Focusing on the Education Continuum Post 2015: Lessons Learnt from the Millennium Villages

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Abstract
The Sustainable Development Goals are meant to be a new set of universal goals. They build upon the current Millennium Development Goals (MDGs) and align with agreed focus areas, shaping the post 2015 agenda. The UN Development Group MDGs Task Force calls for a post 2015 education agenda focused on “a lifelong learning approach,” using both formal and informal delivery mechanisms including Early Childhood Care and Education (ECCE), primary and post-primary education, vocational training and higher education. Aligned to the Sustainable Development Solution Network’s education goals and indicators, the paper presents a framework, for an education continuum based on practical lessons learnt from sites in 10 African countries of the Millennium Villages Project (MVP). Summing experiences of nearly 10 years of implementation in some of the world’s most impoverished sites, the paper presents a scalable model that puts to practice fundamentals of lifelong learning. The paper focuses on interventions and metrics of ECCE, focusing on literacy in primary schools, and technology aiding secondary school skill development. The paper also discusses integration of non-formal education by introducing literacy efforts into the curriculum.
This paper’s backbone is the “real-time” updatable data system helping monitor student learning and inform program strategies.

The paper highlights education system gaps such as non-availability of functional local Education Resource Centers (ERCs). The paper urges making ERCs functional by including low-cost, locally available Teaching Learning Materials, and making ERCs hubs for teacher training. It also highlights the importance of collaborating with local universities on implementation research and teacher training. An example is the ICT in Education Study conducted with education faculty from University of Nairobi, Kampala University and Teachers College Columbia University, which involved multiple data collection platforms and engaged teachers in monthly training workshops to identify best practices to integrating ICT into secondary classroom practice.

The paper concludes by highlighting implementation and policy gaps that have stymied a fully functional education system. Lack of funding initiatives that matter has been a major obstacle. Strengthening government systems locally, regionally and nationally and providing adequate teacher training and literacy programming is key to removing existing learning barriers. Finally, the paper highlights the importance of community buy-in as foundational to any project’s success and potential scale-up. The MVP’s buy-in from national, regional and local government education bodies will help in horizontally implementing this project at scale and providing concrete evidence of vertical absorption of project outcomes for future policymaking.

**Relevant SDSN Thematic Areas**
- 3: Challenges of Social Inclusion: Gender, Inequalities and Human Rights
- 4: Early Childhood Development, Education and Transition to Work

**Key words**
- early childhood education, literacy, secondary education, ICT, girls’ education

**Introduction**

The agreement to launch a process to develop Sustainable Development Goals (SDGs) was one of the main outcomes of the Rio+20 Conference. The SDGs are meant to build upon the current Millennium Development Goals (MDGs) and align with the agreed upon focus areas, shaping the post 2015 agenda. The ‘unfinished’ business of the MDGs must remain a priority post 2015, as 57 million children are still out of school including 31 million girls, due to financial, social, or physical reasons.¹ The MDGs focused on access to primary education, with less attention given to quality and as a result “many of the children in schools are receiving an education of such abysmal quality that they are learning very little” and therefore are unable to advance to higher levels of education and

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employment. To illustrate this point, in East Africa, just 1 in 6 students in Standard 3 of primary school passed a Standard 2 English test (Uwezo, 2012). 250 million young people are unable to read, write, or do basic math, with 130 million of them already enrolled in school (UNESCO, 2014).

The UN Development Group (UNDG) Millennium Development Goals Task Force calls for the post 2015 education agenda to focus on “a lifelong learning approach” encompassing learning throughout the lifecycle, using both formal and informal delivery mechanisms including access to Early Childhood Care and Education (ECCE), primary and post-primary education, vocational training and higher education.” The fourth focus area of the SDGs focuses on education, encompassing more than just universal access to primary education (MDG 2). It focuses on lifelong learning, and promoting quality education, two aspects that were not clearly outlined as priorities in MDG2. Going forward, the aim to ‘provide quality education and lifelong learning’ will include access to early childhood education, quality primary education to provide children with basic competencies, access to lower secondary education, and technical and vocational skill building for youth and adults.

In August 2012, the United Nations Secretary General launched a new initiative in support of the development of the Post 2015 development agenda, the UN Sustainable Development Solutions Network, SDSN. The SDSN, led by its Leadership Council comprised of global experts and leaders from academia, governments, NGOs, the UN-system and the private sector, is mobilizing and energizing global expertise for problem solving for sustainable development locally, nationally, regionally and globally. In June 2013, the SDSN published its first report for the UN Secretary General proposing 10 Sustainable Development Goals, with Goal 3 being to “ensure effective learning for all children and youth for life and livelihood.” The goal calls further that “all girls and boys complete affordable and high quality early childhood development programs, and primary and secondary education to prepare them for the challenges of modern life and decent livelihoods. All youth and adults have access to continuous lifelong learning to acquire functional literacy, numeracy, and skills to earn a living through decent employment or self-employment.”

The specific targets within this goal are:

- 3a: All children under the age of 5 reach their developmental potential through access to quality early childhood development programs and policies.
- 3b: All girls and boys receive quality primary and secondary education that focuses on learning outcomes and on reducing the dropout rate to zero.

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2 UNESCO, 2013. Pg. 13
• 3c: Youth unemployment rate is below 10 percent.\textsuperscript{5}

On July 19\textsuperscript{th}, the Open Working Group at the UN finalized its proposal for the next set of global goals, and proposed 17 goals, with Goal 4 being to “Ensure inclusive and equitable quality education and promote life-long learning opportunities for all.”\textsuperscript{6}

As with the Millennium Development Goals, the process of adoption of the new Sustainable Development Goals by the United Nations includes involvement of member states, consultations with UN agencies, civil society and even the private sector. Therefore, the final adoption of the next set of global goals will be first in late fall of 2015.

The emphasis within the proposed education agenda should include multiple levels of education, and recognize the importance of transition to secondary education. It also must focus more on learning outcomes and quality education, rather than simply measuring access and enrollment. The curriculum should better reflect the needs of modern societies and the importance of skills building and adoption of innovative/enabling technologies as means of providing access to quality educational materials to all. This new focus speaks to the wider social benefit of education for society at large, by providing education that is useful and meaningful to students and will help them progress further in their lives and careers.

**Education Continuum**

*Early Childhood Education*

Despite being one of the six Education for All (EFA) goals, set by a coalition of governments, civil society groups, and development agencies, early childhood education has not been formally included in the global development agenda laid out by the MDGs. Including early childhood education within the framework of the SDGs as proposed both by the SDSN and the OWG, is a major step forward, in recognizing that the education and well being of children begins at an early age. Early childhood education is important in ensuring that young children are ready to start school and that inequalities in education achievement are addressed early on.\textsuperscript{7}

Preparing children socially and developmentally during these critical early years will help them enter school at the appropriate age, reduce the likelihood of them leaving primary school early, and increase their learning outcomes. If children are not adequately stimulated during these critical growth years, it affects their brain development and they may lose the opportunity to develop essential skills and abilities and may later need remediation which is both expensive and less effective.\textsuperscript{8}

\textsuperscript{6}For more details please visit http://sustainabledevelopment.un.org/focussdgs.html
\textsuperscript{7}UNESCO, 2013.
Thus, expanding access to early childhood education sets the foundation for children to be successful in primary school, transition to secondary school, contributing to a more educated and skillful youth and adult population later on. There is also a considerable body of evidence on the impact of ECD programs on economic development.\(^9\) Unfortunately, the most marginalized children are less likely to benefit from good early childhood services, resulting in poorer children being less likely to learn when they start school.\(^10\)

In the initial years, The Millennium Villages Project (MVP)\(^11\) focuses on primary schools and primary school age population. However, there has been consistent an steady increase of investments in pre-schools and pre-school age population. MVP has included access to education to pre-primary age children through school based and community based early childhood, preschool, or kindergarten programs as one of its priority interventions. Recognizing the importance of early childhood education as a contributing factor to on-time enrollment into primary school, and the likelihood of completion, in recent years, the MVP education sector invested in access to early childhood education as a core strategy.

Moving forward, the research and implementation of the ECE projects of the EI in developing countries will build upon lessons learned from the MVP experience. Although we recognize that early childhood development starts from birth, in an effort to limit the scope of activities of this initiative, early childhood education activities in the MVP will target 3-5 year old children, who fall within the age category of preprimary school. Early childhood education programs for 3-5 year olds can be community or school based, depending on the country, its policies, and the resources available. It is critical that the early childhood approach encompasses a combination of both health and education interventions. At this stage, parent-child language interaction, home literacy environments, exposure to mother tongue, and cultural aspects of family functioning are crucial in addition to basic healthcare, cognitive and language stimulation, issues of protection and safety.\(^12\) Suggested activities include

**Activities:**

Cross-sectoral collaborations:

- **Health:** Early childhood development activities must include whole child development, physical, cognitive, and socio-emotional. Basic vaccines against disease, proper nutrition and deworming, targeted at children under 6, can be life saving and preventative of future health complications and dangers.

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\(^9\) Resources and research from early childhood development expert and economist James Heckman can be found at: http://heckmanequation.org/


\(^11\) The Millennium Villages Project is a proof of concept project that addresses the root causes of extreme poverty, taking a holistic, community-led approach to sustainable development. The MVP is operational in 12 communities across 10 countries in sub-Saharan Africa. More info at: millenniumvillages.org

\(^12\) Britto, P. 2012.
Nutrition – Research has continuously demonstrated that improved nutrition during the early childhood years can enhance lifetime earning and learning, and leads to improved child survival, development and educational achievement.13

Early literacy development & oral fluency building, – When beginning primary school, if children are familiar with print materials such as books, have a working vocabulary, and pre literacy skills in their mother tongue they will later be able to gain required reading skills to master literacy.14 Language development and reading outcomes are strongly influenced by the number of books at home and the frequency with which caregivers read to children (Whitehurst & Lonigan, 1998 as cited in GMR 2007) and also how much children are spoken to or hear.15 Early childhood programs offer children a chance to build literacy skills in their mother tongue language, resulting in higher self esteem and better test scores (GMR 2007). Mother tongue language skills development is crucial, because not only are children building skills in a language they are comfortable in, but also once a child can read and write in one language, these skills can be transferred to other languages (GMR 2007).

Community engagement and ownership of ECD program is crucial. Parents, caregivers, and families must be included as partners in child development. UNICEF recommends that communities must be involved in the “design, planning, implementation, monitoring and evaluation of integrated ECD programs” which will lead to strong community ownership, buy in and sustainability of such programs.16 The process of engaging the community should begin with a participatory assessment process, allowing stakeholders to highlight their needs and priorities.17 ECD programming must utilize the existing cultural, structural and physical resources within the community, while discussing the barriers and creating practical and relevant solutions. In particular, education programs should be linked to other sectors to provide a more integrated approach to child development services.18 In order for policies to be implemented into practice, advocacy and social mobilization are crucial. For example in Eritrea, ECD policy and program materials were translated into eight local languages, which was a crucial step for gaining support for implementation at district and community levels (Pence 2004 as cited in16). In Cameroon, the successful promotion of holistic child development

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13 Britto, P. 2012.
14 Britto, P. 2012.
18 USAID, nd.
development can be largely attributed to social mobilization through which traditional leaders and communities were actively engaged and involved in microplanning.\textsuperscript{20}

- Implementation of \textbf{ECD policy into practice} and the integration of ECD into formal schools are crucial in the post 2015 era. Although access to pre-primary schooling has increasingly become one of the mandates of foreign governments, they often lack the capacity to provide such services and non-governmental and community organizations are relied upon to provide the services.\textsuperscript{21} In this case, preschool is privately offered and is unlikely to reach the poorest children. In other instances, advocacy is needed to get the commitment and political will for governments to prioritize ECD, despite competing priorities.\textsuperscript{22} In order to implement ECD policies effectively, crucial elements such as “(1) steering committee, (2) action or operational plan and guidelines, (3), funding, (4) advocacy, social mobilization and information, (5) networking and (6) monitoring and evaluation” must be in place.\textsuperscript{23} The government should be responsible for ensuring that basic services meet all children, including the most vulnerable, through the implementation of preschools within the primary school system. Currently, preschools within the poorest communities are often home based or run privately, which can compromise on equal access due to high cost and quality if not monitored effectively.

\textbf{ECD Indicators}\textsuperscript{24}

10-item \textit{Early Child Development Index (ECDI)} designed to assess whether children aged 36-59 months are developmentally on-track within four domains. Items included in the ECDI are based on benchmarks that children would be expected to have reached if they are developing as the majority of children in the 36-59 months age group. The four domains are defined as follows:

- \textbf{Literacy-numeracy}: Children are identified as being developmentally on track if they can do at least two of the following: identify/name at least ten letters of the alphabet; read at least four simple, popular words; and/or know the name and recognize the symbols of all numbers from 1 to 10.

- \textbf{Physical}: If the child can pick up a small object with two fingers, like a stick or rock from the ground, and/or the mother/caregiver does not indicate that the child is sometimes too sick to play, then the child is regarded as being developmentally on track in the physical domain.

- \textbf{Social-emotional}: The child is considered developmentally on track if two of the following are true: the child gets along well with other children; the child does not kick, bite or hit other children; and the child does not get distracted easily.

- \textbf{Learning}: If the child follows simple directions on how to do something correctly and/or when given something to do, is able to do it independently, then the child is considered to be developmentally on track in the learning domain.

\textsuperscript{20} Garcia, M., Pence, A., Evans, J., 2008.
\textsuperscript{21} USAID, n.d.
\textsuperscript{22} Garcia, M., Pence, A., Evans, J., 2008
\textsuperscript{23} Garcia, M., Pence, A., Evans, J., 2008. Pg 42
\textsuperscript{24} UNICEF MICS survey \url{http://www.childinfo.org/ecd_indicators_mics.html}
\url{http://www.childinfo.org/files/MICS4-EarlyChildhood_developmentmodule.pdf}
The ECDI score is then calculated as the percentage of children aged 36-59 months who are developmentally on track in at least three of these four domains. This index is best interpreted within the context of the other variables related to support for early childhood development in the home and community.

**MICS4 ECD Indicators:**

**Learning materials:**
- Percentage of children under-five who have three or more children’s books.
- Percentage of children under-five with two or more playthings.

**Inadequate care:**
- Percentage of children under-five left alone or in the care of another child younger than 10 years of age for more than one hour at least once in the past week.

**Support for learning:**
- Percentage of children 36-59 months with whom an adult has engaged in four or more activities to promote learning and school readiness in the past 3 days.
- Percentage of children 36-59 months whose father has engaged in one or more activities to promote learning and school readiness in the past 3 days.

**Early child development index:**
- Percentage of children 36-59 months who are developmentally on track in literacy-numeracy, physical, social-emotional and learning domains.

**Attendance at early childhood education:**
- Percentage of children 36-59 months who are attending an early childhood education programme.

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**Health and Nutrition Indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
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<tbody>
<tr>
<td>Incidence of low birth weight (2500 g)</td>
<td>Percent of births of weight less than 2500 g out of the total number of live births in the same time period</td>
</tr>
<tr>
<td>Prevalence of stunting (too short) in children</td>
<td>Percent of children of a specific age (for example under age 2) with height- or length-for-age less than −2 Z-score</td>
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<tr>
<td>Prevalence of underweight (too small)</td>
<td>Percent of children of a specific age with weight-for-age less than −2 Z-score in children</td>
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<tr>
<td>Prevalence of wasting (too thin) in children</td>
<td>Percent of children of a specific age with weight-for-height less than −2 Z-score</td>
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<tr>
<td>Body mass index (BMI)— estimate of body fat</td>
<td>Calculated by using an individual’s weight in kg/height in meters²</td>
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<tr>
<td>Prevalence of overweight/obese (too heavy)</td>
<td>Percent of children of a specific age with BMI-for-age at 85th percentile (overweight) or at or above 95th percentile (obese)</td>
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<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
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<tbody>
<tr>
<td>Infant mortality rate (IMR)</td>
<td>Probability of a child born in a specific year or period dying before reaching age 1 year, subject to age-specific mortality rates of that period, expressed per 1,000 live births.</td>
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<tr>
<td>Under-5 mortality rate (U5MR)</td>
<td>Probability of a child born in a specific year or period dying before reaching age 5 years, subject to age-specific mortality rates of that period, expressed per 1,000 live births.</td>
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<tr>
<td>Prevalence of anemia in young children</td>
<td>Percent of children age 6–59 months with hemoglobin less than 11 g/dL.</td>
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<tr>
<td>Consumption of iodized salt to prevent iodine deficiency disorders (15 ppm or more)</td>
<td>Percent of children age 0–23 months living in a household with adequately iodized salt deficiency disorders (15 ppm or more).</td>
</tr>
<tr>
<td>Immunization rate: coverage of children with DTP3</td>
<td>Percent of children age 1 year who have received three doses of DTP3 in a given time period DTP3 (combined diphtheria-tetanus toxoid and pertussis vaccine).</td>
</tr>
<tr>
<td>Access to safe drinking water</td>
<td>Percent of population using an improved drinking water source.</td>
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<tr>
<td>Access to hygienic latrines</td>
<td>Percent of population using an improved sanitation facility.</td>
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**Primary Education**

The SDGs are to build on the momentum of the MDGs with regards to focusing on primary education, but will likely include a more comprehensive approach than the MDGs. Rather than limiting the scope to access and completion, the post 2015 education approach should include a focus on quality and learning outcomes. UNDG calls for “focused attention on the quality of education, including its content and relevance, as well as on learning levels.”²⁶ Students completing primary school should have basic literacy and numeracy skills, and be able to transition into secondary school or the job market. Efforts must also be made to expand equitable access to education amongst the most marginalized, for instance the disabled, orphans, vulnerable children, and those in areas of unrest.

The emphasis on quality of education and basic skill building has been prevalent through the past few years of programming within the MVP education sector. More and more emphasis has been placed on quality of education and ensuring that students are gaining basic competencies during their time in primary school. Within the context of the MDGs, quality of education and basic skill building contribute to the likelihood that students will complete a full course of primary school, and expands the goal of access to primary education to encompass access to quality primary education. Some key activities to focus on include ensuring there is an adequate supply of trained teachers, measurement of relevant and equitable learning outcomes including functional literacy, and the strengthening of enabling learning environments with access to safe and clean drinking water.

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water, and school feeding programs. MVP has embraced this cross-sectoral approach to education, including WASH (Water, Sanitation and Hygiene), health and nutrition programs into the school environment. These activities should be sustained and continued moving forward.

Moving forward, the lessons learned from the MVP experience in education must be accounted for and incorporated into the education sector strategy. One of the major challenges MVP faced with regards to improving the literacy skills of students was the language barrier. The language of instruction in many countries is often not the language that the rest of the community speaks at home. Therefore, teachers are unfamiliar with the formal language of instruction, as well as students. For early grades, particularly where a bilingual system is in place, there needs to be more emphasis on local language literacy instruction. Overall literacy and numeracy improvement should also be one of the central activities focused on. Ensuring quality education in which students are gaining necessary skills will contribute to school completion. Through the MVP experience, it has become clear that in order for students to complete their primary education, reasons for early dropout must be identified and addressed as early as possible. Therefore, strategies to include completion of primary school as a core part of the education agenda post 2015 must be considered.

Some key activities include:
- Continuation to build the foundations of language using mother tongue. Reading methods often rely on best practices from English and higher-income countries. People in all countries learn fastest any topic if taught according to the rules of human memory. Some of the research guiding basic skills acquisition has existed for decades, but it has not transferred widely into education. Reading instruction of English and French is daunting in itself; native populations require about three years to learn all English spelling patterns (Ziegler and Goswami, 2005). Often complex methods are imported from high-income countries that cannot be implemented by teachers with limited education. Furthermore, reading textbooks are scarce or are written for more knowledgeable students. Unlike English or French, African languages are spelled consistently. Letter by letter methods are simple to teach and have been sustained for centuries in Eastern Europe, using syllabaries. These teach each letter explicitly along with analogies (i.e. ba, be, bi, bo, bu) and provide much text for practice. Similarly, studies from the Gambia suggest that nearly all children can learn letter values and the reading strategy during the first semester of grade 1 (Abadzi 2013, Zafeirakou 2013)
Therefore, to help poorly educated teachers teach reading, a simple routine of 5-6 steps daily will be taught. About half the class time will be spent in reading practice and brief, systematic feedback. If implemented, it is expected that most children will learn at least to decode in consistently spelled languages by the middle of grade 1.

- **Teacher qualifications, skills, competence and motivation** are central to achieving these education goals. Teacher training specifically targeted towards the use of local language instruction techniques and content. Teachers need to be better equipped to teach the basics of language acquisition to students, to lay the foundation for early literacy. Further training for teachers will lead to better implementation of local language and bilingual teaching in the classrooms. Acquisition of local language literacy skills will also help students build their reading skills in another language, if there is a second language of instruction introduced later in their school careers. For example, further training, support, content and materials for teachers to teach in Chichewa and other local dialects in Malawi, will strengthen students’ basic reading skills in these languages, and lay the foundation for English language skills to be built in upper primary school. Both in-service and pre-service teacher training are critical for teacher professional development. Fostering partnership with local teacher education colleges will be critical to develop a cadre of TOTs (Trainer of Trainers), which will form a team of experts for the region.

- Teachers also need to change the way they **assess learning** and student skills, and use assessments for improving learning. Learning assessments help teachers to identify student’s strengths and weaknesses, diagnose learning difficulties and can inform strategies to support students to perform better. Classroom based assessments are crucial for teachers to identify student learning levels and respond to their learning needs. Classroom assessment tools should be linked to instruction, be simple to use, diagnose difficulties, and be able to be administered among learners who have low writing skills. One such assessment is EGRA, which are assessments designed for early grade students, administered orally and can be adapted to a host of local languages.

- There is also a strong push for a **data revolution**, in terms of providing more access to reliable and timely data for governments and people. Information and Communication Technologies (ICT), including mobile broadband, smartphones, tablets and computers, are enable new ways of collecting real-time information. Following in this path, the activities in post 2015 should use metrics to inform teacher training. **Trainings** should be designed to focus on the areas in which students are performing poorly, and in which teachers need

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more strengthening of their own skills. For example the EGRA Plus project in Liberia focused on training teachers on the use of classroom based assessment tools and scripted lessons and reading resources to guide classroom instruction to improve reading achievement. There needs to be a focus on learner centered teaching, engaging students actively in the learning process.

- **The curriculum** in primary schools needs to be revisited, with a stronger focus on basic learning outcomes. In particular early grade curriculum needs to be evaluated and curricular expectations must match learners abilities, and not be over ambitious. The curriculum must help students build basic foundational skills in a language that they understand, and have necessary resources available. There also needs to be more curricular materials that are relevant in the contexts in which they are used. Curricular materials, textbooks, stories, and other learning materials must be locally developed and applicable to the settings in which they are taught. More efforts need to be made to develop relevant materials, to further the goal of providing quality education resulting in a better skill set for students completing school.

- **Building on the MVP experience of a cross-sectoral approach**, further linkages must be strengthened between other sectors and education. The school is a place for multiple sectors to work together towards the improvement of children’s lives, including education, water sanitation and hygiene (WASH), nutrition, and health. Schools need to provide nutritious meals to students (in places where there are school meals programs), and have access to safe water for drinking and hand washing. There must be functional and improved sanitation facilities, to ensure the hygiene and comfort of students, particularly girls. As students spend so many hours at school, their health must also be accounted for. Having a nurse or education worker visit the school to support any students who are sick, or having health issues is critical. Some health related issues also have a major impact on school attendance and performance, including menstrual hygiene, vision, hearing, nutrition. And more recently, we have demonstrated the feasibility of implementing oral hygiene programs in selected schools of the MVP in Ethiopia and Senegal.

**Indicators:**

- Considering the shift in focus post 2015 to quality of education and literacy, indicators gathered must extend beyond access indicators, although they are the most simple and straightforward to gather. Learning skills and literacy levels, although difficult to gather, are at the core of the new learning-focused agenda. Access indicators such as primary completion, enrollment and completion in secondary school are also crucial.

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34 UNESCO, 2014.
Potential indicators include:

- the proportion of pupils starting grade one who reach last grade of primary/secondary/tertiary;
- the survival rate to grade five;
- the proportion of girls completing secondary education;
- the average of the three gender parity indexes (GPI) for primary education, secondary education and adult literacy, with each being weighted equally;
- literacy and numeracy rates of the population;
- the percentage of GDP devoted to education and/or ratio of government subsidies for education to poorer families; and
- universal primary education: the percentage of primary school-age children who are enrolled in either primary or secondary school.
- The percentage of girls and boys who achieve proficiency across a broad range of learning outcomes, including proficiency in reading and mathematics, by the end of the primary cycle, and again by end of lower secondary cycle.

- Learning outcomes must be measured by standardized instruments that are comparable across countries. While many countries use international assessments such as the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS), these written assessments often assume children can already read and write, and do not ascertain whether or not children do not know the test content, or simply cannot read the test itself. Results from PISA and TIMSS tests show that children in developing countries perform at about a third of the percentile of high-income country students. We propose that project sites use Early Grade Reading Assessment (EGRA) or the current ASER/UWEZO tests which are being implemented in some MVP sites currently. The EGRA test is an oral student assessment, designed to measure basic literacy skills for early grades including “recognizing letters of the alphabet, reading simple words, understanding sentences and paragraphs, and listening with comprehension.” EGRA is an individually orally administered test which takes about 15 minutes to complete per child, and is a simple and inexpensive diagnostic of individual student reading levels. EGRA has been conducted in over 50 countries in a variety of local and international languages. It can be administered to students in grades 1-3,

- The Millennium Villages Project (MVP) monitors the reading and numeracy skills of primary school students using the tests and methodology developed by ASER in India and UWEZO in Africa.

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40 RTI International, 2011. EGRA FAQs.
https://www.eddataglobal.org/documents/index.cfm?fuseaction=pubDetail&id=95
42 https://www.eddataglobal.org/reading/index.cfm
44 Uwezo, meaning ‘capability’ in Kiswahili, is a four-year initiative that aims to improve competencies in literacy and numeracy among children aged 6-16 years old in Kenya, Tanzania and Uganda.
The tests are developed in collaboration with curriculum and assessment experts from the national Education Ministries and follow existing government standards and benchmarks set per grade. The tests are simple yet robust, structured to take no longer than 10 minutes per child, and to allow immediate scoring and instant feedback on the competency level of a child. MVP has adapted and programmed these tests for their administration using android phones. The reading tests are designed to assess children’s competency levels in four areas, including: letter recognition, words, paragraphs, and simple story comprehension. Based on national policies regarding language of instruction, reading tests may be administered in the local language (where possible) as well as in English or French (if applicable).

- Both testing methodologies also have a numeracy component, which can be added. ASER/UWEZO tests currently conducted in MVP sites include this numeracy component, and the Early Grade Math Assessment (EGMA) follows a similar methodology to EGRA has been adopted and implemented in over 10 countries and in a variety of languages.

<table>
<thead>
<tr>
<th>Potential indicators include:</th>
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<tr>
<td>• % of children recognizing single letters in a 6 minute oral test</td>
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<tr>
<td>• % of children recognizing given combination of letters in a 6 minute oral test</td>
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<tr>
<td>• % of children with reduced reaction time in combining letters. Time will be recorded and compared with their previous measure.</td>
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<tr>
<td>• % of teachers providing corrective feedback to child.</td>
</tr>
<tr>
<td>• % of primary school students (grades/levels one to three) that demonstrate they can read and understand grade level text. Grade-level text as defined by National Education Systems.</td>
</tr>
<tr>
<td>• % of children with reduced reaction time in combining letter</td>
</tr>
</tbody>
</table>

Source: Adapted from EGRA.

**Secondary education**

One of the major differences between the global discourses of the SDGs as compared to the MDGs is the inclusion of secondary education. All students must have access to secondary education, particularly girls, going forward. After completing a full course of primary schools and being equipped with basic competencies, students must be able to enter secondary school and complete it with the necessary technical and vocational skills to be lucrative in the job market. In Africa, where more than 35% of population is 15-35 years old, access to secondary education is going to play critical role for the continent’s

(http://www.uwezo.net/). In addition to working with Uwezo in East Africa, MVP is in the process of partnering with other NGOs and research institutions using the same approach in West Africa, including Lartes in Senegal and OMAES in Mali.
continued economical growth. Today, with the expansion of broadband, job readiness includes not only basic education but also life skills and knowledge of ICT (ICT literacy).

**Some key activities include:**

**Connect To Learn**
The Connect To Learn initiative is a partnership of the Earth Institute at Columbia University, Millennium Promise and technology company Ericsson, which aims to enable access to secondary education for girls who would otherwise not have the opportunity to attend secondary school by providing multi-year scholarships and co-curricular programming focused on girls’ leadership and life skills. Connect To Learn also promotes the quality of the secondary education these girls and their peers receive by installing computers, local servers and broadband connectivity in their schools, enabling access to a wealth of quality learning materials, preparing students with 21st century skills, and providing professional development to their teachers.

Launched in 2010, Connect To Learn has spent its’ first years developing a model for implementing community-led scholarship programs and impactful integration of ICT that goes beyond installation of hardware, and builds capacity of school leadership and teachers to contribute to and make use of existing digital learning resources for more interactive and engaging student learning experiences.

Beginning with the first 37 scholarship recipients enrolling in early 2011, Connect To Learn has to date enrolled 762 students, 745 of them girls, on multi-year secondary school scholarships across 27 schools within the MVP sites in 10 sub-Saharan African countries. Connect To Learn works with community committees made up of school headmasters, parents, teachers and community leaders to make girls in need aware of the scholarships available, to collect applications, and to select scholars based on need and merit. Once the selected students are enrolled, Education staff within the Millennium Village site offices work closely with school headmasters and teachers to monitor and support the students’ academic progress and well-being, and report termly to Connect To Learn on program implementation, scholar progress, extra-curricular programming and dropout mitigation efforts. To date, Connect To Learn Scholars have maintained a 96.2% retention rate.

UNESCO has noted the important role of ICT in building students’ twenty-first century skills and offering alternative avenues to teacher professional development. It has also been made clear that ICT will only achieve these aims when teachers are properly trained and financing is in place. In 2012-2013, Connect To Learn conducted a year-long Collaborative Action Research (CAR) study that aimed to identify the key facilitators and barriers to effective integration of ICT resources in secondary schools. The study took place in two schools each in Sauri, Kenya and Ruhiira, Uganda. University researchers from the University of Nairobi in Kenya, Kampala University in Uganda and Teachers College of Columbia University in New York conducted monthly professional development workshops designed to give teachers hands-on practice with basic computer

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45 UNESCO/UNICEF, 2013
skills such as word processing, online research and creating presentations, as well as learner centered pedagogies such as small group work, brainstorming and demonstration. Over the course of the project, teachers participated in pre- and post-surveys and interviews, as well as monthly observations to study the evolution of their teaching practice as they moved through the training.

The study found that there was an 18% increase in teachers’ integration of ICT into their teaching practice, and a 24% increase in those reporting themselves to be “advanced” users of ICT. The study also identified a number of necessary factors that must be in place for teachers to fully make use of the ICT tools made available to them, including:

- School level policies that provide time for teachers to prepare for lessons using ICT and that encourage use of computers and other ICT resources in classrooms;
- Physical and ICT infrastructure, including adequate electricity and outlets in all classrooms, reliable connectivity, and servers to house curriculum-aligned content that can be shared easily among teachers and students;
- Ongoing professional development support lasting at least 3 years to ensure uptake and school-level leadership for sustainability.

The research report can be found at http://connecttolearn.org/Education-Study.

Moving forward, Connect To Learn aims to implement these identified solutions and strategies to more effectively integrate ICT into secondary education as a means to improving the quality of teaching as well as the preparedness of students to enter careers of their choice and to engage with diverse populations in an increasingly globalized economy.

UN Women recommends in their post-2015 position paper that gender parity in education must go beyond enrollment numbers, and also ensure that girls achieve equality in learning outcomes and opportunities. Strong interventions must be in place to ensure girls complete primary, secondary and tertiary education, and steps must be taken to ensure school environments are safe for girls.\(^{46}\) Going forward, Connect To Learn plans to expand upon its’ support for girls’ education by increasing the number of scholarships available each year to talented girl students for whom secondary education would not be possible without financial support. Connect To Learn also plans to build upon its’ girls’ leadership and life skills programs and increase the sustainability of its’ local program management by hiring Connect To Learn scholarship alumni recently graduated from secondary school as Connect To Learn fellows. These fellows will be trained to facilitate girl-focused co-curricular programs, as well as to support the monitoring and reporting of CTL Scholar academic performance and overall well-being. These fellowships will be designed to help aid recent graduates in the subsequent enrollment in tertiary education by providing opportunities to earn income while at the same time giving them valuable work experience. Connect To Learn is also currently in the process of developing a Scholar mentorship program in partnership with the New York-based Womensphere network of women professionals and with in-country colleges and universities to engage

young women from fields of interest to the Scholars in video and in-person mentorship exchanges. Further, Connect To Learn’s teacher professional development efforts will include components on gender-sensitive teaching practices.

**CyberSmart**
The Earth Institute, Columbia University, partners with CyberSmart Africa (http://www.cybersmartafrica.org)\(^\text{47}\) to bring “tech-lite” innovative solution to learning. Since 2010, MVP has partnered with CyberSmart in Potou and Louga where they have donated equipment and provided initial teacher training sessions. Strengthening MVP’s relationship with CyberSmart is a natural next step to expand the lessons learnt from the Potou MVP site in Senegal. Partnering with CyberSmart will:

- provide a cost-effective way to reach poor infrastructure schools, including those off the grid
- impact instruction directly in the classroom
- maximize teacher training and use of highly relevant pedagogical content
- minimize technology complexity
- prioritize learner-centered pedagogy as opposed to technology
- optimize ability to impact MDG2 by impacting the quality of instruction
- implement a model capable of tremendous scale at low cost

Up to date instructional content provided within the CyberSmart package offers a rich, exciting and meaningful context with which to learn. Students have the opportunity to learn with the aid of virtual science experiments, multimedia encyclopedia, and other resources never before available. The Senegal experience of MVP with Cybersmart shows that initial and ongoing teacher professional development impacts student motivation and the quality of instruction.

This “tech-lite” approach uses solar-charged Android interactive whiteboard tablets to reach schools without electricity. It will use a new Android reading package called *Motoli* for early grades in Senegal with the ability to adapt for different languages. The reading software is unique and correlates to the five essential components for reading improvement:
- Phonetics
- Letter recognition
- Word recognition
- Comprehension
- Fluency

Development of similar software like Motoli will create online library resources that will aid in enhancing basic numeracy and literacy.

Cybersmart Africa and MVP partnership will encourage:

\(^{47}\) CyberSmart began in 2007 and currently operates in 6 public middle schools and 3 public elementary schools in Senegal.
- Use of inexpensive and highly scalable equipment that enables and encourages the whole class to learn together with 21st century tools.
- There is a very specific program in place through the use of the software - the teacher just needs to follow the program.
- Model lessons will be created on video and placed within the android tablet that is also used as an interactive whiteboard.
- The mobile phone network will be used along with Facebook to establish a secondary level of support via social networking -- a second tablet with an integrated SIM card will be provided for this purpose; and the tablet can also be used for data collection.
- Limited face to face teacher training will be required, as the focus will be to follow the program within the context of a school-based professional learning community.
- Data can be collected through the use of the android tablet.

Along with a classroom based ICT use, CANVAS, MOODLE and MOOCs will be used as platforms to create an online repository of available resources for the teachers. Videos of “Best Practices in Classroom Teaching” will be made available online and used for teacher trainings that will help to enhance the quality of teaching at school.

Another area of focus for secondary school education is Global Citizenship – In the post 2015 era, there is a strong push for global citizenship and life skills education. Global citizenship is defined as related to “fostering peace and human rights; equality, tolerance and respect to people and environment; and recognition of the interconnectedness between the individual at the local level and the world outside.”

Incorporating global citizenship into the formal school curriculum is crucial. Life skills such as gender education and sexual and reproductive health, and job skills should be included in the formal school curriculum as well. Global citizenship education fosters transferable skills such as critical thinking, communication, cooperation, problem-solving, conflict resolution, leadership and advocacy as well as values such as tolerance, diversity and civic responsibility (UNESCO). Each country’s curriculum should incorporate these aspects of global citizenship in a way that is contextually relevant.

### Suggested potential indicators related to ICT (from UNESCO)

<table>
<thead>
<tr>
<th>Indicator label</th>
<th>Indicator</th>
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<tbody>
<tr>
<td>ED10</td>
<td>Average number of hours per week of ICT use in classrooms as recommended in curricula (for ISCED levels 1-3 and by major subjects)</td>
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<tr>
<td></td>
<td>· Maths</td>
</tr>
<tr>
<td></td>
<td>· Sciences</td>
</tr>
<tr>
<td></td>
<td>· Basic computer skills (or computing)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>ED11</th>
<th>Average number of hours per week of ICT use in classrooms as recommended in curricula (for ISCED levels 1-3)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>· Exercises on computer using educational software</td>
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<tr>
<td></td>
<td>· Exercises on computer using the Internet</td>
</tr>
<tr>
<td></td>
<td>· Radio (Interactive Radio Instruction)</td>
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<tr>
<td></td>
<td>· Television</td>
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</tbody>
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| EDR1 | Proportion of schools with electricity                                                                      |
| ED4  | Learners-to-computer ratio in schools with computer-assisted instruction                                    |
| ED4bls | Learners-to-computer ratio                                                                                   |

| ED5  | Proportion of schools with Internet access by type (for ISCED levels 1-3)                                    |
|      | · Any type of Internet access                                                                             |
|      | · Fixed narrowband Internet access (using modem dial-up, ISDN)                                             |
|      | · Fixed broadband Internet access (DSL, cable, other fixed broadband)                                      |
|      | · Both fixed narrowband and broadband Internet access                                                     |

| ED25 | Ratio of learners-to-computer connected to Internet                                                         |
| ED26 | Average number of computers per educational institution                                                    |
| ED27 | Average number of computers connected to the Internet per educational institution                          |

| ED29 | Proportion of all computers available for pedagogical purposes                                           |
| ED30 | Proportion of all computers available for administrative purposes                                        |
| ED8  | Proportion of ICT-qualified teachers in primary and secondary schools                                     |
| ED34 | Proportion of schools with ICT support services                                                           |
| ED36 | Proportion of primary and secondary-school teachers who teach basic computer skills                       |
| ED37 | Proportion of primary and secondary-school teachers who currently teach subject(s) using ICT facilities   |
| ED38 | Proportion of primary and secondary-school teachers trained to teach subject(s) using ICT facilities      |
| ED6  | Proportion of learners who have access to the Internet at school                                          |
| ED48 | Proportion of learners who successfully completed a basic computer skills (or computing) course in the last academic year |
| ED52 | Proportion of rural schools with ICT-assisted instruction                                                  |
| ED53 | Number of female graduates per 1000 male graduates in ICT-related fields                                  |

**Re-activating Existing Government Structures**

In most countries government has set up educational hubs at the district level that are supposed to serve as resource centers for the community. For example, in India they are called the DIETS (District Institute for Education and Training). The structure exists, but in most countries they are not functional. Community-based resource centers can provide necessary materials, tools and educational resources for teachers to use in producing lesson plans, furthering their own knowledge, and working together to share ideas and experiences. Providing such resources to teachers in rural settings will allow them to
utilize the training they have received, share ideas and ultimately improve the quality of teaching within the classroom, thus affecting student learning outcomes.

In Kenya, teacher support through resource and advisory centers has had a long tradition, but many of them are placed in urban areas (Giordano, 2008; UNESCO & IIE, 2007), and thus are not accessible to teachers in rural settings. The resource center would provide a forum for teachers to gather and share experiences, further their knowledge, and create materials and lessons to implement in the classroom. Kenya’s urban resource centers are often used as a distribution point for textbooks and guidebooks (Giordano, 2008). Equipping these district centers with basic teaching learning materials will be ensure that each district has a recourse center that teachers could access. Basic materials would include teaching guides, supplemental curriculum books, lesson plan and activity guides, case studies and books on pedagogy, and other materials for teachers to use to create teaching and learning materials to suit their teaching needs. Trainings by local experts and workshops can be held in this space, and part of the funds would subsidize the cost of initiating these trainings and group workshops.

Community-level resource centers for teachers and community members would serve a dual purpose, where teachers could benefit from additional support and resources and community members could benefit from reading materials and books. Strengthening resources in the form of community based resource centers will encourage a culture of reading amongst children and the wider community, and provide a forum for teachers to utilize the training they receive. The resource center can be a forum for Community Education Workers to host activities for children and community members, including reading clubs, remedial education classes, and literacy programs. The Centers will be used to conduct teacher training, share innovative ideas on teaching, develop supplemental curricular resources, make available relevant books and teaching learning materials to support the teaching practice. Along side these activities, the center could also be used as a community hub to conduct remedial classes and have community meetings to discuss education issues.

**Integrating the Non-formal structures**

The education systems in Mali and Senegal are comprised of different types of schools run by many stakeholders. A large proportion of the students attend non-formal schools that are not recognized by the governments. The non-formal nature of many schools means it is difficult to get precise numbers of students attending, but various sources suggest that in Mali this number is actually between 12-15% of the of the total school

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going population\textsuperscript{53}. In Senegal it is estimated that there are around 6,000-10,000 Koranic schools. These children usually do not attend any other formal school and are deprived of basic education. As the non-formal school system is not recognized, a student graduating won’t receive an official primary school graduation certificate. The infrastructure of these schools is often poor, making the children vulnerable to hazardous environments, and a typical child graduating from these schools after 6 years is likely to lag behind in basic numeracy and literacy skills. Therefore, a large portion of the school-going population in these countries does not have a future attaining any vocational skills because of the lack of fundamental education. Through this project we propose aiding the integration of non-formal schools to fall under the umbrella of a recognized system of education, and thereby helping increase access to quality education.

The non-formal school integration project has the growing support from community religious leaders, local elected representatives, other NGOs, Koranic school owners and the regional and district government education sector support. MVP is currently conducting house-to-house visits and community based meetings to ensure that children are encouraged to attend safe schools that provide a healthy learning environment. These methods help to get community support and to reach out to the most vulnerable families. This project also attempts to work closely with all non-formal schools, especially the Koranic school owners in Mali and Senegal, to incorporate recognized formal curriculum including learning basic numeracy and literacy in the non-formal system. With these efforts the project will be able to mainstream around 2,000 children in Senegal and 3,000 in Mali into the formal recognized school support system in the two countries. These sites also face the challenge of reaching out to the “hard to reach” or “invisible” category of children due to their remote rural locations or the complex nature of educational systems preference. The project will involve meeting with the community leaders and reaching out to the most vulnerable families to ensure that all children, irrespective of gender, have access to quality education at the primary level. Introducing basic literacy into the curriculum would help to ensure that all children, girls and boys alike are able to read and write in these non-formal schools. Therefore to achieve universal basic education - MDG 2 - at the sites, it is important to have a successful integration of un-recognized, non-formal education into the formal school system. The project is one of the core strategies that will help to achieve the MDG for education as it addresses the site-specific needs of Senegal and Mali. Similar efforts need to be made in other countries such as Nigeria.

\section*{Developing Data Systems}

The Earth Institute believes in providing integrated, innovative and scalable solutions to the challenges of rural development. The MVP Education Sector prioritizes the importance of rapid data collection that enables real-time use. The Health Sector of the MVP pioneered the use of phones to conduct rapid diagnostic tests and built a referral system to treat certain diseases. The Health team conducts verbal autopsies using phones to provide real-time data feedback. This concept of using technology for data collection linked to specific interventions was put to scale in the Nigeria Scale-up Initiative.

The process given above helps to make clear the “processes” and “inputs” in terms of school based interventions. However, it is equally if not more important to understand if these “inputs” are translating into the desired outcomes or not. One way to measure outcomes is to gather data on the learning levels of children. Until recently, large–scale assessments of learning levels of children in schools or communities was considered either a very expensive proposition or too vague for any kind of community engagement or policy intervention. When such assessments are administered, it can take many months, if not years, to process the data. This limits the frequency with which assessment reports may be generated. Thus the assessment data is not readily available to policymakers, the government, or to the community or the schools where immediate remediation action is needed the most. The real-time use of data will be critical in helping policymakers assess the success and failure of education programs and schools and will be essential in helping to influence education policy.

This initiative is able to speak to the mission by using cutting-edge technical solutions to measure and improve literacy rates among 6 to 16 year olds in the MVP. This applied education monitoring program will provide information on the levels of literacy and numeracy in the region, paired with spatial data to identify priority areas for ongoing education programs and necessary interventions. It includes the design of a tool that facilitates real-time data collection and report card generation on learning assessments. An integral part of this project is the design of rapid literacy and numeracy assessments specifically tailored to the MVP context that will provide real-time feedback of data in the form of Community-based report cards. There are three components: first, adapting the ASER/Uwezo test and conducting the learning assessment in the Millennium Villages. Second, the use of Android phone technology to reduce the time delay between assessing children and providing community-based learning report cards, which now can be done on the same day. The third component comprises of the MVP site education teams who use the assessment data to prioritize and plan education interventions such as remedial education, teacher assistance and supervision, among other critical interventions, based on learning results and available data. Essentially, the project will demonstrate how real-time data collection can be used to rapidly adapt and improve education interventions.

This initiative is an improvement over the existing approaches in many ways. First, using technology for large-scale recording and analyzing test scores with immediate report card generation and dissemination in the communities will improve data utilization. Second, this project showcases how low-cost technology combined with educational testing could help in large-scale community mobilization, improving accountability measures, plan remediation and improving learning levels. Third, it will be integrated within a larger education program with local collaborations and partnerships with the district education

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54 ASER in India and Pakistan, UWEZO in Kenya, Uganda and Tanzania conduct yearly community based assessments of children aged 6 to 16 year old. Last year, in India alone, ASER was able to administer the test to around 800,000 children in rural India. For more information, please visit: http://images2.asercentre.org/aserreports/ASER_2010_Report.pdf

54 http://www.uwezo.net/
officials, religious leaders and the Parent Teacher Associations. The information will be distributed through the local authorities, education outreach agents and school administrators. The results from the learning assessments could be used as a tool to build more accountability into the education system. Prior evidence suggests that the assessments could be used as a discussion point in the village meetings. Therefore apart from assessing the learning levels of children, an important element of this project is using the assessment to create awareness about education issues in the community. Site-specific interventions should then be planned with the aim of achieving the education goals.

It is a right for all children, girls and boys alike, to get quality education starting from pre-school till they transition into work. Every child has a right to read, write, and receive quality education essential for his or her career path. The Millennium Villages Project attempts to honor this child right. The Millennium Villages Project has been able to push policy initiatives in this regard. However, there are still many implementation and policy gaps that have stymied a fully functional education system. Funding the initiatives that matter has been a major obstacles for education. Strengthening the existing government systems at the local, regional and national levels and filling gaps in teacher training and literacy programs are key to removing the existing learning barrier. The MVP already has a buy-in from the regional and local government education bodies, which will be helpful not only horizontally implementing this project at scale but also provide concrete evidence of vertical absorption of the project outcomes for future policy making.

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References


RTI International (2011) EGRA FAQs. Available at: https://www.eddataglobal.org/documents/index.cfm?fuseaction=pubDetail&id=95


Zafeirakou, A. (2014) Going to scale with reading reform: what the Gambian government has learned (forthcoming)