

SPANDA FOUNDATION

**A MANTRA FOR
A GREEN EARTH**



**PRELIMINARY TBL
FORECAST IMPACT**



SPANDA



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A GREEN EARTH**



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FORECAST IMPACT**



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*Om/Aum, Indian sacred sound/syllable
considered the mother of all mantras.*

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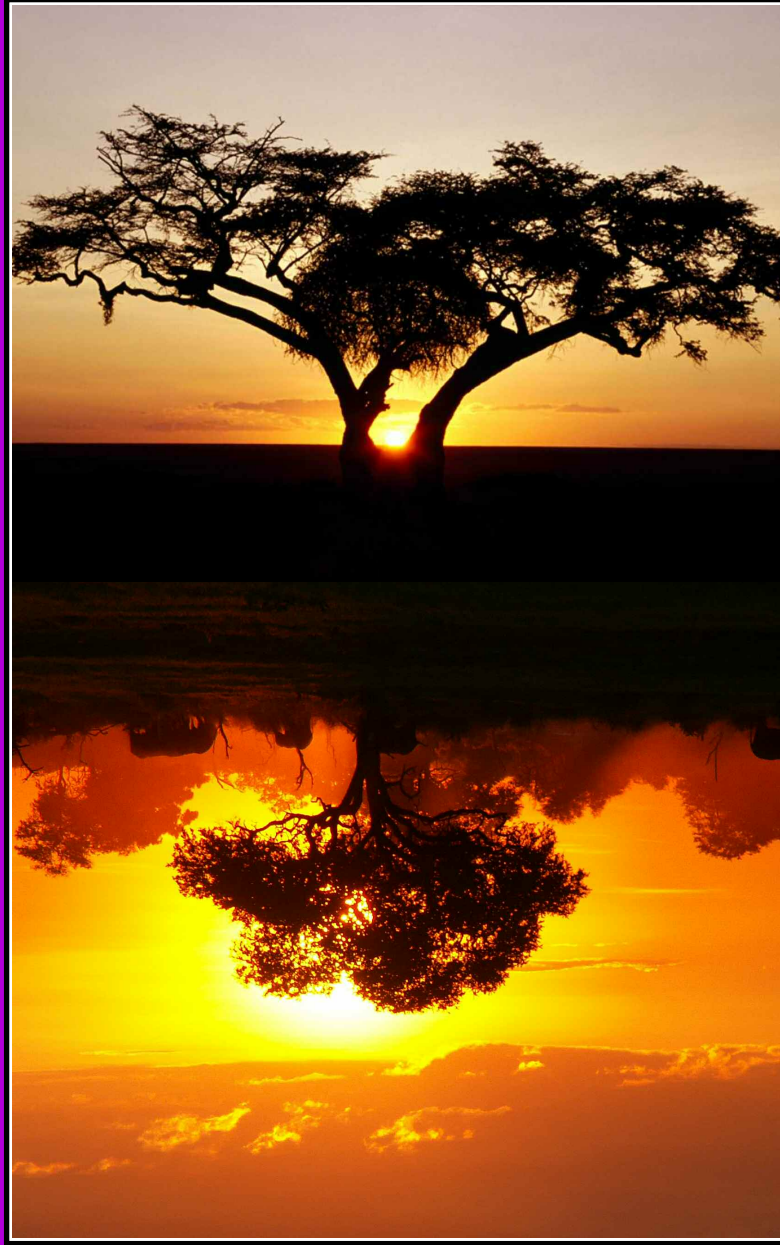


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IMPLEMENTING
OUR SOLAR AFRICA

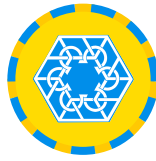
TABLE 1

ACRONYMS



BOP	BASE OF PYRAMID
DHS	DEMOGRAPHIC AND HEALTH SURVEYS
ESMA	ENERGY SECTOR ASSISTANCE PROGRAMME
FAO	FOOD AND AGRICULTURE ORGANIZATION
ICT	INFORMATION AND COMMUNICATION TECHNOLOGY
IEA	INTERNATIONAL ENERGY AGENCY
IEG	INDEPENDENT EVALUATION GROUP
IMF	INTERNATIONAL MONETARY FUND
LED	LIGHT EMITTING DIODE
MDG	MILLENNIUM DEVELOPMENT GOALS
NAPA	NATIONAL ADAPTATION PROGRAMME FOR ACTION
NGO	NON-GOVERNMENTAL ORGANIZATION
MFI	MICROFINANCE INSTITUTION
PRM SL	PEACE AND RECONCILIATION MOVEMENT SIERRA LEONE
PVC	PHOTOVOLTAIC CELLS
RE	RENEWABLE ENERGIES
REDD	REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION
SEWA	SELF-EMPLOYED WOMEN'S ASSOCIATION OF INDIA
SGP	SMALL GRANTS PROGRAMME
TBL	TRIPLE BOTTOM LINE
UN	UNITED NATIONS
UNICEF	UNITED NATIONS CHILDREN'S FUND
WLED	WHITE LIGHT EMITTING DIODE





EMPLOYMENT
 GOOD GOVERNANCE
 SOCIAL DEVELOPMENT
 URBAN AND MUNICIPAL DEVELOPMENT
 ENVIRONMENTAL POLICY AND INSTITUTIONAL DEVELOPMENT
 SECURITY, RECONSTRUCTION AND PEACE
 INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT)
 DEMOCRACY AND THE RULE OF LAW
 ENVIRONMENT AND CLIMATE CHANGE
 ECONOMIC DEVELOPMENT AND EMPLOYMENT
 SOCIAL AND ENVIRONMENTAL STANDARDS
 ENVIRONMENTAL POLICY AND INSTITUTIONAL DEVELOPMENT
 URBAN AND INDUSTRIAL ENVIRONMENTAL MANAGEMENT
 POVERTY, GROWTH, AND DISTRIBUTION
 LABOUR MARKET AND TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET)
 HEALTH AND POPULATION
 FOOD AND NUTRITION SECURITY
 CULTURE AND DEVELOPMENT
 PUBLIC-PRIVATE PARTNERSHIPS (PPP)
 CHILDREN AND YOUTH
 FINANCIAL SYSTEMS
 ECONOMIC POLICY
 HEALTH AND POPULATION
 MANAGING NATURAL RESOURCES
 CLIMATE CHANGE
 CORRUPTION
 PUBLIC SECTOR REFORM
 FOOD AND NUTRITION SECURITY
 ECONOMIC POLICY
 PRIVATE-SECTOR
 PEACE BUILDING
 PARTICIPATION
 DECENTRALISATION
 PUBLIC FINANCE
 REGIONALISATION
 EMERGENCY AID
 EDUCATION
 HIV/AIDS

TRADE
 AND
 TOURISM

MANY AFRICA, ONE AFRICA

TABLE 2

FOREWORD



T

HE REASONS WHY SPANDA FOUNDATION SELECTED SIERRA LEONE AS THE FIRST STATE OF INTERVENTION FOR ITS MANTRA green microfinance project are several. First, the country, besides being one of the poorest in the world, has one of the largest (highest) GDP growth rates of the whole Sub-Saharan region. Second, its post-conflict restructuring and democratization process is amongst the priorities of the current government. Third, Leoneans seem to be well aware of their need for change and for self-sufficiency. They strongly aspire to blossom their massive, albeit underutilized, human and natural capital.

This very sympathetic momentum opens wide the peoples' opportunity window to partake in the collective shift to a more just and humane world. For this, more so than any other nation of the region, the country urgently calls for the support of the international community. The seed needs to be sewn *now*: development stakeholders must come together and, in a participatory and endogenous process suited to the country's specific cultural identity, take action and contribute to maturing its vast underlying potential. To alleviate poverty and help to improve the living conditions of our fellow human beings is not only a philanthropic duty. It is an effective economic, social and environmental investment for the future, in order to move forward as a more humane international community and to ensure the wellbeing of the planet as a whole.

Spanda is determined to do its share
and be instrumental in the course of these events.

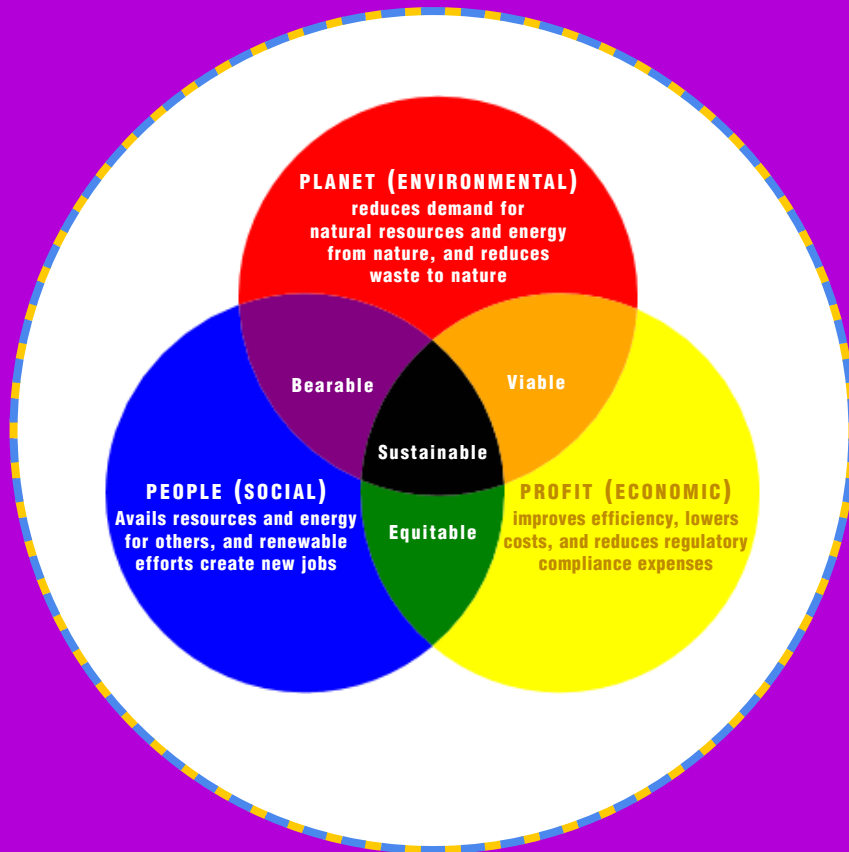
In the few following pages, a brief analysis of
Mantra green microfinance
forecast impact.
A Mantra for a green Earth.
Enjoy the issue.

Sahlan Momo
Chair of the Board



**TRIPLE BOTTOM LINE
(TBL)**

≈ AN OPPORTUNITY ≈



**IMPLEMENTING
GREEN - DRIVEN
SUSTAINABILITY
PROGRAMMES
MAKES SENSE
ECONOMICALLY,
ENVIRONMENTALLY,
AND SOCIALLY.**

TABLE 3

INTRODUCTION



SPANDA COMMENCED WORK ON THE MANTRA PROJECT AT THE BEGINNING OF 2009. SINCE ITS INCEPTION, THOROUGH research and studies in the fields of renewable energies and microfinance have led to the structuring of an innovative, pro-development project, which aims to alleviate poverty and revitalize communities in developing countries by empowering people to lead lives of self-reliance, meet their own basic needs and attain economic self-sufficiency, in harmony with their culture and the environment.

In Sierra Leone, in particular, Mantra intends to

- i) - offer to local micro-entrepreneurs a microfinance-renewable energy package consisting of the provision of solar panels to be used in their business, jointly with a micro-credits-savings scheme, in order to assist them in changing the course of their life;
- ii) - provide educational and professional training for conducting micro-economic activities and for using green technology.

In order to assess the preliminary forecast Triple Bottom Line (TBL) impact of the project, its economic, social and environmental impacts on the targeted communities, it is crucial to outline the country's current state of affairs.

1 - ECONOMY

Sierra Leone is amongst the poorest nations in the world, with a remarkable inequality of income distribution. While it possesses substantial mineral, agricultural and fishery resources, its physical and social infrastructure has yet to recover from the civil war, as serious social disorders continue to hamper economic development. Nearly half of the working-age population engages in subsistence agriculture. Manufacturing consists mainly of the processing of raw materials and of light manufacturing for the domestic market. Alluvial diamond mining remains the major source of hard currency earnings, accounting for nearly half of all exports.

The economy's development depends upon the maintenance of domestic peace and the continued receipt of substantial aid from abroad, essential to offset the country's severe trade imbalance and supplement the government's revenues. The International Monetary Fund (IMF) has completed the Poverty Reduction and Growth Facility Programme that helped stabilize economic growth and reduce inflation. In 2010, the IMF approved a new programme worth USD 45 million, over a period of three years. Political stability has led to a revival of economic activity, such as the rehabilitation of bauxite and rutile mining, which are set to benefit from planned tax incentives. A number of off-shore oil discoveries were announced in 2009 and 2010. However, the development of these reserves, which could be significant, is still several years away.

1.1 - FINANCIAL SERVICES ACCESS

Sierra Leone was chosen as the site for the West African Clearing House, established in Freetown in 1975. Banking was first introduced to the country in 1898 by the, then, Bank of West Africa, which later became the Standard Bank of Sierra Leone. Barclays followed in 1917. The nation's first indigenous commercial bank, the Sierra Leone Commercial Bank Ltd, was opened in 1973 and is entirely government-owned. The Sierra Leone banking system is supervised by the Bank of Sierra Leone, which serves as the central bank and therefore controls, maintains and regulates the nation's money supply and foreign reserves.

Of major importance to the nation's economic growth is the National Development Bank, founded in 1968. It provides finance in the form of loans or equity capital to many development projects in agriculture, agro-based industries

and other industries. However, the 1997 coup d'état and the ongoing civil strife had serious impacts on the provision of financial services. Barclays Bank, for example, ceased operations in the country in September 1999.

Local Micro-Finance Institutions (MFI) provide individual and group microloans in the more developed areas of the country. Interest rates are generally quite high.

1.2 - MANUFACTURING

The country's manufacturing sector is one of the smallest in all of Africa. Manufacturing industries are very few and are still in their initial stage, due to the lack of financial support available during the civil strife. The manufacturing businesses are mainly processors of raw materials and light manufacturers for the domestic market. Items processed are mostly palm kernels and rice. Other manufacturing industries produce a variety of goods, including salt, knitwear and other clothing, paint, oxygen, plastic footwear, nails, soap and cosmetics, as well as a wide variety of furniture. The country also has a refinery for imported petroleum. The continuing trouble in this sector is reflected in the small number of new manufacturing businesses that have recently opened.

1.3 - RETAIL

Sierra Leone is a land of petty traders and street hawkers. Many Indigenous Peoples engage in retail with sundries, including food commodities, clothing and building materials, among others. According to the World Bank (2010), over 8% of the country's working population is engaged in retail and wholesale distribution.

1.4 - MAIN EXPORTS

These include diamonds, rutile, cocoa, coffee and fish.

1.5 - MAIN IMPORTS

These include foodstuffs, machinery, equipment, fuels, lubricants and chemicals.

2 - SOCIAL

2.1 - EDUCATION

Officially, school fees have been abolished for the 6 years of primary education and for a further 3 years for girls. Nonetheless, 25% of children do not attend, especially among the poorest. The standard of schooling is extremely low.

Schools are considered to be *public* since they are funded out of the central government budget, of which the World Bank funds almost 50% each year. The funds are then carefully distributed to local governments, such as Bo and Makeni, to construct and maintain the buildings, supply school materials and implement curricula.

Teachers of first year graduates are paid about USD 40 per month by the central government, although payments are frequently late and, occasionally, are not even made. This notwithstanding, many students wish to be teachers, mainly because there are very few other alternatives.

According to local reports (*Amici di Padre Pini*, Sierra Leone Mission 2005), the children are taught farming by doing it on school grounds. The resulting crops are then collected by the teachers, who bring home-cooked food to class for the children to buy. Marking papers and photocopying texts also supplement their income. Education is, supposedly, free for primary schooling under the age of 12.

The standard of education is very low, the main issue being the poor training standards coupled with the small pay. Public schools seem to spend a great part of the year doing non-teaching activities, such as sports and farming weeks. Classrooms with over 100 individuals worsen these issues. The World Bank reports (2010) that "most schools in Sierra Leone

have very poor classroom conditions and still lack sufficient learning materials and adequately qualified teachers; learning in many schools is minimal". Private schools are quite common; they are not free and usually built on religious grounds.

2.2 ~ ELECTRICITY ACCESS

According to International Energy Agency (IEA) estimates (IEA 2010), the global demand for energy will rise by roughly 55% by 2030, and over 70% of this growth will take place in developing and emerging countries. Given the possible impact on the climate, this demand cannot be met by oil, gas and coal alone.

A rather controversial topic within the field of renewable energy is large-scale hydroelectric plants and the huge dams associated with them. Social, ecological and technical problems, as well as spiralling costs, have led to strong opposition to new dam projects. Currently, hydroelectric power accounts for about 20% of the world's electricity supply. Spanda believes that well-considered hydroelectric projects, combined with a wide range of appropriate social and ecological measures, should continue to contribute towards covering the world's electricity demand with little or no CO₂ emissions. Hopes are pinned on the USD 300 million Bumbuna dam, the recent hydroelectric facility partially operative since November 2009. However, the initial coverage targeted for Freetown has proved intermittent at best. The full completion of the facility requires an investment of USD 520 million and at least five years of development. Furthermore, hydro and solar potential must be exploited if the population as a whole is to have any prospects of access to electricity.

3 ~ ENVIRONMENT

Temperatures and humidity in Sierra Leone are high, while rainfall is heavy. The mean temperature is about 27° C (81° F) on the coast and almost as high on the eastern plateau. There are two distinct seasons: the dry season, from November to April; and the wet season, over the rest of the year, with the heaviest precipitation in July, August and September. Rainfall is the greatest along the coast, especially in the mountains, where it is more than 580cm (230in) annually. It averages, however, more than 315cm (125in) per year in most of the country, with 366cm (144in) in Freetown alone. The relative humidity ranges from an average of 80% during the wet season, to about 50% during the dry season.

There is much evidence of unfamiliar weather behaviour. Farmers have lost confidence in the timing of their planting, unsettled by the incidence of wet and dry seasons in recent years. According to the country's National Adaptation Programme of Action (NAPA 2008), "unusual temperature and rainfall patterns" are common and lead to shortcomings in crop yields, livestock welfare and freshwater resources.

As reported by a climate computer model (Maplecroft Climate Change Risk Atlas 2010), temperatures are rising and will continue to do so, but rainfall projections are less certain. Nevertheless, with 70% of the population trapped below the national poverty line and the rural economy almost entirely dependent on rain-fed agriculture, households are poorly placed to cope with any changes. Climatic variability is already linked with difficulties in achieving the Millennium Development Goals in the country, especially in relation to food security and the provision of clean water.

As it is also the case with many other West African countries, Sierra Leone faces the risk of flooding, salinization and damage to its marine habitat from the rising tides of the warming Atlantic Ocean. Some property loss through coastal erosion has already been reported.

Human activities have compounded problems along sections of the coastline, in particular, the unregulated excavation of sand for building materials. The Kroo Bay slum areas of the capital, Freetown, where about 6,000 people have created homes on low-lying land, face the most explicit vulnerability. Flooding is already a familiar and increasingly severe hazard.

3.1 ~ ADAPTATION TO CLIMATE CHANGE

According to Maplecroft (2010), Sierra Leone is the fourth most vulnerable country in the world, assessed by its incapacity to adapt to the impacts of climate change. The country's recent history of conflict compels priorities relating to governance and rehabilitation of war-torn communities. The institutions and public awareness necessary to respond to climate change have, inevitably, been slow to emerge.

The NAPA report (NAPA 2007) for Sierra Leone recommends actions compatible with the needs of poverty reduction and development. These typically focus on needs relating to soil management, irrigation and seed selection. However, the report suggests that the highest priority should be allocated to the restoration of war-damaged meteorological stations across the country, together with the development of mechanisms to provide early warnings of extreme weather conditions. Fishing depends on a stable marine environment. In response to rising sea levels, NAPA recognizes the importance of coordinating the management of coastal building and industrial activity. Rehabilitation of mangrove forests is another acknowledged priority.

Despite this long list of adaptation proposals, there is little evidence of international donor support. The government has expressed (NAPA 2007) frustration at the slow pace of assistance by those countries responsible for the bulk of greenhouse gas emissions.

3.2 - D E F O R E S T A T I O N

Forest coverage in Sierra Leone was 38% in 2005, including the Gola reserve, part of the Upper Guinea primary rainforest shared with neighbouring Liberia. In 2009, the two countries established the Transboundary Peace Park, an agreement seeking to protect the region from mining concessions and to encourage sustainable management by forest-dwelling communities.

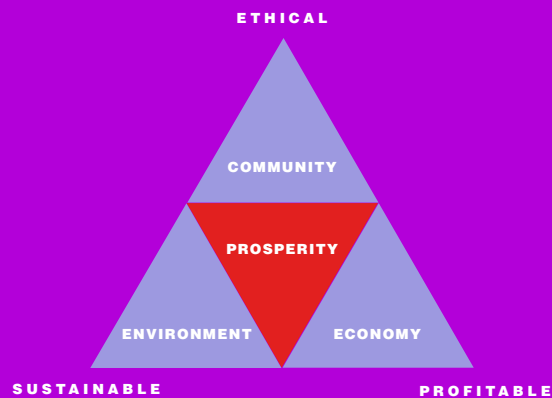
In contrast, the remainder of forest territory is vulnerable to a high rate of degradation, under considerable pressure from 'slash and burn' clearance for agriculture, cattle ranching and mining interests. Over 90% of the country's energy production is sourced from wood fuel and charcoal. In terms of resolve and coordination between government agencies, the institutional capacity to implement forest regulations and logging bans remains unconvincing. Possibly for this reason the country has not been included in the first round of international pilot programmes for Reducing Emissions from Deforestation and Forest Degradation (REDD). However, the government has clearly stated its aspiration to achieve the standards required to receive REDD payments.

4 - S E L E C T I O N C R I T E R I A

As the effectiveness of the project relies on a comprehensive, green approach, it will be implemented by all like-minded stakeholders – beneficiaries, partner organizations, donors, local MFIs, solar equipment providers and the communities – by means of a full, participatory approach.

In selecting the partners and beneficiaries, Spanda will carry out a work of due diligence, in order to make sure that the selected parties will be willing to adopt sustainable products and solutions, establish and maintain a high level of environmental ethics and social responsibility in their day to day work and incorporate a tenable approach in all decisions in a common effort to make their activity flourish.

In harmony with Mantra's core mission, Spanda seeks to model responsible and sustainable environmental behaviour, in order to enforce a framework in which the selected micro-entrepreneurs and their communities can shift towards practices leading to the sustainable development of their, and their community's, daily life. For this aim, the project will further procedures that improve health, safety, work and life conditions. It will select and encourage green micro-entrepreneurs and bio-farmer who are willing to build up healthy soil, who do not use artificially produced fertilizers, chemicals, herbicides and pesticides, but natural fertilizers instead, and who reclaim waste materials and recycle nutrients into the soil and so forth. It will seek to select those willing to use products from local sources and more recycled, recyclable, biodegradable and sustainable materials, as well as those who recycle the paper, glass, aluminum cans and plastic used by their micro-business-related products or services. Those who re-purpose material for immediate use, minimize the use of electricity and maximize energy efficiency, as well as those who pursue short- and long-term environmental protection, will also be targeted as project beneficiaries. In brief, those who are willing to use, take advantage of, advocate and educate their peers and the community on the most innovative and reliable practices of green sustainable development and social performance available will be considered as the most suitable beneficiaries in relation to Mantra's goals.



M A N T R A
G R E E N M I C R O F I N A N C E
I M P A C T

ECONOMIC	SOCIAL	ENVIRONMENTAL
<i>I N C R E A S E</i>	<i>I N C R E A S E</i>	<i>I N C R E A S E</i>
Operating Hours	Working Conditions	Conservation of Natural Environment
Sales	Employment	Water Storage
Income-generating Activities	Opportunities	Irrigation
Mechanization/Automation	Food Security	Soil Nutrients
Economic Security	Nutrition	Biological Diversity
Disposable Income	Cold Chain	Climate Preservation
Savings	Health Care/Services	
Accountability	Safe Water	<i>D E C R E A S E</i>
Business Partnership	Sanitation	Deforestation
Market Access	Education	Pesticides/Herbicides
Economic Activity	Literary Rate	Desertification
Economic Stability	Gender Equality	Use of Kerosene
GDP	Women's Empowerment	Fuel Wood
MFIs Capacity	Living Standards	CO2 Emissions
Community Economic	Communication	Indoor air pollution
Financial Services	<i>D E C R E A S E</i>	
Economic Equality	Gender Disparity	
Consumer Draw	Social Disparity	
	Child Mortality Rate	
	Technological Divide	
	Corruption	
	Poverty	
	Social Conflicts	

I N D I V I D U A L , S O C I A L A N D E C O N O M I C D E V E L O P M E N T

MDG 1 ~ TARGET 1 | MDG 2 ~ TARGET 3 | MDG 4 ~ TARGET 5

MDG 7 ~ TARGET 9 | MDG 8 ~ TARGET 16

TABLE 4

This study examines the Triple Bottom Line (TBL) forecast impact of the Mantra Project. It was conducted on a selected number of estimated target beneficiaries from the chiefdoms of Bo City and Gbedeva, Bandajuma, Potoru, Zimmi, Jendema and Gbondapi, which are all located in the districts of Bo and Pujehun, in the southern province of Sierra Leone. The pledge area has an estimated population of 15,000 people.

The project has a timeline of three years, initially targeting 100 direct beneficiaries for the first year. The primary data used in the analysis was provided by the Bo-based NGO Peace and Reconciliation Movement Sierra Leone (PRM SL), one of Spanda's local implementing partners. They collected the information with the aid of well-structured, validated and pre-tested sets of interview schedules, which were administered through personal interviews and observations, so as to elicit the required information from the targeted beneficiaries. This information was then analyzed using descriptive analyses.

The estimated target beneficiaries were 52 females and 37 males –with a mean age of 41.3 (41 individuals below 40; 48 above 40), with 414 active family members – and 11 public utility centers, with 2,600 members (ANPPENDIX). A total of 3,014 indirect beneficiaries (1993 females and 1121 males) and a grand total of 3,114 targeted beneficiaries, with a direct-indirect ratio of 1:31.14, accounts for 20.76% of the estimated population of the six chiefdoms' 15,000 inhabitants.

The male to female ratio in relation to direct and indirect beneficiaries, respectively 52:37 and 64:34, confirms the traditional belief of providing women with access to productive resources, of which credit is one, and seems to suggest that women participate more than men in most productive activities.

Most (94%) of potential beneficiaries were married with children. The assumed implication was that these figures were expected to enhance the use of more family labour, thereby leading to a reduction in the use of hired labour among those in the study area. Education is an important factor that can influence productivity and determine access to loans and repayment; according to the study, the level of education data showed that 47 were literate and 42 illiterate, while 19 had secondary education.

The direct beneficiaries' average household size was found to be 4.7 persons. The supposed implication is that the relatively small household size may increase the number of labour needed. This is contrary to the findings of Adegbite and Oluwalana (2004) and Adegbite *et al.* (2008) that the larger the household size, the more the likelihood of sustainable labour efficiency, given the constant nature of available labour.

This study only analyzes the TBL impact of the project for the first year. During the following two years, there will be an increase of 50 direct beneficiaries per year.

6 ~ CONCLUSION

Spanda Foundation believes that peace may be assured, economic stability can be reached and sustainable development achieved, through high standards of education, social and gender equality, human rights implementation and an effective preservation of the environment. The Mantra Project was initiated as an innovative combination of the provision of financial aid and green energy equipment to developing countries, to be conducive to their social, ethical, economic and environmental empowerment.

The combination of locally driven funds with solar energy equipment, as well as the relevant training and capacity building activities that Mantra will provide, shall, directly and indirectly, help to increase the local communities' living standards. In particular, the micro-credits granted to the selected micro-borrowers will help them to increase their economic activities, hence, their disposability of income, economic security and savings. This should lead to a higher level of investment in education that will, at first, increase the literacy rate of the population and, in the longer term, decrease local unemployment rates, as well as local economic, gender and social disparity. More employment opportunities and easier access to market and financial services may improve living standards and community economic development in general. As a result, poverty and corruption shall decrease. In addition, the support for female micro-entrepreneurs will provide them with the necessary economic and social power to actively participate in their communities, taking decisions that will, inter alia, improve their own and their families' health conditions; child mortality rates may decrease accordingly.

The direct provision of solar energy equipment and the relevant training for their correct use and maintenance, besides improving work conditions and potentially increasing operating hours, may have a substantial impact on the decreased use of kerosene, fuel wood and of CO2 emissions. Facilitating access to green energy, rather than to electricity alone, will, in turn, contribute to the climate adaptations necessary to maintain biological diversity and conserve the natural environment. Furthermore, the befitting use of solar energy will improve the quality of local water and soil, favour irrigation, water and food storage, therefore improving food security and nutrition.

The potential impact of the Mantra project on the overall prosperity of the selected pledge area is conspicuous and Spanda Foundation is fully committed to transmute this substantial potential to an ethical, authentic, durable and rich reality.



MAIN GLOBAL DEVELOPMENT THEMES

✓ MANTRA IMPACT



<p>GOOD GOVERNANCE</p> <p>DEMOCRACY AND THE RULE OF LAW</p> <p>DECENTRALIZATION</p> <p>CORRUPTION ✓</p> <p>PUBLIC FINANCE</p> <p>URBAN AND MUNICIPAL DEVELOPMENT ✓</p> <p>PUBLIC SECTOR REFORM</p> <p>REGIONALIZATION</p> <p>SECURITY, RECONSTRUCTION AND PEACE</p> <p>CONFLICT PREVENTION ✓</p> <p>PEACE BUILDING ✓</p> <p>EMERGENCY AID</p> <p>SOCIAL DEVELOPMENT</p> <p>EDUCATION ✓</p> <p>HEALTH AND POPULATION ✓</p> <p>SOCIAL PROTECTION</p> <p>ENVIRONMENT AND CLIMATE CHANGE</p> <p>CLIMATE CHANGE ✓</p> <p>MANAGING NATURAL RESOURCES ✓</p> <p>URBAN AND INDUSTRIAL ENVIRONMENTAL MANAGEMENT</p> <p>ENVIRONMENTAL POLICY AND INSTITUTIONAL DEVELOPMENT</p>	↑	<p>ECONOMIC DEVELOPMENT AND EMPLOYMENT</p> <p>✓ POVERTY, GROWTH AND DISTRIBUTION</p> <p>✓ LABOUR MARKET AND TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET)</p> <p>✓ EMPLOYMENT</p> <p>✓ FINANCIAL SYSTEMS</p> <p>✓ TRADE</p> <p>MIGRATION AND DEVELOPMENT</p> <p>✓ PRIVATE-SECTOR</p> <p>✓ ECONOMIC POLICY</p> <p>CROSS-SECTORAL THEMES</p> <p>✓ POVERTY</p> <p>DRUGS</p> <p>✓ FOOD AND NUTRITION SECURITY</p> <p>✓ GENDER</p> <p>HIV/AIDS</p> <p>✓ INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT)</p> <p>✓ CHILDREN AND YOUTH</p> <p>✓ CULTURE AND DEVELOPMENT</p> <p>✓ PARTICIPATION</p> <p>PUBLIC-PRIVATE PARTNERSHIPS (PPP)</p> <p>✓ SOCIAL AND ENVIRONMENTAL STANDARDS</p> <p>✓ TOURISM</p>
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TABLE 5



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HE ANALYSIS OF THE ECONOMIC IMPACT OF THE MANTRA PROJECT WITHIN THE SIX CHIEFDOMS OF THE BO AND PUJEHUN Districts in Sierra Leone has been broken up into two parts: on the one hand, the provision of photovoltaic cells (PVCs) and the relevant training for the maintenance of the cells (the *Al-Sham* programme). On the other, the microfinance programme geared to give access to credit (the *Venus* programme).

The project as a whole will have an economic impact that will determine an increase in economic activity, savings, disposable income, gross domestic product (GDP) and economic security. As a result, there should be a decrease in the unemployment rate, along with an adjustment in both the level of economic disparity and consumer spending habits.

The hypotheses on the potential impacts of the project in Sierra Leone have been conducted on the basis of the analysis of the economic and social structures present there. Due to the minimum amount of national data available in this respect, it has been integrated with that of Nigeria and Uganda as, in terms of women's empowerment and dependency on agriculture, these countries may be considered similar to Sierra Leone.

Year 1
Direct Target Beneficiaries | General

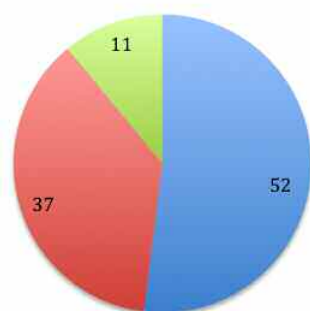


FIGURE 1 ■ Females 52 ■ Males 37 ■ Public Utility Centres 11

The United Nations (the UN) and the World Bank have not published an unemployment rate for Sierra Leone for the last 5 years¹⁻². The *2009 Spanda Report* on Sierra Leone³ states that 85.6% of the population is employed. This being the case, the real issue is how to get those employed above the poverty line. According to the United Nations Children's Fund (the UNICEF), 53% of the population is under the international poverty line, defined as 1.25USD/day⁴. None of the current beneficiaries of the project are below the international poverty line as per their stated 2010 income. In addition, there will be a minimal effect on the percentage of those under the poverty line since most beneficiaries will not be immediately employing additional labour.

It could be estimated that approximately 10% of the beneficiaries would potentially hire additional labourers. For example, if 11 beneficiaries hire 1 additional worker each and this was added to the 10 additional workers being trained per chiefdom, the percentage change of those under the poverty line would be less than .01%. The likelihood of the current income of these additional workers being under 1USD per day is great. If this is the case, the project will address Goal 1 Target 1⁵ of the United Nation's Millennium Development Goals (MDGs).

Data analyzed from Nigeria on the causes of poverty within the country, along with how microfinance credit affects the poverty index (Godwin, 2010), shows that the five most significant causes of poverty in the country were low profit, unsuccessful businesses, high-priced commodities, lack of finance to start or expand business and hard economic times. This

study also analyzed the relationship between microfinance credit and the poverty index. From the economic model⁶, it can be inferred that as microfinance credit increases at a faster rate, the poverty index increases though at a slower rate. As time passes and microfinance credit continues to increase at a faster rate, the poverty index starts to decrease at an additional rate. Ten years after microfinance was introduced in Nigeria, the poverty index is still increasing, but at a slower rate.

A supplementary study (Kono and Takahshi, 2010) found a discrepancy between actual profits and revenues of self-employed businesses and incomes, while business size grew, profits did not. Furthermore, disaggregated data reflects this trend of increased sales only in non-poor households. Though educational investments in poor households may aid in alleviating intergenerational poverty, immediate impacts may be not as prominent. As most of the Mantra beneficiaries are self-employed and considered non-poor when compared to the poverty line, they should profit from being part of the programme.

More specifically, the extent to which the Mantra programme will positively affect the income of the target beneficiaries, as stated in the regression analysis⁷ of the beneficiary list (APPENDIX), must be examined. From this analysis it may be concluded that the project can have a positive impact when investment is isolated. In most cases, beneficiaries' income will increase after the project is implemented. The majority of all the target beneficiaries are between the ages of 38 and 49 years, with an average age of 43.5, this implies that they are highly productive and active (Olaoye, 2010). This is in line with Bello's assertion (2000) that age has a positive correlation with acceptance of innovations and risk taking as implicit in the credit borrowing for agricultural production. Nevertheless, some beneficiaries will not encounter this increase due to their age, as those over 40 years old will experience an income decrease of .18. As long as the amount of beneficiaries 40 years old and over is limited, the issue of age should not be a problem. The age of 40 was used as the cut off due to its statistical significance of its proximity to the life expectancy for Sierra Leone, 48.7 years for women and 46.1 years for men¹.

Because Mantra is a two-sided project, as a result, how the community will be affected by the addition of energy via PVCs must be considered. First, from the new light source there will be potential benefits for the traders who represent 60% of the beneficiaries. These benefits include extended operating hours and increased sales due to improvements in the lighting quality for product displays⁸. If the Mantra beneficiaries experience approximately a 30% increase in revenues after lighting is introduced, it is expected that revenue and profit will have a 1 to 1 correlation. If an increase of 1 unit in revenue increases income by 1 unit, the number of those experiencing a decline in income will decrease. This assumes that this 30% increase in revenue can only be applied to beneficiaries that intend to use the loan for petty trading and trading purposes. It cannot be presumed that this increase will spill over into other industries.

Traders are not the only ones to benefit economically from the introduction of green energy. Households will also save from switching kerosene for photovoltaic systems. Some research has found that the expenditure on fuels was between 10 and 25% of their monthly household budgets⁸. For the next few years, the annual increase in kerosene prices was estimated to be 4% per year. According to a case study completed in Kenya⁹, a household will save one liter/week of kerosene. Assuming that there are 75 households within each chiefdom involved in Mantra, the savings will be 23, 400 liters of kerosene per year. In Pujehun, 87.8% of fuel used for lighting comes from kerosene¹⁰. Therefore, there should be significant savings from switching away from kerosene to solar energy for lighting. As 95.56% of Pujehun uses wood for cooking⁹, there will be additional savings from switching from fuel woods to solar energy. As the solar energy industry becomes larger and more efficient, the monetary savings for households will increase as well.

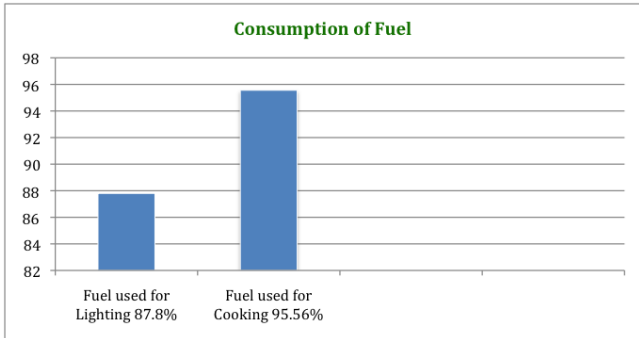


FIGURE 2

Households will save directly in money and in time. For many rural households, obtaining fuel for lighting can be a time-consuming task that requires travelling long distances and is often undertaken by women and children, reducing women's available time for income-generating activities¹¹. The Mantra Project will allow women in the Pujehun community to gain time for income-generating activities and will further assist them by providing funding through micro-finance. It cannot be assumed that an increase in income alone will eliminate poverty in the Pujehun district. Savings play a significant role not only in whether or not the beneficiaries can achieve a higher standard of living but also in their ability to maintain it.

As suggested by a study on the impacts of microfinance on married women in Uganda¹², males dominate the decision-making process, a situation very akin to Sierra Leone's social structure. Due to the fact that approximately 60% of the current beneficiaries of the project are married women, it is important to consider the gender politics involved in microfinance. This study sheds light on the impact microfinance can have on household savings and related issues. This study found that power struggles start from the initial decision of whether or not to take out a loan, to what to do with the money generated by it. Cases were reported where women were manipulated by their husbands to take out a loan only for his interests. MFI clients tend to have more voice in the decision-making process for loans and business; however, this power is usually limited to smaller items such as poultry, women's enterprises and bank accounts. There were also instances of joint ownership, which increased as the amount of the loans increased. Although women are gaining additional decision-making power, decisions regarding larger investments continue to be made by the males within the family. There has been progress made in the ownership of enterprises and adjustments in women's ability to enter into male-dominated industries such as fishing. This social issue can also affect the economic well being of the household as a whole; the poor "typically spend about 2 percent of their income educating their children, and often larger percentages on alcohol and tobacco" (Kristof, 2010).

The objective of Mantra is to empower women within the decision-making regarding wealth and savings. Through providing them with training and advice on financial and administrative practices, they will be stimulated to use the money efficiently. When women get access to their accounts, they can limit men's ability to get as much money as they want. In the long-term, the expected result from this action plan is that women can act as the decision-maker in the family on what the income is used for. For example, a larger portion of money can be used for education, whether for children or informal, health care, production, agriculture and opening independent savings accounts, etc. Promoting gender equality is, thus, an important part of a development strategy that enables women and men to escape the poverty trap and improve their standard of living.

Another economic benefit is that the Mantra Project can potentially increase food security within the Pujehun chiefdoms involved. By increasing the available credit for additional assets and production, micro-loans allow households to be less susceptible to misfortunes such as droughts (Doocy *et al.*, 2005). Participation in lending programmes also improves the household's ability to deal with periods of crisis and economic difficulty (Dunford 2001). Dunford's (2001) findings indicate that female client status remains a significant predictor of children's nutritional status (presence of moderate to severe wasting) in multivariate regression models. An enhanced nutritional status among children of female clients is positively correlated to participation in the lending programme. It is also found that female client households are more successful in maintaining quality diets than households of male clients. With the majority of Mantra's beneficiaries being female, there is a potential for the households of these beneficiaries to experience increased food security.

Although there are studies that link microfinance with increased food security, such as that of Dunford (2001), there are also studies that refute this argument. "Access to formal credit has no statistically significant direct effect on per capita household daily food expenditure [...] it is the mere act of borrowing (and not just from formal sources) that is negatively correlated with both calorie and protein intake" (Diagne and Manfred, 2001). The authors propose two reasons for this: first, there is a negative correlation between borrowing and crop income. Second, the loan amount borrowed was insufficient to cover the planned investment. As a result, the household chose to consume less in order to pay off the loan amount. Food security affects individual households and can create potential challenges for the entire community. With the continuous increase in food prices, the ability to battle food insecurity will not only be an economic issue for the Pujehun community, but may in fact become an issue of security as well.

The project's economic benefits also have social implications. Higher productivity and new job opportunities often reduce gender inequalities in employment. To achieve this goal, Mantra's action plan is to provide entrepreneurship training. This may facilitate more employment opportunities for beneficiaries. In the long run, economic stability will attract more investors. Gender disparities regarding rights constrain the sets of choices available to women in many aspects of their lives and limit their ability to participate or benefit from development. One challenge is the lack of independent rights of women to own land in Sierra Leone, much like other countries of Sub-Saharan Africa. Women obtain land rights through their husbands as long as the marriage endures. They often lose these rights when they are divorced or widowed. As a consequence, compared to male-run enterprises, many female-run enterprises tend to be undercapitalized and have poorer access to machinery, fertilizer, information and credit. Thus, micro-credit will focus on the ability of women's enterprises to participate more fully in development by expanding their businesses and contributing to higher living standards. Greater women's participation and gender equality are associated with more transparent practices of cleaner business and government. With increased influence of women in the community and economy, the level of corruption may decrease. Women in business and politics are less likely to pay or receive bribes because of their higher standards of ethical behaviour and higher aversion to risk. These characteristics support the government in attracting international investors and opening new business opportunities in the country.

Electric power is one of the most fundamental factors behind job creation. It will supply reliable cost-effective and environmentally sustainable electricity for industrial, commercial and domestic use. With PVCs, Spanda hopes to achieve the adequate energy and water supply required for primary growth in sectors like agriculture, mining, fisheries and tourism. These prospective areas can open up new opportunities for employment in eco-tourism, attracting more tourists to the natural beauty of Sierra Leone. Eco-tourism promotes responsible practices within the tourism industry, whereby local communities work hand in hand with the government, entrepreneurs and stakeholders in managing waste and emissions. In Kenya¹³, for example, women organized a group to run a tree nursery with eucalyptus, pine, cypress, etc. Furthermore, they planted a man-made forest for production of bio-diesel and also made handicrafts using local materials.

Finally, with regard to the economic impacts it is important to note that the Mantra Project will also benefit the MFIs involved with the project. The project will provide additional funds to the MFIs and, as a result, increase their capacity and reach. Moreover, due to the increased accountability imposed by the Spanda Foundation, the involved MFIs will be held to more strict standards.





HOPE & REALITY

TABLE 6

2 - SOCIAL IMPACT



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2.1 - HEALTH BENEFITS

NE OF MANTRA'S CORE GOALS IS TO IMPROVE HEALTH IN THE TARGET VILLAGES. THE ESTIMATED INCREASE IN 89 HOUSEHOLDS' income will modify the nutrition and health expenditure of the 400 family members whilst access to renewable solar energy will have a strong impact on health facilities and behaviour.

Even if there is no clinic targeted within the list of beneficiaries, the eleven community centres provided with solar panels will have the opportunity to strengthen the cold chain for vaccines and help expand vaccination coverage, as well as reduce child mortality (269/1000)¹⁴. Barely 40% of children aged 12-23 months have been fully vaccinated in Sierra Leone¹⁴, thus, the impact of the project on children's health in the Pujehun areas may be significant.

The use of electric appliances like refrigerators or water pumps could directly affect the quality of food and drink, thus reducing diarrhoea infection, one of the first causes of high child mortality (about one in eleven children born in Sierra Leone dies before their first birthday and one in seven children dies before their fifth birthday)¹⁵. Furthermore, the introduction of green energy for household cooking, lighting and heating will reduce the indoor air pollution derived from the combustion of traditional fuels, which cannot only lead to respiratory infections, but also to low birth weight, infant mortality and pulmonary tuberculosis, which causes between 1.6 to 2 million extra deaths every year¹⁶. In particular, some candles available in developing countries' markets are shown to contain high quantities of lead in their wicks. Lit for few a hours in enclosed rooms, lead concentrations sufficient enough to cause fetal damage or to harm the mental development of children are emitted.

In South Africa, a few important motivations for desiring household electrification are given by both women and men. These include the prevention of accidental kerosene poisoning of children and the prevention of devastating house fires caused by kerosene cooking and lighting (Mehlwana and Qase 1996; Jones, *et al.* 1996; Banks *et al.* 1996). Safety hazards from cooking and/or lighting with kerosene can be eliminated through the use of alternative products. An example of this is the electric iron, which is widely enjoyed for its cleanliness, safety and ease of use.

Finally, behavioural transformation may occur as a result of the increased knowledge of health and nutrition facilitated by access to mass media, mainly television. The World Bank IEG study¹⁷ found that the main uses for first access to electricity are lighting and television. Exposure to television also seems to increase awareness about the risks related to unsafe sex, as well as contraceptive methods, leading to additional benefits. In respect to long-term health and safety concerns, households can improve their quality of life by adjusting their behaviour, purchasing goods and services that are less energy-intensive and adjusting managerial habits, such as recycling and composting, as well as using bicycles or public transport instead of private automobiles.

There should also be an increase of access to better health services. Women may face violence when fuel must be collected in areas of civil disturbance. For instance, women face snipers while seeking fuel supplies in Sarajevo. In Somalia, refugee women have been raped by bandits while collecting fire-wood (*The Economist*, 1993). Spanda supports household use of PVCs as an energy source, leaving households to allocate their time to productive activities like studying in the evening, community life, watching television, etc.

One benefit of new energy technology for women and men is the value of time saving. For women, time saved in fuel collection and cooking can be used to devote more time to their families and themselves and to have better education, both formally and informally.

2.2 - EDUCATIONAL BENEFITS

United Nations MDG2 is seeking to achieve universal primary education that ensures all boys and girls complete a full course of primary school, as well as literacy amongst youth between 15-24 years of age.

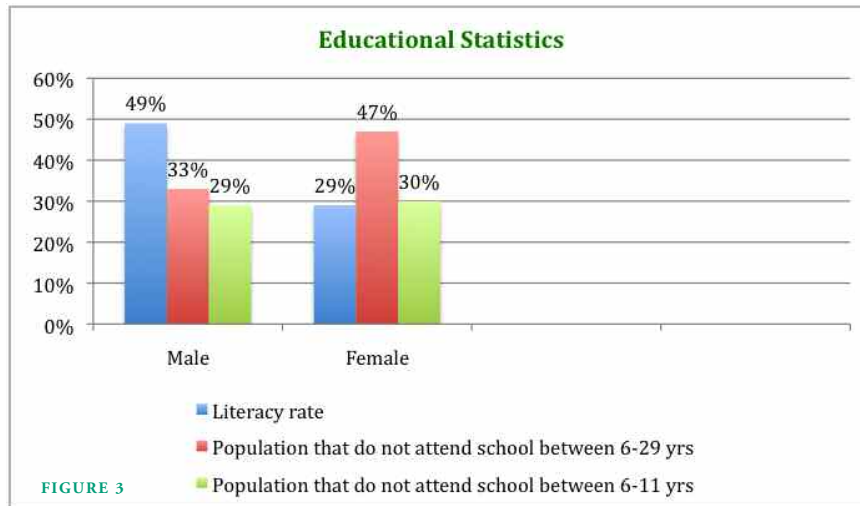


FIGURE 3

SOURCE: Statistic SL Report 2009.

Conventional households do not see education for their daughters as a priority. Girls experience unequal treatment within the family. After finishing primary education, girls are occupied with traditional roles at home. They are underestimated in their intelligence and are not involved in decision-making processes. Due to this lack of education for women, they are less attractive to banks and other financial institutions as potential clients to open a bank account and receive loans. For this same reason, women are less likely to be considered as potential employees of credit facilities. As soon as a household has an alternative power supply to firewood and petroleum, which are very expensive, both in respect to money and to the environment, households can enjoy using electronic appliances, like lighting, television, radio, computer, water pump, electric cooker, etc. Electrification will indirectly increase the quality of education by increasing the time available for students to allocate to studying at school, rather than working in the field. Furthermore, for teachers, electricity is an appealing factor for work within rural areas: the more teachers pay attention to students, the better the quality of education. Additional channels through which electrification may affect education are:

- (i) improving the quality of schools, either through the provision of electricity-dependent equipment, or increasing teacher quantity and quality; and
- (ii) increased allocation of study time at home. Although the availability of television may decrease that time, it may also provide educational benefits.

The Energy Sector Program (ESMAP)¹⁸ study shows that children in electrified households have higher education levels than those without electricity. However, this does not allow for other factors such as parental education, household income and school facilities to be taken into account. Demographic and Health Surveys (DHS) data¹⁹ also shows that electricity has a direct impact on rural education once these factors are controlled for. In low-income countries, rural schools often lack basic equipment, such as furniture and adequate textbooks; therefore, the presence of electricity often does not affect these important constraints. The failure of teachers to take up posts in remote locations and frequent absenteeism from such postings is a problem in many countries and shows that the availability of electricity makes rural positions more attractive to teachers. This is one possible reason for higher education levels, with improved school quality encouraging students to stay longer or enabling them to do so, as their grades improve from better quality teaching. The other possible explanation is that increased study time at home results in better grades, so children stay in school longer. There is indeed evidence that electricity increases study time but no study follows the causal chain through to improved results and higher educational attainment.

Mantra's action plan for education is to empower people to be able to read and write at every age level, through self study at home or informal education in the community centres. The long-term objective is to increase awareness of how important education is. Economically speaking, households are expected to save more money for their children's education. Increasing education levels for women improves the welfare of both males and females, since both benefit from higher average wages and national income. This may impact gender equality whereby communities will appreciate women's invisible time and/or effort and take into account the portion of women's economic contributions.

Studies of the impacts of microfinance on the poor have to consider social outcome variables such as strengthened social networks and social development. In the *Microfinance Impact Report 2010*, Brau and Woller (2004:26) and Kabeer (2003) further highlight that studies should not only look at individual and/or household-level impacts but also look at impacts on the community, economic and national levels. The energy sector needs capital-intensive, large-scale and commercial activities that require professional expertise. The new trend in energy policy and gender analysis is to focus on gender analysis in the energy sector. Women are considered as active, rather than passive, participants in the energy sector, resulting in a greater demand for women in energy professions, equal gender training within the energy sector and the rise of national and international networks regarding gender and energy. The role of women in sustainable energy development is explained (Cecelski, 2000) from the key players' perspectives: renewable energy manufacturers that do not pay attention to the needs of women will be missing a huge potential market. Energy policy-makers who ignore the needs of women will be missing out on a powerful force for renewable energy development. Energy researchers who leave women out of energy research and analysis will be unable to understand a large part of energy consumption and production. Donors who do not support gender-sensitive energy assistance will be overlooking one of their primary target groups. From the user's point of view, Mantra emphasizes women as the main users of household energy and recognizes their influence over family purchases related to energy. Thus, policy-makers and practitioners should involve women as key players in the planning, implementation, training and monitoring of impacts and benefits. The policy-makers and practitioners need to have formal training in the discipline of gender mainstreaming; thus, Mantra tends to encourage the recruitment of women on the basis that they will understand the issues.

Due to a lack of formal legislation, women living in rural areas outside the capital city of Freetown have little protection from discrimination, violations of human rights and brutal abuse. Sierra Leone's constitution recognises both formal and customary laws. Women have limited access to justice, which may be severely impeded by practices that take place under customary laws; for instance, the Islamic law (*Shariah*) related to marriage, divorce, and inheritance among Muslims in most areas. The main challenges include the lack of confidence to claim political or legal rights and the lack of female representation in the government. Mantra aims to give priority to women by providing access to monetary funds, increasing their productivity in order to reduce poverty, as women represent less of a credit risk than men. For example, this is seen in their decision to use money to improve the lives of their children. Economic output can be maximized through investing in informal business (petty traders, repairs, and crops farming) or savings.

Societal and economic institutions, such as markets, shape the roles and relationships between men and women. They influence what resources women and men have access to, what activities they can or cannot undertake and in which ways they can participate in the economy and society. Higher income means fewer resource constraints within the household that force parents to choose between investing in sons rather than daughters. But how precisely women and men are affected by economic development depends on what income-generating activities are available, how they are organized, how effort and skills are rewarded and whether women and men are equally able to participate. Mantra will indirectly support the involvement of the community in the design of a childcare system that addresses specific demands, with positive effects on gender and child-related issues. Increasing income for households means that more will be invested in knowledge and vocational education. This prepares a workforce to enter the labour market. By doing so, it creates strong market signals regarding the return to labour participation and eliminates some economic inefficiencies. For instance, where active labour markets exist, hired labour provides a substitute for female family labour, whether on farms or in household maintenance and care activities. This allows households to use time more efficiently and reduces women's workloads. As the economy grows, the community will invest more in infrastructure, such as transportation services and low-cost childcare. This means more women in the labour market and more girls in school. Improving education levels encourages more women to migrate into activities outside of agriculture. This tends to reduce females' time spent on domestic chores and care activities, while giving benefits to females' health and participation in income-generating activities and schooling.

2.3.1 ~ TECHNOLOGICAL BENEFITS

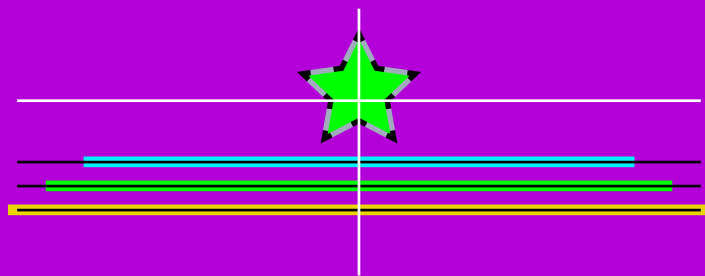
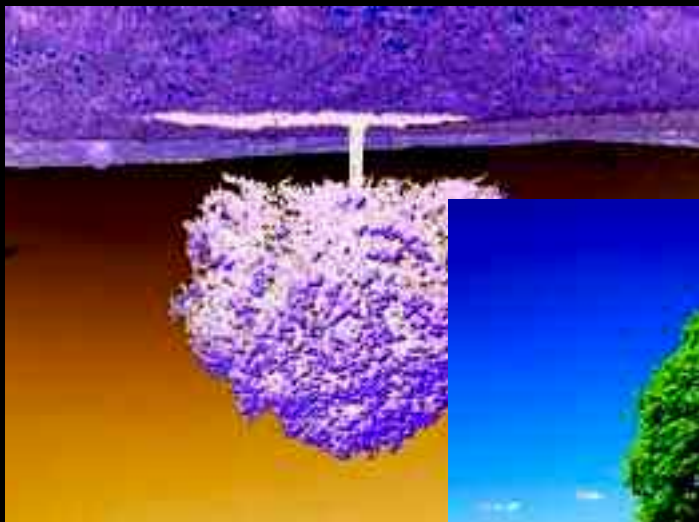
The project aims to increase women's attention to technological development through the replacement of traditional ways of cooking by the use of solar technology. As a result, cooking will be much safer, healthier and less labour intensive.

As household use of PVCs increases, the demand from households to renew their kitchen and housing designs may increase. This is caused by the fact that households may switch to electric appliances once electricity is available to them. However, research shows that access to electricity does not necessarily lead to a change in consumption patterns. According to the World Bank²⁰, this happens mainly because it implies the purchase of expensive appliances, but tradition also plays a role. Nevertheless, those able to invest in time-saving, albeit costly, technology, such as kitchen appliances or television, may experience a resulting shift in cooking traditions; if this shift does involve saving time, less time for food preparation will allow women to have more time to learn about the opportunities available through other technologies, such as ICTs. Increased computer use helps to diminish manual paperwork and save time in finding archives or files. In an internet era, computers provide a tool to access information, as well as education, communication and, in the future, internet banking, for example. The goal is to increase women's literacy regarding technology in general.

2.4 ~ CONFLICT PREVENTION

Sports, as well as cultural activities, have the ability to engage and bring groups of all different ages together. By supporting sport and cultural activities in Sierra Leone, Mantra seeks to promote community health and build trust and respect by providing the means to share common experiences. Hence, these activities will reinforce national and regional pride and identity and create a universal language to prevent conflict and violence. There is a need to focus on developing roles for young people in order to build self-confidence outside of their school or daily work activities. Sports and cultural activities could also take place at night, powered by the PVCs in the community centres. Building social capital and facilitating lifestyles and solidarity may further the peace-building process. Having an outlet where women, along with men, can actively participate in community life, whether during the day or at night, could engender greater equality.





T U R N I N G N I G H T I N T O D A Y

TABLE 7



THE MANTRA PROJECT WILL SUPPLY CHIEFDOMS WITHIN THE BO AND PUJEHUN DISTRICTS WITH ADDITIONAL ENERGY SERVICES. These energy services are a crucial input to providing adequate food, shelter, clothing, water, sanitation, medical care, schooling and access to information, all of which are important aspects in addressing poverty reduction in Sierra Leone. Energy use is closely linked to a range of social issues, including population growth, urbanization and opportunities for women. Most importantly, energy is needed to meet basic human needs, such as food consumption, clean water supply, shelter, health, education, employment and so forth. In addition, quality of life may improve with commercial energy use, which is linked to increased economic activities and industrial development.

Approximately 80% of Sierra Leone's²¹ primary energy is derived from traditional biomass, while great quantities of crude oil and its by-products supply the rest. The use of charcoal and firewood is increasingly recognized globally as one of the major causes of deforestation and environmental degradation. Producing charcoal entails cutting down trees, causing deforestation and its ensuing effects on climate. Wood has to be burnt in kilns for long periods of time, a process that releases CO₂, the principal greenhouse gas leading to global warming and climate change. In total, between 1990 and 2005, Sierra Leone lost 9.5% of its forest cover, around 290,000 hectares, mainly due to shifting cultivation, commercial logging and the cutting of trees for wood to make charcoal²².

Expanding sustainable renewable energy resources is imperative to the economic and social development of the country and can be attained without enhancing pressure on the environment and damaging people's health. Mantra is expected to have a positive impact on the environment; there can be a potential decrease of 23,400 liters of kerosene per year for 75 households' lighting needs alone. Furthermore, it can reduce the use of fuel wood, extensively used for cooking and for artisanal activities. Spanda supports the introduction and the dissemination of renewable energies for rural electrification such as wind energy, bio-energy, solar energy and hydropower in the partner regions. By using Renewable Energies (RE) and establishing long-term energy security, dependence on imported energy can be reduced and energy prices can be stabilized in the long run. Stimulating the use of RE will help to improve living conditions while sustainably fuelling the basis for economic development. In addition, the use of RE creates regional and local employment, added value for the regions concerned and fewer greenhouse gas emissions.

Two major global challenges can effectively be tackled by the increased use of renewable energies: insufficient access to energy for the population in rural areas; local pollution and emission of greenhouse gases caused by electricity generation from fossil-based energy sources.

The almost total absence of electricity throughout Sierra Leone is a fundamental constraint on economic and social development and leaves no choice for poor households in terms of sourcing their fuel needs from trees. RE technologies are often the most suitable and cost effective option to satisfy the basic energy demand for cooking, lighting and heating, where required. Additionally, RE solutions enable cost effective supply of drinking water, health care, education, communication and other infrastructural services.

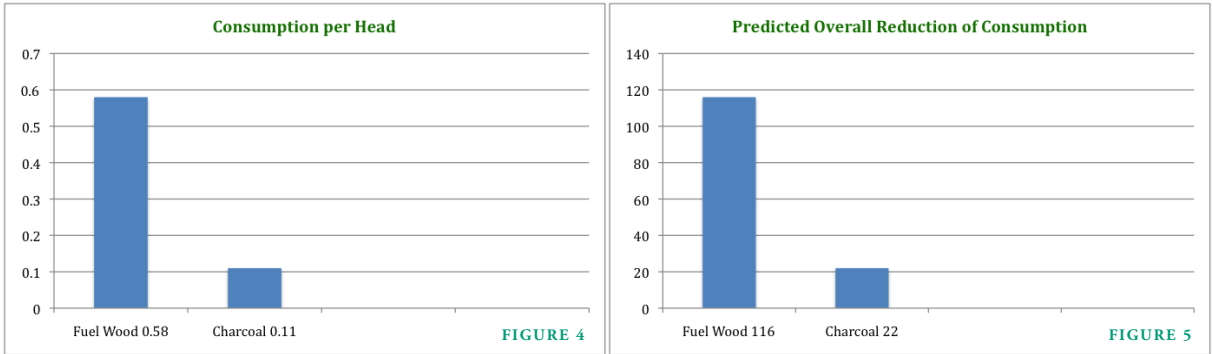
For the supply of cooking energy biogas and improved stoves as well as solar cookers can minimize health risks caused by harmful smoke emission from open fires. At the same time, the consumption of local biomass, especially firewood, is reduced. This makes a crucial contribution to reducing the overexploitation of natural resources and therefore helps to preserve this valuable traditional energy source.

In remote areas far from central power stations, RE technologies can contribute to increasing agricultural productivity, e.g. through the use of photovoltaic pumping systems, or solar dryers to help conserve agricultural products.

A FAO study (1990) shows fuel wood consumption at 0.58 m³ per head²³. If just one-half of the members of the households involved in the project are predicted to change over from fuel wood to electrical appliances, it would already mean an overall reduction of 116 m³ (40.000 m³ per year). This will contribute to decreasing both CO₂ emissions and

deforestation, which addresses MDG 7 Target 9. The same will occur for charcoal, whose average consumption per head is 0.11 m³; a reduction of 22m³²⁴.

Unfortunately, there will also be some negative effects on the Pujehun district due to an increase in agricultural productivity, such as water pollution, soil depletion, deforestation and soil exhaustion. Mantra sees the effects of large-scale agriculture as damaging to the environment, especially land degradation, due to the overuse of chemical fertilizer. Spanda, through the Mantra Project, promotes the application of organic fertilizer including bio-fertilizer and compost. This objective corresponds to MDG 7 to ensure environmental sustainability. Farmers will receive technological training to produce their own bio-fertilizer using local materials such as rice husks, waste from vegetables or animal farms. The target group for this project is women in particular, in order for more to be employed in crop farming as well as becoming entrepreneurs to supply bio-fertilizer to agricultural industries within the country. This will have several impacts. First, it will reduce community dependence on high-priced chemical fertilizers, which are often unaffordable and ineffective. Second, it aims to increase women's and community income by selling bio-fertilizer. Third, the use of bio-fertilizer will reduce water pollution from agricultural waste and agricultural irrigation. This will improve the image of women in the work force and promote public organization and government involvement in protecting local natural resources and the environment. The use of bio-fertilizer has been proven²⁵ to offer economic and ecological benefits by way of soil health, fertility and safety to farmers, revealing that an average 10-20% increase in production can be realized by their use. In terms of nutrients, bio-fertilizer can provide 10-20kg of Nitrogen per hectare. In terms of solubility, it can solublize 10-12kg of Phosphate per hectare per cropping season. It can also improve soil health by helping other beneficial micro-organisms to grow.



Sierra Leone is also facing a serious problem of pollution. The country imported approximately 200,000 tons of petroleum products as sources of energy³. Many households rely on charcoal and kerosene for cooking and lighting, while 70% of firewood is utilized as fuel for cooking, fisheries, bakeries and pottery. Furthermore, rapid growth in population and farming lands are gradually replacing forest areas due to the growing need for food. In the future, households with PVCs may choose to swap out traditional cooking methods for those involving electric stoves, electric water heaters, and electric refrigeration systems. Examples of uses of PVCs for business purposes include electric commercial baking ovens, electric fruit and vegetable dryers, electric fish smokers, or electric millers. PVCs can also be used on a larger-scale for the lighting of markets, hotels, restaurants and entertainment for households and communities. Large-scale energy use within households and communities will allow women to work or do activities in the evening. In addition, income generated from home-based work in the evenings with improved lighting could also benefit women and children economically. As electricity is used to light up the city, the security level of people walking on the street in the evening should increase.



NOTES



¹ United Nations, *Country Profile: Sierra Leone*, <http://data.un.org/CountryProfile.aspx?crName=sierra%20leone> (accessed 15 March 2011).

² The World Bank, http://ddp-ext.worldbank.org/ext/ddpreports/ViewSharedReport?&CF=-&report_id=9147&request_type=viewadvanced (accessed 15 March 2011).

³ Spanda Foundation, *Moving On. Sierra Leone Report 2009* (The Hague: Spanda Foundation).

⁴ Unicef, *Sierra Leone Statistics*, http://www.unicef.org/infobycountry/sierraleone_statistics.html (accessed 15 March 2011).

⁵ Goal 1 Target 1: “Halve, between 1990 and 2015, the proportion of the people whose income is less than one dollar a day.”

⁶ The quadratic economic model that was as result is a follows: $PI = b_0 + .13 MFBC + -4.359e-7 MFBC^2 + U_t$, where PI = poverty index and MFBC = microfinance credit.

⁷ Chen P. (2011), Technical paper on the regression analysis to project income as a function of the characteristics of Mantra’s beneficiaries. The following is the function for estimated income per the information given on the beneficiary list for individuals only.

$\ln(\text{income}) = 1.27 - .18 * \text{Age} + .23 * \text{Sex} + .97 * \ln(I)$ where:

Income = income realized in 2010, in local currency

Age = 0 if < 40, 1 if > 40

Sex = 0 if woman, 1 if man

Education = 0 if basic primary education was completed, 1 for higher titles

Members = number of family members active in income generating activities

I = investment of which the applicant will benefit of, in local currency.

⁸ Dahlberg Global Development Advisors, *Solar Lighting for the Base of the Pyramid – Overview of an Emerging Market*, <http://www.lightingafrica.org/> (accessed 30 March 2011).

⁹ Sierra Leone Statistics, *Annual Statistics Digest*, http://www.statistics.sl/final_digest_2006.pdf (accessed 30 March 2011).

¹⁰ Karlan D. (2010). “Helping the Poor Save More”, in *Stanford Social Innovation Review* (Winter): 48-53. “Loss aversion is similar to the economic law of diminishing marginal utility. [...] In banking, loss aversion may stymie people from putting their money into a savings account [...] putting off consumption until the future feels like a loss. Avoiding that uncomfortable feeling of loss, then, people spend now rather than save for later.” The author suggests ways for MFIs to overcome loss aversion.

¹¹ Rural Energy Foundation (2010) *Ashden Awards Case Study Summary*, <http://www.ashdenawards.org/files/reports/REF%20case%20study.pdf> (accessed 5 April 2011).

¹² Lakwo A. (2006). *Microfinance, Rural Livelihoods, and Women’s Empowerment in Uganda* (Leiden: African Study Centre).

¹³ Mason A. - King E. (2000). *Engendering Development through Gender Equality in Right, Resources, and Voice*, <http://go.worldbank.org/ughofep50> (accessed 6 April 2011).

¹⁴ World Health Organization (2010), *World Health Statistic Serra Leone 2008* <http://www.who.int/countries/sle/en/> (accessed 6 April 2011).

¹⁵ World Health Organization (2010). *Female Genital Mutilation*, <http://www.who.int/mediacentre/factsheets/fs241/en/> (accessed 17 May 2011).

¹⁶ Statistics Sierra Leone (2009), *Demographic and Health Survey 2008*, (Calverton: ICF Makro).

¹⁷ World Bank Independent Evaluation Group (2008). *The Welfare Impact of Rural Electrification: A Reassessment of the Costs and Benefits An IEG Assessment I* (Washington DC: IBRD) (accessed 6 April 2011).

¹⁸ ESMAP (2003), *Annual Report*, <http://www.esmap.org/esmap/node/598> (accessed 7 April 2011).

¹⁹ Statistics Sierra Leone (2009), *Demographic and Health Survey 2008*, (Calverton: ICF Makro).

²⁰ The World Bank (2010), *Climate Change Report*, <http://climatechange.worldbank.org/reports/new-slant-slopes-measuring-benefits-increased-electricity-access-developing-countries> (accessed 8 April 2011).

²¹ Developing Renewables, *Country Energy Information, Sierra Leone*, September 2006., <http://www.energyrecipes.org/reports/genericData/Africa/061129%20recipes%20country%20info%20Sierra%20Leone.pdf> (accessed 15 March 2011).

²² Kulubya S. (2008), *Efforts underway to address energy consumption in Sierra Leone*, 6 March 2008 <http://www.thecommonwealth.org/EZInformation/176101/060308efforts/> (accessed 17 March 2011).

²³ CEMMATS Group Ltd (2004), *The energy policy for Sierra Leone*, May 2004 http://www.uneca.org/eca_resources/Conference_Reports_and_Other_Documents/sdd/cemmats_study.pdf (accessed 15 March 2011).

²⁴ Beneficiaries’ information was used to calculate an approximate savings. Per the current information on beneficiaries, there are 89 individuals with the average active members per household at 4.48. If we multiply the average consumption per head of .11m³ * 89 households * 4.48 active household member the savings will be 44m³. Half of this would be 22m³.

²⁵ Fertilizer Suppliers Association of Nigeria (2011), “Increasing fertilizer production in Africa”, in *FEPSAN Newsletter* 1(2): 2-3.



Direct Target Beneficiaries | Population

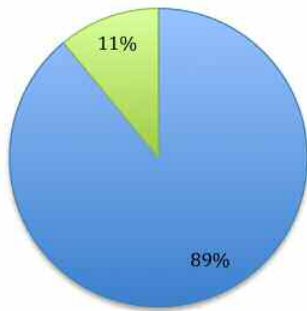


FIGURE 6

Total 100

■ Individual Members 89 ■ Public Utility Members 11

Indirect Target Beneficiaries | Population

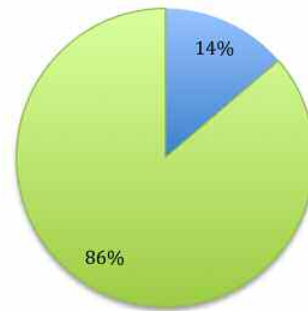


FIGURE 7

Total 3114

■ Active Family Members 414 ■ Public Utility Members 2600

1:31,14
Direct-Indirect Ratio



Direct Target Beneficiaries | Gender

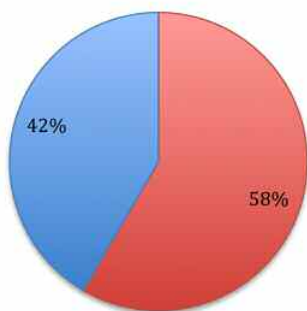


FIGURE 8

Total 100

■ Females 52 ■ Males 37

Indirect Target Beneficiaries | Gender

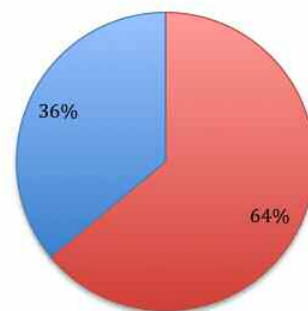


FIGURE 9

Total 3114

■ Females 1993 ■ Males 1121

1:31,14
Direct-Indirect Ratio

APPENDIX



ESTIMATED TARGET BENEFICIARIES

YEAR 1

PROVIDED BY "PEACE AND RECONCILIATION MOVEMENT - SIERRA LEONE" (PRM SL) | IMPLEMENTING PARTNER

PLEDGE TARGET AREAS & LOCATION DESCRIPTION

BO CITY & GBEDEVA TOWN

The PRM SL office and its environs in the Kakua Chiefdom, Bo District. The office is situated at Gbedeva Town, Bo-Koribundo Highway and in Bo city. The estimated target beneficiaries range from 50 to 100, houses are built in isolation settlement type.

BANDAJUMA TOWN

Chiefdom headquarter of the Sowa Chiefdom, Pujehun District. It comprises about 170 dwelling houses with an estimated total population of 1200 inhabitants. The distance from Bo to Bandajuma is 30 miles.

POTORU TOWN

Chiefdom headquarter of the Barri Chiefdom, Pujehun District. It comprises about 200 dwelling houses, with an estimated total population of 5000 inhabitants. The distance from Bo to Potoru Town is 46 miles.

ZIMMI TOWN

Chiefdom headquarter of the Makpele Chiefdom, Pujehun District. It comprises about 400 dwelling houses, with an estimated total population of 5,600. The distance from Bo to Zimmi is 67 Miles (from Potoru to Zimmi is about 21 miles).

JENDEMA TOWN

Strategically and economically important town in the Soro-Gbeima Chiefdom, one of the most underdeveloped chiefdoms in the Pujehun District. Business centre and border town, it shares a boarder with Liberia and comprises about 190 dwelling houses, with an estimated total population of 2,500 people. The distance from Bo to Jenedema is 92 miles.

GBONDAPI TOWN

Situated in the Kpanga Karbodeh Chiefdom, in the Pujehun District. It comprise about 80 dwelling houses with an estimated total population of 700 inhabitants and business centre where people converge every week on Tuesday and Wednesday for a community trade fair. The distance from Bo to Bandajuma is 58 miles.

TOTAL POPULATION 15,000 units.

SUMMARY LIST OF ESTIMATED BENEFICIARIES

NO	LOCATION	INDIVIDUAL BENEFICIARIES	PUBLIC UTILITY BENEFICIARIES	TOTAL
1	BO CITY & GBEDEVA Kakua chiefdom, Bo District	19	1	20
2	BANDAJUMA Sowa Chiefdom, Pujehun District	9	1	10
3	POTORU Barri Chiefdom, Pujehun District	19	1	20
4	ZIMMI Makpele Chiefdom, Pujehun District	18	2	20
5	JENDEMA Soro-Gbeima Chiefdom, Pujehun District	16	4	20
6	GBONDAPI Kpanda Kabondeh Chiefdom, Pujehun District	8	2	10
	TOTAL	89	11	100

LIST OF ESTIMATED TARGET BENEFICIARIES

NO	GENDER	AGE	MARITAL STATUS	EDUCATION	TYPE OF BUSINESS ACTIVITY	ACTIVE FAMILY MEMBERS
BO & GBEDEVA						
1	F	36	Married with children	Teachers' certificate	Social work	4
2	M	34	Married with children	Secondary education	Police officer	5
3	M	29	Married with children	Form 5	Private investment	3
4	M	56	Married with children	University degree	Education	5
5	M	47	Married with children	Diploma	Social work	2
6	M	38	Married with children	University degree	Printing	6
7	M	32	Married with children	Illiterate	Driving	4
8	M	38	Married with children	Diploma	Social work	5
9	F	42	Married with children	Teachers' certificate	Social work	4
10	F	48	Married with children	Higher diploma	Administration	5
11	M	54	Married with children	Degree	Private business	4
12	M	32	Married with children	Form 3	Social work	3
13	F	33	Married with children	Medical nurse	Social work	4
14	M	59	Married with children	Illiterate	Contracting	8
15	M	35	Married with children	Degree	Contracting	5
16	M	46	Married with children	Literate	Culinary/Cooking	9
17	F	38	Married with children	Form 2	Skills Training	4
88	F	35	Married with children	Illiterate	Vegetable gardening	2
19	F	48	Married with children	Form 4	Petty trade	3
20	ORG	5yrs	12 members	Literate & Illiterate	Public Utility	
BANDAJUMA						
21	F	45	Married with children	Illiterate	Vegetable gardening	6
22	F	39	Married with children	Literate	Palm oil & Guest house	5
23	F	38	Married with children	Illiterate	Petty trade	4
24	F	50	Married with children	Illiterate	Petty trade	4
25	F	32	Married with children	Literate	Petty trade	3
26	F	43	Married with children	Literate	Petty trade	2
27	F	34	Married with children	Literate	Petty trade	5
28	F	38	Married with children	Illiterate	Petty trade	4
29	M	42	Married with children	Literate	Farming	8
30	ORG	5yrs	15 members	Literate & Illiterate	Agriculture	
POTORU						
31	F	35	Married with children	Literate	Vegetable gardening	4
32	F	38	Married with children	Literate	Vegetable gardening	5
33	F	41	Married with children	Teachers' certificate	Vegetable gardening	4
34	F	26	Married with children	Illiterate	Fishing	3
35	F	32	Married with children	Literate	Petty trade	3
36	F	56	Married with children	Illiterate	Fishing	6
37	F	32	Married with children	Illiterate	Vegetable gardening	4
38	F	34	Married with children	Literate	Vegetable gardening	2
39	M	52	Married with children	Literate	Petty trade	5
40	F	41	Married with children	Illiterate	Petty trade	3
41	F	38	Married with children	Primary Education	Vegetable gardening	4
42	M	43	Married with children	Literate	Farming/Mining	10
43	M	47	Married with children	Arabic education	Farming	5
44	M	54	Married with children	Form 5	Trading	6
45	M	51	Married with children	HTC	Education	4
46	M	58	Married with children	Arabic education	Trading	5
47	F	41	Married with children	Illiterate	Palm Oil	5
48	M	42	Married with children	Arabic education	Farming	6
49	M	43	Married with children	University degree	Administration	5
50	Community Market			400 Traders	Public Utility	
ZIMMI						
51	F	42	Widow	Illiterate	Petty trade	7
52	F	32	Single	Form 4	Restaurant	5
53	F	40	Married with children	Medical nurse	Drugstore	4
54	F	37	Married with children	Form 3	Petty trade	3

NO	GENDER	AGE	MARITAL STATUS	EDUCATION	TYPE OF BUSINESS ACTIVITY	ACTIVE FAMILY MEMBERS
55	F	34	Married with children	Form 1	Petty trade	4
56	F	36	Married with children	Class 3	Petty trade	5
57	F	39	Married with children	Illiterate	Petty trade	4
58	F	32	Married with children	Primary education	Soap production	2
59	F	35	Married with children	Form 2	Petty trade	3
60	M	47	Married with children	Form 5	Trade	4
61	F	34	Married with children	Primary education	Petty trade	3
62	F	44	Married with children	Illiterate	Petty trade	4
63	M	57	Married with children	Arabic education	Trade	5
64	M	51	Married with children	HTC	Education	3
65	M	58	Married with children	Diploma	Culinary/Cooking	12
66	M	55	Married with children	Diploma	Social work	5
67	F	31	Married with children	Class 5	Petty trade	3
68	M	46	Married with children	Arabic education	Petty trade	7
69	Community Market			300 Traders	Public Utility	
70	Community Mosque			500 Members	Public Utility	
JENDEMA						
71	F	39	Married with children	Illiterate	Petty trade	4
72	M	46	Married with children	Arabic education	Petty trade	6
73	M	34	Married with children	Form 4	Petty trade	4
74	M	47	Married with children	Form 4	Social work	4
75	M	56	Married with children	Form 3	Petty trade	5
76	M	42	Married with children	Teachers' education	Social work	3
77	M	49	Married with children	Form 5	Social work	4
78	F	32	Single	Primary education	Petty trade	3
79	M	50	Married with children	Primary education	Trade	8
80	F	34	Married with children	Form 2	Petty trade	5
81	F	24	Single	Form 2	Petty trade	4
82	F	29	Married with children	Form 1	Petty trade	3
83	F	46	Married with children	Illiterate	Petty trade	4
84	F	49	Married with children	Illiterate	Petty trade	5
85	F	34	Married with children	Form 2	Petty trade	3
86	F	48	Married with children	Illiterate	Petty trade	4
87	Community Market			400 Traders	Public Utility	
88	Community Mosque			400 Members	Public Utility	
89	Community Group			200 Members	Public Utility	
90	Community Group			100 Members	Public Utility	
GBONDAPI						
91	F	30	Married with children	Form 1	Vegetable gardening	3
92	F	26	Married with children	Primary education	Petty trade	2
93	F	35	Married with children	Form 1	Trade	4
94	M	48	Married with children	Illiterate	Fishing and other	6
95	M	45	Married with children	Teachers' certificate	Farming	5
96	F	45	Married with children	Illiterate	Petty trade	4
97	F	44	Widow	Illiterate	Vegetable gardening	3
98	M	50	Married with children	Illiterate	Petty trade	4
99	Community Market			200 Traders	Public Utility	
100	Community Mosque			100 Members	Public Utility	

DIRECT INDIVIDUAL LOAN/PVC BENEFICIARIES 89

GENDER MALE = 37 FEMALE = 52
EDUCATION LITERATE = 47 ILLITERATE = 42
AGE < 40 = 41 > 40 = 48
AVERAGE HOUSEHOLD SIZE 4,7 PERSONS

DIRECT PVC PUBLIC UTILITY BENEFICIARIES 11

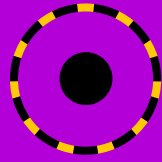
TOTAL DIRECT BENEFICIARIES 100

INDIRECT LOAN/PVC BENEFICIARIES (ACTIVE FAMILY MEMBERS) 414

INDIRECT PVC BENEFICIARIES (PUBLIC UTILITY MEMBERS) 2600

TOTAL INDIRECT BENEFICIARIES 3014

TOTAL BENEFICIARIES (DIRECT + INDIRECT) 3114



THIS CANNOT BE!

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