
MEMORANDUM

TO: Rebecca Tunstall

FROM: Randall Blair, Alexander Persaud, and Larissa Campuzano

DATE: 6/23/2010
ESVED-239

SUBJECT: Baseline Comparison of Artisans - **Revised**

This memo presents baseline analysis results for the impact evaluation of the Productive and Business Services (PBS) activity of the Millennium Challenge Corporation-funded Productive Development (PD) project in El Salvador. In this memo, we analyze baseline survey data related to the handicrafts value chain of the PD project. Our analysis of key measures of employment and income indicates that artisans randomly assigned to the second year of implementation activities (the treatment group) are very similar to artisans randomly assigned to the third year of implementation activities (the control group). Given these findings, we can conclude that random assignment produced an internally valid control group.

A. BACKGROUND

The Productive Development (PD) project is one of three large-scale projects financed under the 2006 Compact between the Millennium Challenge Corporation (MCC) and the Government of El Salvador.¹ The main objective of the PD project is to assist in the development of profitable and sustainable business ventures for individuals and organizations that benefit poor people in El Salvador's Northern Zone. The project will use nearly \$72 million in allocated funds to benefit an estimated 55,000 beneficiaries over five years.^{2,3} The PD project comprises three activities: (1) Productive and Business Services (PBS); (2) Investment Support; and (3) Financial Services. The PBS activity is designed to include pre-investment studies, training, and technical assistance to small farmers and business owners, in-kind contributions of agricultural and genetic materials, legal assistance, and other business development services. The Investment Support activity is designed to offer investment capital for competitively selected business proposals. Finally, the Financial Services activity provides technical assistance and financial resources to the banking sector and loan and output guarantees to small producers, as appropriate. One overarching

¹ The Compact's other two projects are the Human Development Project and the Connectivity Project.

² The PD project will directly benefit an estimated 11,000 producers with technical and material assistance. Using an estimate of 5 persons per producer household, the PD project will benefit an estimated 55,000 people overall.

³ Executive Summary, Millennium Challenge Compact with El Salvador, 2006, and Acuerdo Modificado y Redefinido de Entidad de Implementación del Proyecto de Desarrollo Productivo, May 2010.

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service provider, Chemonics, is coordinating and managing the various components of the PBS activity. In partnership with FOMILENIO, Banco Multisectorial de Inversiones (BMI) is coordinating the Investment Support and Financial Services activities.

MCC has contracted Mathematica Policy Research to design and conduct the impact evaluation of the PBS activity. The objective of the evaluation is to answer the following research question: What is the impact of PBS on employment creation and household income? Based on extensive consultations with MCC, FOMILENIO, and Chemonics, we chose a randomized design for the evaluation. Under this design, producers from three value chains—handicrafts, horticulture, and dairy—were randomly assigned to the second or third implementation cycles according to their municipality of residence or group membership. To determine the impact of PBS, outcomes of producers that were offered services in the second implementation cycle (treatment group) will be compared with outcomes of producers that were offered services in the third implementation cycle (control group).

For the handicrafts value chain, Mathematica randomized 750 producers into treatment and control groups according to their municipality of residence: 377 producers in 11 municipalities were randomly selected to receive Chemonics services during 2009-2010 (treatment group), and 373 producers in 11 municipalities were randomly selected to receive Chemonics services during 2010-2011 (control group). Before Chemonics services began in late 2009, baseline interviews were conducted with artisans in treatment and control groups by the Dirección General de Estadística y Censos (DIGESTYC), retained by FOMILENIO as the data collection contractor for this study.

B. DATA SOURCE AND DATA COLLECTION

The baseline Productive Development Survey-Handicrafts (PDS-H) is the sole data source for this baseline analysis. Mathematica worked with MCC, FOMILENIO, and DIGESTYC to design and administer the baseline PDS-H to producers in the study sample. The survey instrument contained two modules: one for all individual producers in the study sample, and one for all leaders of productive groups of artisans in the study sample. The individual module focused on each artisan’s production and income, whereas the leader module focused on production and income at the group level. The two modules included the following sections:

| Individual Module | Leader Module |
|--|---|
| <ul style="list-style-type: none"> • Section A: Demographic information • Section B: Household Composition • Section C: Artisan activities • Section D: Artisan expenses/income • Section E: Household income • Section F: Household expenses • Section G: Credit | <ul style="list-style-type: none"> • Section H: Demographic information • Section I: General group information • Section J: Group production and sales • Section K: Information and marketing • Section L: Common problems • Section M: Productive activities • Section M: Group expenses/income |

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With oversight from Mathematica, DIGESTYC personnel administered the individual module of the baseline PDS-H to artisans in 22 municipalities in El Salvador's Northern Zone from October 2009 to November 2009. The target sample size for the baseline ESE survey was all 750 artisans in treatment and control groups who were certified as eligible by a census of artisans conducted by Aid to Artisans.⁴ DIGESTYC interviewed 730 of these 750 artisans, for a completion rate of 97 percent.⁵ In addition, 41 artisans in the sample identified as group leaders completed the survey's leader module.

AENOR Centroamérica—an independent organization retained by FOMILENIO—evaluated the PDS-H survey instrument, training procedures for interviewers, and DIGESTYC's data collection and quality control procedures as part of a comprehensive data quality review. AENOR gave a score of 99 out of 100 possible points for the quality of the survey instrument, survey materials, and sampling frame, and a score of 92 out of 100 possible points for all training, data collection, and quality control procedures. Given these high scores, Mathematica staff is satisfied that the baseline PDS-H data are of high quality.

C. PRODUCER AND HOUSEHOLD CHARACTERISTICS

In Tables 1 and 2, we summarize the characteristics of all producers and households in the sample; producers and households in the treatment group are combined with producers and households in the control group in these tables. As illustrated in Table 1, the majority of artisans in the study are married women. Most artisans are either members of workshops or not members of any organized group of producers. On average, artisans report a net income of less than \$300 a year from handicraft production and sales, and less than \$900 a year from all income sources. As illustrated in Table 2, households in the sample reported an average annual gross income of around \$4,000⁶ and an average annual net income of around \$2,500. About 27 percent of

⁴ Aid to Artisans is the entity contracted by Chemonics to administer PBS to beneficiaries in the handicraft value chain.

⁵ A small number of these interviews were actually conducted with family-members of producers who served as proxies for producers who were away from their place of residence at the time of the baseline survey. Some of these proxy interviews may not be included in follow-up impact analyses, particularly if producers have not returned to their place of residence at the time of the follow-up survey.

⁶ This estimate is above average annual gross household income for rural families in the Northern Zone (\$3,762), but below average annual gross household income for all families in the Northern Zone (\$4,604), according to the 2009 Encuesta de Hogares para Propósitos Múltiples. It should be noted that the sample of producers in this study is not directly comparable to all families (or all rural families) in the Northern Zone.

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households in the sample report a daily income of less than \$1.25 a day per person, and about 41 percent of households report a daily income of less than \$2.00 a day per person.⁷

Table 1. Background Information on All Producers in the Sample, 2009

| Characteristic | Average (in US\$) or Percentage |
|--|---------------------------------|
| Female | 83 |
| Age (in years) | 40 |
| Married or cohabitating | 67 |
| Educational level | |
| None | 23 |
| Basic | 65 |
| More than basic | 13 |
| Membership in a group of artisans | |
| Workshop | 33 |
| Cooperative | 0 |
| Another association | 7 |
| Owner of association | 4 |
| None | 56 |
| Gross annual income from handicrafts | 618 |
| Net annual income from handicrafts | 280 |
| Net annual non-handicraft income | 587 |
| Total net annual income, including handicrafts | 867 |
| Producers | 730 |
| Municipalities with Reporting Producers | 22 |

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted from September 2009 to October 2009.

Note: Percentages may not add to 100 because of rounding.

⁷ This is higher than a 2009 poverty estimate by Carranza of poor households in the Northern Zone in the document, “Caracterización de la Pobreza de la Zona Norte de El Salvador” (2010). The author estimated that 12 percent of households—and 16 percent of rural households—in the Northern Zone had a per-capita income of less than \$1.25 a day. This discrepancy suggests that the distribution of income and consumption within the study’s sample is fundamentally different from the distribution of income and consumption among all households (or all rural households) in the Northern Zone.

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Table 2. Background Information on All Households in the Sample, 2009

| Concept | Average (in US\$) or Percentage |
|---|---------------------------------|
| Household size (people) | 5 |
| Gross non-handicraft income | 3,264 |
| Gross handicraft income | 745 |
| Gross income, including handicrafts | 4,009 |
| Net income, including handicrafts | 2,542 |
| Consumption | 2,379 |
| Savings (net income minus consumption) | 163 |
| Percentage of households living below \$1.25 a day ^a | 27 |
| Percentage of households living below \$2.00 a day ^b | 41 |
| Households | 656 |
| Municipalities with Reporting Producers | 22 |

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted from September 2009 to October 2009.

Notes: ^a Based on per-capita gross household income. Estimates based on per-capital household consumption yielded higher proportions of families under the \$1.25-a-day poverty line (29 percent). All estimates are adjusted for purchasing power parity using 2005 prices in El Salvador.

^b Based on per-capita gross household income. Estimates based on per-capital household consumption yielded higher proportions of families under the \$2.00-a-day poverty line (53 percent). All estimates are adjusted for purchasing power parity using 2005 prices in El Salvador.

D. BASELINE COMPARISONS

Background Information. To determine whether producers in the treatment group were demographically similar to producers in the control group, we compared their sex, age, average family size, education, and group membership (Table 3).⁸ We detected significant and substantive treatment-control differences for only one variable: membership in a group of artisans. Producers in the treatment group are more likely to belong to a workshop, whereas producers in the control group are more likely to have no affiliation with any formal productive group. This treatment-control difference is likely a consequence of the unique mix of artisan organizations operating in each municipality in the study sample.

⁸ The results presented in all tables account for the fact that random assignment was done at the level of the municipality. For this reason, we used a fixed-effects model in which individuals are nested in municipalities. As a sensitivity test, we also verified that a random-effects model generated the same statistical results.

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Table 3. Producers' Background Information (Percentages Unless Otherwise Indicated), 2009

| Characteristic | Treatment | Control | Difference | <i>p-Value</i> |
|--|------------|------------|------------|----------------|
| Female | 84 | 82 | 2 | 0.84 |
| Average age (in years) | 39 | 41 | -2 | 0.35 |
| Married or cohabitating | 66 | 68 | -1 | 0.86 |
| Average household size (people) | 5 | 5 | 0 | 0.69 |
| Educational level | | | | |
| None | 21 | 25 | -4 | 0.50 |
| Basic | 67 | 62 | 5 | 0.54 |
| More than basic | 12 | 13 | 0 | 0.97 |
| Membership in a group of artisans | | | | |
| Workshop | 48 | 17 | 31 | <0.01*** |
| Cooperative | 1 | 0 | 1 | 0.15 |
| Another association | 9 | 5 | 4 | 0.33 |
| Owner of association | 3 | 5 | -1 | 0.68 |
| None ^a | 39 | 73 | -34 | 0.01*** |
| Producers | 369 | 361 | | |
| Municipalities with Reporting Producers | 11 | 11 | | |

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted from September 2009 to October 2009.

Notes: *** Significant at 0.01 level.

Reported differences are not equal to the treatment value minus the control value due to rounding.

^a Includes blank responses, which denoted membership in no organized group.

Labor, Employment, and Income. Across treatment and control groups, artisans reported devoting similar amounts of labor to handicraft production and sale of their products. In both groups, individual producers worked between 7 and 8 months in the past year, on average (Table 4). Producers in treatment and control groups also reported working a similar amount of days during months with lowest and highest sales. In addition, less than 10 percent of artisans in either group reported employing workers to help with handicraft production and sales (9 percent in the treatment group versus 7 percent in the control group).⁹

Examining reported individual income, artisans in the treatment group reported higher annual net income from handicrafts (around \$330 versus around \$230 in the control group), as

⁹ Reporting of full-time equivalent jobs is infeasible given how the questions on employment were asked of producers. However, follow-up rounds of the PDS-H will include additional employment questions to determine the number of full-time equivalent jobs created by the intervention. These questions can be incorporated into the impact analysis; however, we will not be able to analyze changes in full-time employment from baseline to follow-up.

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well as slightly higher total annual net income (around \$920 versus around \$810 in control; Table 4). However, these differences were not statistically significant.

Table 4. Producers' Labor, Employment, and Income (Averages Unless Otherwise Indicated), 2009

| Concept | Treatment | Control | Difference | <i>p-Value</i> |
|--|------------|------------|------------|----------------|
| Labor Devoted to Handicrafts | | | | |
| Months worked in handicrafts by producer during last year | 8 | 7 | 1 | 0.57 |
| Number of days worked per month during the month with highest sales ^a | 21 | 20 | 1 | 0.62 |
| Number of days worked per month during the month with lowest sales ^a | 14 | 13 | 1 | 0.62 |
| Employment of Workers | | | | |
| Percentage of producers who employ workers outside the workshop or group | 9 | 7 | 2 | 0.72 |
| Number of workers paid by producer related to handicrafts ^b | 1 | 0 | 0 | 0.17 |
| Annual Income (US\$)^c | | | | |
| Gross income from handicrafts ^d | 703 | 532 | 170 | 0.66 |
| Net income from handicrafts ^e | 334 | 225 | 108 | 0.49 |
| Net non-handicraft income ^f | 588 | 586 | 2 | 0.99 |
| Total net income, including handicrafts | 922 | 811 | 110 | 0.67 |
| Producers | 369 | 361 | | |
| Municipalities with Reporting Producers | 11 | 11 | | |

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted from September 2009 to October 2009.

Notes: Reported differences are not equal to the treatment value minus the control value due to rounding.

^a Sample size for number of days worked during highest and lowest months are 552 (274 treatment, 278 control) and 430 (199 treatment, 231 control), respectively.

^b The conditional values for this variable were 5.5 and 2.6 for treatment and control, respectively. In other words, among those producers that reported paying workers, the average number of workers paid by treatment and control producers was 5.5 and 2.6, respectively.

^c All income variables are unconditional, meaning that producers who reported no income were given values of 0. Because 85 producers in the treatment group (23 percent) and 87 producers in the control group (24 percent) reported no income from handicrafts, unconditional estimates for this variable are significantly lower than conditional estimates (or estimates excluding producers that reported no income).

^d Conditional on reporting income from handicrafts, gross annual income from handicrafts is \$913 and \$701 for producers in the treatment and control groups, respectively.

^e Net income from handicrafts is gross individual income from handicrafts minus all input costs, including raw materials, labor, transportation, packaging, and marketing expenses.

^f Consult Table A2 for a full accounting of all components included in producers' net non-handicraft income.

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Household Income, Consumption, and Poverty. As shown in Table 5, producers in the treatment group reported higher annual gross household income than producers in the control group (around \$4,400 versus around \$3,600 in the control group).¹⁰ However, net household income between the two groups is similar, as well as savings (net income minus consumption). On average, household members in both groups reported spending slightly less than they made in the last 12 months. In addition, poverty rates are similar across the treatment and control groups; more households in the treatment group live on less than \$1.25 a day per person, but identical proportions of households in both groups live on less than \$2.00 a day per person.

Table 5. Annual Household Income and Consumption (Averages in US\$ Unless Otherwise Indicated), 2009

| Concept | Treatment | Control | Difference | <i>p-Value</i> |
|---|------------|------------|------------|----------------|
| Gross non-handicraft income ^a | 3,587 | 2,925 | 662 | 0.51 |
| Gross handicraft income | 827 | 659 | 169 | 0.72 |
| Gross income, including handicrafts | 4,414 | 3,583 | 831 | 0.42 |
| Net income, including handicrafts | 2,770 | 2,301 | 470 | 0.42 |
| Consumption ^b | 2,646 | 2,099 | 547 | 0.22 |
| Savings (net income minus consumption) | 125 | 202 | -77 | 0.82 |
| Percentage of households living below \$1.25 a day ^c | 29 | 24 | 5 | 0.41 |
| Percentage of households living below \$2.00 a day ^d | 41 | 41 | 0 | 0.95 |
| Households | 336 | 320 | | |
| Municipalities with Reporting Producers | 11 | 11 | | |

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted from September 2009 to October 2009.

Notes: Reported differences are not equal to the treatment value minus the control value due to rounding.

^a This concept is the sum of all household members' wages, business income, agricultural income, and additional income (including remittances), before subtracting agricultural and business expenses.

^b Includes all household expenses on food, household items, utilities, health care, transportation, and education, among others.

^c Based on per-capita gross household income. Estimates based on per-capita household consumption yielded higher proportions of families under the \$1.25-a-day poverty line (27 and 31 percent for treatment and control, respectively). All estimates are adjusted for purchasing power parity using 2005 prices in El Salvador.

^d Based on per-capita gross household income. Estimates based on per-capita household consumption yielded higher proportions of families under the \$2.00-a-day poverty line (51 and 55 percent for treatment and control, respectively). All estimates are adjusted for purchasing power parity using 2005 prices in El Salvador.

¹⁰ All household-level estimates reported in these tables (including all estimates in Table 2 and Table 5) are weighted with a sampling weight adjusted for multiple respondents in the same household. A total of 656 households (336 in treatment and 320 in control) are represented in these analyses.

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E. DISCUSSION

In terms of employment creation, producer income, and household income, the treatment and control groups are more similar than they are different. The only statistically significant difference between the two groups is the higher portion of workshop members in the treatment group than in the control group. This difference can be mitigated by using statistical controls when estimating impacts. Given the small number of statistically significant differences between the treatment and control groups, we can conclude that randomization produced an internally valid control group, as required by a robust and rigorous impact evaluation.

Mathematica's next deliverable for the PD evaluation is a draft survey instrument for the follow-up PDS-H. We will complete this task in July 2010. In addition, we expect baseline data for the horticulture and dairy chains in late summer 2010. One month after we receive these data, and if there are no issues with the data files, we will also submit similar baseline comparisons for these two productive chains.

cc: L. Moreno, M. Induni, File

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Table A1. Additional Information on Producers' Income from Handicrafts (Averages in US\$), 2009

| Concept | Treatment | Control | Difference | <i>p</i> -Value |
|--|------------|------------|------------|-----------------|
| Gross income from handicrafts during high months ^a | 182 | 172 | 10 | 0.91 |
| Gross income from handicrafts during low months ^a | 80 | 65 | 15 | 0.68 |
| Gross income from handicrafts during average months ^a | 118 | 113 | 6 | 0.92 |
| Gross annual income from handicrafts | 703 | 532 | 170 | 0.66 |
| Net income from handicrafts during high months | 81 | 72 | 9 | 0.82 |
| Net income from handicrafts during low months | 41 | 21 | 21 | 0.13 |
| Net income from handicrafts during average months | 51 | 54 | -2 | 0.92 |
| Net annual income from handicrafts | 334 | 225 | 108 | 0.49 |
| Producers | 369 | 361 | | |
| Municipalities with Reporting Producers | 11 | 11 | | |

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted from September 2009 to October 2009.

Note: Reported differences are not equal to the treatment value minus the control value due to rounding.

^a Sample sizes for gross and net income for high, low, and average months are 394 (179 treatment, 215 control), 404 (183 treatment, 221 control), and 439 (213 treatment, 226 control), respectively.

Table A2. Additional Information on Producers' Annual Non-Handicraft Income (Averages in US\$), 2009

| Concept | Treatment | Control | Difference | <i>p</i> -Value |
|---|------------|------------|------------|-----------------|
| Wage income | 197 | 215 | -18 | 0.83 |
| Additional employment income | 7 | 7 | 0 | 0.99 |
| Net business income | 98 | 62 | 36 | 0.66 |
| Secondary income | 8 | 6 | 2 | 0.76 |
| Net agricultural income | -9 | -8 | -1 | 0.94 |
| Additional income ^a | 287 | 305 | -18 | 0.85 |
| Net non-handicraft income (sum of all previous income sources) | 588 | 586 | 2 | 0.99 |
| Producers | 369 | 361 | | |
| Municipalities with Reporting Producers | 11 | 11 | | |

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) interviews conducted from September 2009 to October 2009.

Notes: Reported differences are not equal to the treatment value minus the control value due to rounding.

All values are unconditional, meaning that producers reporting no income for a category were given values of 0 for that category.

^aIncludes remittances.

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Table A3. Additional Information on Groups Producing Handicrafts (Averages Unless Otherwise Indicated), 2009

| Concept | Treatment | Control | Difference | <i>p-Value</i> |
|--|-----------|-----------|------------|----------------|
| Number of people in the group ^a | 42 | 24 | 18 | 0.36 |
| Percentage of groups in which members produce jointly | 53 | 55 | -2 | 0.93 |
| Percentage of groups producing: | | | | |
| Ropework | 53 | 14 | 39 | 0.14 |
| Metalwork | 0 | 50 | -50 | 0.03** |
| Dyed Textiles | 11 | 5 | 6 | 0.56 |
| Mats and Bedrolls | 0 | 14 | -14 | 0.01*** |
| Jewelry | 16 | 0 | 16 | 0.14 |
| Other | 21 | 18 | 3 | 0.87 |
| Number of enterprises that buy group's production | 8 | 2 | 6 | 0.29 |
| Percentage of sales destined for export | 17 | 4 | 12 | 0.22 |
| Group's annual gross income (in US\$) ^b | 13,464 | 5,139 | 8,325 | 0.19 |
| Leaders | 19 | 22 | | |
| Municipalities with Reporting Producers^c | 9 | 8 | | |

Source: Baseline Productive Development Survey-Handicrafts (PDS-H) leader interviews conducted from September 2009 to October 2009.

Notes: ** Significant at 0.05 level; *** Significant at 0.01 level.

Reported differences are not equal to the treatment value minus the control value due to rounding.

These data are compiled from the leader module of the PDS-H survey. As such, the sample size is 41 and the unit of observation is the productive group, as opposed to the individual producer or household.

^a Median group size is statistically indistinguishable between treatment and control groups (23 for each group). A small number of groups in the treatment group with a high number of group-members skewed the average group size upward.

^b Median gross group income is well balanced between treatment and control groups (\$4,000 for treatment versus \$4,510 for control). A small number of groups in the treatment group with high annual gross income skewed average gross income upward. Gross group income is leaders' estimates of the value of all the group's sales and other income in the past 12 months.

^c Some groups did not have a sufficient level of organization or history of collective activities to complete the leader module. For this reason, not all municipalities in the study are represented in the table.