

Supplementary appendix

Building a unified database for ASP programmes

As part of the targeting process, PMT and HEA rely on different questionnaires to obtain information on potential household beneficiaries. The data collected through these questionnaires, as well as key administrative information (such as who the beneficiaries are and what benefits are involved), are separately hosted and managed by different actors.

Building a unified database for ASP programmes based on a harmonised questionnaire could significantly improve the efficiency of an ASP system in Niger and the system's capacity to expand programmes quickly in response to shocks. These gains could derive from lower overall data collection costs, enhanced coordination among actors, the reduced duplication of benefits, the better availability of data that can be quickly used if shocks occur, and improved targeting efficiency.¹

The unified database would contain household-level information on potential beneficiaries that would allow PMT, HEA, and other approaches used by ASP actors in Niger to identify beneficiaries based on their own criteria and objectives. Data would be provided through two primary sources: (a) a harmonised questionnaire and (b) key programme administrative data containing information such as who the beneficiaries are and the nature of the benefits involved.

Developing a unified database may require three principal steps. First, PMT, HEA, and, potentially, other programme questionnaires would need to be harmonised into a single questionnaire that would allow various ASP actors to identify households according to their own criteria. The harmonisation of the PMT and HEA questionnaires would only require marginal effort; while both methods target different populations, they both largely rely on the same type of information. Second, an information system is needed that can allow the hosting and management of the data. Third, procedures and protocols for feeding and retrieving information would need to be defined to assure the quality and safety of data.

In addition to the above main steps, a range of considerations need to be taken into account, including implementation arrangements, the frequency of data updates, privacy concerns, costs, and institutional aspects. Regarding implementation arrangements, the data collection could, for example, be carried out in a centralised way, or, alternatively, each actor could collect data in the respective areas of intervention and then feed the data to a centralised database (which is currently the case in Chad). The merits and challenges of each option should be assessed based on the country context. Regarding the frequency of data updates, a question remains open on the trade-offs between the targeting efficiency gains from frequent data collection and costs (discussed in section 6). While the literature has usually evaluated the targeting efficiency impacts resulting from outdated datasets used to create formulas, little is known on the targeting efficiency impacts resulting from outdated welfare proxies. The privacy of data may also be a concern, and adequate laws and protocols for data exchange should address this concern.

Excluded households

As shown in tables SA.8 and SA.9, an important number of households are wrongly excluded. Based on consumption, PMT excludes 30, 40, and 60 per cent of the households in the lowest, second lowest, and third lowest decile, respectively. Similarly, based on food insecurity, HEA excludes 40, 50, and 60 per cent of households in the lowest, second lowest, and third lowest decile, respectively. Table SA.10 sheds light on the characteristics of the wrongly excluded households. It shows the average characteristics of PMT- and HEA-excluded households that are at the bottom 30 percent of the consumption per capita and food insecurity distribution, respectively.

While differences in household characteristics between households selected by PMT and HEA are large, this is not the case in a comparison of the characteristics of the households wrongly excluded by each method. For instance, while households selected by each method present substantial differences in terms of demographic characteristics, these characteristics are nearly the same among households wrongly excluded by each method.

Meanwhile, within each method, important discrepancies are found between the households selected and the households wrongly excluded. Relative to those selected, PMT tends to exclude households wrongly that are relatively smaller in size, while PMT-selected households have an average of nine members (see table 4 in main manuscript), the wrongly excluded households have an average of seven members. Similarly, PMT wrongly excluded households tend to be relatively less polygamous, have less land, and have less revenue relative to those selected by PMT. However, PMT wrongly excluded households tend to have slightly more livestock and nonproductive assets relative to PMT-selected households. In contrast with PMT, HEA tends to exclude households wrongly that are relatively larger in size and more polygamous and having more land and with more revenue, compared with those selected by HEA. There is also a large difference between HEA wrongly excluded households and those selected by the method, based on the gender of the household head; while 26 per cent of HEA-selected households are woman headed, this is true of only 7 per cent of HEA wrongly excluded households.

Tables SA.1–SA.14 here

Endnote

- ¹ Bah, Bazzi, Sumarto, and Tobias (2018) find that, in Indonesia, targeting based on a unified database can lead to substantial targeting efficiency gains relative to other programme-specific approaches to beneficiary selection.

Reference

Bah, A., Bazzi, S., Sumarto, S., & Tobias, J. (2018). *Finding the poor vs. measuring their poverty: Exploring the drivers of targeting effectiveness in Indonesia* (Policy Research Working Paper No. 8342). Washington, DC: World Bank.

Tables

Table SA.1. Food insecurity, by season

<i>Food insecurity, lean season (June–August)</i>		<i>Food insecurity, harvest season (October–December)</i>		<i>Total</i>
		<i>Food secure</i>	<i>Food insecure</i>	
Food secure	#	501	97	598
	%	57	10	66
Food insecure	#	201	68	269
	%	25	8	34
Total	#	702	165	867
	%	82	18	100

Note: Households with an FCS lower than the food insecurity threshold are considered food insecure.

Table SA.2. Poverty, by season

<i>Poverty lean season (June-August)</i>		<i>Poverty harvest season (October-December)</i>		<i>Total</i>
		<i>Nonpoor</i>	<i>Poor</i>	
Nonpoor	#	289	89	378
	%	32	10	42
Poor	#	168	321	489
	%	21	37	58
Total	#	457	410	867
	%	53	47	100

Note: Households with consumption per capita lower than the national poverty line are considered poor.

Table SA.3. Percentage change in welfare measures between the lean and harvest seasons

<i>Expenditure quintiles</i>	<i>Consumption per capita</i>	<i>Food consumption score</i>	<i>Food consumption per capita</i>	<i>Nonfood consumption per capita</i>	<i>Energy consumption per capita</i>
1	0.81	3.24	1.70	0.42	1.23
2	0.63	1.55	0.82	0.26	0.43
3	0.61	0.72	0.58	0.26	0.18
4	0.32	0.66	0.56	0.19	0.11
5	0.20	0.32	0.20	0.29	-0.07
6	0.12	0.10	0.13	0.26	-0.16
7	0.11	0.02	0.18	0.12	-0.13
8	0.02	-0.06	-0.07	0.18	-0.13
9	0.05	-0.07	-0.03	0.07	-0.13
10	-0.07	-0.16	-0.19	0.02	-0.14

Table SA.4. Correlations across welfare measures

	<i>fcs1</i>	<i>fcs2</i>	<i>pcexp1</i>	<i>pcexp2</i>
FCS lean	1			
FCS harvest	0.22	1		
Consumption per capita lean	0.20	0.17	1	
Consumption per capita harvest	0.13	0.45	0.67	1

Note: fcs = food consumption score. pcexp = per capita consumption expenditure.

Table SA.5. Overlap between beneficiaries during the selection of different shares of households

<i>Share of PMT households selected, %</i>	<i>Beneficiary overlap with HEA, %</i>	<i>Beneficiary overlap with random method, %</i>	<i>N</i>
10	10	10	83
20	14	20	162
30	24	30	243
40	39	40	329
50	51	50	410

Table SA.6. Inclusion errors based on different welfare measures, %

<i>Welfare measure</i>	(1) <i>Random</i>	(2) <i>PMT</i>	(3) <i>HEA</i>	(4) <i>Diff. (2) – (3)</i>	(5) <i>Diff. (1) – (2)</i>	(6) <i>Diff. (1) – (3)</i>
Cultivated land	70	78	33	44***	–8***	37***
Livestock index	70	71	40	31***	–1	30***
Asset index	70	57	65	–8*	13***	5**
Income per capita	70	61	62	–1	9**	8*

Note: Inclusion errors are defined as the share of ineligible beneficiaries. The sample is thus restricted to beneficiaries (N = 243). A household is considered eligible if it is ranked below the 30th percentile in the distribution of the given welfare metric. All models assume the same number of beneficiaries (corresponding to 30 per cent of all households). Diff. = difference.

p-values derived from tests of equality: * = 10 percent, ** = 5 percent, *** = 1 percent

Table SA.7. Inclusion errors during the selection of different shares of households

<i>Share of households selected, %</i>	<i>PMT</i>	<i>HEA</i>	<i>#</i>
	<i>Inclusion errors based on persistent poverty, %</i>	<i>Inclusion errors based on transient food insecurity, %</i>	
10	68	70	83
20	55	61	162
30	43	52	243
40	35	46	329
50	26	37	410

Note: Persistent poverty is defined as the average consumption per capita between the two seasons. Transient food insecurity is defined as the FCS during the lean season. Inclusion errors are defined as the share of ineligible beneficiaries. The sample is thus restricted to beneficiaries (N = 243). A household is considered eligible if it is ranked below the 30th percentile in the distribution of the given welfare metric.

Table SA.8. Share of households identified in each consumption decile, %

<i>Deciles, per capita consumption</i>	<i>1</i> <i>PMT</i>	<i>2</i> <i>HEA</i>	<i>3</i> <i>Random selection</i>	<i>4</i> <i>Difference (1) – (3)</i>	<i>5</i> <i>Difference (2) – (3)</i>	
1	69	29	30	39	***	–1
2	59	26	30	29	***	–4 *
3	42	31	30	12	**	1
4	33	30	30	3		0
5	36	24	30	6		–6
6	25	25	30	–5		–5
7	8	32	30	–22	***	2
8	19	30	30	–11	***	0
9	5	40	30	–25	***	10
10	4	35	30	–26	***	5

Note: The average consumption per capita between the two seasons is used. All models assume the same number of beneficiaries (corresponding to 30 per cent of all households).

p-values derived from tests of equality: * = 10 percent, ** = 5 percent, *** = 1 percent

Table SA.9. Share of households identified in each FCS decile, lean season, %

<i>Deciles of FCS (R1)</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	
	<i>PMT</i>	<i>HEA</i>	<i>Random selection</i>	<i>Difference (1) – (3)</i>	<i>Difference (2) – (3)</i>	
1	27	59	30	–3	29	***
2	26	48	30	–4	18	***
3	39	36	30	9	6	
4	21	39	30	–9	9	***
5	25	23	30	–5	–7	
6	31	22	30	1	–8	***
7	44	18	30	14	–12	*
8	33	19	30	4	–11	***
9	28	16	30	–2	–14	***
10	30	18	30	0	–12	***

Note: All models assume the same number of beneficiaries (corresponding to 30 per cent of all households). FCS (R1) = food consumption score (lean season).

p-values from tests of equality: * = 10 percent, ** = 5 percent, *** = 1 percent

Table SA.10. Characteristics of wrongly excluded households not selected by PMT and HEA

<i>Indicator</i>	(1)	(2)
	<i>PMT</i>	<i>HEA</i>
<i>Household demographics</i>		
Household size	7.1	6.9
Woman-headed household	0.11	0.07
Polygamous family	0.23	0.20
<i>Assets</i>		
Has cart	0.24	0.09
Has hoe	0.89	0.97
Number of small ruminants	3.7	2.9
Number of large ruminants	0.8	0.5
Cultivated land	11.6	16.0
Nonproductive asset index	-0.15	-0.18
<i>Other</i>		
Average monthly revenues in cash	20,331	23,130
Food coverage based on own production (months)	3.5	4.4
Number of sectors in which the household is engaged	2.3	2.2
Share of income from remittances	16.3	12.4

Note: A household is considered wrongly excluded if it is ranked below the 30th percentile in the distribution of the average consumption per capita (model 1) or in food insecurity during the lean season (model 2). The sample is restricted to wrongly excluded households (N = 116 in model 1; N = 72 in model 2). All models assume the same number of beneficiaries (corresponding to 30 per cent of all households). The nonproductive asset index was constructed using principal component analysis based on selected variables, including dwelling characteristics and ownership of household goods such as telephone, beds, chairs, furniture, and so on.

p-values derived from tests of equality: * = 10 percent, ** = 5 percent, *** = 1 percent

Table SA.11. Inclusion errors of alternative formulas based on different welfare measures, %

<i>Welfare measure</i>	(1)	(2)
	<i>PMT</i>	<i>PMT recalibrated</i>
Consumption per capita, lean	50	41
Consumption per capita, harvest	44	40
Total consumption per capita	43	36
FCS lean	70	68
FCS harvest	65	62
Land	78	75
Livestock index	71	77
Asset index	57	62
Income per capita	61	59

Note: Total consumption per capita represents the average consumption per capita between the two seasons. Inclusion errors are defined as the share of ineligible beneficiaries. The sample is thus restricted to beneficiaries (N = 243). A household is considered eligible if it is ranked below the 30th percentile in the distribution of the given welfare metric. All models assume the same number of beneficiaries (corresponding to 30 per cent of all households).

p-values derived from tests of equality: * = 10 percent, ** = 5 percent, *** = 1 percent

Table SA.12. Inclusion errors: Geographical and combined poverty targeting approaches, %

<i>Welfare measure</i>	(1) <i>Full universal</i>	(2) <i>PMT</i>	(3) <i>Geographical poverty</i>	(4) <i>Combined poverty</i>	(5) <i>Difference (2) – (3)</i>	(6) <i>Difference (2) – (4)</i>	(7) <i>Difference (3) – (4)</i>
Cultivated land	70	78	78	82	0	–5	–5
Livestock index	70	71	72	73	–1	–2	–1
Asset index	70	57	64	61	–8*	–5	3
Income per capita	70	61	70	63	–8**	–1	7

Note: Inclusion errors are defined as the share of ineligible beneficiaries. The sample is thus restricted to beneficiaries (N = 243). A household is considered eligible if it is ranked below the 30th percentile in the distribution of the given welfare metric. Except for the full universal model, all models assume the same number of beneficiaries (representing 30 per cent of all households).

p-values derived from tests of equality: * = 10 percent, ** = 5 percent, *** = 1 percent

Table SA.13. Inclusion errors: Geographical and combined food insecurity targeting approaches, %

<i>Welfare measure</i>	(1) <i>Full universal</i>	(2) <i>HEA</i>	(3) <i>Geographical food insecurity</i>	(4) <i>Combined food insecurity</i>	(5) <i>Difference (2) – (3)</i>	(6) <i>Difference (2) – (4)</i>	(7) <i>Difference (3) – (4)</i>
Cultivated land	70	33	66	51	–33***	–18***	15***
Livestock index	70	40	55	37	–15***	2	17***
Asset index	70	65	79	74	–14***	–9**	4
Income pc	70	62	61	55	1	7	6

Note: Inclusion errors are defined as the share of ineligible beneficiaries. The sample is thus restricted to beneficiaries (N = 243). A household is considered eligible if it is ranked below the 30th percentile in the distribution of the given welfare metric. Except for the full universal model, all models assume the same number of beneficiaries (representing 30 per cent of all households).

p-values derived from tests of equality: * = 10 percent, ** = 5 percent, *** = 1 percent

Table SA.14. Inclusion errors: Geographical poverty targeting approaches, %

<i>Welfare measure</i>	(1)	(2)	(3)
	<i>Geographical poverty</i>	<i>Geographical poverty (PMT)</i>	<i>Difference (1) – (2)</i>
Cultivated land	78	76	1
Livestock index	72	69	3
Asset index	64	53	11**
Income pc	70	69	0

Note: Inclusion errors are defined as the share of ineligible beneficiaries. The sample is thus restricted to beneficiaries (N = 243). A household is considered eligible if it is ranked below the 30th percentile in the distribution of the given welfare metric. All models assume the same number of beneficiaries (representing 30 per cent of all households).

p-values derived from tests of equality: * = 10 percent, ** = 5 percent, *** = 1 percent

Table SA.15. Intraclass correlation of poverty and food insecurity

	<i>Intraclass correlation</i>	<i>Standard errors</i>	<i>[95% conf. Interval]</i>	
Total consumption per capita	0.09	0.03	0.04	0.14
FCS lean	0.37	0.05	0.27	0.48

Note: Primary sampling units are used as clusters. The total number of clusters is 51, and each cluster has an average size of 17 households.