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The impact of assistance on poverty and food security in a protracted conflict context: the case of West Bank and Gaza Strip

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The impact of assistance on poverty and food security in a protracted conflict context: the case of West Bank and Gaza Strip

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ABSTRACT: This paper assesses what is the impact of assistance on the wellbeing of Palestinian households, using in an original way standard econometric techniques coupling the classical counterfactual framework of the impact evaluation analysis – specifically, using a difference-in-difference approach that allows the treatment of sample selection bias – with instrument variable econometric modelling – specifically a fixed effect IV model that gets rid of endogeneity problems.

Using data from the last two rounds (2013 and 2014) of the Palestinian Socio-Economic and Food Security (SEFSec) survey, we estimate the impact of assistance to West Bank and Gaza Strip households on their poverty and food security status.

Results suggest that whereas in the case of poverty reduction there is a clear positive impact of the intensity of assistance, in the case of food security results show mixed evidence. Specifically, the intensity of assistance affects positively the frequency of consumption of fruit, vegetable, cereals, tubers and pulses while it seems to have a negative impact on the consumption of other food groups such as meat, milk, oil and sugar.

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[1] The views expressed in this paper are those of the author(s) and do not necessarily reflect the views of the Food and Agriculture Organization of the United Nations.

1. INTRODUCTION

One of the most discussed issues in recent development policy debates is that of the effectiveness of assistance in fragile countries, and specifically in conflict-affected context. This interest was triggered from one side by the empirical evidence that natural, economic and political risks are on the rise across the world (World Bank, 2011; Zseleczky and Yosef, 2014) and from the other by the fast-increasing literature on the determinants of conflicts (Collier and Hoeffler, 1998, 2004; Stewart et al., 2001) and more recently on the consequences of conflicts (Akresh and de Walque, 2008; Voors et al., 2012). The result was that many practitioners, policy-makers, and even laypeople show a profound discontent looking at the poor development records of conflict countries despite they are among the largest recipients of aid. This called for a renewed approach to assistance in these countries that needs to explicitly take into account the fragility determined by conflicts (EU Commission, 2009; World Bank, 2011; OECD, various years).

However, at the best of our knowledge, the proposition about the ineffectiveness of aid in conflict countries has not been empirically tested yet. In fact, the so-called 'aid effectiveness debate' focused mostly on the econometric evidence that the ineffectiveness of aid is due to the failure of the recipient governments to create the right policy environment (cf., among others, Boone, 1995, and Burnside and Dollar, 2000).[2] These studies were usually based on a cross-section of countries, without any specific focus on conflicts, that at best were treated as a dummy in the regressions. The relatively small body of critiques which emerged soon after (Hansen and Tarp, 2001; Dalgaard and Hansen, 2001; Easterly et al., 2003), focused primarily on the methodological and sample-related weaknesses in the Burnside and Dollar-type analyses, still accepting the original analytical framework.

A different approach was proposed by authors adopting a political economy perspective to the analysis of the workings of aid in conflict regions (Sogge, 2002; Taghdisi-Rad, 2011). They provided a more radical critique arguing that the aid effectiveness debate has consistently treated conflict as an external factor to be taken into account only at a much later stage in the analysis, rather than taking the conflict and its interaction with the socio-economic structures of the country as the starting point of the analysis. However, this approach is admittedly more ideological because "understanding the nature of the conflict and the ideological forces behind its continuation are essential in order to construct a framework for the analysis of economic performance under any given conflict" (Taghdisi-Rad, 2015: 5).

This paper departs from both lines of research insofar it focuses on a specific conflict-affected contexts, West Bank and Gaza Strip (WBGS), and tries to empirically assess what is the impact of assistance on the wellbeing of Palestinian people, measuring it in terms of poverty and food security in a counterfactual framework.

WBGS is indeed an excellent case study for several reasons. It is the highest per capita recipient of non-military aid worldwide, being at the same time the place of the longest contemporary conflict that has a profound impact on many, if not all, aspects of Palestinian society and economy. This is mirrored in the macroeconomic data that show that despite the massive aid inflows over the last decades, that amounted at more than 2.5 billion USD per year in 2013-2014 or around 18% of Palestinian GNI (DAC, 2016), the GNI per capita is still around 3,000 USD (WDI, 2016), qualifying WBGS as a lower-middle income country, while its HDI was 0.677 in 2014, positioning it 113 out of 188 countries and territories (UNDP, 2015).

At the same time, since 2009 the Palestinian Central Bureau of Statistics (PCBS) has administered the Socio-Economic and Food Security (SEFSec) survey, which is an initiative aimed at identifying and

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[2] Thus, calling for more policy conditions that would bring about the desired 'good governance' and 'good policies' required to enhance the effectiveness of foreign aid and stimulate growth in the recipient country.

characterizing changes in the food security status among Palestinian households. Recently PCBS released the data on the last two surveys (2013 and 2014) that for the first time were designed as a panel. This offers an opportunity to assess the impact of assistance on poverty and food security in WBGS in a period characterized not only by persisting occupation in the West Bank, but also by an open armed conflict in the Gaza Strip.[3]

In pursuing this objective, the paper is organized as follows. Section 2 provides an overview of assistance to Palestinian households in 2013-2014. Section 3 illustrates the data and methods used in the impact evaluation. Section 4 provides an introduction of Palestinian households' profiles in terms of poverty and food security at the beginning of the period of analysis (2013). Section 5 discusses the results of the impact evaluation analysis. Section 6 summarizes the main findings and discusses the main policy implications.
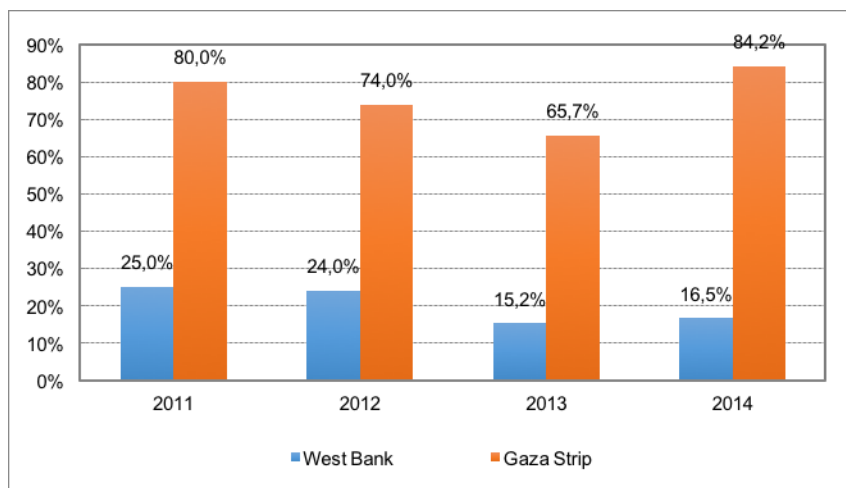
2. HOUSEHOLD ASSISTANCE

2.1. Assisted Households

According to SEFSec (FSS-PCBS, 2016), approximately 40% of all Palestinian households reported receiving at least one type of assistance in 2014, with a marked difference in the share of households receiving assistance between Gaza Strip (84%) and West Bank (less than 17%) (Figure 2.1). Between 2013 and 2014 the major change was recorded in the Gaza Strip where the share of assisted households increased by more than 18 percentage points, bringing it back to a level higher than that observed in 2011. Vice versa, the change between 2013 and 2014 in the West Bank was less than 2 percentage points, still 8 percentage points below the level existing in the region in 2011.

The composition of the various types of assistance in 2013 and 2014 did not change significantly in the West Bank, while in the Gaza Strip there were significant changes (Table 2.1). In the West Bank, a larger share of households reported 'cash' and 'food' assistance in 2013-2014. Vice versa, the dynamics of the major categories of assistance in the Gaza Strip was much more pronounced. In addition to the three types of assistance constituting the core of assistance in the Gaza Strip – 'food', 'cash' and 'health insurance' in order of importance – new types of assistance were reported as important by respondents such as the 'housing (shelter, rent, caravan)' types of assistance that jumped to 25% in 2014. Significantly, 'food coupons', drinking water' and 'clothing' all increased significantly between 2013 and 2014 in response to the heavy worsening of living conditions in the Gaza Strip as a result of the armed conflict that called for the delivery of significant in-kind assistance (food and non-food) to meet people's basic needs.

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[3] From July 8th to August 26th 2014 Israel launched the 'Protective Edge' operation against the Hamas-ruled Gaza Strip. According to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), some 520,000 Palestinians in the Gaza Strip (approximately 30% of its population) had been displaced as of 5 August 2014, of whom 485,000 needed emergency food assistance. According to the main estimates, between 2,125 and 2,310 Gazans were killed and between 10,626 and 10,895 were wounded (including 3,374 children, of whom over 1,000 were left permanently disabled).

Figure 2.1. Share of households receiving at least one type of assistance, 2011-2014

Table 2.1. Share of households receiving assistance by type of assistance and region, 2013-2014

	WBGS		West Bank		Gaza Strip	
	2013	2014	2013	2014	2013	2014
Food	24.6%	28.0%	7.5%	7.6%	57.5%	67.0%
Health care	0.4%	2.3%	0.6%	2.7%	0.2%	1.6%
Clothing	0.7%	2.1%	0.4%	0.3%	1.3%	5.7%
Job creation	1.3%	0.3%	0.3%	0.2%	3.2%	0.6%
Compensation martyrs	0.2%	0.3%	0.1%	0.3%	0.4%	0.4%
Cash	16.8%	16.2%	10.5%	8.3%	28.9%	31.2%
Health insurance	11.5%	7.8%	0.7%	1.2%	32.2%	20.3%
Food coupons	3.0%	8.2%	2.0%	1.6%	4.7%	20.8%
School feeding	0.1%	0.1%	0.1%	0.0%	0.1%	0.4%
Productive inputs	0.1%	0.0%	0.2%	0.0%	0.0%	0.1%
Drinking water	0.4%	1.8%	0.0%	0.1%	1.0%	5.2%
Electricity	0.2%	0.2%	0.2%	0.3%	0.0%	0.2%
Housing[a]	-	9.2%	-	0.9%	-	25.0%
Other	0.6%	1.2%	0.2%	0.0%	1.3%	3.4%

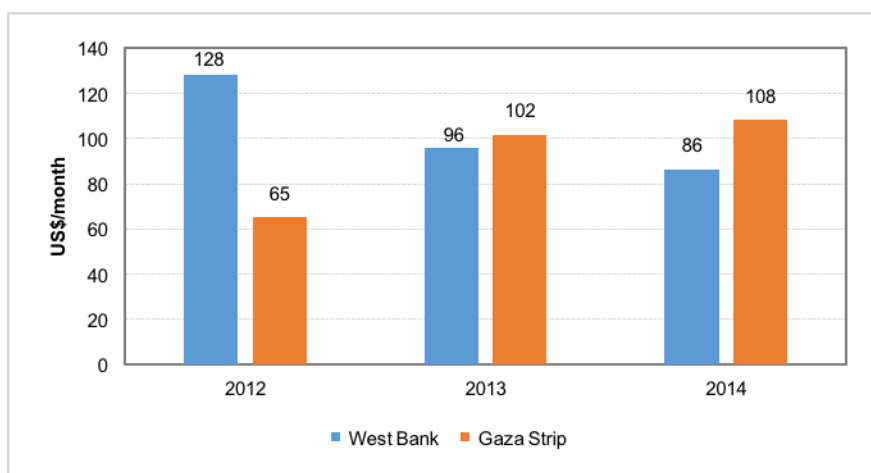[a] Not included in the 2013 SEFSec survey.

2.2. Value of Assistance

The average value received by assisted households in 2014 was equal to 102 US$/month. However, the national averages hide significant regional differences both in levels and trends (Figure 2.2). While in the West Bank the average level of assistance dropped from 128 US$ in 2012 to 86 US$ in 2014, in the Gaza Strip the value increased from 65 to 108 US$ (+66%).

Table 2.2 reports the average monthly value received per household for each of the main types of assistance in the two regions during the period 2012-2014. Between 2013 and 2014 there has been a generalized decline in the average value of assistance for cash and food in the West Bank. Conversely, assistance for employment and provision of agricultural inputs increased. Employment assistance provided households with the largest average allowances in 2014 also in the Gaza Strip, where food assistance did not change too much. Among 'other' forms of support, the largest average values were provided for housing/shelter forms of assistance. The support to agricultural production activities almost disappeared in Gaza Strip after 2012.

Source: FSS-PCBS (2016): Figure 7.3.

Figure 2.2. Average monthly value of total assistance per household (US$/month)

Table 2.2. Average value of support by type of assistance, US$/month

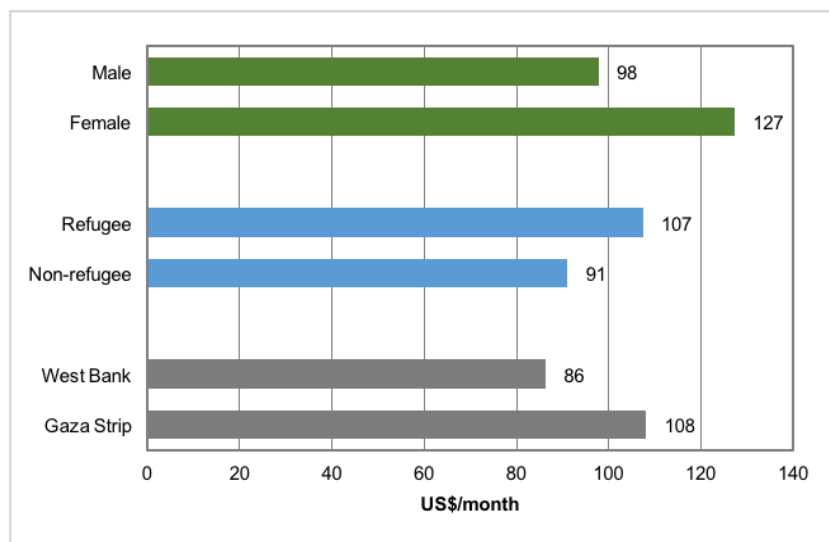| Type of assistance	West Bank			Gaza Strip		
	2012	2013	2014	2012	2013	2014
Cash	115	79	55	95	92	123
Food	45	34	27	37	36	48
Food coupons	42	43	28	30	48	32
Job creation	115	97	126	82	147	215
Agricultural inputs	46	69	123	129	na	9
Housing	na	na	231	na	na	211
Other[a]	71	70	135	4	17	110

[a] The 'Other' category in years 2012 and 2013 includes also housing.
Source: FSS-PCBS (2016): Table 7.3.

The value of assistance varies across different types of households (Figure 2.3). The value of support received by households with a refugee status was slightly greater than that received by non-refugee households (107 vs. 91 US$/month). A more substantial difference was recorded in 2014 between households according to gender: female-headed households received on average 30% greater support than male-headed households (127 vs. 98 US$/month).[4]

The composition of assistance across different household typologies emphasizes the different needs of various groups (Table 2.3). Female-headed households are more likely to receive assistance in the form of cash and free health services than male-headed households: this is probably due to the demographic composition of the former, with the largest part of households headed by widows and old-age women. The comparison between refugee and non-refugee indicates the cash support orientation of non-refugees, while refugee households receive a larger share of assistance in 'other' forms, including a substantial support for housing.

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[4] Interestingly, within the female-headed group the food secure households receive an average value of total support almost equal to that received by the food insecure group (141 vs. 144 US$/month, cf. FSS-PCBS, 2016). This result reveals a greater vulnerability of female-headed households, suggesting a more pronounced dependence on assistance to gain their own livelihood.

Source: FSS-PCBS (2016): Figure 7.4.

Figure 2.3. Average monthly value of assistance by selected household typologies, 2014

Table 2.3. Composition of assistance by region and household group, share of total value received, 2014

Type of support	West Bank	Gaza Strip	Refugee	Non-refugee	Male	Female
Cash	36.4%	34.5%	31.8%	40.2%	34.0%	40.4%
Food	15.3%	26.8%	23.6%	24.7%	25.7%	15.6%
Health insurance	19.8%	0.8%	5.3%	5.0%	3.1%	16.2%
Food coupons	3.1%	5.5%	4.7%	5.7%	5.5%	2.3%
Housing	13.1%	21.6%	24.4%	12.2%	20.9%	12.9%
Other	0.1%	5.6%	5.5%	2.2%	5.0%	0.7%
Remaining sources	12.2%	5.2%	4.7%	10.0%	5.8%	11.8%

Source: FSS-PCBS (2016): Table 7.4.

2.3. Sources of Assistance

The coverage of social assistance increased between 2013 and 2014 reflecting the deteriorating livelihood conditions – especially in the Gaza Strip where more than four households out of five received assistance. Overall, the most reported sources of assistance are the Palestinian Ministry of Social Affairs, The United Nations Relief and Work Agency for Palestine Refugees in the Near East (UNRWA), International agencies, Charitable and religious associations and family, relatives and friends. However, there are differences between West Bank and Gaza (Table 2.4).

In the West Bank, the Ministry of Social Affairs was reported by 7% of households receiving assistance in 2014, a figure lower than the 2013 share (8%). The other two most cited sources of assistance were UNRWA, and informal assistance (family and relatives), which were virtually stable at the 2013 levels.

A quite different picture emerges from Gaza data. Not surprisingly, in the Gaza Strip the most cited source is UNRWA, which in 2014 was providing food assistance to some 867,000 refugees. A number of other sources of assistance were reported, including the Palestinian Ministry of Social Affairs, charitable and religious associations, worker unions, and family and relatives. The last-named sources decreased to 7% in 2014, a sign that informal social networks were unable to provide assistance in times of generalized severe hardship caused by the war.

Table 2.4. Reported sources of assistance by Region[a]

	West Bank		Gaza Strip	
	2013	2014	2013	2014
Ministry of Social Affairs	8.2%	6.8%	19.6%	23.5%
Other PA agencies	0.9%	2.0%	4.2%	8.6%
Political parties	0.0%	0.1%	0.4%	8.6%
Zakat/other religious institutions	0.5%	0.6%	0.5%	2.7%
International agencies (excluding UNRWA)	1.4%	1.2%	9.3%	21.3%
UNRWA	2.1%	4.0%	42.6%	62.3%
Arab countries	0.0%	0.1%	0.3%	2.8%
Charity/religious	0.4%	0.3%	3.8%	19.5%
Family and relatives	2.8%	2.8%	14.8%	6.8%
Friends/Neighbors	1.1%	0.9%	1.8%	4.8%
Workers union	0.0%	0.0%	21.6%	12.9%
National banks	0.0%	0.0%	0.0%	0.5%
Local reform commission	0.0%	0.0%	0.1%	0.6%
Other	0.4%	0.9%	0.3%	3.3%
Any type of assistance	15.1%	16.5%	65.7%	84.2%

[a] Sources of assistance are not mutually exclusive. Some households reported receiving assistance from more than one source.
Source: FSS-PCBS (2016): Table 7.5.

3. DATA AND METHODS

3.1. Data

The data were provided by PCBS that since 2009 administers the Socio-Economic and Food Security (SEFSec) survey, whose aim is to identify and characterize changes in the food security status among Palestinian households. The SEFSec methodology accounts for the multi-dimensional drivers of food insecurity in WBGS by exploring topics as asset-based poverty, qualitative and quantitative aspects of food consumption, and resilience to capture the capacity of households to adapt, transform and cope with shocks or stressors. Besides these three main pillars the questionnaire covers a number of other issues such as socio-demographics, assistance, expenditure and consumption, food diversity, income sources, agricultural issues and a section on immigration and freedom of movement.

The dataset includes data from the fifth and sixth SEFSec surveys. Data collection took place in 2014 and 2015, with a reference period covering the six months preceding the interview (the second half of 2013 and 2014, respectively). The 2013 SEFSec survey was conducted on a sample of 7,503 households (4,949 in the West Bank and 2,554 in the Gaza Strip), while the 2014 sample size was of 8,177 households (5,047 in the West Bank and 3,130 in the Gaza Strip). The sample is representative at the levels of disaggregation that concern: gender, refugee status, governorate, locality type – i.e. urban, rural and refugee camp – and, for the West Bank, Areas A/B and C (FSS-PCBS, 2016).

An important feature of the SEFSec 2013-2014 is the rotating nature of its sampling design. As 92% of the household interviewed in the 2013 were included also in the 2014 wave, we obtained a panel dataset of 6,881 units (4,454 in the West Bank and 2,427 in the Gaza Strip) which was used to analyze the impact of assistance on Palestinian households exploiting the panel structure of the dataset.

The main variables used in the analysis are summarized in Table 3.1. Poverty is measured as an asset-based poverty index.[5] The index is built with a regression approach whereby weights are obtained from a regression of expenditure on a set of dummies for durables and household characteristics using data from the Palestine Expenditure and Consumption Survey 2011 (PECS).[6]

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[5] Asset ownership reflects long-term wealth, which is closely related to living standards. Furthermore, collection of asset data is quicker, easier, more reliable than collecting data on income and expenditures.
[6] PECS is a survey carried out to assess expenditure and consumption behaviour of Palestinian households. As usual for this kind of

Table 3.1. Summary statistics of key variables

Variable	Meaning	Mean	Standard deviation	Min	max
l_ass_index	Log of asset based poverty index	7.09	0.33	5.52	8.28
fcs	Food consumption score (FCS)	74.28	17.06	0.00	112.00
vegfru_fcs	FCS vegetable, pulses and fruit	26.96	4.93	0.00	49.00
meatmilk_fcs	FCS meat and milk	40.85	14.65	0.00	56.00
oilsug_fcs	FCS fats and sugar	6.46	1.13	0.00	7.00
mass	log of HH monthly assistance	1.96	2.63	0.00	10.82
ydum	dummy for year 2014	0.50	0.50	0.00	1.00
massy	interaction mass*ydum	1.04	2.12	0.00	10.82
ydum	Dummy for year 2014	0.50	0.50	0.00	1.00
massy	Interaction mass*ydum	0.70	1.50	0.00	8.62
lhsize	Log of household size	1.81	0.42	0.69	3.30
lexp	Log of household monthly expenditure (NIS)	7.75	0.60	1.79	11.16
dep_ratio	Dependency ratio (aged 0-15+aged >65)/aged 15-65	1.10	1.34	0.00	7.00
agehead	Age of HH head (years)	45.34	14.37	19.00	98.00
femhead	HH head gender (female = 1)	9.7%		0.00	1.00
refhead	HH head status (refugee = 1)	41%		0.00	1.00
high_ed	HH head education (secondary education or higher = 1)	38.1%		0.00	1.00
employed	HH head occupational status (employed = 1)	74.1%		0.00	1.00
qly_deprived	HH with low FCS (< 61) (yes = 1)	22.3%		0.00	1.00
qty_deprived	HH with insufficient food intake, HFIAS (yes = 1)	23.2%		0.00	1.00
ass	HH receiving assistance (yes = 1)	37.7%		0.00	1.00
WB North	Regional dummy (West Bank North = 1)	27.6%		0.00	1.00
WB Center	Regional dummy (West Bank Center = 1)	17.7%		0.00	1.00
WB South	Regional dummy (West Bank South = 1)	19.5%		0.00	1.00
GS North	Regional dummy (Gaza Strip North = 1)	18.5%		0.00	1.00
GS Center	Regional dummy (Gaza Strip Center = 1)	5.2%		0.00	1.00
GS South	Regional dummy (Gaza Strip South = 1)	11.6%		0.00	1.00
rural	Locality of residence (rural = 1)	18.6%		0.00	1.00
camp	Locality of residence (refugee camp = 1)	9.7%		0.00	1.00
urban	Locality of residence (urban = 1)	71.6%		0.00	1.00

Food security is proxied by the Food Consumption Score (FCS) which is an indicator based on the count of how many days specific food groups are consumed over the seven days preceding the survey. Each food group is assigned a specific weight according to its contribution to dietary quality. We disentangled the overall food consumption score in three additive components relating to:

- fruit, vegetable, cereal, tubers and pulses (weights ranging from 1 to 3);
- milk and meats (weight equal to 4);
- oil, sugar and others (weight equal to 0.5).

3.2. Methods

To estimate the impact of assistance on a given wellbeing dimension (i.e. poverty and food security) we need to take into account the possible unobserved heterogeneity in participation in the assistance program. Indeed, as a result of the targeting strategies of the different agencies that provide assistance to Palestinian households treated households are quite different from untreated ones. Notably, the probability of receiving assistance is typically correlated with a set of characteristics of which poverty or food security are just some of the most salient (cf. section 4). As a result, the selection bias is likely to be pervasive (Khandker et al., 2010). Moreover, further unobserved targeting variables may affect both the probability to receive assistance and the outcome variable.

Building on the panel structure of SEFSec dataset, we used a difference-in-difference (DD) approach to get rid of this bias. The DD model assumes that the heterogeneity in participation is fundamentally time invariant once conditioned on a set of household characteristics (**X**):

$$E(Y_t^0 - Y_{t-1}^0 | T = 1, \mathbf{X}) = E(Y_t^0 - Y_{t-1}^0 | T = 0, \mathbf{X}) \tag{1}$$

where Y_t^0 is the potential outcome without the treatment measured at time t and T is the treatment status (1 if the household received assistance, 0 otherwise). The implication of the assumption of time invariant heterogeneity is that the dynamics observed in the control group is the same of the one we would have observed in the treated group had it not been treated.

In regression form the DD estimator is given by:

$$Y_{i,t} = \alpha_i + \beta T_i + \gamma t + \delta T_i t + \sum \zeta X_{i,t} + \varepsilon_{i,t} \tag{2}$$

where t is a time dummy (1 in the second period, 0 otherwise), T_i is the treatment dummy assuming values 1 for the treatment group and 0 for the control, and the casual effect of the treatment is assumed to be additive. In the classical DD model the δ parameter, associated with the interaction term between the treatment T_i and the time dummy variable t, identifies the expected impact (Angrist and Pischke, 2008).

The traditional DD regression uses dychotomic, i.e. treated/non-treated, treatment variables. However, continuous treatment variables, i.e. measuring the intensity of treatment, can be also used (Acemoglu et al., 2004). This allows to fully exploit the information content of available data. In our case a natural candidate is the monthly value of assistance received by the household. In this case, it can be demonstrated that for the i-th household the δ parameter is equivalent to:

$$\delta = \frac{(Y_{i1} - Y_{i0} | T_i = T_{i1}, X_i) - (Y_{i1} - Y_{i0} | T_i = T_{i0}, X_i)}{T_{i1} - T_{i0}} \tag{3}$$

where the numerator is the difference in outcome variation over time given the final and the initial values of the continuous intervention variable, and the denominator is the difference between the final and the initial value of the continuous treatment variable. In the case of an increase of the continuous treatment variable between the two periods, a positive value of δ indicates that the increased treatment intensity determines a higher increase of the outcome variable, that is the impact of the treatment is positive.

Moreover, thanks to the time dimension of the panel, we can include in (2) household specific intercepts or fixed effect, α_i. Irrespective of the adopted fixed effect estimator, this is equivalent to include in (2) a dummy variable for each household (Wooldridge, 2013). Equation (3) still holds provided that now we condition on both $\mathbf{X}$ and α_i.

The logic underpinning the choice of the fixed effect estimator can be shown by means of a direct acyclic graph (DAG)[7]. DAGs are useful instruments to fully understand the intervention logic and to identify whether a covariate should or not be included in the model, that is they are useful to detect confounding factors (Glymour, 2006). In the case of poverty model[8] (Figure 3.1) we posit that the intensity of assistance (*mass*)

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[7] DAGs are diagrams originally developed in epidemiology to make clear the causality pattern characterizing the study framework on which the researcher works. Through a series of arrows causal relationships among variables are highlighted according to the researcher prior beliefs and hypothesis. Graphs "provide a direct and powerful way of thinking about casual systems of variables and the identification strategies that can be sued to estimate the effects within them" (Morgan and Winship, 2008: 62).

[8] The following considerations are valid only for the poverty asset based index model, while in the case of the food security model the independent variables could be considered exogenous given the nature of the dependent variable (FCS).

impacts the outcome variable *directly* as well as *indirectly*, i.e. through the per capita expenditure[9] which acts as a mediator. Furthermore, both the intensity of assistance and the outcome variable are affected by a set of household characteristics that we assume to be time invariant factors such as location, refugee status, education of the head of household and so on. The dependency ratio is a time varying variable that may affect the outcome variable through per capita expenditure. The error term of the dependent variable is assumed to be correlated with per capita expenditure because of the serious error of measurement that affect the latter. Therefore, to account for the possible endogeneity of per capita expenditure we implemented the 2SLS version of both the pooled OLS.
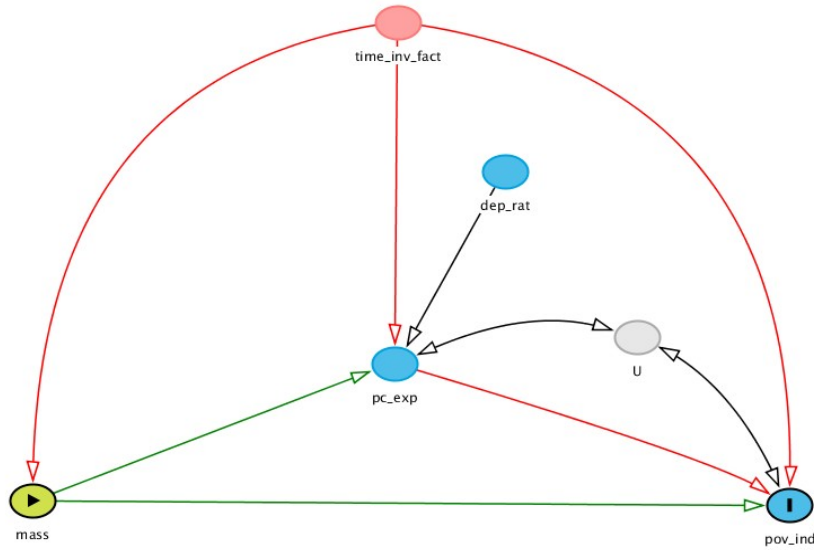

Figure 3.1. Assumed casual paths in assessing the impact of assistance on the poverty index

It is worth noticing that, assuming linearity, the casual relationships depicted in the above DAG would be modeled by two linear equations (Pearl, 2014):

$$lexp = \alpha(mass) + u_{lexp} \qquad\qquad pov\_ind = \beta(mass) + \gamma(lexp) + u_{pov\_ind} \ (4)$$

where *lexp* is the log of the per capita expenditure, *mass* is the log of the value of monthly assistance, *pov_ind* is the log of the outcome variable (e.g. the asset-based poverty index in this case), u_{lexp} and u_{pov_ind} stand for omitted factors that explain variation in *lexp* and *pov_ind*, while the coefficients α, β and γ are structural parameters with β defining the direct effect, $\alpha\gamma$ the indirect effect and $\beta + \alpha\gamma$ the total effect of the intensity of assistance on the outcome variable.

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[9] Actually, we did not use per capita expenditure in our model but two separate variables (in logarithms) for expenditure and household size. Using the log of per capita expenditure would have been equivalent to constrain the coefficient of household size to -1.

4. POVERTY AND FOOD SECURITY

The profiling of Palestinian households per poverty quartile before the treatment (i.e. providing assistance) shows all expected regularities[10] (Table 4.1): moving from poorer to richer households the household size decreases, the educational level increases, the dependency ratio decreases, and the employment rate (including the household head's) increases.

Table 4.1. Households' profile per poverty quartile, 2013

	Q1	Q2	Q3	Q4	Total
Average household size	7.7	5.2	4.8	4.5	5.6
Share of HH with female head	6.4%	11.5%	11.4%	9.1%	9.6%
Share of HH with head with secondary education or above	28.1%	34.2%	39.1%	51.0%	38.1%
Global dependency ratio	1.20	1.19	1.02	0.90	1.08
Share of HH whose head does not work	28.9%	28.4%	23.5%	22.4%	25.8%
Household employment rate	32.1%	36.9%	40.5%	43.7%	38.3%

Authors' elaboration on SEFSec 2013 data.

Poverty in WBGS is largely determined by the 'employability' of household members and food security is largely dominated by its access dimension and specifically by individual's labor entitlement. Therefore, Table 4.2 provides a detailed account of major labor indicators for household heads across poverty quartiles. By and large, the poorer the household, the more problematic its labor conditions. Households whose heads work for fewer hours are more likely to be poor. Irregular employment and lower level occupations are more related to poverty. Usually, poverty is more related to employment in the primary and construction sectors. The overall emerging picture is that the heads of poorer households have more informal and irregular jobs, not requiring high skills and/or education, such as the ones in basic production sectors.

Table 4.2. Head of household employment statistics per poverty quartile, 2013

	Q1	Q2	Q3	Q4	Total
Working Status					
Employed from 1-14 hours	5.1%	4.6%	2.5%	1.3%	4.2%
Employed 15-34 hours	6.1%	6.9%	5.1%	3.2%	6.0%
Employed 35 hours and over	41.7%	46.5%	58.5%	63.5%	47.7%
Temporarily absent	14.6%	10.6%	6.6%	3.9%	11.2%
Looked for a job (already worked)	6.9%	3.9%	1.2%	2.1%	4.6%
Looked for a job (never worked)	2.1%	2.6%	0.7%	1.1%	1.9%
Did not look for work because of frustration	0.7%	0.9%	0.6%	0.6%	0.7%
Full time student	0.1%	0.0%	0.0%	0.0%	0.0%
Housewife	4.0%	5.0%	4.9%	3.4%	4.4%
Unable to work	16.8%	14.7%	12.8%	8.1%	14.8%
Other	0.0%	0.0%	0.2%	0.0%	0.0%
Professional Status					
Employer	2.4%	2.2%	3.9%	11.9%	5.1%
Self-employed	11.3%	11.5%	12.4%	13.9%	12.3%
Unpaid family worker	0.2%	0.1%	0.3%	0.1%	0.2%
Waged employee	61.9%	59.9%	60.5%	52.2%	58.6%
Sector of employment					
Agriculture, fishing and forestry	8.7%	6.7%	3.5%	2.2%	5.3%
Mining, quarrying and manufacturing	6.5%	8.6%	11.5%	13.6%	10.0%
Construction	18.2%	16.7%	16.3%	12.6%	16.0%
Commerce, restaurants and hotels	10.9%	11.2%	14.6%	20.2%	14.2%
Transportation, storage and communication	7.2%	5.5%	6.1%	5.1%	6.0%
Services and other activities	24.3%	24.9%	25.1%	24.5%	24.7%

Authors' elaboration on SEFSec 2013 data.

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[10] Only the share of household having a female head does not show a clear pattern. Another characteristic (not reported in the table) that does not change at all is the number of sources of income per household (on average two per household).

As expected there is a direct relationship between poverty and food insecurity, measured as FCS as well as HFIAS[11] (Table 4.3). Probably the most striking indicator related to poverty is the share of households receiving assistance which is almost two thirds of all households in the lowest quartile, while it is only 7.6% in the highest quartile. Quite surprisingly, the average value of assistance is also rapidly decreasing from the lowest to the second-lowest quartile, but then goes up again in the two higher quartiles[12]. Both indicators of food security show the expected regularities: the poorer the household the lower the household FCS and the larger the shares of households with poor or borderline FCS[13] (Q1 three times larger than that of Q4) as well as insufficient dietary quantity (Q1 eight times larger than that of Q4).

Table 4.3. Households' assistance and food security status per poverty quartile, 2013

	Q1	Q2	Q3	Q4	Total
Per capita expenditure (NIS/month)	305	461	593	860	554
Share of HH receiving assistance	62.5%	41.8%	21.3%	7.6%	33.3%
Average value of assistance per HH (NIS/month)	418	293	347	321	368
Households with insufficient dietary quantity (HFIAS)	50.7%	29.3%	14.8%	6.4%	25.3%
Households with poor or borderline FCS	30.4%	26.4%	17.8%	10.2%	21.2%
Average household FCS	70	72	76	80	74

Authors' elaboration on SEFSec 2013 data.

5. RESULTS

We provide an assessment of the impact of the intensity of assistance over two key variables: an asset-based poverty index and the food consumption score. We first run a pooled OLS regression using a sandwich estimator of the covariance matrix. Results in the case of the asset-based poverty index[14] are reported in the first two columns of Table 5.1. All independent variables parameters are significant at $p=0.05$ but the gender of the household head and a few regional dummies. Noticeably an increase in household expenditure is positively correlated to household wealth whereas household size affects the index negatively. As far as the characteristics of the head of household are concerned, education, age, being employed, being a refugee or living in the West Bank show a positive impact on the index whereas residence in rural areas and refugee camps have a negative impact. As expected, and increase in the dependency ratio reduces household wealth.

The impact of the intensity of assistance is captured by the interaction term 'massy'. The value of monthly assistance has a direct positive impact on the asset-based poverty index. However, although statistically significant, the impact is quite low.

To deal with possible endogeneity of either the intensity of assistance or the expenditure we performed a pooled 2SLS instrumenting these variables and the interaction term. The SEFSec database provides some variable that can serve as good instruments, namely the dummy for assistance and time, the food consumption score and two dummies for quality and quantity dietary deprivation, all variables that while not being directly

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[11] The Household Food Insecurity Access Scale (HFIAS) The HFIAS was developed by the USAID under the Food and Nutrition Technical Assistance (FANTA) Project (Coates et al., 2007). This indicator was devised to obtain information about quantitative aspects of food security through responses about reduction of the frequency and amount of consumed meals.

[12] However, this seems to be related to the higher average value of assistance in WB to households that own some type of business: essentially, it is support to investment that is able to generate employment.

[13] Poor or borderline food consumption are defined as a FCS less or equal to 45 and between 45 and 62, respectively. In words, poor food consumption consists of cereals (bread and rice), potatoes, sugar and oil consumed on a nearly daily basis, vegetables 4 times during the 7 days prior to the survey and very rare consumption of animal products and fruit. Borderline food consumption is similar to the previous category but includes a slightly more frequent consumption of vegetables (5 a week).

[14] The dependent variable – i.e., the asset-based poverty index – is built in such a way that the higher the value of the index the wealthier the household. This should be taken into account in interpreting the results of Table 5.1.

related to the asset-based poverty index should be correlated with the endogenous variables. The size of the coefficient of the interaction term more than doubled in the case of 2SLS (column 2).

Table 5.1. Asset-based poverty index regression models

	Pooled OLS (1)		Pooled 2SLS (2)		Fixed Effect (3)		Fixed Effect IV (4)	
	Coef.	Student's t	Coef.	z	Coef.	Student's t	Coef.	z
mass[a]	-0.03	-24.12	-0.01	-4.53	-0.02	-16.42	-0.01	-4.91
ydum	-0.02	-3.12	-0.04	-4.65	-0.03	-6.35	-0.05	-6.94
massy[a]	0.00	3.08	0.02	6.03	0.01	5.99	0.02	7.77
lexp[a,b]	0.10	15.84	0.50	23.23	0.07	18.85	0.42	13.19
lhsize	-0.36	-55.44	-0.59	-38.33	-0.32	-46.19	-0.53	-24.47
dep_ratio	-0.02	-11.78	0.00	1.30	-0.02	-9.62	0.00	0.25
agehead	0.00	6.79	-0.00	-0.12				
refhead	0.04	8.24	0.04	5.57				
femhead	-0.02	-2.12	-0.00	-0.16				
high_ed	0.07	15.81	0.02	2.13				
employed	0.02	3.52	0.01	0.83				
WB North	0.11	12.30	0.08	5.81				
WB Center	0.19	18.00	0.03	1.87				
WB South	0.08	7.87	0.03	1.96				
GS North	-0.00	-0.58	0.03	2.36				
GS Center[c]								
GS South	-0.01	-0.91	0.01	0.50				
rural	-0.09	-14.22	-0.05	-5.29				
camp	-0.03	-4.29	-0.00	-0.40				
constant	6.84	152.86	4.23	29.32				
R^2	0.47				0.42			
KP rk under-identification ChiSq			561.00	p=0.00			228.652	p=0.00
CD Wald F			133.43				78.75	
HJ over-identification ChiSq			4.30	P=0.12			0.38	P=0.82
IV (excluded)			ass, assy, fcs, qly_deprived, qty_deprived				fcs, qly_deprived, qty_deprived	
F test of fixed effect					1.65	p=0.00		

[a] These variables have been instrumented in the pooled model; [b] These variables have been instrumented in the FE model; [c] GS Center, where Gaza City is located, is assumed as reference.
Note: Robust standard errors have been used to compute t and z statistics; KP is the Kleibergen-Paap LM test for under-identification of the model; CD is the Cragg Donald weak identification test; HJ is the Hansen J statistics for over-identification of the model (cf. Baum, 2007).

In order to account for unobserved individual heterogeneity, we run a fixed effect regression[15]. Column 3 of Table 5.1 reports the estimates of the parameters obtained with the fixed effect estimator on transformed data as deviations from group means[16] . Also for the fixed effect estimator we implemented the corresponding 2SLS version using a subset of the instruments employed in the pooled model: as once accounted for fixed effect, we are left with only the expenditure as endogenous variable (column 4). As all time-invariant regressors are perfectly correlated with the household specific intercepts, only time varying variables are considered in the regression model. Both models confirm that the intensity of assistance has a positive direct impact on household wealth.

The overall conclusion is that the changing magnitude of parameter estimates between instrumented (2SLS and FE-IV) and non-instrumented models (OLS and FE) as well as the overall significance of the household-specific intercepts suggest that the pooled regression suffers from endogeneity bias. Furthermore, the unbiased (from IV models) estimate of the coefficient of the interaction term is stable around 0.02 and highly statistically significant: a 10% increase in the assistance on average determines a direct 0.2% increase of the asset-based index.

As explained in section 3.2, the coefficient of the interaction term of the above regressions capture the direct effect of the assistance on the poverty index, as a mediator (the log of monthly household expenditure)

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[15] The Hausmann test rejected the hypothesis of absence of correlation between random effects and regressors.

[16] With this transformation, we get rid of the large number of group dummies that would be included in the least square dummy variable estimator had the transformation not being made (Baltagi, 2005).

is included among the regressors. If we exclude such a regressor from the model we capture the total effect of the intensity of assistance. Table 5.2 compare the IV fixed effect estimator with the endogenous expenditure variable included among the regressors with a simple FE estimator without the expenditure. As it can be seen the total effect of the intensity of assistance, although positive and significant is smaller than the direct one.

Table 5.2. Asset-based poverty index regression models with and without expenditure

	Fixed Effect		Fixed Effect IV	
	Coef.	z	Coef.	Student's t
mass[a]	-0.03	-17.56	-0.01	-4.91
ydum	-0.03	-5.49	-0.05	-6.94
massy[a]	0.01	4.67	0.02	7.77
lexp[a, b]	--		0.42	13.19
lhsize	-0.27	-41.24	-0.53	-24.47
dep_ratio	-0.02	-11.44	0	0.25
R^2	0.35			
KP rk under-identification ChiSq			2163.40	p=0.00
CD Wald F			9556.74	
HJ over-identification ChiSq			268.00	p=0.00
IV (excluded)				
F test of fixed effect	1.78	p=0.00		

[a] These variables have been instrumented in the pooled model; [b] These variables have been instrumented in the FE model.
Note: Robust standard errors have been used to compute t and z statistics; KP is the Kleibergen-Paap LM test for under-identification of the model; CD is the Cragg Donald weak identification test; HJ is the Hansen J statistics for over-identification of the model (cf. Baum, 2007).

This means that the indirect effect is a negative one, a counterintuitive result that can be explained with the peculiar features of the assistance delivered to Palestinian households in the investigated period. Indeed, as reported in Table 2.3, only about 35% of assistance is delivered in cash, the remaining being in kind. It is possible that the mixed nature of support could actually induce expenditure saving rather than expenditure improvement.

The same analysis was performed using FCS and its components as dependent variables (Table 5.3). This time we can assume that regressors are exogenous given the nature of the dependent variable. Total FCS seems to be unaffected by the intensity of assistance, being both the pooled OLS and the fixed effect estimates of the coefficient of the interaction term not significant. All variables whose coefficients are statistically significant show the same signs as in the poverty index models except two cases, namely: the dependency ratio, that has a positive effect on overall FCS, possibly because a higher share children and elders calls for particularly dietary requirements and/or makes the household more targeted for food aid, and the regional dummies, that are all negative vis-à-vis Central Gaza, possibly because of the massive food aid to Gaza City population as a result of the Gaza war of July-August 2014.

However, if we analyze the impact of assistance on FCS components we obtain a slightly different picture. Intensity of assistance show a strong positive impact on the fruit and vegetable component (which includes also cereals, tubers and pulses), a negative significant impact on the meat and milk component, and a little negative impact on the oil and sugar component. This may be attributed, in part to the nature of in-kind food assistance, that was constituted mostly of cereals during the war in Gaza, in part to the low-income elasticity of some elements of the first group which includes cereals and tubers as well, a source of low cost calories and proteins.

Table 5.3. FCS regression models

Variables	Pooled OLS		Fixed Effect							
			(Total)		(Fruit, vegetables)		(Meat, milk)		(Oil, sugar)	
	Coef.	Student's t	Coef.	Student's t	Coef.	Student's t	Coef.	Student's t	Coef.	Student's t
pcass	-0.80	-9.32	-0.69	-6.22	-0.16	-4.58	-0.52	-5.26	0.02	2.53
ydum	-0.42	-1.25	-0.75	-2.22	-0.12	-1.10	-0.10	-0.36	-0.37	-14.12
pcassy	-0.18	-1.64	-0.16	-1.29	0.22	5.79	-0.31	-2.76	-0.02	-2.69
lexp	4.66	12.79	3.79	10.12	0.86	8.09	3.02	9.09	0.09	3.57
lhsize	0.96	2.40	2.36	4.63	0.48	3.11	1.38	3.03	0.28	7.33
dep_ratio	0.42	3.68	0.42	2.94	0.06	1.31	0.36	2.88	-0.03	-2.62
agehead	0.04	3.70								
refhead	-0.60	-1.93								
femhead	-0.42	-0.75								
high_ed	2.56	8.75								
employed	1.66	3.88								
WB North	-1.34	-1.87								
WB Center	-2.03	-2.67								
WB South	-10.68	-14.48								
GS North	-5.66	-7.97								
GS Center[a]										
GS South	-7.50	-9.94								
rural	-0.60	-1.63								
camp	-1.49	-2.77								
constant	39.84	14.66								
R^2	0.15		0.09		0.03		0.10		0.05	
F test of fixed effect			1.16	p=0.00	1.11	p=0.00	1.20	p=0.00	1.11	p=0.00

[a] GS Center, where Gaza City is located, is assumed as reference.

6. CONCLUSIONS

This paper deals with a question that at best of our knowledge has not yet been addressed so far: Does assistance improve the well-being (poverty and food security) of Palestinian households? In doing this, we use in an original way standard econometric techniques coupling the classical counterfactual framework of the impact evaluation analysis – specifically, using a difference-in-difference approach that allows the treatment of sample selection bias – with instrument variable econometric modelling – specifically a fixed effect IV model that mitigates endogeneity problems.

Results suggest that whereas in the case of poverty reduction there is a clear positive impact of the intensity of assistance, in the case of food security results are mixed. Although there is no significant impact of assistance on the overall FCS, its three components seem to be affected in opposite ways by the intensity of assistance. In particular, the intensity of assistance affects positively the frequency of consumption of fruit, vegetable, cereal, tubers and pulses while is seems to have a negative impact on the consumption of other food groups such as meat, milk, oil and sugar.

These results partly reflect the plethora of actors – and their own strategies and different targeting mechanisms – providing assistance in WBGS, and partly the very complex situation on the ground characterized not only by the long-lasting Israeli occupation but periodical outbursts of armed conflict such as in the Gaza Strip in Summer 2014. Understanding why assistance determined the above-mentioned outcomes would require more detailed and richer information as well as an information-eliciting tool different from the one used by the SEFSec. Indeed, the SEFSec dataset, although quite informative on quantitative aspects of assistance to Palestinian households, is not able to open the black box of the mechanism leading to these outcomes. Nor was it possible to analyze the different forms and sources of assistance, which possibly have different logic of intervention. Dealing with these themes would have required a larger database and the supplement of qualitative information (e.g. in-depth interview, focus groups).

Nevertheless, the SEFSec dataset may be further exploited to shed some light on issues such as spatial distribution of assistance or finer analysis of the impact of different type of assistance on food security. From the methodological viewpoint, a possible future improvement can be modelling the different impact of assistance on household expenditure and on asset accumulation/decumulation.

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