



Millennium Villages

# Harvests of Development in Rural Africa

The Millennium Villages  
After Three Years

THE EARTH INSTITUTE  
COLUMBIA UNIVERSITY

Millennium  
 Promise  
Extreme Poverty Ends Here

## ACKNOWLEDGEMENTS

The Millennium Villages Project is anchored in a global collaboration network that spans half a million village community members, local and national governments across Africa, and an array of international partners. An extraordinary network of talented African scientific, technical, and programmatic professionals guide implementation across 10 sub-Saharan African countries, including in two regional MDG centers, the Center for National Health Development in Ethiopia, and Millennium Development Ethiopia. They work in close day-to-day collaboration with complementary teams based in New York. The MVP Monitoring and Evaluation team, including Earth Institute staff and colleagues in the sites, makes crucial information available for the Project to identify adaptations in program design on an ongoing basis. The same team led the preparation of this report.

The project's corporate, scientific, philanthropic, and multilateral partners contribute a broad range of resources and strengths. We are grateful to all our partners for their great generosity of resources, technologies, advice, and insights, all of which are critical for the success of this effort. The project's core partners are the Earth Institute at

Columbia University, Millennium Promise Alliance, and the United Nations Development Program. We thank the Governments of Japan and Korea for their direct support to village sites presented in this report, and the Governments of Norway and Portugal for their partnership in supporting the expansion of Millennium Villages to additional countries. We also give special thanks to the Soros network of foundations for enormous generosity, advice, and support in all aspects of this project.

The communities in the Millennium Villages merit particular gratitude for their steadfast contributions to the project, including patience and cooperation with surveying efforts that enable measures of progress to be presented in this report. This report is dedicated to the residents of the Millennium Villages, and to the hundreds of millions of people living in, and working hard to escape from, similar conditions of extreme poverty. We are confident that extreme poverty can be ended in our time, and believe that the Millennium Villages can help to provide poor communities with ideas and tools for success in their valiant efforts.

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# Executive Summary



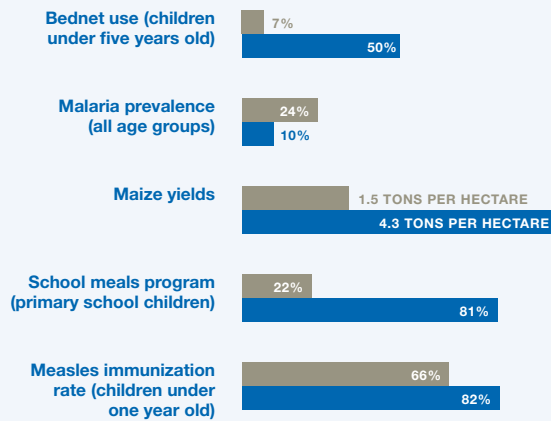
At the UN Millennium Summit in September 2000, world leaders adopted the Millennium Declaration, committing nations to a new global partnership to reduce extreme poverty and address pressing challenges of hunger, gender inequality, illiteracy, and disease. The year 2015 has been affirmed as the deadline for reaching these Millennium Development Goal (MDG) targets.

The Millennium Villages Project was piloted in Kenya and Ethiopia in 2005 and then launched at scale in 2006 to reach nearly half a million people across ten countries. The goal is to show how an integrated approach to community-level development can translate the international MDG agreements into ground-level breakthroughs throughout rural sub-Saharan Africa. Villages are located in deeply impoverished rural areas that were considered hunger hotspots—with at least 20% of children malnourished. Sites were selected to reflect a diversity of agro-ecological zones, representing a range of challenges to income, food production, disease ecology, infrastructure, and health system development. The projects are locally led by host communities and governments, which receive support from the Earth Institute at Columbia University, Millennium Promise, and the United Nations Development Program (UNDP), in addition to an array of other key partners.

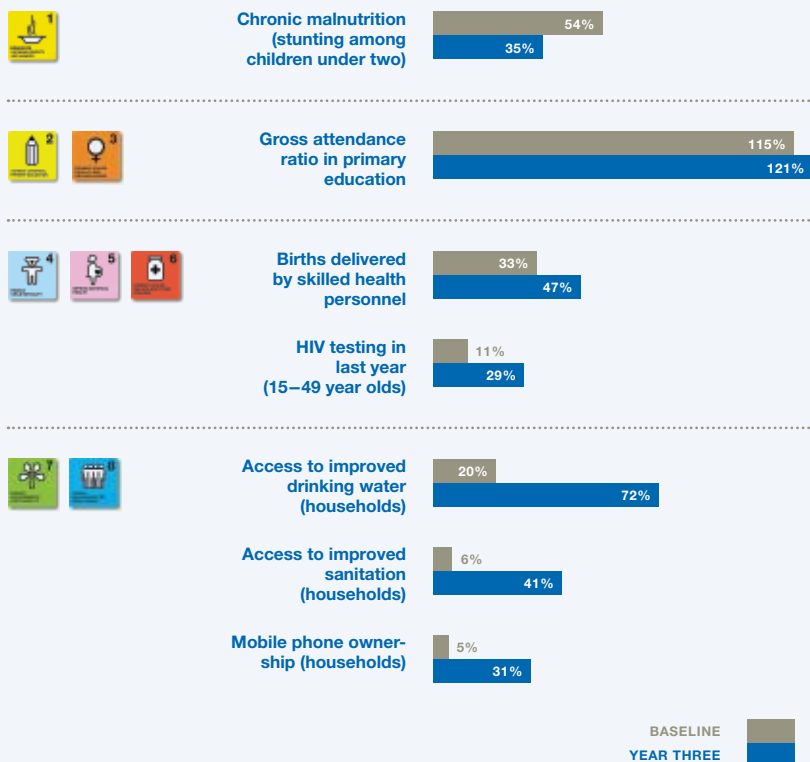
The Millennium Villages Project is a ten-year initiative spanning two five-year phases. The first phase focuses on achieving quick wins, especially in staple crop production and disease control, and on establishing basic systems for integrated rural development that help communities escape the poverty trap and achieve the MDGs. The Project involves the coordinated community-led delivery of a locally tailored package of scientifically proven interventions for agriculture, education, health, and infrastructure. Over the first five-year phase, interventions are delivered at a modest cost, totaling approximately \$120 per capita per year, of which MVP brings about half to complement funds from the host government, the local community, and other partners. The second five-year phase will focus more intensively on commercializing the gains in agriculture and continuing to improve local service delivery systems in a manner that best supports local scale-up.

# Average MDG Progress Across Five MV Sites

## AVERAGE QUICK WIN PROGRESS



## AVERAGE PROGRESS ON OTHER KEY MDG INDICATORS





## Progress to Date

The Millennium Villages are underpinned by a robust monitoring and evaluation platform. Detailed socio-economic and health surveys, including biological and anthropometric measurements, and biophysical data on crop yields, take place at Project initiation and are repeated after three and five years of program exposure. An economic costing study measures the contributions of Project partners to all cluster-level activities. Finally, qualitative process evaluation systematically documents the experience of implementers, Project partners, and beneficiaries.

This report highlights the early results after three years of implementation across five initial Millennium Village sites in Ghana, Kenya, Malawi, Nigeria, and Uganda. Progress toward achieving the MDGs are derived from recently completed mid-term (year three) surveys. All data contained in this report compare baseline values to year-three assessments, among a sample of several hundred households across each cluster. A summary of these findings is presented in this report. A more detailed description of the overall evaluation methodology is provided in the Appendix.

Further scientific results, including comparisons with other villages, will be published later this year, including in peer-reviewed scientific literature. We therefore emphasize the provisional nature of the results presented here, both in the sense that they are after only the third year of a ten-year project, and in that they represent only part of the third-year evaluation underway this year. We are presenting these partial results now in order to foster a better public understanding of the Project and its potential to help reduce extreme poverty, hunger, and disease in rural Africa. We hope that this report contributes to the public discussion in the lead-up to the MDG Summit in September 2010.



## Program Impacts

One of the first interventions introduced was the provision of long-lasting insecticidal bednets (LLINs) for every sleeping site. Three years later, there is a seven-fold increase in bednet utilization rates and a 60% reduction in malaria prevalence on average across the sites. Levels of measles immunization, an intervention that can be delivered through coordinated campaigns, have increased to over 80%. In agriculture, input support for improved seeds and fertilizers accompanied by training of farmers in agronomic techniques has resulted in well over a doubling of staple crop yields. This has contributed to a 35% reduction in levels of chronic undernutrition (stunting) among children under two years old (those conceived since the start of the Project). Through partnerships with communities and local farmers, who donate a portion of their crop surplus, 80% of children now receive a school meal—an intervention linked to increased school attendance and better learning outcomes.

Alongside supporting quick wins, the Project initiated parallel efforts to improve access to basic infrastructure and services. In education, classrooms were renovated, schools were electrified, and the supply of learning materials was increased. Levels of gross primary school enrolment were maintained at high levels.

In health, clinics were built or refurbished, and supplied with appropriate levels of staff and equipment including essential drugs, water, and electricity. Free primary health care at the point of service has been the cornerstone of the Project, to remove access barriers for patients. Local hospitals were strengthened to support emergency referrals and obstetric services—a process enhanced by access to emergency transport, road improvements, and critical partnerships to expand mobile phone coverage. Some of these longer term effects are beginning to show—as evidenced by a threefold increase in HIV testing rates and a 30% increase in women giving birth in the presence of skilled birth attendants—an important intervention for reducing the number of maternal deaths.

Finally, through partnerships between the government, local communities, and the Project, major gains have been made in improving access to basic infrastructure—including more than a threefold increase in access to safe water and a sevenfold increase in access to high quality sanitation facilities.

## Next Steps

While encouraging evidence of solid progress has been made on a number of fronts, consolidating these gains and ensuring their durability will require effective coordination between Project partners in the final two years of the Project's first phase. In agriculture, this will entail efforts to enhance the diversity of crop production, increase market access, and extend the value chain through agro-processing and business development interventions. In education, efforts to enhance the enrolment of girl learners in some sites, improve school quality, and facilitate the transition to secondary school are a clear priority. In health, with basic infrastructure present in most sites, improving the continuum of care, extending intervention coverage to the household level through a community health worker program and linking all the components into a self-correcting system all remain a critical focus. The application of mobile phone-based technologies to generate real-time information on program performance will greatly enhance these efforts. Finally, ongoing efforts to complete major infrastructure projects while developing locally appropriate strategies for their ongoing maintenance remains a major priority.



The September 2010 UN MDG Summit heralds the final five-year push toward the 2015 deadline for achieving the MDGs. The experience highlighted in this report suggests that with political support, effective partnerships, and modest financial resources well within the bounds promised to Africa by the donor countries (though not yet delivered), villages across rural Africa can achieve the MDGs and escape the poverty trap. This report provides information on the range of sector strategies employed at these Millennium Village Project sites, as well as a more detailed description of site-specific progress, and barriers and facilitators to implementation. It is our hope that the early and still-provisional lessons drawn from this experience, even after just three years of a ten-year effort, will provide guidance to governments in scaling up their efforts to address extreme poverty in a holistic manner. We believe that the integrated, community-led, rural development approach described here, properly tailored to local conditions, marks a key strategy for ending extreme poverty and achieving the MDGs. ■



# UN Secretary-General Visits Malawi Millennium Village



On May 30, 2010, United Nations Secretary-General Ban Ki-moon spent time with pupils of Dindi School of Mwandama in Malawi. The Secretary-General made his first visit to a Millennium Village and expressed his optimism after seeing the progress made toward achieving the MDGs.

## SECRETARY-GENERAL'S REMARKS AT MWANDAMA MILLENNIUM VILLAGE

*Good morning, ladies and gentlemen, and also farewell.*

*As my visit to Malawi comes to a close, I would like to thank President Mutharika and the people of Malawi for their warm welcome and generous hospitality.*

*I depart with tremendous optimism for the future, in part because of what I have seen here.*

*This is a crucial time for African development. And this Millennium Village of Mwandama is in many ways a model for how to do it.*

*Five years ago, one of every three people in this village was not getting enough to eat. Most children did not go to school. Exposure to HIV/AIDS was dangerously high.*

*Today, I met with many of the people who live here. They told me their stories. I heard what life was like in the past, and how it is today.*

*The good news is that people's lives are far better. The vast majority of families now have enough food. I saw that for myself at the community Grain Bank. Thanks to new fertilizers and seeds, the area's small farmers produce a surplus of grain.*

*Mwandama has seen dramatic improvements in health and education. Bednets have been distributed to all households. Nearly everyone now has clean drinking water. Significantly more children go to school, including many more girls. Roughly 40% of vulnerable people now get tested for AIDS.*

*I saw many people using cell phones, and even solar-powered lights.*

*The key to these successes is strong leadership and good policy—specifically, well-integrated investments in education, health, agriculture and technology.*

*These programmes are all pragmatic, results-oriented and scaled to the real needs of real people. And this is only the beginning.*

*I congratulate the leadership of the village and the whole community—especially the women of Mwandama—for their hard work and their commitment to a better life for their children and for generations to come.*

*Today, I call on every country to look closely at this success. It is case study in what is possible, even in the poorest places in the world.*

*The message I want you to take away is this: we should support these ambitious strategies for meeting the MDGs. They work.*

*They offer real-world, real-people evidence that we can achieve the Millennium Goals—on schedule and with the resources world leaders have already committed to.*

*All we have to do is try.*

*Thank you.*

— United Nations Secretary-General Ban Ki-moon

Introduction



# Introduction



## I. Why Millennium Villages?

Achieving the Millennium Development Goals (MDGs) in sub-Saharan Africa requires integrated rural development as one core component of an overall economic development strategy. The other core components include progress in urban areas, in the rollout of national-scale infrastructure (highways, ports, rail, power), and in the voluntary reduction of fertility rates to slow runaway population growth. Rural development itself requires community-based investments that empower local leadership in priority sectors including agriculture, health, education, water, transport infrastructure, energy services, business development, and the environment. It also requires effective community-level institutions that are capable of implementing and sustaining these investments.

The Millennium Villages Project (MVP) is a partnership initiative designed to identify and scale-up solutions to the challenge of integrated rural development (IRD). The Project is divided into two five-year phases, the first of which began in 2006, following initial pilots in Kenya and Ethiopia.<sup>1</sup> The MVP is working with approximately half a million people living in communities across 14 sites (or “clusters”) in ten countries, with catchment areas reaching up to 70,000 people per site. The ten countries are Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, Senegal, Tanzania, and Uganda. Other countries are joining the project, but these are not yet fully integrated into the management structure of the first ten countries.

This report presents data from the first of the MV sites to complete their assessments following three years of MVP activities: Bonsaaso (Ghana), Sauri (Kenya), Mwandama (Malawi), Pampaida (Nigeria), and Ruhiiira (Uganda). Forthcoming reports will present data for the other sites, including comparison sites and sector-specific data that are being submitted for peer-reviewed scientific publication.

The MVP highlights the value and feasibility of integrated community-based investments, rather than the one-by-one investment strategies too often deployed in rural areas. Because of budgetary limitations, donors and NGOs too often search for a single “highest-impact” or magic-bullet initiative that will be most “cost effective”: girls’ education, safe water and sanitation, HIV/AIDS control, livestock support, and so forth. One, or maybe two, of these are commonly deployed in a village

1. The very first Millennium Village was initiated as a pilot in Sauri, Kenya in late 2004, with main interventions beginning in 2005. The second village in Koraro, Ethiopia was launched in 2005. In mid-2006, these sites were both expanded to full “clusters” of more than 50,000 people, and the Project was expanded to include clusters in eight other countries.

without the benefit of a more holistic strategy. The result, all too often, is the lack of sustainability of the individual investment, and the lack of an overall breakthrough out of extreme poverty. Such one- or two-dimensional strategies fail to reach threshold levels of community capital investment needed to break the poverty trap.

There are two reasons for an integrated investment strategy. First, for multiple objectives (health, nutrition, poverty, disease control, safe water, etc.) we need multiple tools (such as community-based clinics, diversified local food production, commercial farming, malaria control, piped water, etc.). Second, these multiple tools are synergistic. While each is of merit in supporting a main target, each also contributes to progress on several or all of the goals. Access to safe drinking water, for example, supports health and educational outcomes. Moreover, after decades in which many analysts declared integrated rural development to be unmanageable (and perhaps unnecessary), the MVP and other projects are showing how IRD can indeed be accomplished using the stronger technologies, policies, information systems, macroeconomic environments, and institutional capacities now available, compared with the much weaker tools and context 30 years ago, when the last wave of integrated rural development was pursued.



The MVP's early results have already helped to highlight, at the national and international policy levels, several of the key—and until recently, neglected—investments needed for successful rural transformation, including an African Green Revolution for higher agriculture productivity (mainly through improved inputs, diversification, agribusiness development, and agronomic practices); comprehensive malaria control (based on full coverage of all sleeping sites by long-lasting insecticidal bednets, improved case management, and deployment of community health workers); the expanded training and deployment of paid community health workers; the expansion of school meal programs using locally produced foods; and the creation of effective community-based institutions, such as a local MDG implementation team.

## II. The Millennium Villages Approach

The MV sites were identified based on some key criteria. First, all sites were located in hunger hotspots, defined as areas where more than 20% of children under the age of five were underweight for their age, as identified by the UN Millennium Project's Hunger Task Force. Second, the sites were selected to represent a cross-section of Africa's key agro-ecological zones and farming systems, since a central proposition of the initiative is that a green-revolution-style breakthrough in smallholder farm productivity is central to escaping the poverty trap throughout rural Africa. An African Green Revolution is indeed crucial for the dual purposes of tackling hunger and for kick-starting rural economic growth by raising productivity and rural incomes. Third, sites are located in countries where the national government is committed to partnering in the initiative and to the MDGs, more broadly.

In each location, pre-Project activities began with an extensive community- and government-level consultative process to identify the local needs and to agree on a basic partnership framework for initiating the Project locally. Once these pieces were in place, initial efforts focused on distribution-type quick win campaigns and on needed facilities construction, with a growing emphasis on major infrastructure and delivery systems over time. The basic sequence of activities of the first five-year phase is presented in Table 1.

## The Role of Finance and Investment

At a financial level, the scale-up of the MVP should be understood in the context of global MDG policies. The MVP focuses on low-cost technologies and is inexpensive on a per capita basis, but it is not free. It assumes predictable external donor support on the order of \$80–100 per person per year in rural areas, for a period of around a decade. This level of external support is sometimes misunderstood to be large, but it is in line with global commitments for scaled-up aid. The G8's 2005 Gleneagles promises, for example, would amount to around \$100 per African per year in aid as of 2010, and these commitments are premised on yet further increases through to 2015, including the EU's commitment to reach the international target of 0.7% of GDP in official development assistance. The proposed scaling up of community-based investments is also fully in line with the policy consensus spelled out in the UN Secretary General's MDG Africa Steering Group Report (July 2008), which has also been adopted by the African Union.

Millennium Village communities carry out integrated targeted investments in agriculture, health, education, infrastructure, and business development. In 2004, total investments were estimated to cost \$110 per villager per year, plus another \$10 per villager per year for establishing, training, and paying local staff to lead the village-based systems. This costing was based on the MDG needs assessment work of the UN Millennium Project, and addressed core activities for agriculture, education, health, infrastructure, environment, and gender equality, as shown in Figure 1. Thus, the total cost per village was budgeted at \$120 per person per year. As shown in Figure 2, half of that is mobilized directly through the MVP initiative, and the other half is to be mobilized through partners, including the community itself (\$10), the national government (\$30), and NGO partners (\$20). Given the trends in global inflation and adjustments in the US dollar value over the past five years, the total equivalent cost in 2010 USD might be scaled from \$120 to approximately \$160 per capita, although the MVP itself has continued to work within its own budget envelope, and preliminary assessments indicate that cluster-level expenditures to date have averaged less than \$120 per capita per year.

Importantly, village-level budgets are implemented in a flexible but coherent manner across sites. For example, community-based assessments and participatory planning processes helped some sites decide to place special priority on some



Table 1:  
MVP Phase I  
Intervention  
Timeline

	Year One	Year Two	Year Three	Year Four	Year Five
<b>Agriculture and Nutrition</b>					
Seed and fertilizer support	█	█	█	█	
Extension training and storage	█	█	█	█	
Crop diversification			█	█	█
<b>Education</b>					
School staffing	█	█	█		
Construction of classrooms and refurbishment		█	█	█	
School meals		█	█	█	█
<b>Health</b>					
Bednets, immunizations, vitamin A, deworming	█	█	█		
Clinic construction and staffing		█	█	█	
Referral hospitals		█	█	█	█
Community health workers			█	█	█
<b>Infrastructure</b>					
Water and sanitation		█	█	█	
Roads		█	█	█	
Grid infrastructure			█	█	█
<b>Business Development</b>					
Microfinance			█	█	█
Cooperative-based businesses				█	█

This figure shows an indicative general timeline for MVP interventions. In each site, the actual timing and composition of interventions is implemented to match local priorities and context.

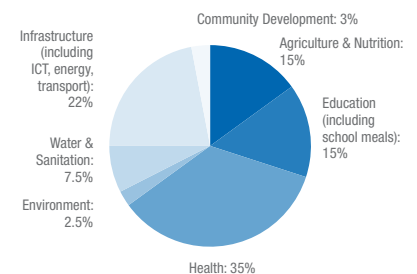


activities. And some sites decided to front-load agriculture budgets into the first few years, while some did not place as much early emphasis on supporting inputs for staple crops. Others sectors, especially those with larger infrastructure investments, are back-loaded in view of the time needed to carry out the larger projects. Other parts of the budget may be adjusted based on the pre-existing availability of services and estimated financial needs.

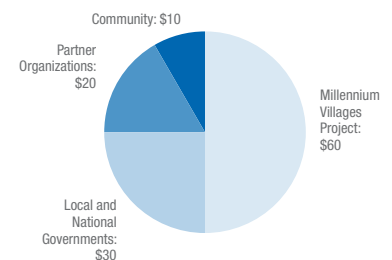
The guiding principle of the MVP budget framework does not imply a top-down set of fixed interventions across every community. Instead, it implies a basic approach to multi-sector budgeting that ensures communities have access to a minimum set of basic goods and services, including agricultural inputs, primary health services, functioning schools with school meals, clean drinking water, sanitation, and simple infrastructure. The agricultural investments support an increase in food production and a transformation from subsistence farming to commercial farming. The health interventions target child and maternal survival and the control of the major diseases, including HIV/AIDS, TB, malaria, and worm infections (neglected tropical diseases). The education interventions support universal primary school completion, improvements in school facilities, and the establishment of school meals programs. The infrastructure investments focus on electrification, feeder roads, and water and sanitation. All of these are areas in which national and international programs, if properly scaled-up as promised at the Monterrey International Conference on Financing for Development in 2002 and the G8 Gleneagles Summit in 2005, would support nation-wide investments at the levels envisaged in the MVP.

The MVP aims to spur broad scaling up of integrated rural investments for MDGs. This scale-up is only possible if the ODA promises come true. The MVP will be successful if it: (1) demonstrates the feasibility of integrated investments to achieve the MDGs in impoverished rural Africa; (2) helps to create new models for community-based delivery, monitoring, and measurement; (3) plays a constructive role in helping the global aid commitments come to pass by making the MVP lessons widely known within Africa and internationally; and (4) helps to encourage increased global public financial flows towards more practical and effective ground-level investments rather than to low quality aid.

**Figure 1: Budget Allocation by Sector**



**Figure 2: Financial Contributions from Key Stakeholders**



## Some Institutional Priorities

The MVs emphasize practical mechanisms to foster: (1) local leadership and community participation; (2) long-term institution building, including professional community-based management and staff; and (3) global multi-sector partnerships directly with the villages.

**Local Leadership and Participation.** All MVP teams are local. There are no expatriates on the ground in leadership positions. The Project assumes that the community itself, in concert with district government (i.e., the next higher level of political authority) and with civil society organizations, will take the lead in implementing and sustaining the integrated investment package. Community leadership is constituted by a management team that works together with community committees to promote and—as far as possible—to ensure full participation, community ownership, gender equity, and accountability at the community-level. For both the committees and the management teams, the MVP provides training in budgeting, leadership, gender awareness, and other areas.

**Long-term Institution Building.** The MVP emphasizes capacity building mainly through learning-by-doing and in-service training rather than off-site training. It also emphasizes institution building as part of the intervention delivery, rather than focus on “getting the institutions right” first and then service delivery afterward. The successes of the Project—increased food production, disease control, higher school attendance, and the like—demonstrate the possibility to achieve quick wins and to build (and strengthen) institutions along the way, rather than several years of preparation of institutions before the interventions begin.

The Millennium Village Project is emphasizing multiple types of long-term institution building at the local level, including:

- Formation of a *community-based, multi-sectoral management team*, with capacity to guide and implement integrated investments, as well as to lead community-based staff (in, for example, health, agriculture, and infrastructure). Many or most rural communities in Africa have some kind of participatory village committee, but very few have professional management teams. District officials are usually responsible for management functions within the villages, but this leaves a crucial capacity gap at the community level. The MVP community management team solves the “last mile” problem of investment design and implementation. The project recommends “professionalization” of community-based expertise, for example by putting community health workers on a proper payroll and in-service training program.
- Formation of *producer organizations*, notably including *farmers’ associations and farmers’ cooperatives*. One goal is for each cluster to have its own farmers’ association (or cooperative) that will carry out functions including: financing and procuring inputs (fertilizer, improved seeds); storing harvests in safe locations; marketing village farm outputs; diversifying agricultural and agribusiness production; and





establishing market linkages between the communities and the local, national, and international markets. Some sites have already enjoyed tremendous success in this area.

- Introduction or spread of *microfinance institutions*, including both saving and lending operations. Microfinance institutions can only play their full, dynamic role in helping to commercialize and monetize the gains from agriculture after initial success in increasing harvests. The goal is to connect each household with a microfinance institution, especially to encourage saving accounts and lending for small-scale business startups.

**Global Multi-Sector Partnerships for Development.** The MVP has fostered a global network of expertise in science, policy, and implementation that connects day-to-day problem solving across businesses, universities, international agencies, national governments, local governments, private philanthropies, non-profit organizations, and individual community leaders. The focus on problem solving leverages the respective strengths of each constituency in a coherent, practical, and action-oriented framework to advance the achievement of the MDGs in Africa.

The partnership embraces three sectors with global reach: business and civil society (including NGO leadership, foundations, philanthropies, and individual volunteers), the scientific community, and the policy community. These three global sectors are mobilized through the teamwork of Millennium Promise, which has principal leadership vis-à-vis business and civil society; the Earth Institute, with its network of scientific expertise; and the UN Development Program, with its partnerships throughout the international agencies. Bolstered by new and emerging technologies for information connectivity, this network is evolving into a new and unique form of outcome-oriented global partnership for development.

### III. Scaling Up and Integration into National Strategies

The MVP started in 2006 at a modest scale of less than half a million people in order to demonstrate success. Meanwhile, some observers question the limited scale of the project. We agree that the MVP should be scaled up, in line with the wishes of most of the host country governments. The limiting factor is not design or human resources, but donor financing. We believe that official bilateral and multi-lateral donors should respond to the call of many governments for scaling up the MVP in their respective countries.

To achieve the MDGs and the escape from extreme poverty, each rural community in rural Africa will need functioning clinics, schools, safe water points and sanitation, agricultural upgrading, and roads and power. This objective might seem impossible at first glance, but the experience from the MVP suggests that it is feasible with focused and scaled effort, and many governments are eager to pursue just that course of action.

The Millennium Villages have indeed prompted several countries to initiate both sector-specific scale-ups—for example, in agriculture and health—and integrated ru-



ral scale-up initiatives. The MVP has also contributed, directly and indirectly, to several global initiatives, such as the mass distribution of insecticide-treated bednets in malaria zones; the rapid scale up of community health workers; and the new Global Agriculture and Food Security Program (GAESP) established at the World Bank to support smallholder farmers.

In September 2009, President Bingu wa Mutharika of Malawi, current Chairman of the African Union, stated: “It is important that the MVP should be included in every country’s national development agenda.” Similarly positive statements on the MVP’s powerful evidence for community-led development were included in a recent report by the African Union Commission, the African Development Bank, the UN Economic Commission for Africa, and the UNDP, entitled “African Common Position on the Millennium Development Goals: Mid-term Review of Progress Towards the MDGs.”

Multiple countries have started to pursue this course. In 2008, Malian President Amadou Toumani Touré presented a plan to scale up a Millennium Village-inspired approach to 2.5 million people living in Mali’s 166 most food insecure *communes*, with roughly half of the cost to be financed domestically and the remainder through official development assistance. The Malian Foreign Minister presented this plan at the United Nations in September 2009. In Nigeria, the government has put forward a strategy to scale-up a Millennium Village-inspired program to reach more than 20 million people, with a focus on health, education, and agriculture. The initiative is to be entirely self-financed through the country’s debt relief savings account.

Other MV program countries are in the process of identifying their own scale-up processes. In Ghana, an advisory board of senior government officials from the national government and the regional government was launched in October 2009 to advise on implementation of the Project and plans for scale-up, starting in the Amansie West District. In Senegal, the Office of the President has put forward a proposal to scale up Millennium Villages to other parts of the country, starting in the northern region. In Ethiopia, several members of the federal cabinet joined MV project leadership for a July 2009 retreat to discuss opportunities for scaling the program to other regions in the country.

Interest is also strong well beyond the first 10 MVP countries. Governments in Benin, Cameroon, Liberia, Madagascar, and Mozambique have initiated their own MV programs. The MVP has also received requests from many other countries in Africa and beyond: Burkina Faso, Chad, Central African Republic, Comoros, Congo Brazzaville, Cote d’Ivoire, the Democratic Republic of Congo, The Gambia, Guinea, Haiti, Mauritania, Niger, Papua New Guinea, Sierra Leone, Togo, and Zambia. This waiting list results from the lack of adequate donor support to scale up the Project in line with the incoming requests. Fortunately, a growing number of public and private donors are prepared to back the expansion of the Project, though by far not enough to meet the burgeoning demand.





#### IV. Next Steps

The MVP has hit on a crucial and too-often-neglected part of successful development: community-based and community-led integrated rural development, with a simultaneous focus on agriculture, health, education, gender equality, infrastructure, and business development. The initiative shows that targeted low-cost interventions are effective, and that community-based teams can successfully implement a holistic package of interventions.

The data in this report show evidence only from the first three years and from a subset of sites. The data are therefore incomplete and preliminary, but we believe, helpful for the public discussion in the lead-up to the MDG Summit in September 2010. Much work remains to be done in the Millennium Villages—both in the completion of the first five-year phase, and in the transition to the second five-year phase. The MVP has highlighted the feasibility of quick wins in areas like food production and disease control, while also underscoring the deeper viability of systems for community-based development. By mid-2011, the basic platform should be in place in the first 80 Millennium Villages to support both the transition to localized service delivery systems and a systematic approach to business development. A core goal of Phase II will be to ensure that all the MVs have achieved the MDGs by 2015, including the income targets, and are on a self-sustaining path of economic development, embedded in their respective national systems.

In view of the burgeoning demand for the Millennium Village approach, the early successes must now be backed by a long-term strategy, one that shows how those successes can be sustained and carried out effectively at district, regional, and national levels. Thus, a related MVP goal is for the extraordinary network of African MV Project staff to be fully leveraged to inform and advise on the broader scale-up efforts for integrated community-based development strategies around Africa. Their inspiring ingenuity and leadership has been the guiding force of the MVP's success to date, and it will continue to lead the next waves of success through to 2015 and beyond. ■

Millennium  
Villages Project  
Sector Strategies



# Agriculture and Business Development



Over the past four decades, per capita staple food crop production has increased steadily from one to three tons per hectare in most of the developing world. The exception is sub-Saharan Africa, where average cereal crop yields remain less than one ton per hectare (Hazell and Wood, 2008).

The Green Revolution has not yet reached Africa. The reasons include the absence of crop varieties that are appropriate for the continent's soil and climate, low adoption of improved crop varieties, and, most importantly, depleted soil fertility. For the last several decades, farmers have been removing soil nutrients through farming without replenishing them (Sanchez, 2002). At the root of the problem is the high cost of fertilizers and limited access to them. African farmers presently use only eight kilograms of fertilizer per hectare, compared to an average of 100 kilograms for all developing countries and 200 kilograms in many developed countries (Heisey and Norton, 2007). Transforming agricultural production is an essential first step for sub-Saharan Africa to feed its population and achieve the hunger MDG. The Millennium Villages (MVs) were selected to represent the range of sub-Saharan Africa's agroecological zones, climatic conditions, and farming systems. Together, they provide a platform for localizing and accelerating the African Green Revolution across the continent.

**Table 1: Characteristics of Farming in Select Millennium Villages at Baseline**

MV Site	Average area cropped per household (hectare)	Amount of Fertilizer used (kilograms Nitrogen per hectare)	% of households using improved seed
Sauri	0.6	<10	2
Bonsaaso	4.9	<10	0
Mwandama	1.0	<30	20
Pampaida	3.4	<30	2.3

**Figure 1: Agriculture Strategy in the MVP**



**QUICK WINS IN THE AGRICULTURE SECTOR**

- Reversing decline in soil fertility with subsidized mineral fertilizers
- Providing improved crop varieties appropriate for the location
- Empowering agricultural extension agents
- Establishing grain storage facilities

In the MVs, agriculture is the main source of household income. However, farmers generally practice subsistence agriculture on areas smaller than five hectares and even lower than one hectare. Prior to MVP interventions, few farmers applied mineral fertilizer, and average rates of use were less than 20 kilograms of nitrogen per hectare—far below recommended rates of 80–100 kilograms. Improved crop varieties were used by fewer than 10% of farmers. Post-harvest losses were as high as 50% due to pests and improper storage. As a result, net crop yields were low, averaging 1.5 tons per hectare in the five sites discussed in this report. This resulted in high levels of food insecurity and chronic hunger and malnutrition.

**Agriculture Strategy in the MVP**

Drawing from then Secretary-General Kofi Annan’s call for a uniquely African Green Revolution in 2004 (MDG Centre, 2004), the agricultural strategy of the Millennium Villages Project is founded on four pillars: (1) increasing sustainable agricultural crop production, (2) improving food and nutrition security, (3) farm diversification for income generation, and (4) underpinning sustainability by restoring and conserving the natural resource base. This strategy aimed to make progress on MDG 1, namely decreasing poverty and increasing food security.

The first years of the MVP (years 1–3) focused on increasing staple food crop production to increase food security. After that initial period, the strategy shifts toward crop diversification for better nutrition, including crops and livestock that provide foods rich in protein and micronutrients. Farmers in sub-Saharan Africa are unlikely to earn significant income from staple crops grown on small farms. Therefore, once food production has increased and begins to address food security, higher value cash crops are introduced, alongside adding value to the crops by local packaging and/or processing. This begins the transition to commercial agriculture. Finally, integrated soil fertility management practices that combine mineral and organic fertilizers and soil conservation techniques are promoted for long-term sustainable production.



### 1. INCREASED AND SUSTAINABLE CROP PRODUCTION

Subsidized fertilizers and improved seeds were provided to all farmers in the Millennium Villages to quickly and dramatically increase crop yields. Mineral fertilizers were applied at recommended rates, ranging from 50–100 kilograms of nitrogen and 5–20 kilograms of phosphorus per hectare. The MVP also facilitated access to locally adapted improved crop varieties, either hybrids or open-pollinated cultivars,

## Storage of Crop Surplus for Food Security, Food Safety, and Higher Incomes



Post-harvest crop losses can be as high as 50%, wiping out much of the yield increases from the subsidized inputs. These losses are due to many factors. For example, inadequate drying leads to molds, and the harmful aflatoxins contained in these molds infest maize, groundnuts, and other crops, destroying food quality. Also, pests, such as rodents and the large grain borer, can devour improperly stored cereal crops, eating through entire supplies in just months. Post-harvest management and storage can reduce these losses; additionally, by storing surplus harvests for

several months, farmers can sell crops at much higher prices than immediately after harvest when supplies are abundant and market prices are the lowest.

In Mwandama (Malawi), farmers were trained in the construction of raised cribs for drying their maize cobs. The cribs have adequate ventilation, and rodents can be easily seen. In Sauri (Kenya), farmers were trained in safe methods of dusting maize grain with pesticide to reduce attack by the large grain borer. This will protect maize for home

consumption after three months or longer. For longer periods of storage, farmers in Sauri were encouraged to use community cereal banks where surplus crops could be fumigated and stored properly. They also received guaranteed minimum prices for their grain. The cereal banks in Sauri store approximately 70 tons of maize and five tons of beans annually and sell at peak prices, often at twice the price immediately following harvest, and farmers received a dividend from the sales.

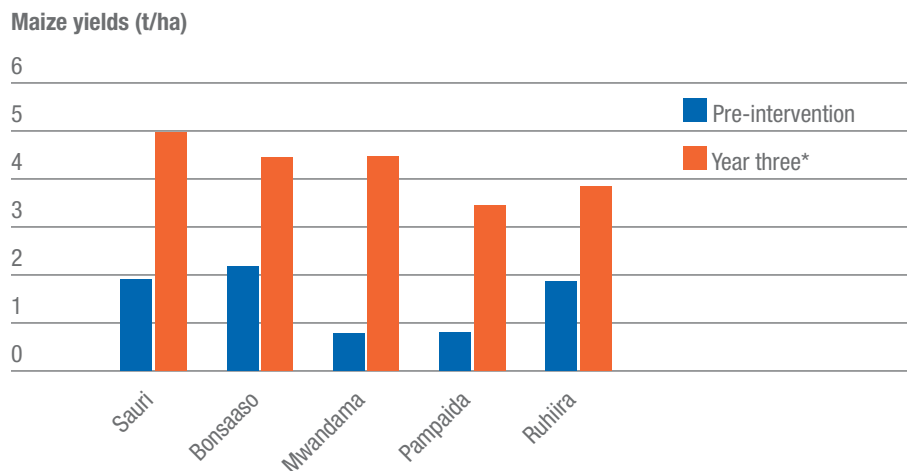
as determined through consultation with local extension services, national research institutes, and offices of the Consultative Group in International Agricultural Research (CGIAR). Inputs were subsidized to support a half or full hectare of cropland, depending on the site. Farmers signed contracts or received vouchers for input subsidies and, in turn, agreed to partially repay these inputs through in-kind payment to the school meals programs or to community grain banks. Soil management practices that incorporated organic inputs alongside soil conservation techniques were also introduced to sustain the initial increases in crop yields.



Training on best agronomic practices is essential to realize yield increases. Farmers received training from government agricultural extension officers based on agronomic best practices. These included early planting, plant spacing, seed and fertilizer placement, harvest and storage methods, and small-scale water management. Local agricultural extension agents were empowered with refresher training and transport as required.

Storage and post-harvest management guarantees food for the family between harvests. It protects increased crop yields from substantial losses due to water and pests and gives farmers the option to sell crops several months after harvest when prices can be twice as high compared to immediately after harvest. Farmers were trained in various post-harvest management practices, including drying racks to allow complete drying and minimize contamination and construction of storage facilities that have good aeration and keep out rodents and other pests. Some MVs emphasized proper storage in households while others promoted community storage facilities (cereal banks) that are organized and run by community groups. Improved storage, whether through cereal banks or at the household level, has allowed farmers to organize and negotiate better prices for bulk sales of their crops.

**Figure 2: Crop Yields in Select MVs Before and After Introduction of Subsidized Fertilizers, Improved Crop Varieties, and Training on Best Agronomic Practices**



\* Year three data represents average yield level over three years of interventions. The Ruhira year three data only includes one year of yields during MVP interventions.



## Cocoa Production in Ghana: Training Farmers in Agronomic Practices and Providing Links to Markets



In Bonsaaso, Ghana, cocoa production was low because plantations were old and neglected and links to markets were poor. The local MVP management team helped the community gain access to high-yielding planting material from the Ghana Cocoa Board. Cocoa farmers in Bonsaaso have planted over two million hybrid cocoa seedlings since

2007. In addition, farmer field schools were established in which 560 cocoa farmers (300 men and 260 women) were trained in improved management techniques (e.g., shade management, pruning, disease management, and harvesting). More than 3,000 hectares of land under cocoa cultivation have been rehabilitated, increasing

production by 53%. These productivity increases have had a direct impact on farmers' incomes, generating additional income among the 3,700 cocoa producers.

Over the first three years, results across the five MVs show, on average, a doubling or even tripling of crop yields where maize is a main staple crop. The increased yields provided sufficient calories for increasing food security. In addition to providing food for home consumption, these staple crops were also profitable with value-to-cost ratios of two or higher, particularly when sold at peak prices after three to six months in storage.

### 2. FOOD AND NUTRITION SECURITY

Crop diversification with nutritious crops is key to promoting consumption of foods rich in protein and micronutrients. Within the MVs, extension agents introduced crop diversification through demonstrations and training at school and home gardens. The major food products introduced have been African green leafy vegetables that are rich in Vitamin C and iron, orange-fleshed sweet potatoes that are high in Vitamin A, grain legumes, dairy products, and poultry that are high in protein. These efforts were accompanied by nutrition education on food preparation and storage methods that optimize food quality.

Across the five sites, farmers are growing new crops with high nutritional value. For example, the orange-fleshed sweet potato has been introduced to 200 farmers in Mwandama (Malawi), 556 farmers in Ruhira (Uganda), and 400 farmer in Sauri (Kenya). Regarding grain legumes, soybeans were introduced to 1,251 farmers in Ruhira (Uganda) and 544 farmers in Pampaida (Nigeria), and cowpeas were introduced to 440 farmers in Bonsaaso (Ghana).

### 3. FARM DIVERSIFICATION AND INCOME GENERATION

Crop diversification to cash crops was introduced to support the transition from subsistence farming to commercial agriculture. This process begins through market studies to determine the appropriate crops, taking into consideration factors such as climate and soils, profitability, and market demand—locally, nationally, and regionally. This market study was a critical dimension of the MVP and, if not conducted thoroughly, could lead to promoting crops with limited market potential that do not provide sufficient returns to farmers. In some MVs, cash crops were already grown but production was low and links to markets were poor; in such cases, improving these existing crops was the entry point. Once a few key cash crops were determined, farmers were trained on the best agronomic practices for each crop.



Access to loans and savings was essential for farmers to make the needed investments for farm diversification into cash crops, such as irrigation and agro-processing equipment, and also to save the income generated through these activities. A few financial institutions are beginning to operate in rural areas and provide loans to small-scale farmers with little collateral. Linking farmers and farmer cooperatives to such institutions remains a key intervention in the transition to commercial farming.

It is crucial to address links to markets at the beginning of the diversification stage to ensure that communities can produce sufficient and good quality crops and receive favorable prices for such crops. Forming farmer cooperatives or producer groups has been an effective first step in this process.

Several MVs have already initiated activities, including introducing or rehabilitating high-value crops such as vegetables, fruits, spices, as well as dairy cows and goats, poultry, beekeeping, and fish farming. As examples, 1,500 households produce tomatoes for the local market in Mwandama (Malawi), and banana farmers in Ruhira (Uganda) were organized into producer groups and received almost twice the price for their bananas than when they sold as individuals; in Ghana, cocoa production and marketing has improved dramatically.



## Conclusions and Looking Ahead

The experience of the first three years of the MVP has brought a dramatic and quick doubling of staple crop yields, providing encouraging evidence that an African Green Revolution can be achieved. Maize has been successful across the five MVs discussed here. Looking ahead, programs for sustaining partial subsidies for basic agricultural inputs and providing access to rural financial institutions and credit are essential if these gains are to be maintained.

As Africa will depend on rain-fed agriculture for staple crop production for the foreseeable future, yields are subject to inter-annual rainfall variation as well as the negative effects of climate change. One crop failure can wipe out the gains made in a few short years. Interventions that build resilience and reduce risk must be implemented—from small-scale water management initiatives, to drip irrigation for high value crops, to crop insurance programs.

While overall increased yields achieved through the MVP agriculture strategy produce sufficient food to meet the basic caloric requirements, this does not necessarily mean that all people and all households are food secure. Pockets of vulnerability remain, as many households have insufficient land, labor, or rights to implement these agricultural innovations. Such households must be identified, and safety nets must be put into place to ensure that their basic needs are met. ■

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# Education



The second MDG aims at universal primary education for both boys and girls. In addition, the MDG on gender equality—MDG 3—proposes to eliminate gender disparities in primary and secondary schooling. Countries in sub-Saharan Africa have experienced important progress in primary school participation, as witnessed by the increase in net enrollment rates (NER) from 56% to 73% between 1999 and 2007 (UNESCO 2010). There have also been major strides toward greater gender parity in primary education. These improvements are partly a result of the abolition of primary school fees and the push toward universal access, which has taken place in a number of countries—including Uganda, Ghana, Kenya, Malawi, Tanzania, Zambia, Mozambique, and Ethiopia—over the last two decades.

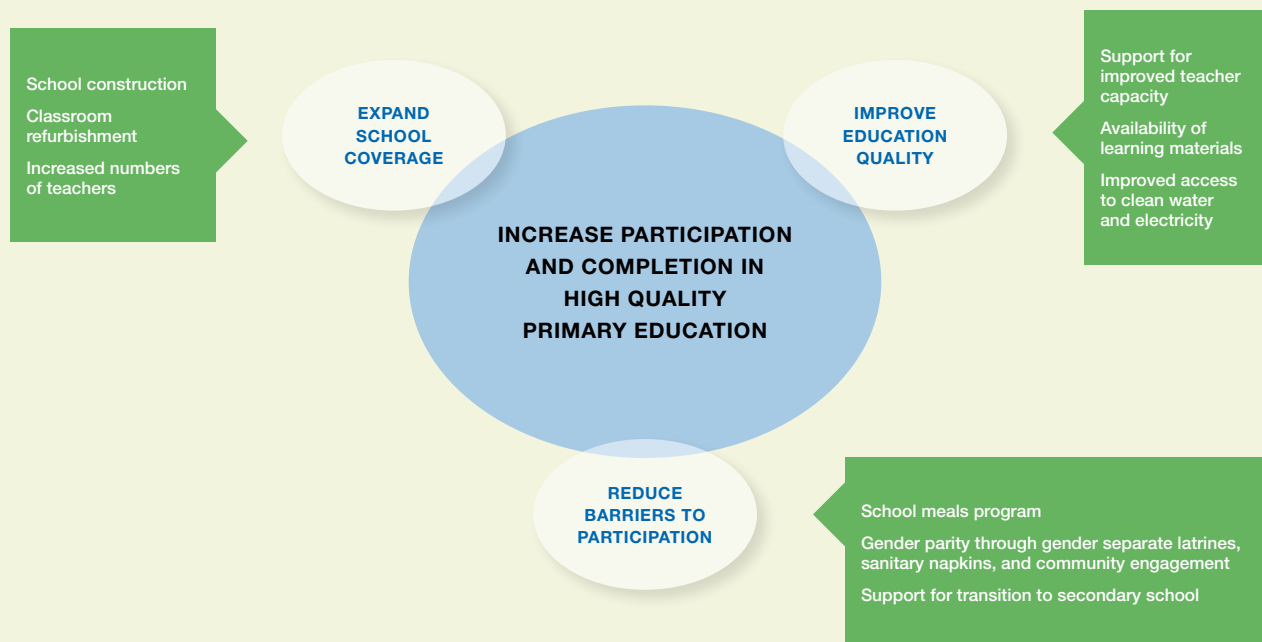
Against this backdrop of progress, a number of challenges remain in sub-Saharan Africa. In 2007, 25% of primary school age children were not enrolled in school. It is estimated that, among children not in school, one in three enrolls at an age older than the official entrance age for primary school, and the other two never enroll. Moreover, the gender gap among children who fail to enroll is striking—nearly twice as many girls will never enroll in school as compared to boys. Finally, quality of education is a serious concern. According to recent estimates, between 50% to 70% of sixth grade students had not acquired basic math skills, and high levels of illiteracy persist among adults who spent several years in school (UNESCO 2010).

In the MVPs, overall rates of primary school participation are relatively high, with some disparities across regions. MVPs in West Africa, for example, have particularly low enrollment levels. Net attendance ratios, which measure attendance among students in the level appropriate for their age group, tell a more nuanced story: on average, approximately two-thirds of the primary-school aged children in the MVPs were enrolled in school before the MVP, with the number of out-of-school children varying from approximately 20% in Bonsaaso (Ghana) or Sauri (Kenya) to close to 50% in Pampaida (Nigeria).

## Education Strategy in the MVP

The Project's main goal in the education sector is to work with local, national, and international partners to increase access to a full course of quality primary education for all children. In addition to enrollment, a critical objective is retention—namely ensuring that students progress through school and complete the final grade. During the first three years, the MVP worked with government and communities to address

**Figure 1: Education Strategy in the MVP**



the supply of and demand for education through the expansion of school coverage, the introduction of a school meals program, the removal of social and economic barriers to school participation, and improving the quality of education offered.

### 1. EXPANDING SCHOOL COVERAGE

During the first phase of the Project, the education sector focused on rehabilitating existing school infrastructure and constructing new classrooms to ensure schools were a safe walking distance from pupils' homes. Since 2006, in the five MVs discussed in this report, approximately 20 new primary schools have been built (representing a 20% increase in school coverage). There have also been dramatic increases in schooling coverage in some of the MVs, such as in Mwandama (Malawi) and Ruhiira (Uganda), where enrollment has nearly tripled, or in Pampaida (Nigeria), where the total number of children enrolled in 2009 is nine times greater than pre-MVP levels in 2006. Of note, this data are derived from school records and capture enrollment across the entire MV clusters, rather than the more limited sample of children from households undergoing surveys.

Many schools, especially those in rural areas, suffer major staff shortages. Attracting and retaining well-qualified professionals requires incentives, such as safe and affordable housing arrangements. In addition to increasing the number of students enrolled in school, the MVP simultaneously worked to improve teacher-to-pupil ratios. Doing so in the face of rapidly increasing school participation has proven to be a challenge. In addition to increasing numbers of teachers, the Project has focused on incentives such as training opportunities, renovation and construction of teachers' houses, and staff rooms.

## **2. REDUCING BARRIERS TO SCHOOL PARTICIPATION AND RETENTION**

The MVP has worked with the community to undertake a number of interventions to reduce barriers to attendance and retention. For example, a school meals program offering a locally produced, farmer contributed, free, and nutritious midday meal for students, serves as an incentive for parents to send their children to school and helps alleviate short-term hunger of children and improve attention in classrooms. The program has seen tremendous success, with nearly all sites offering daily meals. Other interventions address the social and cultural barriers to girls' schooling—such as the lack of gender separate latrines—and support students' transition to secondary school. Sensitizing communities and parents on the value of girls' education and the advantage of postponing the age at which girls marry has been an important part of the MVP's work, as has improving access to post-primary education, especially for girls. Workshops for School Management Committees (SMCs) and Parent-Teacher Associations (PTAs) on gender-related issues have been conducted in many MVs, with the aim of increasing attendance and making schools safer for girls. In several MVs, sanitary towels have been distributed to girls to help ensure that they do not miss school during menstruation.

Finally, students have benefitted from secondary school scholarships, with a majority of the beneficiaries being girls. These scholarships provide support for food, school fees, accommodation, and educational materials, and have been instrumental in enabling students to successfully transition to secondary education and remain in school. Improving access to post-primary education remains a critical dimension of the next phase of interventions.

## **3. IMPROVING EDUCATION QUALITY**

The ability to retain children in school and ensure that they acquire the necessary skills and knowledge is strongly determined by the resources available to support the teaching and learning process. Schools without adequate classrooms, teachers, textbooks or learning materials will not be able to provide a supportive learning environment. Interventions have focused on training teachers, providing resources such as textbooks, and improving the school environment, such as providing access to clean water and electricity.

Significant efforts and resources have been directed to building the capacity of teachers and School Management Committees in the first three years of the Project. Teachers in schools in MV sites have received training in topics ranging from core curriculum

subjects such as mathematics and social sciences to workshops on teaching skills, innovative pedagogical approaches, methodologies for multi-classroom instruction, and use of computers for teaching and learning purposes. Refresher trainings for head teachers on school administration and management have also been conducted in many sites. Writing materials and textbooks in core subjects, such as English and French, mathematics, and social sciences, have been provided freely in the schools across the MVs.

MVP interventions to improve access to safe drinking water through boreholes and water tanks for rainwater harvesting have yielded promising results for education. Among other improvements, the availability of clean water in schools has made hand-washing programs possible and significantly improved sanitary conditions. The number of schools connected to the electricity grid is also increasing. Connection to solar panels or electricity grids provides light both during and after school hours, enabling the use of electronic devices, such as laboratory equipment, televisions, and computers, and allowing pupils to study on their own in the evenings.

## Conclusions and Looking Ahead

During the first three years of the MVP, education interventions have focused on expanding access to school as measured by enrollment and attendance. Over this period, the sector has engaged and partnered with communities to conduct needs assessments and identify areas of concern. The community has been actively involved in the construction of school infrastructure, provision of school meals, sensitization on school participation for girl learners, and in monitoring both pupils' and teachers' attendance. The education sector has also worked closely with other sectors within the MVP and developed strong partnerships with NGOs and local institutions working in the MV area.

Despite major achievements made across the MV sites within a relatively short time, serious challenges remain, including shortages of qualified teachers in some areas, as well as inadequate infrastructure to cope with the rapid increase in school participation. In the next phase of the Project, while continuing to sustain partnerships and improve availability of school infrastructure and learning materials, the education sector will focus on improving primary school quality, increasing rates of primary school completion, and improving enrollment in secondary schools. These aims will require continued emphasis on gender parity in school participation, as well as building the capacity of teachers through training and development, and implementing efficient monitoring and evaluation procedures to track teacher performance, project activities, and learning outcomes. ■

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### Source

UNESCO, *Education for All Global Monitoring Report 2010: Reaching the Marginalized*. 2010.



# Gender



The social and economic empowerment of women and girls is critical to achieving the MDGs and achieving sustainable development. The multiple burdens on women's time and labor, limited access to economic assets and to post-primary education opportunities, exposure to health risks, denial of women's property and inheritance rights, gender-based violence, limited political participation as well as high fertility rates oppress women and contribute to the poverty trap exhibited in developing countries.

In sub-Saharan Africa, significant gender disparities remain in many areas. Girls fall behind in enrollment in both primary and secondary school. Women work primarily in agricultural employment, with 64% of women's employment being done in agriculture work in sub-Saharan Africa. The region also has the lowest proportion of women among wage and salaried workers. In the MVPs, girls and women face the challenges seen across rural Africa.

## Gender Strategy in the MVP

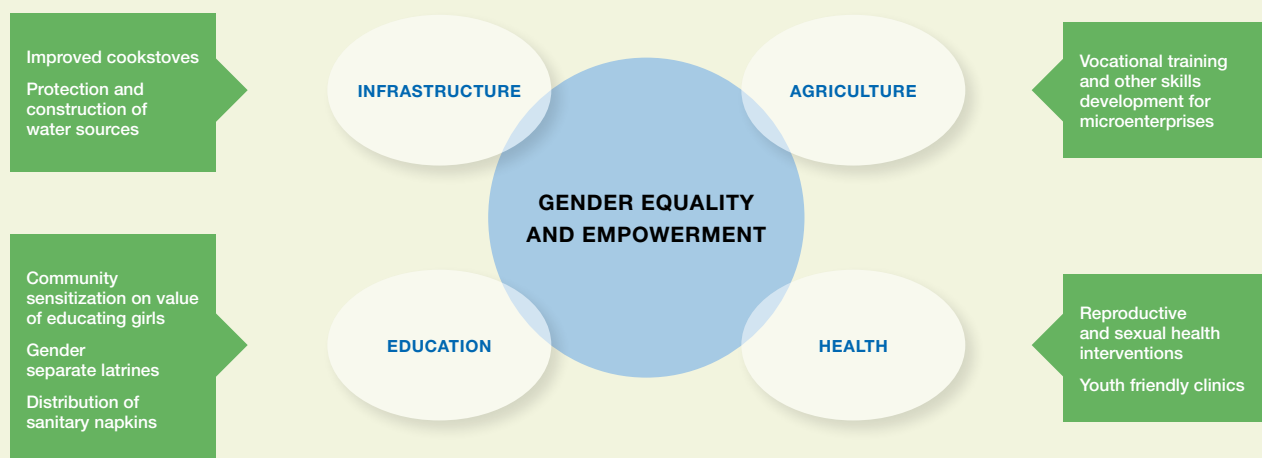
The MV gender strategy adopts a dual lens strategy, which intends to both mainstream gender into all sectors while also ensuring that attention is paid to gender specificities. Gender thus constitutes a cross-cutting sector, with both gender-specific initiatives and the mainstreaming of gender issues into sectoral interventions. All sectoral interventions are designed so women's and girl's interests are taken into account and promoted. The MVP gender dual lens approach advocates that sectoral interventions are systematically analyzed, monitored, evaluated, and revised in relation to their gender impacts.

### More specifically, gender activities in the MVP intend to:

- Ensure that women participate in agricultural income management starting at the household level
- Ensure that infrastructure interventions are sensitive to women's needs and priorities
- Create a comprehensive strategy to address gender-based violence in schools and at home
- Ensure active participation of women in all sectoral committees and meetings
- Develop a strategy to enable equitable access to health services



**Figure 1: Gender Strategy in the MVP**



### MAINSTREAMING GENDER INTO ALL SECTORS

In all MV sectors, women benefit from the interventions being implemented throughout the community. For example, all farmers, including female farmers, receive inputs to boost yields. Girls are also fed a daily meal at school. Closer proximity to water sources to households help women, who are often the ones bearing the brunt of fetching water from far distances. Women benefit from improved access to health-care through the refurbishment of clinics and increase in skilled health personnel. In all sectors, there are also interventions that target women and girls more specifically, with the goal to empower women and girls to overcome the challenges they face.

### GENDER IN THE AGRICULTURE AND BUSINESS DEVELOPMENT SECTORS

Economic empowerment strategies have been introduced to address the specific vulnerabilities faced by women. Adolescent girls and women are supported to engage in microenterprises through vocational training and training in other skills such as management and bookkeeping. As a result, women are increasingly venturing into small businesses. In Ruhira (Uganda), women are making artisanal crafts. In Sauri (Kenya), out-of-school adolescent girls formed a group that was trained in business management, visited with business mentors, developed business plans, and was connected with a revolving fund.

### GENDER IN THE EDUCATION SECTOR

The MVP aims to address the economic, social, and cultural barriers to girls' schooling. Early marriage and pregnancies often prohibit girls from attending schools. One of the main areas of work has been sensitizing communities and parents on the value of girls' education, with the aim of increasing attendance and retention. In some MVs where early marriage is common, the MV team has facilitated education with community and religious leaders on the disadvantages of early marriage.

In addition, interventions to increase retention of girls have been implemented across the MVs. This includes the construction of gender separate and safely located latrines

## Empowering Women through Agriculture: Women's Vegetable Gardens



Horticulture offers a unique opportunity to address gender inequality, as it is an activity practiced almost exclusively by women. Vegetable production occupies 70% of female labor in Tiby (Mali) and is a vital source of household income and nutrition. Prior to the MVP,

there were 13 vegetable gardens, involving 2,726 women, which were operated and managed by women's cooperative groups. However, there was little activity because unavailability of water was seriously limiting productivity, and the gardens were insufficiently protected from grazing animals. Women were drawing water from deep wells by hand with small buckets and carrying them over 100 meters. In addition, existing storage facilities were inadequate. Because of these challenges, only one of the gardens was used year round, and the women were discouraged about the gardens' potential.

The MVP rehabilitated the gardens: broken water pipes

were repaired, wells were equipped with motor pumps, irrigation canals were dug to deliver water to the vegetable plots, and fences were built to protect the crops. A horticulture technician was stationed at the garden to promote the use of the best gardening practices. Regular monitoring and technical training in seed production, planting, harvesting, and marketing strategies helped boost yields for household consumption, with surplus vegetables sold in local markets. The women were also helped to align their cultivation cycles with periods of high prices in the market. For example, using adapted seeds, watermelon will be grown during the hot season when this fruit is otherwise not

available in Mali, and tomatoes will be grown during the rainy season. These investments are aimed to create the social and economic systems within which the women can cooperate in productive enterprises, increasing the value of their products, and generating income for their villages. Most importantly, the women using the first garden that was renovated, which served as a model for other renovations, agreed to reimburse the investment, creating a future source of financing that will be used to upgrade the infrastructure, purchase improved seeds, and ensure sustainability.



in schools. A key program to support retention of girls in schools is the provision of sanitary napkins. Early assessments revealed that girls miss an average of three to five school days a month due to lack of protective materials to use during menstruation. In several MVs, local groups were trained in how to make reusable sanitary napkins, which were then distributed to girls, along with training and education around this activity. These included training for teachers distributing sanitary napkins and for peer educators who gave monthly training sessions on adolescence, menstruation, hygiene, and use of sanitary napkins.

Other education interventions are aimed at girls who have dropped out of school, did not pass the entrance examination for the final years of secondary school, or required support for their studies. In these situations, the MV team has supported girls to pursue vocational training and provided literacy classes and tutoring.

### **GENDER IN THE HEALTH SECTOR**

A key aspect of the MV health strategy is the provision of healthcare for women and mothers to support maternal and child health. This includes antenatal care, skilled birth attendants, post-natal checks, referral for emergency obstetric care, training and education on immediate and exclusive breastfeeding, and access to modern contraception. In several sites, notably Bonsaaso (Ghana) and Ruhiira (Uganda), there has been significant progress in these areas, with the number of births conducted by a skilled birth attendant increasing significantly.

Women and girls, community members, and health staff are provided with training on health issues affecting women and girls, such as sexual and reproductive health, HIV/AIDS, and gender-based violence. Health clinic staff and community health workers are also provided with relevant training. In a few sites, such as Sauri (Kenya), the health clinic runs youth friendly days, where adolescent girls are invited to health services. Sessions at the youth friendly clinics are also an avenue to provide a range of information to adolescents on topics such as drug abuse, relationships, nutrition, family planning, HIV/AIDS, and voluntary counseling and testing. Counseling, referrals, and treatment are also conducted during these sessions.



### **GENDER IN THE INFRASTRUCTURE SECTOR**

In rural Africa, girls and women are tasked with domestic activities including fetching water from streams and rivers and gathering firewood and other biomass for cooking. These activities demand extensive time and physical labor, leading girls to skip school or have less time for studying, and both girls and women have very little time for other productive activities.

As a result, several important infrastructure interventions have a gender component, including the distribution of improved cookstoves, which reduce the amount of fuelwood needed and the amount of indoor air pollutants inhaled. The Project is piloting improved cookstoves in some MVs, with plans to roll out the program in all sites. In addition, the protection of water sources is helping the communities make progress on improving access to clean water closer to households, thus reducing the distance that community members, primarily women and girls, travel to collect water.

### **Conclusions and Looking Ahead**

Several aspects of the MVP gender approach have been central to progress in promoting gender equality. This includes both the mainstreaming of gender considerations into MVP sector interventions as well as the participatory approaches utilized in planning and implementing these interventions. It is also clear that gender equality involves the entire community. Interventions cannot simply focus on women, but must also target a range of community members to ensure that these practices are embedded within communities. For example, community leaders must be encouraged to take leadership in facilitating girls' education. Gender sensitization programs should target boys and men so they respect girls and women. Looking forward, the MVP will continue to both mainstream gender into sector planning, implementation, and monitoring and also specifically target women and adolescent girls, empowering them and their families to reach their full potential. ■

# Health



The MDG framework has set ambitious targets for 2015 to improve maternal and child health and reduce avoidable death and disease from HIV/AIDS, tuberculosis (TB), and malaria. While many regions of the world are on track to meet these targets, gaps in progress remain in many low-income countries and in sub-Saharan Africa.

In sub-Saharan Africa, levels of maternal mortality are unacceptably high. Nearly one in 100 births result in the death of a mother—a situation largely unchanged from 1990. Rates of child death from pneumonia, diarrhea, malaria, malnutrition, and complications in births without skilled attendance are 20 times higher than in developed countries and continue to rise in many places (UNICEF 2008). Sub-Saharan Africa is home to two-thirds of global HIV infections, and the numbers of new TB cases, already the highest in the world, have doubled between 1990 and 2005 (UNAIDS 2008 and Chaisson and Martinson 2008). The continent also suffers from 350–500 million malaria cases each year, resulting in nearly one million avoidable child deaths (WHO 2009).

What these alarming figures conceal is that the majority of rural Africa's disease burden can be prevented or treated through the integrated delivery of simple, effective, proven, and low-cost interventions (Bhutta et al 2008).

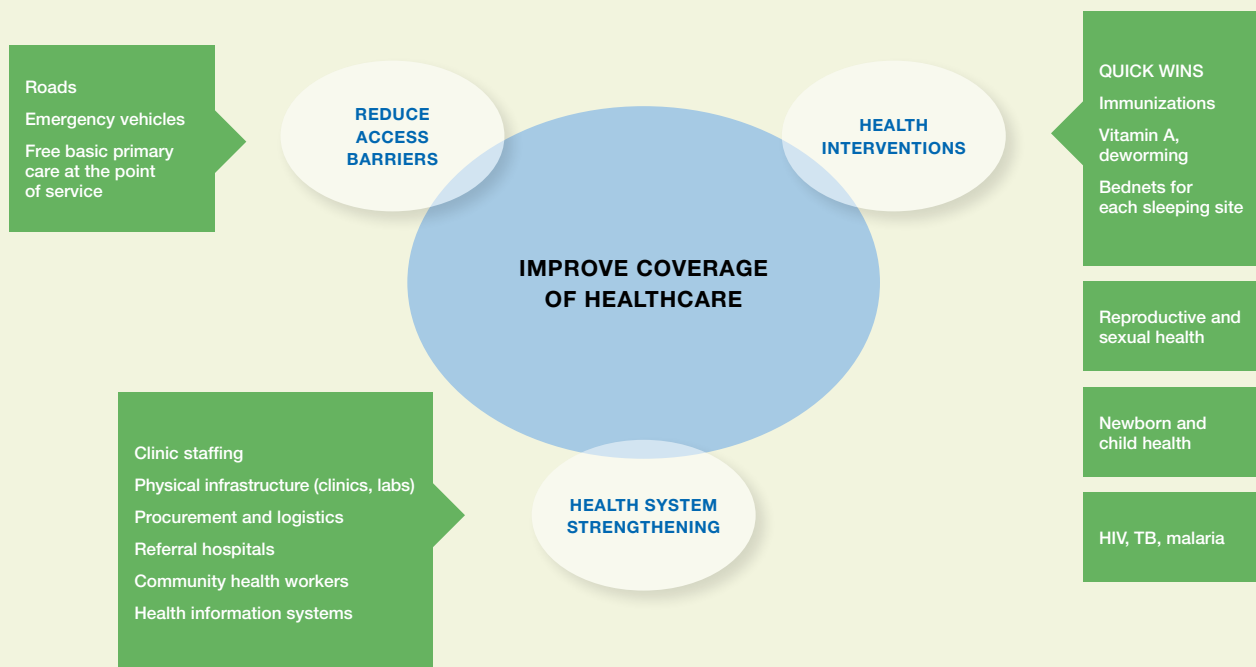
At the start of the Project, all MVPs faced major public health challenges and serious coverage gaps with essential interventions. Levels of chronic undernutrition among children under five approached 50% in the five sites detailed in this report. While three-quarters of women received some form of antenatal care during pregnancy, less than one of every three deliveries took place with a skilled health provider present. Women had an average of six children, and only 22% accessed modern contraception. Levels of HIV infection were as high as 12% in Malawi. Finally, an average of nearly one in four children had malaria parasites in their blood, with only 7% using bednets for protection.

## Health Strategy in the MVP

The health strategy is founded on the premise that sustainable health gains can only be achieved through an integrated model—where health sector interventions take place alongside efforts to increase food production, enhance education and economic opportunities, and improve access to clean water and basic infrastructure.

Within the health sector, the MVP works with national governments to achieve universal coverage with an evidence-based package of essential health interventions.

Figure 1: Health Strategy in the MVP



Intervention components, which are in line with national and World Health Organization guidelines, are implemented in an integrated manner to optimize coverage.

The first three years of implementation involved interventions to reduce access barriers, introduce quick wins, and extend intervention coverage to reach vulnerable households. These efforts were accompanied by the first steps of a longer-term agenda to strengthen health systems.

### 1. REDUCING ACCESS BARRIERS

In order to ensure full access to services, the MVP has introduced free basic primary health care at point of service. The MVP has also focused on improved transport systems (roads and ambulances) and communication to facilitate access to health services.

Of the ten countries where the MVP is operating, only Malawi and Uganda have free primary health care as a national policy. In Ghana and Rwanda, governments have tried to reduce fees for service payments with a range of insurance and *mutuelle* schemes. However, the costs to access such health systems are still prohibitively high. In Mali, due to the decentralization of the health care system, patients and their families bear almost all costs at the point of service.

To demonstrate the increase in utilization of health services and its impact, the Project negotiated with national governments of the ten countries in which it

**Figure 2: Summary of Core Health Interventions**

REPRODUCTIVE AND SEXUAL HEALTH	NEWBORN AND CHILD	HIV	TUBERCULOSIS	MALARIA
Four antenatal visits	Post-natal check in the first week of life	Comprehensive prevention activities	Case finding	Long-lasting insecticidal bednets for all sleeping sites
Antenatal iron, folic acid, tetanus toxoid	Immunization	Management of sexually transmitted diseases	Sputum smear microscopy	Rapid diagnostic tests at facilities and households
Skilled birth attendants	Twice yearly community deworming & vitamin A	Counseling and testing	Treatment with directly observed therapy	Indoor residual spraying
Post-natal checks	Malnutrition screening and management	Prevention of mother-to-child transmission	TB/HIV integration	Artemisinin-Combination Therapy at facility and households
Referral for emergency obstetric care	Diarrhea management with oral rehydration and zinc	Antiretrovirals		Intermittent presumptive treatment for malaria in pregnancy
Exclusive breastfeeding	Pneumonia management			
Access to modern contraception				

operates to abolish all clinic fees within the MVs. The resulting arrangement is that the costs of operations of a clinic, including medicines and maintenance, are covered through the combination of government inputs, MVP funding, and strategic partnerships with other partners, including international organizations and NGOs, with no costs passed on to community members. In Ghana, where there was a pre-existing insurance system, the Project supported a mass enrollment campaign to cover all MVP community members. The Project bore most of the cost of enrollment, with commitment from governments to honor insurance claims and to provide medicines and supplies in a timely manner. All MVs have vehicles and telephony for emergency consultations, such as injuries or deliveries, and for evacuation to referral hospitals for caesarian section.

## 2. HEALTH INTERVENTIONS

The Project has launched both quick win interventions—evidence-based interventions that can be rapidly taken to scale in communities to achieve high levels of coverage in a short time—and interventions that aim to strengthen health systems and support a comprehensive spectrum of essential services.

Among the quick wins, one of the Project’s first interventions was community-led mass distribution of free long-lasting insecticidal bednets (LLINs) to cover all sleeping sites to prevent malaria. This intervention was followed by other quick win community campaigns, such as vitamin A supplementation for children and community-wide deworming (albendazole) for children and adults. A single dose of albendazole dramatically reduces the burden of intestinal parasites. These campaigns are repeated every six months. In addition, the MVP facilitated access to governments’ expanded programs on immunizations. On average, malaria bednet usage rates have increased from 7% to 50%; levels of malaria parasitemia have been greatly reduced; and rates of measles immunization and children receiving vitamin A supplements now average between 80% and 90%.

## Free Care: Eliminating Financial Access Barriers at the Point of Service

Despite bearing 25% of the global disease burden, people in sub-Saharan Africa seek health services less than once every two years. A major reason for low clinic utilization is that poor households cannot afford even minimal user fees for clinic visits and medications, and the health insurance programs used in some countries are also inaccessible for families living in extreme poverty.

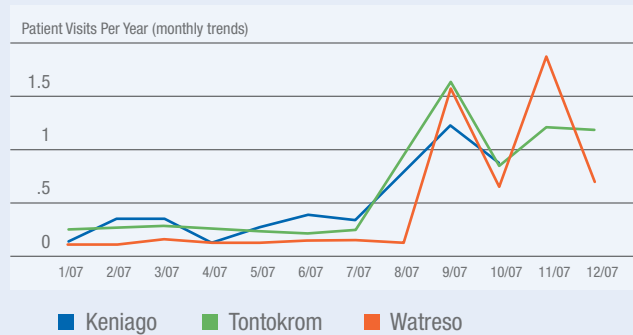
In Ghana, community members in the MVP area visited a health facility only 0.23 times per year (once every four years) before the initiation of MVP interventions. Furthermore, only a third of the population was registered for nationally provided health insurance because the enrollment fees amounted to almost 20% of annual income for over half the MV households and were, therefore, a barrier to access.

In July 2007, the Project began supporting three health centers in Bonsaaso to provide free health services. Use of these facilities subsequently increased sixfold in terms of patient numbers, and, in early 2008, the government requested the MVP to integrate its approach into the country's national health insurance program.

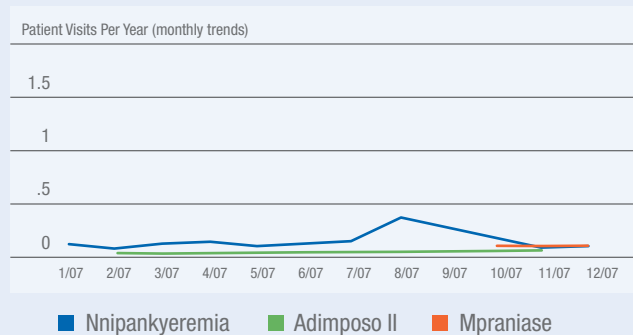
In partnership with local community leaders, the MVP has also introduced progressive subsidies for enrolling in the national health insurance program and has maintained free care at the point of service. The Project works with the Ministry of Health's district administration to assure steady supplies of drugs and essential items at points of service. As a result of these strategies, community members in Bonsaaso now visit a health facility an average of once a year—a fourfold increase in utilization.

### Utilization Rates from the MVP in Ghana and neighboring control facilities

#### Bonsaaso Cluster Health Facilities



#### Neighboring Health Facilities



### 3. STRENGTHENING HEALTH SYSTEMS

The basic building blocks of a health system involve establishing a network of well-staffed and adequately equipped health facilities. Strengthening systems includes providing support to governments for basic procurement of equipment and medications, creating links to referral hospitals for secondary care and laboratory services, establishing a network of professionalized community health workers to increase household-level coverage, and building an information system to chart progress and inform interventions.



In almost all MVs, clinic construction was the first systems building activity to be undertaken, as there was limited infrastructure to deliver quality services. The community provided land and labor, and the Project worked with local governments to determine the type and architectural plan for the structures. The MVP negotiated with ministries of health to post nurses, midwives, and other essential clinic staff. To maintain the staff in remote postings, the MVP has put in place a number of interventions, including hardship allowances, staff quarters, and responsive management, with additional training provided as needed.

Connections were established with the closest government delivery points for medicines, and a forecasting system was put in place to prevent stock-outs. If government medical stores did not stock a drug, the Project supported forging partnerships with private pharmacies, which provided supplies at a reduced rate. At the global level, partnerships with General Electric, Ericsson, and UNICEF facilitated equipping clinics with obstetrical equipment, telephony, and anthropometric tools. In addition, these partners helped provided referral facilities with comprehensive emergency obstetric care equipment.

To support emergency medical care, the transportation, infrastructure, and telephony systems were upgraded. The Project assured access to an emergency transport vehicle and worked through Ericsson and its service providers to bring mobile phone and Internet connectivity to all MVs. All clinics and community health workers (CHWs) have mobile phones to support referral, emergency care, and algorithm support as well as reporting of deaths and births.



## Quick Wins: Long-Lasting Insecticidal Bednets



Malaria is prevalent in all of the MVs, with the proportion of children with parasites in their blood reaching as high as 50% at baseline. One of the first MVP interventions was the distribution of free long-lasting insecticidal bednets (LLINs) to cover all sleeping sites, with an average of one bednet for every two people.

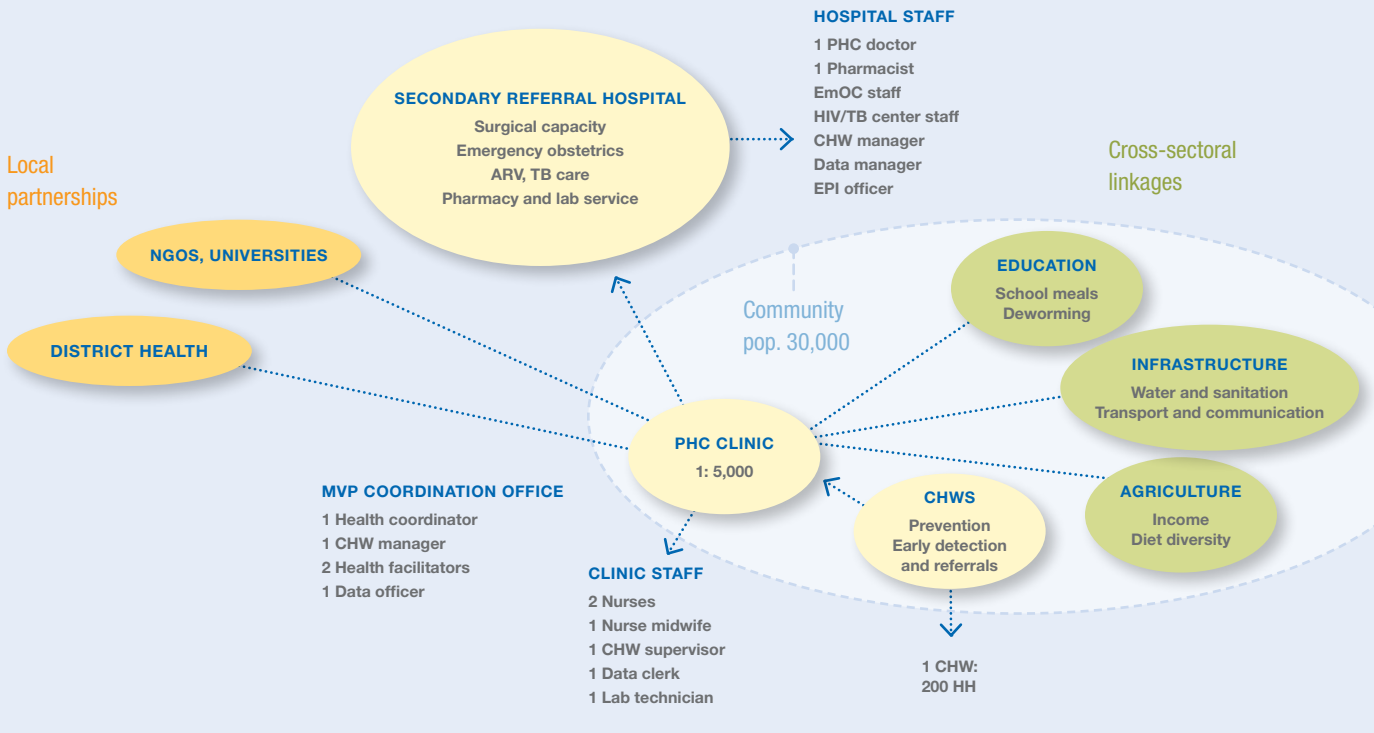
As the *Anopheles* mosquitoes that transmit malaria bite at night, LLINs are an important intervention to interrupt

transmission. These bednets have insecticide incorporated into their fibers during the manufacturing process, which remains active for about five years without needing chemical retreatment. LLINs, which cost \$5 each, can cover a sleeping site for two people, and can last for five years. The nets create a mechanical barrier to biting while also repelling and killing mosquitoes.

Three years into the MVP, the results have been dramatic.

Levels of bednet use by children range between 34% and 62%. In Sauri (Kenya), parasite prevalence in the population has decreased from 50% to 8%. In Ruhiira (Uganda), levels of malaria parasitemia are approaching zero, from a level of 17% prior to MVP interventions.

Figure 3: Building Blocks for a Model Primary Health System



Finally, the Project supported establishing a network of paid professional CHWs in all sites. CHWs are an essential bridge to extend the reach of health services to vulnerable households. CHWs provide household-level services at a ratio of one CHW per 200 households. CHWs are supervised and linked to the local clinic and supported by mobile telephony for urgent calls and to a clinical expert system through a platform called ChildCount+. This is an mHealth-based community health events registry and alert system aimed at routine monitoring of pregnant women, newborns, and children under five, supporting early detection, referral, and treatment of diarrhea, malaria, and fever, with immediate referral for a list of danger signs.

There are functioning, staffed, and well-equipped health clinics across the Millennium Villages. At least one nurse or midwife, covering a catchment area of 5,000 persons, staffs each clinic. Retention is very high, with all nurses and midwives working in MVP clinics opting to stay at this duty post rather than seeking transfers to more urban areas. The high retention rate is due, in part, to the top-up of salaries that have been provided at some sites. There are professionalized, remunerated CHWs employed across the MVs. In all sites except Nigeria (where there is concern about drug quality), there is a consistent supply for essential drugs through Ministry of Health distribution channels.

Early evidence suggests that systems strengthening interventions are starting to pay off. Services that depend on a well-functioning health system, such as institutional delivery, have increased from 33% to 47% across the first five sites. Care for chronic diseases such as HIV and tuberculosis (TB), have demonstrated similar gains. The average case

detection rate for TB was 55% in 2008, which is better than national figures at most sites. Half the sites reached treatment success rates higher than their national rate by 2008, a substantial challenge for these deep rural areas. HIV prevalence averages 6% across these five sites, with a range of 1% to 16%. All sites currently offer antiretroviral therapy for AIDS patients, either within cluster or at local referral hospitals. Operational data suggest 60% of eligible patients are currently benefiting from antiretroviral therapy—nearly double the rate for the continent as a whole.

## Conclusions and Looking Ahead

During the first three years of the Project, health sector activities have succeeded in increasing access to health services and establishing or beginning to establish basic human and physical infrastructure necessary for a well-functioning health system. The quick win interventions have yielded encouraging results in reducing rates of diseases such as malaria. Taken together, these efforts support a continuum of care from the household to the clinic to the referral hospital.

With core building blocks now largely in place, major efforts are underway to improve the quality of care through optimizing the use of information for health decision-making, and to establish management systems to provide additional support to CHWs in their role as a formal extension of primary care system. With the adoption of a verbal and social autopsy conducted by senior CHWs on all deaths of children under five and pregnant women, the local health teams can review monthly data and make real time corrections of gaps in the health system that this intervention reveals. Finally, the Project will be working to fill gaps in a number of areas such as the introduction of simple, cost-effective interventions to reduce neonatal mortality, and working to improve uptake of modern, long acting methods of contraception by ensuring that supply-side issues are met alongside efforts to stimulate community demand for family planning services. ■



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# Infrastructure: Energy, Transport, and Information and Communication Technologies



Rural sub-Saharan Africa exhibits fundamental challenges in energy, transportation, and information and communication technologies (ICT), with poor levels of all infrastructure. Yet because of their critical linkages to progress in a range of MDG targets, it is especially important that energy, transportation, and communication-related challenges are overcome.

At the start of the Project, levels of basic infrastructure in the Millennium Villages mirrored conditions found in other rural areas of the continent. Most public institutions lacked grid electricity connections, and household connections were virtually non-existent. Almost all cooking in homes and schools was performed with biomass fuel using traditional three-stone fires. Basic telecommunication was limited, and less than one-third of the population lived within two kilometers of roads that can be used throughout the year (known as an all-weather road).

Many barriers exist to easy access and affordable use of energy and communication technologies and related infrastructure in the region. First, high fixed costs and added transaction costs of implementing programs in rural areas can make initial costs prohibitive for governments and donors. Second, high recurrent costs (such for maintaining and repairing roads and solar photovoltaic systems) limit private sector investment since projects require sustained and guaranteed investments to be productive. Third, thin value chains for technologies (sparse presence of vendors that sell technologies or support them) and limited after-sales support result in the perception that both systems and technologies are unreliable.

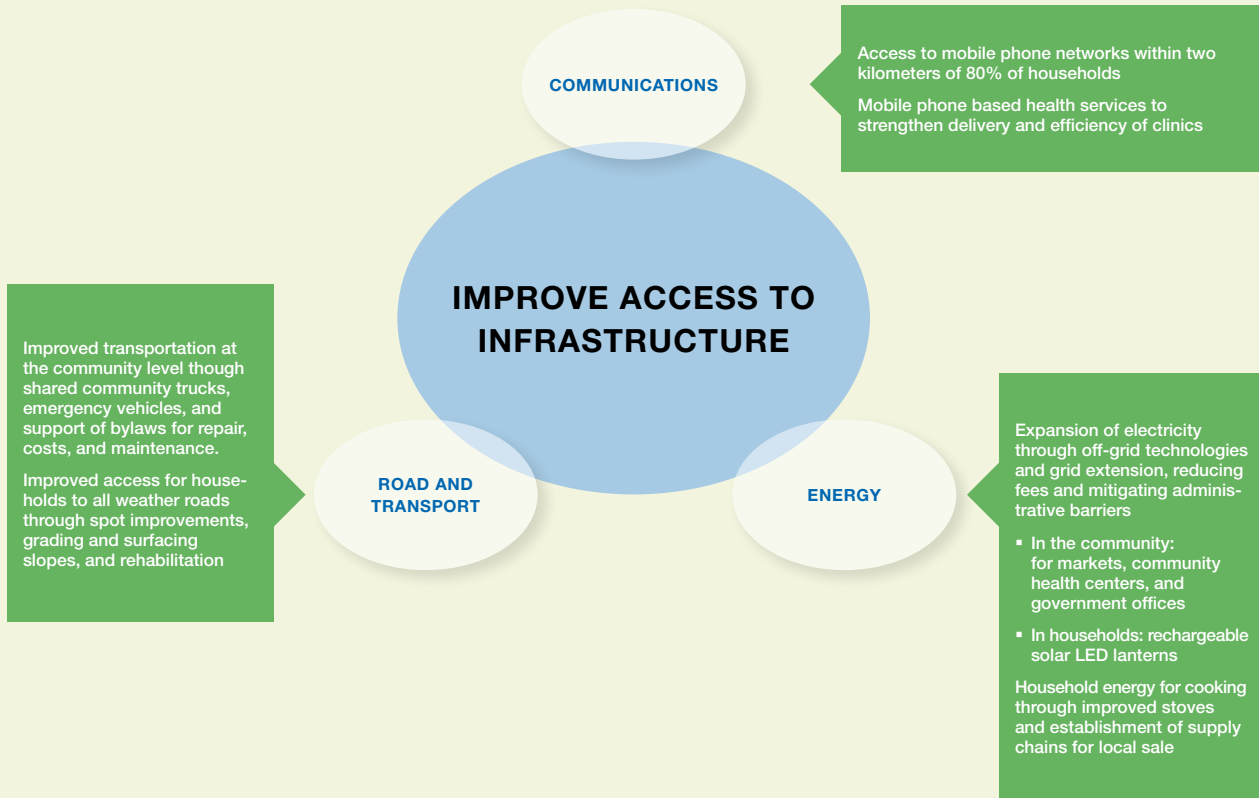
**Table 1: Role of Transport, Energy, and ICT in Achieving the MDGs**

	MDG 1	MDG 2	MDG 3	MDGs 4, 5, and 6	MDG 7
<b>Transport</b>	Facilitates trade of goods and access to markets; lowers input prices; and reduces the monopoly power of agricultural traders	Increases access to educational facilities, reducing drop out rates, especially for girls	Reduces time and transport burden on women by increasing their access to appropriate transport services, empowering them to take control over their lives	Increases access to health facilities and reduces emergency response time; Rational and integrated planning of road networks avoids unnecessary interventions	Use of public transport services contributes to a better environment
<b>Energy</b>	Increases productivity and expands income-generating opportunities	Enables reading and studying at home and in schools	Facilitates domestic work and income-generation; reduces burden of fuelwood collection	Improves quality of healthcare; increases hours of clinic operation; facilitates vaccine cold-chain; decreases indoor pollution	May reduce pressure on local biomass and carbon emissions
<b>ICT</b>	Improves access to price information and markets; improves dissemination of agricultural information	Improves access to educational material; improves school management	Improves social/family linkages; improves ability to report gender violence	Improves access to and quality of public and community health systems; increases access to emergency care	Improves monitoring of natural resources

## Infrastructure Strategy in the MVP

In the MVP, the MDG-related target for infrastructure is to reduce by half the number of people without access to modern energy, transportation, and communication services by 2015. In the realm of energy, interventions focus on electric grid extension, increased access to off-grid electricity and improved energy for cooking in households and institutions. Regarding roads and transport, interventions aim to improve transportation and support improved access for households to all-weather roads. Finally, regarding ICT, the MVP supports access to mobile phone networks within two kilometers of 80% of households and is introducing mobile phone-based health services to strengthen delivery and efficiency of clinics.

Figure 1: Infrastructure Strategy in the MVP



### 1. ENERGY

Prior to the MVP, many communities lacked grid electricity. Where grids existed, connection rates to households and shops were typically 5% or less, leaving most homes with only traditional, inefficient, and high-cost options for services such as lighting and battery recharging. A key objective of the MVP has been to provide essential electricity services at both the community and household levels, through a combination of electric grid extension, mini-grids (small off-grid electricity systems serving 10–50 households) and portable, rechargeable light emitting diode (LED) lanterns.

Collaborations with national and local governments and utilities have been critical for electric grid extension. Where extension is not feasible, the MVP has worked to provide stand-alone systems (solar photovoltaic or diesel systems or mini-grids), which generate electricity independently from the national grid.

**Table 2: Infrastructure Indicators in Rural Sub-Saharan Africa Between 2000 and 2006**

	% of rural households
Households with access to electricity*	10%
Rural population living within two kilometer of all-weather road	34%
Mobile phone signal coverage	40%
Households with access to a mobile phone	5%
Households with a landline phone	1%

Source: International Telecommunications Union, Measuring ICT Availability in Villages and Rural Areas, 2008.

\* The figures represent household survey data. They show the percentage of rural households that have electricity connections and use a mobile phone.

Costs for medium voltage grid extension in remote rural areas, such as the MVs, have ranged from \$15,000–40,000 per kilometer, with \$25,000 as an approximate average. In some MVs, programs have been implemented to try to reduce costs of connection to \$50, possibly with the help of loans or installment plans offered by revolving funds facilitated by the MVP. The national electricity grid has been extended to more than 50% of the community in two MVs: Bonsaaso (Ghana) and Sauri (Kenya). In most other MVs, some communities and institutions have been connected to the grid, with additional construction planned for 2010. Where grid extension has not been feasible, plans to implement mini-grid programs are underway.

The MVP also supports commercial sale of solar-powered, rechargeable LED lanterns with mobile phone charging to reduce reliance on fuel-based lighting as well as high-cost phone-charging. A lantern program was piloted in Malawi, with lessons that can be applied to other MVs.



**Table 3: Electricity Grid Coverage in Select MVs (Estimated Percent Access at Community Level)**

MV	Baseline	Progress (Early 2010)	Planned by Project Completion
Bonsaaso, Ghana	0%	40%	60%
Pampaida, Nigeria	0%	20%	60%
Ruhiira, Uganda	0%	10%	65%
Mwandama, Malawi	< 10%*	10%	70%
Sauri, Kenya	40%*	55%	80%

Note: Table includes estimates only for MV sites where electricity grid extension is feasible.

\* Even in areas with a grid backbone, baseline rate of connections to households and institutions was very low (less than 5%).



The MVP has also worked on introducing improved cookstoves that are more energy-efficient. Typically, nearly all households in MVs cook with biomass fuels using inefficient, polluting three-stone stoves. Collection of fuelwood is a time-consuming burden, borne mostly by children and women. Moreover, there are environmental impacts. Each year, an average household burns an estimated 2–3 tons of woody biomass, which emits 3–4 tons of carbon equivalents. The MVP aims to make improved household cookstoves inexpensive and available for local purchase.

## 2. ROADS AND TRANSPORTATION

Limited access to transportation and related services remains a major challenge throughout the MVs. In the initial phase of the MVP, interventions focused on providing access to all-weather roads and providing transportation services at the community level.



The MV aims to ensure that at least 50% of the population is within two kilometers of an all-weather road. To achieve this goal, the MVP supports spot improvements, including culverts at water crossings, grading, and surfacing dangerous slopes. It collaborates with national and local governments to facilitate support for these interventions, while engaging community members for improvements and maintenance. Community labor for spot improvements helps keep small roads open for most of the seasons at low cost and requires strong community organizations that can undertake maintenance of roads, at least once a year.

The MVP also implements community-managed transport services, such as a shared community truck, emergency vehicles, and other vehicles for transporting people and goods to the market. The MVP uses a model that manages the recurring costs, repairs and reinvestments of revenue arising from community-managed transport. The communities are therefore benefitting from increased access.

Most MVs have rehabilitated existing roads that had been damaged and carried out critical spot improvements. Many improvement projects have occurred through partnerships with governments to rehabilitate main roads connecting the MVs to the national networks. Community-managed transport projects are at different stages of implementation in the MVs.

## 3. INFORMATION AND COMMUNICATIONS TECHNOLOGIES

The MVP has focused on improving voice communication and using ICT to strengthen existing service systems. For example, the MVP aims to achieve mobile phone network access within two kilometers of 80% of all households and to provide basic data connectivity to key institutions (schools, clinics, and ICT kiosks). These objectives have been facilitated by partnerships with Ericsson and regional GSM operators (Zain and MTN) that have helped to expand and strengthen GSM network coverage. The MVP also aims to increase access to computers and the Internet in schools and community centers/ICT kiosks. To improve the delivery of basic services in health using ICT, the



## Bringing Renewable Energy to Homes in Rural Africa: Solar charged LED Lanterns in Malawi



In Mwandama (Malawi), the MVP has pioneered the sale of renewable energy solar-charged lanterns. Over 700 households have purchased lanterns. In these households, kerosene related expenditures dropped by more than 80% within the first two weeks of purchase of the lantern. This represents an annual savings of \$30–\$50 on kerosene expenditures per household. Each lantern sells for approximately \$40. Lanterns that provide mobile phone charging are preferred overwhelmingly by community

members to those that only provide light. Some users have also reported increased income generating opportunities (more working hours), increased educational opportunities (brighter light for studying), reduced health risks (especially for emergency transport), and reduction in indoor soot/air pollutants.

The MVP established a supply chain for commercial sale of LED lanterns, through a wholesaler (a cooperative) and vendors in the individual villages. The MVP started the

cooperative, which consists of community members, to purchase the lanterns and sell them to vendors. Already, the cooperative has secured revenue of approximately \$16,000, which is now being used as working capital to buy lanterns and extend the catchment area. Sustainability and independent operation of the cooperative are achievable goals as capacity building efforts proceed.

MVP has introduced mobile phone-based health (mHealth) services to strengthen the delivery and efficiency of community- and clinic-based health services.

The MVP has achieved voice coverage for the majority of communities through two programs. In most MVP sites, Ericsson provided support for GSM network coverage (voice and data). Other MVs benefited from aggressive expansion of network coverage by local operators. In Ruhira (Uganda), a 65-kilometer Village Wi-Fi network was created connecting clinics, schools, and the community center to the Internet and facilitating VOIP calls between these locations. Additionally, many schools in the MVs now have computers, and many schools, community centers/ICT kiosks, and clinics have Internet connectivity.

Other ICT programs are supporting MVP interventions, especially those in the health sector. This includes ChildCount+, which is now being used in Sauri (Kenya) to register and systematically track 10,000 children under the age of five for malnutrition and major childhood illnesses, and this system is being rolled out across the remaining MVs. In Bonsaaso (Ghana), a telemedicine program will allow patients improved access to doctors for remote diagnosis and clinical support.

## Using Technology to Enhance Health, the Status of Women, and the Environment: Improved Cookstoves



The MVP piloted improved cookstoves in 2009. A rigorous trial of different brands of cookstoves assessed community preference, cooking efficiency, and potential cost-savings. Cooking time and convenience were critical for the community's preferences. On average, improved stoves reduce wood consumption by up to 30%. The MVP mobilized communities and held cooking demonstrations with large turnouts in each village. The subsidized price of each stove was \$10, and demand has outpaced supply. Preliminary

estimates suggest a savings in wood consumption averaging 51 kilograms per household per month.

The MVP is also helping establish a supply chain for local sale and is aiming to use income from carbon credits to cover a subsidy for the purchase price and monitoring costs. Each cookstove can potentially reduce emissions of carbon dioxide by 1.5 tons over its lifetime.

### Conclusions and Looking Ahead

The role of government in the infrastructure structure cannot be understated. Because of high initial fixed costs and high recurrent costs, it is critical that governments contribute and participate in all infrastructure-related plans early on. This requires sustained, high-level engagement with the government.

When government commitments to infrastructure interventions have not been realized, alternative strategies, such as partnerships with private sector firms, larger cooperatives or other entities, have become necessary. The MVP has piloted and launched several projects in this context, and, to date, community-level distribution systems and management procedures for non-network technologies (lanterns, household stoves, and village vehicles) have shown encouraging steps toward sustainable self-management.

Critical activities for the upcoming years include implementation of the additional large infrastructure projects, in particular, for the extension of the national electricity grid and the completion of road rehabilitation plans. Overall, grid plans should prioritize extension to markets and public institutions. In areas where connection to the national grid is less imminent, there are plans to implement micro-grid systems (covering 10–30 households), and stand-alone energy for public facilities and pumping for drinking water and irrigation will be provided as needed.

Pilot studies were key to choosing appropriate technologies for promoting household energy technologies in the MV communities. As a result, lanterns and household stove programs will be rolled out in other MVs. Quality control, which involves laboratory tests for lanterns and field tests for stoves, will be essential. Developing international supply chains to import both lanterns and stoves in bulk is among the programs' most difficult challenges.

In ICT, there are plans to build additional computer labs in schools and ICT kiosks that provide Internet, phone, and related services. Low power computers have allowed the MVP to affordably create computer labs at off-grid schools that rely on relatively inexpensive solar power. Government programs selling used computers offer a cost-effective option for schools with grid power, especially when the supplier provides several years of guaranteed maintenance. With proper national policies, network expansion can be market-driven and would require little support from the public sector. Meanwhile, based on success to date, there are plans to expand community health programs through ICT, for example, by systematically scaling up mHealth services. Mhealth programs will not be driven by market demands for access to technology, but rather are developed as an integral part of MVP interventions to reach the MDGs. Mobile phone-based projects are both quickly scalable and require much less infrastructure and maintenance than a clinic would. Also, systems such as ChildCount+ have proven effective at improving the monitoring, management, and delivery of health services. ■



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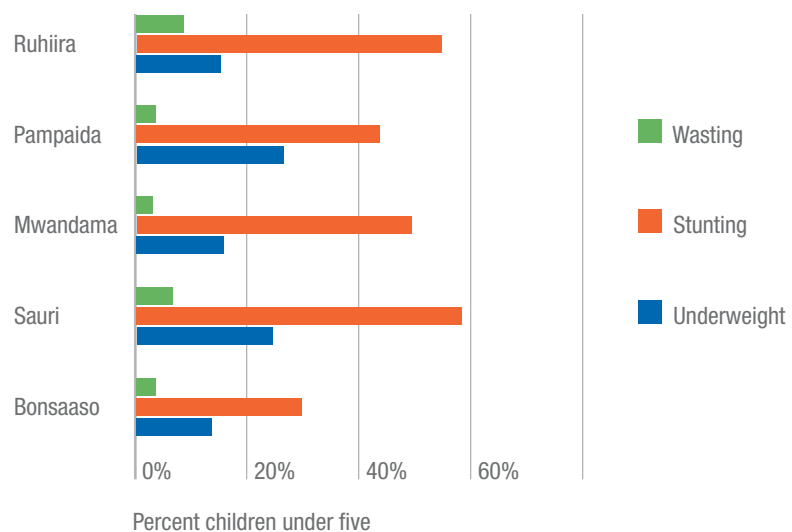
# Nutrition



Undernutrition contributes to roughly half of the 8.8 million global child deaths each year (UNICEF, 2009), representing nearly one-third of the global burden of disease among children. As of 2009, one billion people are hungry, with 129 million children under five underweight and another 195 million stunted (FAO, 2009a; UNICEF, 2009). Sub-Saharan Africa faces some of the most pressing hunger challenges in the world: 21% of children are underweight, and 40% are stunted (UN, 2009). Global food shortages in 2007–2008 and the global recession of 2009–2010 have further plunged more households into a state of food insecurity (FAO, 2009b).

One of the main criteria for site selection of the Millennium Villages was that they be located in hunger hotspots, defined as areas where 20% or more of children are undernourished. As Figure 1 demonstrates, numbers of underweight children and levels of stunting among children under five were high before the MVP started interventions.

**Figure 1: Undernutrition in Select MVs at Baseline**



**Figure 2: MVP Nutrition Strategy**



**Nutrition Strategy in the MVP**

The Project aims to improve nutrition security and eliminate hunger. Since undernutrition is the result of a complex array of socio-economic, health, and environmental factors, to achieve these aims, the Project simultaneously works on multiple fronts, ranging from water and sanitation interventions, to basic education, to increasing food production and dietary diversity to meet longer term requirements.

The MVP nutrition strategy has three main elements: (1) clinical interventions, (2) school-based interventions, and (3) household- and community-based interventions. In the first three years of the Project, the MVP identified and implemented quick-win nutrition interventions falling within these three broader strategic categories. These initiatives occurred alongside complementary agricultural interventions to enhance food production and community resilience.

## Using Technology to Track and Monitor Children's Nutrition and Health



Accurate and timely health information is scarce in much of sub-Saharan Africa. Health information systems are critical for setting priorities, allocating resources, and knowing how and where to intervene. In an effort to close the information gap in accurate and timely nutrition data, the Project is currently involved in and supporting several electronic health (eHealth) and mobile health (mHealth) initiatives.

Using open source technologies, the Project is piloting and scaling up an electronic medical record system, OpenMRS, which is rapidly becoming a standard across the continent. This system

called the Millennium Global Village Network (MGV-Net), integrates information from the community and the district health information system, allowing automated reporting of key facility level indicators for ministries of health, while providing valuable data to providers and community members alike. This information is useful for disease surveillance, analyzing vital statistics, clinical support for CHWs, emergency transport and basic management.

Additionally, through a partnership with Ericsson, mobile phone coverage is rapidly improving in all sites. Each CHW is equipped with a

mobile phone as is the clinic, the hospital and the emergency transport operator. A new mHealth initiative using a system called ChildCount+ allows CHWs to write short SMS texts that encode the results of a household visit. The system processes information in a database and provides immediate feedback. For example, a low mid-upper arm circumference (MUAC) indicator score, which indicates malnutrition, triggers an alert to the CHW, instructing him/her to refer the patient to the clinic. All core maternal and child health interventions are similarly encoded, generating a real-time data set of household visits, activities, and outcomes.

### QUICK WINS IN THE NUTRITION SECTOR

- Antenatal iron and folic acid supplementation
- Vitamin A supplementation for children under five
- Zinc supplementation to manage diarrhea (when treated with ORS)
- Exclusive breastfeeding
- Iodized salt promotion

### 1. CLINIC-BASED INTERVENTIONS

The Project engages in and continues to engage in several interventions at the health clinic level. Clinics promote maternal and child nutrition through intensive antenatal nutrition counseling, vitamin A supplementation, iron and folic acid supplementation, antenatal deworming, and child growth monitoring. Most supplementation programs are active in the MVs through government-supported programs with high levels of coverage of vitamin A supplementation for children under five years old. Growth monitoring is a core program at both the clinic and community levels

Additionally, through a partnership with Ericsson, mobile phone coverage is rapidly improving in all sites. Each CHW is equipped with a mobile phone as is the clinic, the hospital and the emergency transport operator. A new mHealth initiative using a system called ChildCount+ allows CHWs to write short SMS texts that encode the results of a household visit. The system processes information in a database and

provides immediate feedback. For example, a low mid-upper arm circumference (MUAC) indicator score, which indicates malnutrition, triggers an alert to the CHW, instructing him/her to refer the patient to the clinic. All core maternal and child health interventions are similarly encoded, generating a real-time data set of household visits, activities, and outcomes.

## 2. SCHOOL-BASED INTERVENTIONS

A key school-based intervention supported by the Project has been to develop and ensure cost-effective, nutritious school meals for all children of primary school age attending school. The MVP has been conducting school meals programs since its inception in 2006, expanding significantly after each site had increased harvests. The aim of the program has been twofold: to serve as an incentive for parents to send their children to school and to alleviate short-term hunger among school-going children. Primary school age children in the MV sites are receiving a locally grown school meal across the MV sites. The school meals are often linked to other health and nutrition interventions such as access to clean drinking water, gender sensitive sanitary latrines, deworming, and other initiatives such as school gardens.

## 3. COMMUNITY- AND HOUSEHOLD-BASED INTERVENTIONS

At the community and household levels, the Project has worked with site-based health teams that include community health workers (CHWs) and clinic staff to teach food preparation and nutrition education, with a major emphasis on maternal and under-two child nutrition. CHWs and staff at health clinics are promoting immediate and exclusive breastfeeding and locally appropriate complementary feeding, highlighting the nutritional value of traditional and locally available foods, home-based fortification, cooking demonstrations, and proper food storage techniques.

Other community-based programs have been used to prevent and treat acute malnourishment in children. Community-based management of acute malnutrition programs that involve the regular screening of all children under five are being instituted within the MVs. CHWs use a mid-upper arm circumference indicator to screen nutrition levels, and, in cases of undernutrition, they provide ready-to-use therapeutic foods or other nutrient-dense foods.

Additionally, the Project supports enhanced food production and diet diversity through cross-sectoral efforts in agriculture (improved seed and fertilizer and farmer training), infrastructure (irrigation), and the environment (efforts to reduce soil erosion). Communities have been working with agricultural extension officers to diversify their crops for markets and to improve household nutrition. Staple crops were supplemented by high value legumes and vegetables, spices, and fruits. Farmers have also engaged in other income-generating activities through demonstration projects, such as livestock for dairy production, poultry, fish farming, and bee keeping.



### NUTRITION EDUCATION ACTIVITIES

- Diet diversity
- Exclusive breastfeeding
- Complementary feeding
- Cooking techniques
- Food preparation and storage
- Kitchen gardens
- Fortifying traditional foods with local ingredients at home
- Iodized salt
- Diarrhea and undernutrition

## Conclusions and Looking Ahead

Early results of Project interventions show encouraging signs of progress. In Bonsaaso (Ghana), Mwandama (Malawi), Pampaïda (Nigeria), Ruhiira (Uganda), and Sauri (Kenya), proportions of children under two exhibiting stunting have been reduced by approximately a third. This progress suggests that the integrated cross-sectoral approach holds great promise. Looking ahead, the next years of the Project will seek to enhance current gains and intensify efforts to eliminate acute malnutrition, while supporting longer-term improvements in hunger and undernutrition through introducing high value nutritious crops, agro-processing innovations, and wider efforts in business development. ■



## Providing a Nutritious Daily Meal to Children at School

The school meals program is run as a partnership between the Project and the local community. The Project facilitates infrastructure development for kitchens and cooking stoves and works to ensure that the meal is nutritious. Local farmers initially donate approximately 10% of their harvest surplus to

support the program in compensation for input subsidies, and the community provides in-kind contribution of labor to prepare the meals.

The number of schools offering meals across the MVs has expanded in the last three years. The program has seen tremendous success, with

nearly all sites offering a daily meal to school children. In Sauri (Kenya), for example, over 21,000 children in 31 schools are provided a daily meal during the school year.

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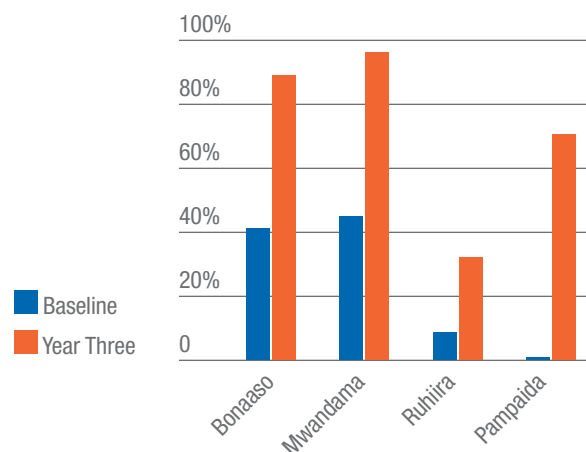
# Water and Sanitation



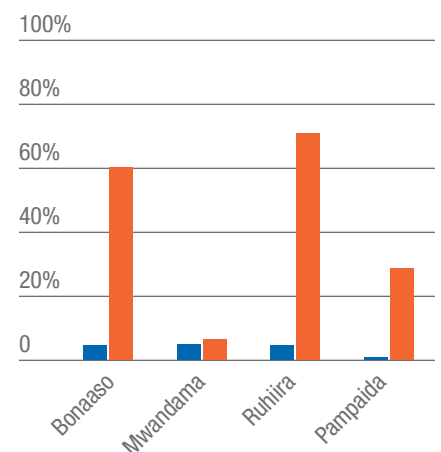
MDG 7 on environmental sustainability aims to halve the proportion of people without access to safe drinking water and basic sanitation services by 2015. Access to clean water and basic sanitation is critical because it has enormous implications for health and economic development. An estimated 94% of diarrheal diseases are attributed to unsafe drinking water, inadequate sanitation, and poor hygiene (Prüss-Üstün and Corvalán, 2006). Diarrhea is the second leading cause of death among children under five. The collection of water from remote sources also places an enormous burden on women and young children and limits their participation in gainful employment and education. Moreover, estimates suggest that every \$1 invested to improve water and sanitation brings benefits in the range of between \$4 and \$34 (WHO/UNICEF, 2008).

Global progress in achieving increased access to safe drinking water and basic sanitation has been mixed, and progress in sub-Saharan Africa lags behind much of the world. Only 58% of households have access to an improved drinking water source—a modest increase from 49% in 1990. In sanitation, gains have been even smaller, with just 31% of households having access to improved sanitation, representing a marginal increase from 26% in 1990 (UNICEF/WHO, 2008).

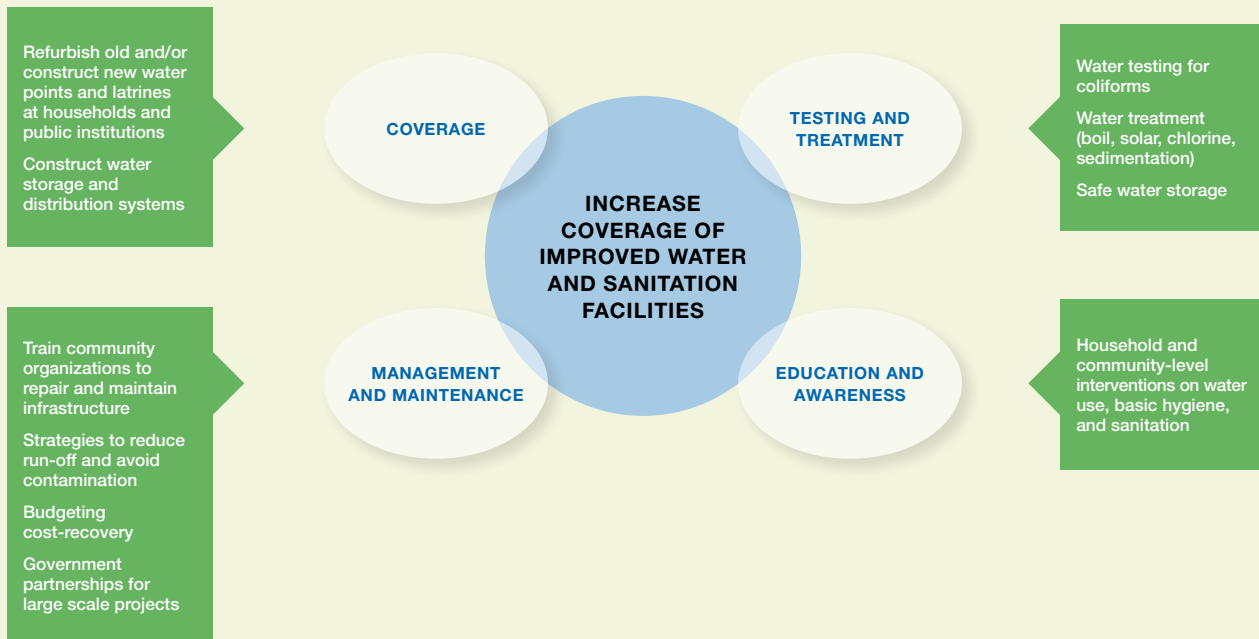
**Figure 1: Access to Improved Water Sources in Select MVs: Baseline and Year Three**



**Figure 2: Access to Improved Sanitation in Select MVs: Baseline and Year Three**



**Figure 3: Water and Sanitation Strategy in the MVP**



There are many challenges to improving access to water and sanitation in sub-Saharan Africa. First, the availability of fresh water is highly variable. Ten of the 14 countries in the world subject to water stress or scarcity are in sub-Saharan Africa. Second, the human and institutional capacity necessary to implement and manage programs is limited in this region. Third, there are tremendous financing gaps. Estimates suggest that approximately \$4.55 billion is required annually to meet MDG 7 in sub-Saharan Africa (of which 75% would go to sanitation) (UNICEF/WHO, 2008). Finally, ensuring sustainable solutions means balancing the appropriate technologies with simultaneous efforts to ensure the participation of local communities—otherwise sanitation facilities and water points are likely to become non-functional quickly.

### Water and Sanitation Strategy in the MVP

At the start of the Project, access to water and sanitation was much worse in the MVs than in sub-Saharan Africa as a whole. Levels of access to safe water and improved sanitation were very low, with some sites totally lacking access. The MVP’s water and sanitation strategy aims to increase access to safe and reliable water and



## Definitions of Improved Water and Sanitation

An improved drinking water source is defined as a safe drinking water source or delivery point that ensures protection from contamination, especially by fecal matter.

Examples include piped water supply, boreholes, rainwater collection, and protected springs, streams, and shallow wells.

Safe drinking water is water that meets WHO guidelines or national standards on drinking water quality in terms of microbial, chemical, and physical characteristics.

Basic sanitation protects humans from contact with feces. Improved sanitation refers to use of facilities such

as pit latrines with a covered slab, ventilated improved pit latrines, pour-flush latrine, and connections to septic or public sewer systems.

improved sanitation for households and public institutions, while simultaneously building local capacity to maintain and manage these facilities.

The first three years of MV interventions have focused on expanding coverage with improved water sources and improved sanitation facilities; management and maintenance of water sources and sanitation facilities, testing and treatment for drinking water quality, and education and awareness programs for better sanitation and hygiene practices.

### 1. EXPANDING COVERAGE OF IMPROVED WATER SOURCES AND SANITATION

Efforts to expand coverage of improved water have focused on rehabilitating existing infrastructure and building new infrastructure where needed. Drinking water sources in the MVs have ranged from boreholes, protected springs, roof rainwater harvesting with storage tanks, and piped water systems.

The MVP supported basic interventions to improve sanitation infrastructure, increasing coverage with improved latrines at households, facilities (schools and clinics), and public spaces, such as markets. A key strategy to rapidly accelerate progress was forming partnerships between the MVP, communities, and governments, with each contributing technical support, labor, and materials.

The MVs have made great progress increasing access to improved water sources. A diverse range of strategies has been employed to achieve these results. In Mwandama (Malawi), the number of improved sources of water has increased from 5 to 15, primarily through drilling new boreholes. In Bonsaaso (Ghana), access has increased through rehabilitation of existing boreholes. Similarly, through innovative partnerships, access to improved sanitation has increased significantly across the MVs.

### IMPROVING ACCESS: CRITICAL GOALS FOR THE WATER AND SANITATION SECTOR

- Access to 20 liters of water per day, per person, within a distance of one kilometer and less than 30 minutes round trip, from an improved water source serving 250–400 people (depending on national policy).
- Access to improved sanitation facility with a maximum usage of 20 people, within a distance of 50 meters from the household.

## 2. MANAGEMENT AND MAINTENANCE OF WATER SOURCES AND SANITATION FACILITIES BY THE LOCAL COMMUNITY IN PARTNERSHIP WITH THE GOVERNMENT

Partnering with communities and governments is critical for achieving sustainable basic infrastructure improvements and maintenance and repair. A key step toward sustainability is to involve community groups in planning and construction/refurbishment activities. Community committees must be trained and empowered in management and maintenance of water sources and sanitation facilities. Watershed management is also important to minimize contamination by human and animal waste, which can leach into the water supply. Finally, if the improved water sources are larger scale and involve considerable infrastructure investment, partnerships with governments should be negotiated in the earliest phase of the planning process.



Most MVs have community water management committees. For example, in Pampaida (Nigeria) and Bonsaaso (Ghana), community members were trained to maintain boreholes, and a water and sanitation committee collects a small monthly fee from households, which is used to pay maintenance when repairs are needed. In Bonsaaso, 25 out of 30 communities operate the water tariff system, nearly all of which have opened bank accounts to save funds to maintain the boreholes.

## 3. TESTING AND TREATMENT OF DRINKING WATER

Testing and treatment of water is as important as improving access to water sources. Even sources that are referred to as improved may be contaminated with coliform bacteria or contain toxic heavy metals. Initial testing for heavy metal contamination is necessary to assess the need for removal systems. Treatment for bacterial contamination includes various chlorine-based additives, boiling, or solar purification. The Project has supported water quality testing in most MVs, finding significant coliform contamination in many instances and contamination with heavy metals in two MVs.



Additionally, experience from the MVs suggests that while treatment of water at the source is more efficient, much contamination takes place at the household level from unhygienic practices. Household-level interventions, such as introducing low-cost hygienic storage containers, and hygiene education and awareness programs and campaigns are essential.

In the MVs with heavy metal contamination, water systems were installed to remove these heavy metals. In MVs where water was contaminated with coliform, household-level treatment with chlorine-based products is underway. Additionally, in Ruhira (Uganda) and Sauri (Kenya), a Procter & Gamble project uses Purifier of Water (PuR) treatment targets for households and pupils in schools.

## An Effective Public Private Partnership with JM Eagle: Improving Community Access to Water



The success of a partnership between the MVP and JM Eagle in Potou (Senegal)—which has resulted in nearly all communities in Potou having access to improved water through a piped water system—led to the extension of this partnership to seven additional MV clusters, including Bonsaaso (Ghana), Sauri (Kenya), Mwandama (Malawi), and Ruhiira (Uganda). The piped water designs for these sites—developed by the MV team in collaboration with local government water

agencies—have been approved, and the pipes are now being delivered to the MV sites. These piped water systems are expected to facilitate a significant step toward efforts to achieve universal coverage in access to safer water for households and public institutions.

### 4. EDUCATION AND AWARENESS

Water and sanitation education and awareness interventions are essential to informing and supporting hygienic practices. Interventions vary from staging community drama performances, to teaching about water and sanitation through school programs. Additionally, community health workers have been involved in teaching about and monitoring sanitation and hygiene practices during household visits.

In Sauri (Kenya), awareness of safe water and sanitation practices has been spread through a local drama group and incorporated in art exhibits by local students. In Mwandama (Malawi) and other MV sites, the Personal Hygiene and Sanitation Education Program (PHASE) project aims at teaching and promoting sanitation and hygiene through school programs. In Pampaida (Nigeria), monthly water and sanitation meetings educate community members about these important issues.



## Partnering with GlaxoSmithKline: Preventing Diarrhea through Hygiene Education (PHASE)

More than three million people die of diarrheal diseases every year, most of them children. The Personal Hygiene and Sanitation Education Program (PHASE) is a hand-washing program for children, which teaches them how to reduce the spread of germs and provides guidance on hand-washing and other basic

practices. The program, which is designed and supported by GlaxoSmithKline, is being piloted in Mwandama (Malawi) and other MV sites. The program involves latrine construction, production and distribution of educational materials, and distribution of sanitation materials, including wheelbarrows, shovels,

dustbins, and gloves. School management committees are being trained on PHASE materials and methodology, and teachers are teaching sanitation and hygiene in their respective schools.

## Conclusions and Looking Ahead

Installing and rehabilitating infrastructure to increase access to improved water sources and latrines are important first steps in increasing access to safe drinking water and basic sanitation services. While improvements in water have outpaced those in sanitation, substantial gains have been achieved in both areas in a relatively short period. Experience in the MVs also suggests that building infrastructure may be easier than shifting entrenched norms, attitudes, and embedded habits around water use and storage, and basic sanitation and hygiene practices. These behavior change activities require sustained longer-term efforts along with locally adapted programs and interventions.

The next phase of water and sanitation interventions will focus heavily on increasing sanitation services where coverage gaps remain, on-going water testing and treatment, transitional plans for water management and maintenance in partnership with local groups and government, and locally adapted programs to promote sanitation and hygiene behavior change, through, for example, perhaps expanding PHASE to other MVs and community engagement by piloting community-led sanitation programs in MVs where open defecation persists. ■

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**Millennium  
Villages Project  
Site Profiles**



# Ruhiira, Uganda



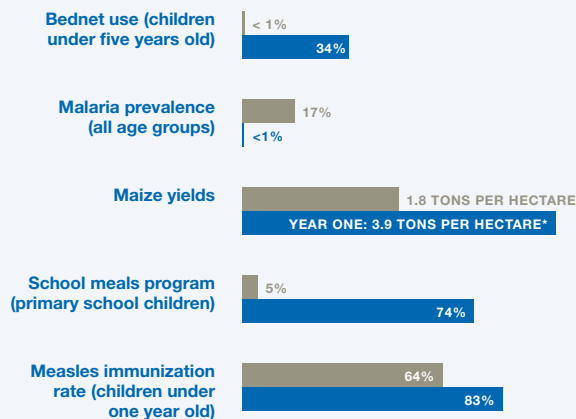
The MVP site in Uganda, which is located in the southwestern district of Isingiro, consists of approximately 50,000 people, spread over 77 square kilometers in six villages. The landscape is rugged and characterized by broken mountains that rise to nearly two kilometers above sea level, with river valleys that form part of the Lake Victoria drainage system. The climate is sub-humid and tropical, with two rainy seasons each year. The steep hillsides are extensively degraded from forest clearing, soil erosion, and rapid population growth.

Prior to MVP interventions, over 90% of households survived on subsistence agriculture, mainly from the production of bananas, with 60% of households earning less than a dollar a day. At this time, there was no way to purchase agricultural inputs and no space to store the extra harvest. There were no local financial institutions or access to credit, and the nearest market was 15 kilometers away. More than half of children under five years old were chronically malnourished (stunted). Only 9% of women delivered their babies in the presence of a skilled birth attendant.

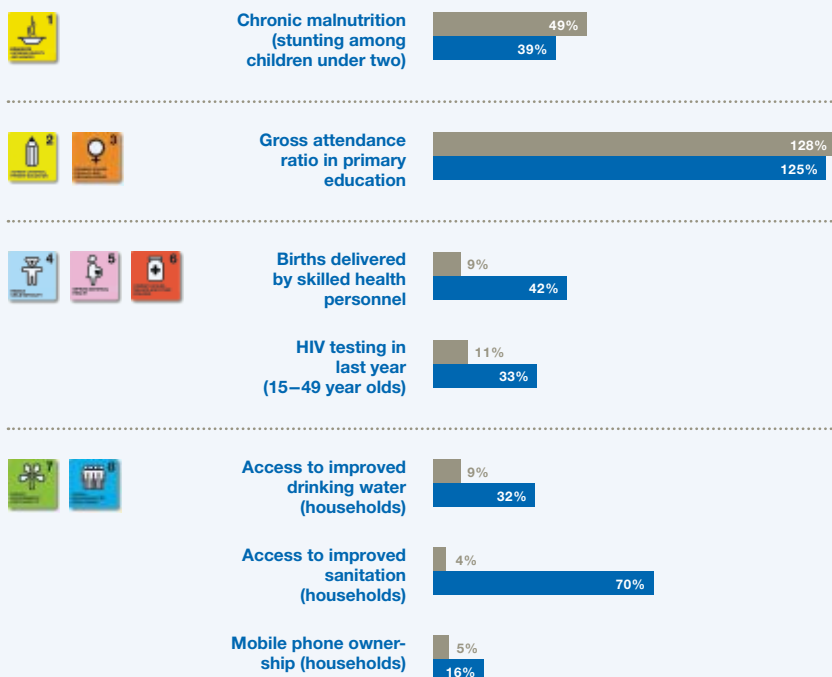
The nearest town is Mbarara, 45 kilometers away, which was connected to Ruhiira by a gravel road. Overall, there were few roads at the Project's outset, and the hilly landscape made access to clinics, schools, and markets extremely difficult. The electrical grid was 15 kilometers away, there were no telephones, and less than 5% of



## Quick Wins



## Progress on Other Key MDG Indicators



BASELINE (2006)   
YEAR THREE (2009) 

\* Year one represents yield data from 2006/2007 season. Other data forthcoming.



### ADAPTING THE MVP MODEL TO LOCAL DEVELOPMENT CHALLENGES

- Improving access to basic infrastructure and services:** Steep and rugged terrain made access to facilities and services very difficult and led to high levels of erosion; there were long distances and enormous burdens of carrying water from valleys to ridge tops where people live
- Supporting cooperative farming:** Banana farmers received low prices due to lack of organization and exploitation from middlemen
- Improving the reliability of maternity services:** Just 9% of women delivered with skilled birth attendants

## Principal Interventions

	2006	2007	2008	2009
<b>Quick Wins</b>				
Distribution of improved seeds and fertilizers; community nurseries	■	■	■	■
School meals program (14 schools)	■	■	■	■
Prevention and treatment of malaria, including distribution of bednets	■	■	■	■
Measles immunization	■	■	■	■
<b>Agriculture, Business Development, and Nutrition</b>				
Training for farmers, including in improved agriculture techniques and management		■	■	■
Provision of livestock and related support		■	■	■
Creation of village savings and credit cooperative banks (2)		■	■	■
Tree planting, environment conservation training, erosion control terraces, and soil and water conservation structures		■	■	■
Crop diversification for income and nutrition, including fruit tree orchards, soybeans, cardamom, ginger, and carrots		■	■	■
Improving and supporting farmers' links to markets		■	■	■
<b>Education</b>				
Distribution of sanitary napkins		■	■	■
Improving quality of education, including through teacher training and curriculum development		■	■	■
Construction of schools (5), including access to water, latrines, and energy		■	■	■
<b>Health</b>				
Free, 24 hour universal coverage of health care (6 clinics)	■	■	■	■
Construction and renovation of clinics (6), including access to water, solar energy, and sanitation	■	■	■	■
Prevention and treatment of HIV/AIDS and TB		■	■	■
Hiring and training of health staff, including doctors, nurses, midwives, and CHWs		■	■	■
Regular community health days		■	■	■
<b>Infrastructure</b>				
Upgrading, repair, and construction of roads (90 km)	■	■	■	■
Solar energy and hydroelectric power in institutions; improved cookstoves			■	■
Network tower construction and coverage; computers in schools (4 schools) and clinics (4 clinics); community radio			■	■
<b>Water/Sanitation</b>				
Improved latrines in schools, clinics, and households	■	■	■	■
Construction and repair of water sources, including shallow wells (4), water springs (2), rainwater harvesting system (11), and a piped water system	■	■	■	■

households owned a mobile phone. Access to water for domestic consumption was severely limited. Most springs and shallow wells were contaminated, and most people live near the hilltops, while the water sources are in the valleys.

## Linking Interventions to Progress-to-Date



### MDG 1

Eradicate Extreme Poverty and Hunger

In addition to major improvements in yields farmers are also obtaining higher prices for yields through the organization of cooperatives and construction of centralized community-run facilities for storing and marketing crops, especially bananas. Many new crops were introduced, including green leafy vegetables, carrots, green pepper, soya beans, and orange-fleshed sweet potatoes. Business development interventions have also supported income gains. These included the distribution of fast-growing improved Boer goats, support to local women's groups involved in craft production, and the formation an informal savings and credit scheme that was eventually transformed into a formally registered credit and savings organization.

#### MDG 1: BIGGEST IMPACTS

- Average maize yield increased from 1.8 tons per hectare to 3.9 tons per hectare\*
- 20% reduction in chronic malnutrition among children under two years old

\* Increased yield level represents data from 2006/07 season after one year of MVP interventions. Other data forthcoming.

## Shortening the Value Chain to Increase Farmer Incomes



One of the significant challenges in Ruhiira was the very low prices obtained for bananas, which are the largest crop in this area. When the MVP started operating in Ruhiira, a bunch of

bananas (25 kilograms) sold for \$1.20. Altogether in Ruhiira, farmers sold approximately 1,800 metric tons of bananas per month, obtaining approximately \$79,200 per month for all farmers, translating into \$8 per household. With local partners such as Technoserve, the MVP began organizing banana farmers in groups, with training in group production and bulking, negotiation, and group marketing as well as leadership and management skills. The group was registered as a

cooperative with the Isingiro District Department of Commerce and linked to banana buyers in Kampala and commercial banks. In 2009, farmers were able to obtain \$2.50 per bunch, with farmers selling approximately 5,400 metric tons of bananas per month, yielding approximately \$475,200 per month, a sixfold increase. A market impact assessment was conducted in December 2009 to compare prices of bananas among farmers from the MVP to areas

outside the MVP area (where no banana marketing group exists). According to the assessment, banana prices were consistently \$1 more per bunch in the MVP area, with MVP farmers earning \$2.50 per bunch and non-MVP farmers earning just \$1.50. Group marketing and banana bulking ensured that farmers could obtain higher margins directly from banana dealers in the capital. This strategy eliminated middlemen and shortened the value chain of banana marketing.



Increased access to food through greater income and crop production, as well as efforts to increase the quality and diversity of diets, and a smoothing of consumption during harvest periods have made substantial progress in reducing levels of hunger and undernutrition. Levels of chronic malnutrition (stunting) among children under two were reduced by 20% and levels of acute malnutrition (wasting) underwent a more dramatic reduction and are now nearing elimination. Food frequency surveys noted increased consumption of more nutritious foods, which provide proteins and micronutrients necessary to increase growth.



## MDG 2

Achieve Universal Primary Education

### MDG 2: BIGGEST IMPACTS

- Persistently high gross attendance ratios
- Increase in children receiving school meals from 5% to 74%

In addition to refurbishment and construction of classrooms, education interventions have centered around efforts to improve access, retention, and the quality of schooling, mainly through the school meals program, construction of gender-separate latrines, and provision of sanitary napkins to girls. Communities contribute a portion of the food—five kilograms of beans per child—used in the school meals program, which provides children with a substantial midday meal of maize meal, beans, and school-grown vegetables as well as an afternoon snack. Nearly 300 teachers have benefitted from skills development and training and closer supervision in collaboration with the District Education Office. The construction of staff quarters in the more remote areas has also assisted in recruiting and retaining teachers where they are most needed.

### MDGS 4, 5, AND 6: BIGGEST IMPACTS

- Measles immunization and vitamin A coverage have increased to 83% and 76%, respectively
- Nearly two-thirds of pregnant women were tested for HIV
- A fivefold increase in deliveries by a skilled birth attendant
- Malaria bednet use has increased from 1% to 34%
- Prevalence of malaria has decreased from 17% to less than 1%



## MDGs 4, 5, and 6

Reduce Child Mortality, Improve Maternal Health, and Combat HIV/AIDS, Malaria and Other Diseases

The Project made early efforts to concentrate on quick wins—including malaria and immunization rates. However, a sequenced process of strengthening health systems was crucial to impacting progress on the health-related MDGs. In addition to clinic refurbishment and construction, health staff was bolstered from just ten personnel—none of whom were medical doctors—to 53 staff, including two medical doctors and 13 midwives, serving the entire cluster population. Most of these staff have been recruited and appointed in collaboration with the district government. Poor staffing at clinics had been a major reason for the community's reluctance to visit health facilities.

Improving access to safe delivery services was a major priority for the MVP and the community. A number of interventions were undertaken in this regard including recruiting skilled midwives so there is a midwife at the lowest level health facility; providing adequate delivery space, equipment, and medicines; and establishing an emergency referral system with a 24-hour standby ambulance and toll free mobile phone numbers. A critical intervention to increase uptake of services was the use of

## Mobilizing the Community for Quick Wins: Health Days in the Villages



Quick wins are evidence-based interventions that can be rapidly taken to scale to achieve high levels of coverage. In the health sector, these include long-lasting insecticidal bednets for malaria, basic immunization, vitamin A for children under five, and community-wide deworming efforts held every six months to reduce levels of intestinal parasites. Many of these interventions can be delivered efficiently through community-wide campaigns. In the hilly terrain of Ruhiira,

long distances to clinics made it difficult for households in remote villages to access services.

In response, the Project provided a motorbike and fuel to facility-based health workers to improve their mobility. Services were delivered to the community during health days, which were conducted on a quarterly basis in each village. These campaigns were preceded by mass mobilization through community health workers and traditional leaders, as well as through radio talk

shows, local drama groups, a public address system, and door-to-door health education. Interventions were gradually expanded to include antenatal care, family planning, voluntary counseling and testing for HIV, and growth monitoring among children. Efforts have resulted in high levels of coverage for measles (83%), vitamin A (73%), increased antenatal care, and expanded coverage with HIV testing with nearly one third of 15–49 year old adults tested in the past year.

a Mama Pack for women delivering in health facilities. This kit contained a baby blanket, a polythene sheet to prevent infection, cotton wool, a ligature for safely tying the cord, and a pair of gloves.



## MDGs 7 and 8

Ensure Environmental Sustainability and Develop A Global Partnership For Development

Considerable increases in the number of people using improved drinking water followed initial surveys that revealed very low levels of access. Baseline assessments revealed that there were no functional boreholes in Ruhiira, but there were over 50 potential sites for spring protection. In response, the MVP protected 16 existing springs that were previously shown to have high levels of bacterial and heavy metal contamination. Other interventions include rainwater harvesting at schools and health clinics, which has increased the amount of harvested water available from just 30,000 liters to 222,000 liters. Plans for installing a system of piped water to the ridge tops are underway. Efforts to improve the quality of water at the household level include distribution of water treatment containers and PuR sachets for disinfecting and cleaning water.

### MDGS 7 AND 8: BIGGEST IMPACTS

- A nearly fourfold increase in the proportion of people using an improved drinking water source
- Two-thirds of people have access to basic telecommunications, and mobile phone ownership has increased nearly fourfold

The MVP has initiated numerous infrastructure interventions to support local progress toward the MDGs. A successful pilot project to introduce improved cook-stoves that reduce the fuelwood requirement by almost 50% was initiated in 2009, with plans to move to scale over the coming period. In addition, over 50 kilometers of roads capable of motor vehicle transport have been built with an additional 40 kilometers rehabilitated. The MVP collaborated with the government on contracting large machinery and equipment for road construction and repair while the communities contributed locally available materials (clay, stones, sand, and bricks) and labor. Schools and clinics now have access to electricity through low-cost solar technologies. A partnership with Zain and Ericsson has significantly increased mobile phone coverage through the construction of cell towers.



### Priorities for the Next Phase

Working toward ensuring the sustainability of gains, the Project is making concerted efforts to strengthen community participation and institutional development and to increase the capacity of community institutions to support the progress seen in the MVP. In the transition from subsistence farming toward commercial agriculture, market linkages will be critical. The Project is also working toward agro-processing ventures that will be greatly facilitated by an imminent connection to the electrical grid. This will be supported by partnerships to facilitate access to business financing.

Another key priority will be expanding school gardens to ensure the sustainability of the school meals program. In response to the need for continued and expanded support of girls' empowerment, the MVP is developing early childhood development centers to both provide support for young children in terms of education and nutrition and to ensure that girls are not kept out of school to care for younger siblings. In the health sector, continued monitoring of households by community health workers, in particular, following up on newborn babies, is crucial to address pneumonia, a key driver of child mortality in Ruhira. CHWs will also be involved in a comprehensive campaign, along with community facilitators and local and church leaders, to increase utilization of family planning. Finally, while great strides have been made regarding improved water and sanitation coverage, efforts are still underway to improve access through a piped water scheme, as well as water purification at the household level and tree planting in the catchment area to address water quality issues. ■



## Partners in Ruhira

*The following provides a list of many of the partners who provide operational and in-kind support in Ruhira. A more complete list of MVP partners and donors is provided in the appendix.*

### GOVERNMENT OF UGANDA

#### Ministries of Health, Education, Water and Environment, and Energy

Technical assistance;  
Policy guidance

#### Isingiro District Government

Resources provision;  
Policy guidance

#### National Agriculture

Advisory Services  
Technical assistance

#### National Malaria Control Program, Ministry of Health

Technical assistance;  
Policy guidance

### NGO/IO

#### Heifer International

Livestock capacity building

#### Kambara Deaf Development Project

Education and life skills  
development for the deaf

#### Marie Stopes International

Family planning services;  
Management of sexually  
transmitted diseases

#### Technoserve

Value chain development

#### The AIDS Support Organization

Holistic management  
of HIV/AIDS

#### Uganda Youth Anti-AIDS Association

HIV and community activities

#### UNAIDS

HIV/AIDS and PMTCT

#### World Food Program

Food security

### PRIVATE SECTOR/ FOUNDATION

#### Ericsson

Mobile telephony infrastructure

#### General Electric

Medical equipment

#### JM Eagle

Improved water infrastructure

#### Lenovo

Computer technologies

#### The Mosaic Company

Agricultural inputs

#### Procter and Gamble

Water and sanitation supplies

#### SAN PLATS

Sanitation activities

#### Sony Ericsson

Mobile phone technologies

#### Sumitomo Chemical

Long-lasting insecticidal bednets

#### Uganda National Agro Input Dealers Association

Agribusiness partnership

#### Ugastove and Stovetec

Improved cookstoves

#### Zain Telecom

Mobile telephony infrastructure

### RESEARCH INSTITUTE

#### Department of Civil Engineering, Makerere University

Technical assistance

#### Department of Crop Science and Agronomy, Makerere University

Agricultural research and support

#### International Potato Center

Agricultural research and support

#### Primary Teachers College, Isingiro District

Teacher training

#### Uganda Martyrs University

Curriculum development

#### Zonal Agricultural Research and Development Institute

Technical assistance



# Sauri, Kenya



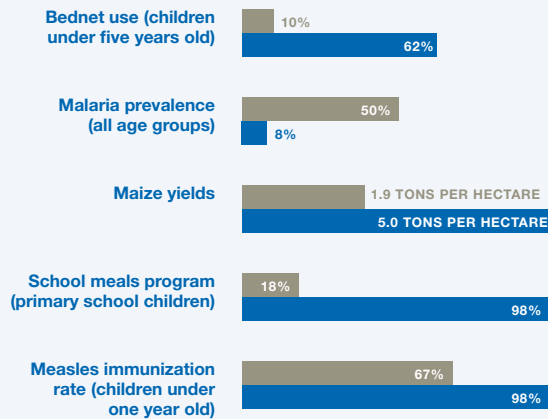
Sauri is located west of the Rift Valley and north of Lake Victoria in Siaya District in the Kenyan highlands. The climate is sub-humid tropical, with two rainy seasons a year. The topography is undulating with ephemeral streams, rivers, and wetlands meandering through rounded hills. There are approximately 65,000 people in Sauri, spread over 132 square kilometers in 11 villages. The population density in this area is extremely high with 500–600 people per square kilometer, resulting in small farms with an average size of 0.60 hectares.

Despite being in an area with high potential for agriculture and sufficient rainfall for two crops per year, agricultural production in Sauri is quite low. Soils have been depleted from overfarming and insufficient use of nutrients by farmers. Even though there is good road access to a nearby town, markets are not sufficiently developed to either obtain fertilizer and seeds or to allow farmers to sell crops. When the MVP started operating in Sauri, poverty and hunger were widespread, with almost 80% of the population earning less than \$1 per day, and 59% of children under five years old exhibited stunting, a sign of chronic malnutrition.

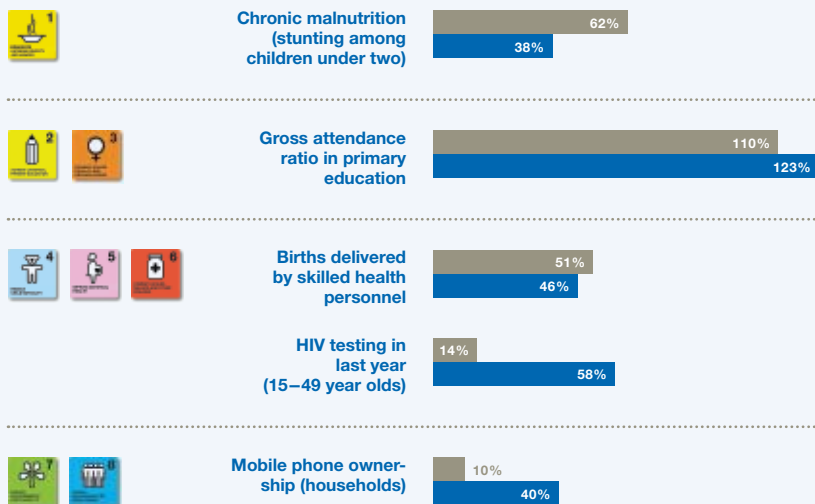
Education and health facilities were generally in poor condition. Most schools lacked sufficient number of teachers, supplies, improved latrines, and electricity. There were five health facilities when the MVP started interventions, and the average distance to a clinic was five kilometers. The burden of disease in this area was quite



## Quick Wins



## Progress on Other Key MDG Indicators



BASELINE (2005)   
YEAR THREE (2008) 



### ADAPTING THE MVP MODEL TO LOCAL DEVELOPMENT CHALLENGES

- **Improving productivity of small farms:** High population density leading to very small farm sizes and very low crop yields due to lack of fertilizer inputs
- **Preventing and treating HIV**
- **Controlling malaria**

## Principal Interventions

	2005	2006	2007	2008
<b>Quick Wins</b>				
Distribution of improved seeds and fertilizers; community nurseries	■	■	■	■
School meals program (31 schools)	■	■	■	■
Prevention and treatment of malaria, including distribution of bednets	■	■	■	■
Measles immunization	■	■	■	■
<b>Agriculture, Business Development, and Nutrition</b>				
Training for farmers, including in improved planting techniques and post-harvest management	■	■	■	■
Environmental sustainability, including integrated soil fertility management, water conservation, and tree planting	■	■	■	■
Crop diversification for income and nutrition, including ground nuts, soybeans, orange-fleshed sweet potatoes, and leafy vegetables		■	■	■
Improving and supporting farmers' links to markets			■	■
<b>Education</b>				
Construction of schools (51 classrooms), including water, sanitation, and energy			■	■
Distribution of sanitary napkins			■	■
Vocational training for out-of-school youths and youth clubs			■	■
Improving quality of education, including through teacher training and curriculum development				■
<b>Health</b>				
Construction and renovation of clinics (8), including access to water and energy	■	■	■	■
Community education and sensitization, including on nutrition, SRH, HIV/AIDS, and malaria	■	■	■	■
Prevention and treatment of HIV/AIDS and TB	■	■	■	■
Free, 24 hour universal coverage of health care	■	■	■	■
Hiring and training of health staff, including doctors, nurses, midwives, and CHWs		■	■	■
<b>Infrastructure</b>				
Improved cookstoves for schools and households		■	■	■
Grid electrification for schools and clinics		■	■	■
Construction and rehabilitation of roads (85 km) and culverts (887 meters)		■	■	■
<b>Water/Sanitation</b>				
Construction and repair of water sources, including water springs (200), piped water systems, and rainwater harvesting systems (52)	■	■	■	■
Construction of latrines in the community, schools, and households			■	■

## Accelerating Access to Care and Support: Home-based Counseling and Testing for HIV



According to UNAIDS, adult HIV prevalence in Kenya was 6.5% in 2007. Levels are as high as 9% in Sauri, which borders the Lake Victoria region of the country. At the start of the MVP,

approximately one-third of pregnant women were routinely tested for HIV infection, and approximately 14% of adults had undergone a test in the past 12 months.

HIV voluntary counseling and testing (VCT) is important both as a prevention tool and as a first step in facilitating access to life-saving care and support with antiretrovirals. To increase access to VCT, a community awareness campaign was

conducted in early 2008. Adults were offered the opportunity to have a home visit by a trained HIV counselor and undergo VCT. Of 3,180 15–49-year olds exposed to the awareness campaign, 64% agreed to be visited by counselors, of whom 98% agreed to be tested and receive the results. The proportion of adults in the population who had been tested for HIV in the past year increased to 58%. Since the start of the intervention, 76% of

pregnant women now receive HIV testing as a routine part of antenatal care, and 1,800 individuals have initiated combination antiretroviral therapy—which approximates all of those who are eligible. Michel Sidibé the Executive Director of UNAIDS, recently visited Sauri to kick-off a new initiative to eliminate mother-to-child transmission of HIV across all Millennium Village sites.

high. National adult HIV prevalence in Kenya was nearly 7% in 2007. Sauri is also in a holoendemic area for malaria, and half of the total population and almost three-quarters of children aged 5–12 had malaria parasites in their blood prior to MVP interventions, with less than 10% of children sleeping under bednets.

There is abundant water from rivers and streams, but just 7% of the population had access to an improved drinking water source prior to the MVP, with the majority using unimproved springs, which showed high levels of bacterial contamination.

### Linking Interventions to Progress-to-Date



## MDG 1

Eradicate Extreme Poverty and Hunger

The dramatic increases in maize yields can be linked to the provision of subsidized fertilizers and improved maize seeds for every farming household, plus intensive training on agricultural practice throughout the cropping season, including land spacing, fertilizer application, pest management, and post-harvest storage. Community cereal banks were established, and farmers received a guaranteed minimum price after the harvest but also benefitted from sales at peak prices. Extensive efforts to introduce high value crops and livestock production to address nutrition and poverty soon followed. Farmers were organized into common interest producer groups, trained in agronomic practices, and were linked to potential markets. Some of the enterprises included poultry, fish farming, onions, and honey. Farmers have also been linked to certified agrodealers and microfinance institutions to obtain loans for agricultural investments.

#### MDG 1: BIGGEST IMPACTS

- Average maize yields increased from 1.9 tons per hectare to 5.0 tons per hectare
- Just 4% of children under two are now underweight, down from 26% at baseline, and stunting has decreased by 39%

#### MDG 2: BIGGEST IMPACTS

- Near universal coverage of school meals in primary schools, up from 18%
- Consistently high levels of attendance



## MDG 2

Achieve Universal Primary Education

The continued expansion and support of the school meals program supports the retention of students in school. In this regard, efforts have focused on ensuring the program's sustainability. Select schools were given dairy cows, with the milk sold to support the school meals programs. In addition, some schools now have school gardens and poultry, which also contributes to nutritious school meals and generates income for the program. Education programs have also focused on improving educational outcomes among girls. In response to various challenges voiced by adolescent girls, the MVP developed a program for adolescent girls.

## Empowering Adolescent Girls: Sanitary Napkins, Youth Friendly Health Services, and Clubs at Schools



In communities like Sauri, adolescent girls face a number of challenges, such as large amounts of time spent on domestic chores, lack of access to health information, and impediments to education, such as the lack of gender separate latrines at school. In addition, because these girls leave their households or villages after marriage, communities often have little incentive to invest in their education, health, or well-being. In Sauri, adolescent girls identified a number of challenges affecting their lives. Lack of access to sanitary napkins was an obstacle for attending school because girls

often missed school during menstruation. In response, the MVP trained local producer groups to make re-usable sanitary napkins, which were distributed to girls in primary schools. The program also trained teachers and peer educators at each school to facilitate monthly training sessions on menstruation, sanitary napkins, and hygiene. Another program created regular youth friendly days at clinics, which gave young boys and girls the opportunity to access treatment, information, and reproductive health services. Additionally, girls empowerment clubs were started at primary schools. At

the clubs' weekly meetings, girls discuss issues that affect them, including reproductive health, HIV/AIDS, and career aspirations, often receiving counseling, training, and education on these subjects. This diverse range of programs has had numerous impacts on the lives of adolescent girls.



## MDGs 4, 5, and 6

Reduce Child Mortality, Improve Maternal Health, and Combat HIV/AIDS, Malaria and Other Diseases

Expansion of the existing health facilities' infrastructure and services and creation of a paid community health worker program were crucial in increasing access to essential healthcare. Efforts to prevent malaria have dramatically reduced prevalence among all age groups, transforming a community that previously experienced holoendemic malaria. Distribution of long-lasting insecticidal bednets targeting 48,000 sleeping sites and the availability of modern diagnostics and treatment for malaria in all clinics were the most important planks of the malaria strategy. HIV care, which was previously only available at the nearby referral hospital, has been decentralized to seven clinics that work as satellite sites providing antiretroviral therapy and sending blood samples to the referral lab, which was upgraded to conduct CD4 counts, blood counts, and biochemistry for patient monitoring. Community-based testing has also significant increased rates of HIV testing.

### MDGS 4, 5, AND 6: BIGGEST IMPACTS

- Near universal coverage of measles immunization for children
- Dramatic reductions in malaria prevalence, with levels among the total population decreasing from 50% to just 8%
- Nearly two-thirds of children under five sleeping under a bednet, up from 10%
- Proportion of pregnant women tested for HIV has more than doubled to 76%



## MDGs 7 and 8

Ensure Environmental Sustainability and Develop A Global Partnership For Development

Before MVP interventions, access to clean water was quite low, mainly due to high levels of bacterial contamination. In response, the MVP has protected 200 water springs, which are managed by community committees that were trained on spring catchment conservation and techniques to reduce contamination. Water access was also increased through a collaboration with the government that extended an existing water pipeline, providing piped water to households and several schools. The piped water is safe for drinking but many of the improved springs are still contaminated.

Modern toilet blocks were constructed in primary schools to improve hygiene, privacy, and safety in the schools. At the household level, the MVP provided materials to households to construct improved ventilated pit latrines. A community-wide program was established to treat water in homes. Campaigns through drama, art, and community health workers stress the importance of safe water systems and proper hygiene.

Following a mapping and prioritization of roads for improvement, the MVP collaborated with the government to construct bridges, improve 85 kilometers of roads, and build 887 meters of culverts. In addition, the national grid was extended across Sauri in collaboration with the government's Rural Electrification Program, providing electricity to primary schools, clinics, and the market centers. Energy saving institutional cookstoves, which use approximately one half the amount of fuelwood compared to previous stoves, were installed in schools, and local groups were trained to construct energy saving cookstoves.

### MDGS 7 AND 8: BIGGEST IMPACTS

- Proportion of households that own a mobile phone increased fourfold



### Priorities for the Next Phase

While significant progress has been made on several fronts, notably the tremendous increases in crop yields to address the high levels of food insecurity in Sauri, as well as important interventions that have dramatically reduced the high burden of malaria and are preventing and treating HIV, various priorities must be addressed to ensure that these achievements are sustainable and continue. In this regard, efforts will continue to strengthen community processes, including aligning MVP committees with local government structures. The partnership with the District Development Committee will transition toward increased financial and managerial support from the district. As the MVP continues the transition toward commercial agriculture, farmers will have continued access to agriculture loan programs through local Equity Bank branches and other microfinance institutions. In addition, further capacity development in business management and aggregation of producer groups into cooperatives will help strengthen their competitiveness for markets. In the education sector, the emphasis will be on the quality of education, with a focus on lowering student-teacher ratios by engaging the government and school management committees to deploy more teachers and conducting more in-service training for teachers. In the health sector, an important intervention will be the creation of a comprehensive program for orphans and vulnerable children. Access to water remains a priority, with the extension of a piped water system and further engagement with the district water office to maintain water systems. Lastly, the MVP will continue work to connect more communities to the electricity grid as well as engage with the government to upgrade roads and maintain them regularly. ■



## Partners in Sauri

*The following provides a list of many of the partners who provide operational and in-kind support in Sauri. A more complete list of MVP partners and donors is provided in the appendix.*

### GOVERNMENT OF KENYA

#### Constituency Development Fund

Construction of primary school classrooms and bursary for post-primary education for needy pupils

#### Government of Kenya

Staffing, water testing and supply, community mobilization, security conflict resolution, rural electrification, HIV/AIDS testing, counseling, and treatment, school, health and other infrastructure improvements

#### Local Authority Transfer Fund

Construction of community learning resource center and school classrooms

### NGO /IO

#### CARE Kenya

Prevention of mother to child transmission services in health clinics, nutritional supplementation and staff training

#### CDC/KEMRI

HIV care and support

#### GTZ

Technical support, especially for improved household cookstoves

#### Heifer International

Dairy cows for schools, capacity building on dairy goats

#### Rabuor Sinaga Association

Financial services, general development

#### UNAIDS

HIV/AIDS and PMTCT

#### World Food Program

Support of the school meals program

### PRIVATE SECTOR/ FOUNDATION

#### Agricultural Market Development Trust

Capacity building of agro-dealers, supervision, and certification of practice

#### Agrium Inc.

Agricultural inputs

#### Ericsson

Mobile telephony infrastructure

#### Equity Bank

Input credit and savings programs

#### General Electric

Medical equipment

#### JM Eagle

Improved water infrastructure

#### Kentainer

Ecosan toilets, PVC tanks

#### Lenovo

Computer technologies

#### The Mosaic Company

Agricultural inputs

#### Procter & Gamble

Sanitary napkins for adolescent girls

#### SAGA

Input credit programs for farmers

#### Sony Ericsson

Mobile phone technologies

#### Sumitomo Chemical

Long-lasting insecticidal bednets



# Pampaida, Nigeria



Pampaida is located in the Ikara Local Government Area in the northern part of Kaduna State in northwestern Nigeria. The area is in the transition zone between the Guinea Savanna and the Sudano-Savanna of West Africa. This zone is characterized by desertification and land degradation caused by frequent droughts, low and highly unpredictable rainfall, high temperatures, and land pressure from human and livestock populations.

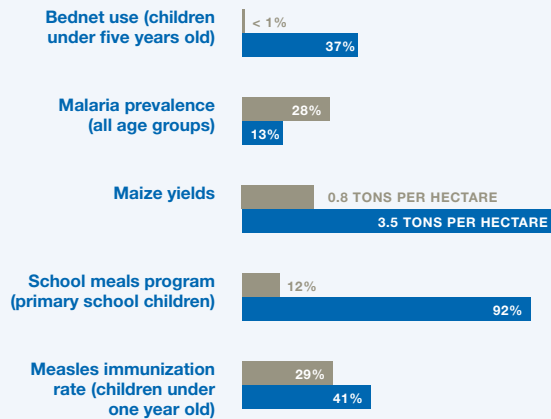
The MVP site comprises 28 settlements spread over 41 square kilometers. As of survey timing, the population consisted of approximately 6,000 people, with an average of six people per household. Livelihoods depend almost exclusively on subsistence agriculture and livestock. For three to five months each year, the region experiences profound food shortages. Prior to the MVP's work, poverty and hunger touched nearly every household in the community, with 90% of the population living below \$1 a day and high levels of malnutrition, with 44% of children under five chronically undernourished (stunted).

Pampaida is remote, isolated, and lacked even the most basic infrastructure and services. Before MVP interventions, community members travelled 10 kilometers to the closest market. The nearest paved road was 12 kilometers away, reachable by a poor quality dirt road. There was no electricity and increasingly scarce fuelwood was the main energy source. There was neither mobile phone coverage nor landlines. With just one borehole functioning intermittently, access to safe water was extremely limited. No households had access to an improved sanitation facility, and even the schools lacked functioning latrines. There was just one dilapidated primary school, with only five teachers. There was no health clinic, and the nearest hospital was 40 kilometers away.

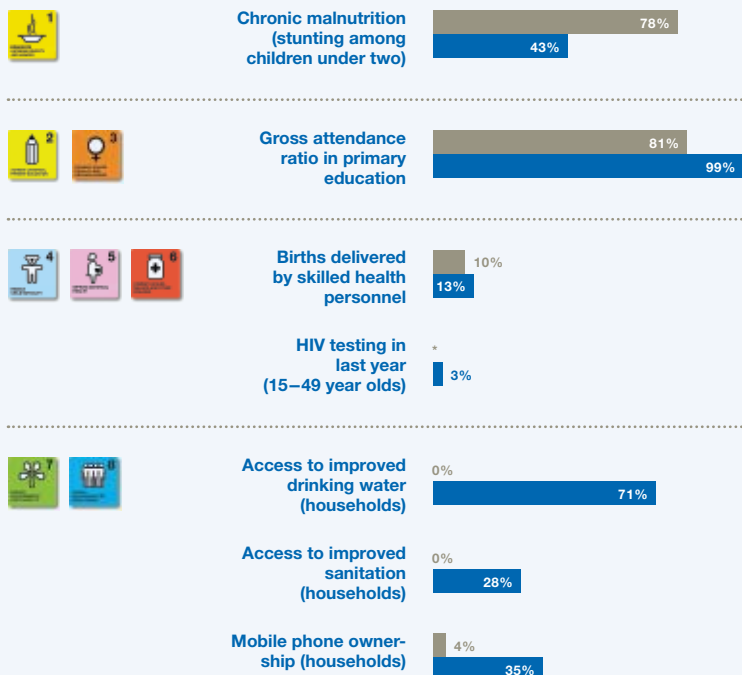




## Quick Wins



## Progress on Other Key MDG Indicators



BASELINE (2006)   
YEAR THREE (2009) 

\* Data is not available.



### ADAPTING THE MVP MODEL TO LOCAL DEVELOPMENT CHALLENGES

- Shifting from pastoral to agricultural livelihoods:** Frequent droughts, exhausted land, and lack of market access leading to profound food shortages and reliance on pastoral livelihood
- Improving primary school enrollment rates:** Very limited education facilities, with few teachers
- Instituting basic health services**
- Improving access to safe water**

## Principal Interventions

	2006	2007	2008	2009
<b>Quick Wins</b>				
Distribution of improved seeds and fertilizers	■	■	■	■
School meals program (10 schools)		■	■	■
Prevention and treatment of malaria, including distribution of bednets		■	■	■
Measles immunization			■	■
<b>Agriculture, Business Development, and Nutrition</b>				
Training for farmers, including in improved agriculture techniques and management	■	■	■	■
Environmental sustainability, including integrated soil fertility management and tree planting	■	■	■	■
Livestock interventions, including poultry farming, distribution of goats and workbulls		■	■	■
Crop diversification for income and nutrition, including tomatoes, soybeans, rice, and cowpeas			■	■
Improving and supporting farmers' links to markets and other enterprise development			■	■
<b>Education</b>				
Construction of schools (5), including access to water, latrines, and energy	■	■	■	■
Improving quality of education, including through teacher training and curriculum development		■	■	■
<b>Health</b>				
Construction and renovation of clinics (4), including access to water, solar energy, and sanitation	■	■	■	■
Hiring and training of health staff, including doctors, nurses, midwives, and CHWs		■	■	■
Free, 24 hour universal coverage of health care (4 clinics)			■	■
Prevention and treatment of HIV/AIDS and TB			■	■
<b>Infrastructure</b>				
Upgrading, repair, and construction of roads (22 km)	■	■	■	■
Access to energy in the community and institutions, including for boreholes and clinics		■	■	■
Network tower construction and coverage			■	■
<b>Water and Sanitation</b>				
Construction and repair of water sources, including boreholes (23), shallow wells (38), rainwater harvesting system		■	■	■
Improved latrines in the community and hygiene training		■	■	■

## Enhanced Rural Livelihoods Facilitate Gains in Primary School Attendance



Attendance rates in primary schools have increased significantly since the start of the MVP. Pampaida's gains in the education sector highlight the synergies between stable rural livelihoods and education. Before MVP interventions, low agricultural productivity and water scarcity meant that Fulani tribesmen favored cattle over agriculture and lived a highly nomadic lifestyle. MVP's environmental, agricultural, and

infrastructure interventions encouraged migrant groups to adopt a more settled lifestyle, and encouraged cattle-farmers to diversify their livelihoods. Water points eliminated the need for dry season migrations to water cattle herds, and increased the likelihood of year-round crop production. With parents more settled in one place, and livelihoods more secure, children were more likely to be enrolled in schools.

### Linking Interventions to Progress-to-Date



## MDG 1

Eradicate Extreme Poverty and Hunger

Declining poverty and hunger rates can be attributed to the combined effect of several initiatives. In 2006 and 2007, subsidized seed and fertilizer for maize led to a major increase in crop yields. At the same time, infrastructure improvements have helped translate these early yield increases into longer-term gains. For example, a 12-kilometer tarred road ensured markets could be accessed and produce sold, grid electrification assisted in agro-processing, a community storage warehouse helped communities market crops strategically, and additional safe water points encouraged inhabitants to adopt more settled agrarian lifestyles. The community warehouse that stores surplus helped households to better plan for hunger periods. The community stockpiled 10% of the 2007–08 harvests, part of which was used to sustain a school feeding program. Revenue from the sale of a portion of the 10% excess has also been used to raise capital for agro-inputs. This has provided a valuable source of microfinance for farmers after input subsidies were phased out.

Following these agriculture interventions, Pampaida has experienced the return of youth back from urban areas and an influx of formerly dispossessed and migratory farmers into the region. The area under cultivation has increased by 44%, and there has been a local proliferation of local business entrepreneurs and agro-input traders. This steady transition toward agro-business has emphasized bringing farmers into commodity groups, establishing broader linkages to commercial banks, and selling produce to major agricultural produce buyers.

#### MDG 1: BIGGEST IMPACTS

- Average maize yields have increased significantly from 0.8 t/ha to 3.5 t/ha
- 44% increase in land area under major staple crop cultivation
- A 45% reduction in levels of chronic malnutrition (stunting) among children under two

### MDG 2: BIGGEST IMPACTS

- A 20% increase in gross attendance rates
- Average test scores up 41% for students in grades one through six in primary school
- Levels of children receiving school meals has increased from 12% to 92%



## MDG 2

Achieve Universal Primary Education

Great progress has been made in improving education access and quality. Gains in education quality have been achieved through the recruitment of 15 additional teachers, teacher training sessions to facilitate capacity development, and supplying essential learning materials to children. Gains in enrollment can be attributed to a number of interventions. In 2006 and 2007, a series of intensive sensitization campaigns with religious and community leaders emphasized the importance of universal enrollment and the need for gender equality. Door-to-door household visits were used to appeal to parents to enroll children. The school meals program further incentivized enrollment and bolstered retention.

Sensitization coincided with rapid improvements in school infrastructure. Early negotiations with the government ensured that the existing dilapidated primary school was rebuilt by the end of 2007. The provision of water points also played an important role in boosting enrollment, as perennial water points provided a means for normally migrant communities to remain in settlements during the dry seasons. In order to accommodate additional students, the MVP initiated construction and equipping of ten small (two classroom) satellite schools. In addition, teacher training is improving the quality of education.

## Sustaining Gains in Access to Clean Water: Community-based Water Management



Pampaida has made great strides in access to clean water—from virtually 0% to current levels of 71% of households now having access to a protected water source. Major support has been provided to water-related infrastructure development including boreholes, a rainwater harvesting tank, and protected shallow wells. At the same time, efforts have been made to ensure that existing water sources are managed in a

financially sustainable manner. First, communities were active and participated in borehole construction. Second, the water and sanitation committee now collects a monthly fee from households, which is used to fund maintenance and repairs. Additionally, the MVP has engaged and trained five villagers in borehole maintenance. Using this model, the MVP has been able to focus resources to expand water and sanitation activities.



## MDGs 4, 5, and 6

Reduce Child Mortality, Improve Maternal Health, and Combat HIV/AIDS, Malaria and Other Diseases

Prior to the MVP, there were few, if any, health services available to the community. While planning, resource mobilization, and construction began early, the first health clinic, which is staffed by two doctors, was only completed in early 2008. To facilitate a continuum of care to the household level, 10 volunteer village health workers (VHW) and two more paid community health workers (CHWs) were hired (VHWs are less skilled than CHWs). As a result, the MVP has been primarily responsible for enhancing access to basic health care for HIV/AIDS, TB, malaria, and other diseases. A two- to threefold increase in levels of antenatal care has been the result of the VHWs' efforts to identify and sensitize pregnant mothers on the importance of seeking skilled providers. Work remains to strengthen institutional delivery levels as well as increase the use of modern contraceptives. In addition, campaigns continue to further increase coverage with basic immunizations, vitamin A, and deworming.

### MDGS 4, 5, AND 6: BIGGEST IMPACTS

- Measles immunization has increased by 40%
- Average number of antenatal visits a woman receives during pregnancy is 2.7, up from 1.1
- Malaria bednet use has increased from less than 1% to 37% among children under five



## MDGs 7 and 8

Ensure Environmental Sustainability and Develop A Global Partnership For Development

Access to improved water has shown major gains and has had far-reaching consequences for the agricultural, health, and education sectors. In partnership with government, the Project has built 23 boreholes, a rainwater harvesting tank, and protected 38 of 58 shallow wells. The success of these interventions has been underpinned by careful attention to community engagement and participatory planning while ensuring that groundwater was sustainably tapped.

In Pampaida, promotion of hygiene and sanitation requires a long-term approach. From 2010 onwards, improved household latrines will be a priority. Infrastructure for improved technology will also be a focus. Through a partnership with Zain and Ericsson, Pampaida has benefitted from the construction of a GSM tower that has increased mobile phone signal and Internet coverage in the entire cluster. A close partnership with the Kaduna State Ministry of Rural Electrification has resulted in recent grid electrification.

### MDGS 7 AND 8: BIGGEST IMPACTS

- Access to improved drinking water from 0% to 71%
- Access to improved sanitation have increased from 0% to 28%
- Cell reception now exists across Pampaida, and 35% of households now own a mobile phone



### Priorities for the Next Phase

As agricultural productivity continues to grow, the bridging micro-finance organizations set up by the MVP and managed by the community may no longer meet the production needs of more enterprising farmers. In future years, priority will be given to mobilizing farmers into cooperative groups so they meet the qualifying criteria for accessing larger-scale credit from banking institutions. In health, the top priority is to ensure recruitment of trained midwives to perform clinic-based deliveries. At the same time, the MVP must continue to look for ways to reliably and sustainably procure essential medical supplies. In infrastructure, the provision of improved latrines at the household-level is a priority, as is expansion of the electricity grid to more remote settlements and institutions. In education, emphasis will be given to the process of government advocacy to ensure that the seconding of teachers matches the gains made in infrastructure and enrollment. In the long term, the MVP will prioritize the expansion of satellite schools to perform full, rather than merely bridging, education functions. ■





## Partners in Pampaïda

*The following provides a list of many of the partners who provide operational and in-kind support in Pampaïda. A more complete list of MVP partners and donors is provided in the appendix.*

### GOVERNMENT OF NIGERIA

#### **Kaduna State Government**

Resources, policy guidelines, secondments in all sectors

### NGO/IO

#### **Doctors Without Borders**

Eye screening and treatment

#### **Global HIV/AIDS Initiative Nigeria (GHAIN)**

HIV/AIDS support

#### **Hope for the Blind**

Prevention and treatment of blindness

#### **Kaduna Agricultural Development Project**

Training and technical expertise for maize production

#### **Leventis Foundation**

Youth agricultural training

#### **SASAKAWA 2000**

Training and technical expertise in for maize production

#### **WATSAN**

Support and knowledge transfer on water management

#### **WECARE**

Alternate energy sources

### PRIVATE SECTOR/ FOUNDATION

#### **Agrium Inc.**

Agricultural inputs

#### **Bank PHB, Unity Bank, NACRDB**

Finance partner institutions

#### **Ericsson**

Mobile telephony infrastructure

#### **General Electric**

Medical equipment

#### **Lenovo**

Computer technologies

#### **The Mosaic Company**

Agricultural inputs

#### **Nestle, Grand Cereals, Olam Nigeria**

Agricultural produce buyers

#### **Premier Seeds**

Provided improved seeds

#### **Sony Ericsson**

Mobile phone technologies

#### **Sumitomo Chemical**

Long-lasting insecticidal bednets

#### **SAWA Rice**

Solid fertility management and training

#### **Zain Telecom**

Mobile telephony infrastructure

### RESEARCH INSTITUTE

#### **International Fund for Development Cooperation**

Groundnut production, processing, value-chain addition

#### **International Institute for Tropical Agriculture**

Aflatoxin, soil fertility management, seed hybrids

#### **National Universities**

Youth capacity building in all sectors



# Bonsaaso, Ghana



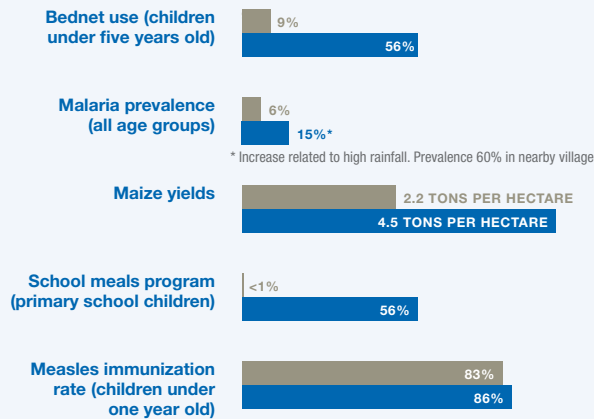
Bonsaaso is located in the Amansie West District in the Ashanti Region of Ghana. The total population of 35,000 people is spread over 389 square kilometers in six villages. The area falls within the humid tropics with two well-defined rainy seasons. There are several activities in the area that contribute to deforestation, including commercial timber extraction and cocoa farming. Gold mining also contributes to land devastation, soil degradation, and pollution of water and the environment.

Agriculture is the main livelihood source in Bonsaaso, with cocoa and palm oil the main cash crops. A total of 75–80% of the total planted area is under cocoa cultivation, while the remaining portion is for production of food and staples.

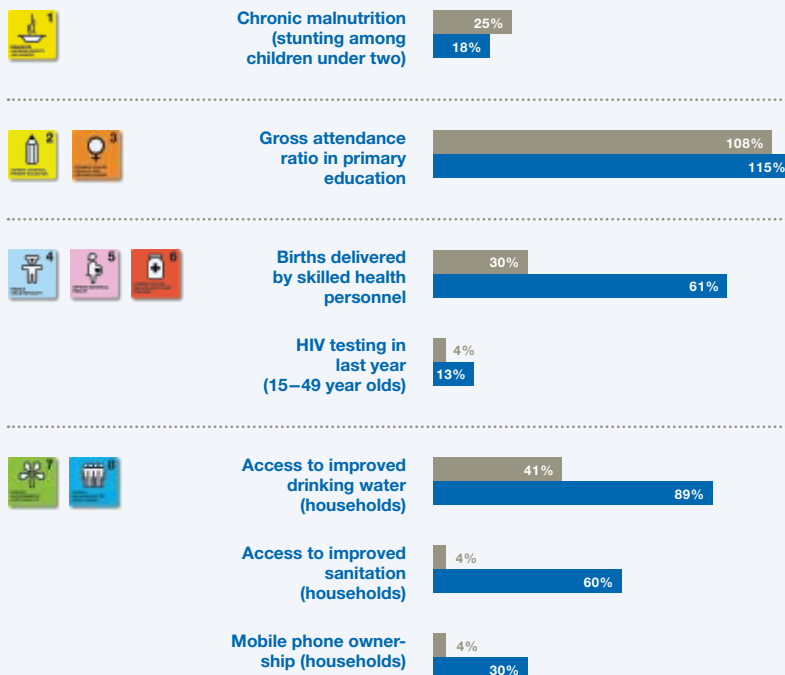
When the MVP first began interventions in the area, levels of poverty were high, with nearly 70% of community members living on less than \$1 a day. Infrastructure development lagged behind—with little access to safe drinking water, electricity, and communication services. Just 4% of households had access to improved sanitation. There were few clinics. Primary schools were poorly staffed, largely a result of a lack of accommodation for teachers. Roads were dusty during the dry season and impassable during the rains.



## Quick Wins



## Progress on Other Key MDG Indicators



BASELINE (2006)   
YEAR THREE (2009) 

### ADAPTING THE MVP MODEL TO LOCAL DEVELOPMENT CHALLENGES

- Improving roads:** Hilly terrain and torrential rains make roads impassable for large parts of the year. Access to markets and referral hospitals was extremely difficult.
- Emphasizing high value crops:** The high potential value of local palm oil and cocoa production was undeveloped.
- Improving school quality:** Low quality primary education due to lack of incentives and housing to attract and retain teachers.
- Reducing financial barriers to health:** User fees limited utilization of health care services.

## Principal Interventions

	2006	2007	2008	2009
<b>Quick Wins</b>				
Distribution of improved seeds and fertilizers	■	■	■	■
School meals program (22 schools)	■	■	■	■
Prevention and treatment of malaria, including distribution of bednets	■	■	■	■
Measles immunization	■	■	■	■
<b>Agriculture, Business Development, and Nutrition</b>				
Crop diversification for income and nutrition, including citrus, tomatoes, okra, cowpeas, rice, and tomatoes	■	■	■	■
Environmental sustainability, including integrated soil fertility management tree planting, and bushfire management	■	■	■	■
Linkage of farmers to markets, including in palm oil production; farmer cooperative development	■	■	■	■
Livestock interventions and artificial insemination	■	■	■	■
Training for farmers, including in improved agriculture techniques, management, and farmer field schools		■	■	■
<b>Education</b>				
Improving quality of education, including through teacher training and curriculum development		■	■	■
Construction of schools (5), including access to water, latrines, and energy		■	■	■
<b>Health</b>				
Hiring and training of health staff, including doctors, nurses, midwives, and CHWs	■	■	■	■
Free, 24 hour universal coverage of health care (7 clinics)		■	■	■
Prevention and treatment of HIV/AIDS and TB		■	■	■
Community education and sensitization, including on nutrition, hygiene, family planning, and HIV/AIDS		■	■	■
Construction and renovation of clinics (7 clinics), including access to water, solar energy, and sanitation		■	■	■
<b>Infrastructure</b>				
Upgrading, repair, and construction of roads (219 km), culverts (162), and bridges	■	■	■	■
Network tower construction and coverage; computers in schools; community learning center, laptops for schools	■	■	■	■
Improved cookstoves in institutions and households			■	■
Grid electrification and solar energy for 10 communities			■	■
<b>Water/Sanitation</b>				
Construction and repair of water sources, including boreholes (25) and iron and manganese removal systems	■	■	■	■
Latrine construction in schools and households, community hygiene education	■	■	■	■

## Linking Interventions to Progress-to-Date

### MDG 1

Eradicate Extreme Poverty and Hunger

Major increases in maize yields were witnessed in the first growing season after improved seed and fertilizer inputs were used. With the enhanced food security from staple crop production, efforts quickly turned toward agribusiness development to capitalize on the local presence of high-value crops such as cocoa and palm oil. To support these efforts, farmer field schools were established to mentor groups of farmers in new and improved practices. Cocoa productivity among participating households nearly doubled, while palm oil production and processing became an important source of income. Farmers were linked to agroprocessors, and existing farming cooperatives, including women's groups, were supported with management training and linkages to credit. Female-headed households were specifically targeted with support to begin palm oil processing. Using a community vehicle purchased by the Project and capitalizing on road improvements, a community-based management team manages the transport of palm oil to local markets in the district.



#### MDG 1: BIGGEST IMPACTS

- Average maize yields increased from 2.2 tons per hectare to 4.5 tons per hectare
- A 27% decrease in chronic malnutrition (stunting) among children under two

## A Comprehensive Program to Increase Safe Deliveries



Maternal mortality in much of sub-Saharan Africa remains high, with women delivering at home without access to obstetric care. In Bonsaaso, deliveries by skilled birth attendants increased from 30% to 61% in just three years. This increase was the result of a range of interventions. First, community education and mobilization on the importance of antenatal care and safe delivery took place through community meetings, village health committees, health days,

and household visits by community health workers who formally register all pregnant women. Second, infrastructure improvements included the deployment of two ambulances, road improvements, and mobile phone coverage that together reduced major access barriers. Third, user fees at the point of service were abolished through an agreement with the government insurance system. Fourth, the MVP constructed and rehabilitated health clinics. Finally, through salary top-ups,

training, and support, an additional six midwives were hired. The experience in Ghana has highlighted the importance of a multi-component cross-sectoral strategy for improving institutional delivery rates and, furthermore, that success can be achieved in a relatively short period of time.

### MDG 2: BIGGEST IMPACTS

- 56% of primary school students now receive a daily school meal, up from less than 1%



## MDG 2

Achieve Universal Primary Education

With the recent abolition of school fees, levels of school attendance were high even before MVP interventions. The MVP has improved the education infrastructure by building and refurbishing 52 classrooms, including connecting schools to the electricity grid, building gender separate latrines, and providing access to clean water. Issues of quality have also been a focus, and the most significant challenge in the education sector has been the lack of teachers, particularly trained teachers, because of the difficulties in attracting trained teachers to remote rural areas. In response, the Project has focused on training, which has reached 61 teachers, and building housing for teachers. In collaboration with CARE, an education project has focused on girls, including sensitization for teachers, training for 90 Parent/Teacher Associations, a mentor camp for girls, and distribution of laptops to select girls.

### MDGs 4, 5, AND 6: BIGGEST IMPACTS

- 61% of births attended by skilled health personnel, double from baseline levels
- 86% of women have at least four antenatal care visits, up from 50%
- Threefold increase in HIV testing levels among adults
- 56% of children sleeping under bednets, up from less than 10%



## MDGs 4, 5, and 6

Reduce Child Mortality, Improve Maternal Health, and Combat HIV/AIDS, Malaria and Other Diseases

The start of the Project focused on quick wins in health. There was a mass bednet distribution, followed by regular campaigns for basic immunization, vitamin A supplementation, and deworming. In parallel, rapid efforts were undertaken to improve the utilization and quality of health services. The Project collaborated extensively with the district government, which seconded most of the staff to the clinics serving the area, with the MVP topping up salaries to attract and retain health workers to this remote rural area. As a national government insurance scheme led to persistent financial access barriers to healthcare, the Project established an agreement to provide progressive subsidizes for Bonsaaso residents that eliminated fees at the point of service. An existing cadre of community health workers was supplemented with additional staff and training. Finally, a major push was made to increase antenatal care and safe deliveries.

## Sanitation Successes: Collaborating to Build Dramatic Increases in Access to Improved Sanitation



In Bonsaaso, access to improved sanitation increased dramatically from 4% to 60%, largely through the construction of covered pit latrines in households. Sanitation was identified as an early priority by the community, and a program was quickly established to pool resources in the community. The MVP provided materials and technical support; the government supported the effort by subsidizing construction costs; and the community provided much of the labor, particularly pit excavation. Skilled masons were recruited

to train community members to make the concrete slabs to cover the pits. To ensure sustainability and facilitate latrine maintenance, the MVP has worked with the community to leverage a nominal borehole usage fee. Existing water and sanitation committees were also strengthened to include an engineer, an environmental health officer, and a community development specialist. Once these committees were formed, the MVP's technical team delivered basic maintenance and repair training. Finally, to consolidate

these gains and reinforce norms on good hygiene, the community development and education sectors conducted a series of plays for youth in the community.



## MDGs 7 and 8

Ensure Environmental Sustainability and Develop A Global Partnership For Development

There has been tremendous progress in the water and sanitation sector in Bonsaaso. The MVP and the District Assembly have worked together to drill new hand pumps and fix broken down pumps, providing clean water to most of the population. However, underground water sources in Bonsaaso had high concentration of iron and manganese compounds that were well above safe World Health Organization limits. The government and the MVP installed iron and manganese removal tanks (Mwacafe plants)—concrete structures containing specialized material (activated carbon, coated sand and virgin sand) that entirely removed iron and manganese. By late 2008, the MVP had installed systems for five communities. The Project also initiated a cost-sharing program with the government and the community to achieve significant increases in access to sanitation among communities that, prior to the MVP, had almost no access to improved sanitation.

### MDGS 7 AND 8: BIGGEST IMPACTS

- Access to a safe water source more than doubled, from 41% to 89%
- Major gain in access to improved sanitation, from 4% to 60%
- Ownership of mobile phones has increased from 4% to 30%

Poor road infrastructure and underdeveloped transport services have been a significant challenge in Bonsaaso, hindering access to markets and institutions. The MVP worked with the government to invest in the rehabilitation and routine maintenance of roads, leading to the repair of 219 kilometers of roads and the construction of 162 culverts under the government's routine maintenance program. There has also been significant progress in access to energy. From a situation of zero electricity connection prior to the MVP, eight communities are now fully connected to the national grid, with several more communities soon to be connected. Solar photovoltaics have also been installed in clinics to ensure off-grid access in hard to reach areas.

A partnership with Ericsson and Zain has resulted in the construction of five mobile phone towers, giving coverage to approximately 30,000 people. All health facilities, selected schools, and learning centers will be connected to the Internet.

### Priorities for the Next Phase

For the coming period, MVP has identified several priorities to ensure that progress continues. Foremost is strengthening the capacity of local institutions to take over Project management. To further economic gains and a transition to commercial farming, the Project will work to develop value chains in palm oil, establish market linkages, and connect farmers to microfinance institutions. Similarly, the MVP plans to continue its engagement with all levels of government in enhancing the access to energy, roads, ICT, and water. Finally, other planned activities include an emerging partnership with the Forestry Commission to improve community-based forest management as well as programs with other national institutions to regularize small-scale mining activities. ■



## Partners in Bonsaaso

*The following provides a list of many of the partners who provide operational and in-kind support in Bonsaaso. A more complete list of MVP partners and donors is provided in the appendix.*

### GOVERNMENT OF GHANA

#### Amansie West District Assembly

Governance framework, provision of water, capacity building, and advocacy

#### Department of Cooperatives, Amansie West District

Business development

#### Department of Feeder Roads

Road construction and rehabilitation

#### District Cooperatives Department/Rural

#### Enterprises Project

Business development

#### Environmental Health Department

Technical assistance

#### Forestry Commission of Ghana, Wildlife and Forestry Services Divisions

Agriculture research and development

#### Ghana AIDS Commission

Technical assistance

#### Ghana Education Service

Technical assistance

#### Ghana Health and Education Initiative

Technical assistance

#### Ghana Health Service

Technical assistance on health

#### Komfo Anokye Teaching Hospital

Clinic services

#### National Youth Employment Program

Community development

### NGO/IO

#### Americares

Medical equipment

#### Amansie West Rural Bank

Microfinance

#### CARE

Support for girls enrollment and retention in school

#### Ghana Community Based Rural Development Project (CBRDP), World Bank

Community development

#### Heifer International

Livestock activities

#### Himalayan Cataract Project, USA

Cataract services

#### One Laptop Per Child

Information and communication technologies

#### UNAIDS

HIV/AIDS and PMTCT

#### UNCDF

Community development

#### UNICEF

School nutrition

### PRIVATE SECTOR/ FOUNDATION

#### Chinese Water and Energy Company

Access to energy

#### Ericsson

Mobile telephony infrastructure

#### General Electric

Medical equipment

#### Inveneo

Provision of computers in schools/clinics

#### Juaben Oil Mills Co.

Agribusiness partnership

#### JM Eagle

Improved water infrastructure

#### Korandan, Ltd

Technical assistance on agriculture/aquaculture

#### Lenovo

Computer technologies

#### MTN

Information and communication technologies

#### Sony Ericsson

Mobile phone technologies

#### Sumitomo Chemical

Long-lasting insecticidal bednets

#### Zain Telecom

Mobile telephony infrastructure

### RESEARCH INSTITUTE

#### Council for Industrial and Scientific Research

Agricultural research on improved germplasm, trainings, demonstration plots, and yield assessments

#### Cocoa Research Institute of Ghana

Agriculture research and development

#### Crop Research Institute

Agriculture research and development

#### Forestry Research Institute of Ghana

Agriculture research and development

#### Institute of Industrial Research

Technical assistance on energy

#### International Institute for Tropical Agriculture

Provision of extension services for agriculture

#### Oil Palm Research Institute

Agribusiness partnership

#### Soil Research Institute

Agriculture research and development



# Mwandama, Malawi



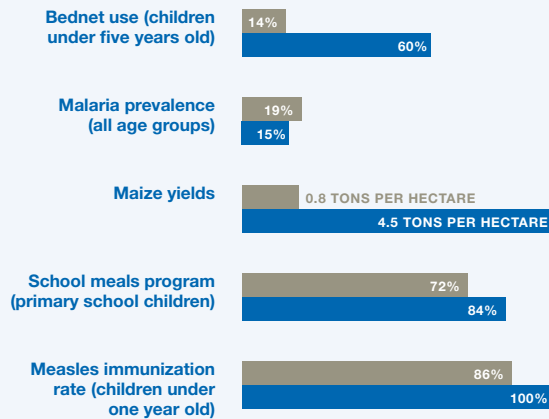
Mwandama is located in Zomba District in southern Malawi. The site has 35,000 residents living in seven villages, spread out over 72 square kilometers. Population density is high, ranging from 500 to over 600 people per square kilometer in some areas. The landscape consists of steep and gentle slopes, with valleys that are water logged for a large part of the year. The region has a sub-humid tropical climate and experiences one rainy season a year.

Nearly three-quarters of the population lived off subsistence farming when the MVP started operating, with 74% of the population living on less than \$1/day. Food insecurity was pervasive and chronic, with nearly half of children under five exhibiting stunting, a sign of chronic malnutrition.

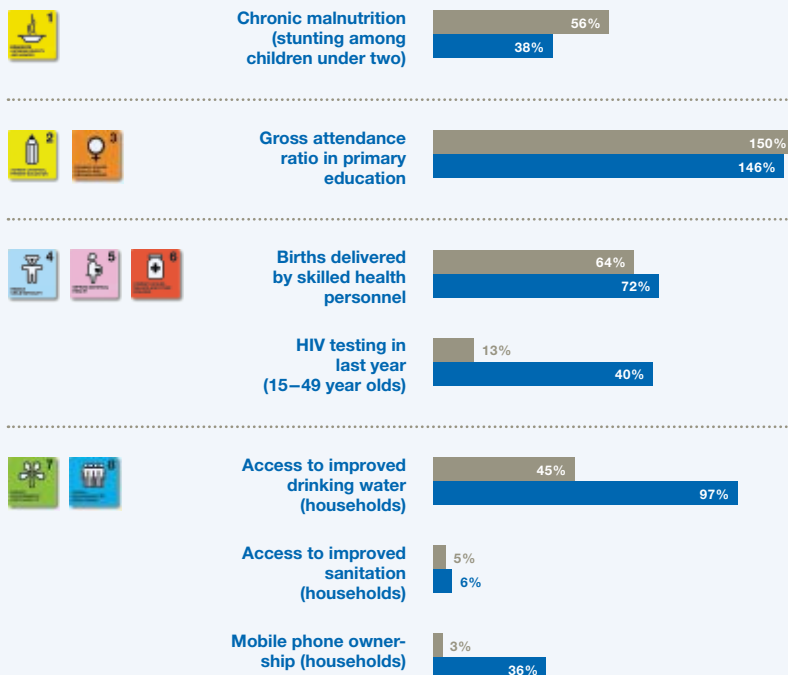
Mwandama also lacked basic facilities and infrastructure. There were no landlines, no electricity, and very limited health infrastructure—with no clinic in the site and the closest referral hospital more than 20 kilometers away. HIV prevalence was estimated to be 12%. Access to clean water was limited, with community members, primarily women, retrieving water from open shallow wells located in inland valleys. These open sources of water are usually muddy and often have bacterial contamination.



## Quick Wins



## Progress on Other Key MDG Indicators



BASELINE (2006)   
YEAR THREE (2009) 



### ADAPTING THE MVP MODEL TO LOCAL DEVELOPMENT CHALLENGES

- **Addressing chronic hunger:** Very poor maize yields led to chronic and pervasive food insecurity
- **Improving water quality:** Reliance on contaminated sources from shallow wells
- **Strengthening primary health care services:** No clinic in the Project area
- **Preventing and treating HIV**

## Principal Interventions

	2005	2006	2007	2008
<b>Quick Wins</b>				
Distribution of improved seeds and fertilizers	■	■	■	■
School meals program (12 schools)		■	■	■
Prevention and treatment of malaria, including distribution of bednets	■	■	■	■
Measles immunization	■	■	■	■
<b>Agriculture, Business Development, and Nutrition</b>				
Training for farmers, including in improved agriculture techniques, management, and post-harvest storage	■	■	■	■
Crop diversification for income and nutrition, including tomatoes, soy beans, leafy vegetables, onions, pigeon peas, and okra		■	■	■
Environmental sustainability, including integrated soil fertility management		■	■	■
Linkage of farmers to markets			■	■
<b>Education</b>				
Construction of schools (4), including access to water and latrines			■	■
Improving quality of education, including through teacher training and curriculum development			■	■
<b>Health</b>				
Access to healthcare through integrated outreach clinics (10 per month)		■	■	■
Community education and sensitization, including on nutrition, hygiene, family planning, and HIV/AIDS		■	■	■
Prevention and treatment of HIV/AIDS and TB		■	■	■
Training of health staff, including in malaria, family planning, HIV/AIDS, and TB		■	■	■
<b>Infrastructure</b>				
Upgrading, repair, and construction of roads (22 km), culverts (50), and bridges (3)			■	■
Installation of off-grid energy system, solar PV systems, and solar charged lanterns; improved cookstoves				■
<b>Water/Sanitation</b>				
Construction and repair of water sources, including boreholes (12), hand-dug wells, rainwater harvesting, and small piped water system		■	■	■
Latrine construction in institutions and community hygiene education				■

# Dramatic Gains in Crop Yields to Boost Food Security, Address Malnutrition, and Raise Incomes



The community in Mwandama has seen tremendous increases in maize yields, addressing the extreme food insecurity experienced in that area before the MVP started interventions. At that time, farmers averaged maize yields of just 0.8 tons per hectare. Years of cultivation, without the use of fertilizers, have depleted the soil of many necessary nutrients. Improved access to fertilizer (50 kilograms each of NPK and UREA) and 10 kilograms of hybrid maize seed were provided to all farmers through

a subsidy program similar to a program at the national level. In the first year of interventions, maize yields more than doubled, eventually reaching 5.2 tons per hectare, and averaging 4.5 tons for three years of interventions. The yields obtained in Mwandama are almost twice that obtained nationwide and could be partially attributed to the intensive field level trainings of best agronomic practices by agriculture extension workers. Some of the training topics included a new plant spacing

practice that increased the amount of maize planted by 30% per hectare, fertilizer application, and better post-harvest handling of maize. In addition to substantial reductions of household food insecurity, improved yields also allowed each household to donate 100 kilograms or more of maize to the school meals program or store surpluses in the grain warehouses to sell at peak prices.

## Linking Interventions to Progress-to-Date



### MDG 1

Eradicate Extreme Poverty and Hunger

A combination of interventions in the agriculture sector has dramatically increased yields in Mwandama, providing community members sufficient food to address high levels of malnutrition. In addition to seeds and fertilizer inputs to improve maize yields, crop diversification has also contributed to nutrition and income generation, including crops such as orange-fleshed sweet potatoes and high-protein pigeon peas. Vegetables, such as tomatoes and cabbages that are produced off-season in the inland valleys, have contributed to income gains. To improve the consumption of proteins and micronutrients, community members received instruction in diet diversification, appropriate food storage, and cooking methods to maximize the nutritional content of foods. The construction of a community grain bank has further allowed farmers to pool surplus harvest and obtain higher prices for their crops.

In 2008, Opportunity International Bank of Malawi (OIBM) began making regular visits to Mwandama to give community members a place to store savings generated by the crop surpluses as well as provide credit to farmers and others starting microenterprises. To date, community members have opened 2,000 bank accounts. Through the OIBM trainings, men and women have learned to save their surplus

#### MDG 1: BIGGEST IMPACTS

- Increase in average maize yields from 0.8 tons per hectare to 4.5 tons per hectare
- Chronic malnutrition (stunting) reduced by approximately one-third



income, which they are using to pay school fees, purchase household items, and start small businesses. Many small businesses, such as small grocery shops and tailoring shops, have sprung up throughout the area. In the last harvest season, the bank gave loans to 138 farmers. Women's participation has been high, comprising over 40% of all small business loan clients.



## MDG 2

Achieve Universal Primary Education

Primary school fees were abolished in Malawi in 1994, leading to high levels of enrolment. In addition, a school meals program existed prior to the MVP through the World Food Program. The MVP is complementing various government interventions to improve education standards. These include, among others, capacity building for community institutions and teachers, infrastructure development, provision of teaching and learning materials, scholarship programs, and school health programs. To enhance school quality, the construction and rehabilitation of schools, reaching 20 classrooms, was undertaken, including installing solar energy in schools, the provision of clean water, and the construction of gender separate latrines. The Project also worked with the Ministry of Education to ensure schools were adequately supplied with textbooks and learning materials and provided supplementary training for 123 teachers—both of which have contributed to higher pass rates on national primary school exams, which increased to 82% in 2009. To support the transition from primary schooling, a secondary school scholarship program was recently initiated, with a first group of 47 learners benefitting.

### MDG 2: BIGGEST IMPACTS

- Persistently high numbers of children benefiting from school meals program

### MDGS 4, 5, AND 6: BIGGEST IMPACTS

- Universal coverage of measles immunization
- Numbers of men and women tested for HIV in the last year has increased threefold
- 85% of pregnant women are now tested for HIV/AIDS, nearly a fourfold increase
- 60% of children now sleeping under a bednet, up from 14%



## MDGs 4, 5, and 6

Reduce Child Mortality, Improve Maternal Health, and Combat HIV/AIDS, Malaria and Other Diseases

In the health sector, interventions have aimed to rapidly increase coverage with essential interventions. Because Mwandama lacked a primary care facility for the first years of the Project, the community was largely served by mobile health clinics and a cadre of community health workers or health surveillance assistants, both of whom have contributed to ensuring access to care. These health workers have been instrumental in facilitating reasonably high levels of contraceptive use (53%), antenatal care (an average of over three visits per pregnancy), and institutional deliveries (72% of pregnancies). A primary care facility was opened in the community in 2010.

With rates of HIV in Zomba District exceeding 10% among adults, health interventions have focused on issues of prevention and treatment. HIV testing has been a major focus through referral to local VCT centers and mobile testing units. There have also been important efforts to reduce mother to child transmission, with nearly all pregnant mothers now counseled and tested for HIV during antenatal visits—

levels far better than national figures. Community campaigns help spread HIV/AIDS prevention and education messages as well as information regarding the importance of adhering to medication regimens for those on antiretroviral therapy.

## MDGs 7 and 8

Ensure Environmental Sustainability and Develop A Global Partnership For Development

The amount of people with access to improved water has increased dramatically, with levels reaching universal coverage after three years of MVP interventions. This was accomplished through the rehabilitation of water points and construction of boreholes, along with the installation of hand pumps. Community members were also trained in community-based management of water points so they can maintain and repair these sources on an ongoing basis. Community water committees collect a small fee from water users, with revenue used to purchase necessary equipment for upkeep. The water from these sources is primarily tapping on underground aquifers so the quality of water is quite high. Households also receive chlorine to treat water at home because water was also becoming contaminated during transport or in the household. In addition, a school program distributed buckets and soap, along with educational materials for children on the importance of sanitation and hygiene.

A five-year development strategy for roads, ICT, and energy was developed in consultation with communities, which has led to improvements in all realms of infrastructure. The proportion of households having access to all-weather roads has increased from 40% to 60%, due to the rehabilitation of a 22-kilometer road network, construction of 50 lines culverts, and construction of three bridges. A community road maintenance committee maintains the road network.

Several projects have increased access to energy among households. Pilot programs to test and introduce improved cookstoves showed 15% fuelwood savings for household stoves, and 44% savings for institutional stoves used for school meals programs. This fuel savings can reduce the burden of fuelwood collection, particularly for women and children. To improve access to electricity services at the household level, the MVP supported the development of a local cooperative to facilitate commercial sale of rechargeable, solar-powered LED lanterns. Local vendors belonging to the cooperative have sold over 700 lanterns to date, which provide electric light to households and have reduced kerosene expenditures by over 80%. A solar energy system at the grain bank and five primary schools has provided access to energy and enhanced security at the schools, increased pupils' study and teaching hours, as well as provided a venue to charge mobile phones.



### MDGS 7 AND 8: BIGGEST IMPACTS

- Access to improved water has more than doubled, with near universal coverage
- Over one-third of households now own a mobile phone, up from 3%

The MVP has undertaken various activities to improve mobile phone signal coverage and reception. Through a partnership with Zain and Sony Ericsson, two mobile phone towers have been constructed that will increase coverage across Mwandama. In addition, mobile phones have been distributed to health personnel and communities, along with three solar-powered charging booths.

### Priorities for the Next Phase

With significant progress over the past three years in supporting farmers to achieve food security and increase incomes, in the coming period, the Project will be working with the community to facilitate the transition from subsistence agriculture toward improving the profitability of agricultural activities. This includes the introduction of higher value crops, improving market access, and agro-processing initiatives. The Project is also moving away from purely subsidized inputs toward loans and credit for agricultural enterprises. This depends on the existence of viable financial institutions as well as sufficient profit margins and incentives for reinvesting income into agriculture and non-agricultural business enterprises. Some other important activities in this regard include the expansion of small-scale irrigation and scaling up of integrated soil fertility management.

There are also continued needs to develop infrastructure to ensure the sustainability of progress in various sectors. The Project will expand construction of drainage structures, such as bridges, culverts, and water retaining structures to increase the life span of the roads. Interventions will also continue to expand access to energy, including ensuring that every trading center and public institution has access to the electricity grid, as well as providing a revolving fund to households that will be within 500 meters of transformers. In addition, construction will continue on four health clinics and staff housing at schools to support access to these services. ■





## Partners in Mwandama

*The following provides a list of many of the partners who provide operational and in-kind support in Mwandama. A more complete list of MVP partners and donors is provided in the appendix.*

### GOVERNMENT OF MALAWI

#### Department of Forestry

Agriculture extension services and donation of seedlings

#### Department of Research

Technical assistance in agriculture

#### Ministry of Trade and Industry

Assist in developing cooperative business, including registration, supervision, monitoring and auditing

#### Ministry of Health

Provision of all immunizations, provision of health services at Thondwe health center; provision of trainers for various training in health; paying salaries for some health surveillance assistants in the cluster

#### Ministries of Health, Water and Environment, Energy, Finance, and Agriculture

Provision of resources provision, policy guidelines, and extension services across all sectors

### NGO/IO

#### Christian Health Association of Malawi

Run Namikango Maternity Clinic, including provision of emergency obstetric care, ANC, institutional deliveries, post natal care, under five clinic, and PMTCT activities

#### Church of Central African Presbyterian

Provision of resources for education and management of schools

#### Dignitas

Provision of voluntary counseling and testing services and ART drugs

#### Save the Children

Capacity building in education and provision of materials

#### Tikumbe Mijigo Maintenance Systems

Training of water point mechanics and provision of some small equipment

#### UNAIDS

HIV/AIDS and PMTCT

#### UNICEF

Provision of resources for education

#### World Food Program

Implement school meals program in six primary schools

### PRIVATE SECTOR/ FOUNDATION

#### Ericsson

Mobile telephony infrastructure

#### General Electric

Medical equipment

#### JM Eagle

Improved water infrastructure

#### Lenovo

Computer technologies

#### The Mosaic Company

Agricultural inputs

#### Opportunity International Bank

Input credit and savings programs for farmers

#### Sony Ericsson

Mobile phone technologies

#### Sumitomo Chemical

Long-lasting insecticidal bednets

#### Zain Telecom

Mobile phone technologies

### RESEARCH INSTITUTE

#### International Maize and Wheat Improvement Center/Soil Fertility Consortium for Southern Africa

Technical assistance in agriculture

#### International Crops Research Institute for the Semi-Arid Tropics

Technical assistance in agriculture

#### International Potato Center

Support for crop diversification

#### World Agroforestry Centre

Technical assistance in agriculture

## Appendix 1

# Millennium Villages Project Monitoring and Evaluation Platform

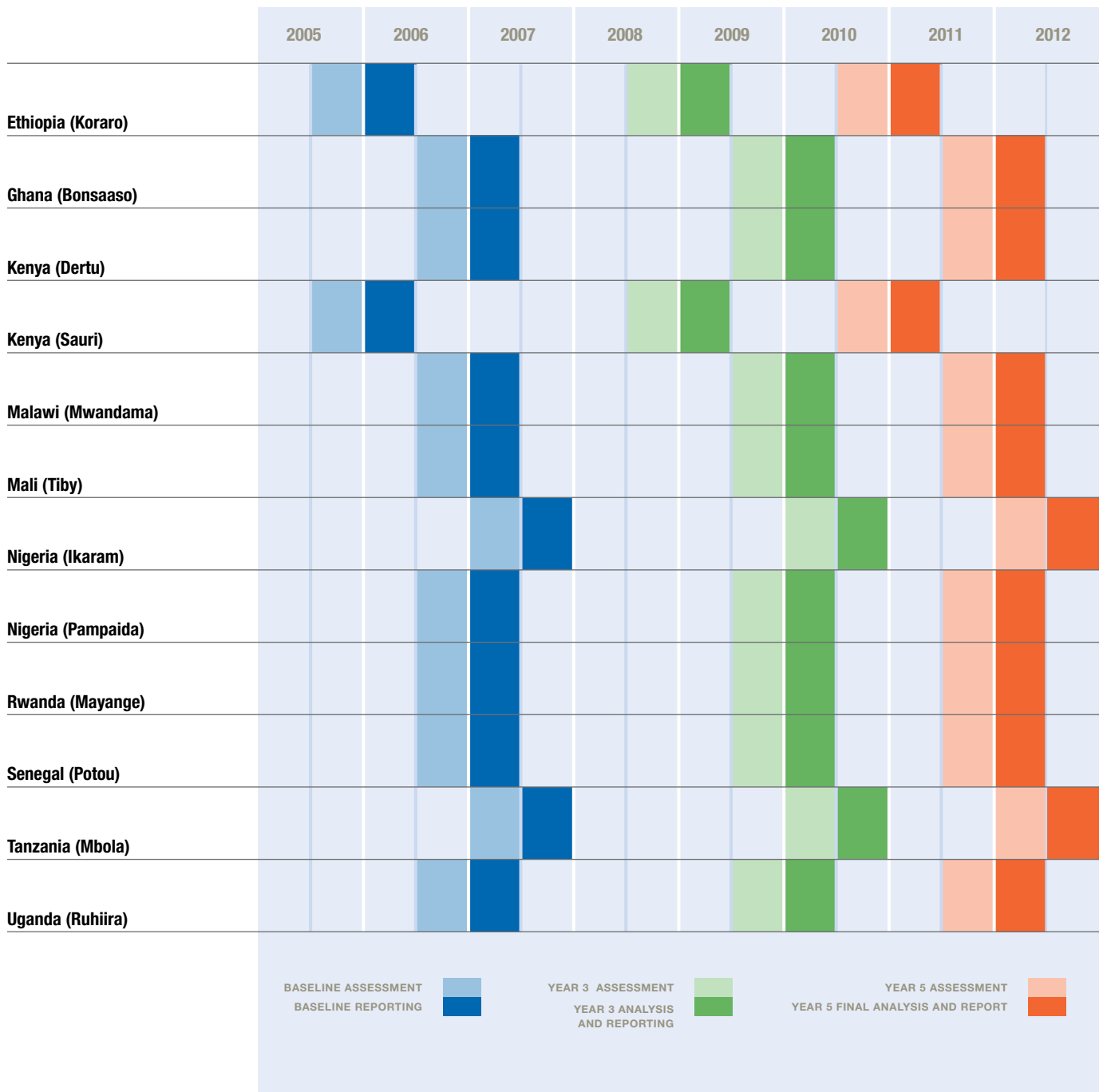
There are four key components to the Millennium Villages Project Monitoring and Evaluation platform: 1) assessment of the impact of the MVP interventions on accelerating progress toward MDG targets; 2) review of costs of the interventions and the contribution of project partners relative to the \$120 per capita cost ceiling of the project; 3) performance monitoring of the adequacy, uptake, and coverage of project interventions; and 4) process evaluation of the timing and sequence of interventions, alongside key barriers and facilitators to implementation. Taken together, these components will yield important insights into the progress that can be made in achieving the MDGs through the MVP's integrated rural development approach. The intensity and practical village-level scale of the project, combined with the diversity of rural contexts, provide a unique opportunity for better understanding the inputs, systems, and partnerships required for rapid progress. Lessons learned from the project carry substantial potential to inform policy and program development in sub-Saharan Africa and elsewhere.

Data presented in this report: To assess the impact of the integrated delivery system on MDG-related outcomes, the MVP conducts detailed social, economic, and health surveys, along with anthropometric measurements and biological monitoring of disease surveillance. Survey tools utilize previously validated best-practice standards in economics, agriculture, infrastructure, and health to generate a comprehensive picture of change over time in multiple sectors. The surveys and biological measurements are administered among 300 randomly selected households, stratified by wealth, in all sites at years 0 (baseline), three, and five. This longitudinal cohort allows the monitoring of changes before and after introduction of the program. To assess agricultural productivity, biophysical data is being collected from 30 randomly selected plots within the study area.

The MDG indicators in this report describe changes in the villages before and after three years of exposure to the interventions. This list of MDG-related indicators and proxies are defined below. Additionally, at year three, a series of matched comparison villages have been introduced in 10 MVP sites to allow us to assess the consistency of effects across sites and make more definitive statements about attribution and causality—whether the observed changes were due to the MVP



**Table 1: Assessment Timeline**





intervention package or were instead a consequence of secular change (ie. food and oil prices, drought, political instability). Comparison villages were randomly chosen from a series of candidate villages matched on a range of agro-ecological, geographic, socio-economic, and demographic parameters. A cluster level analysis will be conducted between matched pairs across MVP sites to assess the size and consistency of effects of the integrated delivery system on a range of MDG-related outcomes.

A more detailed presentation and analysis of these and other data will be forthcoming in scientific publications.

The MVP Study Evaluation Protocol has been peer reviewed and registered with *The Lancet* ([www.thelancet.com/protocol-reviews/09PRT-8648](http://www.thelancet.com/protocol-reviews/09PRT-8648)). In addition, the trial has been registered both with the United States National Institutes of Health at ClinicalTrials.gov (protocol number NCT01125618) and with the ISRCTN Register for Current Controlled Trials (protocol number ISRTN 24907704).

For additional details regarding the evaluation protocol and assessment tools, please refer to: [www.ciesin.columbia.edu/mvpeval/](http://www.ciesin.columbia.edu/mvpeval/).

**Table 2: Key Indicators Definitions and Sources**

Indicator	Definition	Source
<b>Bednet use</b> (children under five years old)	Percentage of children aged 0–59 months who slept under an insecticide treated mosquito net the night prior to the survey.	Socioeconomic Survey
<b>Malaria prevalence</b> (all age groups)	Percentage of individuals who tested positive for malaria ( <i>P. falciparum</i> ) parasitaemia	Blood Smears
<b>Maize yields</b>	Maize output measured in tons per hectare; year three figure represents average over three years of interventions	Crop Yield Measurements
<b>School meals</b> (primary school children)	Percentage of children attending primary school who report having received a school meal during the last four weeks of schooling	Socioeconomic Survey
<b>Measles immunization</b> (children under one year old)	Percentage of children under one year of age who have received at least one dose of a measles vaccine.	Health Survey
<b>Chronic malnutrition</b> (stunting among children under two years old)	Proportion of children under two years of age whose height for age is less than minus two standard deviations from the median for the international reference population ages 0–23 months.	Anthropometric Measurements
<b>Gross attendance ratio in primary education</b>	The number of pupils attending primary school, regardless of age, expressed as a percentage of the population of official primary school age	Socioeconomic Survey
<b>Births delivered by skilled health personnel</b>	The percentage of births among children under two years of age who were attended by doctors, nurses, or midwives.	Health Survey
<b>HIV testing in last year</b> (15–49 years old)	The percentage of women and men ages 15–49 who received a Human Immunodeficiency Virus (HIV) test within the past year.	Health Survey
<b>Access to improved drinking water</b> (households)	The percentage of households using improved drinking water sources, such as borehole or protected spring, that protects water from outside contamination	Socioeconomic Survey
<b>Access to improved sanitation</b> (households)	The percentage of households who use improved sanitation facilities, such as pit latrine with concrete slab, that hygienically separates human excreta from human contact.	Socioeconomic Survey
<b>Mobile phone ownership</b> (households)	The percentage of households who own a mobile phone.	Socioeconomic Survey

## Appendix 2

# Millennium Villages Project Partners

The following list represents major individual, government, foundation, and corporate partners that have provided critical support to the Millennium Villages Project and to the science and policy work behind achieving the Millennium Development Goals more generally. Additional operational partners and other donors who have given in-kind support to individual sites have been listed in the respective site chapters.

Agrium Inc.	Dunwalke Trust	Good Shepherd Catholic Church (Cincinnati, Ohio)
The Allwin Family Foundation	Mrs. Dolores Connolly and Mr. Daniel Casey	Government of Ethiopia
Anonymous Donors	Craig Family Foundation	Government of Ghana
Apax Foundation	Curaterra Foundation	Government of Ireland
Bead for Life	The David and Lucile Packard Foundation	Government of Japan
Bechtolsheimer Family	DEC Financial, LLC	Government of Kenya
Becton, Dickinson & Company	The Earl Phillips Jr. Family Foundation	Government of Korea
Mrs. Nancy and Mr. Randy Best	Entertainment Industry Foundation	Government of Malawi
The Bill & Melinda Gates Foundation	Equity Bank	Government of Mali
Mr. Greg Block	Ericsson	Government of Mozambique
Mr. Andrew Boszhardt	Ethel & Philip Adelman Charitable Foundation	Government of Nigeria
Brightline Partners LLC	The Flora Family Foundation	Government of Norway
BuildOn	The Frankel Family	Government of Rwanda
CAF American Donor Fund	Mrs. Miriam Frankel	Government of Senegal
CARE	General Electric	Government of Tanzania
CareerBuilder.com/CB Cares Foundation	GlaxoSmithKline	Government of Uganda
Carleton University	The Goldhirsh Foundation	Government of the United States
The Case Foundation	Goldman Sachs	Patrick Peyton Grace/Santa Maria Foundation, Inc.
The Ceil & Michael E. Pulitzer Foundation	GoodAdds	Mrs. Sue and Mr. William Gross
Clarence and Anne Dillon		Gyeongsangbuk-do Province, Republic of Korea

Hallym University	Monsanto Company	Rogers	UNICEF
Harold Grinspoon Charitable Foundation	Mr. J. Todd Morley	Mr. Ummul Ruthbah	UNWTO ST-EP Foundation
Mr. Darko Horvat	The Morton K. and Jane Blaustein Foundation, Inc.	The Sanchez Tropical Agriculture Foundation	Mr. Vivek Viswanathan
JM Eagle	The Mosaic Company	SapientNitro	Walker Family Foundation
Mr. Christoph Janz	Motorola	The Schaden Family Foundation	Mrs. Shirley and Mr. Walter Wang
The John and Christine Fitzgibbons Foundation	The Nduna Foundation	Shaklee Corporation	Mr. Robert Weinstein
The John D. & Catherine T. MacArthur Foundation	The Neuberger Berman Foundation	Sight and Life	The William and Flora Hewlett Foundation
The Jon S. Corzine Foundation	Nike Foundation	The Simmons Family Foundation	Willumstad Family Charitable Trust
Mrs. Ann F. Kaplan and Mr. Robert A. Fippinger	Mr. Christopher Norton	Sony Ericsson	Wilson-Thornhill Foundation
Mr. Leonard J. and Mrs. Tobee Kaplan	Novartis	Soros Economic Development Fund	The World Bank
The Kersten Foundation	Novartis Foundation for Sustainable Development	Soros Humanitarian Foundation	World Food Program
Mr. Rajen Kilachand	OmniPeace	Source of Hope Foundation	Yara International
Mr. Philip Knight	ONEXONE Foundation	SNV Netherlands Development Organization	Zain Group
Korea International Cooperation Agency	Only the Brave Foundation	Mrs. Barbara and Ambassador Clifford Sobel	
KPMG LLP	Open Society Institute & Soros Foundations Network	Spin Master Ltd.	
Mr. H.F. "Gerry" Lenfest, Esq. and Mrs. Marguerite Brooks Lenfest/The Lenfest Foundation	Opportunity International	St. John the Evangelist Church (Cincinnati, Ohio)	
Lenovo Hope Fund Triangle Community Foundation	Ms. Betsee Parker	Stephen Lewis Foundation	
The Libra Foundation	PepsiCo Foundation	Stichting Adessium Foundation	
MAC AIDS Fund	Ms. Julia Pershan and Mr. Jonathan Cohen	Stichting Blossom	
Ms. Marjorie Magner	Pfizer Incorporated	Stichting Eureka Achmea Foundation	
Mrs. Phyllis D. Mailman/ Mr. Josh Mailman/ The Mailman Foundation, Inc.	Playing for Good	Stichting Millennium Promise Nederland	
Mrs. Kay and Mr. Shigeki Makino	Presbyterian Church of Basking Ridge (Basking Ridge, New Jersey)	Sumitomo Chemical Co., Ltd.	
The Martin Family Foundation	The Prince Albert II of Monaco Foundation	Swiss Lung Foundation	
The Merck Company Foundation	The Principality of Monaco	Table for Two	
MCJ Amelior Foundation	Procter & Gamble	Time Warner Inc.	
Ms. Sara Miller McCune	Procter & Gamble Fund of the Greater Cincinnati Foundation	The Tommy Hilfiger Corporate Foundation	
Mr. John F. Megrue, Jr.	R.A.P.J. Foundation	Ms. Diane Troderman and Mr. Harold Grinspoon	
The Michael Zamkow and Sue Berman Foundation	Raising Malawi	UBS Financial Services, Inc.	
	Research Affiliates LLC	UNAIDS	
	Reservoir Capital		
	The Rockefeller Foundation		
	Mr. Edward and Mrs. Suzanne		

## Appendix 3

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