Lesotho Child Grant Programme and Linking Food Security to Social Protection Programme

A From Protection to Production report

PtoP

from PROTECTION
to PRODUCTION

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Food and Agriculture Organization of the United Nations (FAO)

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Abstract

This paper presents findings from an impact evaluation of a combination of two types of agricultural and social protection programmes: the Lesotho Child Grant Programme (CGP) and the FAO-Lesotho Linking Food Security to Social Protection Programme (LFSSP).

Overall we find positive effects of the programmes on homestead gardening and productive agricultural activities. Many of these observed outcomes appear driven by the combination of the two programmes. An additional year of CGP along with one year of the LFSSP achieved a number of outcomes which two years of receiving the CGP alone did not, and impact varies in relation to household labour constraints. The LFSSP appears to have assisted households facing labour constraints in homestead gardening activities. For labour non-constrained families, an additional year of CGP plus the LFSSP allowed for greater investments in more substantial productive items, perhaps with intentions of scaling up agricultural operations.

Some degree of caution is warranted in interpreting findings on impacts surrounding labour time. We find increases in children's labour time (especially younger girls) devoted to own-farm activities. These findings are different to those reported in Daidone *et al.* (2014), which looked only at the CGP from 2011 to 2013. Conceptually, differences may be related to competing objectives of the programmes. The CGP incentivizes schooling (Daidone *et al.* 2014) whereas the LFSSP incentivizes homestead gardening activities: task work often undertaken by younger females (UNICEF, 2014).

While it is natural to interpret findings from this report in the context of the larger scale CGP impact evaluation (Daidone *et al.* 2014) – and many similar findings emerge – it is important to recognize that only a subset of communities included in the overall CGP evaluation are considered here. The purpose of this paper is not to replicate the evaluation of the CGP, but rather understand how additional CGP benefits, combined with the LFSSP, affected livelihoods in two specific community councils in rural Lesotho.

1. Introduction

In July 2013 FAO-Lesotho began a pilot initiative called the Linking Food Security to Social Protection Programme (LFSSP). The programme's objective was to improve the food security of poor and vulnerable households by providing vegetable seeds and training on homestead gardening. The training also included information on food preservation practices, and guidelines for achieving healthier diets and nutrition. The programme was rolled out in Litjotjela and Malaoaneng Community Councils (CCs) in Leribe district; it lasted six months, and was intentionally provided to 799 households eligible for a large-scale social cash transfer programme – the Child Cash Grant Programme (CGP). The decision to target these specific households was made with the idea that the two programmes, in combination, would result in stronger impacts on the food security of beneficiary households as compared to each programme in isolation.

During inception phases of the LFSSP it was decided to conduct an impact evaluation to address three questions, namely: (i) to assess the programme's impact on stated objectives; (ii) to interpret findings in view of scaling-up similar initiatives across the country; and (iii) to identify linkages and complementarities between the two programmes.

The impact evaluation strategy makes use of a randomized control design that was devised as part of an ongoing study to assess the impacts of the CGP (Daidone *et al*., 2014). That study, conducted over the period 2011-2013, included a multi-topic survey of CGP beneficiary households (treatment group) and eligible non-beneficiary households (control group[1]). During the follow-up CGP survey in June/July 2013 supplemental information on homestead gardening was collected to constitute a baseline for the LFSSP. The same households were visited again in June/July 2014 and a similar survey was re-administered[2].

Because the households in the control group are similar to those in the treatment group, they provide a counterfactual scenario of how effective the LFSSP would be without a cash transfer. Comparing the behaviour of households in these two groups reveals the impact of combining cash with the LFSSP on agricultural and food security outcomes.

This paper presents findings from this research and is structured as follows: Section 2 provides a brief summary of the two programmes; Section 3 describes the methodology; Section 4 documents the sample of households used for the analysis; Section 5 presents results; and conclusions and recommendations are drawn in Section 6.

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[1] Households in the control group were enlisted in the CGP programme and had received one payment in March/April 2014. A period of about four months had thus elapsed between that single payment and the follow-up survey. We hereafter maintain the original treatment and control consignments, and assume potential bias generated by the single payment is negligible.

[2] During the survey conducted in July 2014 a few questions on Conservation Agriculture (CA) were included to assess the level of knowledge and practice among beneficiaries. LFSSP did not provide any support on CA but other programmes implemented by FAO across the country aim at the national upscale of CA and support spillover effects through the action of the agricultural extension services. Therefore the survey was used partly to assess the situation in this regard, unrelated to LFSSP but of great interest to FAO's strategic framework in Lesotho.

2. The CGP and LFSSP

The CGP is an unconditional social cash transfer programme targeting poor households with children. Eligible households are selected through a combination of Proxy Means Testing (PMT) and community validation, and are registered in the National Information System for Social Assistance (NISSA). Beneficiaries receive a quarterly transfer of between LSL 360 and LSL 750, with the request that the money be spent on children. The programme is run by the Ministry of Social Development (MoSD) of the Government of Lesotho, with financial support from the European Union and technical support from UNICEF-Lesotho. The programme was launched in 2009 with 1 250 beneficiary households. Through a series of expansions the programme covered five districts (Berea, Leribe, Mafeteng, Maseru and Qacha's Nek) and approximately 20 000 households (50 000 children) at the end of 2013. Originally the transfer was LSL 120 (USD 12) per month irrespective of the number of children. In April 2013, the quarterly transfer amount was indexed to the number of resident children as follows: 1-2 children: LSL 360 (USD 36); 3-4 children: LSL 600 (USD 60); 5+ children: LSL 750 (USD 75).

The two eligibility criteria for the CGP are that a given household must a) have at least one resident child aged 0-17; and b) be among the poorest in the community. To identify the poorest households a combination of PMT and community validation procedures are conducted. In PMT, information on different wealth indicators (e.g. dwelling conditions, ownership of land and assets, etc.) is used to statistically estimate a given household's wealth status or score. Households falling within the first and second quartiles of this score-distribution are identified as being poor. In addition, and independently, village heads identify the households they deem to be worst off in their respective communities. Households identified as being poor by both the PMT and the community leaders qualify for the programme (UNICEF 2011, UNICEF 2014)[3.]

The rationale behind the CGP is to foster the greater well-being of poor and vulnerable children living in the poorest households in Lesotho. By supplementing household income the transfer aims to promote greater levels of education, health and nutrition – especially for children. While the transfer is unconditional the CGP features strong messaging conveying the programme's intended purpose and desired outcomes. To the extent possible beneficiaries are urged to spend the cash for the betterment of their children.

Daidone *et al.*, 2014, examined the impact of the CGP on a range of productive indicators to assess how a cash transfer policy might influence agriculture. The motivating hypothesis is that financial transfers to poor agriculturally dependent households can relax constraints and encourage investment in productive activities.

The LFSSP combined training on homestead gardening and food preservation practices with the distribution of vegetable seeds to 799 CGP-eligible households. The specific input package comprised a kit including 300 grams of seeds (50 grams of 6 different vegetable varieties each: carrot, onion, English rape, Florida broad leaf, beetroot, and spinach). The training consisted of demonstrations and hands-on training on the construction and upkeep of

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[3] These studies conclude the performance of CGP is similar to other programmes in the region. Nevertheless, exclusion errors (not reaching poor households) and inclusion errors (enrolling non-poor households) were estimated at around 50 percent and 30 percent respectively. Also there is some concern that the community validation process was, at least initially, perceived as lacking transparency and provoking community conflicts. Currently cheaper and better targeting alternatives are being explored.

keyhole and trench gardens, and included knowledge dissemination on food preservation and production practices to achieve better nutrition. The approximate value of the seed package was USD 11.

The primary mode of knowledge transfer was through demonstration and practical exercises. Field Extension Facilitators (FEFs) would mobilize participants to construct a keyhole or trench garden at identified households, and were able to learn the technique as they engaged in the construction process. Demonstrations/construction took at least a half a day per garden, and longer if there were a large number of participants with many questions.

Because of time limitations and training method, training information focused on the construction of homestead gardens, appropriate seeding and maintenance. The more theoretical aspects were omitted. Moreover, information on nutrition and food preservation was given to community participants, but not systematically, with some communities receiving information on both topics (Litjotjela), while in Malaoaneng such information was not shared. The FEFs with previous project knowledge were often more successful at incorporating nutrition/preservation information in their demonstrations. In any event, project staff often reported that both project participants and facilitators were very motivated and active during the training sessions.

Government extension agents were present at some of the community training sessions though their participation was sporadic. CGP-eligible households were targeted to help rural and ultra-poor families better achieve food security through increasing homestead garden vegetable harvests. Additional details on the training methods and materials can be found in CRS, 2014.

The initiative was implemented by FAO-Lesotho, in collaboration with Catholic Relief Services (CRS) and the Rural Self-Help Development Association (RSDA). Primary funding for the LFSSP came from the UK's Department for International Development (DFID).

3. Method

In this study it was not possible to randomize receipt of the LFSSP, and thus both control and treatment groups received the LFSSP. Instead, the LFSSP was given to both treatment and control households within the CGP evaluation. Since the control group households are similar to those in the treatment group they provide a counterfactual scenario of how effective the LFSSP would be without a cash transfer. A comparison between the behaviour of households in these two groups reveals the impact of receiving three years of CGP and one year of LFSSP, versus only one year of the LFSSP on agricultural and food security outcomes.

Our approach involves taking a so-called 'double difference', which requires two rounds of data collected before a given intervention (pre-treatment) and at a later stage (post-treatment). By subtracting the post-treatment values from the pre-treatment values of an observed outcome within treatment and control groups (the first difference), and subsequently subtracting those changes across treatment and control groups (the second difference), we obtain an estimate of the programme effect.

It is generally regarded as being among the most rigorous methods in impact evaluation because it enables one to account for general trends that influence outcomes which have nothing to do with the programme. For example, if there was a severe drought over the study period it may look like a programme spoils crop harvests. The counterfactual reveals how beneficiaries would have fared with the severe drought in the programme's absence.

In practice this is carried out in a statistical regression framework (details in Annex A), which attaches statistical properties to the impact estimate. If an estimate is not significant then we cannot claim that the impact is different from zero. Accordingly, much attention is paid to these statistics when interpreting findings. (In the present study statistically significant estimates are underlined.)

Since it was not possible to randomize receipt of the LFSSP, we cannot infer impact of the LFSSP by itself with any statistical certainty. Yet we would like to know something about the differential impact of the CGP versus the LFSSP. Given that there is no counterfactual for this aspect of the treatment, we will compare the impacts from two years of the CGP with the combination of the CGP and the LFSSP during the third year. A different estimation strategy is adopted in order to assess what two years of the CGP accomplished. Since detailed information on home gardening-related activities was collected only in 2013 and 2014 and not at baseline in 2011, we use a single difference across the treatment and control groups using the 2013 data. Fortunately the original experimental design of the study, in which treatment and control households were very similar at baseline, lends rigour to this approach as well.

Lastly, with the exception of labour supply outcomes, all results refer to household-level outcomes. To better understand labour/time use impacts these programmes are having we also look at a sample of individuals, by age and gender, at the end of the results section.

4. Sample

For the purposes of this study, we collected additional information on households originally forming part of the overall CGP impact evaluation that were living in the district Leribe, where the LFSSP was to be implemented. We were thus able to take advantage of the existing 2011 baseline data, as well as the data collection efforts for the overall impact evaluation in 2013. This involved 307 households which were interviewed in 2013 and were again targeted for data collection efforts in June 2014. In the district, 316 households were reached: 299 were successfully interviewed in 2013 and 17 had been interviewed in 2011, but not in 2013. A brief overview of households' and individuals' characteristics included in the study is shown in Table 1. All communities were located in Leribe district, which is approximately a two-hour drive north from the capital of Maseru, and within an hour's drive of the district capital of Hlotse.

Owing to financial and logistical constraints the sample size collected for this analysis is considerably smaller than those used in similar impact evaluations. Nevertheless, we are able to detect impacts at conservative significance levels, which allay concerns related to the lack of statistical power often associated with small sample sizes.

Table 1 The sample, by location (2013)

	Litjotjela	Malaoneng
No. of CGP families (individuals)	85 (520)	80 (414)
No. of LFSSP families (individuals)	181 (961)	118 (610)
Age (std. deviation)	25 (19.7)	23 (18.7)
NISSA 1	161	112
Females	51%	50%
Family Size	6.9	6.6
Disabled	3%	3%
Chronically ill	4%	2%
Labour-constrained family	35%	33%
Family has home garden plot	90%	87%
Family crop farms	89%	94%
Family has a cow	35%	28%
Family has an off-farm business	15%	13%

In our sample, 165 households and 934 individuals were enrolled in the CGP. Since both CGP and non-CGP households received the LFSSP, the final sample includes 299 households and 1 571 individuals.

Household demography is similar in the two community councils of Litjotjela and Malaoaneng (Table 1) with family sizes ranging between one to fifteen residents. Although the average age of individuals is around 24, this is belied by the presence of large numbers of the very young and the very old. As can be seen in the Figure 1, both labour-constrained and unconstrained CGP households are characterized by the missing generation of working age members. The national information system for social assistance (NISSA) corresponds to an increasingly nation-wide household census for targeting social protection programmes in Lesotho. Using data collected through NISSA, a household's poverty status is ranked from 1 (ultra-poor) to 5 (well-off). CGP targeting criteria dictates that only households in the first two categories qualify as potential beneficiaries, which is confirmed in the sample, with the majority of families falling under the NISSA category 1[4].

The presence of homestead gardening is quite widespread in these communities. Only 10 percent of households in the sample were without a homestead garden in 2013. Moreover, about ninety percent of families harvest from non-homestead plots of land; around 30 percent own cattle and less than 15 percent operate a non-farm business.

Over 30 percent of sample families are labour constrained. A household is considered to be to be labour constrained if there is no able-bodied member, 18-59 years of age, that is fit-to-work (FTW), or that have one able-bodied member, but the ratio of members not fit-to-work (NF) to FTW is greater or equal to three. A household is thus labour unconstrained if there is at least one able-bodied member and that the so-called dependency ratio is less than three.

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[4] As mentioned in Section 3, the CGP targeting combines NISSA PMT categories with community validation. All households included in the sample were validated as being among the poorest of the poor (results not shown).

Table 2   The sample, by family labour constraints (2013)

	Unconstrained	Constrained
Female-headed family	46%	70%
Household head's age	51	60
Household head single	53%	79%
Household head married	46%	17%
Household head widow	43%	74%
Household head is >64	31%	66%
Household head is <15	0%	1%
Household head's education (yrs)	4.6	4.2
NISSA 1	89%	94%
Family size	6	5
Highest education (yrs)	8.5	7.2
Households' # of healthy males and females aged 18-59 (working age)	3	1.1

The differing characteristics between labour-constrained and unconstrained households are apparent in Table 2. Looking at characteristics of the household head shows constrained families are more likely to be single female-headed, older, and to have achieved less formal education. Note also that constrained households have smaller family sizes, on average. Ninety-four percent of labour-constrained households fall under the NISSA 1 category whereas 89 percent of labour unconstrained families are categorized as being similarly ultra-poor.

Taken together, these features will condition the channels through with the CGP and LFSSP interact and influence desired outcomes. Understanding how benefits and costs vary along demographic dimensions can prove useful for improving programme design. Accordingly, subsequent analysis will separately examine how programme effects differ between the two types of households.

Figure 1   Age pyramids of labour-constrained and labour-unconstrained families, 2013

Age distribution- labour unconstrained   Age distribution- labour constrained
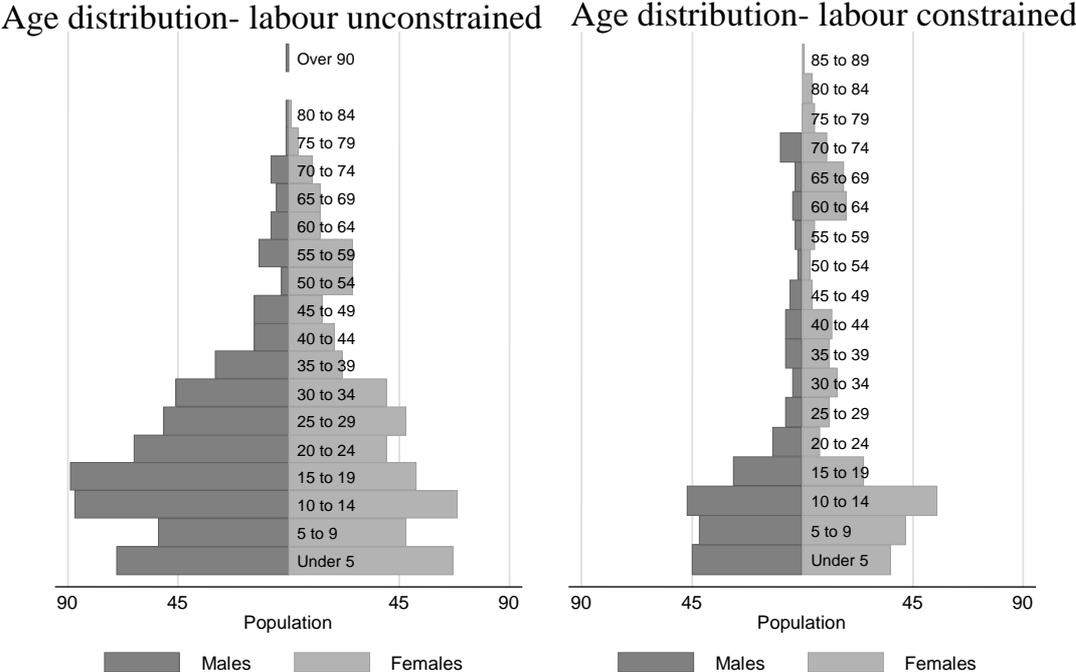
5. Interpretation of results

Results, tables, and discussion in subsequent sections are organized by first comparing trends in outcome indicators between treatment and control households over the study period. The purpose of this comparison is to gain an understanding of the general picture of what took place from 2013 to 2014. Here, statistically significantly changes over the study period in both CGP and non-CGP households are underlined. These comparisons are informative but do not constitute valid impact estimates for reasons outlined in Section 3.

To more rigorously assess impact we turn to regression analysis, where two panels of results are provided. The first panel presents estimates for two years of receiving the CGP, making use of a multivariate single difference estimator. The second panel reports estimates coming from three years of CGP in combination with the LFSSP.

The objective of this evaluation is to compare outcomes that were attainable after two years of CGP only, versus impacts that occurred after an additional year of CGP assistance combined with the LFSSP, compared to those in the CGP control group that only received the LFSSP in the last year.

5.1. Homestead gardening

Comparing changes between 2013 and 2014 for both CGP (treatment) and non-CGP (control) households, all of whom received the LFSSP, reveal large increases in the proportion of harvesting from their home garden plots (Table 3).

Households more than tripled carrot, beetroot, and onion harvests (all three included in the LFSSP package) over the study period, and experienced significant increases in the

production of peppers, tomatoes, and other types of vegetables (not included in the LFSSP package). Few households harvest green beans and peas, although there was a statistically significant uptake among non-CGP households. On average, households grew an additional three vegetables and were able to increase harvests in every season except spring. This reduction may correspond to the conclusion of LFSSP operations, which occurred around this period.[5] Overall, households harvested during two and a half seasons, which represent only a modest (and insignificant) increase from 2013.

Table 3   Trends in homestead gardening harvests

	Treatment		Control	
	2013	2014	2013	2014
HH harvested last year	0.84	0.96	0.83	0.95
… spinach	0.67	0.89	0.61	0.86
… Florida broad leaf	0.47	0.89	0.59	0.77
… English rape	0.55	0.81	0.53	0.73
... onions	0.04	0.53	0.06	0.49
... carrots	0.19	0.80	0.21	0.72
... beetroots	0.18	0.80	0.20	0.73
... cabbage	0.37	0.32	0.36	0.37
... peppers	0.05	0.15	0.02	0.17
... peas	0.02	0.01	0.01	0.04
... tomatoes	0.32	0.42	0.19	0.43
... green beans	0.05	0.05	0.01	0.08
... other	0.15	0.33	0.10	0.34
Number of vegetables produced	3.05	5.99	2.89	5.73
HH harvests in: spring	0.38	0.22	0.34	0.17
HH harvests in: winter	0.63	0.71	0.60	0.61
HH harvests in: summer	0.66	0.77	0.63	0.74
HH harvests in: autumn	0.76	0.93	0.78	0.92
Number of seasons harvested	2.43	2.63	2.35	2.44
Observations	165	165	134	134

Underlined if p<.10

Comparing means in 2013 for both treatment and control groups reveals that households appeared to be similar in homestead gardening activities. This is suggestive that the increasing trends observed in 2014 were related to the LFSSP. To better evaluate the degree to which this was the case we turn to impact estimates reported in Table 4.

Daidone *et al.* (2014) made use of a larger sample of households in additional community councils and found positive impacts on homestead gardening production. In our Leribe district sample (Table 4) we see evidence that the CGP alone encouraged the harvest of peppers (5 pp.), tomatoes (13 pp.) and green beans (4 pp.). With few exceptions, these overall increases appear to be driven by labour-unconstrained households[6], who were additionally able to harvest cabbage (13 pp.) and spinach (12 pp.). In contrast, after implementation of the LFSSP, the labour-unconstrained households appear to have reduced harvests and labour-constrained families achieved gains in homestead harvests. More specifically, harvests of Florida broad leaf (33 pp.), onions (14 pp.) and beetroots (20 pp.) increased; and labour

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[5] LFSSP operations started in July/Aug 2013 and were completed by Dec 2013/Jan 2014 (end of spring, early summer in the Southern hemisphere).

[6] The differential impacts between unconstrained households and constrained households in homestead gardening activities are also noted in Daidone *et. al.* (2014). Namely, impacts are not observed among severely constrained families.

constrained families were able to harvest through more seasons – notably summer (15 pp.) and autumn (19 pp.).

Table 4   **Impacts estimates on homestead gardening harvests**

	Two years of CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
HH harvested last year	0.018	<u>0.082</u>	-0.070	-0.006	<u>-0.095</u>	0.137
… spinach	0.063	<u>0.123</u>	-0.020	-0.019	-0.121	<u>0.140</u>
… Florida broad leaf	-0.083	-0.015	-0.210	<u>0.194</u>	0.098	<u>0.327</u>
… English rape	0.026	0.111	-0.020	0.061	-0.013	0.032
... onions	-0.041	-0.044	-0.000	0.069	0.007	<u>0.141</u>
... carrots	0.013	-0.038	-0.060	0.124	0.219	0.038
... beetroots	-0.052	-0.063	-0.060	0.127	0.116	<u>0.207</u>
... cabbage	0.037	<u>0.125</u>	-0.110	-0.074	-0.136	0.100
... peppers	<u>0.051</u>	<u>0.052</u>	<u>0.056</u>	-0.053	-0.077	-0.057
... peas	0.013	-0.001	<u>0.043</u>	<u>-0.041</u>	-0.015	<u>-0.082</u>
... tomatoes	<u>0.130</u>	<u>0.190</u>	0.013	-0.090	<u>-0.157</u>	0.062
... green beans	<u>0.041</u>	<u>0.064</u>	0.017	<u>-0.084</u>	<u>-0.125</u>	0.010
... other	0.014	-0.008	0.007	-0.015	0.012	-0.011
Number of vegetables	0.149	0.497	-0.340	0.190	-0.311	0.906
HH harvests in: spring	0.022	0.032	0.003	0.084	0.067	0.027
HH harvests in: winter	0.059	0.095	0.058	0.052	<u>0.125</u>	-0.042
HH harvests in: summer	0.029	0.061	-0.040	0.047	0.002	<u>0.153</u>
HH harvests in: autumn	-0.021	0.005	-0.100	0.039	-0.021	<u>0.191</u>
Number of seasons	0.089	0.193	-0.080	0.221	0.172	<u>0.329</u>
Observations	299	194	105	598	388	210

^corresponds to a cross-sectional regression using 2013 information.
^^corresponds to a double-difference regression using 2013 and 2014 information.
Underlined figures for p<.10 or better.

Taken together, it appears two years of the CGP was sufficient for labour-unconstrained families to achieve better harvests in a way that was not possible for the labour constrained. This may be due to differing livelihood strategies and preferences in securing immediate food needs. It is conceivable that the CGP initially allows families with sufficient labour capacity to exploit investments in small-scale operations like homestead gardening. After an additional year of the CGP, however, these families de-emphasize vegetable harvests, perhaps in favour of larger-scale agricultural operations. On the other hand, labour-constrained households may have initial preferences for food purchases, or have been able to increase efforts in vegetable cultivation only after additional years of cash accumulation and LSFPP assistance.

As previously mentioned, the LFSSP included training on food preservation. The first panel of Table 5 reveals some declining trends in the adoption of food preservation practices. With the exception of an increase in fruit canning within control households, the incidence of drying declined significantly between 2013 and 2014.

Table 5   Trends in homestead gardening techniques and vegetable preservation

	Treatment		Control	
	2013	2014	2013	2014
HH used preservation technique	0.31	0.31	0.27	0.25
…drying	0.26	<u>0.18</u>	0.19	<u>0.10</u>
…vegetable canning	0.08	0.07	0.07	0.05
…fruit canning	0.23	<u>0.16</u>	0.15	<u>0.17</u>
…keyhole	0.33	<u>0.42</u>	0.33	<u>0.42</u>
…trench garden	0.08	<u>0.75</u>	0.07	<u>0.66</u>
…rain water conservation	0.08	0.19	0.10	0.22
…home-produced compost	0.05	<u>0.15</u>	0.02	<u>0.13</u>
…purchased fertilizer	0.12	0.16	0.16	0.08
…home-produced pest control	0.06	<u>0.39</u>	0.04	<u>0.16</u>
…frost protection	0.24	0.30	0.25	<u>0.40</u>
…kraal manure	0.05	0.06	0.04	0.01
HH expanded plot in past year	0.18	<u>0.33</u>	0.10	<u>0.41</u>
…lack of cash	0.16	<u>0.02</u>	0.23	<u>0.01</u>
…lack of space	0.28	0.27	0.27	0.26
…lack of labour	0.05	0.07	0.03	<u>0.09</u>
…lack of markets to sell products	0.00	0.01	0.01	0.00
…inputs not available (e.g. seeds)	0.05	0.04	0.04	0.02
…not needed	0.09	<u>0.21</u>	0.09	0.13
…other	0.01	0.01	0.03	0.03
Observations	165	165	134	134

Underlined if p<.10

In contrast, the second panel, which shows the adoption rates of homestead gardening technologies, reveals strong correlation between the LFSSP and homestead gardening practices. Perhaps most notable is the increase in trench gardening (~60 percent increase). In 2014 control households expanded their home garden plots to a larger degree than CGP households (although both groups expanded on average). Reasons given by those not expanding garden plots are primarily related to a lack of space and need. Notice here that the increase in households reporting no need for expansion was statistically significantly higher for CGP households, after receiving the LFSSP. This provides some suggestive evidence of a potential complementarity between the two programmes

Table 6 shows impact estimates on homestead gardening practices and food preservation adoption. Overall, two years of the CGP appear to have had little impact; overall, the share of households canning fruit increased by 5 pp, while labour-constrained households reduced fertilizer purchases (18 pp. reduction) and labour-unconstrained families expanded their home garden plots (9 pp.) On balance, however, the results confirm a relatively muted impact of the CGP alone on the adoption of homestead gardening practices.

By looking at results from an additional year of CGP and LFSSP a more consistent story emerges. Overall, CGP households were 10 percentage points more likely to adopt some kind of food preservation technique; notably "drying" methods (7 pp. increase). The emphasis on

particular vegetables delivered via the LFSSP might partly explain the change from fruit canning (two years of CGP) to drying methods (three years of CGP and LFSSP). In terms of home gardening practices, positive overall impacts are observed with purchased fertilizer (12 pp.), home-produced pest control (18 pp.), kraal manure (6 pp.) and trench gardening (10 pp.).

Impacts on homestead gardening activities are most important among those living in labour-constrained homes. In contrasting Table 4 and Table 6, the impact on homestead garden harvests seems to be influenced by the CGP alone, whereas impacts on homestead gardening practices appeared only after introduction of the LFSSP. While given the limitations of the study we cannot differentiate the impact of the LFSSP from the three years of the CGP, given the content of the LFSSP, this would make sense.

Table 6 **Impacts on home gardening techniques and vegetable preservation**

	Two years of CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
HH uses any	-0.014	0.032	-0.100	<u>0.098</u>	0.072	0.097
…drying	0.018	0.048	-0.076	<u>0.067</u>	0.073	<u>0.117</u>
…vegetable canning	-0.003	0.009	-0.054	0.025	0.006	0.074
…fruit canning	<u>0.050</u>	0.052	0.080	-0.042	-0.080	-0.051
…keyhole	-0.078	-0.097	-0.107	0.023	-0.012	0.133
…trench garden	0.002	-0.012	0.080	<u>0.105</u>	0.057	0.153
…rain water conservation	-0.012	0.000	-0.058	0.014	0.000	0.043
…home-produced compost	0.011	0.018	-0.015	0.008	0.053	-0.010
…purchased fertilizer	-0.066	-0.03	<u>-0.186</u>	<u>0.121</u>	<u>0.149</u>	<u>0.188</u>
…home-prod pest control	0.012	0.022	-0.033	<u>0.177</u>	<u>0.166</u>	<u>0.166</u>
…frost protection	0.034	0.076	-0.102	<u>-0.121</u>	<u>-0.146</u>	0.034
…kraal manure	-0.018	-0.011	-0.055	<u>0.058</u>	0.043	<u>0.099</u>
HH expanded garden	0.053	<u>0.092</u>	0.006	-0.114	-0.156	-0.096
…lack of cash	-0.010	-0.004	-0.047	0.034	0.044	0.034
…lack of space	-0.001	-0.013	0.004	-0.002	-0.030	-0.006
…lack of labour	0.003	0.014	0.015	-0.018	0.025	-0.069
…lack of market	-0.005	-0.009	0.000	0.006	0.012	0.000
…inputs not available	0.012	0.018	-0.014	0.006	-0.012	0.051
…not needed	-0.017	0.013	-0.049	<u>0.085</u>	<u>0.018</u>	0.265
…other	-0.012	-0.010	-0.015	-0.010	-0.015	-0.014
Observations	299	194	105	598	388	210

^*corresponds to a cross-sectional regression using 2013 information.*
^^*corresponds to a double difference regression using 2013 and 2014 information.*
 Underlined figures for p<.10 or better.

Potential programmatic implications can be drawn from the differential impacts observed between the two types of households. In terms of vegetable harvests it appears families with sufficient labour achieve benefits from the CGP alone. It takes additional resources, and potentially the LFSSP, to help constrained families achieve homestead gardening objectives.

Table 7 shows findings related to perceptions and practice of Conservation Agriculture (CA), which is also being promoted in Lesotho as a means for building resilience to climate change

and increased agricultural production.[7] Around seventy percent of households were aware of CA and about a quarter had received training. While thirty percent of households claim to already practice CA, the majority intend to attempt CA in the next two years.

CA training and assistance was provided throughout agricultural resource centres in the CCs and was independent of LFSSP activities. The purpose for inclusion in this report was to assess the degree of spillover between the two programmes.

Table 7   **Conservation Agriculture awareness**

	Treatment	Control
	2014	2014
aware	0.75	0.73
trained	0.28	0.24
practices	0.33	0.32
prefers	0.26	0.22
does not prefer	0.13	0.13
intends to practice in future	0.59	0.64
Observations	165	134

Impact evaluation estimates using single differences from 2014, the only year for which data on CA was collected, suggests no impact of the CGP and LFSSP on CA (results not shown). Community level interviews concerning CA (also not shown) revealed a widespread awareness of CA in every village, but that its practice was not widespread.

The lack of impact is in a sense not surprising since the LFSSP did not include any training on CA methods. Furthermore it is likely that wealthier and more productive landholders are the ones accessing the CA programme, as opposed to poorer and labour-constrained households targeted by the CGP and LFSSP. In other words, the targeting of the two programmes differed in the following way: the CGP and LFSSP targeted the poorest of the poor, whereas CA training was self-selecting, and probably favoured wealthier families more exposed to large-scale crop farming.

5.2. Land operation

The above section posited that labour-unconstrained households may have satisfied constraints to homestead garden production and consequently are more oriented towards larger-scale agricultural operations. Land ownership and operation proves a natural starting point for exploring this hypothesis. Table 8 shows increasing trends in land operation and increases in ownership of home garden plots. Most striking perhaps is the increase in operated land area observed among treatment households (a doubling from 0.35 to 0.70 hectares). Comparing mean values for the two groups in 2013 shows that the levels are generally similar, signifying that observed changes in 2014 may be due to the additional cash and LFSSP – which we explore with the impact analysis.

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[7] NB: Conservation Agriculture was not directly promoted by LFSSP, but assessing CA knowledge and practice is an area of interest for FAO in Lesotho.

Table 8   Trends in land operation

	Treatment		Control	
	2013	2014	2013	2014
HH has home garden plot	0.89	<u>0.98</u>	0.89	<u>0.96</u>
HH cultivated/owned land	0.55	<u>0.69</u>	0.51	<u>0.62</u>
# non-homestead plots	0.81	<u>1.10</u>	0.62	<u>0.86</u>
owned land, ha	0.56	<u>0.82</u>	0.51	0.68
operated land, ha	0.35	<u>0.70</u>	0.34	0.35
Observations	165	165	134	134

Underlined if p<.10

Impact estimates in Table 9 show that the combination of the CGP and the LFSSP led to a large increase in operated land among beneficiary households[8] -- over a third of a hectare. This was most likely due to the three years of cash, and less to the LFSSP, which was primarily geared to homestead gardening. Among unconstrained households the combination of the two programmes led to an increase in the area of operated land by over half a hectare. No impacts are discernible for labour-constrained households, which again likely reflect the inability of the CGP and LFSSP to generate larger investments in agriculture.

Table 9   Impact on land operation

	Two years CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
HH has home garden plot	0.013	0.021	0.047	0.009	-0.013	0.010
HH cultivated/owned land	-0.020	0.002	-0.030	0.053	0.018	0.091
# non-homestead plots	0.103	0.083	0.193	0.042	0.073	-0.025
owned land, ha	0.021	-0.107	0.301	0.004	0.041	-0.244
operated land, ha	-0.090	-0.104	-0.081	<u>0.342</u>	<u>0.548</u>	-0.069
Observations	299	194	105	598	388	210

^corresponds to a cross-sectional regression using 2013 information.^^corresponds to a double difference regression using 2013 and 2014 information. Underlined if p<.10

5.3. Agricultural inputs and assets

Table 10 shows trends in the usage and ownership of agricultural assets. The usage and ownership of hoes, sprayers and ploughs are common within both control and treatment groups. The impact estimates in Table show that beneficiaries made greater usage of hoes (13 pp.), sprayers (6 pp.) and tractors (8 pp.). In addition to usage rates we observe increases in the ownership of hoes (19 pp.) and planters (4 pp.). In general, overall estimates are again driven by labour-unconstrained households.[9] Thus those households that received both programmes experienced large impacts – this likely stems from the three years of cash

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[8] As always, caution is warranted in the estimation of land size. Enumerator trainings conducted in both 2013 and 2014 accorded special focus using GPS devices, but fields in Lesotho are often located far from the homestead, and more importantly, respondents often have difficulty estimating land size; frequently relying on local and inconsistent understandings of land measurement (e.g. a one-dimensional "Lesotho foot").

[9] Findings of impact on asset investment are also confirmed in Daidone *et al*. (2014).

transfers, but some of these tools may also have been used in the home garden plot, and are thus a result of the impact of the LFSSP.

Table 10 Trends in agricultural assets

	Treatment		Control	
	2013	2014	2013	2014
HH used any	0.78	0.91	0.79	0.83
… hoe	0.75	0.88	0.74	0.75
… sprayer	0.06	0.04	0.08	0.01
… plough	0.57	0.61	0.46	0.56
… planter	0.40	0.45	0.35	0.36
… tractor	0.18	0.21	0.19	0.15
… cultivator	0.08	0.37	0.07	0.27
… scotch cart	0.34	0.35	0.29	0.22
… yokes	0.55	0.61	0.46	0.56
HH owns any	0.72	0.87	0.75	0.84
… hoe	0.64	0.79	0.63	0.61
… sprayer	0.01	0.01	0.01	0.01
… plough	0.18	0.17	0.15	0.12
… planter	0.06	0.08	0.08	0.07
… tractor	0.01	0.00	0.01	0.00
… cultivator	0.00	0.10	0.01	0.05
… scotch cart	0.12	0.11	0.08	0.07
… yokes	0.16	0.17	0.13	0.12
Observations	165	165	134	134

Underlined if p<.10

Table 11 Impacts on agricultural assets

	Two years of CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
HH used any	-0.033	-0.058	0.028	0.117	0.134	0.066
… hoe	-0.005	-0.006	-0.005	0.133	0.157	0.071
… sprayer	-0.038	-0.020	-0.095	0.064	0.036	0.118
… plough	0.089	0.064	0.123	-0.029	-0.044	-0.012
… planter	-0.018	0.050	-0.125	0.037	0.060	-0.030
… tractor	-0.018	0.018	-0.104	0.082	0.149	-0.057
… cultivator	0.044	0.082	-0.028	-0.004	0.020	-0.011
… scotch cart	0.003	0.065	-0.167	0.076	0.084	0.090
… yokes	0.061	0.058	0.095	-0.005	0.022	-0.119
HH owns any	-0.012	0.032	-0.112	0.037	0.020	0.040
… hoe	-0.011	0.004	-0.054	0.196	0.208	0.135
… sprayer	-0.011	-0.020	0.000	0.003	0.005	0.000
… plough	0.027	-0.007	0.061	0.014	0.031	-0.001
… planter	-0.034	-0.058	0.036	0.047	0.060	0.002
… tractor	-0.006	-0.010	0.000	0.006	0.010	0.000
… cultivator	-0.003	-0.007	0.000	0.048	0.057	0.067
… scotch cart	0.033	0.042	0.019	-0.019	-0.002	-0.069
… yokes	0.04	0.036	0.035	-0.016	-0.009	-0.013
Observations	299	194	105	598	388	210

Overall, we observe strong positive impacts in agricultural assets. The use of any kind of agricultural asset (11pp.) and more specifically of hoes (13 pp.), sprayers (6 pp.) and tractors (8 pp.) increased due to the programmes. Moreover, the ownership of many assets increased as well: hoes, planters and cultivators increased (20 pp., 4.7 pp and 4.8 pp, respectively). While labour-constrained households increased the use of seeds (11pp.) there are few other general impacts on input usage and a notable reduction in pesticide purchases for unconstrained households (Table 12). This result potentially corresponds with findings on the increased use of home-produced pesticides, mentioned above in the homestead gardening results section. Alternatively, Daidone *et al.*, 2014 found strong impacts on the increased use of pesticides in 2013, arguing that the CGP allowed households to invest in pesticides in response to an outbreak of army worm and pests – a shock that has since abated (FAO Lesotho, 2014). Beneficiaries reduced seed purchases (15 pp. reduction), most likely because the LFSSP provided free vegetable seeds. Labour-constrained households reduced the usage (7 pp. reduction) and purchase (5 pp. reduction) of livestock fodder.

Table 12 Impacts on crop inputs

	Two years of CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
Input usage						
… seed	-0.005	0.041	-0.064	0.025	-0.033	<u>0.114</u>
… pesticide	0.084	<u>0.210</u>	<u>-0.157</u>	<u>-0.084</u>	<u>-0.186</u>	0.189
… organic fertilizer	0.020	0.044	-0.009	0.050	0.004	0.123
…inorg. fertilizer	0.023	0.074	-0.053	0.006	0.022	-0.014
… livestock inputs	0.080	0.115	0.056	0.016	0.004	-0.049
… feed	0.036	0.064	-0.008	0.025	0.032	-0.002
... fodder	0.034	0.077	0.051	0.020	-0.014	<u>-0.070</u>
…vet services	0.042	<u>0.105</u>	-0.049	-0.022	-0.095	0.071
Input purchase						
… seed	0.117	<u>0.189</u>	-0.059	<u>-0.149</u>	<u>-0.211</u>	0.011
… pesticide	0.010	0.094	<u>-0.128</u>	-0.033	-0.094	0.080
… organic fertilizer	-0.016	-0.001	<u>-0.064</u>	0.025	0.032	0.032
…inorg. fertilizer	-0.032	0.006	-0.118	0.034	0.037	0.066
… livestock inputs	0.049	0.096	0.005	0.032	0.020	0.027
… feed	0.030	0.078	-0.044	0.024	0.021	0.025
... fodder	0.017	0.020	0.023	-0.003	0.016	<u>-0.054</u>
…vet services	0.040	0.090	-0.049	-0.009	-0.062	0.071
Observations	299	194	105	598	388	210

5.4. Livestock

In terms of livestock (Table 13), roughly 60 percent of the sample owned an animal: households own over 2 chickens and a cow, on average. For non-CGP households there was relatively no change in behaviour surrounding livestock during the study period. In contrast, CGP households increased their ownership of sheep and goats between 2013 and 2014 and engaged in productive activities surrounding the selling of animal by-products.

Impact estimates in Table 14 reveal that two years of the CGP alone resulted in reductions in animal ownership. The likelihood of owning a goat decreased (5 pp.) and the average number of goats and pigs owned declined. After an additional year and LFSSP, however, labour-unconstrained households were more likely to own sheep (6.5 pp.) and owned more (0.4) on average. Smaller and labour-constrained households owned more pigs —about an additional 0.45, on average.

Table 13 Trends in livestock

	Treatment		Control	
	2013	2014	2013	2014
HH owns livestock	0.62	<u>0.69</u>	0.58	0.64
sheep	0.08	<u>0.12</u>	0.08	0.09
goats	0.05	0.06	0.10	0.08
horse	0.03	0.04	0.04	0.05
donkey	0.14	0.17	0.16	0.20
chicken	0.38	0.44	0.36	0.42
pig	0.16	<u>0.22</u>	0.18	0.22
cattle	0.35	0.36	0.30	0.28
# sheep	0.38	<u>0.61</u>	0.46	0.59
# goats	0.20	<u>0.44</u>	0.62	0.59
#horses	0.04	0.05	0.07	0.08
#donkeys	0.22	0.22	0.25	0.31
# chickens	2.46	2.84	2.47	2.22
# pigs	0.20	0.30	0.31	0.35
# cattle	1.00	1.18	0.80	0.75
livestock market	0.15	0.16	0.13	0.09
sold by-products	0.02	<u>0.07</u>	0.04	0.06
Observations	165	165	134	134

Underlined if p<.10

Table 14 Impacts on livestock ownership

	Two years of CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
HH owns livestock	0.058	0.059	0.045	-0.001	0.006	0.008
sheep	0.013	0.002	0.016	0.027	<u>0.065</u>	-0.046
goats	<u>-0.056</u>	<u>-0.077</u>	-0.018	0.026	0.048	-0.030
chicken	-0.012	-0.036	-0.054	0.025	0.070	0.018
pig	-0.029	-0.026	-0.049	0.034	0.054	0.003
cattle	0.076	0.059	0.080	0.022	0.016	-0.010
# sheep	-0.006	0.015	-0.018	0.161	<u>0.402</u>	-0.356
# goats	<u>-0.398</u>	<u>-0.632</u>	-0.018	0.241	0.423	-0.091
# chicken	-0.171	-0.017	-0.953	0.532	0.267	1.124
# pig	<u>-0.135</u>	-0.063	<u>-0.350</u>	0.107	0.013	<u>0.448</u>
# cattle	0.294	0.387	0.084	0.112	0.096	-0.152
Observations	299	194	105	598	388	210

^corresponds to a cross-sectional regression using 2013 information. ^^corresponds to a double difference regression using 2013 and 2014 information. Underlined if p<.10

Daidone *et al.,* (2014) found limited impacts on livestock investments. One notable exception was an overall (and small) increase in the ownership and purchase of pigs. A re-analysis of that data, using data from 2011 looking only at Leribe district, however confirms general

livestock disinvestment similar to that observed in Table 14. In other words, the small impact on pigs from two years of CGP was driven by household investment in other areas of the country. A plausible explanation for this is that roughly 64 percent of communities reported livestock deaths in 2013 in Litjotjela and Malaoaneng (results not shown). By 2014 this had dropped to 7 percent, suggesting that some animal disease afflicting Leribe district in 2013 contributed to the observed disinvestment in livestock.

Overall, Daidone *et al.* (2014) observed significant decreases in the purchase of feed and fodder, although a potential explanation given suggests that beneficiaries substituted fodder from increased maize harvests. On more common ground, Daidone *et al.* (2014) notes that impacts occurred to a much greater degree in crop production versus livestock. One potential explanation for this may be related to a Food Emergency Grant which was disbursed to CGP households in response to poor harvests in 2012. That short-term programme encouraged beneficiaries to increase crop harvests through the provision of a top-up (LSL 400) to the CGP funded by DFID through UNICEF. In combination with a looming food security crisis it is conceivable beneficiary households were nudged towards crop production over livestock investment, but able to re-invest over time.

5.5. Consumption

Given positive impacts observed on homestead gardening production and investment in agriculture it is natural to expect an increase in the consumption of home produced vegetables. Table 15, which shows results on home-produced food consumed by the household, indicates this was indeed the case.

Table 15 Consumption from own-production in last seven days

	Two years of CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
cereal	-0.037	0.011	0.034	0.072	0.080	-0.145
meat	-0.005	0.040	-0.067	0.064	0.018	0.101
dairy goods	-0.035	-0.068	-0.022	0.072	0.075	0.071
fats	-0.021	-0.003	-0.066	0.020	-0.007	0.082
vegetables	-0.066	-0.037	-0.084	0.155	0.178	0.173
other foods	0.028	0.030	0.029	-0.002	0.001	-0.035
Observations	299	194	105	598	388	210

^*corresponds to a cross-sectional regression using 2013 information.*
^^*corresponds to a double difference regression using 2013 and 2014 information.*
Underlined if p<.10.

Here again, two years of the CGP alone had little to no impact on the own-consumption of farm production. With the introduction of LFSSP and the extra year of transfers, however, households receiving cash consumed more home-produced meat (6 pp.), dairy goods (7 pp.) and vegetables (15 pp.). In looking at impacts among the different types of households it is interesting to note that the statistical significance accorded to vegetable consumption is driven by unconstrained households (which while positive for constrained households, is not significant). Why would there be an impact on vegetable consumption among unconstrained households when we observed generally negative impacts on homestead gardening? One potential explanation for this is that this group has sufficiently secured the benefits of small-scale homestead vegetable gardening, and is perhaps more apt to engage in larger-scale

agricultural operations. This possibility also corroborates with earlier home garden plot findings suggesting unconstrained families do not expand because there is no perceived need.

Two years of the CGP resulted in increased food purchases, especially for the unconstrained. Interestingly one year later with the LFSSP there was no change among the unconstrained but reductions in purchases (notably vegetables) for the constrained (Table 16). Presumably they were purchasing less and producing more.

Table 16 Consumption from purchases in last seven days

	Two years of CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
cereal	0.068	0.078	0.035	0.028	0.052	0.026
meat	<u>0.123</u>	<u>0.150</u>	0.165	-0.006	-0.068	-0.024
dairy goods	<u>0.087</u>	0.098	0.080	0.042	0.049	0.019
fats	<u>0.092</u>	<u>0.134</u>	0.124	-0.054	-0.077	<u>-0.115</u>
vegetables	<u>0.150</u>	<u>0.137</u>	<u>0.249</u>	-0.061	-0.025	<u>-0.286</u>
other foods	0.025	0.021	0.027	-0.014	-0.004	-0.054
Observations	299	194	105	598	388	210

^corresponds to a cross-sectional regression using 2013 information. ^^corresponds to a double difference regression using 2013 and 2014 information. Underlined if p<.10.

5.6. Labour allocation

The extent to which a household has available labour is likely to condition the potential for cash transfer and homestead gardening impacts. If labour is available and under-utilized due to liquidity or knowledge constraints, an increase in work participation would be expected for less labour-constrained households.

Conversely, households with tighter labour constraints may be less responsive (or reduce labour supply) in their work participation if members are not fit to work. Furthermore, household labour supply is likely to vary over the course of the year. The overall impact of the CGP on individual labour supply depends on the nature and location of the activity in question, as well as the gender and age of the household member.

To assess the impact household on labour supply information was collected covering two time periods: the last year and the last seven days. The former captured information on the number months an individual was engaged in a particular activity, and the latter captured hours and days in that activity.

We analyse data at household level, and aggregate labour indicators, which are displayed in Table 17. The most striking result to emerge here is a strong and significant impact of 15 percentage point increase in the proportion of households allocating labour to crop farming – a result driven by labour-constrained households. There appears to be a substitution of labour allocation from wage labour (10 pp. reduction) to on-farm activities. Given average baseline values of around 60 percent, this corresponds to a 25 percent increase in at least one member of a beneficiary household spending time on own-farm. The single-difference estimate in the first panel again suggests that this shift to on own-farm did not occur with only two years of the CGP benefits alone.

Table 17 Impacts on labour supply

	Two years of CGP^			Three years of CGP + LFSSP^^		
	all	labour-unconstrained	labour-constrained	all	labour-unconstrained	labour-constrained
any (12 months)	0.020	0.013	0.021	-0.016	-0.004	-0.021
NFE (12 months)	0.025	0.065	-0.015	-0.045	-0.084	-0.025
own-crop (12 months)	-0.120	-0.100	-0.186	0.152	0.056	0.333
own-livestock (12)	0.023	-0.002	0.038	-0.034	0.021	-0.112
wage (12 months)	0.039	0.004	0.151	-0.108	-0.086	-0.224
any (7 days)	-0.015	-0.059	0.124	0.023	-0.012	0.027
NFE (7 days)	0.006	0.017	-0.007	-0.052	-0.062	-0.043
own-farm (7 days)	0.035	0.029	0.074	0.051	0.043	0.054
wage (7 days)	0.018	0.018	0.032	0.025	-0.039	0.174
permanent	0.049	0.080	0.016	-0.055	-0.044	-0.087
temporary	0.055	0.006	0.143	-0.023	0.044	-0.172
occasional	-0.029	-0.011	-0.010	0.004	-0.050	0.023
Observations	299	194	105	598	388	210

^corresponds to a cross-sectional regression using 2013 information.
^^corresponds to a double difference regression using 2013 and 2014 information.
Underlined if p<.10.

In contrasting the two panels in the table above we see a decrease among labour-constrained families in own-crop activities (19 pp. reduction) and an increase in temporary jobs (14 pp.). In line with previous findings, additional resources provided by the CGP and LFSSP reversed this impact by 2014. Own-crop activities increased (33 pp.) for the labour unconstrained and temporary wage work decreased (22 pp. and 17 pp. reductions, respectively). A shift from occasional agricultural wage labour to own-farm would be considered welfare enhancing.

To gain some insight into the individual labour dimensions of agriculture and social protection programmes Table 18 and Table 19 show summary descriptive statistics for females and males respectively present in the 2013 and 2014 waves of the study. We split the sample at 13 years of age. This is the scheduled age for completing primary school which is – at least technically – free and compulsory in Lesotho. Additionally, the legal age for employment is 15. Taken together, the break-off provides an intuitive basis for examining labour market choices of children benefitting from the CGP.

Table 18 Trends in labour with CGP and LFSSP, females

	Treatment		Control	
	2013	2014	2013	2014
Females (ages < 14)				
own non-farm business activities	0.00	<u>0.03</u>	0.01	0.02
own-crop production activities	0.11	0.38	0.21	0.35
own-livestock production activities	0.03	0.07	0.17	0.07
any own-agriculture activities	0.24	<u>0.69</u>	0.47	0.49
Females (ages < 14 & >18)				
own non-farm business activities	0.02	0.02	0.03	0.13
own-crop production activities	0.20	<u>0.63</u>	0.29	<u>0.55</u>
own-livestock production activities	0.02	0.05	0.10	0.03
any own-agriculture activities	0.46	<u>0.78</u>	0.52	<u>0.74</u>
Females (ages >17 & <60)				
own non-farm business activities	0.11	0.14	0.12	0.22
own-crop production activities	0.40	<u>0.57</u>	0.50	0.57
own-livestock production activities	0.05	0.03	0.01	0.01
Any-own agriculture activities	0.75	0.92	0.70	0.83
Females (ages>59)				
own non-farm business activities	0.19	0.22	0.07	0.17
own-crop production activities	0.50	<u>0.35</u>	0.50	<u>0.28</u>
own-livestock production activities	0.06	0.00	0.07	0.00
any own-agriculture activities	0.91	0.94	0.82	0.85
Observations	988	988	1 116	1 116

Note: one category not included is the simultaneous involvement in livestock and crop production. Results are not shown for simplicity but can be seen as the difference between any own agriculture and the sum of crop only and livestock only participation.

Table 19 Trends in labour with CGP and LFSSP, males

	Treatment		Control	
	2013	2014	2013	2014
Males (ages < 14)				
own non-farm business activities	0.01	<u>0.03</u>	0.01	0.05
own-crop production activities	0.07	0.31	0.21	0.21
ownlivestock production activities	0.19	0.11	0.17	0.19
any own-agriculture activities	0.41	<u>0.74</u>	0.47	0.68
Males (ages < 14 & >18)				
own non-farm business activities	0.02	0.04	0.04	0.11
own-crop production activities	0.27	0.39	0.20	0.18
own-livestock production activities	0.14	0.14	0.24	<u>0.04</u>
any own-agriculture activities	0.73	<u>0.98</u>	0.64	0.84
Males (ages >17 & <60)				
own non-farm business activities	0.02	0.10	0.07	0.12
own-crop production activities	0.24	0.28	0.30	0.33
own-livestock production activities	0.15	0.07	0.12	<u>0.02</u>
any own-agriculture activities	0.83	0.88	0.73	0.84
Males (ages>59)				
own non-farm business activities	0.05	0.00	0.13	0.00
own-crop production activities	0.19	0.29	0.27	0.20
own-livestock production activities	0.05	0.05	0.13	0.13
any own-agriculture activities	0.67	0.76	0.80	0.93
Observations	988	988	1 116	1 116

Note: one category not included is the simultaneous involvement in livestock and crop production. Results are not shown for simplicity but can be seen as the difference between any own agriculture and the sum of crop only and livestock only participation.

The most notable feature to emerge from glancing at the tables is the large increase in work activities undertaken by females, and especially younger children (notably young girls). In 2013, 24 percent of young girls were engaged in own-agricultural activities. In 2014, that figure spiked to close to 70 percent in treatment households and just under 50 percent in control households.

Were these changes due to the CGP and LFSSP? Table 20 and Table 21 present results from individual level regression analysis. We note a 25 pp. increase in the probability of spending time in own-farm activities for younger girls; whereas elderly men reduce their participation in crop activities (0.34 pp. reduction). While no overall impacts were observed with respect to a household's operation of non-farm enterprise, younger girls and older boys nevertheless increased the time spent assisting in their operation – both in terms of hours worked (0.14) and days worked (0.10 for girls) the week prior to the survey.

These findings present potential conundrums considering social protection objectives. The increase in time spent working for younger children is not necessarily negative; it depends on how it is balanced with school-related activities and domestic chores. It is also worth pointing out that the survey rounds correspond to the winter season in Lesotho, which is in some cases aligned with winter school holidays and represents the end of harvest for most of the main crops.

Unfortunately data limitations prohibit a more complete understanding of the implied time-use substitution these impacts are having on younger girls. Future planned evaluations of the CGP through the collection of more complete information on time use may prove useful in drawing policy recommendations.

Table 20 **Impact on individual labour supply for children**

	Young boys	Older boys	Young girls	Older girls
any (12 months)	0.032	-0.068	<u>0.232</u>	0.048
NFE (12 months)	-0.002	-0.09	0.021	-0.097
own-crop (12 months)	<u>0.156</u>	0.12	0.143	0.184
own-livestock (12 months)	-0.064	<u>0.162</u>	0.043	0.031
own-agricultural (12)	0.094	0.066	<u>0.255</u>	0.128
wage (12 months)	-0.057	<u>-0.189</u>	0.024	-0.044
any (7days)	-0.101	-0.07	0.055	0.093
NFE (7 days)	0.009	0.035	0.023	-0.053
own farm (7 days)	-0.089	0.051	0.01	0.103
wage (7 days)	0.007	<u>-0.181</u>	0.021	0.043
Hours worked last week				
any (7 days)	-0.059	-10.187	<u>1.493</u>	4.567
NFE (7 days)	-0.231	<u>0.14</u>	<u>0.138</u>	-0.528
own farm (7 days)	-0.005	-2.684	0.843	1.412
wage (7 days)	0.178	<u>-7.643</u>	0.512	3.682
Days worked last week				
any (7 days)	-0.641	-0.102	0.089	0.082
NFE (7 days)	-0.066	0.045	<u>0.104</u>	-0.106
own farm (7 days)	-0.567	-0.147	-0.014	0.187
permanent job	0	-0.009	-0.016	-0.001
temporary job	0.011	-0.071	0	0.004
occasional job	-0.068	-0.108	0.041	-0.047
Observations	356	188	346	144

Note: NFE = non-farm enterprises.

Table 21   Impacts on individual labour supply for adults

	Adult men	**Elderly men**	**Adult women**	**Elderly women**
any (12 months)	0.019	-0.029	-0.018	0.05
NFE (12 months)	0.011	0.016	-0.082	-0.116
own-crop (12 months)	0.061	-0.143	0.098	0.086
own-livestock (12 months)	-0.02	-0.02	-0.031	-0.026
own-agricultural (12 months)	-0.067	<u>-0.343</u>	0.072	0.031
wage (12 months)	-0.006	0.059	0.016	0.103
any (7days)	0.106	-0.311	-0.097	0.005
NFE (7 days)	-0.004	0.045	-0.03	-0.091
own farm (7 days)	-0.087	-0.312	-0.111	-0.088
wage (7 days)	0.148	-0.021	0.017	0.122
Hours worked last week				
any (7 days)	3.892	-14.136	-1.838	2.012
NFE (7 days)	-1.157	0.373	-1.089	-2.097
own farm (7 days)	-2.197	-19.271	-0.331	-0.923
wage (7 days)	<u>7.247</u>	4.762	-0.418	5.031
Days worked last week				
any (7 days)	-0.464	-2.581	-0.783	-0.611
NFE (7 days)	-0.04	0.241	-0.236	-0.392
own farm (7 days)	-0.361	<u>-2.807</u>	-0.635	-0.431
permanent job	0.069	0.168	-0.061	0.019
temporary job	-0.025	-0.065	0.021	-0.035
occasional job	-0.05	-0.044	0.055	0.119
Observations	372	72	438	188

Note: NFE = non-farm enterprises.

6. Conclusions

The purpose of this impact evaluation is to address three issuess: (i) to assess the programme's impact on stated objectives; (ii) to interpret findings in view of scaling-up similar initiatives across the country; and (iii) to identify linkages and complementarities between the two programmes.

Overall we find positive effects of the programmes on homestead gardening and productive agricultural activities. Many of these observed outcomes appear driven by the combination of the two programmes. Namely, an additional year of CGP in combination with the LFSSP achieved many outcomes for which two years of receiving the CGP alone did not. This suggests that additional cash in combination with the LFSSP has the potential to positively impact the food security and welfare of poor families, at least in the two CCs considered in this study. Of course, as has been highlighted throughout the report, it is reasonable to believe most of the impacts related to small-scale homestead gardening practices are a consequence of the LFSSP and CGP. In contrast, it is likely that the other impacts – land operation and asset investment, for example – are probably more related to receiving a CGP grant for three years.

Observed impacts differ considerably based on the demographic nature of the household. In general, results suggest that two years of the CGP alone can achieve some outcomes in terms of achieving agricultural investments for households with labour capacity, but they were still relatively limited. In terms of vegetable harvests, it appears families with sufficient labour achieve benefit from only the cash transfer, whereas it takes additional resources, and potentially the LFSSP, to impact families with limited labour supply.

Lastly, although awareness of CA is high, there is no evidence to suggest much complementarity between the LFSSP and the CA training initiatives. This, in a sense, is not surprising as the LFSSP included no aspects concerning CA practices. Additionally, this lack of impact may be reflected in the differing targeting mechanisms of the two programmes. Training on CA is likely self-targeted to wealthier families with larger land and crop operations. In contrast, the CGP and LFSSP are specifically targeted to poorer households, with a dedicated focus on securing basic food needs through small vegetable harvests.

Potentially countering many of these impacts is an increase in children's labour time (especially younger girls) devoted to own-farm and non-farm enterprise activities. Some of this increased demand for child labour may come from increased homestead gardening activities (and the LFSSP), while others from increased agricultural and non-farm enterprise activities which presumably derive from the additional year of CGP benefits. Unfortunately, data constraints limit the possibility of understanding the time use implications of the increase in child labour, and how it relates to time spent on schooling and domestic chores. Future analysis and data collection might consider additional information gathering on how this labour substitution influences other important social protection functions, such as schooling and health outcomes.

Annex - Analytical Method

Difference-in-difference estimators

When panel data are available with pre- and post-intervention information, which is the case with most of the outcome variables, the statistical approach we take to derive average treatment effects of the CGP is the difference-in-differences (DiD) estimator. This entails calculating the change in an indicator (*Y*), such as homestead gardening production, between baseline and follow-up period for beneficiary (T) and non-beneficiary (C) households and comparing the magnitude of these changes.

Two key features of this design are particularly attractive for deriving unbiased programme impacts. First, using pre- and post-treatment measures allows us to net out unmeasured fixed time-invariant family or individual characteristics (such as entrepreneurial drive) that may affect outcomes. Second, using the change in a control group as a comparison allows us to account for general trends in the value of the outcome. For example, if there is a general increase in maize production because of higher rainfalls, deriving treatment effects based only on the treatment group will confound programme impacts on production with the general improvement in weather conditions.

The key assumption underpinning the DiD is that there is no systematic unobserved time-varying difference between the treatment and control groups. For example, if plot quality for the T group remains constant over time but the C group experiences, on average, deterioration and erosion, then we would attribute a greater increase in agricultural production in T to the programme rather than to this unobserved time-varying change in soil characteristic. In practice, the random assignment to T and C, the geographical proximity of the samples, and the rather short duration between pre- and post-intervention measurements make this assumption reasonable.

In large-scale social experiments like the CGP, it is typical to estimate the DiD in a multivariate framework, controlling for potential intervening factors which might not be perfectly balanced across T and C units and/or are strong predictors of the outcome (*Y*). Not only does this allow us to control for possible confounders, but it also increases the efficiency of our estimates by reducing the residual variance in the model. The basic setup of the estimation model is shown in equation (1):

1. $$Y_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 R_t + \beta_3 (R_t * D_i) + \Sigma \beta_i Z_i + \varepsilon_{it} \qquad (1)$$

where Y_{it} is the outcome indicator of interest; D_i is a dummy equal to 1 if household ^{i} received the treatment and 0 otherwise; R_t is a time dummy equal to 0 for the baseline and to 1 for the follow-up round; $R_t * D_i$ is the interaction between the intervention and time dummies, and ε_{it} is the statistical error term. To control for household and community characteristics that may influence the outcome of interest beyond the treatment effect alone, we add in Z_i, a vector of household and community characteristics to control for observable differences across households at the baseline which could have an effect on Y_{it}. These factors are not only those for which some differences may be observed across treatment and control at the baseline, but also ones which could have some explanatory role in the estimation of Y_{it}. As for coefficients, β_0 is a constant term; β_1 controls for the time-invariant differences between the treatment and control; β_2 captures changes over time; and β_3 is the double-difference estimator, which captures the impact of the programme.

Cross-sectional estimators

When panel data are not available, as is the case for some of our outcome variables that are observed only at follow-up, a single-difference (SD) estimator or propensity score matching (PSM), or a combination of the two like the inverse probability weighting (IPW), can be applied.

SD estimates impacts by comparing the mean values of the indicator of interest for the recipients and the non-recipients. This estimator relies on the random assignment of the households to the treatment and the control groups before the intervention takes place. Causal effects estimates are unbiased since both potential outcomes and observed characteristics are independent from the treatment. Equation (2) presents the regression equivalent of the SD with covariates,

$$Y_i = \beta_0 + \beta_1 D_i + \Sigma \beta_i Z_i + \varepsilon_i \qquad\qquad (2)$$

where the estimated $\beta 1$ coefficient is the causal effect of the programme, conditional on the Zi vector of pre-treatment variables, added to remove any potential bias arising from the misallocation of the transfer. In this setting it is crucial to ensure that the controls Z are also exogenous. Even with an RCT, it is easy to break the experimental design by introducing endogeneity at the analysis stage.

Reweighting methods like the IPW are generally preferred for their finite sample properties (smaller bias and more efficient) over the PSM methods.

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