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2011

Online at <https://mpra.ub.uni-muenchen.de/35661/>  
MPRA Paper No. 35661, posted 31 Dec 2011 22:04 UTC

# Who Benefit from Cash and Food-for-Work Programs in Post-Earthquake Haiti?\*

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## Abstract

In this paper, a unique post-earthquake survey designed to provide a rapid assessment of food insecurity in Haiti is used in order to address the question of whether cash and food-for-work (C/FfW) programs are allocated adequately in Haiti. We consider that the allocation principle should meet two main criteria. First, C/FfW programs should be targeted towards people who are in the most necessitous circumstances (i.e., poor and food insecure people). Second, these programs should be targeted at the most vulnerable people on the labor market. Modelling the impact of various covariates on C/FfW programs participation, we find that these programs are not specifically targeted at people who are most in need, be it because of their low level of subsistence or because of earthquake-related losses. Pre-earthquake participation to programs appears to be an important determinant of post-earthquake participation. What is more, cash-for-work is very rarely declared as the main source of household income. So, a more efficient targeting of these programs should focus on reaching the poorest and most vulnerable households in the directly affected areas. Crowding out effect of temporary jobs should also be assessed on the labor market.

**Keywords:** Cash and Food for Work; Targeting; Livelihood; Earthquake; Natural Disaster; Haiti.

**JEL Codes:** H53; I38; Q18.

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\* We thankfully acknowledge Gary Mathieu from CNSA-Haiti for providing the data used in this paper. Marc-André Morin provided valuable research assistance. The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the World Bank or its Board of Directors.

## 1. Introduction

The strongest earthquake to occur in Haiti in more than 200 years, with a magnitude of 7.0 on the Richter Scale, struck western Haiti on January 12th, 2010, with an epicentre located at 17 kilometers south-west of Port-au-Prince. Due to its location, the human toll was extremely severe: around 2.8 million people were affected by the earthquake, causing between 150,000 and 220,000 deaths or more depending on the estimate, and even more injuries.<sup>2</sup> Over 97,000 houses were destroyed and over 188,000 were damaged. 661,000 people moved to non-directly affected regions. It inflicted tremendous infrastructural damage to the water and electricity systems, roads and ports in the capital, Port-au-Prince, and the surrounding areas. In the early days and weeks after the earthquake, a large number of camps were set up by the homeless population in the disaster-stricken areas. From a high of 1.5 million people living in 1,555 makeshift camps and settlements in July 2010, 810,000 were still staying in 1,150 of these sites in January 2011.

Emergency assistance programs have rapidly been set up. In addition to food assistance programs, cash and food-for-work (C/FfW) programs have provided immediate cash or food support to the unemployed after the disaster. Until November 2010, about 240,000 people were employed through C/FfW schemes (OCHA, 2011). The work consists in removing and disposing of debris and rubble,<sup>3</sup> and cleaning drainage to avoid floods. The United Nation World Food Program (WFP) reached about 400,000 direct or indirect beneficiaries through C/FfW programs.

This paper aims to assess the targeting performance of cash and food-for-work programs as well as their coverage, cost and efficiency. To do so, we use a unique post-earthquake survey conducted in June 2010 and designed for a rapid assessment of food insecurity in Haiti.<sup>4</sup> These data enable us to present how cash-for-work programs are being run, in particular with respect to the skills of participants and their economic situation.

As reported in the economic literature, public sector jobs can be created within a short time frame in order to respond to unemployment situations. However, such programs may induce a crowding out effect on private sector jobs. Indeed, in case labor supply should be insensitive to

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<sup>2</sup> Main sources: United Nation Office for the Coordination of Humanitarian Affairs (OCHA); also, based on a random survey in Port-au-Prince, Kolbe et al. (2010) estimated that 158,679 people in Port-au-Prince died during the quake or in the six-week period afterwards owing to injuries or illness.

<sup>3</sup> Note that, of the 10 to 11 million cubic meters of rubble, about 10 to 15% only were managed.

<sup>4</sup> Cf. CNSA (2010a, 2010b).

wages, the wage rise induced by the increase in labor demand can cancel out the impact of the creation of public sector jobs (Cahuc and Zylberberg, 2004).

Concerning cash transfer programs in general, several studies and reports from charity organizations have evaluated the economic impact of relief for such disasters. For instance, it was found that a relatively small-scale program of cash injection into the local grains markets of Ethiopia had no impact on prices (Save the children UK, 2001; Mattinen et Ogden, 2006). There is however little evaluation of the effects of large-scale cash injections. Research has also shown that cash injections did not affect the competitiveness of local markets in Somalia (Narbeth, 2004), and that the market quickly adjusted to the new cash influx. Finally, Davies (2006) mentions that since cash injections are usually made in US dollars, they can result in a dual economy and weaken the government's control over their monetary policy, causing a biased exchange rate and affecting exportations.

Some studies have also shown evidence on the specific effect of cash-for-work (CfW) interventions. Although this is based on anecdotal evidence only, there is indication that CfW programs resulted in slightly higher labor wages in post-tsunami Aceh in 2004 (Doocy et al., 2006). Also, local food markets were monitored by Oxfam which did not report any systematic inflation. Other studies have also found no major price increases due to CfW programs (Adams, Meehan and Satriana, 2005; IFRC, 2003). Mascie-Taylor et al. (2010) found that a CfW program in Bangladesh resulted in an improvement in nutrition measures for women and children, and in higher amounts of money spent for food than for the non-receiving households.

The impact of food-for-work programs has also been studied. Maxwell et al. (1994) found that these programs did not create a drop in the labor supply, nor did they reduce agricultural production in Ethiopia in 1989. However, Barret et al. (2002) found that labor and land productivity did decrease with household participation to FfW programs in Ethiopia.

In this paper, we propose to estimate the effects of various covariates on C/FfW programs participation in order to assess the targeting efficiency of such programs after the Haiti earthquake. Data allow us to differentiate cash-for-work program participants from food-for-work program ones. Indeed, as pointed out by Zaidi et al. (2010), giving cash instead of food may be problematic as cash beneficiaries may not be interested in food aid; so, they may be less vulnerable than food beneficiaries.

Our results show that these programs are not specifically targeted at people who need it the most, because of their low level of subsistence or losses due to the earthquake. However, due to data limitation it is not possible to assess whether better paid public jobs have replaced lower paid private jobs on the labor market.

The paper is structured as follows. Section two presents the main interventions on the labor market, their cost and their coverage as well as a description of the beneficiaries. Section three provides survey data description and methodological issues. Empirical results are presented in section four. In the last section, we discuss the results and suggest avenues for further analysis of the labor market.

## **2. Description of the Main Interventions**

Before the earthquake, the labor market in Haiti was already a major issue. According to CNSA (2008), in rural Haiti, half of the population was inactive (with a higher concentration in the North) and the dependency rate (i.e. the number of inactive persons over active ones) appears to be particularly high with about 103 inactive persons for 100 employed persons.

In response to these very restrictive conditions on the labor market, and in addition to food assistance programs, cash-for-work (CfW) programs provide immediate cash support to the unemployed. In general, CfW are short-term interventions (normally 2-3 months) which provide temporary employment in public projects (such as repairing roads, cleansing irrigation channels or re-building infrastructure) to the most vulnerable segments of the population or in areas affected by natural disasters. After the earthquake, CNSA (2010a) reported that many people interviewed in focus groups expressed a preference for activities where their skills and capabilities could be used, such as the cash and food-for-work (C/FfW) programs which allow people living in affected areas to keep their dignity and self-esteem.

### *(a) C/FfW programs before the earthquake*

Among the main actors identified in Haiti before the earthquake,<sup>5</sup> the Ministry of Agriculture and the Ministry of Interior stood as the most important ones as they handle a big share of the PetroCaribe fund for this type of intervention, respectively \$6.7 and \$2.9 million of USD (see Table 1a). Before the earthquake, the MARNDR had spent \$1.6 million (\$3 million including materials) on projects for protection of river banks and clearings out of rivers, creating 91,000

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<sup>5</sup> Cf. Borgarello, Echevin and Lamanna (2009).

person days of employment, \$2.4 million (\$4.7 million including materials) for irrigation infrastructure rehabilitation, creating around 655,000 person days of work and \$2.7 million (\$5.1 million including materials) for gullies correction, creating 951,420 person days of work, with a total of 42,000 temporary employees (MARNDR, 2009).

Apart from the PetroCaribe initiative, the Government implemented other cash-for-work programs. The Ministry of Transport (MTPTP) had a well-organized Fund for Road Maintenance which constantly used high labor-intensive work programs according to a rotating system. The MTPTP determined the area of the intervention, and the city mayor organizes a public bid. The road was then divided into 5km plots and each local organization/association (recognized as a legal entity by the MTPPT) made an offer. At the end of the bidding process, one was selected for each plot but that winner had the option to work and share the plot with other organizations. The organization employed the people, paid them, while the MTPTP supervised the work. The salary was defined by the organization and was close to the minimum wage. In 2008, it was on average \$2.5 USD (per 5 hour work day), and it increased in 2009 to \$5 USD for an 8 hour work day.

One advantage of cash and food-for-work programs is that they can be self-targeting, for example when the staple foods or wages offered are inferior to what richer households will work for. So, the success of such programs is determined by the level of wages. According to a MercyCorps paper (2009), a good practice is to set the wage 10-20% below the market rate in order to attract less advantaged people. Nevertheless, in the immediate aftermath of a large-scale disaster it may be appropriate to adopt a higher wage scale in order to compensate for the abrupt interruption of regular employment activities. The cash injected by a cash-for-work project also should be calibrated to minimize market distortions such as price fluctuations, worker dependency or competition with local producers. Where situations include food shortage or when barter is predominant in society, it might be better to consider food-for-work programs instead of cash.

Before the earthquake, the World Food Program was implementing a food-for-work program (2 years – \$9.1 million USD). The unemployed people, and also often the single heads of households as well as vulnerable and food insecure people were selected to participate in labor-intensive food-for-work activities. Beneficiaries were selected in both urban and rural communities. Food-for-work (FfW) activities with an agricultural orientation were implemented in the Northern and North-Eastern departments in order to create agricultural assets and to prevent further environmental degradation through water management interventions. Other types

of FfW interventions targeted urban and peri-urban areas around Port au Prince, Gonaives and Cap-Haitian, such as community-based labor-intensive activities to prevent civil unrest and other smaller scale activities in other parts of the country.

The FfW activities were implemented on the basis of worked days. Communities had agreed to rotate work teams. FfW participants received a family ration of five goods consisting of grains, pulses, vegetable oil and iodized salt. Taking into account the seasonal and geographical variation in the costs of the principal foodstuffs, the per worker cost of the ration is equivalent to approximately \$2.25 USD.

After conducting a pilot project in 2007 that focused on peri-urban areas, the WFP is now working jointly with UNDP (and ILO for technical assistance). Workers received half of their income in cash and half in kind (UNDP pays \$1.14 USD per day per worker). The implementing agencies were always NGOs or local associations which had signed an agreement with the MARNDR. This joint modality solved a situation of shortage in food production (that can be caused by large food distributions) and increased the possibility for workers to feed their families and avoid market problems of illiquidity (lack of cash market). After the pilot phase, the UNDP, WFP and ILO were implementing a \$50 million USD program over 24 months, where 10-15% will be used for CfW.

Among the other donors who did not operate through UN agencies, the main ones were USAID and EU: they spent almost \$15 million USD in CfW, following similar program rules, mainly working through NGOs (such as CHF International OIM, World Vision, CRS for USAID; and AVSI GRET Caritas OIM, Oxfam, Action aid, Concert action, Action contre la faim for EU). France, the WB (PRODEP) and the IDB with MTPTC/DTP also used this social safety net modality.

Program beneficiaries were spread all over the country, but with a higher concentration around main cities (Port au Prince, Gonaives, Cap Haitien) and in specific rural areas. For the most part, beneficiaries were unemployed, adults between 18-45 years, with a percentage of female workers between 30% and 40% depending on the project. As a general rule, residency in the area of intervention was the only conditionality. People were eligible for a maximum of 25-40 days of employment on a rotating basis. Otherwise, wage level was the basis for the self-styled selection process of eligibility.

The project cost per employee highly varied across projects. Many variables cannot always be extrapolated from the total spending on salaries -such as the number of days worked, the spending on materials and administrative overhead. However, on average, the estimated cost per employee ranged between \$150 USD and \$300 USD (e.g. the WFP program had a cost of \$123 USD to which we should add the UNDP cost of \$57 USD).

**Table 1a. Main interventions in cash/food-for-work programs before the earthquake**

	Million of USD	Temporary employees	Average USD day wage for unskilled
MARNDR (PetroCaribe)	6.725	42,000	2.8-3.7
MIC/BMPAD (PetroCaribe)	2.925	10,636*	(unskilled) 3.8–5.0 (skilled) 6.3–10
USAID	8.221	106,744	2.8
MTPTC	2.750	6,360	(5 hours) 2.5
EU	6.500	41,000*	NA
WFP	3.811	30,900**	(5 hours) 2.25
UNDP (& ILO)	1.528	27,026**	3.38 (1.14cash + 2.24kind)
OTHER (France, WB, IDB)	1.170	7,297	3-3.75

Source: Borgarello, Echevin, Lamanna (2009).

Note: \* Estimation from the average wage. \*\* Some beneficiaries receive half of the wage in kind (food) and half in cash, which means they are the same employees.

*(b) C/FfW programs after the earthquake*

Cash or food-for-work programs data are hard to come by after the earthquake in Haiti. The previous main sources for those programs were the different Haiti Ministries who understandably have not provided any new information since the earthquake. According to the United Nation Office for the Coordination of Humanitarian Affairs (OCHA), between February and November 2010, 240,000 people have benefited from C/FfW programs through 231 projects (OCHA, 2011). Based on published information by main international organizations, Table 1b reports that USAID has invested about 7 million USD for about 60,000 employees across four different programs, while the United Nations Development Programme (UNDP) has spent about 34 million USD for almost 100,000 jobs.<sup>6</sup> It is also found that the United Nations World Food Program (WFP) has funded about 55,000 jobs, while the Mercy Corps has done the same for about 29,000 jobs.

<sup>6</sup> The UNDP's CfW program has planned to employ several hundred thousands people over the course of 2010. The work consists in removing and disposing of debris and rubble, and cleaning drainage to avoid floods.

**Table 1b. Main interventions in cash/food-for-work programs after the earthquake**

	Million of USD	Temporary employees	Average USD day wage for unskilled
USAID	7.27	60,505	N/A
WFP	N/A	55,000	N/A
UNDP (& ILO)	33.89	95,700	5
OTHER (France, WB IDB)	N/A	29,000	N/A

Sources:

1. <http://kosovo.info.usaid.gov/oig/public/fy10rpts/1-521-10-009-p.pdf>
2. <http://documents.wfp.org/stellent/groups/public/documents/communications/wfp226995.pdf>
3. [http://www.undp.org/french/haiti/Haiti\\_updates.pdf](http://www.undp.org/french/haiti/Haiti_updates.pdf)
4. <http://www.mercycorps.org/haiti/whatweredoing>

*(c) Description of beneficiaries of C/FfW programs*

Using data from a post-earthquake food security-oriented survey conducted in June 2010 (see section 3 for data description), we have tried to describe the beneficiaries of post-earthquake C/FfW programs. Since data are available only at the household level, we consider that when at least one household member takes part in cash or food-for-work programs, all the people living in the household benefit directly or indirectly from these programs.

Table 2a reports results from our estimates. The estimated population is calculated from the last census corrected with some updates. According to the EFSA II survey, the active population in June 2010 made up for about 53% of the total population in the directly affected areas, that is 95% of the working age population.<sup>7</sup> This active population represents about 1,474,000 individuals (including all household members in households benefiting from these programs). These figures are lower in the non-directly affected areas: 265,000 people are active in these areas, which represents 45% of the total population and 91% of the working age population. After the earthquake, the population in the non-directly affected areas appears to be less food insecure (21% have poor or limit food consumption) than those living in the directly affected areas (27%).

Tables 2b and 2c compute statistics on cash-for-work and food-for-work beneficiaries respectively. In June 2010, in the directly affected areas, there are around 146,000 estimated beneficiaries of cash and food-for-work programs (compared to 37,000 before the earthquake); among them 34% have a poor or limit food consumption (compared to 42% before the earthquake). In the non-directly affected areas, about 22,000 people are direct or indirect beneficiaries of these programs after the earthquake (compared to 18,000 before the earthquake);

<sup>7</sup> Note that because of the nature of the questionnaire, calculations on the active population are limited to those aged 18 and over, whereas the standard is 14 and over.

among them, 35% have a poor or limit food consumption (compared to 43% before the earthquake).

Interestingly enough, whereas the number of direct or indirect beneficiaries of these programs has increased after the earthquake (from a total of about 55,000 people before the earthquake to 168,000 people in June 2010), the percentage of food insecure people among beneficiaries has decreased (from about 42% before the earthquake to 34% in June 2010 in both directly and non-directly affected areas). These figures thus suggest that the targeting of new beneficiaries after the earthquake has been less effective than the targeting of beneficiaries before the earthquake.

#### *(d) Targeting performance of C/FfW programs*

Beside the issue of allocating C/FfW programs to the poorest and most vulnerable households, these programs also present some critical issues. First, the risk of competition with the agricultural sector should be stressed. Indeed, the better season for road maintenance and infrastructure rehabilitation coincides with seasonal agricultural period. This basically means that not all the temporary workers in CfW program would necessarily be unemployed. This effect is of course much smaller in the urban earthquake-affected areas where the projects are currently concentrated. With regard to program implementation, there is apparently little control or supervision, especially among donors. The MTPTP also recorded cases of subcontracting workers.

Furthermore, the use of C/FfW can create a risk of dependency. This has been the case for the Solid Waste Clean-up activities. This program exemplifies that the use of CfW programs can generate two types of dependency. At the institutional level, CfW programs can become a way of solving budget constraints. Before the earthquake, the DAS within MTPTP started using CfW programs according to available funds instead of developing a sustainable strategy. At the same time, at the community level, the presence of CfW programs induced local people to stop any voluntary waste removal jobs in their neighborhoods. The risk of long-term market distortion is however lower in the current earthquake relief situation, since most of the programs are used for rubble clearing, which is an activity that is mostly needed only now, and should not have an impact on the long-term labor market in the country.

### **3. Data**

#### *(a) Data sources and methodology*

A post-earthquake food security-oriented survey was conducted in June 2010 by the CNSA in collaboration with its main partners (ACF, FEWS-Net, Oxfam GB, FAO, UNICEF and WFP). The sampling used for the household survey is a probabilistic cluster method, using two stages: (i) enumeration sections (geographical areas) and camps and (ii) households. 2003 census data is used to select the enumeration sections, with a probability proportional to population size. Eight households are then selected randomly in each section. Camps are selected using the International Organization for Migration (IOM) data; the number of camps selected was proportional to the size of the communes. The sampling method yielded 1901 interviewed households, located in the disaster areas (camp and non-camp sites) as well as in some non-directly affected areas. Geographic strata covered by the EFSA II survey are presented in Figure 1.

To randomly select households, different methods were used for the urban households, the rural households and the camps. For urban households, survey investigators observe and mark the location of households on a street map that does not contain socio-economic infrastructure, and the households are randomly selected. For rural households, previously mapped buildings are randomly selected using enumeration section maps, and households living in those buildings are interviewed; if there are no households inside, then the closest household is selected. For camps, survey investigators start from the centre of the camp and walk towards the outside in a different randomly selected path. They number each household encountered in the way, and randomly select two households to interview. For all three types of sampling, when multiple households are found living in the same building or tent, a single household is randomly selected.

In the June 2010 survey, rough estimates were made of the total post-earthquake populations using the 2009 projected populations estimates from the Institut Haïtien de Statistique et d'Informatique (IHSI), estimated deaths due to the earthquake, and out-migration as estimated by Bengtsson et al. (2010). This allowed for improved population weights in analysis, although this could not correct for the potential bias introduced by the obsolete sampling frame of enumeration sections.

These population weights were used to more accurately estimate population percentages and numbers for programmatic use. However, in this paper the probability weights were not used in analysis. This decision was made to simplify analysis and to maximize the household data available (rather than weighting and under- or over-counting certain households, and thus possibly underutilizing certain data when observing relationships between variables or exaggerating measurement error when over-counting some household data). Additionally, the

low confidence in the population estimates, even if an improvement over no estimates for programmatic purposes, do not warrant use in this study.

This paper does not claim that the findings are representative of the population; however the relationships between the findings are believed to still be correctly indicative. All statistically significant findings were run both with and without the probability weights to ensure that the weights (or lack of weights) do not change the overall findings.

*(b) Asset index before and after the earthquake*

Based on the June survey, an asset index is calculated using a set of pre-earthquake dichotomous variables, namely durable goods and access to basic utilities. Results from multiple correspondence analysis (see, *e.g.*, Asselin, 2009) are presented in Table 1.<sup>8</sup> Weights have signs consistent with interpretation of the first component as an asset-poverty index. In directly affected areas, contribution to inertia of lighting appears to be particularly high (26.7%). Water source also contributes in a large extent to inertia (18.9%). Having tools or material for fishery, agricultural production and handicraft contributes to 12.2% of the inertia explained by the first component of the analysis.<sup>9</sup> Other items contribute to less than 10% of inertia each.

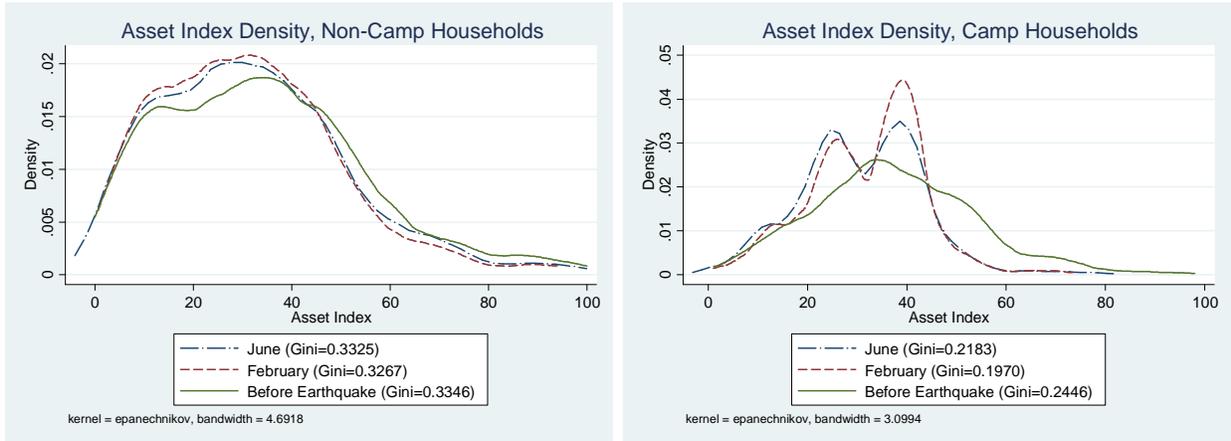
In non-directly affected areas, determinants of asset-poverty are very similar: contribution of lighting and water source represents 48.5% of first component inertia. Having a television, a fan or tools and material contribute respectively to 11.5%, 9.3% and 9.0%.

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<sup>8</sup> Note that all our results have been replicated using a more restrictive definition of the asset index for which water source, water filtration, lighting, type of toilet and tools/material were not included in the multiple correspondence analysis. Regression results (presented later) in particular did not differ greatly when using this alternative asset index. Also, results do not vary much when using factor analysis instead of multiple correspondence analysis to build the index.

<sup>9</sup> Table 1 shows that households with tools/material (for fishery, agricultural production and handicraft) will be classified as poorer households (asset index weight equals -0.951). This is due to the fact that such asset variable is not well correlated with other asset indicators (*e.g.*, private water, electricity for lighting, WC, oven, television, fan and so forth) that would classify them as richer. In this sense, the asset index can be described as the best regressed latent variable on the assets variables (or primary indicators) since no other explained variable is more informative (Asselin, 2009).

**Figure 3. Asset-wealth distribution**



Source: Own computations using June 2010 (EFSA II) surveys. Notes: The sample is restricted to the households residing in the six strata that cover areas directly affected by the earthquake. Asset index weights are calculated using pre-earthquake assets.

Using retrospective data on assets from the June survey, Figure 3 presents the asset index distributions before the earthquake, in February and in June. Using this index, it is to be noticed that the inequality in household wealth (as measured by the Gini coefficient) has decreased after the earthquake due to bigger losses among the wealthiest. This is particularly true among households living in camps (Gini is 0.2446 before the earthquake and 0.1970 in February). Then, between February and June, inequality in household wealth has increased—from 0.3267 to 0.3325 among non-camp households and from 0.1970 to 0.2183 among camp households.

**Figure 4. Asset-wealth losses distribution**



Source: Own computations using June 2010 (EFSA II) surveys. Notes: The sample is restricted to the households residing in the six strata that cover areas directly affected by the earthquake. Asset index weights are calculated using pre-earthquake assets.

Figure 4 presents the distribution of asset-wealth losses in percentage of pre-earthquake asset-wealth. The percentage of asset loss among households who lost assets is around 25%. This percentage does not seem to vary a lot according to asset-wealth quintile.

*(c) Food insecurity after the earthquake*

The food consumption score is calculated based on the number of different food groups consumed by the household, to represent diversity, and on how many days they are consumed in the past week. This score is then converted into three groups using standard cut-offs (poor, borderline, and acceptable food consumption), and these groups are often used as a proxy for food security status of households. In February, 31% of the households living in directly affected areas were experiencing borderline or severe food insecurity (22% and 9% respectively, borderline or poor food consumption), that is nearly double the food insecurity prevalence observed before the earthquake. According to the EFSA surveys conducted in February and in June, in the directly affected areas, food insecurity (as measured by the food consumption score) had dropped from 31% in February to 27% in June (cf. CNSA, 2010a, 2010b).

#### **4. Empirical Results**

Tables 5a and 5b present descriptive statistics by pre-earthquake asset-wealth. First, Tables present variables describing household vulnerability such as employment status, death of workers, housing damage and asset losses after the earthquake. Second, variables such as the household's main income source, participation in cash and food-for-work programs as well as the benefice derived from remittances from relatives or friends are presented before and after the earthquake. Benefits from various assistance programs are presented in June.

*(a) Losses*

These figures reveal that, in directly affected areas, the richest households lost more than the poorest ones: although in June only 4.5% of the richest households had no workers (6.8% among the poorest), 11.5% of them experienced the death/missing of workers due to the earthquake (5.6% among the poorest) and 86.5% lost assets in February (17.6% among the poorest). An equal proportion of the richest and the poorest had had their housing partially or totally destroyed due to the earthquake (32.4%). Finally, because they were mostly urban, the richest households had not registered agricultural assets losses, whereas the poorest had (for 7.2% of them).

Interestingly enough, in June 2010, many of the richest households had recovered from the pre-earthquake situation (16.0% of them), whereas the poorest households were more numerous to have lost assets in comparison with pre-earthquake conditions (19.6% in June compared to 17.6% in February).

*(b) Main income sources*

Table 5a also shows that main income sources have been hit by the disaster: although the percentage of households for whom agriculture production is the main source of income has kept stable over the period, incomes from trade, unskilled and skilled works have dropped. Conversely, income from transfers and other income sources have logically become more prominent: in February, 22.8% of households declared these sources of income as their main one, whereas they were only 6.9% to do so before the earthquake. This percentage fell to 13.8% in June.

Furthermore, clear differences appear between the richest and the poorest: the structure of income sources is relatively stable among the poorest before and after the earthquake, whereas it was sharply modified among the richest due to the earthquake. This can be explained by the fact that income sources are less diversified among the poorest and only few of them benefit from money remittances. What is more, poorer households relied more commonly on informal activities that resumed more quickly than formal activities, and activities such as agriculture were little impacted by the quake, but teachers, shop owners, etc. were not as able to quickly return to that kind of work.

*(c) Remittances*

When considering remittances received from relatives or friends, we observe that, in June, 9.2% of the poorest households in directly affected areas received remittances from Haiti, while they were 22.1% among the richest. Remittances from Haiti decreased over the period: from 14.1% before the quake among the poorest (resp. 14.5% received transfers from abroad) to 10.4% in February (resp. 10.4%) and 9.2% in June (resp. 8.4%). Among the richest, remittances from Haiti decreased from 29.1% to 23.4% in February and 22.1% in June, and remittances from abroad decreased from 34.4% before the quake, to 28.7% in February and 21.7% in June.

*(d) Participation in cash and food-for-work programs*

Participation in cash-for-work (CfW) concerned 1.2% of households before the earthquake (0.8% among the poorest and 0.4% among the richest), 4.3% in February (4.4% among the poorest and 4.1% among the richest) and 6.0% in June (5.6% among the poorest and 5.3% among the richest). Interestingly, CfW does not represent a primary source of income for households: only 0.9% of households declare it as their main source of income in June (0.4% among the poorest and 0.8% among the richest).

Unlike what was observed for CfW programs, the percentage of households benefiting from food-for-work programs did not change drastically over the period (around 1% of the households benefited from FfW programs). Furthermore, in the same way as CfW programs, FfW programs did not appear to be particularly targeted at the poorest.

When comparing participation in programs in non-directly affected areas, the targeting performance of C/FfW programs appears to be more efficient: indeed, the poorest benefited more from C/FfW programs than did the richest households. Nevertheless, the participation in such programs fell slightly over the period.

Hence, although disaster-related shocks (e.g., death of workers, loss of income sources, loss of remittances, etc.) have affected all quintiles, the poorest households should also be considered as the most vulnerable ones in the face of these changes (because of low diversification of income sources, less workers in the household, more agricultural and fewer skilled jobs, etc.). However, programs did not seem to benefit more the poorest households.

From these facts, it is possible to conclude that C/FfW programs after the earthquake are not well-targeted. These programs do not seem to benefit in priority the poorest households. The efficiency of these programs is, however, difficult to fully assess from these figures. Indeed, on the one hand, losses were often more sizeable among the wealthiest, so assistance programs may have also made up for them. On the other hand, C/FfW programs should have benefited the most unskilled people in order not to distort the good working order of the labor market. For instance, better paid public jobs may have replaced low paid private jobs in agriculture or elsewhere. Available data, however, do not enable us to assess this possibility.

#### *(e) Multivariate analysis*

Regressions are estimated separately for cash-for-work, food-for-work and both considered jointly. Table 7a first provides estimates for CfW and FfW programs participation without other

covariates than pre-earthquake assets, asset losses and pre-earthquake participation to programs. Second, Table 7b presents estimates when adding other covariates such as pre-earthquake agricultural assets, agricultural asset losses, the number of workers dead or missing (in directly affected areas), hosting displaced people (in non-directly affected areas), post-disaster housing damage (in directly affected areas), location, social associations membership and participation to other assistance programs. Third, Table 7c provides estimates of the effects of other household characteristics such as marital status, gender, age and education of the head of the household, the fact of living in a private housing or not, the number of infants, children, youths, adults and elderly people in the household, the number of workers, the fact of having agricultural practice or not, and post-earthquake variables such as the main source of income and the fact of having savings or banking accounts. (See Table 6 for descriptive statistics on these variables).

As a result, estimates appear not to be concerned with multicollinearity problems: indeed, estimates of the effects of pre-earthquake assets, asset losses and pre-earthquake participation to programs are not very different when adding or not other covariates in the regressions. Pre-earthquake asset index and the asset losses appear to have no significant effects on participation in either CfW or FfW programs. What is more, pre-earthquake participation to programmes appears to be an important determinant of post-earthquake participation. Thus, this enforces our doubt concerning the efficiency of targeting of C/FfW programs, particularly in areas where people were severely hit by the earthquake.

On the other hand, regressions presented in Table 7b, with more covariates included, show that participating to a cooperative as well as other social association membership have positive and significant effects on CfW participation in directly affected areas, whereas Tontine/Sol/Sabotay membership increases CfW participation in non-directly affected areas. Concerning FfW programs, other social association membership has a positive effect in directly affected areas, whereas Union membership and agricultural association membership have positive effects in non-directly affected areas. These results are evidence of the existence of social networks that may favour the participation to programs. However, as indicated in Table 8, social association membership appears to be rather equally distributed according to households' asset-wealth. So the social network effect may not foster an efficient targeting of C/FfW programs.

**Table 8. Social association membership**

In %	Asset-wealth quintile					All
	Poorest	2	3	4	Richest	
<i>Directly affected areas</i>						
Religious association	20.7	30.5	21.6	38.3	27.6	26.3
Non religious association	11.9	9.0	12.3	9.4	12.1	11.2
All	29.6	35.6	29.3	42.3	34.3	33.1
<i>Non-directly affected areas</i>						
Religious association	8.9	9.6	13.8	13.6	9.2	11.0
Non religious association	17.7	30.8	37.3	16.1	8.4	21.9
All	24.5	37.4	42.9	22.3	16.0	28.5

Source: Own computations using June 2010 (EFSA II) survey.

One step further, we consider supports allocated by social associations to their members in Table 9. In directly affected areas, it appears that 33.8% of the poorest benefit from support (21.8% in religious association and 55.2% in non religious association) against only 11.7% among the richest (9.7% in religious association and 11.1% in non religious association). As a matter of fact, social associations mostly contribute to support the neediest people to face bad conjuncture (according to the June 2010 survey, 43.2% of households receive support from social associations at this occasion in directly affected areas, 33.3% in non-directly affected areas).

**Table 9. Supports to social association members**

In %	Asset-wealth quintile					All
	Poorest	2	3	4	Richest	
<i>Directly affected areas</i>						
Religious association	21.8	14.1	5.6	11.3	9.7	12.1
Non religious association	55.2	15.8	36.8	14.3	11.1	29.9
All	33.8	15.7	17.7	13.6	11.7	18.6
<i>Non-directly affected areas</i>						
Religious association	0.0	0.0	0.0	6.7	20.0	4.7
Non religious association	26.9	31.0	37.2	16.7	30.0	29.9
All	19.4	23.7	32.7	16.0	26.3	18.6

Source: Own computations using June 2010 (EFSA II) survey.

Lastly, in Table 7b, an *Assistance* variable has been included in order to test the existence of substitution or complementarity effects between C/FfW programs and other assistance programs. Benefiting from other social assistance programs may indeed decrease or increase the probability to benefit from C/FfW program. For instance, a positive effect can indicate that more informed (or more ‘connected’) people may get better access to assistance programs and cumulate them. Our estimates show a positive effect of the *Assistance* variable on CfW participation in directly

affected areas, and a negative effect in non directly affected, but these effects have low statistical significance (at 10 percent level).

Table 7c presents regressions with all covariates included. Estimates show that agricultural asset losses have a negative and significant impact on CfW participation (but not on FfW participation). This may be an indication that the most agrarian households participated less in CfW programs. Being married and living in a female-headed household significantly decrease CfW participation. Living in private housing and having savings before the earthquake both have positive and significant effects on CfW participation. In non-directly affected areas, none of these variables are significant. In these areas, participation in Tontine/Sol/Sabotay and the presence of breast-feeding women in the household significantly increase CfW participation.

Also, in Table 7c, determinants of FfW appear to be different from CfW ones. In directly affected areas: other social associations, the number of adults between 18-60 and having a bank account have positive and significant effects on FfW participation. The number of workers significantly decrease FfW participation. In non-directly affected areas: the number of children displaced and hosted in the household, Union or agricultural association membership significantly increase FfW participation.

## **5. Discussion**

Despite its questionable representativeness, the survey used in this paper provides a unique source of information in order to study cash and food-for-work programs participation after the Haiti earthquake. Although it is not possible with this data to assess the crowding out effects of C/FfW programs on the labor market, the targeting performance of these programs is carefully assessed. It is shown that C/FfW programs after the earthquake are not well-targeted to benefit in priority the poorest households. What is more, these programs do not beneficiate in priority those households that have lost more because of the earthquake. Instead, pre-disaster participation to C/FfW programs and other determinants such as agricultural asset losses, marital status, housing, savings and social association membership have significant impact on post-disaster participation to C/FfW programs. Such empirical evidences can be considered as contradictory to an efficient targeting that would give priority for social assistance—in particular C/FfW programs—to most vulnerable households.

These findings thus suggest that there is scope for C/FfW programs to better target poor and vulnerable people in Haiti. For that purpose, government and development agencies should take

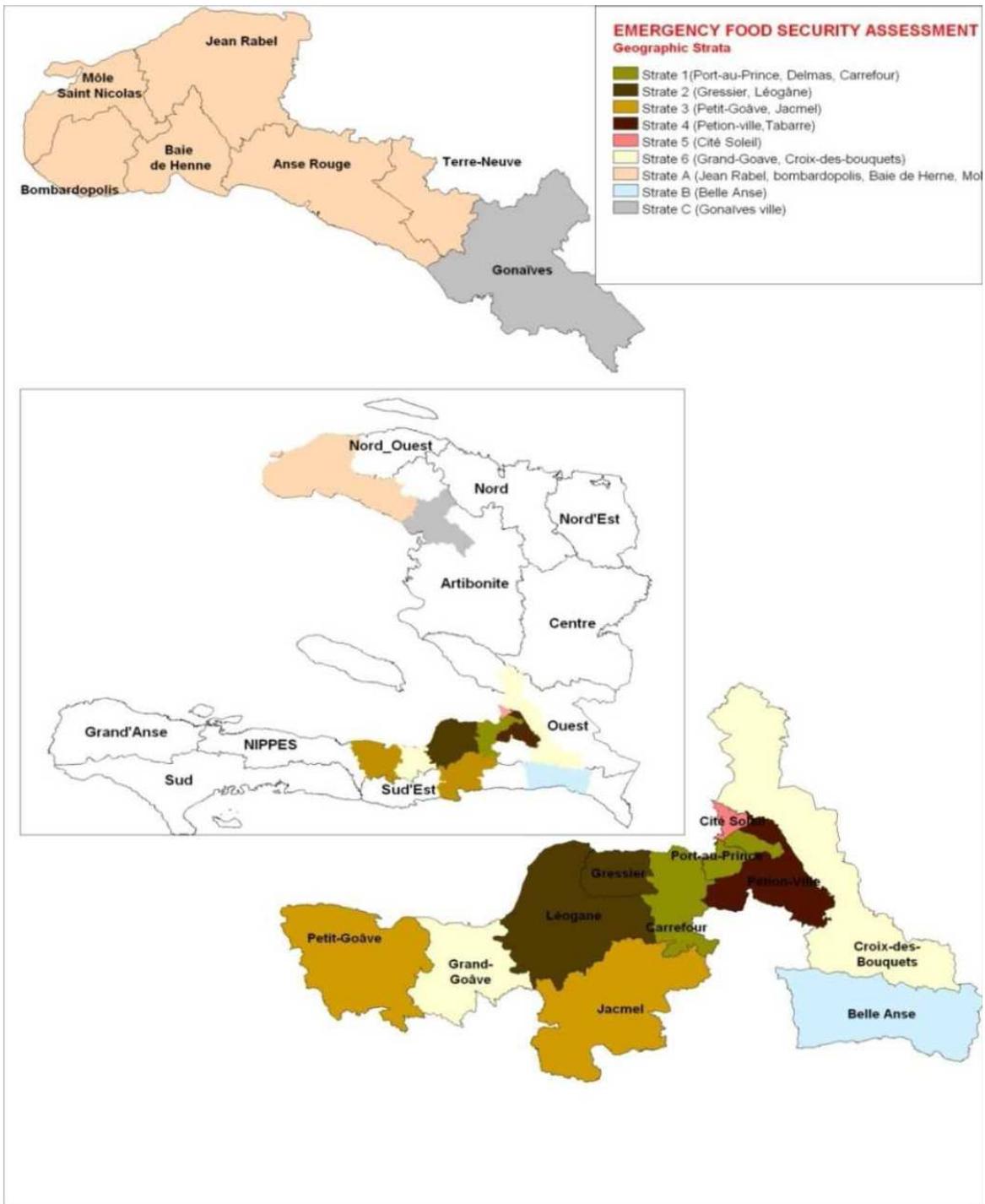
stock of the situation in Haiti which is changing rapidly. In particular, after a peak in mid-2010, the population in camps has decreased drastically. Many people have been displaced from one area to another. People moved to escape the disaster area and then they came back home. Furthermore, in the wake of the 2010 earthquake, Hurricane Tomas, the cholera epidemic, the rising prices of basic foodstuffs, and the socio-political uncertainty following the election results of November 28, 2010, are, among others, some major factors likely to further deteriorate living conditions in Haiti. So, in the perspective to better target assistance programs and safety nets responding to major shocks, households' livelihoods and vulnerability on the labor market should be reassessed based on new data.

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**Figure 1. Geographic strata covered by the EFSA II survey**



Source: CNSA (2010b).

**Table 2a. Descriptive statistics on the labor market**

	Estimated Population	Poor/Limit Food Consumption		Adults (18 years and over)		Active Population <sup>1</sup>		
		%	Number of people	%	Number of people	% of adults	% of population	Number of people
Strata 1 (Port-au-Prince, Delmas, Carrefour)	1316000	25	327563	60	791899	92	55	729834
Strata 2 (Gressier, Leogane)	211000	26	54348	58	121861	96	55	116971
Strata 3 (Petit Goave, Jacmel)	326000	31	101895	54	175538	98	53	171412
Strata 4 (Petionville, Tabarre)	389000	18	71514	57	220636	92	52	203960
Strata 5 (Cite Soleil)	212000	29	61181	54	115248	94	51	107779
Strata 6 (Grand Goave, Croix-des-Bouquets)	351000	35	121537	50	174042	98	49	170801
<b>Total, affected areas</b>	<b>2804000</b>	<b>27</b>	<b>759503</b>	<b>55</b>	<b>1555802</b>	<b>95</b>	<b>53</b>	<b>1474353</b>
Strata A (Jean Rabel, Bombardopolis, Baie de Herne, Mole St. Nicolas, Anse Rouge, Terre Neuve)	291000	21	60734	50	145063	98	49	142005
Strata B (Belle Anse)	69000	30	20803	43	29626	92	39	27175
Strata C (Gonaives Ville)	229000	14	31480	54	123871	85	46	105861
<b>Total, non- affected areas</b>	<b>589000</b>	<b>21</b>	<b>123799</b>	<b>49</b>	<b>290609</b>	<b>91</b>	<b>45</b>	<b>264859</b>

Source: CNSA (2010b) and own computations using June 2010 (EFSA II) survey. Note: (1) active population is calculated over only the adult population (18 years and over).

**Table 2b. Cash-for-work beneficiaries**

	Before Earthquake				June			
	Beneficiaries <sup>2</sup>		Poor/Limit Food Consumption Amongst Beneficiaries <sup>3</sup>		Beneficiaries <sup>2</sup>		Poor/Limit Food Consumption Amongst Beneficiaries <sup>3</sup>	
	%	Number of people	%	Number of people	%	Number of people	%	Number of people
Strata 1 (Port-au-Prince, Delmas, Carrefour)	1	19539	65	12643	9	116084	50	58617
Strata 2 (Gressier, Leogane)	1	2633	0	0	7	13916	24	3385
Strata 3 (Petit Goave, Jacmel)	3	9523	60	5714	7	23490	26	6031
Strata 4 (Petionville, Tabarre)	0	0	0	0	2	8338	31	2566
Strata 5 (Cite Soleil)	1	1779	30	534	4	7826	20	1601
Strata 6 (Grand Goave, Croix-des-Bouquets)	2	6158	32	1945	3	11019	44	4861
<b>Total, affected areas</b>	1	37210	42	15711	5	145947	34	49614
Strata A (Jean Rabel, Bombardopolis, Baie de Herne, Mole St. Nicolas, Anse Rouge, Terre Neuve)	2	5462	42	2276	5	13327	0	0
Strata B (Belle Anse)	8	5500	55	3008	7	4956	55	2710
Strata C (Gonaives Ville)	0	0	0	0	0	1025	0	0
<b>Total, non-affected areas</b>	3	17827	43	7586	4	22496	35	7953

Source: Own computations using June 2010 (EFSA II) survey. Notes: (2) all members of a household receiving cash/food-for-work are considered as beneficiaries; (3) percentage calculated over the number of beneficiaries.

**Table 2c. Food-for-work beneficiaries**

	Before Earthquake				June			
	Beneficiaries <sup>2</sup>		Poor/Limit Food Consumption Amongst Beneficiaries <sup>3</sup>		Beneficiaries <sup>2</sup>		Poor/Limit Food Consumption Amongst Beneficiaries <sup>3</sup>	
	%	Number of people	%	Number of people	%	Number of people	%	Number of people
Strata 1 (Port-au-Prince, Delmas, Carrefour)	1	16091	21	3448	1	12643	0	0
Strata 2 (Gressier, Leogane)	0	376	100	376	1	1128	100	1128
Strata 3 (Petit Goave, Jacmel)	2	5079	44	2222	4	13649	16	2222
Strata 4 (Petionville, Tabarre)	0	0	0	0	0	0	0	0
Strata 5 (Cite Soleil)	1	1245	0	0	1	2134	42	889
Strata 6 (Grand Goave, Croix-des-Bouquets)	0	972	100	972	1	2593	100	2593
<b>Total, affected areas</b>	1	17365	36	6202	1	33076	33	10750
Strata A (Jean Rabel, Bombardopolis, Baie de Herne, Mole St. Nicolas, Anse Rouge, Terre Neuve)	2	4588	21	978	1	2622	0	0
Strata B (Belle Anse)	5	3485	82	2873	5	3485	78	2726
Strata C (Gonaives Ville)	1	2050	0	0	1	2636	0	0
<b>Total, non-affected areas</b>	2	14007	55	7752	2	13300	63	8339

Source: Own computations using June 2010 (EFSA II) survey. Notes: (2) all members of a household receiving cash/food-for-work are considered as beneficiaries; (3) percentage calculated over the number of beneficiaries.

**Table 4. Asset index weights**

Variable	Directly affected areas		Non-directly affected areas	
	Weight	Inertia (%)	Weight	Inertia (%)
Water Source				
Tap water	-0.494	0.055	-0.802	0.075
Private water	0.845	0.121	1.093	0.092
Well water	-0.511	0.013	0.615	0.021
Water Filtration				
Filtration product*	-0.354	0.025	-0.294	0.009
Rudimentary method	0.102	0.000	-0.057	0.000
Cooking Fuel	-0.232	0.026	-0.234	0.021
Lighting				
Electricity	0.405	0.049	1.094	0.131
Lamp	-1.273	0.218	-0.803	0.166
Toilet				
Latrine	-0.134	0.007	0.221	0.010
WC	1.467	0.095	1.391	0.017
Oven	1.369	0.086	1.066	0.006
Heater	0.003	0.000	0.196	0.009
Hot water tank	-0.133	0.009	-0.235	0.020
Television	0.402	0.050	1.112	0.115
Radio	0.102	0.004	0.411	0.029
Cell phone	0.018	0.000	0.113	0.003
Bicycle	0.215	0.003	0.933	0.039
Motorcycle	0.373	0.004	1.040	0.026
Flatiron	0.155	0.008	0.172	0.006
Fan	0.597	0.069	1.359	0.093
Car	1.092	0.029	0.758	0.007
Sewing machine	0.308	0.004	0.555	0.012
Tools/Material	-0.951	0.122	-0.588	0.090
Small business stocks	0.089	0.001	0.068	0.001
Partial inertia contribution (%)	14.78		19.16	

Source: Own computations using June 2010 (EFSA II) survey. Weights are estimated according to the pre-earthquake situation of households. Note: \*Filtration products are generally used in relatively poor regions so that it can explain the negative weight.

**Table 5a. Employment status, main income sources, cash/food-for-work and other transfers, by pre-earthquake quintile of asset-wealth (directly affected areas)**

In %	Before the earthquake						After the earthquake (February 2010)						After the earthquake (June 2010)					
	1	2	3	4	5	All	1	2	3	4	5	All	1	2	3	4	5	All
<b>Affected areas</b>																		
Number of households	250	259	239	254	244	1246	250	259	239	254	244	1246	250	259	239	254	244	1246
No workers	-	-	-	-	-	-	-	-	-	-	-	-	6.8	6.2	8.8	7.9	4.5	6.8
Workers dead/missing	-	-	-	-	-	-	-	-	-	-	-	-	5.6	8.1	9.6	8.7	11.5	8.7
Housing partially/totally destroyed	-	-	-	-	-	-	-	-	-	-	-	-	32.4	45.9	38.9	35.0	32.4	37.0
Asset losses	-	-	-	-	-	-	17.6	38.2	51.9	79.5	86.5	54.6	19.6	39.0	57.3	74.0	70.5	51.9
Agricultural losses	-	-	-	-	-	-	-	-	-	-	-	-	7.2	6.2	2.9	0.4	0.0	3.4
Main income source																		
Without sources of income	1.2	0.8	1.3	0.8	0.0	0.8	0.8	0.8	1.7	2.8	2.9	1.8	0.4	0.0	0.8	0.4	1.2	0.6
Agricultural production	37.6	15.4	4.2	1.6	0.4	12.0	38.0	15.1	5.0	1.6	0.4	12.1	38.8	15.1	5.0	2.0	0.4	12.4
Trade	29.6	32.4	39.7	42.5	42.2	37.2	26.4	24.3	31.4	35.4	30.3	29.5	28.0	27.8	31.4	36.2	35.7	31.8
Unskilled work	20.0	32.8	29.7	28.3	16.8	25.6	19.2	29.0	22.2	21.7	12.3	20.9	20.4	32.8	30.5	28.0	15.6	25.5
Skilled work	8.0	15.8	16.7	16.9	30.3	17.5	6.4	10.0	10.0	12.2	23.4	12.4	6.0	11.6	13.4	16.1	29.1	15.2
Cash-for-work	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.4	0.4	0.4	0.5	0.4	0.8	1.7	0.8	0.8	0.9
Remittances	2.0	1.2	3.8	3.9	5.3	3.2	4.4	8.9	13.4	12.2	16.0	10.9	4.0	6.2	8.4	9.1	9.8	7.5
Other income sources	1.6	1.5	4.6	5.9	4.9	3.7	4.4	11.2	15.9	13.8	14.3	11.9	2.0	5.8	8.8	7.5	7.4	6.3
Cash/food-for-work	1.6	1.9	2.1	2.0	0.8	1.7	4.8	4.2	4.2	5.9	4.1	4.7	6.0	6.9	4.2	8.7	5.3	6.3
Cash-for-work	0.8	1.5	1.7	1.6	0.4	1.2	4.4	3.9	3.8	5.5	4.1	4.3	5.6	6.2	4.2	8.3	5.3	6.0
Food-for-work	0.8	0.8	0.8	0.8	0.4	0.7	0.8	1.2	1.3	0.8	0.4	0.9	0.4	1.5	1.7	0.8	0.8	1.0
Remittances received from relatives/friends																		
from Haiti	14.1	17.0	25.3	25.6	29.1	22.1	10.4	13.9	24.9	23.6	23.4	19.1	9.2	11.6	22.8	22.4	22.1	17.5
from abroad	14.5	11.6	15.6	21.3	34.4	19.4	10.4	9.7	12.7	18.5	28.7	15.9	8.4	7.7	8.9	13.0	21.7	11.9
Assistance																		
Food	-	-	-	-	-	-	-	-	-	-	-	-	23.3	33.2	37.9	33.9	33.6	32.3
Non food (material)	-	-	-	-	-	-	-	-	-	-	-	-	14.8	10.0	10.0	12.6	10.2	11.6
Healthcare	-	-	-	-	-	-	-	-	-	-	-	-	10.0	14.3	12.1	20.1	18.9	15.1
Agricultural	-	-	-	-	-	-	-	-	-	-	-	-	10.6	2.4	2.2	0.8	0.4	3.3

Source: Own computations using June 2010 (EFSA II) survey.

**Table 5b. Employment status, main income sources, cash/food-for-work and other transfers, by pre-earthquake quintile of asset-wealth (non-directly affected areas)**

In %	Before the earthquake						After the earthquake (February 2010)						After the earthquake (June 2010)					
	1	2	3	4	5	All	1	2	3	4	5	All	1	2	3	4	5	All
<b>Non-affected areas</b>																		
Number of households	151	109	130	130	130	650	151	109	130	130	130	650	151	109	130	130	130	650
No workers	-	-	-	-	-	-	-	-	-	-	-	-	10.6	5.5	3.1	3.8	6.2	6.0
Hosting displaced people	-	-	-	-	-	-	-	-	-	-	-	-	24.5	26.6	36.2	60.8	63.8	42.3
Main income source																		
Without sources of income	0.0	0.0	0.8	0.0	1.5	0.5	0.0	0.9	1.5	1.5	6.2	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Agricultural production	54.3	59.6	52.3	21.5	5.4	38.5	55.0	57.8	52.3	20.0	4.6	37.8	54.3	56.9	54.6	22.3	5.4	38.6
Trade	23.8	19.3	22.3	25.4	42.3	26.8	22.5	17.4	23.1	26.2	34.6	24.9	24.5	19.3	21.5	24.6	34.6	25.1
Unskilled work	18.5	15.6	13.8	30.8	20.8	20.0	17.2	15.6	13.1	30.0	20.8	19.4	17.2	15.6	13.1	31.5	22.3	20.0
Skilled work	2.6	2.8	6.2	10.0	12.3	6.8	2.6	2.8	5.4	10.0	13.8	6.9	2.0	2.8	5.4	10.8	16.2	7.4
Cash-for-work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.2
Remittances	0.7	0.9	1.5	5.4	13.1	4.3	1.3	2.8	1.5	6.2	13.1	4.9	0.7	2.8	2.3	6.2	14.6	5.2
Other income sources	0.0	1.8	3.1	6.9	4.6	3.2	1.3	2.8	3.1	6.2	6.9	4.0	1.3	2.8	3.1	4.6	6.2	3.5
Cash/food-for-work	13.2	11.0	3.8	1.5	2.3	6.5	11.3	7.3	2.3	0.8	2.3	4.9	11.3	8.3	2.3	0.8	0.8	4.8
Cash-for-work	6.0	3.7	0.0	0.8	1.5	2.5	4.0	3.7	0.0	0.8	1.5	2.0	6.0	3.7	0.0	0.8	0.8	2.3
Food-for-work	8.6	10.1	3.8	0.8	0.8	4.8	9.3	6.4	2.3	0.0	0.8	3.8	7.9	7.3	2.3	0.0	0.0	3.5
Remittances received from relatives/friends																		
from Haiti	23.2	37.6	40.0	26.9	19.2	28.9	23.8	30.3	16.9	13.1	20.8	20.8	23.2	27.5	16.9	13.1	16.9	19.4
from abroad	2.0	4.6	9.2	13.1	26.9	11.1	0.7	3.7	6.9	7.7	25.4	8.8	0.7	3.7	6.2	9.2	21.5	8.2
Assistance																		
Food	-	-	-	-	-	-	-	-	-	-	-	-	12.0	12.8	13.1	5.4	0.8	8.8
Non food (material)	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	2.3	0.5
Healthcare	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	3.1	0.6
Agricultural	-	-	-	-	-	-	-	-	-	-	-	-	1.4	4.7	5.6	3.7	0.0	3.0

Source: Own computations using June 2010 (EFSA II) survey.

**Table 6. Descriptive statistics**

	Affected areas		Non-affected areas	
	Mean	Std	Mean	Std
Cash-for-work before the quake	0.01	0.11	0.02	0.15
Food-for-work before the quake	0.01	0.09	0.04	0.20
Pre-earthquake assets	35.57	18.84	25.15	21.81
Asset losses in February	4.18	11.37	1.05	5.31
Pre-earthquake agricultural assets	8.19	17.13	-	-
Agricultural asset losses	-0.05	3.16	-	-
Number of workers dead/missing	0.11	0.41	-	-
Hosting displaced people	-	-	0.42	0.49
Number of children hosted	-	-	0.38	0.89
Number of adults hosted	-	-	0.94	1.64
Number of elderly people hosted	-	-	0.02	0.17
Some hosted people still remain	-	-	0.08	0.26
All hosted people still remain	-	-	0.15	0.36
Housing damaged but still usable	0.45	0.50	-	-
Housing partially or totally destroyed	0.37	0.48	-	-
Sleeping beside the house	0.09	0.28	-	-
Sleeping in the neighborhood	0.27	0.44	-	-
Sleeping in the commune	0.18	0.39	-	-
Sleeping outside the commune	0.02	0.14	-	-
Sleeping in a camp	0.45	0.50	-	-
Religious association	0.25	0.44	0.11	0.31
Sports/ Cultural association	0.02	0.15	0.02	0.14
Union	0.00	0.03	0.01	0.08
Cooperative	0.00	0.05	0.00	0.07
Tontine / Sol / Sabotay	0.04	0.19	0.01	0.12
Womenfolk's association	0.02	0.13	0.03	0.16
Consumer association	0.00	0.05	0.01	0.11
Konbit, eskwad, other agricultural association	0.02	0.14	0.12	0.33
School committee	0.01	0.08	0.00	0.07
Other social association	0.01	0.10	0.01	0.12

Married	0.26	0.44	0.47	0.50
Female head	0.51	0.50	0.53	0.50
Age of head	41.84	13.52	44.71	14.57
Primary education	0.40	0.49	0.27	0.44
Secondary education	0.07	0.25	0.07	0.26
Tertiary education	0.03	0.16	0.02	0.14
Living in private housing	0.45	0.50	0.77	0.42
Number of infants 0-5	0.69	0.87	0.98	1.08
Number of children 6-11	0.79	1.10	1.18	1.17
Number of youths 12-17	0.78	1.11	0.98	1.14
Number of adults 18-60	3.19	1.91	3.35	2.12
Number of elderly over 60	0.18	0.43	0.27	0.56
Number of sick persons	0.32	0.54	0.25	0.49
Number of pregnant women	0.09	0.30	0.09	0.29
Number of lactating women	0.18	0.40	0.20	0.41
Number of disabled people	0.03	0.18	0.06	0.24
Number of workers	3.02	2.01	3.05	2.34
Agricultural practice	0.24	0.43	0.67	0.47
Agricultural production	0.12	0.32	0.39	0.49
Trade	0.37	0.48	0.27	0.45
Unskilled work	0.26	0.44	0.20	0.40
Skilled work	0.18	0.38	0.07	0.25
Remittances	0.03	0.18	0.04	0.20
Other income source	0.04	0.19	0.03	0.17
Savings	0.36	0.48	0.26	0.44
Bank account	0.35	0.48	0.18	0.39

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Source: Own computations using June 2010 (EFSA II) survey.

**Table 7a. Cash and food-for-work determinants**

	Cash-for-work				Food-for-work				Cash or food-for-work			
	Directly affected areas		Non-directly affected areas		Directly affected areas		Non-directly affected areas		Directly affected areas		Non-directly affected areas	
	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value
Cash-for-work before the quake	0.453	0.000	0.711	0.000	0.067	0.004	0.217	0.000	0.380	0.000	0.567	0.000
Food-for-work before the quake	0.128	0.111	0.048	0.027	0.640	0.000	0.527	0.000	0.485	0.000	0.450	0.000
Pre-earthquake assets	-0.001	0.233	0.000	0.245	0.000	0.961	-0.001	0.149	-0.001	0.184	-0.001	0.070
Asset losses in February	0.002	0.104	0.001	0.460	0.000	0.611	0.001	0.398	0.001	0.182	0.001	0.216
Number of households	1180		613		1180		613		1180		613	
R2	0.0553		0.5332		0.3083		0.4519		0.0775		0.4581	

Source: Own computations using June 2010 (EFSA II) survey.

**Table 7b. Cash and food-for-work determinants (more covariates included)**

	Cash-for-work				Food-for-work				Cash or food-for-work			
	Directly affected areas		Non-directly affected areas		Directly affected areas		Non-directly affected areas		Directly affected areas		Non-directly affected areas	
	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value
Cash-for-work before the quake	0.453	0.000	0.701	0.000	0.068	0.004	0.198	0.000	0.379	0.000	0.547	0.000
Food-for-work before the quake	0.108	0.180	0.047	0.039	0.644	0.000	0.516	0.000	0.466	0.000	0.436	0.000
Pre-earthquake assets	0.000	0.704	0.000	0.243	0.000	0.753	0.000	0.203	0.000	0.620	-0.001	0.107
Asset losses in February	0.001	0.371	0.001	0.431	0.000	0.937	0.001	0.467	0.001	0.559	0.001	0.244
Pre-earthquake agricultural assets	0.000	0.761	-	-	0.000	0.693	-	-	0.000	0.799	-	-
Agricultural asset losses	-0.004	0.068	-	-	0.001	0.444	-	-	-0.004	0.094	-	-
Number of workers dead/missing	-0.019	0.275	-	-	-0.007	0.267	-	-	-0.020	0.271	-	-
Hosting displaced people	-	-	-0.009	0.567	-	-	0.009	0.622	-	-	-0.001	0.953
Number of children hosted	-	-	0.007	0.208	-	-	0.015	0.033	-	-	0.017	0.042
Number of adults hosted	-	-	0.003	0.384	-	-	0.001	0.741	-	-	0.002	0.752
Number of elderly people hosted	-	-	-0.005	0.847	-	-	-0.001	0.968	-	-	-0.010	0.797
Some hosted people still remain	-	-	0.003	0.862	-	-	-0.032	0.173	-	-	-0.014	0.611
All hosted people still remain	-	-	0.009	0.531	-	-	0.004	0.843	-	-	0.004	0.860
Housing damaged but still usable	0.021	0.290	-	-	-0.004	0.623	-	-	0.024	0.245	-	-
Housing partially or totally destroyed	0.020	0.410	-	-	0.002	0.796	-	-	0.024	0.331	-	-
Sleeping beside the house	0.003	0.897	-	-	-0.006	0.557	-	-	0.005	0.863	-	-
Sleeping in the neighborhood	0.032	0.362	-	-	-0.016	0.228	-	-	0.028	0.428	-	-
Sleeping in the commune	0.040	0.281	-	-	-0.014	0.315	-	-	0.033	0.369	-	-
Sleeping outside the commune	0.004	0.945	-	-	-0.018	0.383	-	-	-0.003	0.951	-	-
Sleeping in a camp	-0.004	0.891	-	-	0.016	0.201	-	-	0.002	0.952	-	-
Religious association	-0.017	0.293	-0.015	0.302	0.000	0.938	-0.037	0.044	-0.014	0.403	-0.045	0.037
Sports/ Cultural association	0.040	0.379	-0.034	0.287	-0.027	0.114	-0.030	0.449	0.027	0.557	-0.039	0.402
Union	-0.051	0.827	-0.010	0.861	-0.011	0.897	0.148	0.037	-0.051	0.830	0.167	0.045
Cooperative	0.283	0.040	0.008	0.902	0.022	0.678	0.032	0.678	0.290	0.039	0.030	0.747
Tontine / Sol / Sabotay	0.031	0.383	0.128	0.001	0.007	0.599	-0.033	0.476	0.023	0.521	0.093	0.087
Womenfolk's association	-0.043	0.415	-0.018	0.527	-0.003	0.863	0.017	0.612	-0.045	0.397	-0.007	0.854
Consumer association	-0.044	0.740	0.000	0.995	0.000	0.995	-0.050	0.329	-0.047	0.729	-0.058	0.334

Konbit, eskwad, other agricultural association	-0.007	0.896	0.014	0.293	-0.004	0.844	0.058	0.001	-0.008	0.876	0.052	0.008
School committee	-0.072	0.421	-0.007	0.917	-0.010	0.757	-0.005	0.953	-0.069	0.450	-0.016	0.861
Other social association	0.130	0.056	0.003	0.935	0.079	0.002	0.009	0.842	0.128	0.064	0.008	0.877
Assistance	0.027	0.069	-0.024	0.092	0.002	0.735	0.001	0.943	0.028	0.065	-0.014	0.497
Number of households	1180		613		1180		613		1180		613	
R2	0.0772		0.5452		0.3191		0.4819		0.0984		0.4788	

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Source: Own computations using June 2010 (EFSA II) survey.

**Table 7c. Cash and food-for-work determinants (all covariates included)**

	Cash-for-work				Food-for-work				Cash or food-for-work			
	Directly affected areas		Non-directly affected areas		Directly affected areas		Non-directly affected areas		Directly affected areas		Non-directly affected areas	
	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value	Marginal effect	P-value
Cash-for-work before the quake	0.435	0.000	0.696	0.000	0.055	0.023	0.168	0.000	0.356	0.000	0.518	0.000
Food-for-work before the quake	0.096	0.239	0.040	0.089	0.644	0.000	0.485	0.000	0.452	0.000	0.398	0.000
Pre-earthquake assets	0.000	0.620	0.000	0.470	0.000	0.305	-0.001	0.218	0.000	0.492	-0.001	0.227
Asset losses in February	0.001	0.331	0.001	0.450	2.45e-06	0.995	0.001	0.467	0.001	0.518	0.001	0.304
Pre-earthquake agricultural assets	0.001	0.331	-	-	0.000	0.435	-	-	0.001	0.295	-	-
Agricultural asset losses	-0.005	0.026	-	-	0.001	0.519	-	-	-0.005	0.037	-	-
Number of workers dead/missing	-0.018	0.338	-	-	-0.008	0.268	-	-	-0.018	0.342	-	-
Hosting displaced people	-	-	-0.008	0.594	-	-	0.012	0.537	-	-	0.002	0.921
Number of children hosted	-	-	0.007	0.199	-	-	0.015	0.028	-	-	0.017	0.042
Number of adults hosted	-	-	0.003	0.406	-	-	-0.001	0.773	-	-	-0.001	0.895
Number of elderly people hosted	-	-	0.000	0.999	-	-	-0.003	0.934	-	-	-0.009	0.834
Some hosted people still remain	-	-	0.001	0.975	-	-	-0.024	0.306	-	-	-0.007	0.793
All hosted people still remain	-	-	0.013	0.431	-	-	0.013	0.510	-	-	0.013	0.578
Housing damaged but still usable	0.018	0.388	-	-	-0.004	0.652	-	-	0.020	0.336	-	-
Housing partially or totally destroyed	0.019	0.454	-	-	0.006	0.524	-	-	0.024	0.358	-	-
Sleeping beside the house	0.024	0.434	-	-	-0.007	0.518	-	-	0.024	0.443	-	-
Sleeping in the neighborhood	0.053	0.156	-	-	-0.018	0.214	-	-	0.049	0.200	-	-
Sleeping in the commune	0.069	0.084	-	-	-0.017	0.276	-	-	0.061	0.135	-	-
Sleeping outside the commune	0.034	0.565	-	-	-0.020	0.371	-	-	0.025	0.677	-	-
Sleeping in a camp	0.007	0.849	-	-	0.018	0.173	-	-	0.012	0.729	-	-
Religious association	-0.003	0.854	-0.020	0.197	0.001	0.871	-0.033	0.079	0.000	0.991	-0.046	0.035
Sports/ Cultural association	0.036	0.441	-0.028	0.404	-0.019	0.289	-0.019	0.649	0.025	0.598	-0.037	0.453
Union	-0.008	0.972	-0.027	0.657	0.003	0.975	0.156	0.031	-0.008	0.973	0.170	0.047
Cooperative	0.231	0.105	-0.003	0.959	0.006	0.908	0.053	0.501	0.240	0.096	0.044	0.635
Tontine / Sol / Sabotay	0.025	0.509	0.113	0.004	0.006	0.649	-0.040	0.395	0.018	0.638	0.078	0.164
Womenfolk's association	-0.032	0.553	-0.022	0.450	-0.003	0.868	0.023	0.509	-0.034	0.536	-0.007	0.859
Consumer association	-0.014	0.916	-0.004	0.919	-0.002	0.962	-0.059	0.253	-0.021	0.879	-0.068	0.260

Konbit, eskwad, other agricultural association	-0.003	0.961	0.012	0.421	0.007	0.743	0.060	0.001	-0.004	0.937	0.054	0.010
School committee	-0.081	0.375	-0.009	0.885	0.007	0.850	0.016	0.837	-0.074	0.425	0.008	0.931
Other social association	0.124	0.075	0.012	0.769	0.082	0.002	0.014	0.769	0.123	0.081	0.013	0.829
Assistance	-0.041	0.016	0.010	0.304	-0.001	0.928	-0.018	0.108	-0.038	0.028	-0.006	0.643
Married	-0.035	0.020	-0.001	0.893	0.006	0.316	0.002	0.868	-0.030	0.048	0.006	0.672
Female head	-0.001	0.323	0.000	0.461	0.000	0.224	0.000	0.829	-0.001	0.292	0.000	0.645
Age of head	-0.003	0.852	-0.005	0.677	0.000	0.977	-0.026	0.089	0.002	0.888	-0.024	0.190
Primary education	0.012	0.691	0.011	0.611	-0.004	0.761	-0.004	0.875	0.010	0.757	0.016	0.602
Secondary education	-0.029	0.575	-0.001	0.978	-0.014	0.477	-0.021	0.634	-0.023	0.659	-0.024	0.649
Tertiary education	0.051	0.034	-0.005	0.666	0.003	0.726	0.019	0.159	0.049	0.042	-0.009	0.575
Living in private housing	-0.001	0.941	0.004	0.362	0.002	0.583	-0.005	0.351	0.000	0.982	0.001	0.937
Number of infants 0-5	-0.011	0.080	-0.007	0.072	0.002	0.526	0.007	0.136	-0.012	0.059	0.003	0.540
Number of children 6-11	-0.003	0.687	0.004	0.352	0.003	0.270	-0.001	0.842	-0.002	0.731	0.000	0.957
Number of youths 12-17	0.005	0.539	-0.001	0.804	0.011	0.002	-0.006	0.125	0.010	0.276	-0.010	0.031
Number of adults 18-60	0.019	0.339	-0.001	0.912	-0.006	0.407	0.020	0.096	0.025	0.216	0.010	0.467
Number of elderly over 60	0.011	0.419	-0.016	0.128	-0.004	0.405	-0.019	0.131	0.008	0.534	-0.024	0.102
Number of sick persons	-0.025	0.295	-0.006	0.712	0.002	0.854	0.008	0.657	-0.024	0.310	0.003	0.894
Number of pregnant women	-0.022	0.272	0.026	0.029	-0.003	0.690	0.021	0.142	-0.017	0.403	0.036	0.040
Number of lactating women	0.012	0.762	-0.003	0.887	0.021	0.162	-0.008	0.757	0.012	0.771	-0.005	0.863
Number of disabled people	-0.007	0.445	-0.002	0.485	-0.010	0.002	0.004	0.248	-0.011	0.221	0.007	0.105
Number of workers	-0.018	0.569	0.007	0.618	-0.010	0.375	0.026	0.121	-0.023	0.466	0.023	0.246
Agricultural practice	0.039	0.702	0.009	0.895	0.013	0.737	-0.006	0.947	0.045	0.661	-0.023	0.818
Agricultural production	0.062	0.527	0.013	0.847	0.009	0.811	0.034	0.685	0.063	0.525	0.011	0.911
Trade	0.056	0.568	0.015	0.831	0.023	0.529	0.068	0.415	0.067	0.503	0.052	0.599
Unskilled work	0.022	0.826	0.003	0.970	0.015	0.689	0.039	0.646	0.021	0.833	0.009	0.932
Skilled work	0.066	0.527	-0.018	0.798	0.007	0.862	0.030	0.733	0.066	0.536	-0.012	0.905
Remittances	0.043	0.681	0.017	0.817	0.014	0.730	0.034	0.697	0.047	0.656	0.018	0.864
Other income source	0.039	0.012	-0.016	0.209	0.000	0.939	-0.007	0.661	0.033	0.034	-0.022	0.232
Savings	-0.001	0.959	0.024	0.146	0.017	0.009	0.025	0.212	0.004	0.805	0.042	0.077
Bank account	0.024	0.115	-0.022	0.147	0.002	0.787	0.002	0.896	0.025	0.101	-0.010	0.657

Number of households	1154	609	1154	609	1154	609
R2	0.1059	0.5631	0.3398	0.5198	0.1252	0.5104

Source: Own computations using June 2010 (EFSA II) survey.