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**Economic and agricultural transformation through large-scale farming :
impacts of large-scale farming on local economic development,
household food security and the environment in Ethiopia**

Bekele, M.S.

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Annexes

Annex 1.1: Distribution of household population in Bako Tibe district, Oromia regional state

Name of Kebele	Household population (N _i)	Category	Sample size (n _i)
Baca Ode Walde	931	Affected	142
Oda Gibe	531	Non-affected in 2012 but affected in 2014	75
Tirkafeta Gibe	592	Non-affected	83
Oda Korma	411	Non-affected	0
Amarti Gibe	852	Non-affected	0
	3317		300

Source: Bako Tibe District Agricultural and Rural Development Office, 2011

Annex 1.2: Distribution of settlers household population in Abobo District, Gambella regional state

Village name	Household population (N _i)	Category	Sample size (n _i)
Mender 7	198	Affected	23
Mender 8/9	423	Affected	49
Mender 11/12	233	Not-affected ⁷⁰	0
Mender 13	245	Affected	28
Mender 14	217	Not-affected	65
Mender 17	203	Not-affected	60
Total	1519		225

Source: Abobo District Agriculture Office, 2013

⁷⁰ Mender 11/12 though not affected by Basen farm, there is another domestic farm operating near to it which might bring a biased estimate of impact. Hence, excluded as target population for the data collection

Annex 1.3: Matching algorithms

1. The Nearest Neighbour Matching (NN): the NN picks each treated unit and searches for its match in the control group with its closest propensity scores. This could be done with replacement or without replacement; in the former case, a single control unit could be used several times the closest match to the treated unit. In this study, NN without replacement is applied. The Average Treatment Effect on the Treated (ATT) is then computed as the average outcome difference between all treated and control units that are matched based on their propensity scores. In the case of NN, all treated units will get matches from the control units. But in effect, however, some of the nearest neighbour in the control units might have propensity scores different from the propensity scores of the treated units.

2. Radius Matching (RM): the RM overcomes the drawbacks of NN by specifying the propensity score of nearest neighbour within some radius limits. In the RM each treated unit is matched to the control unit whose propensity score falls within a predefined radius limit. If the radius is set too small, the criteria would be very stringent and some treated units might not get matches from the control units though the quality of the match is high. If the radius is set too big, the ATT would be a biased estimate. The default radius is 0.01 unit.

3. Kernel Matching (KM): in KM, all treated units are matched with a weighted average of the propensity scores of all units from the control category with weights that are inversely proportional to the distance between the propensity scores of treated and control units.

4. Stratification Matching (SS): it divides the propensity scores in an interval and matches treated and control units that have propensity scores falling in that interval. Then the ATT is calculated as the difference between the average outcomes of the treated and the controls falling in that propensity interval. One of the shortcomings of SS is it discards observations in the blocks either of the treated or control units are missing. In effect, it might underestimate the ATT. For details of the different matching algorithms, see Becker and Ichino (2002), Heinrich *et al.* (2010) and Khandker *et al.* (2010).

Annex 3.1: Land Lease Tariff in Ethiopia

Distance of the land from Gedarfi port (Km)	Land rent value (ETB/ha)
Starting point	880.42
100	805.42
150	767.92
200	730.42
250	692.92
300	655.42
350	617.92
400	580.42
450	542.92
500	505.42
504	502.42

Source: MoARD (2010)

Annex 3.2: Lists of duty free imports by Karuturi Agro-products PLC (Oromia and Gambella farms)

Reference #	Date	Bill of Loading	Type of import	Quantity
KAP/436/11	11/MAY/11	2300907	ECW-150/260-BG,200X150 SIZE, 1450 rpm COUPLED WITH 30 KVA AL DIESEL ENGIEN, 50 Hz	23
			PROMOTIANAL ITEM - ORGANIZER	25
		2300929	ECM-300/320-BG, 300X300 SIZE,1450rpm, coupled with 62.5 kva AL DIESEL ENGIEN, 50Hz and accessories	10
			ECM-200/320-BG,250X200 SIZE,1450rpm, coupled with 62.5 kva AL diesel engien,50Hz and accessories	22
			ECW -150/260-BG,200X150 SIZE,1450 rpm coupled with 30 kva AL diesel engine ,50Hz and accessories	25
KAP/511/11	03/JUNE/11	08/KGL/11-12	Silencer &connecting pipe for 30kva &62.5kva ashok leyland engine (CRI PUMPS)	80
			Nuts, bolts &washer	55kg
			Packing kit	160
		04/KGL/11-12	LDPE NURSERY BAGS 6 inches (15cms)x 9 inches (23cm) with 300 gauge	2000kg
			LDPE nursery bags 15 inches (38cm) x 18 inches(26cm) with 600 gauge	16000kg
KAP/432/11	28/MAY/11	SHORTAGE 1	PLNTR CNTRL OUTPUT MODULE (POM)	1
			DJ SWITCH SPDT W/WISKER & WIRE	1
			DJ HALL EFFECT SPEED SENSOR CP	1
			NUT HEX JAM 3/4-10 PLT	2
			HOSE 1 ID 200PSI EPDM	12
			CLAMP WRM DRV 16 SS(68-1.5)	8
			25 S BULK FILL COVER SUB ASY	1
			HH3/8R2 360 9/16F JIC 3/4 MORB	2
			CABLE TIE 19X7.25 1.75D 50 LD	300
			CABLE TIE 19X14.25 3DIA 50 LD	100
			SNAP RING 875	25
			LUXURY Swiss cottage tent	6
			Executive safari tent	4
			Army troop tent supervision	4
			Toilet cum bathroom tent	6
			Dining tent	2
			Kitchen tent	1

KAP/321/11	28/APR/11	40/KGL/10-11	Bath tray	6	
			LUXURY Swiss cottage tent	4	
			Executive safari tent	2	
			Army troop tent supervision	2	
			Army troop tent supervision	2	
KAP/402/11	14/MAY/11	11-12/EX-3019	PVC 3 core flat cable submersible cables(3cx 10 sQMM)	5000	
			PVC 4 core flat cable submersible cables(4c x 25 Sqmm,4c x 50 SQ MM, 4C X 70 SQ MM)	5907	
KAP/401/11	14/MAY/11	46/KGL/10-11	Wheel loader's model types LG956L	5	
			40" HC containers(soc)	5	
KAP/404/11	23/MAY/11	GP11153-63	2 S yeild pro planter 31- row	11	
KAP/400/11	11/MAY/11	D357977	608C STALKMASTER 8 row chopping corn head	2	
			75cm row spacing	2	
			temporary surface rust/corrosion protection	2	
		D357982	630R -30 FT. rigid cutting platform	2	
			Auger with hard faced fliting and full width steel fingers	2	
			poly tine pickup real	2	
			temporary surface rust/corrosion protection	2	
			D357973	608C stalkmaster 8 row chopping corn head	2
			75 cm row spacing	2	
			temporary surface rust/corrosion protection	2	
			D358215	630R -30 FT.rigid cutting platform	2
				Auger with hard faced fliting and full width steel fingers	2
		poly tine pickup real		2	
		temporary surface rust/corrosion protection		2	
		D357984	630R -30 FT.rigid cutting platform	2	
			Auger with hard faced fliting and full width steel fingers	2	
			poly tine pickup real	2	
			Temporary surface rust/corrosion protection	2	
		D357961-80	608C stalkmaster 8 row chopping corn head	4	
			75 cm row spacing	4	
			Temporary surface rust/corrosion protection	2	

			608C stalkmaster 8 row chopping corn head	2
		D358929	630R -30 FT.rigid cutting platform	2
			Auger with hard faced fliting and full width steel fingers	2
			poly tine pickup real	2
			temporary surface rust/corrosion protection	2
KAP/388/11	11/MAY/1 1	D357447	4930 SELF PROPELLED SPRAYER(modal year 2011)	1
			380/105R50 IN 168AB R1 OR R1W RADIAL	1
			2X1.1/2 IN STANDARED FLOW SOLUTION PUMP	1
			CHEMICAL EDUCTOR	1
			120FT BOOM HIGH FLOW 1 IN STAINLESS STEEL PIPE 15 IN ON CENTER NOZZEL	1
			LESS BOOM TRAC	1
			LOAD COMMAND READY	1
			LESS FOAM MARKER	1
			COMMON VIEW CAB GREEN STAR AUTO TRAC READY WITH PLUG AND PLAY INCLUADING FACTORY	1
			WHEEL SLIP CONTEROL	1
			UNDERFRAME SHIELD -MACHINES WITH OUT LOAD COMMAND	1
			FIELD VISION XENON HID LIGHTING PACKEGA	1
			AFRIC INCLUDES TEXT FREE DECALS AND ENGLISH OPRETER MANUAL .LESS RADIO	1
KAP/375/11	10/MAY/1 1	110304	620/70 X42 INNER TUBE	1
KAP/375/11	11/MAY/1 1	10/KGL/10-11	VOLVO CREWLER EXCAVATER MODEL EC210 B	10
			710/ 70 X 42 INNER TUBE	1
			12.5 L -15 TUBE	1
KAP/138/11	09/MAY/1 1	09/KGL/11-12	VOLVO & BEML SPERA PART	0
KAP/324/11	28/APR/11	D357213	4930 SELF-PROPELLED SPRAYER(modal year 2011)	2
KAP/299/11	27/APR/11	A0141201	YAHAMA MOTORCYCLES	8

KAP/328/11	03/MAY/11	37/A/KGL/10-11	TRACTORS SPARE PART(TOP LIK (13)AND SIDE LINK LH(3))	16
			PLANTER SPARE PART	25
KAP/321/11	28/APR/11	43/KGL/10-11	ASHOK LEYLAND ELECTRIC GENERATING SET	12
KAP/265/11	11 APR /11	44/KGL/10-11	VOLVO CRAWLER EXCAVATER MODEL EC210 B	7
		39/KGL/10-11	WHEEL LOADER'S	10
			40" HC CONTAINERS	10
		EXP-482-I	ROPS CABIN,MULTI SHANK RIPPER AND HYDROLIC TANK FOR BEML BD65 BULLDOZER	5
		EXP-482-II	BD65 BULLDOZER FITTED WITH BEML ENGINE MODAL BS 125-1 DIESEL ENGINE HAVING HP OF 180@1859 RPM FITTED ANGLE BLADE WITH ROPS CABIN AND MULTI SHANK RIPPER	5
EXP-482-III	BD65 BULLDOZER FITTED WITH BEML ENGINE MODAL BS 125-1 DIESEL ENGINE HAVING HP OF 180@1859 RPM FITTED ANGLE BLADE WITH ROPS CABIN AND MULTI SHANK RIPPER	5		
KAP/111/04/11	4 /APR/11	GP11164-167	2 S yeild pri planter 31- row	4
KAP/215/11	29/MAR/11	ETH11-008	9770 STS RICE COMBINE	8
KAP/125/11	07/MAR/11	36/KGL/10-11	TRACTOR SPARE PART, RAJDOOT SPARES &JCB HOSEPIPES	586
KAP/231/10	15/JAN/2011	EXP-482	BD65 BULLDOZER FITTED WITH BEML ENGINE MODAL BS 125-1 DIESEL ENGINE HAVING HP OF 180@1859 RPM FITTED ANGLE BLADE EXCLUDING ROPS CABIN AND MULTI SHANK RIPPER	5
EM/932/10	14/DEC/11	32/KGL/10-11	VOLVO CRAWLER EXCAVATOR MODEL EC210 B	8
		PL100299	TOYOTA HILUX PICK UP D/CABIN,4WD	5
KAP/657/10	03/NOV/10	131549	4-710 X42 WHEELS AND TYRES	1
			4-380 X34 WHEELS AND TYRES	1
			8-710 X42 WHEELS AND TYRES	1
KAP/657/10	03/NOV/10	18/KGL/10-11	TRACTOR MOUNTED SPREYERS(HTT 50)	20
KAP/F12+F129/11	4/FEB/2011	GP10088	VERTIY TILL 4-SHANK	2
		GP10089	VERTIY TILL 4-SHANK	1
			DITCHER 55 SERIES	7
			VT4360 REPAIR PART KIT	5
Kap/406/11	23/May/2011	03/KGL/11-12	RAJDOOT DIESEL ENGINE PUMP SPARES AND RAJDOOT DIESEL GENERATER SPARES	2340

			5 ROW RIDGE PLANTER FOR MAIZE SOWING ROW TO ROW SPACE 24"	12
			5 ROW RIDGE PLANTER FOR MAIZE SOWING ROW TO ROW SPACE 24"	12
kap/521/10	03/Oct/10	D339651	17'6" MULCH RIPPER	15
		D325450	9430 425TRACTOR RILL	5
			9530 475HP TRACTOR RIL	10
KAP/233/10	8/MAR/10	77/kg1/09-10	6-ROW MAIZE PLANTER	16
KAP/235/10	31/MAR/10	81/KGL/09-10	FOUR DISC PLOUGH	25
		80/KGL/09-10	TRACTOR MOUNTED SPRAYER	5
KAP/277/10	03/MAR/10	B325450	9430 425HP TRACTOR RILL	5
			9530 475HP TRACTOR RIL	10
KJO/6438/14 69/02	26/05/2002E C	SPI/EXP/103/09- 10	RIGID PVC PIPES /FITTING	0
KAP/198/06/ 11	20/JUNE/11	962 E 006	113HM011027 HYDROLIC PUMP	1
ET/VH /00106/2011	AUG 1/2011	UT/VHP/INV/00 4 11-12	TOYOTA PICKUP	1

Data source: AILA

Annex 3.3: Lists of duty free imports by S & P Energy Solution

Reference #	Date	Bill of Loading	Type of import	Quantity
SPES/MOARD-377	13/JUNE/11	113396 AND 113398	SPREYR UG 3000 UNBROKENED	2
SPES/MOARD-333	09/MAY/11	6.2E+09	TRACTOR	2
SPES/MOARD-334	09/MAY/11	2011-066	DISC HARROW MODEL VSL 200-810/26	1
SPES/MOA-269	12/APR/11	6.2E+09	TRACTOR MODAL "XERION 3800 TRAC"-TYPE 781-250	2
SPES/MOA-269	12/APRI/11	F0039/11	TATA LPT1618TC/52 LHD LOAD BODY	1
SPES/MOARD-264	07/APRI/11	2061	DIGITAL SOIL PH METER MODEL ; - PH -220 S	1
			DIGITAL SOILMOISTURE METER MODEL ; - PMS -714	1
			DIGITAL ELECTRONIC WEATHER STATION MODEL ; - WS-2800-IT	1
			ANALOGUE SOIL PH /MOISTURE METER ZD-06-SAMPLE	1
SPES/MOA-266	11/APRI/11	533437	MOTOR CHAINSAWS AND SPERE PARTS	
SPES/IBA-153	08/FEB/11	PM/179/C/10	CATAPILLAR MODAL D8R TRACK TYPE TRACTOR OF 305 HP	2
2837	13/MAY/10	Not available	TOYOTA LANDCROSER	1
			TOYOTA PICKUP HILUX	1
SPES/MOARD-383	15/JUN/11	2205011	ROTARY CALTIVARE MODEL-KG 6000-2	1
			AIR PLANTER MODEL;ED 602-K	3
			AIR PLANTER MODEL;ED 302	2
			FERTILIZER SPREADER MODEL-ZA-M 2201	2

Source: AILAA (2012)

Annex 4.1: Determinants of wage in plantation agriculture (Interaction between schooling and experience, and experience squared included as variables)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939 ^a	.882	.877	.25239

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	118.685	10	11.868	186.320	.000 ^a
	Residual	15.861	249	.064		
	Total	134.546	259			

a. Predictors: (Constant), Experience_Squared, Type of crop, Education level, Type of work, Sex of the employee, Age of the employee, Origin, Location of the farm, Schooling_Experience, Years of experience

b. Dependent Variable: lnWage_Day

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.463	.090		27.436	.000		
	Sex of the employee	.084	.037	.054	2.296	.023	.841	1.190
	Education level	.022	.005	.105	4.075	.000	.711	1.407
	Origin	-.125	.063	-.086	-1.996	.047	.252	3.962
	Type of work	.170	.041	.100	4.175	.000	.824	1.214
	Location of the farm	1.071	.064	.721	16.673	.000	.253	3.952
	Age of the employee	.001	.002	.013	.487	.627	.669	1.496
	Type of crop	.155	.055	.085	2.834	.005	.524	1.908
	Schooling_Experience	4.699E-5	.002	.002	.028	.978	.152	6.559
	Years of experience	.026	.018	.119	1.430	.154	.069	14.556
	Experience_Squared	.001	.001	.065	.978	.329	.108	9.299

a. Dependent Variable: lnWage_Day

Annex 5.1: Food basket that gives 2200 kcal per adult equivalent per day for cereal-based farming rural areas of Ethiopia

No	Food item	Quantity
A	<i>Cereals (in Kg)</i>	
A.1	Teff	1.63
A.2	Barley	4.24
A.3	Maize	3.82
A.4	Millet	4.53
B	<i>Pulses (in Kg)</i>	
B.1	Lentils	0.35
B.2	Horse beans	1.84
B.3	Cow Peas/Grass Pea	0.35
B.4	Chick peas	0.71
B.5	Shiro	0.92
C.	<i>Vegetables (in Kg)</i>	
C.1	Gomen	0.21
C.2	Onion	0.35
D.	<i>Root Crops (in Kg)</i>	
D.1	Potato	0.14
E.	<i>Other Food Items</i>	
E.1	Milk (lt)	0.49
E.2	Coffee (Kg)	0.57
E.3	Sugar (Kg)	0.14
E.4	Salt (Kg)	1.20
E.5	Cooking Oil (lt)	0.28
E.6	Berbera (Kg)	0.85
E.7	Bread (Kg)	0.14

Source: Adapted from S. Dercon and M. Tadesse (1999, p.89)

Annex 5.2: Nutrition based adult equivalent conversion factors

Age	Male	Female
<1	0.33	0.33
1-2	0.46	0.46
2-3	0.54	0.54
3-5	0.62	0.62
5-7	0.74	0.70
7-10	0.84	0.72
10-12	0.88	0.78
12-14	0.96	0.84
14-16	1.06	0.86
16-18	1.14	0.86
18-30	1.04	0.80
30-60	1.0	0.82
60 and above	0.84	0.74

Source: Dercon, S and P, Krishnan (1998, p.40)

Annex 5.3: Food security coping strategies adopted by households in Bako Tibe district, Oromia regional state

Coping strategy	Weight for severity score ⁷¹					Average Weight	Severity level
	FGD 1	FGD 2	FGD 3	FGD 4	FGD 5		
Eating cheap but less preferred food	1	1	1	1	1	1.0	Least severe
Limit meal portion	2	2	2	2	2	2.0	Moderate
Buy food on credit	2	3	1	3	2	2.2	Moderate
Decrease meal frequency	2	2	3	2	2	2.2	Moderate
Send children to eat with relatives	3	2	4	3	2	2.8	Severe
Borrow food	3	3	4	2	2	2.8	Severe
Consume seeds	3	4	3	3	2	3.0	Severe
Skip eating whole day	4	4	4	3	4	3.8	Most severe

Source: FGD conducted in Bako Tibe district on 03, 04 and 06 April 2012

⁷¹ **Note:** Severity score is measured as follows: 4=Most severe 3=Severe 2=Moderate; and 1=Least severe

Annex 5.4: Mean weighted CSI score adopted by affected and non-affect households before (2012) and after (2014) Karuturi's intervention, Bako Tibe district, Oromia regional state

Coping strategy	Weighted mean CSI score for affected households (n=75)			Weighted mean CSI score for non-affected households (n=83)		
	Before (2012)	After (2014)	% change	Before (2012)	After (2014)	Change
Eating cheap but less preferred food	0.04	0.08	50.0%	0.03	0.035	14.3%
Limit meal portion	0.03	0.16	81.2%	0.04	0.042	4.8%
Buy food on credit	0.02	0.22	90.9%	0.03	0.032	6.3%
Decrease meal frequency	0.01	0.16	93.8%	0.02	0.021	4.8%
Send children to eat with relatives	0.02	0.32	93.8%	0.01	0.01	0%
Borrow food	0.02	0.33	93.9%	0.02	0.02	0%
Consume seeds	0.01	0.27	96.3%	0.01	0.01	0%
Skip eating the whole day	0.01	0.27	96.3%	0.01	0.01	0%
Overall weighted mean CSI score	0.16	1.81	91.2%	0.17	0.18	5.6%

Source: Household survey, 2012 and 2014

Annex 5.5: Food security coping strategies adopted by the settlers and their severity weights in Abobo district, Gambella regional state

Coping behavior/strategies	Weight for severity scores					Average weight	Severity level
	FGD 1	FGD 2	FGD 3	FGD 4	FGD 5		
Reducing meal portion	1	1	1	1	1	1	Least severe
Requesting emergency food aid	3	3	3	3	3	3	Severe
Reducing portion and frequency of meal	3	3	2	3	3	2.8	Severe
Borrowing food from neighbors/relatives	2	2	3	2	2	2.2	Moderate
Skip eating the whole day	4	4	4	4	4	4	Most severe
Hunting and eating game meat	1	1	1	1	1	1	Least severe
Consuming seed stock	4	4	4	4	4	4	Most severe

Source: FGD conducted in Abobo district on February 8, 2013

Annex 5.6: Mean weighted CSI score adopted by affected and non-affected households in Abobo district, Gambella regional state

Coping behavior	Weighted mean CSI score	
	Affected households	Non-affected households
Reducing meal portion	0.22	0.76
Requesting emergency food aid	0.86	0.25
Borrowing food from neighbors/relatives	0.70	0.35
Reducing portion and frequency of meal	1.00	0.30
Skip eating the whole day	0.60	0.11
Hunting and eating game meat	0.50	0.40
Consuming seed stock	0.32	0.01
Weighted overall mean CSI score	4.20	2.18

Source: Household survey data, 2013

Annex 5.7: Food security coping strategies adopted by the Anuak and their severity weights in Ilia village, Gambella regional state

Coping behavior/strategies	Weight for severity scores					Average Weight	Severity level
	FGD 1	FGD 2	FGD 3	FGD 4	FGD 5		
Reducing portion of the meal	2	2	2	2	2	2	Moderate
Reducing portion and frequency of meals	3	3	3	3	3	3	Severe
Looking for food aid	1	1	1	1	1	1	Least severe
Eating with or borrowing food from neighbors/families	1	1	1	1	1	1	Least severe
Skip eating	4	4	4	4	4	4	Most severe
Temporary migration to neighboring areas to search foods from the forest	3	3	3	3	3	3	Severe

Source: FGD conducted in Ilia village on March 10, 2013

Annex 5.8: Mean weighted CSI score adopted by affected and non-affected Anuak households in Gambella regional state

Coping behavior/strategies	Weighted mean CSI score for affected households	Weighted mean CSI score for non-affected households
Reducing portion of the meal	0.41	0.70
Reducing portion and frequency of meals	1.12	0.10
Looking for food aid	0.32	0.22
Eating with or borrowing food from neighbors/families	0.50	0.92
Skip eating	0.53	0.15
Temporary migration to neighboring areas to search foods from the forest	1.22	0.01
Weighted overall mean CSI score	4.1	2.1

Source: Household survey, 2013

Annex 5.9: Food security coping strategies adopted by the Nuer and their severity weights in Makuey district, Gambella regional state

Coping behavior	Weight for severity scores					Average Weight	Severity level
	FGD 1	FGD 2	FGD 3	FGD 4	FGD 5		
Reducing portion of the meal	2	2	3	2	2	2.2	Moderate
Reducing frequency and portion of meal	4	3	3	3	3	3.2	Severe
Eating with or borrowing food from neighbors/families	1	1	1	1	1	1	Least severe
Seeking emergency food aid	3	3	3	3	4	3.2	Severe
Skip eating	4	4	4	4	4	4	Most severe
Consuming seed stock put aside for next planting season	3	3	2	3	3	2.8	Severe

Source: FGD conducted in Bildak village on March 29 2013

Annex 5.10: Mean weighted CSI score adopted by affected and non-affected Nuer households in Gambella regional state

Coping behavior	Weighted mean CSI score for affected households	Weighted mean CSI score for non-affected households
Reducing portion of the meal	0.61	0.62
Reducing frequency and portion of meal	0.22	0.11
Eating with or borrowing food from neighbors/families	0.75	0.72
Seeking emergency food aid	0.27	0.25
Skip eating	0.15	0.11
Consuming seed stock put aside for next planting season	0.33	0.31
Weighted overall mean CSI score	2.33	2.12

Source: Survey data, 2013

Annex 5.11: Food insecurity coping strategies adopted by households in Dangur district, Benshanguel Gumuz regional state

Coping strategy	Weight for severity scores					Average weight	Severity level
	FGD 1	FGD 2	FGD 3	FGD 4	FGD 5		
Buy food by borrowing money	1	1	2	1	1	1.2	Least severe
Borrow food and/or eat with neighbors	1	1	2	1	2	1.4	Least severe
Consume seeds stock	2	2	1	2	2	1.8	Moderate
Limit meal portion	2	2	2	3	2	2.2	Moderate
Decrease meal frequency	3	4	3	3	3	3.2	Severe
Skip eating the whole day	4	4	4	4	4	4	Most severe

Source: FGD conducted in Kota village of Dangur district on April 20 2014

Annex 5.12: Mean weighted CSI score adopted by affected and non-affect households before (2010) and after (2014) S & P Company's intervention, Benshanguel Gumuz regional state

Coping strategy	Weighted mean CSI score for affected households			Weighted mean CSI score for non-affected households		
	Before (2010)	After (2014)	Change	Before (2010)	After (2014)	Change
Buy food by borrowing money	0.28	0.29	1%	0.19	0.27	8%
Borrow food and/or eat with neighbors	0.19	0.20	1%	0.19	0.25	6%
Consume seeds stock	0.34	0.35	1%	0.33	0.34	1%
Limit meal portion	0.34	0.41	7%	0.35	0.36	1%
Decrease meal frequency	0.8	0.93	13%	0.85	0.85	0.0%
Skip eating the whole day	0.07	0.09	2%	0.07	0.07	0.0%
Overall weighted mean CSI score	2.02	2.27	25%	1.98	2.14	16%

Source: Household survey, 2010 and 2014

Annex 5.13: Ranking of income and food sources for the Gumuz in Dangur District,
Benshanguel Gumuz regional state

Income and food sources	Ranking
Cultivation of sorghum	1
Cultivation of sesame	2
Gold mining	3
Collection of root crops and vegetables from the forest ⁷²	4
Collection of honey from wild honey bees	5
Hunting different types of animals	6
Livestock rearing and management	7

Source: Key informants' interview conducted at Kota village on April 23 2014

⁷² This include *echa*, *cici*, *boya* and pumpkin

Annex 6.1: Major companies that acquired land for biodiesel production in Ethiopia (Typology IV)

S.N	Company Name	Country of Origin	Region	Land size (ha)	Year
1	Adventure Ethiopia Agric. Development PLC	China/South Africa/Ethiopia	Amhara	50000	2007
2	Biomassive AB	Sweden	Amhara	100000	2007
3	BDFC Ethiopia Industry	NA	Amhara	18000	NA
4	Ambasel Trading	Ethiopia	Benshanguel	20000	2007
5	S&P Energy Solution	India	Benshanguel	50000	2010
6	Sun Biofuel Eth	UK	Benshanguel	80000	NA
7	Jatropha Biofuels Agro Industry	NA	Benshanguel	100000	NA
8	IDC investment	Denmark	Benshanguel	15000	2007
9	Sisay Yohannes	Ethiopia	Gambella	100000	2008
10	African Climate Exchange PLC	USA/Ethiopia	Multiregional	100000	2005
11	Africa Sustainable Energy Corporation PLC	Netherlands/USA	Multiregional	20000	2006
12	Ertale Bio Diesel PLC	Britain/Ethiopia	Multiregional	50000	2007
13	A.B.S.A Bio-Fuels PLC	South Africa China/Ethiopia	Multiregional	30020	2007
14	Horizon Plantation PLC	Saudi Arabia /Ethiopia	Multiregional	300000	2007
15	OBM Ethio Renewable Energies PLC	Italy/Ethiopia	Multiregional	50000	2008
16	Ardent Energy Group	USA	Multiregional	10000	2008
17	Petropalm Corp-Ethiopia PLC	Austria/USA	Oromia	50000	2009
18	Yehuda Hayun	Israel	Oromia	8000	2007
19	Green Energy plc	Ethiopia	Oromia	50000	2007
20	Flora Ecopower PLC	Germany	Oromia	6148	2008
21	J.M.B.O Bio Fuel Production PLC	USA/Ethiopia	Oromia	2000	2008
22	Soubra Abdallah Khalid	Lebanon	Oromia	10000	2008
23	Emami Bioteck	India	Oromia	11000	2009
24	Petro Palm Corporation Ethiopia	NA	Oromia	50000	NA
25	VATIC International Business	NA	Oromia	20000	NA
26	Etan Biofuels	Ethiopia	SNNPR	5550	2007
27	Getachew Mulugeta	Ethiopia	SNNPR	25000	2007
28	2A 2S International Business PLC	Ethiopia	SNNPR	60000	2007
29	F.E.P.E.Amaro Bio-Oil PLC	Cyprus/Israel	SNNPR	50000	2008
30	Gereth Modular Fuel & Energy PLC	Germany	SNNPR	5000	2009
31	Global Energy Ethiopia	NA	SNNPR	2700	NA
32	Omo Sheleko Agro Industry	NA	SNNPR	5500	NA
33	Fri-el Green	Italy	SNNPR	30000	2006
34	Agro-Peace Bio Ethiopia PLC	Israel	Somalia	50000	2009
Total				1,533,918	

Source: Shete and Rutten (2014); NA= Data Not Available

Annex 6.2: State and private owned sugar factories and bio-ethanol targets in Ethiopia (Typology IV)

Sugar Factories	Regional Location	Land size (ha)	Water Source	Production capacity		Expected Employment	Status
				Sugar (t/year)	Ethanol (m ³ /Year)		
Fincha	Oromiya	21000	Finchaa River	270,000	20,000	Data not available (NA)	Completed in 2013
Metehara	Oromiya	11000	Awash River	130,000	12,500	12,500	Completed in 2013
Wonji/Shoa	Oromiya	25022	Awash River	95,000	20,775	NA	Completed in 2013
Tendaho	Afar	50000	Tendaho River	619,000	55,405	50,000	2015
Omo Kuraz	South Omo, SNNPR	175000	Omo River	278,000	26,162	117,131	Kuraz-One is expected to be completed in 2014
Tana Beles	Amhara and Benshanguel	75000	Beles River	726,000	62,481	50,199	Tana Beles one and two factories expected to be completed in 2014
Wolkayit	Tigray	11000	Zarema and Kalema River	284,000	26,750	NA	2015
Kessem	Afar	20000	Kebena River	153,000	12,500	NA	To be completed in 2014
Arjo-Dedessa	Oromiya	28000	Dedissa River	155,520*	NA	NA	90 percent completed
Hiber Sugar	Amhara	6000	Tana Beles	NA	NA	NA	Implementation started
Karuturi	Gambella	15000	Baro River	N A	NA	NA	At nursery stage
Total		330,000					

Source: Shete and Rutten (2014); NA= Data Not Available