



**International Initiative for Impact evaluation**  
*Improving lives through impact evaluation*

# **Impact Evaluation of a New Millennium Village in Northern Ghana**

## **Peer Review Group assessment of the initial design document**

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## Overall Assessment of the Initial Design Document

The evaluation of the new Millennium Village in Northern Ghana uses a difference-in-difference approach and combines this with propensity score matching to assess the impact of the intervention. Additionally, the evaluation will assess the synergistic effect of the intervention by conducting a cost-effectiveness analysis of each component of the intervention. The sustainability of the effects of the intervention will be assessed by estimating the effects of the intervention after 10 years, while externalities will be detected by building in an additional treatment so that the control consists of both 'faraway' and 'nearby' communities. Externalities will also be estimated through social network analyses. Complementary qualitative research will address the questions why and how the Millennium Village has or has not had an impact.

By combining propensity score matching with difference-in-difference analysis the researchers make an important improvement over the existing evaluations of the Millennium Villages, which mostly focus on before-after analysis. Additionally, the mixed-methods approach allows the researchers to not only address the question "What is the impact of the new Millennium Village?", but also "Why the new Millennium Village has or has not had an impact? Finally, it is encouraging that the empirical approach is explicitly linked to the big-push theory of change, on which the Millennium Village model is based.

However, we also believe that the research approach has some important limitations. Although this potential weakness of the design is beyond the control of the researchers there will always be some lingering doubts about the existence of unobservable differences between the treatment and the comparison group. This concern is exaggerated by the time lag of about three months between the surveys in the treatment and the comparison group.

Despite these limitations, the evaluation design is thorough and rigorous and addresses the constraints imposed by the intervention openly and with clarity.

## Strengths and Limitations of the Research Design

### The Quasi-Experimental Research Design

The Millennium Village model is based on the implementation of an integrated package of interventions across a cluster of villages. Taking into account the constraints imposed by this model, we believe the combination of propensity score matching and difference-in-difference analysis can be perceived the next best option after a randomized controlled trial design. The research team has also adopted an ex-ante propensity score matching strategy based on community characteristics to select comparison villages. This approach is obviously constrained by the limited availability of community level data, which may also not reflect differences between households. Nonetheless, we believe that using ex-ante propensity score matching can be considered a credible strategy to select appropriate comparison villages.

Additionally, the validity of the difference-in-difference approach depends on the assumption of parallel trends in the treatment and the comparison groups. To assess the validity of this assumption the research team proposes to collect retrospective data. This approach allows the research team to test the assumption of parallel trends, which is encouraging.

The research team also proposes to conduct two additional smaller surveys to focus on expenditures. We encourage this approach, since it will allow the research team to achieve the statistical power in order to detect relatively small effects of the intervention.

The risk of bias from unobservable characteristics is an unavoidable concern because the process through which the Millennium Village site was not transparent. Additionally, aggregate shocks in the treatment or the comparison group might bias the impact estimates. However, the research team has taken appropriate steps to mitigate these concerns.

### **The Theory of Change**

We very much appreciate the effort of the research team to explicitly test the big-push theory of change. The evaluation really delves into the question whether an integrated package of interventions can bring about a sustainable reduction in poverty in the kinds of communities where individual interventions, even implemented concurrently, have not made much of a difference. This approach, which needs to be accompanied by the estimation of different production function functions in treatment and comparison villages, is one of the major strengths of the proposal. The focus of the researchers on the estimation of returns to investment in treatment and comparison villages is challenging though. At this moment we cannot yet be sure whether the research team will succeed in achieving their ambitious aspiration to test the big-push theory of change.

The extensive effort to diagram the theories of change for every individual intervention is also impressive. This effort demonstrates that the research team has given a lot of thought to each of the interventions that are implemented within the Millennium Village model of an integrated package of interventions. Nevertheless, the inherent difficulty in testing explicitly the assumptions behind every individual intervention will limit the ability to fully analyse the causal chain.

### **The Estimation of Synergistic Effects**

The research team proposes to estimate synergistic effects, as generated by the simultaneous investment in all sectors of the economy. For this purpose, the research team proposes to explore whether the new Millennium Village is the most cost-effective way to achieve comparable results. Additionally, a cost-effectiveness analysis will be carried out for each major programme component. The new Millennium Village is only likely to have sufficient synergies to be cost-effective when each major programmatic element is more cost-effective than in a non-synergistic programme. To assess this assumption the research team proposes to compare the cost-effectiveness of the Millennium Village with the cost-effectiveness of other major development interventions in Ghana.

The validity of the above discussed approach, however, depends on a number of assumptions. For example, the specific context in the Millennium Village might be different from the context in which other major development programmes in Ghana operate. These contextual differences make it difficult to ascribe differences in cost-effectiveness to the synergistic effects of the Millennium Village. Additionally, it may not be possible to extrapolate the results from this evaluation to a situation in which the Millennium Village approach would be scaled up across Ghana. It is also very difficult to define the benefits and costs that should be attributed to particular improvements in living standards in the Millennium Village. We thus believe that the results concerned with the estimation of synergistic effects should be treated with caution. Nevertheless, we believe that the comparison of the cost-effectiveness of the Millennium Village with the cost-effectiveness of several comparator interventions can provide relevant information for policy makers.

### **The Mixed-Methods Approach**

We are pleased to know that the research team intends to use a mixed-methods approach with sufficient space for qualitative research in their research design. The research design contains a poverty and vulnerability assessment, an interpretational lens using participatory rural appraisal tools, an institutional assessment and a so-called reality checks methodology, which is basically a mini-anthropological study. Ideally, we would also have liked to see qualitative research to inform the baseline survey. However, this did not prove to be logistically possible due to the start of the rainy season in Northern Ghana.

Using the above discussed qualitative methods should certainly help the research team to not only answer the question “What is the impact of the new Millennium Village?” but also “Why did the Millennium Village have this impact?” It is important to address the interpretation of how change has occurred through means of qualitative research. Additionally, we believe it is encouraging that the qualitative research aims to prevent leading questions, in the sense that respondents in the qualitative research are not asked directly whether the Millennium Village has had a major influence on their life. This absence of leading questions reduces the risk of cognitive biases.

## **Challenges**

### **Seasonal Differences between the Treatment and the Comparison Group**

Due to a time-lag in the surveys for the treatment and the comparison group there exists the risk that baseline comparisons between the treatment and the comparison group are biased due to seasonal differences. As discussed in the proposal, baseline interviews in the treatment group were conducted over the period April to June, while interviews in the comparison group were conducted over the period July-September.

Several variables (consumption, food security, mosquito net use and health related questions) might contain systematic measurement error due to the time-lag. This could bias the impact estimates. The

research team proposes the use of secondary data to assess the size of the potential seasonal bias for key variables in the region. If large differences in treatment and comparison villages are found, the impact of seasonality can be estimated. This is the best the researchers can do to mitigate these concerns. However, it won't be known until data are collected and analyzed whether the impact of the seasonality can be estimated.

### **Contamination**

In order to have a good overview of what other development programmes exist in the treatment and comparison communities the research team proposes to map the operations in the area through means of a community survey. Furthermore government representatives will be asked to present info on how government resources and services were used, both in the treatment and in the comparison villages as well as before and after the intervention. These research components should mitigate the concern of contamination. Although this approach has its limitations, we believe that the research has taken appropriate measures to mitigate the concern of contamination.

### **Conclusion**

The research design concerned with the impact evaluation of the Millennium Village is rigorous and thorough in its attempt to mitigate the constraints imposed by the intervention. The research approach has its limitations but these are mostly beyond the control of the researchers and the research design addresses these constraints openly and with clarity.