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The Millennium Villages Project: What was the evaluation design?

This Briefing Paper is the eighth in a series to communicate key points from the independent impact evaluation of the Millennium Villages Project (MVP). The MVP aimed to demonstrate that rural Africa could address poverty and achieve the Millennium Development Goals (MDGs) through low-cost, science-based interventions at the village level.

This mixed method impact evaluation of one MVP site in Northern Ghana took place over more than five years. The evaluation consisted of a statistically representative survey of over 2,000 households within 35 villages in the project site and 68 comparison villages. It also included three longitudinal qualitative studies that collected evidence on institutional change, a range of welfare measures and local perspectives (see MVP Briefing Paper 8). Undertaken by Itad, the Institute of Development Studies (IDS) and Participatory Development Associates Ltd (PDA Ghana) and commissioned by DFID, it is anticipated that the findings will be of interest to a wide range of people in the development sector.

Millennium Villages Project

Beginning in 2005, the MVP aimed to overcome the 'poverty trap' facing some countries by applying an integrated strategy for health care, nutrition, education, water supply and sanitation, infrastructure, agriculture and small business in clusters of villages. The idea was to achieve the MDGs by undertaking simultaneous investments, rather than the usual sectoral or step-by-step efforts. The synergies from these multiple interventions were intended to have a greater impact than that of separate interventions.

By 2016, the project had been implemented in 14 different sites in 10 African countries, reaching approximately half a million people in 79 villages. The MVP sites cover different agro-ecological zones and together represent farming systems used by 90% of the agricultural population of sub-Saharan Africa.

What evaluation questions were asked?

The evaluation considered the MVP's impact in relation to the MDGs, as well as a wider set of outcomes. This also included assessing whether gains were sustainable and whether the intervention was cost-effective compared to alternative options.

The key evaluation questions were:

1. Did the MVP deliver on promises to reach the MDGs within the project site?
2. What externalities or spillover effects did the MVP generate, and did they significantly add to or detract from the positive impacts that might have been achieved within the project site?
3. Were the positive impacts of the MVP sustainable after direct implementation of the project ended?
4. Was the MVP intervention package cost-effective in the results it achieved, compared with possible alternatives?
5. Did the MVP package empower disadvantaged or marginalised groups (e.g. women, people with disabilities, or the elderly)?
6. Did the MVP achieve additional benefits arising from synergies across implementation of an integrated package of interventions?

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The MVP in Northern Ghana

From 2012–16, the £11 million MVP in Northern Ghana targeted a cluster of 35 villages of up to 30,000 people in the West Mamprusi, Mamprugu Moagduri and Builsa South districts. This is an area of extreme poverty, with 80–90% of the population living below the national poverty line. The project was spearheaded by the Earth Institute (Columbia University), with operations overseen by the Millennium Promise and the Savannah Accelerated Development Authority (SADA), a semi-autonomous Government of Ghana agency.

Difference-in-difference design

The mixed method evaluation had a difference-in-difference (DiD) design at its core. This approach compared changes in outcomes in the MVP areas with changes in the same outcomes for an explicit comparison group.

The validity of a DiD approach rests on the assumption that project and comparison groups are similar. At baseline, the comparison groups were chosen by matching district villages to project villages using a propensity score built through village-level characteristics obtained from census data and field visits. To remove baseline differences in characteristics between the project and comparison groups, the evaluation employed matching methods at household and individual levels. The DID effect was calculated using regression analysis.

What instruments were used to collect the data?

The baseline survey targeted a sample of 755 households in project villages, and 1,496 households in comparison villages. These sample sizes were able to detect impacts of an acceptable size though power calculations. The size of the comparison group is twice the size of the project group to:

1. stratify the impact of the intervention by distance in order to identify spillover effects; and
2. perform matching of observations at the household level to further improve the comparability of the two samples.

In every survey round, the same households were targeted for interview, though at each round not all targeted households were found. Attrition rates were very low, and less than 8% of the original target sample of households was lost over time. For individuals, over 85% of the original target individuals were included in the last survey round.

Table 1. Quantitative data collection instruments

Survey instrument	Description
Household (full)	Modules are mostly focused on questions regarding achievement of the MDGs (education, malaria, water, sanitation, time use in the home, etc.), plus others on income, expenditure, in/out migration and social networks. At baseline, a separate survey to test people's expectations of survival, income and educational returns was conducted, and later incorporated into the main survey instrument.
Adult	Developed from internationally accepted standards for demographic and health surveys (DHS) used to calculate child mortality, etc.
Facility	A tool on characteristics, staffing and usage of main health and education facilities (clinics, primary schools and junior secondary schools).
Community	Designed by the impact evaluation team to capture village-level data on land area, distance to facilities, economic activities, market prices, shocks and development projects.
Anthropometry	Heights and weights of all children under five are taken.
Blood tests	Haemoglobin of children under five and malaria infection testing obtained by finger-pricking.
Cognitive and learning tests	Observe the MVP's impact on learning outcomes – these are not otherwise captured by the household questionnaire, which focuses on attendance rates and highest grade achieved. They include Raven's matrices, backward and forward digit span, short and advanced mathematics and English language tests.

What was the role of the qualitative studies?

A number of qualitative studies were also undertaken with the objectives of explaining impact, exploring the synergistic and other effects and capturing the perspectives of stakeholders and community members, particularly disadvantaged and marginalised groups. These were repeated at baseline (2012), midline (2014) and endline (2016):

- **An institutional assessment** that investigated how relationships between institutions at community, district and regional levels have changed from the perspectives of the community members and institutional actors. The assessment took place in all three project districts.
- **An interpretational lens approach** that undertook a poverty and vulnerability assessment in the baseline and subsequently used participatory rural appraisal (PRA) methods to obtain feedback and interpretation from different groups on the preliminary statistical findings. The PRA study took place in 20 field sites (seven project villages, and 13 comparison villages).
- **A reality check approach** that used a condensed immersion approach to better understand how the MVP affects the realities of people's lives, and capture any unintended consequences. Trained and experienced researchers stayed in people's homes for several days and nights, joining in their everyday lives and chatting informally with family members, neighbours and others they came into contact with.

The analysis and synthesis

An analysis plan for the statistical work was produced early on, and included deliberate sequencing of the statistical analysis, participatory rural appraisal and reality check approach studies. The process of analysis and synthesis was incremental with themes and areas of enquiry emerging over the five-year study period.

Findings from earlier years and project documentation were used to develop a set of causal chains that provided a framework to assess the DID analysis (net effect) alongside explanations of how the project activities led to these impacts. Each study area produced preliminary summary reports during baseline and midline, and findings were presented and discussed during team workshops to draw out:

1. areas where qualitative research corroborated the emerging statistical analysis of impact; and
2. areas where qualitative research challenged the statistical findings and further analysis was required to understand why.

What were the limitations of the evaluation?

As with any evaluation, there are a number of limitations including:

- projects are rarely assessed on final impact indicators such as the MDGs, given the likely scale and time frame needed to produce sufficient change;
- all MDG indicators are measured as ratios, shares and percentages, sometimes relying on somewhat arbitrary cut-off points (poverty and undernutrition);
- the observed impacts may be dampened by spillover effects, such as if benefits extend and the comparison sites are contaminated;
- the absence of DID impact does not necessarily mean that the project did not have an impact, if similar interventions were conducted in other areas;
- seasonal biases are possible for estimates of malaria prevalence and use of bed nets because of a delay in timings during the baseline; and
- the evaluation design is limited in that it covers only one MVP cluster in one country, and its results cannot be extrapolated to other contexts.

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The MVP Endline Summary Report and MVP briefings can be accessed from **www.itad.com/knowledge-and-resources/MVEval**

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Credits
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