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Does the Hunger Safety Net Programme Reduce Multidimensional Poverty? Evidence from Kenya

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Abstract

The purpose of this research is to evaluate the short-term impact and long-term sustainability of Kenya's Hunger Safety Net Programme (HSNP). Difference-in-difference and propensity score matching estimations are used to determine the impact of programme participation on the household multidimensional poverty index (MPI). We found that programme participation reduced the MPI significantly, which is mainly driven by the food insecurity dimension, and that the reduction in poverty is due to the reduction in the incidence and intensity, the latter in particular, of poverty among the ultra-poor households. Our analysis of the political economy of Kenya suggests that, while the government is making progress in the institutionalisation of social protection, weaknesses in the implementation and financing of the programme, as well as the short-term focus of impact evaluation, may undermine the programme's potential to help build a strong state that is accountable for the eradication of poverty.

Keywords: Hunger Safety Net Programme (HSNP), Poverty, Multidimensional Poverty Index (MPI), Food Security, Kenya.

JEL classification: C23, I31, I32, I38, O22

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1. Introduction

Poverty and food insecurity are of particular concern for the drought-prone regions of northern Kenya.¹ Over 60% of the households there have been dependent on food aid for more than ten years, yet malnutrition persists, at a staggering 30%, and appears to be deepening (Garcia and Moore, 2012). Emergency food aid sometimes provides a temporary remedy but remains ineffective at combating chronic food insecurity (e.g. Barrett and Maxwell, 2007). Kenya needs a development solution that not only reduces food insecurity in the short term, but also contributes to the eradication of poverty in the longer term.

Social protection programmes that use antipoverty transfers have emerged as a viable solution for many developing countries facing similar issues. Advocates of social protection believe that regular and predictable income can reduce the need for emergency food aid and help the poor to manage recurring risks (Garcia and Moore, 2012). A regular income stream can also address the credit constraints arising from market imperfections, by providing liquidity and income to rural households (Dercon, 2004; Devereux et al., 2006; Hoddinott, 2008). Further, recent literature suggests that social protection may be integral to adequate food consumption and to asset accumulation among poor people (Hidrobo et al., 2018), and to even economic development, considered by many researchers to be the holy grail of poverty reduction. Empirical studies of social protection programmes such as Brazil's Bolsa Familia and Mexico's Oportunidades have demonstrated that it is indeed possible to reduce poverty through antipoverty transfers. In the aftermath of these pioneering programmes, a whirlwind of social protection programmes spread through developing countries in Latin America and sub-Saharan Africa in the fashion of a 'quiet revolution' (Barrientos and Hulme, 2009). With the support of the UK's Department for International Development (DFID), the Government of Kenya (GoK) began contemplating social protection and antipoverty transfers as a development solution to its multifaceted poverty problems.

The current study seeks to analyse the comprehensive impact of one such programme – Kenya's Hunger Safety Net Programme (HSNP). The HSNP is an unconditional cash transfer programme designed to strengthen the livelihoods of extremely vulnerable populations in Kenya. The programme focuses on the Arid and Semi-arid Land (ASAL) districts of Turkana, Mandera, Marsabit and Wajir, located in northern Kenya and identified by the 2005 Kenya Integrated Household Budget Survey (KIHBS) as the poorest districts in the country. The ASAL region is prone to drought and populated by historically marginalised households struggling with weak infrastructure and high rates of illiteracy (OPM, 2011). The HSNP was initially designed as a GoK-led social protection programme with the support of DFID, and later it was further supported by Australia's Department for Foreign Affairs and Trade (DFAT). The idea is to deliver regular cash transfers instead of food aid, to help poor and vulnerable households to cover their basic expenses and avoid sinking further into poverty. Phase I ran from 2008 to 2013 as

¹ In 2005, 45.9% of the Kenyan population suffered from poverty, based on the international poverty headcount ratio at \$1.90 a day (2011 PPP) (World Bank, 2016). More recent statistics on income poverty are unavailable, which will justify our investigation of the MPI based on more recent data.

a pilot project and was followed by Phase II, from 2013 to 2017, during which the programme was expanded. The present study focuses on evaluating the impact of the pilot phase (HSNP, 2016).

While ample literature exists on social protection schemes and antipoverty transfers, the majority of these studies have approached impact assessment using a unidimensional variable, studying one outcome at a time, instead of examining the impact from a wider perspective. During the past decade, a growing collection of research has emerged around multidimensional poverty measures. One approach in particular – the Alkire and Foster (AF) method of calculating the multidimensional poverty index (MPI) (Alkire and Foster, 2011), based on Amartya Sen’s seminal work (Sen, 1997) – has gained widespread international attention. To our knowledge, however, only a handful of impact evaluation studies have been carried out using the MPI, highlighting the need for further research on how the AF method and the MPI can be applied to this area of work. The present study differs from OPM’s (2013) evaluation by investigating the programme’s impact using the MPI, which is, arguably, more suited to analysing multifaceted programmes such as the HSNP, where multiple poverty reduction goals are identified as programme objectives. We also employ a different estimation method, the propensity score matching (PSM) method, which is recommended for evaluating programmes where participation is non-random (Khandker et al., 2009). Finally, we carry out a broader qualitative policy analysis for a comprehensive understanding of the programme’s short-term impact and long-term sustainability.

The present study contributes not only to the literature evaluating the impact of social protection programmes, but also to that on poverty as a multidimensional phenomenon. We will address the following research questions in this paper: (i) Does participation in the HSNP reduce the programme-specific MPI? (ii) What are the political forces and key stakeholders shaping the sustainability of the HSNP? (iii) What policy recommendations can be made to support the HSNP’s long-term sustainability?

The rest of the paper is structured as follows. Section 2 presents a review of key literature, including two existing impact evaluations that use the MPI, and a summary of the key social protection programmes in the region, including the HSNP, and. In Section 3 we will present an overview of the HSNP household survey and detailed descriptions of the variables used in the present research. Section 3 also summarises the methodological estimations used to evaluate the impact of MPI. Section 4 analyses the results from the various estimation methods used in the impact evaluation. We also present findings from the decomposition of the MPI for a more granular understanding of the drivers of change. Section 5 consists of a policy analysis of the political economy in Kenya relevant to HSNP. This is followed by Section 6, a summary of our findings and policy recommendations. These might also be relevant to other developing countries interested in social protection via antipoverty transfers.

2. Review of the Literature

In this section we will briefly examine the literature on social protection and the MPI, to provide a background for the present research on the HSNP. Contextual information about the HSNP will also be provided.

Since the early 1990s, an explosion of social protection programmes has swept through the global South. Social transfers have grown eight-fold in the last two decades, particularly unconditional pensions and transfers based on human development criteria. It is estimated that 0.74 to 1 billion people around the world are now reached by social transfers, as of 2010 (Barrientos et al., 2010).

There has been a growing demand for evidence-based policy, which has given rise to impact evaluations (e.g. Skoufias, 2005; Soares et al., 2006; Gao et al., 2009; Kabeer and Waddington, 2015; Fiszbein and Schady, 2009). Traditionally, impact evaluations are conducted using unidimensional outcome variables, such as income or consumption. Where development programmes involve multiple objectives, they are normally evaluated through the analysis of a number of unidimensional outcomes one at a time to determine the impact of the programme on individual outcomes, or sometimes these unidimensional outcomes can be aggregated into a single outcome variable. Yet there is now an increasing awareness that poverty is multidimensional – it can be characterised by food insecurity, poor education or healthcare, asset deprivation, and/or lack of employment opportunities. We propose to base our analysis on the MPI put forward by Alkire and Foster (2011). Our study is among the first few papers that has used the MPI in impact evaluations. Robano and Smith (2014) applied the MPI to BRAC's Targeting the Ultra Poor (TUP) programme in Bangladesh to determine the programme impact and explore the possibility of using the MPI to fine-tune participant targeting. In the same vein, Tonmoy Islam has also investigated the impact of the TUP using various versions of the MPI (Tonmoy Islam, 2014).

2.1 Background information about the HSNP

Kenya's northern ASAL region suffers from the highest levels of poverty and the lowest access to public infrastructure in the country. According to the 2005/6 KIHBS, about 85% of the ASAL population are living below the national poverty line. The increasingly frequent droughts contribute to chronic food insecurity and a rising incidence of conflicts caused by scarce resources (Campbell et al., 2009). As with food insecurity issues in Ethiopia, governments and donor agencies realised that ad hoc food aid was failing to address these chronic problems and that regular cash transfers might be a more effective way of helping vulnerable households develop resilience to shocks and escape poverty. Under the National Social Protection Policy, five cash transfer schemes were created, which include the HSNP, with the aim of creating 'predictable funding for predictable needs' (Ellis et al., 2009, p. 16, quoted by Garcia and Moore, 2012).

Under the HSNP, a bi-monthly cash transfer is sent directly to the beneficiaries' bank accounts, accessible with a biometric smartcards at local banks or at any ATM in the area.² During Phase I, the pilot project, the transfer was

² See the website of HSNP ([link](#)) for more details of how cash is delivered.

fixed at 3,500 Kenyan Shillings (KES) (approximately US\$34) per household and covered 60,000 households (300,000 individuals) from about 2008 to 2013. During Phase II (2013 to 2017), the transfer was increased to KES 5,400 per household (US\$52) and was estimated to cover 100,000 households (720,000 individuals). The transfer was valued at about 75% of the food aid value, and covered roughly 40% of a household's expenditure (HSNP, 2016). Beneficiaries were also encouraged to spend the transfers productively, though compliance was neither mandatory nor monitored. An innovative humanitarian component allows the transfer to be scaled up to cover 302,000 households (2.7 million individuals) in times of crisis. During July and August 2011, transfers were in fact doubled in value to support households struggling against drought (OPM, 2013). In 2015 the programme was again scaled up four times to provide emergency cash transfers to an additional 207,000 households affected by drought (Fitzgibbon, 2016).

Even though most of its funding comes from external donors, the HSNP is led by the GoK. It was initially financed solely by DFID, at an estimated cost of KES 5.5 billion during the pilot phase. For Phase II, the GoK committed KES 4.68 billion to the programme, which accounted for 26% of the funding. DFAT also entered into a partnership with DFID and contributed KES 2 billion, approximately 11% of the funding, to the HSNP during Phase II (HSNP, 2016). We will discuss the role of DFID and other stakeholders in detail in Section 5.

An in-depth evaluation was conducted by OPM in 2013. This evaluation consisted of quantitative panel household surveys and qualitative research such as focus group discussions and community interviews. The HSNP was based on a multidimensional view of poverty and had a wide range of objectives. Its primary goals are threefold: (i) to increase consumption expenditure and reduce poverty; (ii) to reduce food insecurity and malnutrition; and (iii) to promote asset retention and accumulation. Secondary objectives include increased access to health and education services, improvement in livelihoods and savings, creation of a safety net to protect people from shocks, empowerment of women, and advancement of vulnerable populations such as elderly people and children. Other possible outcomes that are not intended include potential interference with local commodity pricing and informal transfer systems; changes to intra-household composition, migration and social dynamics; and potential welfare dependency (Merttens et al., 2013).

Merttens et al. (2013) discovered that the pilot programme had reduced poverty significantly: beneficiaries were 10% less likely to fall into the bottom national decile of wealth. HSNP beneficiaries also experienced significant improvements in food security: 87% of the households reported having more and/or larger meals, and there was an overall increase in expenditure on food. However, there was no significant increase in dietary diversity or improvement in child nutrition. There is some evidence that HSNP helped households retain livestock, though they do not seem to have accumulated non-livestock assets. The transfer also helped households to purchase consumable goods but did not increase the ownership of productive assets (Merttens et al., 2013).

In terms of secondary objectives, the impact evaluation found evidence that HSNP beneficiaries spent more on healthcare. While there was no significant impact on school attendance or the amount households spent on education, there was an improvement in the academic performance of beneficiary children, attributed to the

potential psycho-social effects of the programme.³ Beneficiary households were also 10% more likely to take out loans and 7% more likely to have savings, which suggests a positive impact as impoverished households tend to have few savings and limited access to formal lenders, owing to their lack of collateral. The programme was also found to help households cope with external shocks by protecting them from having to sell their assets or reduce food consumption. While the programme also helped to empower women, there is some evidence to suggest that, in doing so, it created intra-household tension and that many women did not have control over how the transfers were spent, despite being programme beneficiaries. Children and elderly people also showed no signs of improved wellbeing as a result of the transfer, except some minor improvement in children's psycho-social wellbeing.

Evaluation of the unintended outcomes suggests that the programme did not have a distorting effect on the local economy (i.e. commodity prices, inflation), which was to be expected given the modest scale of transfer and limited programme coverage. Evaluation of the labour supply showed no sign of dependency on the transfers or loss of incentives to work. Analysis by different income quintiles revealed some impact heterogeneity across different segments of the sampled beneficiaries – smaller and poorer households tended to benefit the most from programme participation, which can be explained by their comparatively higher per capita value, as the transfers are fixed per household.

3. Data and Methodology

This section will provide an overview of the data and methodology used in the present study. To determine the most suitable analytical approach, we begin with a summary of the data collection process for the HSNP evaluation, focusing on programme design and beneficiary targeting. This is followed by a description of the base model and definitions of the variables, including the construction of the MPI. The PSM DID method of estimation is chosen. This is because randomisation between treatment and control groups was made at the level of sub-locations (cluster randomisation), rather than at the level of individuals or households (simple randomisation). While the former has been widely used in recent empirical research in economics, the limitations of cluster randomised controlled trials (e.g. Donner and Klar, 2004) are not necessarily well recognised among economists. For example, if beneficiaries are selected after randomisation of clusters/sub-locations has been carried out, it is difficult to guarantee blindness of beneficiaries to the intervention (Donner and Klar, 2004, p. 420). Also, distributions of key variables in paired sub-locations may not be the same, because, for instance, of the existence of a few relatively rich or unusually poor households in one of the paired sub-locations, even if their averages are broadly similar. We have thus carried out PSM DID methods to make the control and treatment groups more strictly comparable by dropping outliers. In the meantime, we have also explored the simple DID method of estimation for comparison.

³ The authors postulated that beneficiary children could potentially experience psycho-social effects, as they were feeling better from being better fed and clothed as a result of receiving the transfer.

3.1 Description of Survey

The pilot phase of the HSNP covered 150 out of 434 sub-locations in the ASAL region, with 48 sub-locations selected for evaluation. Twelve sub-locations were randomly selected from each of the four districts, stratified by population density and divided into groups of two. Each sub-location within the pair was then randomly allocated to either a treatment or a control group (Merttens et al., 2013).

Three types of targeting mechanism were implemented simultaneously in the selection of beneficiary households within the treatment sub-locations: community-based targeting (CBT), dependency ratio (DR) targeting and a social pension (SP) approach.⁴ In the CBT approach, the community determine the poorest households in up to 50% of the population. The DR approach targets households with vulnerable members (children, elderly people, and disabled or chronically ill people) irrespective of other factors (e.g. wealth). The SP approach selects any individual over 55 years old irrespective of other criteria. Households in the treatment group begin receiving transfers immediately, whereas households in the control group operate as counterfactuals throughout the duration of the pilot study, and only begin to receive transfers after two years. Fifty-one per cent of the households in the treatment sub-locations, approximately 60,000 households in total, were selected to receive the bi-monthly cash transfer (OPM, 2011). As discussed by Merttens et. al. (2013) and Hurrell and Sabates-Wheeler (2013), the demographic characteristics of the treatment and control areas were broadly similar.

From the 48 sub-locations selected for evaluation, about 5,280 households were randomly tselected for an annual interview. Table 1 presents the sample size by survey year and treatment status. The interviews were conducted in November 2009, before the transfer began, as the baseline, again in November 2010 as the mid-line, and finally upon conclusion of Phase I in November 2012 as end-line. The current study focuses on the baseline and end-line survey results (see Merttens et. al., 2013 for more details).

Table 1: HSNP evaluation sample size by year and treatment status

Evaluation stage	Treatment	Control	Total
Baseline	2,539	2,569	5,108
Mid-line (Follow-up 1)	2,315	2,322	4,637
End-line (Follow-up 2)	1,224	1,212	2,436

Source: Merttens et al. (2013)

An attrition rate of 7.7% resulted at mid-line and a further 15.0% resulted at the end-line, leading to a general attrition rate of 21.6% between baseline and end-line. Attrition was mostly driven by households that could not be tracked in the second wave. It skewed towards the Mandera and Wajir districts as the share of migrant households is larger in these districts than elsewhere. However, the differential attrition is less than 0.5% between control and

⁴ It would be useful to make comparisons among the three groups, but because of the small sample size as a result of sub-grouping, we have aggregated them into one group.

treatment groups, indicating that attrition is comparable across both groups. The present impact evaluation will focus on the 2,436 households present during both baseline and end-line surveys, to ensure comparability.

Data from three rounds of HSNP surveys are housed in the World Bank's Development Impact Evaluation catalogue (see Table 1); they contain community-level and household-level responses as well as household demographics. These are the same data used by OPM in the formal impact evaluation of the HSNP pilot project. The present study is based on the 99 micro-data files from the 2009 and 2012 periods (i.e. excluding mid-line) as we focus on the eventual impact of the programme.

3.2 Definition of variables

To evaluate the impact of programme participation on poverty, first we examine the relationship between programme status and the outcome variable, the MPI. The MPI is a customised measure constructed in accordance with the HSNP's objectives and subsequently referred to as the *HSNP MPI*. Programme status is a dummy variable, equal to one if the household is in the treatment group and zero if the household is in the control group. As the HSNP MPI is a measurement of the state of poverty, a negative value would indicate a reduction in poverty and hence success of the programme. We would expect the HSNP MPI to be lower for programme participants at the end-line than at the baseline (i.e. negative).

For further understanding of the effect of the programme, we segment the households into 'Poor' and 'Ultra-poor', to explore the driving force behind the impact of the programme. We would expect the reduction in the HSNP MPI to be greater for the ultra-poor segment than the poor segment if the impact heterogeneity identified by OPM holds.

Based on the existing impact evaluation literature and considerations of the HSNP's targeting mechanisms, a range of demographic variables were chosen as baseline control variables. They include continuous variables such as household size (per adult equivalent)⁵ and age of the household head. Dummy variables, such as the gender of the household head, whether he/she is illiterate⁶ and his/her occupation are also included.⁷ These variables also serve as the observable characteristics used in the PSM method discussed later. They are considered exogenous to the outcome variable MPI.

We have extended our analysis to evaluate the impact of programme participation on the global MPI – the original MPI produced by the Oxford Poverty and Human Development Initiative (OPHI). Unlike the HSNP MPI, the global MPI is constructed in accordance with OPHI guidelines, as available on the UNDP website (UNDP, 2010).

⁵ Children under 15 years of age are counted as three-quarters of an adult, while household members over 15 years of age are counted as an adult and take a value of one.

⁶ An individual is considered illiterate if he/she cannot write a simple letter.

⁷ Occupation is split into Working or Not-working based on various classifications, including herding, farming, collecting bush products, being self-employed, doing paid work (including casual labour), helping in the family business, doing unpaid domestic work, doing other unpaid work, such as unpaid work at nursery, not working (too old, unable or no opportunity), no specific duties, fishing and other.

As the global MPI is composed of different indicators and published annually for over 100 developing countries, including Kenya, it allows us to determine the broader impact of participation in the HSNP on additional poverty dimensions, and enables us to make a direct comparison with the standardised global MPI measures available for Kenya at the national level. However, we expect the reduction of poverty to be relatively small for the global MPI, as many indicators within the this MPI are subject to long-term influence (such as education and child nutrition), whereas the HSNP is designed to provide a short-term safety net.

3.3 Construction of the HSNP MPI

A key contribution of the current study is the use of the MPI as an outcome variable. As the HSNP is based on a multidimensional view of poverty, the construction of a single index to reflect the multiple deprivations faced at the same time by a given household should allow us to better understand the programme's impact on the interlocking dimensions of poverty. The current study follows the AF prescription in the construction of the HSNP MPI (Alkire and Foster, 2011), which was also adopted by Robano and Smith (2014). The AF method takes into consideration incidence (headcount) and severity (average poverty gap) for a more in-depth understanding of programme impact. It also allows us to decompose poverty further into individual dimensions and indicators for a granular understanding of which dimension is the main driver of the overall impact.

To understand the value of the MPI, it is important to understand its construction process.

(1) Selection of dimensions

The global MPI (Alkire and Santos, 2014) contains three dimensions for measuring poverty: education, health and standard of living. In the case of development programmes, standardised MPI measures may not effectively capture the objectives relevant to the programme. Hence, a customised measure is constructed to evaluate the impact of the HSNP according to the goals stated in its literature. Three dimensions are chosen to reflect the stated goals of the HSNP: poverty, food insecurity and asset accumulation.

(2) Selection of indicators

The three dimensions within the global MPI are composed of ten indicators: the education dimension is split into years of schooling and school attendance. As child mortality and adult BMI are missing from the HSNP data, we excluded the health or nutrition indicator from the calculation of the global MPI. Though not perfect, the availability of eight out of ten indicators (two out of three dimensions) more than meets the UNDP standard that 'the MPI should not be calculated when all indicators within a dimension or when 50% or more out of the 10 indicators are missing' (Kovacevic and Calderón, 2014). Indicator and dimension weights were adjusted to account for the missing nutrition indicator.

For the HSNP MPI, indicators were selected to accurately and reflect the overall objective. In the poverty dimension, consumption is widely used to reflect welfare, as income is often deemed an inaccurate measurement of poverty in developing countries because it tends to fluctuate over the years. Thus, the 'monthly household consumption expenditure (per adult equivalent)' is chosen to capture the poverty dimension. As food security is a core focus for the HSNP, we included nine indicators for the food insecurity dimension. It contains nine binary variables, each

assuming a value of one if the statement is true and zero otherwise.⁸ The asset accumulation dimension contains three indicators: livestock ownership, land ownership and asset ownership. The first and second indicators are binary variables which take a value of one if the household owns any livestock or land, and zero otherwise. The third indicator is also a binary variable, taking a value of one if the household owns no more than one of the following assets: radio, television, telephone, bicycle, motorcycle or refrigerator; additionally the household must also not be in possession of a car. If the household owns more than one of any of the above then the variable assumes a value of zero.

(3) Determination and application of the poverty threshold

For the calculation of the global MPI, the poverty thresholds established for its indicators are selected from national poverty definitions or based on internationally agreed development standards, such as the targets of the Millennium Development Goals. For example, a child is considered malnourished if their anthropometrics are below the World Health Organization's underweight/stunting/wasting definitions for children of their age (Alkire et al., 2014). For the HSNP MPI, we adopt a similar approach where relevant (for example, asset ownership, an indicator available in both the HSNP MPI and the global MPI, follows the standards established by OPHI). Each household is then assessed against the respective threshold, z_i , to determine whether it is deprived in each indicator.

As mentioned earlier, following the OPHI standard, we have excluded the nutrition dimension from the global MPI. Also, weights for the remaining indicators are adjusted following the UNDP recommendation (UNDP, 2010). Table 2 lists the definitions and origins of poverty thresholds for the HSNP MPI. The HSNP MPI consists of three dimensions, that is, consumption poverty with weight 1/3 (based on monthly household consumption expenditure, per adult equivalent), food insecurity with weight 1/3 (based on nine indicators reflecting household food consumption, with individual weight of 1/27), and asset poverty with weight 1/3 (based on 3 indicators of ownership of livestock, land and assets, with individual weight of 1/9).

⁸ The nine indicators for the food insecurity dimension are based on these questions: 'During worst period, did the household members go an entire day without eating?', 'In the past seven days, did your household eat smaller meals than you would have liked?', 'Did you buy food on credit from a shop?', 'Did you sell any other assets in order to buy food?', 'Did you borrow food or rely on help from family or relatives (other than the main provider) to buy food?', 'Did you collect and eat wild food and/or animals?', 'Did you sell any of your animals to buy food?', 'Did you reduce the number of meals you eat?', 'Did you skip entire days without eating solids?'

Table 2: HSNP MPI framework

Dimension	Indicator(s)	Poverty threshold	Weight	Rationale
Poverty	Monthly household (HH) consumption expenditure (per adult equivalent)	KES 2.238 – average of rural (KES 1.562) and urban poverty lines (KES 2.013)	1/3	KIHBS Kenya 2006 (official poverty line, also used in OPM, 2013)
	Eaten smaller meals than you would have liked	Deprived if true for the HH	1/27	
Food insecurity	Bought food on credit from a shop	Deprived if true for the HH	1/27	
	Sold any other assets	Deprived if true for the HH	1/27	
	Borrowed food or relied on help from family or relatives (other than main provider)	Deprived if true for the HH	1/27	
	Collected and eaten wild food and/or animals	Deprived if true for the HH	1/27	
	Sold any of your animals to buy food	Deprived if true for the HH	1/27	
	Reduced number of meals	Deprived if true for the HH	1/27	
	Skipped entire days without eating solids	Deprived if true for the HH	1/27	
	Gone an entire day without eating (during worst period) (binary)	Deprived if true for the HH	1/27	Used in the IDS report (IDS, 2015)
Asset accumulation	HH owns livestock (binary)	Deprived if HH does not own any livestock	1/9	Used in the IDS report
	HH owns land (binary)	Deprived if HH owns any land	1/9	
	HH does not own more than one of the following: radio, TV, telephone, bicycle, motorcycle or refrigerator; and does not own a car or tractor	No more than one of any of these AND no car	1/9	Formal cutoff standard used by MPI OPHI

3.4 Empirical Methodology

For both the global MPI and the HSNP MPI, we first apply the DID method to the baseline and the end-line data. The DID method estimates the average treatment effect on the treated (ATT) by comparing the change in the outcomes between the treatment and control groups, before and after the treatment (Khandker et al., 2009). The equation below describes the DID estimation method:

$$DID = E(Y_1^T - Y_0^T | T_1 = 1) - E(Y_1^C - Y_0^C | T_1 = 0)$$

where DID is the differential effect in the ATT between the treatment group ($Y_1^T - Y_0^T | T_1 = 1$) and its counterfactual ($Y_1^C - Y_0^C | T_1 = 0$).

The conditions required for unbiased DID estimation are that the model should be correctly specified, and that the error term should be uncorrelated with other variables (Khandker et al., 2009). As mentioned previously, there are endogenous variables which could potentially impact the outcome variable (the MPI), such as whether the HSNP beneficiaries also receive food aid or other cash transfers, or whether they are participating in employment programmes. To satisfy the conditions for DID, the present study will exclude the aforementioned endogenous covariates in the estimation. We will compare and contrast three scenarios under the DID estimation method: (i) the DID – the basic model without any covariates; (ii) the DID with only exogenous variables as covariates; and (iii) the DID with PSM so that the households in the treatment group can be made comparable and observationally similar to those in the control group.

PSM estimates a composite of these characteristics into a scalar value – a propensity score – and matches households based on individual propensity score for a reconstructed panel of control versus treatment groups (Rosenbaum and Rubin, 1983). This reconstruction process also makes it an effective corrective mechanism against panel attrition (and as we recall the overall attrition from baseline to end-line is 21.6%). Reconstructing the panel data based on PSM ensures that the new control and treatment groups are broadly comparable. In addition to addressing the selection bias and attrition, matching is also useful when there is a high occurrence of exclusion or inclusion error in the targeting process; i.e. households receiving transfers when they are not eligible, or households that are eligible not being selected to receive transfers. The HSNP had an overall inclusion error of 11% and exclusion error of 46%. As the programme coverage is not universal, the high level of exclusion error can be partially attributed to the scale of the funding. However, the relatively high level of inclusion error gives justification to PSM estimation (OPM, 2011).

We use a probit model to estimate the propensity scores to match treatment households (with access to the HSNP) and control groups (without access to the HSNP) for each round of the panel data. The sample size is large and comparable between the control and treatment groups, which is ideal for a robust matching. The region of common support has been defined to drop the observations that are not comparable with each other. Here the region of common support is defined for the baseline HSNP in [.30392162, .78421257], and in [.45099445, .61595476] for the end-line, where the numbers show the propensity score, or the probability of a household accessing the HSNP. Outside of the region 2,437 observations were dropped, 2,436 of which were 2009 participants who later were not

selected for inclusion in the HSNP. The means of the covariates in the estimated propensity scores satisfy the balancing property, indicating that treatment and control groups are statistically comparable.⁹ We then applied DID for the reconstructed panel.

4. Results

Table 3: Impact of HSNP participation on the HSNP MPI and the global MPI

Dependent variable	(I) HSNP MPI	(II) HSNP MPI	(III) HSNP MPI	(IV) Global MPI
Explanatory variables	DID	DID with PSM	DID with PSM (with covariates)	DID with PSM (with covariates)
Baseline				
Control	0.768	0.768	0.736	0.460
Treated	0.769	0.769	0.737	0.437
Diff (T - C)	0.000	0.000	0.002	-0.023
	(0.03)	(0.04)	(0.28)	
End-line				
Control	0.621	0.621	0.590	0.528
Treated	0.575	0.575	0.544	0.502
Diff (T - C)	-0.046***	-0.047***	-0.046***	-0.026
	(-4.97)	(-5.94)	(-5.87)	-
DID	-0.046***	-0.047***	-0.048*	0.003
	(-4.80)	(-4.76)	(-4.87)	-
Household size (adult equivalent)	-	-	0.003*	-
Gender of HH head	-	-	0.023***	-
Age of HH head	-	-	-0.001***	-
Occupation of HH head	-	-	0.018**	-
Illiteracy of HH head illiterate	-	-	0.047***	-
Number of observations	4,856	4,854	4,854	4,854
R-squared	0.22	0.22	0.23	0.22

Table 3 reports the results of DID estimations for four models: (I) the basic DID model estimating the impact of programme participation on the HSNP MPI; (II) an augmentation of the basic DID model, controlling for various

⁹ The results of the PSM are available on request.

exogenous covariates and applied to the HSNP MPI; (III) an extension of the above with PSM applied to the HSNP MPI and (IV) same as (II) but applied to the global MPI.

In Model I, the DID estimation of the HSNP MPI between the control and treatment households is negative and significant at the 1% level. One can expect a reduction of 0.046 in the MPI, between the end-line differential and baseline differential for the treatment and control groups.

Both groups saw poverty reduced since the baseline survey, although the improvement was more pronounced for the treatment group than the control group, resulting in a statistically significant difference between both groups at end-line. Approximately 22% of the variability can be explained by Model I.

Model II shows the result of DID for the HSNP MPI based on the reconstructed PSM panel. As a majority of the dropped observations were due to ‘intended’ exclusion, with only two observations dropped due to incomparability, we did not expect significantly different results from the two models. Results from both models indeed bear close resemblance, excepting a slightly higher significance level for baseline and end-line in Model II, implying enhanced comparability between the treatment and control groups in the reconstructed panel, although this is slight, given that only two observations were dropped from the otherwise strongly balanced panels. A reduction of 0.047 in the HSNP MPI can be expected from programme participation, driven by significant end-line differences between the treatment and control groups.

Model III extends Model II by including the same set of covariates as in Model II. We would expect this to be a robust model, given that it controls for any selection bias resulting from the non-randomised HSNP design. Interestingly, the HSNP MPI dropped proportionally for both groups once covariates were controlled for. A reduction of 0.048 can be expected from programme participation, an improvement from Model I. R-squared also increased from 0.22 to 0.23.

Overall, the various estimation methods and models depict a consistent story: that programme participation is effective in reducing the HSNP MPI. Our preferred specification is Model III, DID with PSM where covariates are taken into account.

As an extension, we have constructed the global GDI as a weighted sum of education (schooling years and attendance) (1/2) and living standards (e.g. assets) (1/2) as we do not have the data for adult BMI and child mortality necessary for constructing the health dimension in the global GDI. In Model IV, DID shows that the HSNP has no significant effect on the global GDI. This is primarily because education and assets are long-term measures of poverty and not responsive to the short-term transfer.

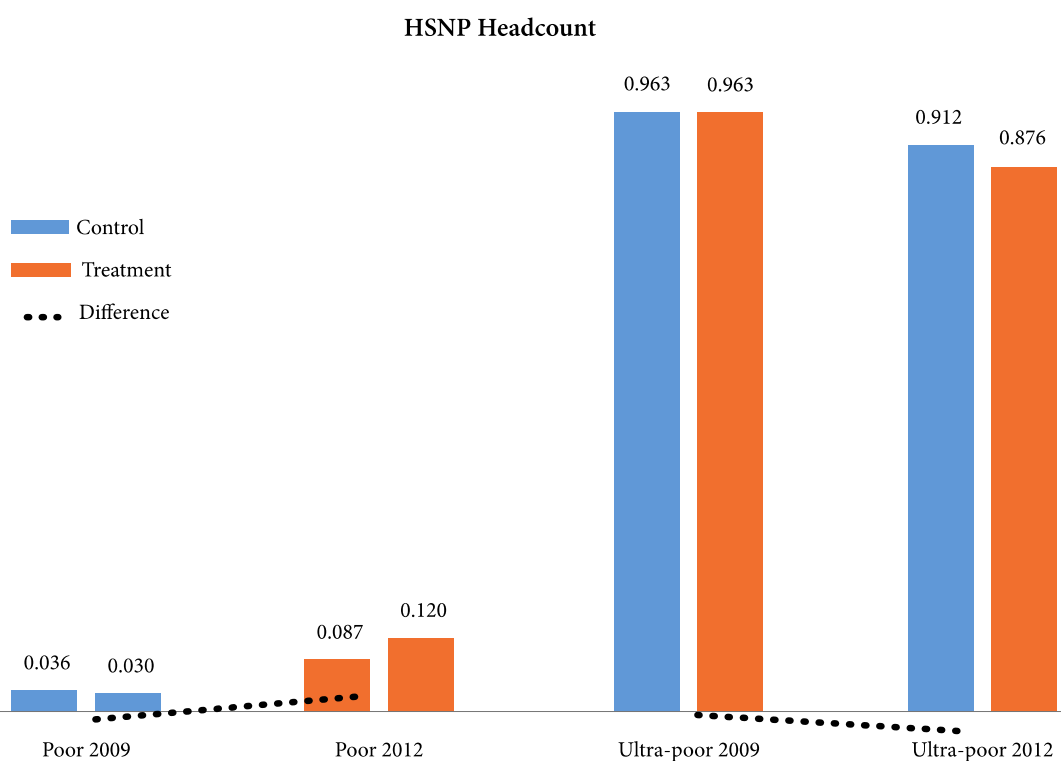
Finally, we have decomposed the HSNP MPI into its individual components to identify the key contributor of change, as well as to examine impact in the two poverty segments (poor and ultra-poor). The HSNP MPI reflects both the incidence and the intensity of poverty. Incidence is measured by a headcount and represents the share of people in poverty. Table 4 and Figures 1 and 2 illustrate the change in incidence and intensity and the aggregate of the HSNP MPI over time, across different poverty segments in the treatment and control groups. At baseline,

incidence is comparable between the treatment and control groups in both segments. The ultra-poor segment accounts for the lion’s share in the total households within both the treatment and the control groups.

Table 4: Impact heterogeneity analysis

The HSNP Multidimensional Poverty Index				
	Treatment	Control	Difference	DID
2009				
Poor	0.013	0.015	-0.003	-
Ultra-poor	0.792	0.797	-0.004	-
2012				
Poor	0.050	0.037	0.014	0.016
Ultra-poor	0.646	0.676	-0.030	-0.025

Figure 1: Incidence of multidimensional poverty by year and poverty segment (HSNP MPI)

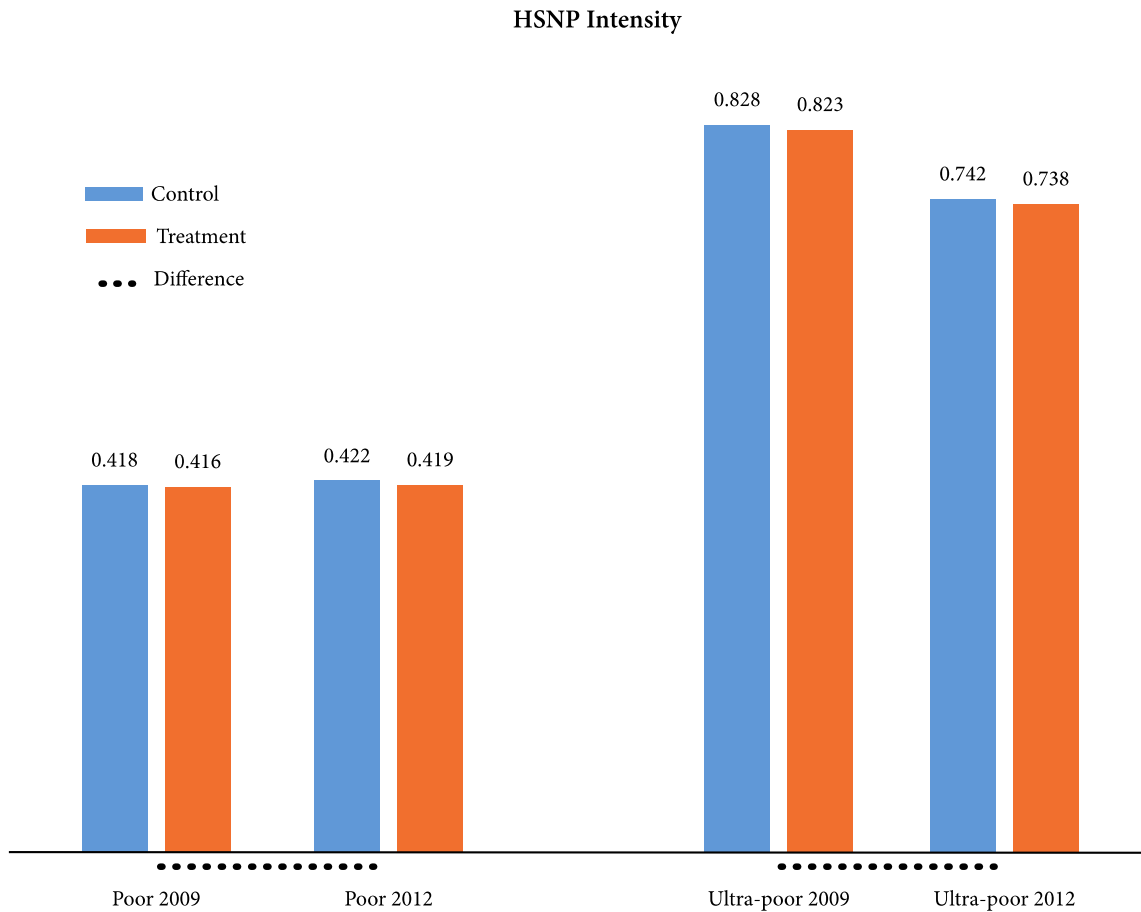


At end-line, poverty among the ultra-poor population declined substantially in the treatment group. The MPI in the treatment group is also 0.032 points lower than the control group. Corresponding to the sharp decline in the ultra-poor segment, the poor segment grew as a result of households shifting out of the ultra-poor segment. Poverty headcount actually worsened for the poor treatment group segment at end-line, as can be seen in the 0.090 points difference between baseline and end-line. Segmentation of the incidence measure suggests that the reduction in multidimensional poverty headcount is driven by an improvement in the lives of the poorest people.

Figure 2 measures the intensity of multidimensional poverty and represents the degree to which households are deprived. A closer examination of the intensity measures has revealed a consistent pattern from baseline to end-line. The degree of deprivation remained fairly stable across the treatment and control groups for the poor segment.

However the ultra-poor segment witnessed the largest drop in poverty intensity between baseline and endline. Taking the above into consideration, we can conclude that the impact of the HSNP on poverty reduction is driven by the decline in the incidence and intensity of poverty among the ultra-poor households.

Figure 2: Intensity of multidimensional poverty by year and poverty segment (HSNP MPI)



It can be argued that there is some evidence to support impact heterogeneity. We can expect ultra-poor households participating in the programme to reduce the MPI by 0.146 points, while the poor households actually see a small increase of 0.037. The heterogenous impact is consistent with findings from OPM on the HSNP, and with findings from evaluations of other antipoverty transfer programmes.

Interestingly, it can be gleaned from these results that although the MPI dropped substantially between the baseline and the endline, the difference in the MPI between the treatment and control groups is less sizeable. The MPI analysis leads to the interesting observation that there appear to be macro-factors driving significant poverty reduction across both groups outside the immediate programme impact (this was not captured in the DID model used by OPM, as the DID approach focuses specifically on the programme before versus after, and treatment versus control). We believe this is driven by an improvement in the macroeconomic conditions in Kenya during the pilot programme. GDP growth in Kenya quickly recovered from the 2008 global financial crisis and grew considerably in 2010 and 2011. This finding contradicts the assertion that the MPI is static across time and overlooks macro-

factors, which perhaps holds true for the global MPI, but in the case of the HSNP in Kenya, the substantial MPI reduction over time yet marginal reduction between treatment and control groups implies that forces bigger than the immediate programme may have driven poverty reduction among the sampled households. This supports the general view that 70% of the poverty reduction is due to economic growth and 30% to antipoverty transfers (Barrientos, 2016). Hence, it is worth bearing in mind the broader context when the scale of impact for antipoverty transfers is evaluated.

In this section we have analysed the impact of participation in the HSNP on the HSNP MPI using DID and PSM DID estimations. Results from various models predicted MPI reduction ranging from 0.046 to 0.048 as a result of the cash transfer. Decomposition and segmentation of the MPI showed that the poverty reduction was driven by the ultra-poor segment. These findings clearly demonstrate the efficacy of the HSNP in reducing poverty, which builds the case for the continuation and expansion of the programme. However, the programme is more effective at helping certain segments of the population. A potential implication is to focus future programme efforts on the ultra-poor segment, which could be achieved by changing the targeting mechanism from a poverty cutoff approach to a poverty-ranking approach, and to increase coverage for the households at the bottom of the ranking. In addition to programme recommendations, we will review the political economy of Kenya in the next section and include further policy recommendations which would support the long-term sustainability of the programme.

Finally, we have carried out the DID for the respective unidimensional poverty indices. The treatment group fared significantly better at end-line than the control group across all three dimensions, and the result was particularly visible for the poverty dimension. However, the DID estimation is only significant for food insecurity. By participating in the HSNP, beneficiaries can expect a 0.015 reduction in food insecurity, significant at the 1% level. There was no statistically significant effect on consumption poverty or asset poverty.

5. Policy Analysis

As can be seen in the impact evaluation, the HSNP significantly reduces multidimensional poverty and is found to be effective in improving food security. This section attempts to place our findings in a broader policy context. The success of the programme can be attributed to the rigorous design and knowledgeable implementation carried out by a network of stakeholders. However, in the long run, the programme needs to be sustainable in order to justify the considerable costs incurred for establishing and maintaining it. For a development project to have lasting benefits and contribute to poverty alleviation, it must have local support and be operationally and financially viable. While major donors and bilateral aid agencies alike are placing increasing emphasis on sustainability in the projects they support, this can be difficult to achieve, owing to the many political factors that are not always within the control of the project managers. It is therefore recommended for the sector to combine short-term, context-specific impact evaluations with broader policy analysis, to fully determine the drivers of potential change and the long-term viability of the project. This section seeks to dissect the political environment which enabled the conception and expansion of the HSNP, and to assess the stakeholders who will be shaping the future of social protection policies in Kenya.

5.1 Political economy of Kenya

While strong advocacy and good design may have helped the HSNP come into being, plentiful empirical evidence in favour of antipoverty transfers existed long before Kenya adopted it. Therefore, this raises the question: what was the political environment in Kenya like when the HSNP was accepted?

Social protection existed in Kenya traditionally in the form of informal assistance from family and community. Contributory assistance such as pensions or health insurance remains relatively low as the majority of the population works in the informal sector (ESRC, 2014). As social protection programmes spread through Africa, Kenya experimented with them through the Cash Transfer to Orphans and Vulnerable Children (OVC-CT) programme. The pilot was deemed hugely successful and was expanded in 2006 and again in 2008, with additional expansions in the plan (Ward et al., 2011). The success of this programme established a receptive climate for the HSNP. Armed with the endorsement of the African Union and the World Bank, and buoyed up by its success with the OVC-CT programme, the GoK was ready to embark upon another social protection programme and the political environment was ripe for it.

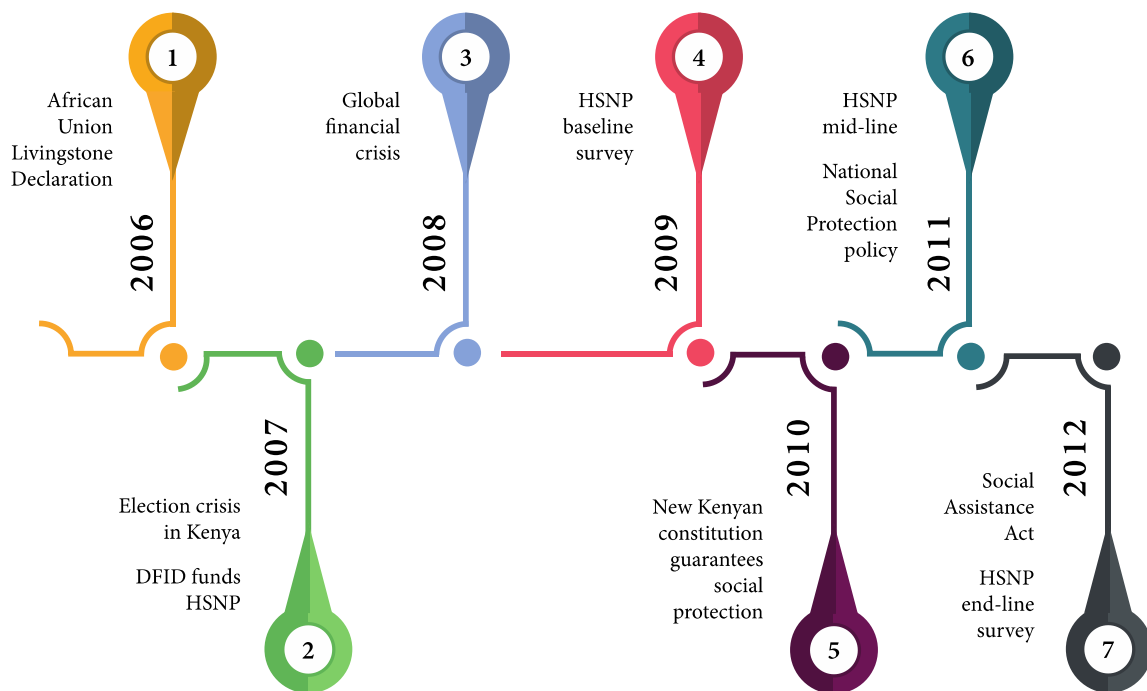
All it took then was a policy window in which the conversation could take place, and funding to kick-start the programme.

Historically Kenya had suffered frequent conflicts caused by ethnic rivalry over territories and resources. The 2003 election opened the development space for the expansion of existing social protection programmes, as the new government's poverty reduction pledges had been fulfilled and its development targets met by the time of the election. A few years later, in 2007, crisis erupted after the alleged electoral manipulation which placed incumbent president, Mwai Kibaki, in power. Protests from opposition supporters were met with counter-protests and police intervention. Violence quickly escalated and it was estimated that up to 1,500 people died and over 600,000 people were displaced from their homes. The incidents also led to the Kenyan police force targeting certain ethnic communities. Donors and the development community were shocked by the election violence. The US, UK and European Commission threatened to withdraw aid in condemnation of the human rights abuses committed by the GoK (ICRP, 2014; BBC, 2018). This placed the GoK under considerable pressure to re-establish legitimacy among the people. Antipoverty transfers are an ideal instrument during such turbulent times. They also signal to the international community that the GoK is accountable for the wellbeing of its citizens and committed to institutionalising social protection. Furthermore, they serve as an externally financed patronage resource that can be used to drum up constituency support.

There is also the issue related to DFID's development agenda and the GoK's lack of resources. In late 2007 DFID entered into a bilateral agreement with the GoK that was to see a transfer of £80 million of development aid to Kenya over the next ten years. Shortly afterwards, in 2009, DFID identified social protection as a key focus area and declared as one of its organisational targets 'to help build social protection programmes to get help to 50 million people in 20 countries over the next three years' (IDC, 2010, p. 25).

Over the course of the next few years, social protection advanced rapidly. In 2010, Kenya passed a new constitution, which for the first time formally guaranteed social protection as a fundamental right to its citizens, under Article 43, and Articles 53 to 57 (GoK, 2010). In 2011, Kenya developed its National Social Protection Policy, which attempts to synchronise different social protection programmes managed by multiple agencies into a coordinated system managed by the National Social Protection Secretariat, housed in the Ministry of Labour, Social Security and Services. The National Social Protection Policy was followed by the 2012 Social Assistance Act, which provides non-contributory social assistance to vulnerable citizens. The National Safety Net Programme was then created, which encompasses five cash transfer programmes, including the OVC-CT and the HSNP (ESRC, 2014). A diagram of the political events leading up to and taking place during the HSNP pilot is presented in Figure 3.

Figure 3: Political timeline in Kenya, 2006–2010



5.2 Stakeholder analysis

In addition to having an conducive political environment, another critical determinant of programme sustainability lies in its stakeholders – their interests, the strength of their network and their commitment to the programme. Of the many stakeholders involved in the HSNP, the most significant are DFID and the GoK. In addition to explicitly committing to an organisational target on social protection, DFID was also involved in the orchestration of the African Union’s Livingstone Declaration in Zambia in 2006; and it finances several social protection programmes in Kenya, including the OVC-CT programme, the HSNP and the MVC (Most Vulnerable Children) programme.

In the international development community, DFID is regarded as a leader in evidence-based development work, highly praised for its practical and collaborative approach. DFID understands that the sustainability of development programmes does not stop at robust programme design and efficient implementation – institutionalisation of the

programme is critical to its long-term persistence. For this programme to ultimately function independent of donor involvement, it needs to be embedded into the DNA of the Kenyan state, by becoming an integral part of the governance structure, and be formally supported in the state budget. To achieve this, DFID financed the initial pilot programme and impact evaluation independently of contributions from GoK, but still branded the programme a ‘GoK-led national social protection programme’ (IDS, 2015). The impact evaluation is vital ammunition for promoting social protection and gaining domestic policy support. This approach allowed the programme to prove its worth, garner grassroots demand and help the GoK to establish credibility as an institution committed to protecting its most vulnerable citizens. Meanwhile, it gave the GoK time to promote social protection on the national agenda, to develop a governmental structure around social protection, and to ratify the newly drafted constitution to formally guarantee social protection as a fundamental right for its citizens. As the macro environment for social protection matured, the GoK became gradually more engaged in the programme, from simply overseeing it to partially funding it in Phase II, and ultimately it will take ownership of it. In the process, DFID not only fulfils its goal of reducing poverty in Kenya and promoting the social protection agenda, it also helps the GoK to establish a sustainable antipoverty programme and strengthen its state capacity.

In summary, the HSNP was conceived at a time when social protection programmes were gaining momentum and support for them in Africa was strong. Demand for social protection grew following the global recession and the successful OVC-CT programme. DFID assumed a major role in the orchestration of the HSNP by bringing together funding and establishing international networks of experts. It also ensured that the programme was designed with institutionalisation in mind, which enhances the HSNP’s chances of long-term sustainability. In the next section we will discuss gaps in the current framework and present programme and policy recommendations.

6. Conclusion

Impact evaluation is a crucial component of forming evidence-based development policies. The current research set out to evaluate the impact of Kenya’s HSNP on multidimensional poverty, and to identify the driving forces in that process. Using longitudinal baseline and follow-up surveys conducted for HSNP evaluation, we constructed an MPI that corresponded to the HSNP’s primary objectives, and analysed the impact of programme participation on the MPI in a series of econometric models. We used the simple DID model to estimate the ATT, and compared it with DID models controlling for covariates (household size, age and gender of household head, occupation of household head and whether he/she was illiterate) and attrition. We also conducted PSM to mitigate the selection bias that could arise in cluster randomised control trials applied to geographical units. Results from all the models showed a unanimously negative and statistically significant relationship between programme participation and reduction of multidimensional poverty. Beneficiaries experienced a reduction in the MPI ranging from 0.046 to 0.048, implying that the programme is successful at reducing poverty.

Furthermore, we decomposed the MPI into its respective components of poverty incidence and intensity, and examined these across the multidimensionally poor households and ultra-poor households. We discovered that the decline in poverty among the ultra-poor households accounts for most of the impact. Our research observed impact

heterogeneity in that the ultra-poor households benefited significantly more from programme participation than the poor and non-poor households. Taken together, these results suggest that the HSNP is successful at poverty reduction, although it could be fine-tuned to focus the finite development resources on the ultra-poor segment.

Results from the impact evaluation and policy analysis of the HSNP offer valuable insights to other developing countries interested in social protection programmes. As evidenced by the current paper and prevailing consensus from existing literature, social protection in the form of cash transfer programmes can successfully reduce multidimensional poverty. The manner in which social protection transfers quickly spread across Latin America and sub-Saharan Africa reflects the growing prevalence of evidence-based policy and the power of development research. Impact evaluations of pilot projects successfully overcame reluctance from elites and generated domestic demand, thus paving the way for sustainable social protection initiatives. Additionally, Kenya's HSNP highlighted the determining role that the political economy plays in the conception and sustainment of development programmes. The academic community's research and the African Union's endorsement of social protection were crucial in garnering domestic support in Kenya. Furthermore, implementation would not have been possible without DFID's financial commitment and its well-coordinated network of experts. Consequently, continued international endorsement as well as DFID's support are crucial for the programme's sustainability in the medium term. Current international focus on social protection is likely to continue, as evidenced in Sustainable Development Goal 1, Target 3, 'Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable'. In the long term, knowledge transfer and institutionalisation are critical to ensure that effective social protection programmes have a home in the legislature and government budget and remain at the top of the national agenda.

The GoK is making exemplary strides towards the institutionalisation of social protection, evidenced by its constitutional recognition and the creation of social protection ministries. In the short term, institutionalisation has the benefit of enhancing the efficient coordination of social protection programmes, which can lead to cost savings and lends further legitimacy to the programmes, as well as reaffirming the state's interest in providing for its vulnerable citizens. In the long term, institutionalisation reinforces the longevity of the programme itself, and has the potential to transform short-term projects into long-term institutions capable of poverty eradication (Barrientos, 2013).

If we look beyond the impact evaluation results and assess the HSNP's merit from a long-term perspective, we can see that it still faces considerable challenges. First of all, the majority of the funding for the HSNP still resides outside the GoK. Despite formal endorsement and pledges of support, there remains limited engagement from the government to date, partially driven by the limited electoral dividends offered by these marginalised northern districts. The mobilisation of domestic finances to cover social protection programmes such as the HSNP is not yet in place, which will be a major challenge to the programme's sustainability once the donor support concludes.

As it were, externally financed development programmes are neither uncommon, nor to be interpreted as a weakness in state commitment; rather they are most likely a result of budget constraints due to the low revenue-generation capacity in developing countries. However, we must also bear in mind that foreign aid priorities and capabilities

change. Reliance on external funding also weakens the legitimacy of the programme and undermines the social contract between the state and its citizens. Therefore, transfer financing needs to be gradually shifted from foreign aid to domestic taxation to safeguard against future uncertainty. This is a key difference between the more successful social protection programmes in Latin America and those in sub-Saharan Africa (Barrientos, 2013). There are some challenges to bear in mind with this approach: income taxes are low in developing countries such as Kenya, where the majority of the population works in the informal economy; consumption tax however, is regressive in that it is increasingly burdensome for the poor. As it seems, the right financing will be a mixture of foreign aid, resource revenue and domestic taxation.

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