



# **COST BENEFIT ANALYSIS OF THE KITCHEN GARDENS INTERVENTION**



**Save the Children**

**WOMEN AND CHILDREN/INFANTS IMPROVED NUTRITION IN SINDH (WINS) PROJECT, PAKISTAN**

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## 1. BACKGROUND:

Women and Children/Infant Improved Nutrition in Sindh (WINS) is a four-year project, funded by the European Union (EU), with the overall objective of improving the nutrition status of children, pregnant and lactating women (PLWs) in three districts of the Sindh Province. The kitchen gardens intervention is one of the nutrition-sensitive activities of the Project, intended to increase year-round access to nutritious foods, thereby bringing down the cost of a nutritious diet and increasing self-sufficiency and improving dietary diversity. A total of 10,000 households (predominantly women-headed), who have sufficient access to small amounts of productive land, were supported to establish healthy and low-input kitchen gardens.



Supporting low cost kitchen gardens is a food security and livelihoods intervention that Save the Children has implemented in Pakistan at a large scale since the widespread floods in 2010, both as a humanitarian and development response to food insecurity. The WINS project provides an opportunity to carry out some critical reflection on the expected results from this intervention. A study was carried out to find out the effectiveness, appropriateness and sustainability of kitchen gardens. Based on the collected data, a cost benefit analysis was also carried out to examine the kitchen gardens activity with a Value for Money (VfM) lens.

The study area was limited to Shikarpur District of the Sindh Province, one of the districts the Project is being implemented. The National Nutrition Survey (NNS) 2011 indicated a high level of acute malnutrition in Sindh, which exceeded WHO's critical threshold of 15% General Acute Malnutrition (GAM). Shikarpur was one of the districts, severely affected by floods in 2010. Even before the floods, a joint study by the Sustainable Development Policy Institute (SDPI) and WFP in 2009 showed that nearly 40% of the population of the District was food deprived. The floods in 2010 further deteriorated

the conditions in the District, exposing lives of thousands of inhabitants to natural and social disasters.

## 2. HOW COSTS AND BENEFITS WERE MEASURED:

Following are the three different cost/benefit ratio scenarios which were analysed:

1. The return on investment by Save the Children ( the overall benefits to the beneficiaries)
2. The return on investment by beneficiaries (during the life of the Project, while inputs are provided to them without cost)
3. The return on investment for households to continue the intervention after the life of the Project (funding their own inputs)

## 3. METHODOLOGY

Below are the six key steps that were taken to complete cost benefit analysis:

1. The first step was to identify the likely outcomes of the kitchen gardens activity for different stakeholders, especially women and their households. This was based on an outcome mapping exercise with Project staff, that identified the following major outcomes of the kitchen gardens intervention:
  - Increased income of beneficiary households due to sale of surplus produce from kitchen gardens
  - Increased saving/reduced expenditure on food in the market due to availability of vegetables from kitchen gardens
  - Improved nutritional status (or at least dietary diversity) of beneficiary households, especially of children (due to accompanying behaviour change communication focusing on infant and young child feeding practices)
  - Increased economic and social empowerment of the women in households due to their contribution to household incomes
  - Increased awareness and enhanced skills of women
  - Increased availability of fresh vegetables in the local market

2. In the second step, proxy indicators were developed to monetise these outcomes. These indicators were incorporated as an exclusive part of the questionnaire in a broader kitchen gardens study. The aim of this questionnaire was to generate data that could monetise these outcomes.
3. In the third step, data was collected by using the Probability Proportional to Size (PPS1) technique, where a sample of 372 respondents were selected from among the 10,000 beneficiaries with 95% confidence level. In next step, the sample from each cohort<sup>2</sup> was drawn using systematic random sampling from targeted 6 sub districts covering 29 Union Councils (UCs). The collected data was analysed and the results of the study were used to carry out cost benefit analysis.
4. In the fourth step, the project outcome/benefits were monetised by an exclusive analysis. In addition, information from existing Cost of Diet (CoD) and Household Economic Analysis (HEA) studies which were conducted during 2013 (the first year of Project's life) were also used to add greater contextual significance to these benefits. For example, the improved nutritional status noted was not exclusively achieved by the addition of kitchen gardens, but also other project interventions like food vouchers and cash for work, as well as developments outside of the WINS project. Therefore, COD and HEA were consulted to compare the projected modeling of kitchen gardens in both studies with actual observed outcomes. This also served to retrospectively test the appropriateness of the modeling function of these tools.
5. In the fifth step, the project costs were analysed with the help of the finance team in order to identify which costs would be attributed to this intervention for the purpose of the analysis. Some costs like that of project human resource and cost of follow-up visits to kitchen garden beneficiaries were not included; rather only direct costs were selected.
6. In the sixth step, basic returns on investments were concluded for the above mentioned three specific scenarios by comparing overall costs and benefits.

### 3.1. Limitations of the analysis:

Additional stages to the analysis that could have strengthened the findings did not take place due to limitations of time and resources. In particular, this analysis did not include attribution<sup>3</sup>, dead weight<sup>4</sup> or drop effect<sup>5</sup> analysis. Furthermore, in this analysis some important costs and benefits could not be monetised. For example, non-programmatic costs, including HR, were not included as it was very challenging to calculate the time project staff spent on this activity during the last three years, given that this was a multi-sectoral project with several interventions.

Similarly, the benefit of improved skills could not be monetised; this is an important benefit for those who participated in the intervention, who otherwise would not have had access to such training without incurring costs themselves. An institute that provides training on keeping kitchen gardens is not available in Shikarpur, so no comparable cost could be identified. Finally, empowerment of women was another benefit that was not monetised.

In future, we can develop specific financial proxies to monetise social benefits such as these, and capture all programmatic and non-programmatic costs as well. However, despite these limitations, the conclusions presented here are based on sufficient analysis to identify useful recommendations for kitchen garden interventions.

## 4. COSTS AND BENEFITS ANALYSED:

### 4.1. Costs included in this analysis are:

- Labour, i.e. the opportunity cost in terms of paid work that beneficiaries could have earned instead of spending time on the gardens. Labour cost was calculated based on the market rate for daily unskilled labour rates. The Project paid Rs.380

1 Probability proportional to size is a method of sampling that takes the varying size of each item within the population into account when selecting the audit sample.

2 There were three cohorts of kitchen garden beneficiaries, who have kept kitchen gardens over a period of three years.

3 Attribution is an assessment of how much of the outcome was caused by the contribution of other organisations or people

4 Dead weight is a measure of the amount of outcome that would have happened, even if the activity has not taken place. It is calculated as a percentage.

5 Drop-off is used to account for this and is only calculated for outcomes that last more than one year.

(\$3.63<sup>6</sup>) per day to beneficiaries involved in cash for work activities, in-line with the government assigned minimum wage rate. The study to evaluate the kitchen gardens initiative estimated that on average, each woman had to spend 1.5 hours per day on her kitchen garden, which if paid, would be equal to Rs.73. So on average, each woman had to spend 30 hours per month on garden activities, which in monetary terms cost Rs.1,380 (\$13.02) per month.

- Training, i.e. the cost of training to Save the Children (however, the cost of follow-up visits conducted by field staff after the kitchen garden training was not included in this analysis). This cost includes a per diem of Rs.300 (\$2.87) per trainee, multiplied by four, as each trainee attended four sessions. The trainer charged Rs.4,500 (\$43) or one session, which was delivered to 20 beneficiaries at a time, with a total of four sessions.
- Tools/inputs provided to the beneficiaries by Save the Children and their current cost in the market. The input cost per beneficiary, per season, is Rs.275 (\$2.63), while the tool kit costs per beneficiary, per season, is Rs.2,960 (\$28.32).
- Travel cost borne by beneficiaries to sell their produce in nearby markets. Beneficiaries reported that they incurred a travel costs to sell vegetables. On average, it was Rs.40 per visit, and on average, each beneficiary conducted two visits to the market to sell these vegetables.

## 4.2. The benefits included in the analysis:

- Increase in income to households from the sale of the produce from their kitchen gardens. On average, 28 Kg of produce per beneficiary was sold in the market in one month (the equivalent of 39% of the total produce.) The average income from kitchen gardens was Rs.1, 400 (\$ 13.39) per month, per beneficiary household.
- Savings by beneficiaries because of the availability of vegetables: Rs.1, 000 (\$9.56) per month (i.e. the market value of the vegetables produced, had they been purchased instead.) The average reported household savings because of kitchen gardens was

Rs.1, 000 (\$9.56) per month, per beneficiary household. In a context of high vulnerability and high debt levels, this is an important benefit – the HEA revealed that there is generally no or low savings for all wealth groups, with only the better off saving 1%, while the poor and very poor have loan arrears of 5% and 6% of their annual incomes.

- Improved nutrition/health status of households (measured as a percentage) savings in healthcare costs. The same percent of contribution that kitchen gardens made to household income was applied to the savings reported in household expenditure on healthcare. This is a very approximate way to attribute nutrition impacts to the intervention. In the absence of anthropometric data, this was the only possible proxy indicator available.
- Women empowerment: It was not possible to monetise women's empowerment. Firstly, it was difficult to develop appropriate proxy indicators that could be monetised. Secondly, it was clear from qualitative discussions that women have not experienced significant empowerment in relation to this intervention.

The HEA highlighted that opportunities for women to earn an income are extremely limited beyond agricultural labour. The project design expected that kitchen gardens would provide women an opportunity to become more active in the household economy and participate in local markets. Indeed, the kitchen garden interventions were mostly implemented by women 90% of the time, and in only 10% of the cases, they were implemented by men. However, the study also revealed that although women are primarily responsible for tending to the kitchen gardens, they do not have control over the incomes they produce; only 26 % women were able to sell their produce in the market, while in 74% of households it is the men who control the sale of the produce. Furthermore, only 27% of the women played an active role in deciding how the income would be utilised.

- Food security: In order to determine changes in food security, data gathered from households during the study was compared with household assessment data carried out during the beneficiary selection process three years ago, which classified households according to their food security level, using a food consumption score. When this household assessment data was compared with the

present kitchen gardens data, it revealed a reduction in the percentage of beneficiaries classified in the poor food consumption group to 19% from 89%. Beneficiaries in the moderate food consumption group increased to 38% from 11% over the three years of project implementation. Additionally, 43% of the beneficiaries fell in the adequate food consumption category, compared with 0% during the time of the assessment. Given that the kitchen gardens intervention was one of several food security and nutrition interventions in the WINS project, and that broader development and economic growth took place during this time. We cannot attribute this enormous change solely to the kitchen gardens, however. It would be reasonable to assume that the intervention made some contribution to this improvement.

- **Sustainability:** More than two-thirds (64%) of the beneficiaries shared that they were currently tending their kitchen gardens. However, there productivity is comparatively lower as compared to the first season when they started the kitchen garden activity. It is worth noting, however, that this data was collected by the same FSL staff involved in the project implementation, so it is possible that some bias influenced the phrasing of questions and recording of results. In terms of the sustainability of the technical support, the Project has successfully engaged the Agricultural Extension Department that trained the beneficiaries in tending kitchen gardens, and now beneficiaries know where they can seek technical support.

we calculate this return on investment over the period of the next 5 years, it is suspected that it would further decline because little or no follow-up is expected from the Agricultural Extension Department, so productivity would likely decline.

2. **Return on investment for beneficiaries during the project:** With the support of the Project, it cost Rs.1, 460 (\$14) per month, per beneficiary household, to establish a kitchen garden that would ultimately give a return of approximately Rs.2, 473 (\$23.6) per month. This means kitchen gardens are economically profitable for beneficiaries when they are supported by Save the Children.



## 5. KEY FINDINGS

### 5.1 Returns on investment

1. **Return on Save the Children's investment:** According to the analysis, the return on investment for Save the Children as an implementing organisation is very low; it's \$1: \$0.32. This means that for every dollar spent by the organisation on the intervention, the overall return on this investment, i.e. the total monetised benefits to the beneficiaries, is only a third of a dollar in one year. From an economic point of view, this is not a very profitable activity in the long term. Furthermore, if
3. **Return on investment for beneficiaries if they continue to maintain the gardens beyond the Project:** Without support from the Project, it would cost Rs.4, 695 (\$44.8) per month, per beneficiary, to maintain a kitchen garden, with an expected return of Rs.2, 473 (\$23.6) per month. Furthermore, the yield of kitchen gardens might be lower than it was during the period that project support was being received, as there would be limited regular follow-up and technical support available for beneficiaries. It was envisaged that the Department of Agriculture's extension staff would provide this follow-up, but in reality this has proved very difficult. The likelihood is that they may continue for a



couple of months after the Project ends, but long-term support and follow-up will be minimal, if any. Indeed, a number of beneficiaries have not maintained their gardens after the project intervention; currently 36 % of the kitchen garden beneficiaries have already ceased kitchen garden activities within two years of their participation in the intervention, due to the perception that it is not profitable enough to continue.

4. Comparison of actual outcomes with projections from the CoD kitchen garden model: The CoD analysis contributed to four key expectations, upon which the project design was based: Firstly, the CoD projected a yield per household, per month, with actual yield of 63.6 kg per household. This is against an actual yield of 72 kg per household, (though is likely skewed due to a few high producers raising the average). This suggests that the production data provided by the Agricultural Extension Department for this forecast on likely household yields was accurate.

Secondly, the CoD assumed, based on anecdotal evidence from previous kitchen gardens interventions in Pakistan, that 15% of the production would be sold. However, this study showed that beneficiaries sold 39 % of their total production. This perhaps suggests that the nutrition Behaviour Change Communication (BCC) was not as successful as expected in encouraging households to prioritise the consumption of nutritious food; or that in a context of such poverty, expecting household to only sell 15% of their produce is perhaps unrealistic.

Thirdly, to model the impact of this intervention on the cost, composition and quality of a nutritious diet, data from the Agricultural Extension Department was used to estimate the expected annual yield that each household would generate from their kitchen garden. The CoD then estimated that households would earn Rs.5, 271 (\$ 50.39) of income per year, or Rs. 439 (\$ 4.20) per month, based on the sale of just 15% of their produce. This was expected to amount to a reduction in the daily cost of a nutritious diet of 2% for the poorest households. In reality, households sold 39% of their produce, or a monthly income of Rs.1, 400 (\$13.38). In other words, we can see that households earned 22% more income than expected, per unit of produce sold. This reveals a reasonable level of

accuracy of the CoD model, and a better than expected performance from the Project in terms of income.

Finally, and perhaps most importantly, the CoD model estimated a positive impact on the quality of the diet as a result of the intervention, in particular by improving intakes of protein, vitamin C, vitamin B1, vitamin B2, niacin, vitamin B6, pantothenic acid and magnesium for the household. Given that the kitchen gardens package of seeds was designed on the basis of the foods identified in the CoD study, we can assume that households did indeed receive these nutritional benefits, though to a lesser extent than predicted due to the fact that less produce was consumed than expected. As explained above, this benefit is accounted for using the proxy indicator of reduced health expenditure.

## 6. CONCLUSIONS AND LESSONS:

Overall, we can conclude that kitchen gardens are only profitable to beneficiaries when Save the Children is investing in this activity; otherwise it is not profitable for the households to continue tending their kitchen gardens unsupported. It can positively affect income and food consumption on a short-term basis, however, when it comes to longer term food security, it is necessary to identify a more cost-effective model. Therefore, we need to carefully consider whether supporting kitchen gardens are an effective approach for food security and nutrition, and what outcomes it can yield for children.

However, there are a number of additional social benefits which have not been monetised, and which go some way to validate the intervention. Kitchen gardens have positively affected the beneficiaries by improving their skills, income, nutritional quality of diets and household savings. Furthermore, kitchen gardens have also contributed to improving the status of women (empowerment) at the household level, though it is not that significant, as only 26 % control the income from kitchen gardens; but still it is very encouraging that it has given some voice to the women in this remote district.

From this experience, Save the Children should internalise the following lessons and apply them to future design of programs with a potential kitchen gardens component:

- 1) Set clear targets in relation to the benefits identified above, and develop a robust MEAL system to measure the impact of the intervention on these throughout the duration of the project (e.g. income, saving, dietary diversity, etc.)
- 2) Develop a cost-effective model for beneficiaries to continue their kitchen gardens without receiving inputs from the project. This may involve using local traditional seed varieties, improving seed storage skills and facilities, ensuring commitments from the government to continue providing support, etc.
- 3) In addition (or even instead of) kitchen gardens, supporting households to invest in other livelihood options, based on the local context, that ensures a regular income (especially for women) to enable households to improve their long-term livelihoods and invest in their children's nutrition and broader wellbeing.
- 4) Continue to further develop and apply the cost benefit analysis tool or Social Returns on Investment (SROI) to foster critical reflection on programs, expanding to food security and livelihoods interventions beyond kitchen gardens. For this purpose, future projects should develop some VFM indicators at the start of the intervention, and continue to track them over the period of project. This will allow program staff to compare different approaches and then select the best strategies, which are not only effective, but also provide a strong VFM case to the organisation and donor.
- 5) In terms of ensuring greater empowerment of women, it is clear that this cannot be achieved through livelihood interventions alone. Additional approaches would need to be considered, for example linking women with markets, financial institutions and skills development, and addressing some of the issues around intra-household control over resources.
- 6) During a long-term FSL project such as this, it is recommended to form a home producers/farmers group that should be linked with relevant government line departments and other private sector players from the outset. This will ensure greater sustainability of the interventions, as these organised groups could continue to engage government extension departments after the completion of projects, and hold them to account.
- 7) The modeling of yields and impact on household incomes and affordability carried out in the CoD analysis were on par with actual findings, suggesting that this modeling was a useful program design tool

in setting targets and anticipating some of the Project's impacts. As the cost benefit analysis has illustrated, this modeling could have been furthered by adding estimates of time and inputs from beneficiaries to generate cost/benefit estimates. In future program design processes, Save the Children should utilise the learning from this process and apply this modeling approach at the design stage to ensure that interventions are scrutinised for their potential economic and social viability and sustainability in the longer term.

- 8) Project should develop their learning agendas at the onset which will ultimately ensure some quality learning during the life of the project. This Cost Benefit Analysis was only possible because there were learning questions about the cost effectiveness of the KG in the learning agenda of the WINS project.

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