friendly security"; they would also have access to water their livestock. They did a lot of capacity building with these projects.
establish markets for NV and outside villagers and run an internship program for Kenyan students (Jomo Kenyatta University; KIOF; Kenyatta University; and Egerton University and students from Ukumbani) to give them first hand experience and use applied knowledge and outreach. This also helps establish relationships between NV and universities. The interns are placed in various areas at NV and if they work out, it can serve as an employment opportunity. The Organic Outgrowers Group is working to build capacity in agroforestry techniques; they have registered with the government as an organization. Trying to expand from gardens to honey production, chickens, and to help in "mother tree mapping", in which they identify a tree with good seed production and they collect the seeds to raise in the nursery and then sell to the village.

2. What is the level of community involvement in these efforts?
the sho-shos were not around at that point. The outside community members were consulted on projects and asked to participate. They were hired to plant the trees in the riparian restoration project- they had some input but really the species selection was done by some outside professionals. They did train them on water conservation and environmental awareness during the planting. The sand dams were built by the outside community, mainly women, used all local materials and labor. Interns are supposed to do outreach and interact with the community. The outgrowers hold workshops to build capacity and develop projects. The sho-shos have been involved in decision-making; they do workshops with the kids. Outsiders also articulate what they need (e.g. with the shallow well that is currently under construction for them to have easier access to water for perimeter shamba gardens).

3. What evaluation techniques have been used to assess these efforts?
performance evaluation of the seedlings' survival rates; biodiversity surveys; outside consultants. Evaluation component was small- had to rely mainly upon the staff's assessment and expert opinions. They had no model to go off of.
not structured. Use John and Victor's input. Quarterly reports to higher ups and hold meetings to discuss progress. Use in-house evaluation in this way. Discussion with participants.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?
the wage labor was very expensive and the unions formed were difficult to work with, they ended up changing the system to pay laborers based on the work completed. Using organic methods is

very challenging. Lack of understanding of what to do when outside villagers provided labor-they had to micromanage them to get the work finished. Trying to get them to use more environmentally appropriate techniques was difficult.

lack of staff to help in these activities. A lot of challenges. Not enough water infrastructure for the activities. They have 3 bore holes, 22 shallow wells, 7 sand dams. Don't have a cost effective way of pumping water that is also renewable. Pests- use of biopesticides for organic farming. Remote location-they are disconnected from markets and transportation is a problem. The program is new and there are a lot of institutional issues, for example the collaboration between departments is an issue and there are a lot of conflicting opinions- often project's initiation can be delayed. Poverty around the village- for example they are promoting organic farming but the villagers have no way to pay for seeds and are dependent on NV for them and land, people can only invest in their own labor. Dryland habitat- massive crop failures are often an issue, the perimeter shambas rely upon rain fed agriculture, which is difficult. Interns don't always work out.

5.   What are the successes of these efforts (ecological, social, economic)?

Ecological- restoration of riparian zone, before it was very overgrazed. A trench was dug along one side of the river to check erosion. Health has been restored to the riparian zone. Also allowed natural regeneration to take place by minimizing grazing. Reducing deforestation and overgrazing of the 1000 acres. Developing an understanding in the outside community of environmental awareness. Social- gave people a new level of exposure to the outside world also allowed them to exchange ideas. The community used to be very isolated and closed, this has helped open them. Development of common goals and community groups. Church/social hall. Economic- wage labor for outsiders. Agroproduction; the have learned new skills in silviculture, farming, conservation that they can take with them. ecological benefits- GEM is promoting sustainable techniques and organic farming; water conservation measures, rotational cropping methods. Trying to change the way they harvest honey because the log methods kill all of the bees and don't produce quality honey. Promoting of afforestation to villagers and planting. Would like for the woodlots to be seed banks because the only place to get seeds in Kenya is Nairobi and you have to buy by the kilo and it is far away. Trying to use biofuels in an integrated approach to reduce their carbon footprint. Also for fuelwood, using coppicing methods for leucaena glauca is efficient.

6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future? N/A

7.   What are future plans for your work in this community? Is there a specific plan that has been developed?

Make sure the village is self-sustaining in food and energy production and is able to gain extra income for other needs such as medical. Give people the skills to use sustainable methods when they leave the village so they can continue the practice in their own homes. To make NV a true example of an eco-village. For the GEM program- to establish markets. More interns. Further development of commercial woodlots.

8.   Has the community developed a shared vision for the future?

They are not fully involved in developing a shared vision because the planning of activities is very disconnected for example between departments. The board of directors makes decision but they don't always apply to what is happening in the field.

Interviewee: NVS8
Interviewers: Lindsey
Date: 9 July 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

The polytechnic is new- it began on 17 March, 2008 and classes started on 6 May. The polytechnic contributes to sustainability by producing products that can be used for income generation to benefit the orphans. For example the beehives were made there and sold to villagers, they had a net profit of 10,000 shillings (about US$166). One of the major problems before the polytechnic began was that children had no place to get a higher education after primary school. The polytechnic gives them an opportunity to learn skills. There are currently 14 students. 11 are from surrounding villages and 3 are from NV. The ages are 16-25. the school keeps them busy and out of trouble. The students are required to complete 1980 hours of work for the first session. The trades are garment making and fashion design; appropriate carpentry and jointery; and building and construction technology.

Materials for projects have been included in the budget and some materials and tools have been donated. For carpentry they have used low-cost leftover materials from lumber yards. For the long term they have planted trees that they themselves maintain so they can use these trees in the future. They are teaching them afforestation techniques and the ecological and economic benefits of it.

2. What is the level of community involvement in these efforts?

People from both within the village and outside seem grateful. The school is close to where they live and parents can monitor their children's progress. Training is better here than in other areas so there is a demand to come to the school. As far as who makes decisions on how it runs, they saw what would be appropriate given the context of the region and the education levels of the people here. Kitui is a handicraft area so they knew it would be in line with the culture. They also had to consider their current resources. For example, they don't have a steady source of electricity.

3. What evaluation techniques have been used to assess these efforts?

They are only in their 1st quarter so there isn't a lot of evaluation at this point. However the enthusiasm, participation, attitudes, of the students is evident. They are developing a stronger sense of self-worth because they are learning skills.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Material supply-especially timber. Deforestation is an issue in the country, but local suppliers are not often stocked. Government regulations also limit felling and wood is expensive.

Lack of electricity- need to run generator to warm it up or use it for only one machine, so it's very inefficient. They need an alternative source of power, but it requires a lot of money and technical assistance.

5. What are the successes of these efforts (ecological, social, economic)?

Ecological- establishment of the woodlot is important for the rain cycle. It helps balance the carrying capacity.

Social- providing children with opportunities. The presence of the polytechnic is bringing the outside villages and NV closer. The trainees also get more social interaction and learn how to work together. They are also involved in sports and the church.

Economic- money generated by the beehives, keeps money in the region instead of going to outside places. The trainees are given skills to use in the future for income generation. It is helping contribute to Kenya's 2030 goal of being a MDC.

6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Have to depend on families, but they can't afford to give them anything. For example they don't have any uniforms. The financial contribution would help, they are provided with lunch but they don't pay any school fees. They may be in the red this budget.

7.   What are future plans for your work in this community? Is there a specific plan that has been developed?

The government has pledged support, possibly to build a boarding house so they can have more students. Have a plan to introduce new trades in 2009-handicrafts, welding, and hairdressing. Need to provide more opportunities for women. Would like to have more trades in the future and possibly make it into a technical college.

8.   Has the community developed a shared vision for the future?

Outside community- need to involve them more to become more engaged in NV. Perhaps form a group of 13 elected people to create a shared vision.

NV- the Board develops the vision, need more collaboration to further develop.

Interviewee: NVS9
Interviewers: Lindsey
Date: 11 August 2008
Questions asked: actions

1.   Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

Goal of the sustainability program that was envisioned by Father Dag was to complete two major goals- to provide revenue to run the humanitarian activities and to work with the regional community to promote livelihoods. These goals were to be accomplished by creating infrastructure to support various agroproduction activities- for food, fuel, fodder and some other commodities, also some of which would be used for the villager's consumption and activities. This infrastructure included rain water harvesting structures, sand dams, shallow wells, non-petrol based pumping systems using solar panels, drip irrigation, storage tanks- all of these activities are to support the permaculture program. In the permaculture program, which is organic, they are using polyculture, intercropping and a deliberate planning system. The past three years have been geared towards setting all of this up, working on capacity building, identification of appropriate crops for the habitat and for both the rain-fed and drip fed plantings. A lot of this was figuring out what not to grow e.g. tomatoes and now they are growing what they can. They are trying to engage the outside community with the production of castor oil- they need to do cost estimates for large scale production, this could be a reliable market for the outsiders. The livestock unit infrastructure has been developed- the current situation however is difficult because they don't have enough nutritious fodder but hopefully the agroproduction can help solve this problem.

The first idea was for it to be an eco-village- to work with local materials and generate income (e.g. beekeeping is a very important but has not reached that critical scale where it is sustainable and can create income- they have involved the OOG and are enriching the practice by using the Langstroth hives; they are expensive and you need to bring the colony, but, bee-keeping is a great way to supply pure organic honey and provide the pollinators the village needs in the farm).

Melia volkinsii- this is a very promising prospect for income generation, especially if they want to break free from donors and to give them more self-reliance.

Sustainability means business. But the management of the sustainability program has not been in tandem with business management. COGRI is a humanitarian organization and does not operate as a business so there is a disconnect between its goals and inability to generate income. It is not working like a business, it's working like a charitable organization- the fusion of a traditional money guzzler versus a money generator are at odds.

They need better management. They have now trained staff but paying them is an issue. Often development programs become dependent on donor funding because they have not created entrepreneurial-ship. It is a big worry. They could be using the premise they wanted as a normal village if they could create/cultivate children who can provide for their families and help their villages as well. Instead, they hire someone for 500Ks to pick their food for them. They see the children as special and just want them to get an education, but they are more detrimental to sustainability because they are not gaining any skills otherwise or contributing. There is no work to help the kids build lives after they leave the village. They need to contribute to the development of the children. It does not have to be monetary but they could do more. There is a lack of energy to implement such efforts.

Regional commodity trade is an easy way to develop a market for the outside community.

If they want to generate economic productivity they need to create a position based upon entrepreneurial that earns money on commission. Their personnel costs are too high and things don't get done. It needs to be a results-based management system. They have the infrastructure, they have a good relationship with the outside community, staff has gained skills so something tangible has been created, but they need to cut costs, and be business focused and do evaluations based upon results. The program does have potential to make a lot of money.

They can grow food in the dryland but need to do it without diesel because they will never make money if they have to pay for petrol. They need to manage water and the water storage capacity. You cannot just farm in the traditional African way, which is to plant and wait for the rains. They need to store water in the times of rain. Using high-tech and making it accessible to poor people, they need to use technology to help people. This is a challenge for the sustainability program. They need to build more capacity in the community so they are not dependent on the staff and can use their labor and knowledge. They need to create a system of mutual benefits- for example they use a non-resident cultivator system where the villagers use the land, water, seeds, and are obliged to sell to the village. If they could work on water storage to allow them to farm in the dry season this would be better.

They need to solve the labor problem; they need to reevaluate the vision of the village. They have had a deficit every year and for various reasons- probably cannot rely upon rain fed agriculture but they can use it for some seasonal hearty crops eg millet, sunflowers, hay. The polytechnic will grow with time and they need to create a Market for the products.

2.   What is the level of community involvement in these efforts?

Sho-shos- high especially with the home gardens and gray water, the kids are not integrated but should be especially with the agroproduction. Outside-growing they are producing crops with the use of the water infrastructure. They produce, NV buys (labor, crops, etc).

3.   What evaluation techniques have been used to assess these efforts?

No formal process either internally or externally. Needs to be done to support new proposals. They need an end of the year external evaluation. They are really lacking. They really need a method of evaluation. They have failed to make money. They need now to just break even. If they could create opportunities for self-employment not just employment they could help this issue. If people are self-employed that will provide motivation. They need to revamp the employment scheme- give them all of the materials, the capacity, allow them the access a market for their products. That is sustainability- interdependence. Currently the community does not have

materials or market or knowledge- NV can provide both. Perhaps they can do a cost-share program for tools.

There is an issue of culturally appropriate practices and fusing different perspectives. They need to work with the regional economy.

The sustainability program is an asset to the village and the outside community. But it needs to be sustainable economic development. There is a lack of inventiveness in the community, brain drain from the area. What is the cause of poverty? Ignorance, lack of know how and understanding the consequences of actions taken. They need exposure and know how to live sustainably, how to process development of human capacity to live well. Need to develop the knowledge they already have. The concept of sustainability is not understood they need to know how to plan for making money, saving it and not wasting the resources they do have. They need to shed the donor driven mentality.

4. What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?
5. What are the successes of these efforts (ecological, social, economic)?
6. What are other issues that exist which are currently unaddressed, but may become a concern in the future?
7. What are future plans for your work in this community? Is there a specific plan that has been developed?

Future plans- melia plot, continuing the income generating activities such as the regional commodity trade, horticultural production for an organic market, upgrading the livestock; bees; long term- castor, melia. Strategic plan for sustainability has been developed (Woodlands Trust 2005).

8. Has the community developed a shared vision for the future?

Not a formal procedure or an interactive process where they deliberately get together for that purpose.

Interviewee: NVS10
Interviewers: Lindsey
Date: 8 July 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

Worked with the community with the perimeter shamba to show them that farming is a business and teaching them how to do it in the drylands. People were against farming because they thought it was too much work. In the beginning some people liked the ideas but others did not. But when the practices began to work others began to catch on.

Now she is employed by the village to work in the main farm. She is very happy because they (outside villagers) are using methods they've been taught at NV on their own farms.

Livestock- they've done workshops on livestock management, especially for fodder conservation during the dry season. The people used to sell their livestock in the dry season because they didn't have food for them, but then they had to pay double the price during the wet season to buy the livestock back. They have also given them information on better breeds that are accustomed to the drylands.

The village has also helped the perimeter shamba people in other ways. They have provided a means of transport if needed, there is a clinic they have access to if they need medical care.

Ecological issues prior to the project- no sand dams, this has helped them improve their livelihoods because the riparian area provides fodder and also has more water, before there was

not any water for livestock. They can also use the grasses for thatched roves. Economic issues before the project- there was not any employment before. For example, John's project is helping create a honey production system. They can also sell crops to Nairobi and maybe sell to the NV as well.

Selection of project- they have planted species that have the potential to bring income. More vegetables that did not exist before- now there is more demand for these vegetables. Sometimes they meet with local/tribal leaders to see what the indigenous knowledge is. with the sho-shos they ask them which vegetables they like but also tries to build capacity to teach them how to use new vegetables that are nutritious.

2.   What is the level of community involvement in these efforts?

Sho-shos- not very involved- at least not as much as is expected of them. In the beginning they did not outline exactly what they wanted them to do and now it is difficult to change. They are not very informed in environmental conservation- some of their income generating actvities are not sustainable (e.g. grandfathers are felling trees without paying for them or replanting to replace. Also felling trees for fuelwood.

Orphans- they have improved a lot. You can tell a difference between the ones that have been here for a short time and those who've been here for longer, they are usually happier. She thinks they have the will but not the time because they are very engaged in school, and when they are out of school they still have to wash their uniforms, do homework.

Perimeter shamba workers- have been very cooperative. They like learning and even though it has been difficult they have stuck with it. They are limited in the amount of seeds available- they don't know the right type of seeds for the area. Explaining the right seeds for the area is difficult. She thinks they are willing to change though.

3.   What evaluation techniques have been used to assess these efforts?

With gardens you can see results very tangibly. In the perimeter shambas- they can see how the plants are performing as well. They do informal interviews to see how people feel about the projects. They also conduct group meetings.

4.   What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?

Organic farming in dryland conditions. Plants recommended for biopesticides are often very expensive and require more water than the farm can accommodate.

Pests. All of the land around the farm is very degraded so the pests all come to the farm, they are forced to have guards at night to protect the produce.

Water salinity. Stunts crops, can change the taste. Drip lines get blocked very easily.

Lack of awareness. Sho-shos and some of the staff don't have a good understanding of what sustainability is. They also have a difficulty with long-term thinking.

Eco-toilets. Don't understand how or why to use them. They don't always use disinfectants either, and the importance of maintaining hygiene.

Use of new plants. Some of the species that are appropriate to grow here and more nutritious are not commonly used so it is difficult to get them to change their ways.

Lack of information. They don't have books, reliable internet to gain information on new management techniques.

5.   What are the successes of these efforts (ecological, social, economic)?

Ecological- in the riparian area, some species that were thought to be extirpated have come back.

Social- improved relations with the outlying community. They know they have something in common now. The organic outgrowers are an official group and can now get loans. They are working more as a group now than they were before. The perimeter shamba lands have provided a boundary for the village and given access to land for community members. The church also provides a social atmosphere.

Economic- provision of casual labor.

6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Payments for services, sometimes they are late and this frustrates the workers.
Communication between NV and the community. For example, they used to give them rides to Kwa Vonza, but this is a liability and they stopped without telling the community why. They don't really understand that NV isn't a rich neighbor, that it is a NGO.

7.   What are future plans for your work in this community? Is there a specific plan that has been developed?

They want to have families producing most of their own crops so the main farm can be used for commercial sales.
Work plan- continue working with the outgrowers group so they can have enough to sell and consume.
Not a specific time-line.

8.   Has the community developed a shared vision for the future?

A stable water source for the future, especially in the perimeter shambas to reduce poverty.
NV- not sure.

Interviewee: NVS11
Interviewers: Lindsey
Date: 16 July 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

At NV they perceive sustainability from a multi-dimensional view. They want the villagers to look at all aspects, for example food production, health, nutritional requirements. In the school they are teaching the children to be well rounded and environmentally aware. They try to do the same with the polytechnic students by teaching them multiple skills. They want to teach the kids to have dreams and try to do big things (they polytechnic also aims to provide products for the community).
NGOs have a long history of receiving external aid; they want to be self-sustaining so that the program can run without funding from external donors. They have only been running for a year and a half, so it is still forming. Often groups receive funding without realizing the impact it will have, they wanted to create a place for orphans that would be similar to their culture and situations before they came to NV. In orphanages kids are often institutionalized- they didn't want to recreate that here. They offer the basic needs to children and people who were destitute. They want the outside village to benefit as well to gain skills for sustainable development. It is difficult because people need to see results before they can really understand and pick up skills- right now sustainability is the dream they are trying to achieve so they can't be a model yet. Trying to teach the children skills to be sustainable when they leave. Finding a balance with the children is difficult because they are still forming and have experienced a trauma.
They are trying to teach organic farming to teach those values.
At NV these are the three priorities they are attempting to merge: help destitute orphans, create individuals that can sustain themselves; promote organic farming.
Needs were identified- they learned from the Lea Toto program and a catholic based NGO based in Kitui called Home Based Care. They had intended to do a baseline survey to identify needs but it didn't happen. They are trying to preserve cultural values- much more so than in the COGRI Lea Toto program. They attempt to channel this through the grandmothers.

2.   What is the level of community involvement in these efforts?

In the outside community- about 80% of the surrounding families were informed of NV but less than that were actually engaged in the work here. They do not have a lot of involvement in the childcare department. The theft was really disappointing, but they also saw a lot of support from the community after it happened. Ownership in caring for the children is growing. They need to create more understanding of NV's goals.

Sho-shos- not a lot of involvement, but it gradually increasing. They are supposed to have 100% responsibility for the children but they are still working on creating discipline. Home care really has to monitor the sho-shos, there have been some cases of negligence. The grandparents are still figuring out what is expected of them. Staff can direct them but the involvement really needs to grow.

3.   What evaluation techniques have been used to assess these efforts?

Have not developed and it is not very official. For staff- do appraisals will probably use Lea Toto as an example.

For the children and the grandparents- they have used a database to monitor who is here. But they have not developed a proper system and are relying upon progress reports, it is a major set-back. They need databases to manage each department.

4.   What are the challenges or difficulties encountered with these efforts (e.g. has one
        solution led to another problem, etc.)?

New project. There is no database, no blueprint to guide them and don't know where to for advice. For example in the school they are all orphans; the blended family concept is new as well.

Sustainability. No policy framework and they are developing as they go.

Behavior challenges. The children all come from different backgrounds and the ranges of discipline vary significantly; there are children that have been abused; many of them have a very negative self-esteem and are projecting this here. Prostitution for some of the girls was an issue before and now there have been cases of teenage pregnancy but they have not yet developed a policy for this.

The blending process. It is not unusual for grandparents to care for children, but they are trying to merge different value systems.

Resources and infrastructure, lack of internet and electricity- they are expected to deliver but often lack the resources to do so and a lot of time is wasted. Lack of transportation.

Communicating the concept of sustainability and the ideas under which NV operates.

Funding. People on the outside think NV has a lot of money and they don't think they need help from them. For example in the school- it is private because they need to address the children's needs so they cannot get money from the government because they would then require outsiders to come as well.

Security. It has not been too much of a problem but since the theft they need more awareness in the outside community.

Dryland habitat- producing enough food for the villagers.

5.   What are the successes of these efforts (ecological, social, economic)?

Ecological successes- difficult at the moment to tell. The riparian areas have improved because there is more greenery and more water in the wells from the tree planting and sand dams. They are treating NR with respect- for example they don't clear any unnecessary areas when they construct buildings. This will take time to reveal itself.

Social- 260 kids are now given a home, education and basic needs are being met. Education- for outside villagers they are learning farming techniques. The outside villagers are also getting exposure, before it was very closed and now it is opening up to a degree and they are receiving training that changes their perspectives. The clinic- the next closest is 15kms but now they can receive better health care. They have been able to expand water infrastructure for the benefit of the outsiders as well. They are also trying to get electricity and help improve roads. They cannot claim full responsibility for these actions, but they are an indirect result of NV being here.

Economic- employment for the outside villagers. Trying to create a commodity trade as well to sustain livelihoods.

6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future?

Currently they need to develop community ownership of the project. For now the main goal has just been to set the village up and now they need to do thorough community mobilization, this is very important for the sustainability of the village.

May need to start an outreach program for the children in the community who cannot be at NV. They don't want to stray too much from the vision of the community but they need to develop a system of governance. Originally they wanted a council of elders from the community to manage it, but this may not be realistic. Perhaps they need to form a sub-board. And develop a system to engage the grandmothers.

Need to review what has happened so far- a lot has happened without surveys and planning; they need to move slower to see what is working here. They need a more practical approach, for example the sustainability program has not even been able to feed the families they have so far, what will happen when there are more children?

7.   What are future plans for your work in this community? Is there a specific plan that has been developed?

Move forward towards sustainability and develop a source of income for the village. More community involvement to help secure livelihoods. Create productive citizens from orphans, more outreach services.

They have a 10 year strategic plan within COGRI but the NV part is still being developed. Each department has a plan but they need to make a comprehensive plan.

8.   Has the community developed a shared vision for the future?

Thinks that a shared vision can be developed. Education is the future and the children are performing well. They have the will but need to develop it.

The external community is divided. The concept of sharing knowledge is growing but didn't exist from the beginning and they still need a lot of education to ensure that expectations are known and understood.

Interviewee: NVS12
Interviewers: Lindsey
Date: 11 August 2008
Questions asked: actions

1. Describe the history of your efforts towards sustainability with this community (hopefully this question will give a history of the actions taken-identify what the biggest issues of this community were and how the project has addressed these issues {ecological, social, and economic issues}). How were needs of community members identified?

The first initiative was to clear the land for cultivation; they planted maize, cow peas, and beans but the lack of rains caused the harvest to be minimal. They got a glimpse of the dryness of the area at this point. in December 2005 they got a better harvest and were able to sell some of the maize and store the rest to have for the villagers when they arrived.

In 2006 the sustainability program began. Maxwell came to be the sustainability consultant. When he came they diversified the crops and found which worked and which did not. They got into carbon farming and wanted to be a center for carbon farming in the area and to engage the outside community. They were not able to get the outgrowers group on board and are now just planting the wood lots.

In 2005 with biofuels- planted jatropha, which did not take. Cuttings from local plants seem to be more effective. Castor- is thriving and they can hopefully exploit it as a long term income generator.

2.   What is the level of community involvement in these efforts?
Villagers- some interest in farming from the grandparents but mostly they cannot be involved because of their age. Children are focused on education but they are also trying to engage them in agricultural activities so they can gain skills.
Outsiders- the perimeter shamba system has not worked out as they had planned or hoped. Water is the major issue for the ps system. They had to haul it a very long way. The sand dams and shallow wells have helped the riparian area, but still it is a challenge to haul water from there to the farms, even with the ox. They are relying on rain-fed agriculture; they have been given access to drip lines and a shallow well. Their participation is low to medium. They are not involved in decision making. The area is very underdeveloped; people were and are living a traditional African lifestyle- they are dependent on the knowledge that NV can bring to them. They were slow in learning about appropriate crops for the dryland habitat.
3.   What evaluation techniques have been used to assess these efforts?
Maxwell prepares a report every three months as an assessment and for recommendations. The accountants check to see if money is in order and if they are moving towards self-reliance, but it is slow right now. They have had to learn a lot.
4.   What are the challenges or difficulties encountered with these efforts (e.g. has one solution led to another problem, etc.)?
Developing a workable systeml; finding the right crops and figuring out the planting schedule. On the business side- which is the largest challenge- developing this dimension to create a profit; management is a challenge in regards to the business.
Permaculture is challenging and labor intensive.
5.   What are the successes of these efforts (ecological, social, economic)?
Reforestation. Sand dams helping to recharge groundwater which enables pumping. Castor- promises income. The livestock program.
6.   What are other issues that exist which are currently unaddressed, but may become a concern in the future?
Permaculture needs further research in order to develop a more effective system. They are currently only getting greens and need to get a system in place to feed the children.
7.   What are future plans for your work in this community? Is there a specific plan that has been developed?
Long term vision- considerable income from M. volkinsii to provide an income. Jatropha could be a part of this as well. Castor will be further developed. They will keep the permaculture if the other projects can work but it may be only used to feed the village not as an income generator. They have a ten year strategic plan for NV- hope to have 1000 kids by 2012. the school, polytechnic are functioning. The clinic hopes to have a lab. The resource center and the social hall exist.
8.   Has the community developed a shared vision for the future?
Grandparents-very much in dialogue with the management in child care and they are helping provide an education. They have come from a very disadvantaged background (poverty, AIDS). Right now they are just trying to get them to view life with hope and to feel secure, to have their basic needs met and help them through the training and build self-esteem. The rehabilitation must happen first.
Outside community- they are trying to respect their traditions. There have been a lot of challenges for them in adapting (eg learning how to farm organically). They are involved with the polytechnic. They have not opened the school to the outside community. NV is a village not an institution but currently cannot provide the independent services. The sustainability project is an independent project to some extent but they lack expertise in dryland approaches so it is difficult. No (the answer) the outsiders can help in molding the village but they are not as engaged. The council of elders vision is not yet in place.

Interviewee: NVL1
Interviewers: Lindsey, Nancy
Date: 2 August 2008
Questions asked: actions (modified)

1. What were the circumstances in the area prior to NV being here?
lack of employment; high rate of orphans, which affected everyone in the area; lack of fresh water; high rates of charcoal burning; food shortage- serious faminefor about 5 years; diseases associated with water quality; malaria; tb; lack of electricity; lack of check dams which affected crop productivity.
2.   How has NV helped address these issues?
Lack of employment- a lot of people in the area have been employed and have been able to use the money to fix their homes and provide for their families.
Orphans- many have been taken to NV; the community is also being educated about HIV/AIDS- NV staff has come to barazas to educate during the meetings.
Water- they have not helped the community- all of the work has gone into the village
Charcoal-there is less felling of trees because they are getting employment and not using charcoal as a source of income generation.
They have received training in farming techniques but they can't always use the skills because there is a lack of water.
Diseases- have helped with awareness and have also introduced some medicinal plants.
Lack of electricity-n/a
Check dams- they have gained skills in building them.
3.   What are other benefits of NV being here?
Polytechinic- education opportunity and skills building.
Brick-making- capacity building
They have learned how to compost using manure and organic waste to grow vegetables.
4.   Challenges or problems?
Low pay rate, delay of payment. Tribalism the staff are often from just one area.
5.   What is the level of community involvement in these efforts at NV?
His office/he have been called to help and he goes there to help them solve problems. They have been involved.
6.   Are there future plans to work with NV?
To make NV a village and have a village elder to report to him so he knows more about what is happening there just like all of the other villages in his region. It should be one of the grandparents.
7.   Is the community actively involved in shaping the vision or future of NV?
They are involved in some activities with the village, but not in shaping its future.
8.   What are the current problems in the community?
Lack of food, water, poor roads, poor housing, diseases, lack of education; high fertility rates.
9.   Does your community come together to discuss and develop future plans?
They first have a meeting with the leaders and the Locational Development Committee and then they call a baraza with the community.
Additional information- what can be done to improve NV? For example with the polytechnic it could become a boarding school in which the fees would help generate income for the village. They need to have more income generating activities at the village. Water- they need a more consistent supply to grow crops. A good relationship with SHGs or CBOs to assist the village would also help.
They want a good relationship with the village. Perhaps NV could help them dig a bore hole that the community can use to help create unity and less division; or sand dams or helping to build road infrastructure.

Interviewee:NVL2
Interviewers: Lindsey, Nancy
Date: 28 July 2008
Questions asked: actions

1.   What were the circumstances in the area prior to NV being here?
lack of water, food scarcity; many orphans, lack of employment and poor education; lack of health facilities
orphans, lack of employment, transportation, lack of higher education or technical schools
2.   How has NV helped address these issues?
water, they have benefited from the sand dams and bore holes; education- primary school has been provided for the orphans which is good because they were idle before, local teachers have also gotten employment.
the workers are able to send their children to school. The polytechnic helps some kids build skills that will help them get jobs or be self-employed. Transport- can take people who are sick to the hospital. Roads have been improved.
health- some people have been able to use the clinic instead of having to travel long distances.
3.   What are other benefits of NV being here?
it has helped to eradicate poverty, for example before some people couldn't even meet the basic needs of their families but the wages they have earned are helping them do so now. People have also learned better farming techniques and better methods of animal husbandry. Organic farming methods, use of non-toxic pesticides.
capacity in construction; use of local materials for building
brick-making
4.   Challenges or problems?
teenage pregnancy, if they get pregnant they are sent away, back home from NV and this causes a lot of problems. Because they are paid low wages they steal from the village.
workers complain that they are underpaid; delayed payment of wages; many of the people working at NV are from far away and local people are not considered for positions.
workers are not given transport and have to travel far. Family issues have occurred (e.g. some break-ups). Some orphans have complained that they do not have enough clothing or shoes.
5.   How are these problems addressed?
Teenage pregnancy-they are not involved in the problem solving of this issue
Low wages/delayed payment- NV does not consult them, they hear about problems from the workers
lack of transportation, people just have to walk, bike or go by boda boda, which is expensive. separation of couples they try to discuss with the pair; they also hold barazas, community meetings, to discuss issues. As far as the orphans' needs sometimes they can purchase for them.
6.   What is the level of community involvement in these efforts at NV?
education, they have common exams and sports. There is no consultation with them and NV-there used to be but now there isn't any at all. They would like to be more involved. Now they have no idea what is going on at NV, they don't hold barazas with them any more and don't have any communication.
7.   Are there future plans to work with NV?
NV has isolated themselves, they would like to collaborate.
8.   Is the community actively involved in shaping the vision or future of NV?
No, see number 7
9.   What are the current problems in the community?
because they have to travel to get there a lot of the community workers spend their wages on eating while working

the cost of treatment in the clinic is high; poor administration (e.g. with the orphans). Their office is not involved but would like to be so they can help. The village does not take time to talk to community members and often do not even know what is happening in the village. Security is also loose because there is not a fence.

10.   Does your community come together to discuss and develop future plans?

The decision making process- they hold barazas with leaders, stakeholders, village elders to discuss issues and inform them of government policies and schemes. Development in the community.

At the end of the interview they had some questions and were interested in working with the village in these ways:

1. *buying bricks from NV*
2. *storage of pigeon peas on nv to store in times of drought and then the people can buy at a fair price*
3. *trainings on how to use organic pesticides*
4. *it would be great for the community to receive more training on farming, animal husbandry, etc.*

Results Categorized by Objective

<u>Objective 2: Identify the needs of each community prior to initiation of the project.</u>

Propositions

Community Member Interviews with Outside Community Workers (7 interviews, 8 interviewees)

Need or Issue	Additional statements	Number of Responses	Interview Codes
"lack of water…problems related to farming"	"the whole community was relying on rain to raise their vegetables"	2/7	NVO1; NVO7
"scarcity of water"	"lack of water"; "there was no water";	3/7	NVO3; NVO4; NVO6;
"orphans…not being cared for"	"many children did not have parents and they had to care for them"	2/7	NVO1; NVO5
"(no) SHGs or CBOs so they were very unorganized"	N/A	1/7	NVO1
"lack of roads and transportation"	"lack of transport"; "lack of transportation and roads"; "road infrastructure was lacking"; "roads were very bad"	5/7	NVO1; NVO3; NVO4; NVO5; NVO6
"lack of employment" (2)	"lack of jobs"; "did not have a place to work"; no work and no way to get money"	5/7	NVO1; NVO3; NVO4; NVO5; NVO6
"the area was a desert"	"land that is now NV was heavily overgrazed and degraded from people felling trees for charcoal"	2/7	NVO1; NVO2
"many problems just meeting basic needs"	N/A	1/7	NVO2
"didn't have food"	"food scarcity"	2/7	NVO2; NVO3
"didn't have…clothing"	N/A	1/7	NVO2
"didn't have…enough money for school fees"	N/A	1/7	NVO2;
"bringing up their children was very hard"	N/A	1/7	NVO7
"lack of knowledge about farming practices"	N/A	1/7	NVO3

Need or Issue	Additional statements	Number of Responses	Interview Codes
"crops were often destroyed by animals that hid in the thick brush because the land was uncleared"	N/A	1/7	NVO3
"lot of insecurity because the brush on the land that is now NV was very think…people could easily steal livestock and hide them there"	N/A	1/7	NVO4
"no medical facility"	N/A	1/7	NVO5

Community Member Interviews with Grandparents Living in NV (10 interviews, 10 interviewees)

Need or Issue	Additional Statements	Number of Responses	Interview Codes
"did causal labor…sometimes… couldn't find work"	"tried to sell eggs to earn some income"; "had to do casual labor…not always able to get work"; "was only able to grow and sell vegetables"	4/10	NVI1; NVI2; NVI4; NVI5
"clothing"	"received help for clothing"	2/10	NVI1; NVI7
"food"	"before the kids…were not…getting enough food"; "often did not have enough food"; "struggled…providing enough food"; "used to have a very hard time…looking for food"	5/10	NVI1; NVI5; NVI6; NVI9; NVI10
"they had to go without…soap"	"can now bathe with soap"; "soap…they never had (this) before"	3/10	NVI1; NVI4; NVI10
"children's basic needs not being met"	"needs not being met"; "meeting basic needs very difficult"; "could not meet their needs"; "didn't have enough to provide for their basic needs"; "could no longer meet needs"; "care for the grandkids…wasn't really able to do it"	7/10	NVI2; NVI3; NVI4; NVI5; NVI6; NVI8; NVI9
"travel far for water"	"to fetch…water …have to go long distances" ;"struggle to get water"	2/10	NVI2; NVI4; NVI5
"to fetch…fuelwood …have to go long distances"	N/A	1/10	NVI4

Need or Issue	Additional Statements	Number of Responses	Interview Codes
"kids not going to school"	"sometimes they could not attend school because she didn't have the money to pay school fees"; "not able to send kids to secondary school because she couldn't not pay fees"; "could no longer…give the children an education"; "struggled to…provide…education"; "in charge of education…sold her land to provide"	6/10	NVI5; NVI6; NVI7; NVI8; NVI9; NVI10

Interviews with NV Staff and Outside Community Leaders (14 Interviews/ 17 interviewees)

Need or Issue	Additional Statements	Number of Responses	Interview Codes
"grandmothers and orphans destitute"	"people…were destitute": "they have come from a very disadvantaged background"	3/14	NVS4; NVS11; NVS12
"many lacked shelter"	N/A	1/14	NVS4
"(orphans) had to drop out of school"	N/A	1/14	NVS4
"many had…psychological trauma"	N/A	1/14	NVS4
"food scarcity"	"food shortage-serious famine"; "food scarcity"	3/14	NVS4; NVL1; NVL2
"no place to get higher education"	"lack of higher education"	2/14	NVS8; NVL2
"not any water for livestock"	"lack of fresh water"; "lack of water"	3/14	NVS10; NVL1; NVL2
"not any employment before"	"lack of employment"; lack of employment"	3/14	NVS10; NVL1; NVL2
"high rate of orphans…which affected everyone in the area"	"many orphans"	2/14	NVL1; NVL2
"high rates of charcoal burning"	N/A	1/14	NVL1
"diseases associated with water quality"	N/A	1/14	NVL1
"no check dams which affected crop productivity"	N/A	1/14	NVL1
"lack of electricity"	N/A	1/14	NVL1
"poor education"	N/A	1/14	NVL2
"lack of health facilities"	N/A	1/14	NVL2

Categorization of Objective Two Results

1.Data from grandparents living in NV

- Basic needs not being met
    - "to fetch…fuelwood …have to go long distances"
    - "travel far for water"
        - "to fetch…water …have to go long distances" ;"struggle to get water"
    - "children's basic needs not being met"
        - "needs not being met"; "meeting basic needs very difficult"; "could not meet their needs"; "didn't have enough to provide for their basic needs"; "could no longer meet needs"; "care for the grandkids…wasn't really able to do it"
    - "they had to go without…soap"
        - "can now bathe with soap"; "soap…they never had (this) before"
    - "food"
        - "before the kids…were not…getting enough food"; "often did not have enough food"; "struggled…providing enough food"; "used to have a very hard time…looking for food"
    - "clothing"
        - "received help for clothing"
- Education
    - "kids not going to school"
        - "sometimes they could not attend school because she didn't have the money to pay school fees"; "not able to send kids to secondary school because she couldn't not pay fees"; "could no longer…give the children an education"; "struggled to…provide…education"; "in charge of education…sold her land to provide"
- No employment
    - "did causal labor…sometimes…couldn't find work"
        - "tried to sell eggs to earn some income"; "had to do casual labor…not always able to get work"; "was only able to grow and sell vegetables"

The situation of the grandparents and children prior to their coming to live in NV was a dire one. Most respondents mentioned factors related to the unavailability of employment. They did not have money to send children to school or to buy food, clothing or soap. Essentially, they were destitute and their basic needs were not being met. Additionally, several of them were forced to travel long distances in search of water and fuelwood.

2.Data from community members working with NV

- Social

- o "no medical facility"
- o "lack of knowledge about farming practices"
- o "(no) SHGs or CBOs so they were very unorganized"
- o "orphans…not being cared for"
  - ▪ "many children did not have parents and they had to care for them"
- o "lack of roads and transportation"
  - ▪ "lack of transport"; "lack of transportation and roads"; "road infrastructure was lacking"; "roads were very bad"
- • Ecological
  - o "scarcity of water"
  - o "the area was a desert"
    - ▪ "land that is now NV was heavily overgrazed and degraded from people felling trees for charcoal"
- • Economic
  - o "didn't have…enough money for school fees"
  - o "bringing up their children was very hard"
  - o "many problems just meeting basic needs"
    - ▪ "didn't have…clothing"
    - ▪ "didn't have food"
      - • "food scarcity"
  - o "lack of water…problems related to farming"
    - ▪ "the whole community was relying on rain to raise their vegetables"
  - o "lot of insecurity because the brush on the land that is now NV was very think…people could easily steal livestock and hide them there"
  - o "crops were often destroyed by animals that hid in the thick brush because the land was uncleared"
  - o "lack of employment"
    - ▪ "lack of jobs"; "did not have a place to work"; no work and no way to get money"

People living in the communities directly outside of NV's boundaries faced a similar situation to that of the grandparents that now live in the village. Respondents mentioned factors related to social, economic and environmental states.

1. Social. The area had limited infrastructure, particularly in terms of roads. The nearest medical facility was very far. There were many orphans whose parents succumbed to HIV/AIDS. Farming techniques that were appropriate to the dryland setting were also largely unknown.
2. Economic. The lack of employment opportunities had impacts throughout the area. It was difficult for them to meet their daily basic needs, such as food, soap or clothing, and did not even have money to send their children to school.
3. Environmental. Water scarcity was an issue, especially for farming. The open land that became NV was also an issue because it was degraded, served as a source of insecurity (because people could hide in it) and because animals found there would destroy crops of surrounding farmlands.

3.Data from NV staff and community leaders

- Economic
  - "food scarcity"
    - "food shortage-serious famine"; "food scarcity"
  - "grandmothers and orphans destitute"
    - "people…were destitute": "they have come from a very disadvantaged background"
  - "lack of employment"
  - "many lacked shelter"
  - "no check dams which affected crop productivity"
  - "not any water for livestock"
- Social
  - "no place to get higher education"
  - "(orphans) had to drop out of school"
  - "high rate of orphans…which affected everyone in the area"
    - "many had…psychological trauma"
  - "diseases associated with water quality"
  - "lack of electricity"
  - "poor education"
  - "lack of health facilities"
- Ecological
  - "high rates of charcoal burning"

Staff working at NV and community leaders were able to provide additional information as to the state of the people living in the area where NV was built. The information gathered in the data was categorized into the social, economic and environmental conditions that impacted the community.

1. Social. There were no medical facilities located in the immediate area. The HIV/AIDS pandemic left many orphans who had psychological trauma from the death of their parents. Many of the orphans did not have any shelter. Overall the education of the community was poor and there was not access to higher education. Infrastructure for water conservation (e.g. check dams) was lacking, which impacted crop production. There was no electricity.
2. Economic. The lack of employment opportunities resulted in parents' inability to pay school fees. People were forced to create charcoal to sell because of they had no other choices to earn a livelihood, which resulted in deforestation. Many of the people were destitute.
3. Environmental. Water and food scarcity were issues directly related to the surrounding environment. Water quality was also an issue that resulted in water-born disease. Charcoal production was an anthropogenic source of environmental degradation.

Conclusions about needs prior to the NV project

Overall, data from the interviews indicate that the condition of the community before NV was one of very low development. The lack of employment opportunities resulted people's inability to meet basic needs, especially the grandparents and orphans, who are indirect victims of the HIV/AIDS pandemic. Infrastructure for transportation and water was minimal. Education was lacking not only because higher levels of schools simply did not exist but also because people did not have money to pay school fees. Water and food scarcity were also significant barriers for the community.

Direct observations of the area provide a deeper sense of what the community was facing. The area is isolated from major roads and markets, which limits people's ability to sell goods they could produce (e.g. crops). Most people are involved in agriculture for subsistence and some extra money. Others sell charcoal in nearby Kwa Vonza village. The environmental conditions are particularly harsh, especially because they rely upon surrounding natural resources for livelihood and subsistence. The climate is semi-arid and prone to severe drought every couple of years. This makes rain-fed agriculture difficult most of the time and nearly impossible some of the time. Anthropogenic environmental degradation, especially deforestation for fuelwood, was a compounding factor limiting ecosystem services. Although not mentioned in the interviews, it is apparent that environmental conditions had a lot to do with the community's destitute state.

Objective 3: Identify what needs were prioritized by each community.

Propositions

Interviews with NV Staff and Outside Community Leaders (14 Interviews/ 17 interviewees)

Prioritized Need	Additional Statements	Number of Responses	Interview Codes
"everything has to be done with the NV orphans and grandparents in mind"	N/A	1/12	NVS1
"provide with basic needs"	"offer basic needs"; "have their basic needs met"	3/12	NVS4; NVS11; NVS12
"sustainability program…provide revenue for humanitarian activities"	"potential to bring income"	2/12	NVS9; NVS10
"education…for the future"	"children focused on education"	2/12	NVS11; NVS12
"work with regional community to promote livelihoods"	"want outside community to benefit as well as gain skills for sustainable development"	2/12	NVS9; NVS11

Discussion of Results

The interview results show that main priorities were meeting the basic needs of the grandparents and children and providing the children with an education. One of the other priorities was to promote sustainable livelihoods in the outside community. The means to meeting these three needs are generating of income to support the village using sustainable practices.

The project did not involve an active, community-based process to identify needs, as the interview results show. COGRI set out with a distinct mission, which was to help one of the regions of the country most affected by the HIV/AIDS pandemic, which is evident on their website (Nyumbani,2008) and in various documents (e.g., COGRI Strategic Plan). COGRI decided to start a place where the "lost generation" would be able to meet their basic needs and get a formal education. This was to be done in an ecologically and economically sustainable manner so that the village would not be reliant upon donors or grants for all of its expenses. Another priority that was mentioned in the interviews was to work with the communities in the surrounding region to promote sustainable livelihoods.

Objective 4: Describe what planning and work initiatives have been implemented to meet the prioritized needs by each community.

Propositions

Community Member Interviews with Outside Community Workers (7 interviews, 8 interviewees)

Action	Additional Statements	Number of Responses	Interview Codes
"skills in making wells"	N/A	1/8	NVO1
"NV has provided employment"	"NV…creating job opportunities" ; "NV has employed many people "money"; "gave them a place to work" "have been provided with employment"; "wages";	7/8	NVO1; NVO2; NVO3; NVO3; NVO5; NVO6; NVO7
"sand dams"	"sand dams"; "sand dams"	3/8	NVO1; NVO3; NVO4
"built a church"	N/A	1/8	NVO1
"organic farming"	"growing crops using organic methods"; "use of organic farming techniques"	3/8	NVO1; NVO3; NVO4
"composting"	"compost"; "composting"	3/8	NVO1; NVO3; NVO6
"intercropping techniques"	N/A	1/8	NVO1
"skills in…farming"	"have been educated in crop management"; "more knowledge about farming"; "have learned new methods for food production"	4/8	NVO1;NVO2; NVO3; NVO6

Action	Additional Statements	Number of Responses	Interview Codes
"learned how to plant and manage trees"	"knowledge…about tree planting"	2/8	NVO2; NVO3
"learned new ways of irrigation"		1/8	NVO3
"improved roads"	"development of NV brought more roads"	2/8	NVO4; NVO5
"skills in milking"		1/8	NVO5
"buildings constructed"		1/8	NVO7
"humanure"		1/8	NVO7
"learned…how to make bricks"		1/8	NVO1
"learned how to construct homes"		1/8	NVO1

Community Member Interviews with Grandparents Living in NV (10 interviews, 10 interviewees)

Action	Additional Statements	Number of Responses	Interview Codes
"kids are getting education"	"access to education"; "getting education"; "children get…education"; "have…education"; "education"; "educate grandkids"; "grandchildren go to school"	8/10	NVI1; NVI2;NVI3; NVI4; NVI5; NVI6; NVI7; NVI8
"perimeter shambas"	"perimeter shamba"; "shamba"; "perimeter shambas"	4/10	NVI1; NVI2; NVI4; NVI5
"(home) shambas"	"ability to cultivate farms"	2/10	NVI5; NVI7

Interviews with NV Staff and Outside Community Leaders (14 Interviews/ 17 interviewees)

Action	Additional Statements	Number of Responses	Interview Codes
"visit the homes to see where are gaps"	N/A	1/14	NVS2
"informal interviews with villagers" (to assess needs)	"have meetings with grandmothers"	2/14	NVS2; NVS4
"with outside community… barazas" (to assess needs)	"meetings…with outside villagers"; "barazas"	2/14	NVS2; NVS4; NVL1
"meet with elders to see what indigenous knowledge is"	N/A	1/14	NVS10
"learned from (other COGRI programs)"	N/A	1/14	NVS11
"agroprocessing center" (AC)	N/A	1/14	NVS1

Action	Additional Statements	Number of Responses	Interview Codes
"develop economic activities" (in AC)	"various agroproduction activities"	2/14	NVS1; NVS9
"market for local surrounding communities" (AC)	"castor…could be a reliable market for outsiders"	2/14	NVS1; NVS9
"develop value-added processes" (in AC)	N/A	1/14	NVS1
(energy production with) "renewables"	"castor oil…solar panels"	2/14	NVS1; NVS9
"create a place…similar to their culture"	N/A	1/14	NVS11
"polytechnic" (P)	"higher education": "teaching..multiple skills"	3/14	NVS1; NVS8: NVS11
"manages trees for…use in future" (P)	"material supply"	2/14	NVS1; NVS8
"income generation" (for NV) (P)	N/A	1/14	NVS8
"essential oils factory" (EO)	N/A	1/14	NVS1
"source of income" (EO)	N/A	1/14	NVS1
"capacity building of NV children"	"workshops with the kids"; "teach…organic farming"; "trying to engage them in agricultural activities so they can gain skills"	4/14	NVS1; NVS7; NVS11; NVS12
"clubs to…teach sustainability"	"environmental clubs that plant trees"; "teach children skills to be sustainable"	3/14	NVS1; NVS6; NVS11
"capacity building…of grandparents"	"given them demonstrations"; "sho-shos involved in decision-making"; "some interest in farming"	4/14	NVS1; NVS4; NVS7; NVS12
"riparian zone"(RZ)	"restore RZ"	2/14	NVS1; NVS7
"planted…trees" (RZ)	"natives and exotics"	2/14	NVS1; NVS7
"outside villagers…involved" (RZ)	"hired to plant trees"	1/14	NVS1; NVS7
"build capacity and change mindsets" (RZ)	"capacity building"	2/14	NVS1; NVS7
"spot farming techniques" (RZ)	"permaculture"	2/14	NVS7; NVS9

Action	Additional Statements	Number of Responses	Interview Codes
"water conservation" (WC)	"trained (outside community) on water conservation"; "rain-water harvesting, sand dams, storage tanks"; "sand dams"; "riparian area…more water in wells"; "sand dams and shallow wells in riparian area…drip lines"; "water…to the village"; "sand dams and bore holes"	8/14	NVS1; NVS7; NVS9 NVS10; NVS11; NVS12; NVL1; NVL2
"sand dams" (WC)	"sand dams were built by outside community"; "water harvesting structures…sand dams"; "sand dams"	5/14	NVS1; NVS7; NVS9; NVS10; NVL2
"at each sand dam…shallow wells"(WC)	"shallow wells…pumping systems"	2/14	NVS1; NVS9
"solar pumps (at shallow wells)…for drip irrigation in farm" (WC)	"pumping systems using solar panels"	2/14	NVS1; NVS9
"bore hole" (WC)		1/14	NVS1
"plantations"	"established other woodlots…luecena"; "woodlot important for rain cycle"; "*Melia volkinsii*"	3/14	NVS1; NVS7; NVS8
"seed orchard"	"woodlots to be seed banks"	2/14	NVS1; NVS7
"perimeter shambas" (PS)	"food for village and…excess to sell"; "perimeter shamba"	4/14	NVS1; NVS7; NVS10; NVS12
"boundary against encroachment" (PS)	"friendly security"	2/14	NVS1; NVS7
"grandparents preparing them with children" (PS)	N/A	1/14	NVS2
"engage outside community" (PS)	"wanted outside villagers to be incorporated…so they established the (PS) system"; "teaching them how to do (farming) in the drylands":	3/14	NVS7; NVS10; NVS12
"livestock" (L)	"livestock unit infrastructure built"; "livestock management…information on breeds"	3/14	NVS1; NVS9; NVS10
"fodder conservation" (capacity building) (L)	N/A	1/14	NVS10
"composting unit…humanure and livestock"	N/A	1/14	NVS1

Action	Additional Statements	Number of Responses	Interview Codes
"chickens"	"establish markets…chickens"	2/14	NVS1; NVS7
"apiculture" (AC)	"establish markets…honey production"; "beekeeping…great way to supply pure organic honey and…pollinators"	3/14	NVS1; NVS7; NVS9
"home gardens"	"every family has been given a garden"	2/14	NVS2; NVS4
"income generating activity…baskets" (grandparents)	N/A	1/14	NVS4
"gray water system to water home gardens"	"grandparents…high involvement"	2/14	NVS2; NVS9
"clinic" (CL)	N/A	1/14	NVS3
"(villagers) do not pay (CL)"	N/A	1/14	NVS3
"cost sharing (for outside villagers)" (CL)	N/A	1/14	NVS3
"teaching preventative care" (CL)	N/A	1/14	NVS3
"given food from main farm"	N/A	1/14	NVS4
"work…with outside community"	"incorporated outside villagers into the village"; "develop market"; "area underdeveloped…dependent on NV"	4/14	NVS4; NVS7; NVS9; NVS12
"buildings built with…outside labor"	N/A	1/14	NVS4
"counseling" (for children)	N/A	1/14	NVS5;
"school"	"primary school has been provided"	2/14	NVS6; NVL2
"capacity"(building with the outside community)	"workshops on livestock management"; "teaching them how to do (farming) in the drylands"; "dependent on knowledge NV can bring them"; "train them in water conservation and environmental awareness"	4/14	NVS7; NVS9; NVS10; NVS12
"fuelwood…coppicing leucena"	N/A	1/14	NVS7
"church"	N/A	2/14	NVS7; NVS8
"selection of plants that are useful…neem… *Croton megalocarpus*" (plantations)	"planted species that have the potential to bring income"	4/14	NVS1; NVS10;
"Bio-fuels"	"biofeuls…jatropha…castor"	2/14	NVS7; NVS12

Action	Additional Statements	Number of Responses	Interview Codes
"selection of plants that are useful…" (farm)	"identification of appropriate crops"; "diversified the crops"	2/14	NVS9; NVS12
"sell excess (milk)"	N/A	1/14	NVS1
(agroprocessing center) "energy…looking for renewables"	N/A	1/14	NVSI
"internship program for Kenyan students (*e.g., from Jomo Kenyatta University, KIOF, Kenyatta University, Egerton University and students from Ukumbani*)	N/A	1/14	NVS7

Categorization of results

1. Work activities in NV
- Assessing needs
  - "informal interviews with villagers"
  - "visit the homes to see where are gaps"
    - "have meetings with grandmothers"
  - "learned from (other COGRI programs)"
  - "with outside community… barazas"
    - "meetings…with outside villagers"; "barazas"
- Capacity building
  - "capacity (with the outside community)"
    - "workshops on livestock management"; "teaching them how to do (farming) in the drylands"; "dependent on knowledge NV can bring them"; "train them in water conservation and environmental awareness"
    - "skills in making wells"
    - "skills in…farming"
      - "have been educated in crop management"; "more knowledge about farming"; "have learned new methods for food production"
    - "learned how to plant and manage trees"
      - "knowledge…about tree planting"
    - "learned new ways of irrigation"
    - "learned how to construct homes"
    - "skills in milking"
    - "learned…how to make bricks"
  - "capacity building of NV children"
    - "workshops with the kids"; "teach…organic farming"; "trying to engage them in agricultural activities so they can gain skills"
    - "clubs to…teach sustainability"

- - "environmental clubs that plant trees"; "teach children skills to be sustainable"
    - o "capacity building…of grandparents"
      - ▪ "given them demonstrations"; "sho-shos involved in decision-making"; "some interest in farming"
- Formal education for children
  - o "polytechnic"
    - ▪ "higher education": "teaching…multiple skills"
  - o "school"
    - ▪ "primary school has been provided"
  - o "kids are getting education"
- "Polytechnic"
  - o "manages trees for…use in future"
  - o "higher education": "teaching…multiple skills"
  - o "income generation"
- Farming
  - o "given food from main farm"
  - o "solar pumps (at shallow wells)…for drip irrigation in (main) farm"
  - o "selection of plants that are useful…"
    - ▪ "identification of appropriate crops"; "diversified the crops"
  - o "perimeter shambas"
    - ▪ "food for village and…excess to sell"
    - ▪ "boundary against encroachment"
    - ▪ "friendly security"
    - ▪ "grandparents preparing them with children"
    - ▪ "engage outside community"
    - ▪ "wanted outside villagers to be incorporated…so they established the (PS) system"; "teaching them how to do (farming) in the drylands"
  - o "(home) shambas"
    - ▪ "ability to cultivate farms"
    - ▪ "every family has been given a garden"
    - ▪ "gray water system to water home gardens"
      - • "grandparents…high involvement"
  - o "intercropping techniques"
  - o "composting"
  - o "organic farming"
    - ▪ "growing crops using organic methods"; "use of organic farming techniques"
- "livestock"
  - o "livestock unit infrastructure built"; "livestock management…information on breeds; "
  - o "fodder conservation"
  - o "composting unit…humanure and livestock"
  - o "sell excess (milk)"
  - o "chickens"
    - ▪ "establish markets…chickens"

- Waste management
  - "composting unit…humanure and livestock"
  - "humanure"
- Construction
  - "buildings built with…outside labor"
  - "buildings constructed"
- Plantations
  - "established other woodlots…luecena"; "woodlot important for rain cycle"; "*Melia volkinsii*"
  - "selection of plants that are useful…neem… *Croton megalocarpus*"
    - "planted species that have the potential to bring income";
  - "fuelwood…coppicing leucena"
  - "seed orchard"
    - "woodlots to be seed banks"
- "income generating activity…baskets" (grandparents)
- Water conservation & infrastructure
  - "trained (outside community) on water conservation"; "rain- water harvesting, sand dams, storage tanks"; "sand dams"; "riparian area…more water in wells"; "sand dams and shallow wells in riparian area…drip lines"; "water…to the village"; "sand dams and bore holes"
  - "bore hole"
  - "sand dams"
    - "sand dams were built by outside community"; "water harvesting structures…sand dams"
    - "at each sand dam…shallow wells"
  - "solar pumps (at shallow wells)…for drip irrigation in farm"
- Riparian zone restoration
  - "restore riparian zone"
  - "spot farming techniques"
    - "Permaculture"
  - "build capacity and change mindsets"
    - "capacity building"
  - "outside villagers…involved"
    - "hired to plant trees"
  - "planted…trees"
    - "natives and exotics"
- Road improvements
  - "improved roads"
    - "development of NV brought more roads"
- "agroprocessing center"
  - "develop economic activities"
  - "energy…looking for renewables"
    - "various agroproduction activities"
    - "market for local surrounding communities"
      - "castor…could be a reliable market for outsiders"
  - "develop value-added processes"

- o "apiculture"
  - ▪ "establish markets…honey production"; beekeeping…great way to supply pure organic honey and…pollinators"
- Energy production with renewables
  - o "renewables"
    - ▪ "castor oil…solar panels"
  - o "bio-fuels"
    - ▪ "biofeuls…jatropha…castor"
    - ▪ (agroprocessing center) "energy…looking for renewables"
- "Clinic"
  - o "counseling for children"
  - o "villagers do not pay"
  - o "cost-share for outside communities"
  - o "teaching preventative care"
- "church"
  - o "built a church"
- "create a place…similar to their culture"
- Building relationships with universities
  - o "internship program for Kenyan students (*e.g., from Jomo Kenyatta University, KIOF, Kenyatta University, Egerton University and students from Ukumbani*)
- "essential oils factory"
  - o "source of income"
- "work…with outside community"
  - o "incorporated outside villagers into the village"; "develop market"; "area underdeveloped…dependent on NV"
  - o "meet with elders to see what indigenous knowledge is"
  - o "NV has provided employment"
    - ▪ "NV…creating job opportunities" ; "NV has employed many people "money"; "gave them a place to work" "have been provided with employment"

2.Providing for the grandparents and children

The primary goal of the village is to provide the "lost generation" with basic needs and give the children the opportunity to gain a formal education. As one respondent commented, "*everything has to be done with the NV orphans and grandparents in mind*" (NVS1 Interview).
Food comes from various sources, the main garden, perimeter *shambas*, home gardens, eggs from chickens, milk from the livestock and *rations provided by the village*.
Ideally, most of the food consumed in the village would come from the land on which it was built.

The main farm is managed by the NV staff and outside laborers perform most of the work planting, watering and harvesting the vegetables[1]. The farm is organic and drip irrigated using a solar panel to run a pump from wells created at the ephemeral river that runs through the property. The main farm supplies maize, cow peas, collards, chard, carrots, cilantro, maringa (used as a spice and for tea) and okra. The grandparents pick up a basket with vegetables from the main farm on Tuesdays and Fridays.

The families also have areas, either at their home site or in the perimeter shambas to grow their own vegetables. The home gardens was a new initiative that began in summer 2008 so that the families would grow more of their own food and produce from the main farm would be sold to earn income for the village. Grandparents also have access to the perimeter shambas, which are located on the periphery of the 1000 acre village property and are rain-fed agriculture systems.

Other provisions for the families include eggs, milk, additional vegetables and water. Families that have HIV positive children are given eggs for extra protein. The village has chickens which are kept by the staff, some families came with their own chickens as well. Milk is given to the grandparents from the livestock unit on site. The livestock unit consists of cows and goats. Rice and some other vegetables, such as tomatoes and potatoes, are purchased and distributed to the grandparents by the NV staff. Water is supplied for household consumption in spigots from wells or bore holes. Fuelwood is also generated in the village. For example, coppicing techniques for *Luecena luecophylla,* a commonly used fuelwood species, provide a consistent source of fuelwood for cooking.

A primary school was built in the village for the kids to attend. *The school is a Hot-Courses private school and is funded by a donor from The United Kingdom. Children who are of age are sent to a secondary school outside the village.* Capacity building exercises in organic farming and tree management have also been given to the grandparents and children to help them build skills for when they leave the village and have their own farms.

In order for the grandparents to earn some extra income, the staff worked with them to develop a scheme for earning money. The grandmothers decided to make baskets, *a Kamba tradition, and the two grandfathers opted to make wooden spoons or handles for tools. The products are then sold to volunteers who come to the village or taken to Nairobi for sale.*

A medical clinic was built to provide the families with health care, especially for those that are HIV positive, and to teach preventative care. The clinic also provides counseling for children or grandparents who are suffering from the psychological trauma of losing their parents or other issues dealing with adolescence.

The staff works with the grandparents to assess their needs. They hold meetings *once a week*, hold informal interviews and visit the homes to make sure they speak with all of the grandparents.

3.Providing the outside community with opportunities

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[1] Italicized text that is not in quotations is the researcher's observational data from the village.

One of the goals for the village was to involve the outside community to help them secure livelihood. The village has offered daily wage labor for various activities including construction of all the buildings, which were built with local materials; the main farm; plantation programs; constructing the sand dams; digging wells; the livestock unit; and the composting unit.

The agroprocessing center (AC) is one of the primary activities in which the outside village is involved and is to serve as an income base for them. In the AC produce is cleaned and, in some cases, value-added processes occur to generate a product. A new project, for example, is the establishment of a local market for honey, in which the outside community will provide raw honey and bought by the village, which then puts it in jars for sale in Nairobi or elsewhere. Through this project, the village is trying to create a local market for outside villagers to sell their goods or produce. Another project in which they are trying to create a local market is for tree seedlings. The outside community raises the seedlings, which are purchased when they reach a foot in height.

Through employment and other activities the village has provided a venue for capacity-building for the outside community. Those involved in the main farm have gained skills in dryland organic farming, including composting, use of biopesticides and drip irrigation; animal husbandry, especially fodder production and animal care; how to plant and care for trees; how to dig wells and construct sand dams; and new apiculture techniques. They learned how to make bricks and construct homes through labor contributed in making the buildings in the village.

NV has also provided access to other services for the outside villagers. All are welcome to worship at the church and can attend the health clinic, where they receive free consultations and have access to a cost-share program if medicine is needed. Children from outside villages have also been able to attend the polytechnic school created by the village, which provides them with vocational training in woodworking and textiles. *Barazas*, or community meetings, are held with village elders and political leaders to maintain connection between the village and the outside community.

4.Generating income for the village

Most of the activities in the village are geared towards providing for the villagers or generating income for the village itself to continue operations. *Water infrastructure is a basis for all of the income-generating activities from use in the farm to household consumption and includes shallow wells, sand dams, bore holes and pipe access to Masinga (potable water) from the Kitui District. The main farm will ideally sell produce to niche markets in Nairobi or within the Kitui District.* The agroprocessing center will provide much of the income through sale of produce and value added products generated on the main farm or purchased from the outside community. It is also a goal for the agroprocessing center to generate energy through biofuels processed on site. The essential oils factory, which is not currently in operation, is also meant to generate income through the sale of high quality essential oils. The polytechnic may produce wooden items, such as furniture, or dresses that can be sold for income. The livestock unit may also generate income from meat sales. The village recently planted a plantation of *Melia volkinsii*, a timber species that is known for high profitability, though harvesting will occur after no less than ten years of growing time. Other trees will provide the

village with what it needs, such as fuelwood (*L. luecophylla*; eucalyptus), biopesticides (neem) or biofuels (castor and jatropha). The livestock unit has flourished, especially with access to fodder in the riparian zone, which means the animals are healthier and can bring more money if sold.

5.Efforts towards ecological sustainability

It is in the village's main goal to provide for the villagers in an eco-village setting, so there are many aspects of the project geared towards this goal. The farms and livestock units are organic, using biopesticides *such as neem (Azdirachta indica)* and Permaculture farming techniques such as rotational cropping, intercropping, and composting. *All of the houses and most of the buildings use composting toilets that are emptied in the humanure site, left to compost and used as fertilizers for tree plantations.* The village has attempted to do capacity building exercises with the grandparents and children as well as the outside villagers to explain the concept of sustainability and to change mindsets about the environment. Most of the construction materials, such as the bricks, were made from local materials with local labor. The restoration of the riparian zone around the ephemeral river was one of the first activities, which included planting vegetation that would help restore hydrological cycles and also be useful for the village in various ways *(e.g., neem can also be used as a antibiotic, is used as a toothbrush and can be ground into flour).* The village is working towards using only renewable sources of energy. There are currently solar panels on some buildings and irrigation pumps. The village is exploring the use of castor and jatropha as biofuels.

Objective 5: Determine if and how the initiatives taken by each community meet the prioritized needs of the community members.

Propositions

The results from Objective Three show that the primary goals, or issues to be addressed by the NV project: meeting the basic needs of the villagers: providing the children with an education, and helping the outside community sustain livelihoods. Although generating an income and conducting activities in an eco-village type setting are goals, these are really a means to an end rather than a need to be addressed.

Community Member Interviews with Outside Community Workers (7 interviews, 8 interviewees)

Helping the outside community sustain livelihoods	Additional Statements	Number of Responses	Interview Code
"acquired skills to help themselves"	"learned…using the methods at their farms at home"; "have earned skills they can use in other areas"	3/8	NVO1; NVO4; NVO5

Helping the outside community sustain livelihoods	Additional Statements	Number of Responses	Interview Code
"earned money"	"created job opportunities"; "NV has employed many people"; "NV gave them a place to work"; "they have been provided with employment"; "employment"	6/8	NVO1; NVO2; NVO3; NVO5; NVO6; NVO7
"now more water is available"	"more water…helps them grow crops"; "sand dams…increased water available"; "sand dams have helped to conserve water"; "NV has helped with water"	4/8	NVO1; NVO2; NVO3; NVO4; NVO6
" able to grow vegetables to sell and consume"	"ability to grow vegetables for consumption and sale";	2/8	NVO1; NVO4
"learned how to construct homes"		1/8	NVO1
"learned how…to make bricks"		1/8	NVO1
"gained skills in composting and organic farming"	"educated in crop management"; "new ways of irrigation…organic farming techniques"; "learned how to use compost"; "gained more knowledge about crops…composting"	5/8	NVO1; NVO2; NVO3; NVO4; NVO6
"earning money to provide for (his) children"	"enabled them to help their families"; "people are more able to provide for their families"; "money to send his kids to school"; "easier to raise their families"	5/8	NVO1; NVO2; NVO3; NVO4; NVO7
"intercropping to maximize outputs"		1/8	NVO1
"wells…have helped them with issues related to farming"		1/8	NVO1
"increased soil fertility because of manure & compost"		1/8	NVO3
"perimeter shambas help them satisfy their basic needs"		1/8	NVO6
"children may get a place to go to school"	"able to pay school fees"	2/8	NVO5; NVO7
"gained more knowledge about… animal husbandry"		1/8	NVO6

Community Member Interviews with Grandparents Living in NV (10 interviews, 10 interviewees)

Basic needs for villagers and education for children	Additional responses	Number of Responses	Interview Code
"basic needs being met"	"able to meet basic needs"; "basic needs are being met"; "now can meet the needs"; "now have food"; "basic needs being met"; "can meet their basic needs"; "basic needs being met"; "meet basic needs"; "basic needs now met"	10/10	NVI1; NVI2; NVI3; NVI4; NVI5; NVI6; NVI7; NVI8; NVI9; NVI10
"kids are getting education"	"education"; "kids getting education"; "kids able to get good education"; "have…education": "getting a better education"; can go to school"; "providing…education"; "provision of…education"	9/10	NVI1; NVI2; NVI3; NVI4; NVI5; NVI6; NVI8; NVI9; NVI10
"selling baskets" (and wood carvings)	"carved wood products to sell"; "wood carvings…source of income"; "basket-making gives…money"; "basket making allow(s) them to earn income"; "baskets"; "baskets"; "sale of baskets"	8/10	NVI1; NVI2; NVI3; NVI4; NVI5; NVI6; NVI7; NVI10
"perimeter shambas help them get extra food"	"perimeter shambas provide them with extra food"	2/10	NVI1; NVI4
"access to firewood and water…(don't) have to travel a long distance"	"does not have to travel far for water"; "easier to get water and firewood"; "does not have to struggle to get water"	3/10	NVI1; NVI2; NVI4; NVI5
"access to… clothing"	"provide clothing"	2/10	NVI2; NVI9
"able to use land…to plant"	""home gardens and perimeter shambas"; "can use shambas"; "able to raise some vegetables"; "ability to cultivate farms"; "being able to have a garden"	6/10	NVI2; NVI4; NVI5; NVI6; NVI7; NVI8

Interviews with NV Staff and Outside Community Leaders (14 Interviews/ 17 interviewees)

Prioritized Need	Need/Issue Addressed	Number of Responses Per Issue	Interview Code[2]
Basic needs of families	"milk" (for families)	1/14	NVS1
Basic needs of families	"families consuming eggs"	2/14	NVS1; NVS4
Help the outside community sustain livelihoods	"apiculture…establish markets"	3/14	NVS1; NVS7; NVS9
Help the outside community sustain livelihoods	"capacity building"	7/14	NVS4; NVS7; NVS8; NVS10; NVS12; NVL1; NVL2
Help the outside community sustain livelihoods	NVS4- "outside community providing labor"	8/14	NVL1; NVL2; NVS1; NVS4; NVS2; NVS7; NVS10; NVS11;
Meeting basic needs of villagers	"get fodder from riparian zone" (for livestock/milk)	1/14	NVS1
Meeting basic needs of villagers	"water" (access for farm, consumption, etc.)	8/14	NVS1; NVS7; NVS9; NVS10; NVS11; NVS12; NVL1; NVL2
Basic needs of villagers	"bore hole…for village consumption"	2/14	NVS1; NVS2
Meeting basic needs of villagers	"selection of plants that are useful… neem… *Croton megalocarpus*" (plantations)	2/14	NVS1; NVS10
Help outside community sustain livelihoods	"market for local surrounding villagers"	3/14	NVS1; NVS7; NVS10
Help outside community sustain livelihoods	"PS…has benefitted the community members"	4/14	NVS1; NVS7; NVS10; NVS11
Basic needs of villagers	"able to grow vegetables for themselves"	2/14	NVS2; NVS4
Basic needs of villagers	"access to medical care"	4/14	NVS2; NVS4; NVS10; NVS11; NVS12

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[2] Additional quotes referenced in Objective Four Community Leader and NV staff interview table.

Prioritized Need	Need/Issue Addressed	Number of Responses Per Issue	Interview Code[2]
Basic needs of villagers	"income generating activity…baskets"	1/14	NVS4
Education for children	"education"	4/14	NVS4; NVS8; NVS11; NVL2
Basic needs of villagers	"produce food"	2/14	NVS4; NVS7
Basic needs of villagers	"provide emotional support for the kids"	1/14	NVS5; NVS3
Basic needs of villagers	"basic needs being met"	2/14	NVS11; NVL2
Help outside community sustain livelihoods	"gained skills in building (check dams)"	1/14	NVL1
Help outside community sustain livelihoods	"polytechnic…provides opportunities"	4/14	NVS4; NVS8; NVL1; NVL2
Basic needs of villagers	"teaching the importance of cleanliness (hygiene)"	1/14	NVS3
Help outside community sustain livelihoods	"received training in farming techniques"	2/14	NVL1; NVL2

Categorization of Results

1.Basic needs of villagers
- "basic needs being met"
  - "produce food"
    - "able to grow vegetables for themselves"
      - "able to use land…to plant"
      - "perimeter shambas help them get extra food"
    - "milk"
      - "get fodder from riparian zone" (for livestock/milk)
    - "families consuming eggs"
  - "access to medical care"
    - "teaching the importance of cleanliness (hygiene)"
    - "provide emotional support for the kids"
  - "water"
    - "bore hole…for village consumption"
  - "selection of plants that are useful…neem… *Croton megalocarpus*" (plantations)
  - "access to firewood and water…(don't) have to travel a long distance"
  - "access to… clothing"
- "income generating activity…baskets"
  - "selling baskets"

The basic needs of the villagers are being met, as indicated in the interviews of all but one of the grandparents. They have access to food from their home gardens, perimeter *shambas* and the main farm and milk, eggs and other items are provided for them by the village. The have access to health services, including psychological support and more knowledge about the importance of hygiene. They are able to get water from the spigots located near their homes. They have also been provided with shelter and clothing. The baskets and wood carvings provides a little extra income for the grandparents so they can provide for their own needs, travel to their homes or buy extra things for the children.

Information from Objective Eight provides for a deeper analysis of whether basic needs are actually being met. Nearly all of the grandparents mentioned that there was a food shortage and that they needed more land on which to farm. This was confirmed in the RRA, where the grandparents prioritized farming and water. The underlying factor of this situation is that the village is having a difficult time feeding all of the villagers, yet they are adding more because of donor pressure to accommodate 1000 orphans and grandparents. Grandparents also articulated that there is often a lack of supplies, such as clothing, especially for girls who have special needs such as congas and sanitary napkins. This evidence shows that although the villagers' basic needs are being met, there are deficiencies in some significant areas.

2.Education for the children
- "kids are getting education"

The children are receiving formal education in the school. Data from Objective Eight, however, shows concern that the children are not gaining life skills needed to live in the harsh conditions they will face when they must leave the village. The children are also not learning about sustainability, which could help them build skills to deal with problems the future will certainly hold.

3.Helping the outside community sustain livelihoods
- Economic
  - "market for local surrounding villagers"
    - "apiculture…establish markets"
  - "outside community providing labor"
  - "earned money"
  - "now more water is available"
  - "earning money to provide for (his) children"
  - Farming
    - " able to grow vegetables to sell and consume"
    - "intercropping to maximize outputs"
    - "wells…have helped them with issues related to farming"
    - "increased soil fertility because of manure & compost"
    - "PS…has benefitted the community members"
      - "perimeter shambas help them satisfy their basic needs"
  - "capacity building"
    - "gained more knowledge about… animal husbandry"
    - "acquired skills to help themselves"

- o "learned how to construct homes"
- o "learned how…to make bricks"
- o "gained skills in building (check dams)"
- o "received training in farming techniques"
    - ▪ "gained skills in composting and organic farming"
- o "polytechnic…provides opportunities"
    - ▪ "children may get a place to go to school"

The NV project is helping the outside community sustain livelihoods in various ways. The project has provided them with direct employment which has allowed them to provide for their children and pay school fees to get an education. The project has also helped them develop capacity and acquire "*skills to help themselves*" (NVO1). The skills they have learned in farming are helping them grow more vegetables for sale and consumption. Farming has been improved because they learned new techniques such as intercropping and composting. Water is more available for farming because of vegetation restoration and infrastructure created for water conservation (sand dams, bore holes and wells). Skills gained in making check dams may also serve to help conserve water for farming and household use if they are constructed in other areas. The perimeter shamba system has also made more land available on which to grow crops. The outside community has also gained skills in construction of homes and other buildings out of bricks, which may be used to construct new buildings in the future. The polytechnic is also providing youth in the area with vocational skills they can use to earn a living.

NV presents a great opportunity for the outside villages to earn livelihoods and provide for their families. That being true, the outside villagers still have many needs and face issues associated with the overall lack of development in the area. They are coming from a situation of abject poverty, so, even with the options NV gives them, they face a tough situation. This was confirmed in the RRA with the organic outgrowers group, where participants focused on education and livelihood security as major elements of their community life that need to be addressed.

Objective 6a- Identify the achievements and challenges of implementing the initiatives to meet the needs of community members.

Propositions

Community Member Interviews with Outside Community Workers (7 interviews, 8 interviewees)

Achievement	Additional Responses	Number of Responses	Interview Code
"learned to live together as a community"		1/8	NVO2
"learning from each other and outsiders"		1/8	NVO2
"there is change in the community"		1/8	NVO2
"reduction in charcoal burning because less trees are being felled"		1/8	NVO3

Achievement	Additional Responses	Number of Responses	Interview Code
"no longer using chemicals to fight off garden pests"		1/8	NVO3
"orphans…big burden lifted"		1/8	NVO1
"church"		1/8	NVO1
"can get transport in times of emergencies"		1/8	NVO3
"development of NV has brought more roads to the area"		1/8	NVO5
"clinic makes it easier"	"ability to get medical care in the clinic"	2/8	NVO5; NVO6

Community Member Interviews with Grandparents Living in NV (10 interviews, 10 interviewees)

Achievement	Additional Responses	Number of Responses	Interview Code
"support each other to deal with problems"	"integrate well"; "lot of support from each other"; "rely on each other to solve problems"; "share experience"; "grandparents get along very well"; "receive emotional/social/psychological help from other grandmothers"; "other grandmothers have helped her when she needed it"; "place to meet with other grandmothers"; "respect each other's space"	10/10	All
"hope…now (have it)"	"bright future": "NV has instilled a lot of hope"; "can see bright future for her kids"	3/10	NVI1; NVI3; NVI5; NVI10
"live together in a community"	"living together"; "adapt together"; "in the community have a forum to discuss issues and come up with solutions"; "sense of community'" "good community relationship"	6/10	NVI1; NVI2; NVI3; NVI8; NVI9; NVI10

Interviews with NV Staff and Outside Community Leaders (14 Interviews/ 17 interviewees)

Achievement	Additional Responses	Number of Responses	Interview Code
"diversity (in riparian zone)"	"it now has many natives and some exotics"; "some species that were thought to be extirpated have come back"	3/14	NVS1; NVS7; NVS10
"orphans- many have been taken to NV"	"primary school has been provided for the orphans"	2/14	NVL1; NVL2

Achievement	Additional Responses	Number of Responses	Interview Code
"community being education about HIV/AIDS"		1/14	NVL1
"diseases… awareness"		1/14	NVL1
"less felling of trees because they are getting employment and not using charcoal as a source of income"		1/14	NVL1
"restore the riparian zone"	"sand dams helping to recharge groundwater"; "riparian areas improved"	3/14	NVS7; NVS12; NVS11
"engaging the outside community"	"provide a lot of support for the village";	9/14	NVS1; NVS2; NVS4; NVS7; NVS8; NVS9; NVS10; NVS11; NVS12
"(grandparents) giving compost to livestock to eat"		1/14	NVS1
"(grandparents) making connection between milk production and nutrition"		1/14	NVS1
"outside community is looking ahead"		1/14	NVS1
"Kamba (staff)…have cultural advantage"		1/14	NVS1
"the school has developed clubs to help teach them sustainability"		1/14	NVS1
"kids are performing well in school"		3/14	NVS2; NVS4; NVS11
"use of locally available resources"		2/14	NVS2; NVL2
"people beginning to see NV as their home"		3/14	NVS2; NVS4; NVS11
"staff and villagers learning from each other"		4/14	NVS2; NVS4; NVS7; NVS8
"positive change in the community"		2/14	NVS3; NVS6

Achievement	Additional Responses	Number of Responses	Interview Code
"change in…perceptions of HIV/AIDS"		2/14	NVS3; NVS4
"organic methods of farming"	"organic farming…practices began to work"; "organic waste to grow vegetables"; "organic farming methods…use of non-toxic pesticides"	5/14	NVS4; NVS10; NVL1; NVL2
"being an eco-village helps introduce the concept of sustainability"	"promoting sustainable techniques"	2/14	NVS4; NVS7
"unity within the sho-shos…community"		1/14	NVS4
"activities and skills that will eventually bring money to the area"	"money generated"	2/14	NVS6; NVS8
"internship program for Kenyan students"		1/14	NVS7
"(grandparents) involved in decision-making"		1/14	NVS7
"reducing deforestation and overgrazing of the 1000 acres"		1/14	NVS7
"development of… community groups"	"organic outgrowers group"	2/14	NVS7; NVS10
"the presence of the polytechnic is bringing the outside villages and NV closer"	"improved relations with the outlying community"	2/14	NVS8; NVS10
"perimeter shamba lands have provided a boundary for the village"	"not a lot of encroachment"	2/14	NVS10; NVS1
"roads have been improved"	"improved roads"	2/14	NVL2; NVS11

Categorization of Propositions

Economic
- "activities and skills that will eventually bring money to the area"
  o "money generated"
- "roads have been improved"
  o "development of NV has brought more roads to the area"

Social
- Knowledge exchange
  o "internship program for Kenyan students"
  o "staff and villagers learning from each other"
  o "Kamba (staff)…have cultural advantage"
  o "learning from each other and outsiders"

- o "community being education about HIV/AIDS"
  - ▪ "diseases… awareness"
  - ▪ "change in…perceptions of HIV/AIDS"
- Participation
  - o "(grandparents) involved in decision-making"
  - o "development of… community groups"
  - o "engaging the outside community"
- Sense of community
  - o "the presence of the polytechnic is bringing the outside villages and NV closer"
    - ▪ "improved relations with the outlying community"
  - o "unity within the sho-shos…community"
  - o "people beginning to see NV as their home"
  - o "live together in a community" (grandparents)
  - o "support each other to deal with problems" (grandparents)
  - o "learned to live together as a community" (outside)
- Other benefits for the outside community
  - o Clinic (outside)
  - o "can get transport in times of emergencies"
  - o "church"
  - o "positive change in the community"
    - ▪ "there is change in the community"
- "hope…now (have it)"
  - o "kids are performing well in school"
  - o "orphans- many have been taken to NV"
    - ▪ "orphans…big burden lifted"
  - o "outside community is looking ahead"

Ecological
- "perimeter shamba lands have provided a boundary for the village"
  - o "not a lot of encroachment"
- Restoration
  - o "reducing deforestation and overgrazing of the 1000 acres"
  - o "restore the riparian zone"
    - ▪ "diversity (in riparian zone)"
- "being an eco-village helps introduce the concept of sustainability"
  - o "the school has developed clubs to help teach them sustainability"
  - o "promoting sustainable techniques"
    - ▪ "(grandparents) making connection between milk production and nutrition"
    - ▪ "(grandparents) giving compost to livestock to eat"
  - o "organic methods of farming"
    - ▪ "no longer using chemicals to fight off garden pests"
  - o "use of locally available resources"
- "less felling of trees because they are getting employment and not using charcoal as a source of income"

o "reduction in charcoal burning because less trees are being felled"

Discussion of Objective Six-A Results

The NV project is showing added benefits in economic, social and ecological realms. Economic benefits are the improvement of roads, which allows for access to markets and transportation in an area that was formerly quite isolated.   The village's mere presence is helping to bring money to the area surrounding its boundary, even for those not directly involved with the village (e.g., volunteers buy produce and goods at local markets, buy baskets from women, pay for rides on motorcycles for transport to and from the village, etc.).

Ecological benefits are also evident. Restoration has been a key factor, especially in the riparian areas, which now have increased diversity.   The concept of sustainability, which is new to the area, has been introduced by the village and its staff. The village is run using organic farming techniques, which have been extended to the villagers and the outside community. Some evidence that using sustainability principles is gaining ground is the comment that the grandparents are giving compost to the livestock and making a connection between healthy animals and nutrition. The use of locally generated materials is also a success, because they were able to construct most of the buildings with minimal materials made in another area and requiring transport. An additional benefit outside of the community is that fewer trees are being felled to make charcoal because people have more access to employment.

Respondents have noted many social benefits to the NV project. NV's presence has allowed for knowledge exchange between the villagers, the outside community, the staff, as well as expert knowledge from universities. Knowledge of health issues has also expanded as a result of the village because health clinic workers have been able to teach overall awareness about diseases and dispel myths and stigmas about HIV/AIDS, which they believe is helping to change attitudes towards victims. Participation in the village has also been a success, primarily that of the grandparents, but also the children's involvement and that of the outside community in helping it run. Participation reflects a sense of community that has developed, even in its nascent years, especially among the grandparents. They now have a venue to discuss issues they all face. The outside community has also gained access to new services, such as the clinic, church and, sometimes, transport, that it did not previously have. Outside community members noted that things are "*beginning to change*" for them. This leads to a significant achievement and that is "*hope for the future*".   The grandparents articulated that they now see a good future for the children and they did not before. The children are doing well in school and are in the top schools for the district in terms of achievement tests. Likewise, the outside community is looking ahead towards the future.

Objective 6b- Identify the achievements and challenges of implementing the initiatives to meet the needs of community members.

Propositions

Community Member Interviews with Outside Community Workers (7 interviews, 8 interviewees)

Challenge	Additional Responses	Number of Responses	Interview Code
"scarcity of materials"	"access to tools to finish their work"; "doesn't have protective gear"	3/8	NVO1; NVO5; NVO7
"poor procurement system for materials"		1/8	NVO1
"often payment is delayed"	"delay of payment"	2/8	NVO1; NVO7
"not given a copy of the work documentation"		1/8	NVO1
"hard time understanding what they are doing with NV, especially the sustainability part…hard to implement what the concept is"		1/8	NVO2
"dry habitat farming"		1/8	NVO2
"low wages"		1/8	NVO3
"not any transportation for them"		1/8	NVO3
"monkeys are stealing crops"		1/8	NVO3
"making people work hard"		1/8	NVO6
"sometimes they come to work and there isn't any work available for them"		1/8	NVO7

Community Member Interviews with Grandparents Living in NV (10 interviews, 10 interviewees)

Challenge	Additional Response	Number of Responses per Need/Issue	Interview Code
" teenagers… behavioral issues"	"teenage crisis"	2/10	NVI1; NVI3;
"blending issue"	"biggest challenge is the blending"; "initially it was very difficult to blend the two families"; "challenging to get the new kids to adjust to (her) ways"; "blending issue is a big one"	5/10	NVI3; NVI4; NVI7; NVI8; NVI10

Challenge	Additional Response	Number of Responses per Need/Issue	Interview Code
"division among (grandparents)"		1/10	NVI4
"shortage of food"	"food shortage"; "food shortage"; "food supply often lacking"	4/10	NVI3; NVI5; NVI6; NVI7
"transportation"		1/10	NVI7

Interviews with NV Staff and Outside Community Leaders (14 Interviews/ 17 interviewees)

Challenge	Additional Responses	Number of Responses per Need/Issue	Interview Code
"(essential oils [EO]) don't have the raw materials"		1/14	NVS1
"(EO)-gas…expensive"		1/14	NVS1
"expenses are higher than the income it generates" (EO)		1/14	NVS1
"Sister Mary's project" (EO)		1/14	NVS1
"the concept of sustainability is not fully understood"	"level of awareness-community members don't know that they want to be self-sustaining"; "concept of sustainability is still being understood"; "don't have a good understanding of what sustainability is"; communicating the concept of sustainability"	5/14	NVS2; NVS3; NVS4; NVS10; NVS11
"didn't set out the expectations in the beginning" (for villagers)	"grandparents (don't understand role in sustainability)"; "contradictory"; "sho-shos not very involved, at least not what is expected of them"; "grandparents still figuring out what is expected of them"	5/14	NVS1; NVS2; NVS4; NVS10; NVS11
"Kids…doesn't see a lot of activities…learning about sustainability"	"need to encourage the children to participate";	2/14	NVS1; NVS4;
"water is the biggest factor in the village"	"semi-arid"; "dryland habitat"; "water"; "organic farming in dryland conditions"; "dryland habitat-producing enough food";	6/14	NVS1; NVS3; NVS7;NVS9; NVS10; NVS11;

Challenge	Additional Responses	Number of Responses per Need/Issue	Interview Code
"infrastructure for water is poor"	"not enough water infrastructure"; "need to manage water and the water storage capacity"; "challenge to haul water"	4/14	NVS1; NVS7; NVS9; NVS12
"lack of trained people to fix and solve problems related to water"	"lack expertise in dryland approaches"	2/14	NVS1 ;NVS12
"have to use a diesel pump (for water)"	"don't have a cost effective way of pumping water"; "need to do it without diesel";	3/14	NVS1; NVS7; NVS9
"(villagers) waste a lot of water"		1/14	NVS1
"(poor water) quality"		1/14	NVS1;
"water salinity"		1/14	NVS10
"watering seedlings (in plantations)"		1/14	NVS1
"overgrazing by goats"		1/14	NVS1
"pests- use of biopescticides for organic farming"	"pests"	3/14	NVS7; NVS10
"(unreliable seed sources)"		1/14	NVS1
"the people who have been leased (perimeter shamba) plots do not plan well"		1/14	NVS1
"people not reliable because they are living in poverty"	"poverty in the surrounding area"; "poverty around the village"; "have to depend on families, but they can't afford to give them anything"	4/14	NVS1; NVS3; NVS7; NVS8
"maintaining organic status…operating costs high" (livestock unit)	"plants recommended for biopesticides are often very expensive"; "permaculture"	3/14	NVS1 NVS10; NVS12
"(in livestock unit) labor and resources difficult to organize"		1/14	NVS1
"don't even have a policy (on waste management)'		1/14	NVS1
"have to change culture (to compost)"		1/14	NVS1
"Chickens…disease"		1/14	NVS1
"families are now consuming eggs instead of letting them hatch"		1/14	NVS1

Challenge	Additional Responses	Number of Responses per Need/Issue	Interview Code
"they don't want to supply chickens or eggs"		1/14	NVS1
"people don't have skills right now to manage" (for apiculture)	""need to build more capacity in the village so they are not dependent on staff"	2/14	NVS1; NVS9
"difficult to engage the villagers to some degree because of their age"	"grandparents…their age"; "grandmothers are very old and slow in taking in information"; "some cannot work because of their age"; "mostly cannot be involved because of their age"	5/14	NVS1; NVS2; NVS3; NVS4; NVS12
"(villagers don't get) systems connections"		1/14	NVS1
"getting the NV villagers to be responsible"		1/14	NVS1
"engaging the outside community was very difficult in the beginning"	"participation low to medium"	2/14	NVS1; NVS12
"short-term thinking" (outside)	"(e.g.,) livestock management"	2/14	NVS1; NVS10
"need to change the mindset" (outside)	"thinks they are willing to change though"	2/14	NVS1; NVS10
"nothing is being done (to evaluate actions)"		1/14	NVS1
"cultural forces that do not include conservation" (villagers)		1/14	NVS1;
"people/staff not involved at all in decision-making…all top-down management"	"policies that are developed elsewhere and not completely understood"; "the planning of activities is very disconnected for example between departments…the board of directors makes decisions but they don't always apply to what is happening in the field"; "the Board develops the vision, need more collaboration"	4/14	NVS1; NVS2; NVS7; NVS8
"how to get kids trained in other life skills"	"they are more detrimental to sustainability because they are not gaining any skills otherwise or contributing"	2/14	NVS1; NVS9

Challenge	Additional Responses	Number of Responses per Need/Issue	Interview Code
"NV is really losing connections with the outside community"	"disconnect between the villagers, staff and the outside community"; "need to integrate with the outside community more to involve them"; "need to involve them more"	4/14	NVS1; NVS2; NVS8; NVS6
"lot of donor pressure to add villagers and housing, but they cannot handle it at this point"		1/14	NVS1
"(vision for future) not actively involved"	"not fully involved in developing a shared vision"; "they have the will but need to develop it"	3/14	NVS1; NVS7; NVS11
"argument between all of the players"	"a lot of conflicting opinions"	2/14	NVS2; NVS7
"what to do when kids exit village"		1/14	NVS2
"no…standard operating procedures to work with (outside villagers)		1/14	NVS2
"unclear objectives"		1/14	NVS2
"kids always in school and can't come for counseling"		1/14	NVS2
"no transportation (for staff to do work)"	"no secure means of transportation"; "transportation is a problem"; "lack of transportation"	4/14	NVS2; NVS3; NVS7NVS11
"lack of staff"	"only two of them in the staff to deal";	2/14	NVS2; NVS5;
"comprehensive HIV care is difficult without a lab"		1/14	NVS3
"population's lack of education"	"poor education"	2/14	NVS3; NVS6
"community has no idea about counseling"		1/14	NVS5;
"isolated…don't always have access to new information and techniques"	"remote location…disconnected from markets"; "lack of information…don't have books, reliable internet"; "lack of internet"	4/14	NVS3; NVS7; NVS10; NVS11
"no way to preserve medicines"		1/14	NVS3
"power supply"	"lack of electricity"; "lack of …electricity";	3/14	NVS4;NVS8; NVS11
"teenagers"		1/14	NVL2

Challenge	Additional Responses	Number of Responses per Need/Issue	Interview Code
"grandparents don't always know about problems"		1/14	NVS5
"lack of understanding of what to do when outside villagers provided labor"	"need to solve the labor problem"	2/14	NVS7; NVS9
"material supply"		1/14	NVS8
"sustainability means business…has not been in tandem with business management"	"developing this dimension to create profit"	2/14	NVS9;NVS12
"cannot just farm in the traditional African way, which is to plant and wait for the rains"	"figuring out planting"	2/14	NVS9; NVS12
"choosing appropriate crops"		1/14	NVS12
"no blueprint to guide them"		1/14	NVS11
"sustainability…no policy framework"		1/14	NVS11
"funding"		1/14	NVS11
"security"	"security is loose"	2/14	NVS11; NVL2
"delay of payment" (for outside villager wages)	"delayed payment of wages"	1/14	NVL1; NVL2
"low pay rate" (for outside villagers)	"workers…underpaid"	2/14	NVL1; NVL2
"tribalism…staff all from one area"	"many of the people working at NV are from far away and local people are not considered for positions"	2/14	NVL1; NVL2
"workers not given transport"		1/14	NVL2
'orphans…don't have enough clothing"		1/14	NVL2
"no consultation with them and NV" (government)		1/14	NVL2

Categorization of Objective Six-B Results

1.Internal Issues
Institutional Issues
- "unclear objectives"

- o "no…standard operating procedures to work with (outside villagers)
  - o poor planning in perimeter shamba
  - o "don't even have a policy (on waste management)'
  - o "nothing is being done (to evaluate actions)"
  - o "sustainability…no policy framework"
  - o "(vision for future) not actively involved"
- Newness of the project
  - o "cannot just farm in the traditional African way, which is to plant and wait for the rains"
  - o "no blueprint to guide them"
  - o "comprehensive HIV care is difficult without a lab"
  - o "no transportation (for staff to do work)"
  - o "(in livestock unit) labor and resources difficult to organize"
- centralized decision-making
  - o "people/staff not involved at all in decision-making…all top-down management"
  - o "lot of donor pressure to add villagers and housing, but they cannot handle it at this point"
- personnel
  - o "lack of staff"
  - o "argument between all of the players"
  - o "lack of trained people to fix and solve problems related to water"
- sustainability
  - o "sustainability means business…has not been in tandem with business management"
    - ▪ "funding"
    - ▪ "lack of understanding of what to do when outside villagers provided labor"
  - o "choosing appropriate crops"
  - o "maintaining organic status…operating costs high" (livestock unit)
    - ▪ "permaculture"
    - ▪ "Chickens…disease"
    - ▪ "pests- use of biopescticides for organic farming"
  - o "shortage of food"
  - o "overgrazing by goats"
  - o role of children and grandparents in village sustainability
    - ▪ "cultural forces that do not include conservation" (villagers)
    - ▪ "how to get kids trained in other life skills"
    - ▪ "didn't set out the expectations in the beginning" (for villagers)
    - ▪ "Kids…doesn't see a lot of activities…learning about sustainability"
    - ▪ "have to change culture (to compost)"
    - ▪ "families are now consuming eggs instead of letting them hatch"
    - • "they don't want to supply chickens or eggs"
    - ▪ "difficult to engage the villagers to some degree because of their age"
    - ▪ "(villagers don't get) systems connections"
    - ▪ "getting the NV villagers to be responsible"
    - ▪ "(villagers) waste a lot of water"
    - ▪ "the concept of sustainability is not fully understood"
  - o essential oils factory
    - ▪ "(essential oils [EO]) don't have the raw materials"
    - ▪ "(EO)-gas…expensive"
    - ▪ "expenses are higher than the income it generates" (EO)

- ▪ "Sister Mary's project"
- social and domestic issues among villagers
  - o "blending issue"
  - o "division among (grandparents)"
  - o "teenagers"
    - ▪ " teenagers… behavioral issues"
  - o "grandparents don't always know about problems"
  - o 'orphans…don't have enough clothing"
  - o "community has no idea about counseling"
  - o "kids always in school and can't come for counseling"
- "security"
- "what to do when kids exit village"

Environmental

- "water is the biggest factor in the village"
  - o "dryland habitat"
    - "cannot just farm in the traditional African way, which is to plant and wait for the rains"
    - "(poor water) quality"
    - "water salinity"
- Pests in farm
  - o monkeys steal crops

2.Infrastructure

- "infrastructure for water is poor"
  - o "watering seedlings (in plantations)"
- "power supply"
  - o "have to use a diesel pump (for water)"
  - o "no way to preserve medicines"

3.Isolation limits access to outside resources and materials

- "material supply"
- "isolated…don't always have access to new information and techniques"
- "poor procurement system for materials"
- "(unreliable seed sources)"
- "lack of transportation"

4.Issues with outside community

- "no consultation with them and NV" (government)
- "population's lack of education"
- "short-term thinking" (outside)
- "people not reliable because they are living in poverty"
- "people don't have skills right now to manage" (for apiculture)
- "the people who have been leased (perimeter shamba) plots do not plan well"
- "engaging the outside community was very difficult in the beginning"
- "need to change the mindset" (outside)
- "NV is really losing connections with the outside community"
- "lack of understanding of what to do when outside villagers provided labor"
- "delay of payment" (for outside villager wages)
- "low pay rate" (for outside villagers)

- "tribalism…staff all from one area"
- "workers not given transport"
- "scarcity of materials"
- "not given a copy of the work documentation"
- "hard time understanding what they are doing with NV, especially the sustainability part…hard to implement what the concept is"
- "making people work hard"
- "sometimes they come to work and there isn't any work available for them"

Discussion of Objective Six-B Results

The challenges NV is currently facing fall into five large themes: environmental factors, lack of infrastructure, isolation, internal issues and issues in working with the outside community. The latter is also an internal issue, but information from the outside villagers working with NV and local community leaders provide a perspective that enriches the relationship between NV and the outside community and the challenges each is facing.

1.Environmental factors

The dryland habitat in which the village is located makes farming especially difficult because rainfall is unreliable. They cannot rely upon rain-fed agriculture to supply the village with food or for income generating crop production. Choosing crops and tree species appropriate to the habitat has been challenging because some desirable and traditional crops, tomatoes for example, simply will not grow there. Salinity in the groundwater poses an even greater problem because it can kill crops and corrodes drip irrigation hardware. NV is an island of resources for native animals and insects because most of the surrounding lands are degraded. The village has been forced to hire a guard at night to chase away monkeys that steal crops. Dealing with pests while maintaining organic status is an added complication.

2.Infrastructure

Infrastructure within the village and what is available in the region poses a significant challenge to the village. Water infrastructure has been constructed on the village property, but there is still need for more wells and bore holes and pumps to bring it to the surface, especially if they are going to use drip-fed irrigation for crop and tree production. The lack of electricity makes pumping water difficult, and although some existing pumps use solar power, others are still using diesel, which is expensive and counter to the goal of sustainability. Lack of electricity makes the efficacy of the clinic minimal because they cannot preserve medicines and thus cannot provide comprehensive care, especially for people with HIV/AIDS. Roads are also an issue because they are poorly maintained and subject to erosion, especially during the rainy season.

3.Isolation

The village is located 14 kilometers from the nearest paved road, which would not seem like such an issue if the roads surrounding the village were not so poor. Transportation to the village is minimal and *boda-bodas*, motorcycles for hire from Kwa Vonza, are expensive. The village only has a few trucks and motorcycles for staff to use if they need to go outside the village. Isolation also impedes the staff's access to new information about farming or medical techniques and the lack of electricity and internet

service means even less access to information networks. Another issue is that materials and resources are often needed (e.g., seeds) but it is challenging to procure them.

4.Internal Issues

Most of the challenges NV is now dealing with are related to institutional factors and the "growing pains" associated with conducting a new type of project in a new setting with people who are living in abject poverty. A lack of planning and clear objectives that tie the whole project together are serious limitations. Though each department is responsible for making and meeting objectives, there is often disconnect between them. Some home care staff, for example, could not describe what the sustainability department does. There are no set standard operating procedures, so the staff often has to act on the fly and deal with the consequences at a later time. Some projects like the perimeter shamba system have not been well-planned and are suffering because of it. Some staff mentioned that decision-making is all top-down and that these decisions are often made without knowledge of what is happening on the ground in the village. Adding new orphans, for example, because of donor pressure, is a huge issue because currently the village is not able to even fully support the ones who are there. The staff lack funding and knowledge to deal with many issues, which puts more pressure on them to deliver. There has been a high rate of staff turn-over, which may reflect the institutional culture and the village's geographical isolation.

Reaching the goal of sustainability has been an ongoing challenge for the village. Maintaining organic status is difficult. An example of this is a disease contracted by the chickens, which could not be treated organically, so they had to receive permission to use anti-biotics or face losing all of the birds. The operating costs are high and some projects have not be successful. The essential oils factory, for example, is currently unused because they were relying upon diesel fuel to run it and the raw material supply (based in western Kenya) was cut-off during the violence of early 2008. The viability of this project is subject to concern anyway because it is not sustainable to use raw materials that require shipping in gas-powered vehicles from far away. Now the factory's machinery is sitting in an unenclosed structure subject to rust and wear. This is an example of how the village is not running like a business and is losing money because of it.

An aspect of sustainability that is an issue for the village is the fact that the villagers do not understand and are not using sustainable practices. The staff did not clearly explain the concept to the villagers or set out clear expectations of what living there would entail. Now the staff wishes for the villagers to be more engaged, but the grandparents are used to their own ways of doing things and the children are always in school. During the RRA with the grandparents, most of whom have been living in the village for over a year at that point, it was clear that they did not understand sustainability at all. They said that they do not see how sustainability applies to them because they are old and the children are going to leave the village after they finish secondary school, so why should they be concerned with long-term issues? This reflects the villager's disconnect to one of the main goals of NV: being an ecovillage. Although there is evidence that some grandparents are composting garden waste and using the ecotoilets, it seems as though the whole of them do not even have an understanding of why sustainability applies to them.

There are also social problems among the villagers. The blending of families is a challenge because grandparents are to raise children to whom they are not related, so

authority is challenged and, in some cases, unaccepted. Teenagers pose a problem and there have been cases of pregnancy. There are also factions among the grandparents because they come from different areas of the Kamba region and have different viewpoints. The children's busy schedules at school limit their ability to get counseling and some of them need it and the grandparents are not always aware of the problems the children are facing. Finally, what happens to the children when they exit the village is a major concern because life is difficult in Kenya even for those who do have an education.

5. Issues with the outside community

The vision of NV was to create a home for the lost generation of the HIV/AIDS pandemic in an ecovillage setting. The buy-in and support of the outside village is a critical aspect of this vision.   HIV/AIDS are symptoms of larger issues, such as the cyclical poverty and social inequity of the country and the Kamba region in particular. Dealing with the AIDS crisis also means dealing with the source, so NV has the opportunity to help the outside community do this. However, there have been many challenges in the relationship between the "inside and outside" (the distinction between the two perhaps being a major factor). The poverty of the outside region means that the laborers often only have physical labor to offer and have little education to understand some of the village's activities. The outside villagers often have short-term thinking patterns because they are forced to live on a hand to mouth basis, so changing this culture to integrate long-term sustainability is a challenge. Like with the grandparents and children, there is a lack of understanding in the outside villages about what NV's goal of sustainability is.

The outside community also has frustrations in working with NV. Wages are low and work is not always a guarantee even if they travel from far away to offer their labor. Delay of payment is a major concern because these people do not have savings on which to rely, and not receiving money from NV means their families may not be able to eat. In one interview respondents felt that the theft of solar panels and other expensive materials was a result of the outside villagers not receiving pay and feeling desperate. There is also a lack of tools and protective gear for them to do their work because NV does not always have supplies for them to use and they cannot afford their own.

Objective 7: Identify what assessment techniques have been undertaken in each community by either external or internal actors related to actions taken towards sustainability.

Propositions

NV Staff (12 interviews, 13 interviewees)

Assessment Techniques	Additional Responses	Number of Responses	Interview Code
"very informal and not well developed"	"evaluation component was small"; "no formal process"; "informal interviews"; "have not developed"	4/12	NVS1; NVS7; NVS9; NVS10; NVS11

Assessment Techniques	Additional Responses	Number of Responses	Interview Code
"in the village departments function independently"	"share with other departments in staff meetings"; "if they are meeting their budget"; "involve grandmothers in meetings"; "progress reports (kids' counseling)"; "education department requires…"; in-house"; "(polytechnic) only in first quarter"; "gardens...tangible results"; "relying on progress reports"; "Maxwell prepares a report (for sus. Department)"	10/12	NVS1; NVS2; NVS3; NVS4;NVS5;NVS6; NVS7; NVS8; NVS11; NVS12
"not currently evaluating the village"		1/12	NVS1
"for each project"		1/12	NVS4
"come up with measurable objectives"		1/12	NVS4
"(ecological issues)outside consultants"	"Maxwell prepares a report"	2/12	NVS7; NVS12
"group meetings"	"meetings"	2/12	NVS10; NVS4

Categorization of Propositions
Present
- "very informal and not well developed"
- "group meetings"

Intra-departmental evaluations
- "in the village departments function independently"
- "for each project"
  - "(ecological issues)outside consultants"
- "come up with measurable objectives"

Absent
- "not currently evaluating the village"

Discussion of Results

  The interview results show that use of evaluation techniques in the village is inconsistent. Some respondents said that they do not have evaluation tools. The inconsistency seems to lie in evaluation of the village as a whole versus intra-departmental evaluations, which are present. However, each department seems to use different techniques, for example, the clinic evaluates based upon whether they are meeting their budget, whereas the home care department comes up with measureable objectives. Respondents mentioned that evaluation is often on a project basis. For example, the sustainability department communicated with outside consultants for evaluation ecological restoration in the riparian areas.

  It is clear from the data that there exists no formal form of evaluation as an institutional guideline, or if there is then there appears to be a lack of knowledge about it in the staff.

Objective 8: Identify what are the current needs of community members.

Propositions

Community Member Interviews with Outside Community Workers (7 interviews, 8 interviewees)

Current Needs	Additional Responses	Number of Responses	Interview Code
"sickness"	"health"	2/7	NVO1; NVO3
"land scarcity"		1/7	NVO1
"lack of markets"		1/7	NVO1
"poor leadership (in government)"		1/7	NVO1
"corruption"		1/7	NVO1
"no accountability"		1/7	NVO1
"water infrastructure"	"enough…wells"; "more bore holes for water";	4/7	NVO1; NVO3; NVO6;
"alcoholism"		1/7	NVO1
"theft"		1/7	NVO1
"shortage of jobs"	"(money) can only buy clothing month to month"; "need more employment opportunities"; "more employment opportunities; "majority of people…still do not have work"	5/7	NVO2; NVO3; NVO5; NVO6; NVO7
"often not able to finish schooling"	"getting education for the children"	2/7	NVO2; NVO4
"dryland habitat makes it difficult to raise crops"	"don't have enough rains to grow crops"	1/7	NVO2; NVO4
"food security"	"food scarcity"; "famine"; "food security"; "many people don't have enough food"	5/7	NVO2; NVO3; NVO4; NVO6; NVO7
"church"		1/7	NVO3
"availability of water"	"water"; "finding good drinking water"; "water"	4/7	NVO3; NVO4; NVO6; NVO7
"education"	"education"; "education"; "lack of education opportunities"	4/7	NVO2;NVO4; NVO5; NVO6
"lack of roads"	"roads are poor"	2/7	NVO5; NVO6
"no medical facilities"	"no nearby medical centers"; "health centers";	3/7	NVO5; NVO6; NVO3

Categorization of Results

1.Outside villagers working with NV

- Isolation
  - "lack of markets"
  - Access to social services
    - "no medical facilities"
      - "sickness"
  - "education"
  - "church"
  - Infrastructure
    - "lack of roads"
    - "water infrastructure"
- Issues related to environmental factors
  - "availability of water"
  - "food security"
    - "dryland habitat makes it difficult to raise crops"
- Poor economic condition
  - "lack of markets"
  - "often not able to finish schooling" (because of money)
  - "shortage of jobs"
  - "theft"
  - "alcoholism"
- "poor leadership (in government)"
  - "no accountability"
  - "corruption"
- "land scarcity"

The needs of the outside villagers reflect an overall low level of development in the region, which affects livelihoods and other aspects of social and domestic life. The villages surrounding NV, like NV itself, are isolated from regional markets, medical facilities, churches and schools. Transportation and water infrastructure are also lacking as a result of isolation from economic centers and inability to pay for them. The poor economic condition of the area is reflected in job shortages, lack of markets, theft, alcoholism and inability to send children to school because they cannot afford school fees. Poor, corrupt leadership and a lack of accountability in local government are impacting villagers' access to decision-making processes and development of social services that benefit the whole community. Environmental factors also place the villagers at a disadvantage because of frequent droughts and low annual rainfall, affecting crop production used for income generation and household consumption. High population density reduces land available to purchase even if people did have money.

Outside villager RRA results

1. Model building exercise

The RRA model created by the outside community (Figure) requires further explanation because the respondents provided extra information about what they believe needs to happen to each resource in order for it to develop. During the RRA participants expanded upon the following resources (but not all 15):

- Land → need more wells
- Rivers → need more sand dams
- Trees → need capacity (to care for them) and to plant more
- Rocks for building → need a market
- Brick-making → (depends on) water availability
- Basket weaving → need markets and materials
- Farming → need pest control, water, quality seeds, machines, plows, and information
- Milk production → need cows and fodder
- Chickens → need training, markets, processing capabilities, cross-breeding, better facilities to keep them

Five of the resources analyzed by the outside villagers are directly related to the need for water and infrastructure for water conservation. Construction of wells on land and sand dams on rivers are believed to be ways to increase access to water. The presence of sand dams would allow for sand extraction as an economic activity. Other income-generating activities, namely farming and brick-making, are dependent on water.

Infrastructure development and increased social services are also important factors for the outside community. There is no electricity, which is related to the municipality's low population and lack of funds to bring it there. Water infrastructure, education and medical services are clearly lacking, which is also connected to the poverty and isolation of the region. Isolation and lack of education also impede access to and possession of information and know-how for development of economic activities.

A lack of markets impacts all income-generating activities, especially selling rocks for construction and basket weaving. Increasing tree cover is also a need, most likely to provide a source of fuelwood for either household consumption or charcoal production. A lack of information and know-how impacts their capacity for farming, animal husbandry, and silviculture. All of the income generating activities (apiculture, sand, farming, milk production, chickens, brick-making, rocks, basket-weaving and wood carving) are dependent upon ecosystem services provided by the environment. The environment's reduced capacity impacts their livelihoods as much as the lack of infrastructure and isolation from local markets to sell their goods.

Themes from the model building exercise:
- Environmental services limit income generating activities, farming for subsistence, milk production
- Lack of markets
- Lack of infrastructure
- Lack of social services (electricity, education and medical services)
- Lack of information about income-generating activities
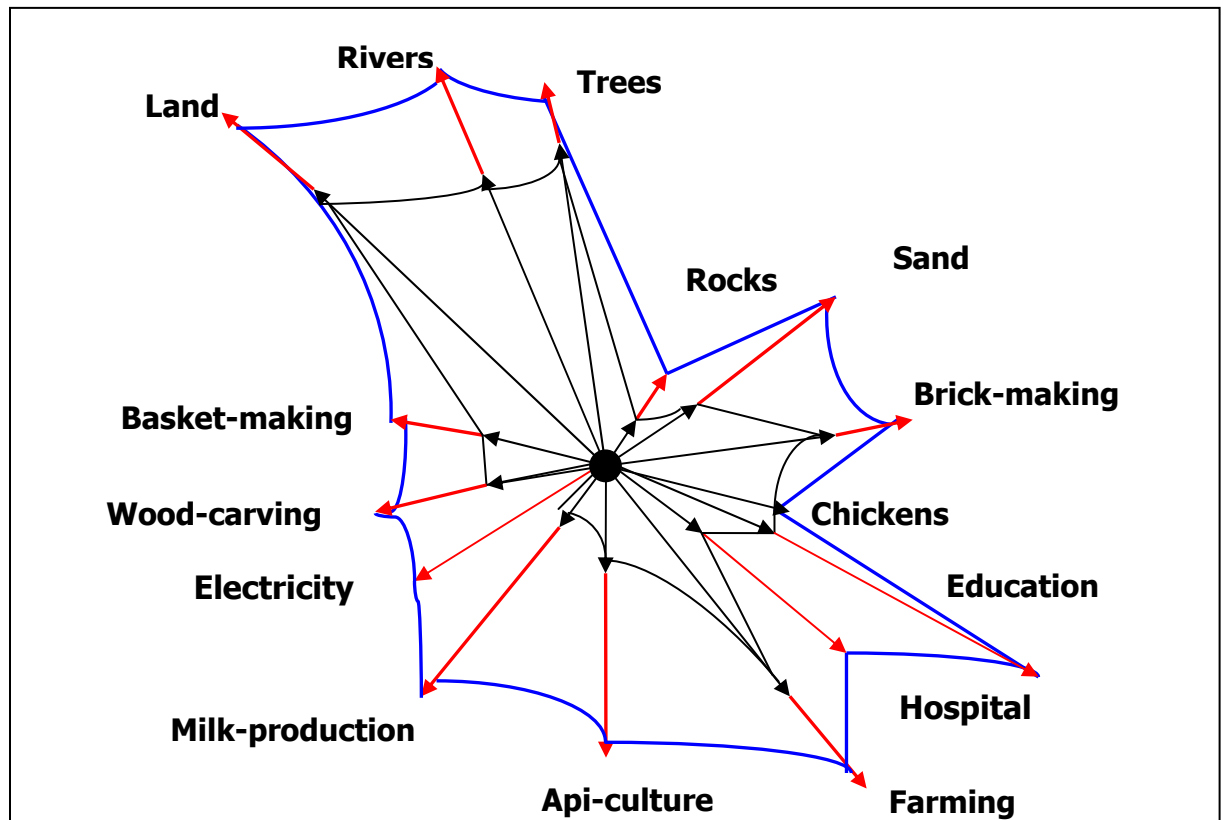
2. Discussion after model-building exercise

Participants agreed that education, farming, land, a hospital, trees and chickens were the most important resources they could develop for sustainability. When asked what steps could be taken to develop these resources they came up with interesting ideas. One of the first things they mentioned was that they could not build more schools without a donor. They were encouraged to think about donations as one-time activities, and sustainability means investing in long-term solutions. With this acknowledgement they came up with the idea of pooling money to provide loans and help each other provide access to education, especially for girls. There was also an emphasis to work together to develop farming and land management. In the discussion about trees and land, participants mentioned the need for soil conservation, terraces and fodder production, which manifests an understanding of basic ecological concepts that influence their ability to conduct their traditional income-generating activities. The need for materials for animal husbandry, farming and silviculture was articulated, which must be preceded by income. Some needs, such as a hospital, are dependent on the government.

When asked how they could work with NV to help develop these resources, participants mentioned maintaining a good relationship and coming together as a group to help the NV children and the larger community. They also mentioned that sometimes there are difficulties in working with NV, including the fact that capacity building exercises sometimes only include a few individuals and that they are often working with volunteers rather than staff.

Grandparents and children living in NV

Community Member Interviews with Grandparents Living in NV (10 interviews, 10 interviewees)

Current Needs	Additional Responses	Number of Responses	Interview Code
"food shortage"	"cannot plant enough to feed themselves"; "food shortage"; "food shortage"; "food shortage"; food supply often lacking"; "food supply"	7/10	NVI1; NVI2; NVI4; NVI5; NVI6; NVI7; NVI9
"bigger farms"	"would like to have her own farm"	2/10	NVI2; NVI4
"girls are growing and have special needs" (congas, sanitary napkins, underwear)	"especially the girls-they will need more clothes…"; "for the girls, they need congas to follow the Kamba traditions"	3/10	NVI4; NVI6; NVI8
"social integration…in village"	"getting all of them to live together"	2/10	NVI4; NVI10
"more income"		1/10	NVI4
"children not getting exposed to what they will face when they have to leave the village"		1/10	NVI5
"transportation"		1/10	NVI7
"lack of supplies (clothing, congas, shoes)"	"supplies are often low"	2/10	NVI8; NVI9

- Basic Needs
  - "food shortage"
    - "bigger farms" (to deal with food shortage)
  - "lack of supplies" (clothing, congas, shoes)
    - "girls are growing and have special needs" (congas, sanitary napkins, underwear)
  - "more income"
- "social integration in village"
- "children not getting exposed to what they will face when they have to leave the village"
- "transportation"

The interview results from the grandparents show that some basic needs are still yet to be met by the NV project. 70 percent of the respondents mentioned that the food shortage was an issue and responses showing the need for more land on which to farm indicate the desire to grow more food for consumption. Some respondents felt that supplies were low for items such as clothing or shoes and supplies for girls were especially an issue. The need for more money is related to the last issue because the only

income generating activities for the grandparents are basket-making and wood carving. Other issues were lack of transportation and lack of social integration among villagers. An interesting response was that the children need to be prepared for the hard future they will face when they leave the village. This indicates concern that the children are cared for at this point in their lives, but after they leave the village may not be prepared for life on their own without an institution giving them support.

Grandparent RRA Results
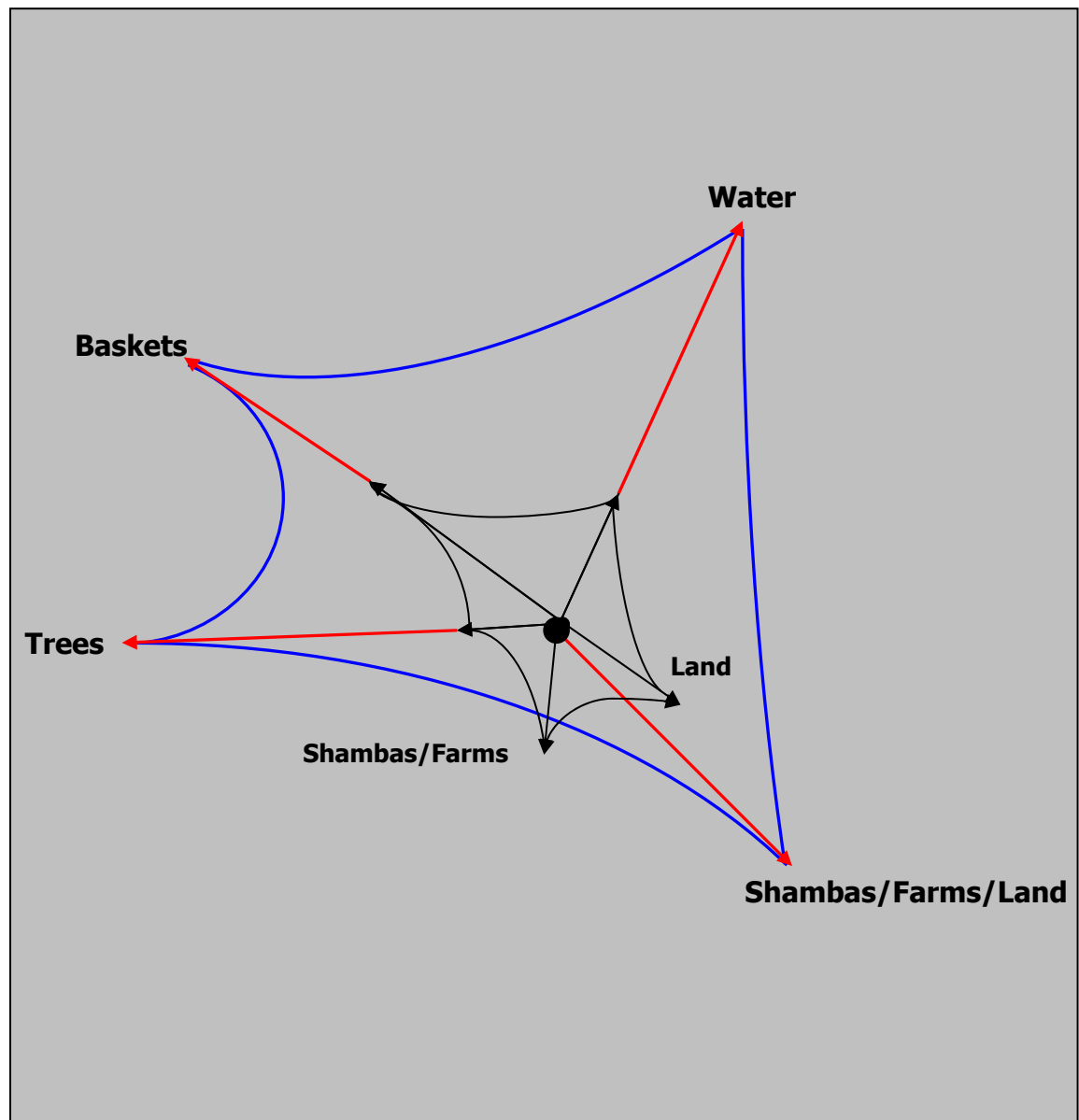
A full report of the RRA is located in this Appendix. In the final RRA grandparents decided to merge land, shambas and farms into one category. A particularly interesting aspect of the RRA was during the discussion of sustainability prior to the model building exercise. The grandparents clearly do not understand the idea of

sustainability. This was evident because they said they did not know how they even play a role in it because they are old and going to die soon and the kids are only going to be there until they graduate from secondary school. This exhibits a lack of willingness to engage in a major part of the village's goal, that of being an ecovillage. The translator asked them to think about what they would need to do to sustain themselves and the children for five years, and then they were able to think about resource use in a more mid-term type of time frame.

In the end the grandparents indicated that water was the most important factor because it affects agriculture. Baskets were considered the other most important resource to be developed because it provides them with a source of income, but needs to be more steady and more lucrative. Trees and farming also need to be developed, but they see water and baskets as the foundation of their well-being.

Discussion of Objective Eight Results

1.Grandparents

The grandparents did not mention that their basic needs were not being met or that the children were not receiving an education, so there is strong evidence that they feel NV is meeting these identified needs and project goals. However, the frequent mention of the food shortage and need for more farms (highlighted in both the interviews and the RRA) show that food security is lacking. This is most likely exacerbated by the global food crisis that began in 2007 and the climactic factors that put the area at such an extreme disadvantage for farming anyway. The RRA results show the need to increase water resources, which highlights that fact that water is a limiting factor for food production, especially given that most of the agriculture in the region is traditionally rain-fed, so it is often at the mercy of drought.

The grandparents also see the need for more money making opportunities. Although baskets and wood carvings have brought some income, they do not provide a steady source because they only make money if they sell one. The earned income from these activities helps the grandparents buy things they need or pay for transportation to their home villages, but does not allow for them to buy extra items the children may need. The village supplies most items for the kids, such as clothing, but it was mentioned that this is lacking and puts a further strain on the household income brought in by the grandparents.

An important comment from one of the grandparents was that the children are not being prepared for the difficult future that lies ahead of them after they leave the village: '*the children are not getting exposed to what they will face when they leave the village…here they are just given water and firewood, but outside they will have to travel long distances in search of both; the same with farming*" (NVI5). This is reinforced by comments made in interviews with the community leaders and NV staff: "*there is no work to help the kids build lives after they leave the village…they need to contribute to the development of the children…they need exposure*" (NVS9). Although NV can provide the children with a formal education, the life skills needed to live in a region with a semi-arid climate, little land available and few job opportunities are lacking in their education.

2.Outside Villagers

The needs of the outside villagers reflect an overall low level of development in the region, which affects livelihoods and other aspects of social and domestic life. First, all of the primary income generating activities (apiculture, sand, farming, milk production, chickens, brick-making, rocks, basket-weaving and wood carving) are limited because they rely upon local ecosystem services, which are extremely reduced because of environmental degradation. The area, a semi-arid dryland prone to frequent droughts, has suffered from overgrazing, removal of sand in river beds and removal of vegetation for fuelwood, charcoal production and agriculture. Being a dryland, the region is particularly vulnerable to anthropogenic stress, which is now to such a degree that humans are having a difficult time eking out a living or even obtaining their basic needs. A lack of knowledge regarding the connection between ecosystem health and human well-being is evident and people are forced to think in very short, day to day, terms rather than improving or restoring natural resources. The region's lack of education and many villagers' inability to pay for school fees reinforces ignorance of systems connections.

The economic state that exists in the surrounding villages is one in which many people are living in abject poverty, which promotes short-term thinking. Employment opportunities are scarce and NV is one of the only job sources in the area. People do not have money for investment in materials that would help them develop economic opportunities. For example, many outside villagers do not even own a *jimbe*, a simple tool used for farming, of their own. This severely limits their ability to escape poverty traps. Isolation from regional markets impacts the economic state as well because the nearest villages, KwaVonza and KwaMatonga, are many kilometers away for most people and do not provide a strong market anyway. Many people cannot pay for school fees because they simply do not have the money. The poverty then becomes cyclical because children are not able to break free from the situation to which their parents are exposed.

The overall poverty of the region and the fact that it is not an urban area means that infrastructure and social services are minimal. The closest medical center is in Kitui, though they can now go to NV for minor issues and consultation. Roads are poor and transportation is lacking, especially for those who live far away from Kwa Vonza. Schools are lacking as well. Electricity does not exist and will only be brought to the area if the villages can help pay for installation, but even if it did come, many would not be able to pay for services anyway.

The outside villagers are faced with a very difficult situation. Poverty is repeated from generation to generation. However, NV is offering some of them the chance to break free from the poverty they to which they have become accustomed. The outside villagers see Nyumbani as a place that can give them opportunities for wage labor and capacity building, as well as a place to care for the orphans who come from their own communities.

Objective Nine Results from Nyumbani Village Interviews

Community vision

Community Members (10 interviewees, 10 interviews)

Desired state	Additional comments	Number of responses	Interview codes
"more perimeter shambas"	"should be given bigger farms"; "bigger farm"	3/10	NVI1; NVI2; NVI9
"bee hives"		1/10	NVI2
"registered group to address issues"		1/10	NVI3
"for NV to help kids after they leave"		1/10	NVI3
"grandparents to do something more than the baskets"		1/10	NVI4
"more social integration"	"more harmony between the staff, grandparents and children"	2/10	NVI4; NVI6
"secondary school"	"higher education for the kids"; "secondary school"; "see children prospering and using their education";	4/10	NVI5; NVI6; NVI8; NVI7
"for kids to prosper"		1/10	NVI10
"grainery to mill corn"		1/10	NVI10

Categorization of results

Develop economic activities
- "grainery to mill corn"
- "grandparents to do something more than the baskets"
- "bee hives"

Children's well-being
- "secondary school"
- "for kids to prosper"
- "more perimeter shambas"
- "for NV to help kids after they leave"

"More social integration"

Discussion of results

     The grandparents would like to develop economic activities and see the children educated and doing well. In the RRA (Figure ???) the grandparents emphasized farming to provide more food for the families and the development of economic activities.

Community Member Interviews with Outside Community Workers (7 interviews, 8 interviewees)

Desired state	Additional comments	Number of responses	Interview codes
"more training in farming"	"more crop productivity"	2/7	NVO1; NVO6
"better transportation system"	"more vehicles for transport"; "roads"; "better roads and access to transportation"; "more road infrastructure"	5/7	NVO1; NVO4; NV03; NVO6; NVO5
"education"	"more schools"	2/7	NVO1; NVO4
"capacity building"		1/7	NVO1
"reduction in corruption"		1/7	NVO1
"more water"		1/7	NVO4
"hospital nearby"	"health centers"; "closer medical clinic"	3/7	NVO4; NVO3; NVO5
"shopping center"		1/7	NVO4
"churches"		1/7	NVO3
"more greenery"		1/7	NVO3
"more employment opportunities		1/7	NVO6
"more realistic view of the unemployment rate"		1/7	NVO7
"to be able to sustain themselves"		1/7	NVO2

Categorization of results

Capacity building
- "more training in farming"
- "to be able to sustain themselves"
Social services
- "hospital nearby"
- "education"
Infrastructure
- "better transportation system"
Improvement of natural resources
- "more water'
- "more greenery"
Economic opportunities
- "more employment opportunities"

- "shopping center"

Other
- "churches"
- "more realistic view of the unemployment rate"
- "reduction in corruption"

Discussion of results

      The outside community would like for the area to become more developed in terms of social services, infrastructure and economic opportunities. There is also desire for there to be improvement in the state of natural resources and capacity building to improve their skills for livelihoods and basic needs provision. The RRA results show an emphasis on developing economic activities and social services, which aligns with the interview results.

NV Staff (12 interviews, 13 interviewees)

Shared community vision	Additional responses	Number of responses	Interview codes
"not actively involved"	"no, there is a lot of disconnection as to where the village should go"; "they are not fully involved in developing a shared vision because the planning of activities is very disconnected…between departments"; "not a formal procedure or an interactive process where they deliberately get together for that purpose"; "not sure"	5/12	NVS1; NVS2; NVS7; NVS9; NVS10;
"have the clinic be self-sustaining"		1/12	NVS3
"NV has its own vision"	"the board develops the vision"	2/12	NVS4; NVS8
"grandmothers play a big role	"grandparents-very much in dialogue"	2/12	NVS5; NVS12
"all activities geared toward the children		1/12	NVS6
"shared vision can be developed"		1/12	NVS11

Categorization of results

No shared vision
- "not actively involved"
- "shared vision can be developed"
Departmental vision
- "have the clinic be self-sustaining
Institutional vision
- "NV has its own vision"
  - "all activities geared towards children"

o "grandmothers play a big role"

Discussion of results

        The interviews with COGRI staff members indicate that there is not a shared community vision for NV. There is an institutional vision developed by COGRI, but it does not seem that NV has attempted to come together with staff, villagers and the outside community to provide a desired state for the future.

Action plan

NV Staff (12 interviews, 13 interviewees)

Have action plan	Additional responses	Number of responses	Interview codes
"had one but had to change it" (sustainability department)	"strategic plan for sustainability has been developed"	2/12	NVS1; NVS9
"just work from week to week-they don't have a long term strategic plan"		1/12	NVS2
"individual work plans for each staff"		1/12	NVS4
"home care does not have a specific work plan"		1/12	NVS5
"(school) have a 2-year strategic plan"		1/12	NVS6
"not a specific time line"		1/12	NVS10
"each department has a plan but they need to make a comprehensive plan"		1/12	NVS11
"have a ten year strategic plan for NV"		1/12	NVS12

Categorization of results

Plan for each department
- "had one but had to change it"
- "individual work plans for each staff"
- "each department has a plan but they need to make a comprehensive plan"
- "(school) have a 2-year strategic plan"

Plan for the village
- "have a ten-year strategic plan for NV

Unsure/Do not have a plan
- "not a specific time line"
- "home care does not have a specific work plan"
- "just work from week to week-they don't have a long term strategic plan"

        It seems as though the COGRI staff members have different levels of knowledge about existing plans for the village. It appears that each department comes up with a plan but there is not a comprehensive plan for the village. COGRI has an overall strategic

plan, but specific actions for NV are not present. The "ten year strategic plan for NV" was not shared with the researcher.

Rapid Resource Assessment Results

<u>RRA with Grandparents</u>

24 July 2008 4pm
Alice, Mercy, June, Lindsey

Introduction:
I had interviewed many of the sho-shos prior to this meeting and began with explaining the concept of sustainability because it appeared from the interviews, conversations, and observations that there is a lack of understanding of the concept in spite of living in a village striving to be an eco-village. The grandparents are a crucial element to the village, so fostering an understanding of sustainability is very important. We moved on to the next question, what is needed for sustainability in the village and they mentioned shambas and baskets. This led back to the discussion of sustainability because they are not there for a long time and don't know how long they will be there so how can sustainability be an issue? The translators had a difficult time explaining the concept, and there was a lot of discussion because they feel that they cannot ensure sustainability of the village because they are older and their children are not going to stay in the village after secondary school anyway. The translators then asked them to think in terms of five years and they were more able to grasp that time frame and what is needed to sustain themselves and their children during that time. 16 of the grandparents were present (out of 29).

Question 2: What human and natural resources do they currently have that are important to sustaining themselves and their children (question rephrased because of the difficulties mentioned above). They came up with the following list. There was a lot of discussion because as soon as someone mentioned an asset they immediately went to analyzing it, I had to keep mentioning that we will do that later and for now we are just brainstorming. They came up with the following list and ranked each as follows (on a 1-10 scale, current rank and then the desired development of each asset/leg):
- Water (3) → 10 (most important) (7 point increase)
- Land (3) → 8 (5 point increase)
- Trees (2) → 9 (7 point increase)
- Shambas/Farms (3) → 8 (5 point increase)
- Baskets (5) → 10 (5 point increase)

They consolidated land and shambas.

Question 3: which are the most important for sustaining themselves and their children?
Baskets and Water (water is the most important because without it they cannot farm or drink or irrigate trees)

Question 4: what can they do to develop these resources?
Baskets- Be hard-working and cooperate together
Water- they have to depend on NV for this.

I then posed the question of how they could do water conservation as families and individuals but there was not any response.

We concluded the meeting at this point. They said that it was making them think and that was a good thing.

Participants:
Agnes Nzembi
Lena Muaya
Mary Ndooni
Ruth Musangi
Telsia Kithsua
Susana Syonzau
Syokwa Mutiaya
Mutave Mwenzwa
Anges Nzambi
Esther Ngithi
Syokwa Kasyoka
Loise Mathua
Ndulu Muli
Malonza
Kathini Mairu
Kansi Mathei

Water

Baskets

Trees

Land

Shambas/Farms

Shambas/Farms/Land
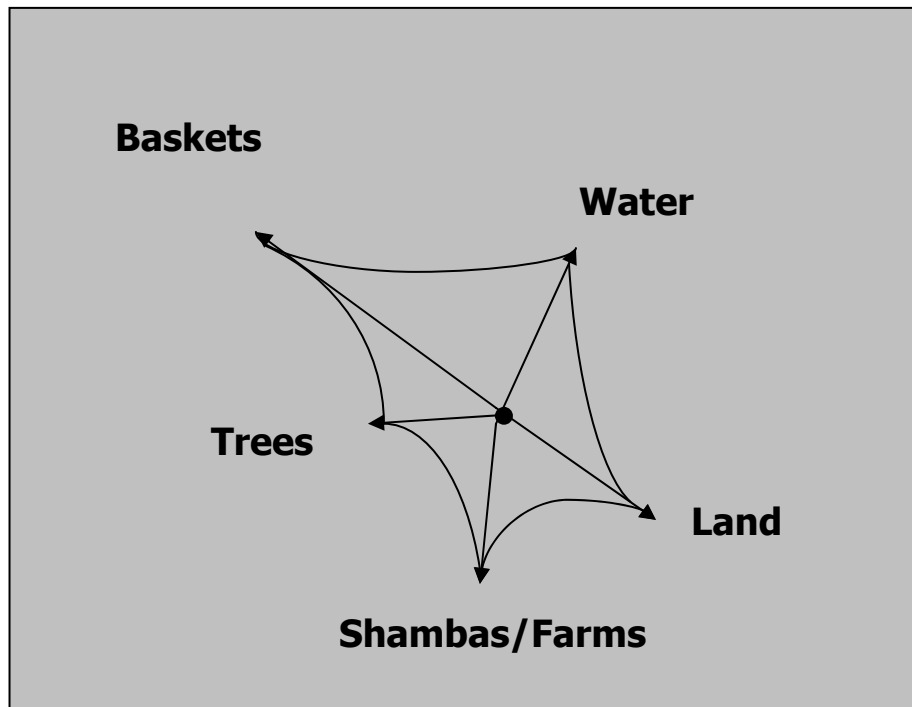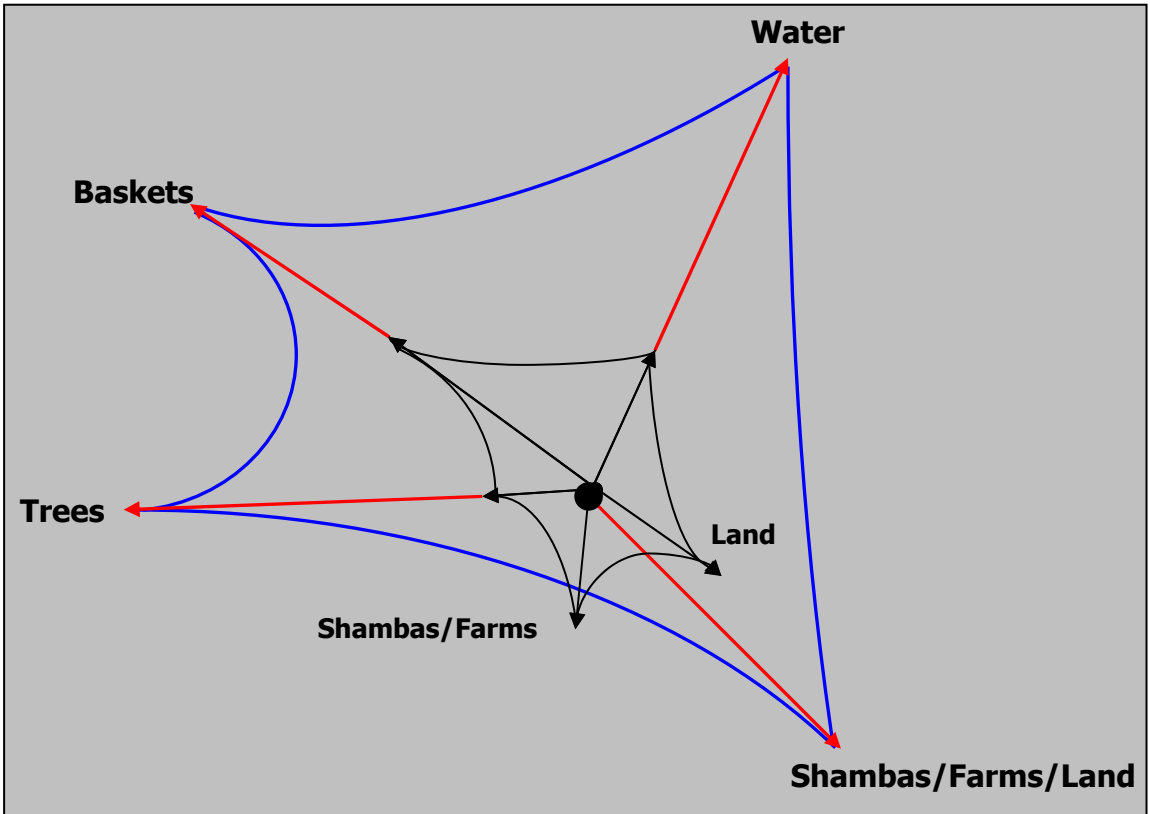
RRA with Organic Outgrowers Group

18 July 2008 8:30 AM- 1st RRA session

The Organic Outgrowers Group was formed by the GEMSAF staff to create income generating activities for villagers living near NV, primarily by selling products to the NV agro-processing center which it would then turn into a value added product to sell. Before a meeting of the group I asked some of the members to participate in the Rapid Resource Assessment exercise. John Ngao, a casual worker on the main farm of NV translated between English and Kikamba for me. With the help of another NV staff member (Nancy), I had translated the questions and process on a sheet of paper to make sure he understood (see appendix). He read through the questions and process before we began. When we began about 10 people were sitting in a circle. He asked them if they agreed to participate and they said yes, so he began with the first question:

1) What are the things in our community that we could change to make it better? Responses were as follows:
- Agriculture
- animal husbandry
- planting trees
- more sand dams and wells and more ability to conserve water.

2) He then explained what sustainability means and posed the question, what is needed to move towards sustainability in this community? Responses were as follows:
- Water availability in order to grow crops for subsistence and income generation
- Hospital
- Education
- Animal husbandry
- Better housing
- Electricity
- Mill to process grains
- Clothing and shoes, snake boots

3) We then moved on to the question: what human and natural resources currently exist that are important in moving towards sustainability: We divided them into categories: natural and human (see # 4 below for the list). At first they had a difficult time discerning between human and natural resources, but I explained some examples of human resources (e.g. their knowledge) and they then understood what the concept meant.

4) We then moved to a room where we could use a chalkboard to draw the spider web model. By then about 19 people were present. They then ranked each from 1-10 to assess how well developed each resources (or leg of the model) is. They discussed and came to a consensus on the rank/number each should receive (if only one or just a few people

gave an answer I would ask if everyone agreed and only then write the rank on the board):

Natural:
- Land (7)
- Rivers (6)
- Trees (6)
- Rocks for building (1)
- Sand for building (2)

Human:
- Brick-making (4)
- Basket weaving (2)
- Farming (5)
- Milk production (1)
- Api-culture (2)
- Chickens (3)
- Wood carving (2)

4) after making the first spider web model we asked them assess and rank each leg they would like to develop in order to move towards sustainability. During this step they ended up saying what they needed to do instead of just ranking, but the process was moving along well so it was not a hindrance; I noted what they said for each leg if they had indeed discussed it. The results were as follows:

Natural:
- Land (7) → 9 need more wells
- Rivers (6) → 8 need more sand dams
- Trees (6) →
- Rocks for building (1) →
- Sand for building (2) → 5 can collect from sand dams

Human:
- Brick-making (4) →
- Basket weaving (2) → 4 need markets, materials
- Farming (5) →
- Milk production (1) → 5 need cows, fodder
- Api-culture (2) →
- Chickens (3) →
- Wood carving (2) →

At this point we stopped because of other commitments and agreed to finish the model at a later time. All of the steps in this process took about 1 hour and 45 minutes.

Thursday 24 July 2008 11 am. Conclusion of the RRA

Nancy and Millicent translated into Kikamba from English. We reviewed what happened in the previous meeting on Friday (what sustainability is, the list they made of needs for sustainability, the current human and natural resources important to sustainability, and the ranking process in the model we began creating). 22 people present excluding myself.

Finishing the model:

Natural:
- Land (7) → 9 need more wells
- Rivers (6) → 8 need more sand dams
- Trees (6) → 7 need capacity and to plant more
- Rocks for building (1) → 2 need a market
- Sand for building (2) → 5 can collect from sand dams

Human:
- Brick-making (4) → 5 water availability
- Basket weaving (2) → 4 need markets, materials
- Farming (5) → 7 need pest control, water, quality seeds, machines, plows, information
- Milk production (1) → 5 need cows, fodder
- Api-culture (2) → 5
- Chickens (3) → 3 need training, markets, processing capabilities, cross-breeding, better facilities to keep them
- Wood carving (2) → 4

I drew the model on a blackboard with chalk and connected the web, using the same model for the current and desired asset development.

Refining the model:
 I asked them to revisit the needs for sustainability (listed on the chalkboard) and to add any of the items on the list they created to the model. They added the following and ranked them according to current status and desired status:

- Electricity (0) → 4 (even though we had been using a 1-10 scale they wanted to give this a zero)
- Education (3) → 8
- Hospital (2) → 5

Analyzing the model:
I asked them which of the legs are most important to the sustainability of the village and they mentioned the following:
- Education
- Farming

- Land
- Hospital
- Trees
- Chickens

I then asked how they, as a group, can move from where they are to where they want to be. We went through each of the 6 listed above and they discussed what they as a group can do.

- Education- they initially say that the only thing they can do is wait for a donor to provide funds because they need money for school fees and a facility. I then mentioned that when they are thinking of solutions they need to consider the long term and solutions that will carry them through to sustainability. They agreed that a donor was a one-time option and perhaps not the best. The then began discussing the creation of a group to get loans and save money to help each other; being active in the community; and sharing the knowledge of the value of education, because many people still do not see why it is important, especially for girls.
- Farming- they need more wells, and to work together to do soil and water conservation; work together to purchase tools and equipment; create terraces; buy quality seeds and share among themselves.
- Land- plant trees for soil conservation, set portions aside for fodder, better breeds of goats, bee-keeping, cows for milk production, terraces, plant grasses for fodder, build a meeting house where they can secure tools.
- Hospital- the government must help
- Trees- nursery development, training for capacity building, water harvesting for irrigation
- Chickens- have a housing structure for them; feed; money to purchase them; markets; ability to process them.

We then noted how there are some underlying themes in each of the activities mentioned above- for example needing money and forming a group to help themselves. I mentioned that some of the things they are discussing Nyumbani can help them to develop. I then asked how they could work with NV to do these things:

- Have a good relationship with NV
- Try to help the NV children when they actually start making money
- As a group they can come together to help the community

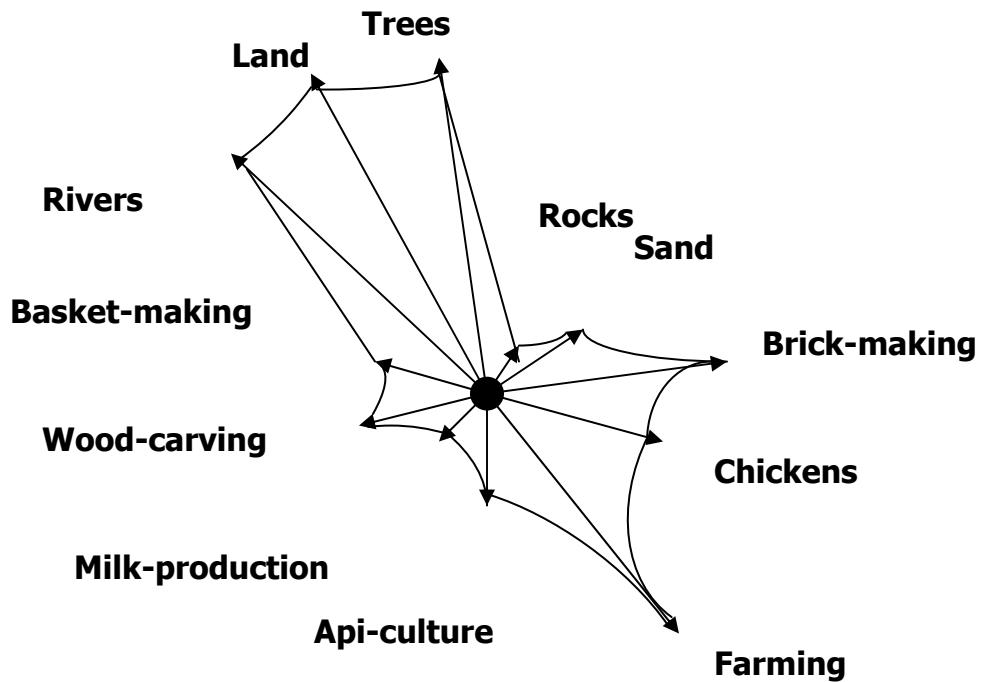They also mentioned some aspects that have been challenging with NV:

- Sometimes when there are trainings they only take one or two people, but they would feel more supported if they could train more people
- They are often only with volunteers, they feel disconnected with the staff because of this and they would like more help from the staff.
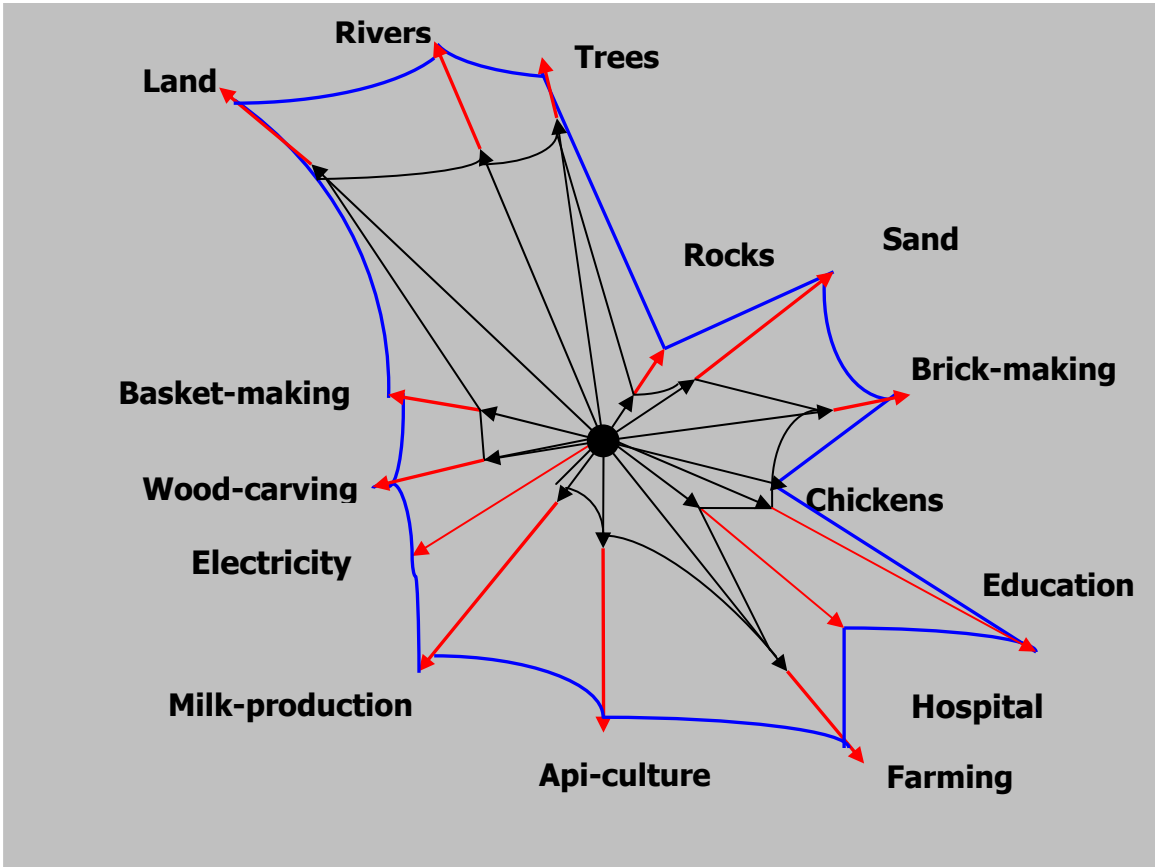
Conclusion:
At this point we came to a conclusion of the meeting. I explained that I would be having similar meetings with the grandparents and NV staff and asked for four volunteers to attend the meeting on Wednesday, 30 July at 2pm to represent the group. Ndeti Ileli,

Peter Mumua, Muthikwa Mwaluko, and Winifred Mwikya offered to come. We then compiled a list of all participants:
David Kimuyu
Kavutha Pius
Kathindi Makilya
Margret Muli
Kakundi Kilungya
Syombua Mwalimu
Kavisi Ngulu
Kawnio Mwambui
Jackline Munywoki
Muwu Mwanzia
Mulwa Munywoki
Mutua Mwambilo
Kyalo Mwathe
Harrison Musyoka
Peter Mutune
Emmah Peter
Millicent Musau
Nancy Mutua
Lindsey Wood

Trees

Land

Rivers

Rocks

Sand

Basket-making

Brick-making

Wood-carving

Chickens

Milk-production

Api-culture

Farming

Rivers Trees

Land

Rocks Sand

Brick-making

Basket-making

Wood-carving

Chickens

Electricity

Education

Milk-production

Hospital

Api-culture Farming

RRA with COGRI Staff

28 July 2008, 3pm

Attendants:
George
Nancy
Millicent
Joseph (clinic)
Steven
Mercy
Alice

1. What do you like best about working at NV? It's unique; helping a sector of the population that is poor and in need; helping orphans.
2. I explained the Brundtland Commission definition of sustainability that I am using in my research; that I had done a similar activity with the grandparents and the Organic Outgrowers Group and that I wanted to combine the results this week.
3. What is needed to move towards sustainability in NV? Attitude change, local knowledge, life skills, good relationships; capacity building; time to evaluate; resource assessment; stable household incomes; self-help groups and other community organizations; local governance.
4. What are the current natural resources that NV has that are important to sustainability? We made the list and then consolidated as follows:
   - Renewable energy sources (consolidated after mentioning solar, wind, humanure, animal waste, animal power, moon light)
   - Water
   - land (consolidated after mentioning soil, hills, stones)
   - time to meet goals (modified in the assessment stage of the model building exercise from "time" and moved to the human resource category)
   - vegetation (changed from "trees" to include all types)
   - livestock for human consumption (meat, milk)
5. Human resources? We made the list and then consolidated as follows:
   - Village institution (NV)
   - Exchange of knowledge (indigenous knowledge, professional knowledge, knowledge from other countries and regions)
   - Cultural Unity
   - Communication
   - Labor (broken into two categories in the assessment phase into Sustainable Labor and Available Labor)
   - Flexibility (broken into two categories in the assessment phase to Interest to Change and Willingness to change)
   - Morals

6. Assessment of these resources; I explained the process we would use and how to rank them- we give them a score of 1-10 based upon how developed the resource is, relative to the others, to move towards sustainability. Results were as follows:

Natural:
- Renewable energy sources (1)
- Water (4)
- Land (6)
- Vegetation (2)
- Livestock for human consumption (2)

Human:
- time to meet goals (1)
- Village institution (NV) (3)
- Exchange of knowledge (5)
- Cultural Unity (2)
- Communication (.5)
- Sustainable Labor (2)
- Available Labor (8)
- Interest to Change (4)
- Willingness to change (2)
- Morals (5)

We had to stop at this point and agreed to meet at a later time to finish the model. Notes: there was a lot of discussion and people seemed engaged in the process. Discussion over the conflict of interests between the grandparents and the village; the outside community and the village's goals (e.g. they only see it as a place to make money and do not want to contribute to the village for the orphans); the grandparents are unaware of the expectations of living in an eco-village- it wasn't spelled out in the beginning and now there are dependent on the village instead of being self-reliant;

Continued on 30 July 2008 3pm

George
Joseph
Mercy
Steven

11. We finished the ranking on Tuesday and began by revisiting the needs identified in number 3 above. They decided to add the following and ranked them:
- Capacity building (1)
- Local governance (0)
- Local resource assessment (2)
- Self-help groups (3)

12. We then went to the desired state of the resources assessed in the model, discussing their relative importance. The assets were ranked as follows, with some descriptions of why following:

Natural:
- Renewable energy sources (1) → 8 (achieving this can help attain other goals)
- Water (4) → 8
- Land (6) → 8
- Vegetation (2) → 8
- Livestock for human consumption (2) → 5

Human:
- time to meet goals (1) → 4 (need not only time, but to use time wisely)
- Village institution (NV) (3) → 7
- Exchange of knowledge (5) → 6 (already rather developed)
- Cultural Unity (2) → 6
- Communication (.5) → 10 (the most important but one of the most lacking)
- Sustainable Labor (2) → 8 (want to be able to pay but also not need a lot of manual labor if, for example, renewable energy is developed)
- Available Labor (8) → 8 (want to sustain the availability even though other activities people may be associated with would rise with the desired state, e.g. people would be increased)
- Interest to Change (4) → 1 (if at the desired state then the interest would be there and they would not need to work developing it)
- Willingness to change (2) → 4 (need capacity building to have this, so it is dependent on that resource)
- Morals (5) → 6
- Capacity building (1) → 8 (lacking especially for the staff, less so for the grandparents and outsiders because the staff provides them with opportunities, this affects willingness to change because people are able to see how new skills can help them move forward).
- Local governance (0) → 9 (right now the village is just top-down management and there is no democracy in decision making; they are also lacking very much in involvement from the local chiefs and government officials, both of these are very important and need attention)
- Local resource assessment (2) → 8 (very important because they need to know what they have in order to move forward or to improve- for example, with increasing the orphans they cannot currently take in more because they are having a difficult time with the amount they currently have)
- Self-help groups (3) → 7 (SHGs are an entry point to sustainability, they develop and then are disintegrated, for example the village is only associated with three in a community of 20,000 people.
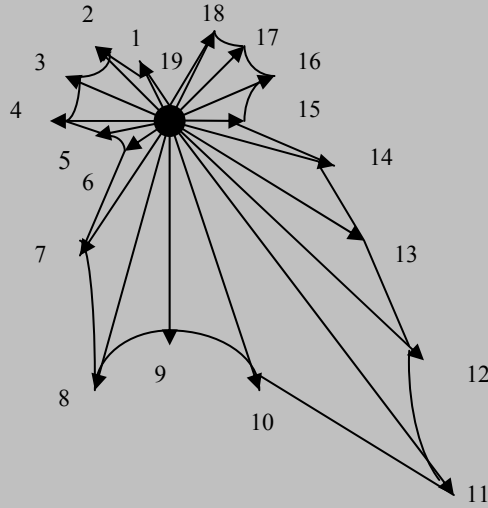
9. I asked them, out of the model you just created, which are the most important resources that you need for sustainability and reaching the desired state of development? They decided upon: communication, capacity building, water, local governance, and renewable energy.

13. How, as a staff do you help develop those resources?
- Communication- need better relationship between outside consultants and staff; with the grandparents and children. Need to have community meetings "barazas", especially engaging the local chiefs and village elders. It is very low and probably the most important.
- Capacity building- new staff need training; need more ability to receive new training, attend workshops (they are very isolated here), they need more exposure to similar programs so they can get advice and ideas, Need to have relationship building exercises with the staff to develop morale and friendship; they need counseling as well because dealing with orphans is difficult.
- Water- take advantage of rain harvesting, recycling water, building capacity in the grandparents, etc to conserve water; teaching the kids how to conserve water.
- Renewable energy- they have the land, they need to utilize it to promote biofuels, for example castor and jatropha; maximize animal power and reduce dependency on petroleum.
- Local governance- identify people who can give support to the village in surrounding areas; they need to go back to the local chiefs and churches to engage them. They need other sources of support aside from the village institution and administration. They want the village to be a part of the community, not some institution plopped down here. The support of local government can reduce crises, help in decision-making. They need more decentralized decision-making processes.

Key

1 Capacity building for staff
2 Willingness to change
3 Sustainable labor source
4 Cultural unity
5 Time to meet goals
6 Communication
7 Village Institution
8 Knowledge exchange
9 Interest to change
10 Morals
11 Available labor source
12 Land
13 Water
14 Self-help groups
15 Renewable energy
     sources
16 Livestock
17 Vegetation
18 Assessment of local
     resources
19 Local governance (0)

Key

1 Capacity building for staff
2 Willingness to change
3 Sustainable labor source
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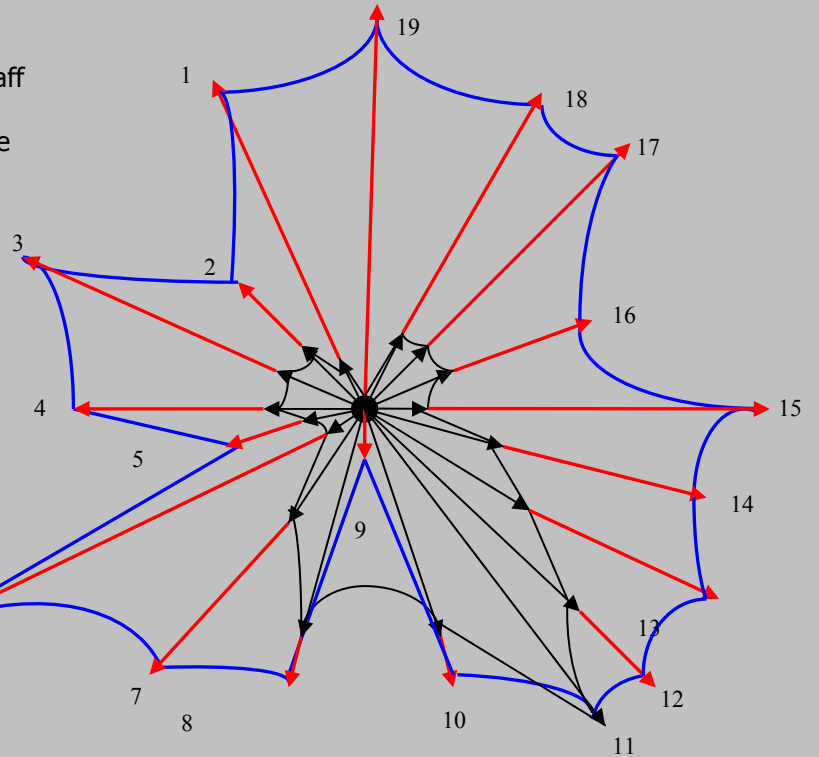
Observations of NV

1. Children and grandparents seem to be reliant completely on NV for food, they are not working in the main farm and only some are working in the home gardens. One grandmother said the kids don't want to work in the gardens- they were given a "grace" period in the beginning to settle in and they were not required to do work, but now the grace period is over and they want them to work but they will not. Note- kids are always in school, sometimes they go at 6 in the morning when it is still dark. When they get home they have to wash clothes and help with dinner and do homework.

2. Disconnect between the departments of the staff.

3. No crop rotation schedule, no reports saying exactly what was planted and when. Hilary is working on this for the main farm.

4. Very sparse in the homes; chickens are all over the place, for example they leave their dishes out to dry and the chickens come to drink the water that is dripping off the plates and they come into contact with the plates.

5. After an interview, one of the staff seemed to be telling the "real story" and actually contradicted what was said in the interview. For example, the level of community understanding and involvement from the outside the interviewee felt just wasn't there; they just see NV as rich and a place to get work- no real connection like they would like. This made me wonder if the staff and other interviewees were not telling the whole truth.

6. Cluster one sho-sho responses- more dependence on the office to provide for them, not so in cluster four, perhaps they think differently as groups because of the housing arrangement?

7. Some limitations of the study- translations; are people honest (e.g., example in number 5 above). How much do interviewees understand what sustainability is?

8. Sand dams, bore hole have helped with water quantity but quality is a huge issue. Also water infrastructure is severely lacking on the outside.

9. Is tribalism an issue with the staff and between staff and villagers? Some staff are from outside and there was a lot of talk about discrimination.

10. Staff seems to be lacking managerial skills, especially business skills. E.g., chickens were ordered from Nairobi but they didn't give the right size chickens and in the second order some of the chickens died. Orders for vegetables were also erroneous- e.g., a shop ordered beets and they only filled half the order even though they had the beets and sent the wrong greens. Lack of oversight and poor work performance (e.g. air valve that was broken and water was leaking was not fixed for quite some time…). Misuse of resources…e.g. Truck going to Nairobi and forgetting to drop off the chickens.

11. Sister Mary gave me a strategic plan but the rest of the staff doesn't seem to know about it.

12. Staff was enthusiastic about RRA.

13. There seems to be a lot of motivation to move forward, especially from the outside community. NV is providing a really good opportunity for them.

14. The idea of sustainability is not infused into all of the departments of the village. The sustainability department is really the only one that is really trying to work

off of sustainability practices. There seems to be discontent with the sustainability department's inability to provide all food for the village, but they are essential.
15. Solar panels stolen at the beginning of the summer- fear in working with outside community as a result.
16. Notes- the sustainability of the village- they need to look at individual units and come up with plans and work sustainability into each department. Right now sustainability is only a very small part of the village as a whole and is really only related to the farm, but sustainability isn't only about food or income, they need it to permeate all of the other workings of the village.

1. Number of acres/hectares of the main farm
- Drip fed – 12. 5 acres
- Rain fed – 33 acres
-1 acre under vegetables

2. Number of acres/hectares of the perimeter shambas
- 240 pieces of 15 by 70 meters.

3. Number of outside residents and grandparents that have access to perimeter shambas
-Grand parents – 40
- Residents - 342

4. Number of outside residents and grandparents that actually are cultivating the perimeter shambas
-outside community - 160
- Grand parents – 11
Vegetable perimeter – 4 grand parents; 28 from community

5. Size of the home gardens and vegetables grown in them
25 meters by 20 meters. No vegetables

7. Volume of solid waste generated by the village each week.
Will take time to estimate

8. Volume of compostable waste generated by the village each week
Take time to quantify

9. Volume of fuelwood used by each family per week. How much is given to them per day?
-40kg per week. The kids collect the firewood.

10. Number of acres/hectares planted with lueceana =5 acres planted but Scattered

11. Number of acres/hectares planted with Melia volkinsii =47 acres already planted

12. Size of the riparian zone in acres/hectares =8 acres planted

13. Number of staff per department
- Sustainability – 15
- School – 13
- Polytechnic – 5
- Social service - 3
- Clinic - 2

14. Number of outside villagers employed in each activity
- Tree planting – 20
- Humanure application – 5
- Mulching – 11

- Agro – processing – 1
- Composting humanure – 1
- Biopesticide preparation – 1
- Mashroom growing - 2
- Apiary – 8
- Vegetable raising – 4
- Clinic assistant – 1
- Grand parent house help – 1
 - Transport loaders – 2
 - Tractor helpers - 2
15. How many beds are in the clinic? - 2 beds in place
16. How many patients are seen in the clinic on a monthly basis?
        - An average number of 250 patients

Notes on Rapid Resource Assessment Methodology

Summarized by Victor D. Phillips, GEM Director
May 1, 2008

In GEM's practical and applied service to communities engaged in building a sustainable future, a rapid resource assessment is often used to engage, empower, and energize local citizens. It is usually a participatory, preliminary action step to focus collective wisdom. After all, community members know their community, culture, conditions, and challenges better than outsiders. They can also best prioritize needs for which they can develop together a shared vision of desired outcomes.

To assist local citizens assess current status of community-based human and natural resources—including strengths and assets, constraints and liabilities, and opportunities and limitations—in the place where they live and work and interact and know well, a Rapid Resource Assessment (RRA) methodology is described as follows. The RRA can be conducted quickly and accurately adapted to local customs and preferences for optimal results. The results, which come from the participants themselves, are presented back to the people as a easy-to-comprehend and easy-to-adjust visual, the "*spider web*" (more on how this visual is constructed and interpreted later).

While group dynamics, including power structures and peer pressure, always come into play when any group convenes, hang loose. Allow these anticipated, natural social mechanisms to occur. You can't prevent or stop them anyway. They always occur, so "get over it." Alright, one quick pointer on group dynamics: Quite often by allowing different formats and flows (e.g., large group, small break-out groups, one-on-one; oral or written or drawings or skits; public or private; external facilitator from outside or internal facilitator from inside, etc.), then more participation occurs with "more light and less heat." Also, different groups can convene at different times convenient to them to conduct separate RRA's, which can be later shared with other groups or a large group for, comparison, refinement and possible aggregation, if desired.

Steps in facilitating Rapid Resource Assessment

In GEM projects, these four steps are commonly used at meetings or workshops to help local citizens quickly and successfully assess the status of community-based assets and limitations:

Step 1 "**Starting with ending**" [focus on the end goal—sustainability]
Step 2 "**Visioning**" [identify what is needed for moving forward towards sustainability]
Step 3 "**Sparring**" [assess current status of community-based human and natural resources]
Step 4 "**Spider webbing**" [assemble spars in building spider web visual for summary analysis]

Brief descriptions of each step's applications with suggested methods are presented below.

Step 1 "***Starting with ending***" [focus on the end goal—sustainability]

In the context of what GEM does, how GEM operates, and how GEM deploys RRA, the end goal is sustainability. It is not necessary or desirable to get hung up on definititions or pitfalls associated with the term "sustainability." Personally, I like the 1987 Brundtland Report (*Our Common Future*) entry best: "meeting the needs of the present without compromising the ability of future generations to meet their own needs." But let's move on, shall we?

The GEM approach to sustainability is local, local, local. Only by helping people help themselves with small, simple, practical steps—one farm field, one stream segment, one factory at a time—can sustainability become an essential, conscious part of the shared vision for their communities.

Suggested methods for Step 1:
o   Sample starter questions:
  ✓   Ask the people why they think they have been asked to gather here (don't lecture or instruct them on the purpose of the meeting or the RRA….allow participants to voice their responses as to why we are gathering together)…or why they choose to come to this gathering [interest, motivation, communication]
  ✓   Ask the people what they like best about their place, their community [local knowledge, local pride]
  ✓   Ask the people if they had a magic wand what changes would they make to their place, community [visioning, sharing]

o   Quick brainstorming activity
  ✓   What are neighboring communities like? [comparison]
  ✓   How are neighboring communities different from our community? [contrast]
  ✓   Is the "grass greener" in neighboring communities or in our community? [attitude, perspective]

Step 2 "***Visioning***" [identify what is needed for moving forward towards sustainability]

Based on the above Step 1 ice-breakers, participants are primed to brainstorm what is needed for moving toward sustainability in their communities. Any and all responses are welcomed for a hodge-podge of concrete actions, dreams, obstacles, ideals, practical steps, impractical objectives, philosophies, concerns, anything goes!

Suggested methods for Step 2:
o   Hodge-podge of needs
  ✓   List of needs is generated by participants [brainstorming]
  ✓   Participants identify similar or redundant needs to consolidate or simplify [agreeing]

o   Further condensation
  ✓   Participants condense remaining list of needs to 5-8 main factors or drivers [discriminating, prioritizing]

Step 3 "***Sparring***" [assess current status of community-based human and natural resources]

No, this doesn't mean mock battle in the meeting room. "Sparring" refers to the process of constructing "spars"—typically 5 to 8 undergirding structural beams deemed most important for building the RRA spider web. Local citizen participants identify community-based human and natural resources (or lack thereof) that reflect the current status of assets (or liabilities) important to sustainability. After agreeing on the spars they have developed, participants assess how well-developed or not well-developed each spar is. Step 3 "spars" (community assets) and Step 2 "needs" (drivers for change) may overlap, or may not…hang loose and let the participants resolve as they deem appropriate and satisfactory. After all, this is their spider web-to-be and they will build and own it.

     Suggested methods for Step 3:
- Community assets
    - ✓ List of assets is generated by participants [brainstorming]
    - ✓ Participants identify similar or redundant assets to consolidate or simplify [agreeing]

- Selecting spars
    - ✓ Participants condense remaining list of assets to 5-8 main spars [discriminating, prioritizing]

- Determining spar lengths
    - ✓ Participants determine how well-developed or not well-developed each spar is, which is represented by the length of each spar, e.g., long spars indicate well-developed assets in the community; short spars depict less well-developed assets (or liabilities) [evaluating]

Step 4 "***Spider webbing***" [assemble spars in building spider web visual for summary analysis]

Quick and easy, the spars are assembled as spokes from a hub. Participants "see" the frame of the spider web they are constructing. To complete the spider web, the happy spiders in the audience "spin the web" by connecting the outward tips of the spars revealing a polygon shape distinctive to their community. This first polygon defines the current status of community assets (see Fig. 1 for visual illustration of the spider web). The spiders will want to spin more polygons on the spars to represent Needs and/or Goals, with the ultimate result or effect being a visual road map they can embrace for building a more sustainable community (see Fig. 2 for visual illustration of desired future). Voila!! …rapid resource assessment.

     Suggested methods for Step 4:
- Set the spars
    - ✓ Draw the spider web frame using the participants' spars [drawing]

- Connect the spars
    - ✓ Draw a line connecting the spar tips to generate a polygon of current status of community assets [drawing]

- Spin more of the web

✓ Ask participants if they would like to "lengthen or shorten" the spars, i.e. address Needs and/or Goals. Alternatively, standard length spars may be used for all spars, with the point at the hub representing total lack of the asset (profound liability) and the point at the tip farthest away from the hub representing a complete cornucopia of the asset. [analyzing; visioning, sharing]

✓ Participants extend or shorten spars (or add new spars??). Alternatively, using standard spar lengths, participants pinpoint "where they wish their community in the future" [discussing, agreeing]

✓ Draw in spar length changes (these reflect Needs and/or Goals) and draw line connecting the tips of the revised spars [drawing]

o Spider talk
   ✓ Now the spider web is complete with an original polygon depicting current status, and one or two more polygons representing where the participants want their community to be in the future (addressing Needs and/or Goals). Ask participants "what's next?" or "how will this spider web 'catch some flies'?" [forward planning]
   ✓ Conclude session congratulating participants on their constructing a visual road map of where they are now and where together they wish to be in moving toward a more sustainable community. [smiling, clapping, dancing?]
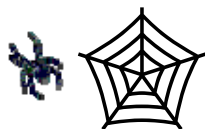
 Spider web model examples

For examples of spider web model RRA application, see the following links:

2004 GEM Wingspread Conference Proceedings (start with section, *Spider-web Model for Stakeholder Assessment* on page 5; also see pages 6, 7 and 23): http://www.uwsp.edu/cnr/gem/InternationalWatershed/PDF/Wingspread.pdf

2002 CARE booklet on *Gender Equity Building Blocks* (see page 6 of booklet for spider web diagram) featured in the 2004 GEM Wingspread Conference Proceedings: pqdhttp://pqdl.care.org/pv_obj_cache/pv_obj_id_9B39F39208A111BDC378BAE7E6EC6034F3F31A00l.care.org/practice/Programmatic%20Strategies/Gender%20Equity%20Building%20Blocks.pdf

 Some final thoughts

o Keep it informal, upbeat, and happy.
o Tailor it to local culture and adapt to participants' time availability and schedule.
o Don't have to finish…just initiate the process and allow participants to determine if they are interested and engaged (indicated by their presence and wakefulness if not active participation) or not (indicated by their absence, sleeping through or walking out the session).
o It's their community, their knowledge, their lives, their future, their hopes and dreams, and their spider web….not ours.
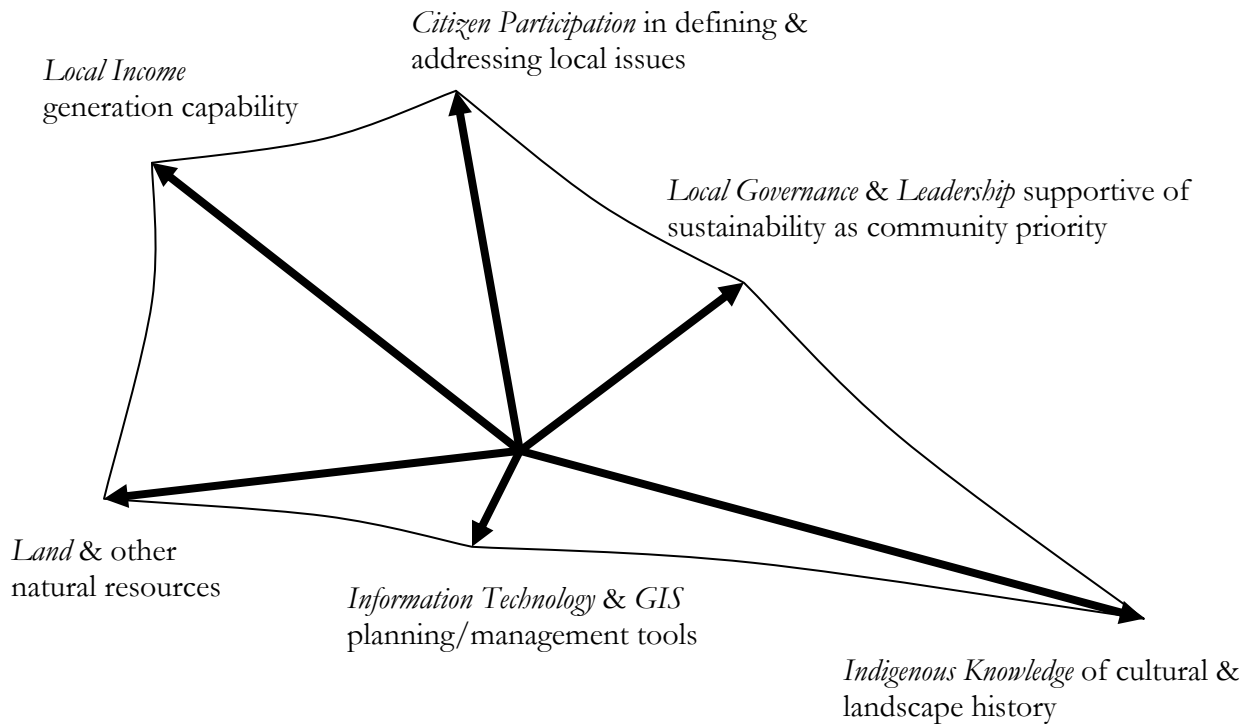
Fig. 1.   Most important community assets as spars arranged as spokes on a hub, with current status of the relative strength of each asset depicted by spar length. Polygon shape characterizes participants' perceptions of their community. [see Step 4 "*Spider webbing*"].

Citizen Participation in defining & addressing local issues

Local Income generation capability

Local Governance & *Leadership* supportive of sustainability as community priority

External financial support to implement priority sustainability projects

Land & other natural resources

Indigenous Knowledge of cultural & landscape

Information Technology & *GIS* planning/management tools

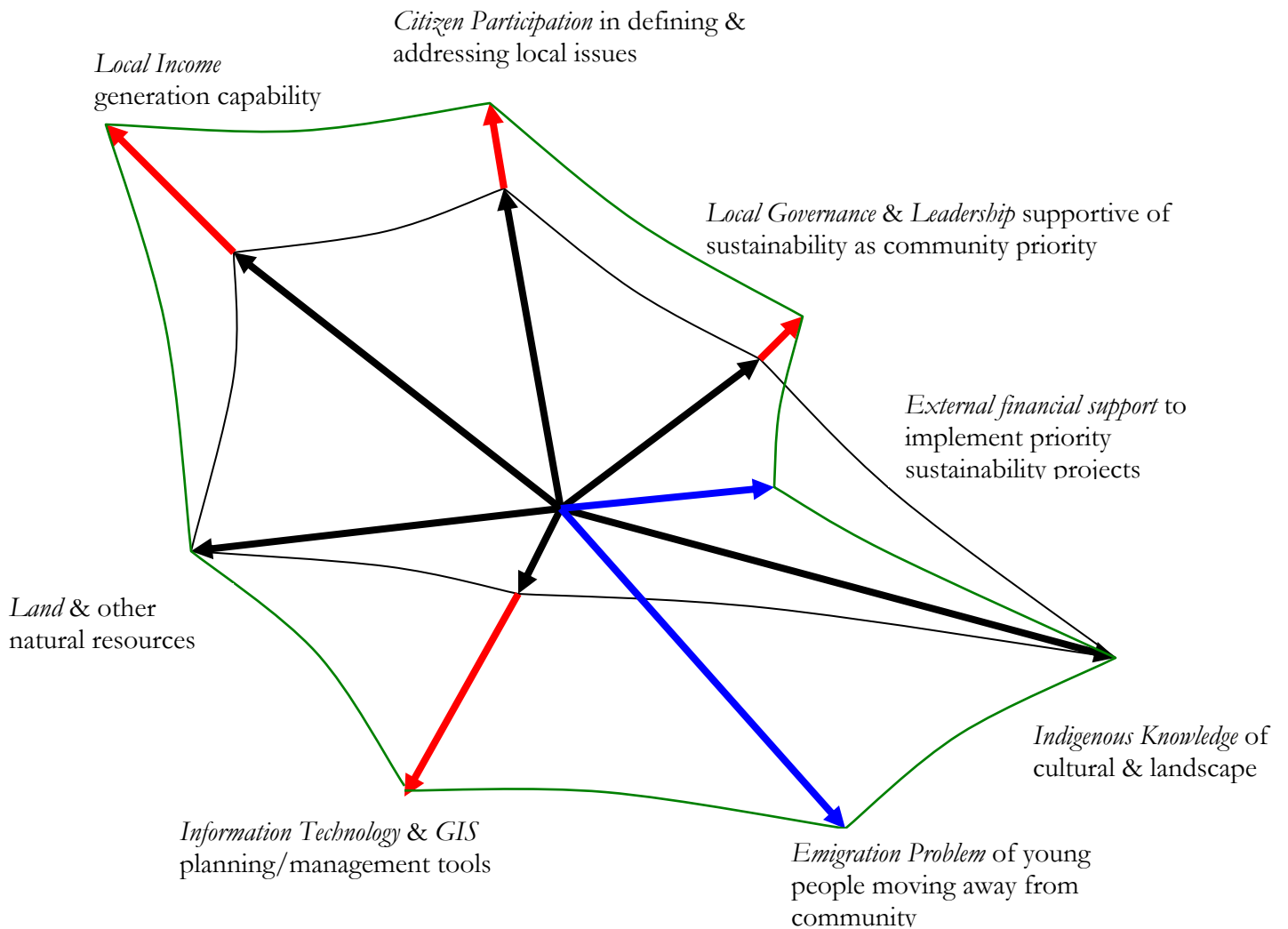*Emigration Problem* of young people moving away from community

Fig. 2. Adding and lengthening spars to indicate meeting priority needs or desired goals in the future. Blue (new) and red (revised) spars represent new community asset, need or goal added by participants. Green polygon depicts the desired end-points envisioned by the participants for their community as a roadmap to their desired future. [see Step 4 "*Spider webbing*"].