

Ethiopia Segmentation Study

DRAFT REPORT – 7/26/2015

This report is a compilation of notes, maps and tables produced with the Bill & Melinda Gates Foundation seeking to prioritize farming areas in Ethiopia that could leverage significant gains in agricultural productivity, especially of food staples, and farm income. Important secondary goals include reducing poverty, improving diets, and empowering women. The Foundation developed a segmentation approach with IFPRI that has three segmenting criteria. The first is agro-climatic conditions, which have been captured by distinguishing between rainfall-sufficient and drought-prone highlands, humid lowlands, and pastoralist lowlands. The rainfall-sufficient highlands are further subdivided according to whether cereals or onset are the dominant crop. The second criterion is market access, which is defined as low or high in terms of time taken to reach the nearest market center. The third criterion is population density, defined as low, medium or high. Of the 30 potential segments that follow (5×2×3), 24 segments were considered to be empirically important for the Foundation's development goals. The sections below outline the segmentation procedure and data sources, and provide key statistics and trends across selected segments.

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Investment Landscape

Agricultural Growth Program

As articulated by the AGP, the detailed selection criteria are as follows: access to markets (access to cities of 50,000 population or over in less than 5 hours), natural resource endowment (rainfall distribution with annual average of 700 mm or over; soil types suitable for crop and fodder production; potential for development of small-scale irrigation facilities); institutional capacity (public staff number and skill base; institutional plurality of service providers, including good basis and growth of viable cooperatives and farmer groups); and willingness and commitment to participate (supportive policy environment; performance of projects/programs supported by other donors; existing partnership engagements with private sector).

In addition to these criteria, woredas receiving support from the PSNP have been excluded with the exception of Tigray as this region has only 3 non-PSNP woredas. In these 5 PSNP woredas of Tigray, kebeles receiving support from the PSNP are excluded from AGP support. www.ethioagp.org

Since its inception in 1991, the Government of Ethiopia (GoE) has articulated a number of agricultural transformation strategies, beginning with the Agriculture Development Led Industrialization (ADLI) strategy, which continues to underpin all its more recent efforts. Recent manifestations include the Growth and Transformation Plan (GTP) – the latest phase of the former Plan for Accelerated and Sustained Development to End Poverty (PASDEP); the Agricultural Sector Policy and Investment Framework (PIF) – the operational version of the CAADP compact signed by the Government and its development partners; and the Agricultural Growth Program (AGP) – which is led by the Ministry of Agriculture and coordinated by the World Bank. Common themes are the recognition of the primacy of agricultural growth and small farm development for achieving an economic transformation, and a desire to raise the productivity of food staples in particular. The Government has backed these strategies with significant investment of its own by African standards (15% of its total budget, or about 10% if PNSP expenditures are excluded, see margin note), and this has led to a steady and impressive rate of agricultural growth (6-8%) in recent years. However, the desired agricultural transformation still lags expectations, and it has not yet launched a broader economic transformation of the country.

Some important limitations of past strategies are that they have tried to drive too many things forward at the same time without recognizing the limitations of existing institutional capacities and infrastructures, and many activities have been undertaken in a piecemeal fashion (often off-budget) with little effective coordination across government and donor investments. The AGP has tried to address these issues in a more systematic and focused way, and the ATA has taken the AGP's approach a step further by focusing on a few first movers - priority commodities that are either imported or traditional export crops, and to drive these hard for growth with the expectation that the rest of the sector will subsequently follow. Like the AGP, the ATA has also chosen to focus on higher potential areas with good market access – first mover regions.

This strategy is very similar to the Asian Green Revolution strategy, where an initial thrust on import substitution for wheat and rice in irrigated areas led to significant growth in agricultural incomes and employment and the successful rural transformation that followed. Like Asia in the 1970s, Ethiopia is at a stage of development where the state will need to play a leading role in driving and coordinating the strategy within each of the selected value chains to encourage this growth, and overcoming cross-cutting constraints like irrigation, land degradation, seeds and finance. Unlike the green revolution model, however, there are greater opportunities today for the state to work in partnership with the private sector and NGOs on market oriented solutions rather than having to rely on state run marketing and lending institutions, and globalization has opened up new opportunities for exploiting the benefits of international trade in agriculture. One of the policy challenges is encouraging the Government to open up more space for some of these partnerships to develop and prosper.

The “first mover” commodities selected so far by the ATA are wheat, teff, and maize, with plans to add coffee, some horticultural crops, livestock and agro-processing at a later stage. The strategy involves strengthening the value chains for the selected commodities, and addressing cross-cutting constraints such as fertilizers, seeds, credit, coops, extension, R&D, agro-processing, and public sector capacities.

Segmentation Approach

The Problem

Effectively targeting agricultural development investments is extremely challenging due to the variation in constraints, opportunities, and implementing environments that exist across and within farming systems.

Farming systems are spatially diverse as they are strongly conditioned by local agro-climatic conditions and access to markets, both of which vary widely over space. There is also significant variation in the farming and livelihood strategies of individual households within farming systems. This household variation is conditioned by the socio-economic characteristics of local communities and individual households, such as the distribution of land and other assets, access to nonfarm employment, cultural values, and the dynamics of family lifecycles.

To manage this variation and provide a basis for targeting interventions to the needs of specific types of households requires a 'segmentation' or 'typology' analysis.

An Approach to Segmenting

The segmentation approach outlined in this note is tailored to the needs of the Bill & Melinda Gates Foundation. The Foundation has established goals for what it wants to achieve (agricultural productivity growth, increased value to farmers, poverty reduction, improved nutrition outcomes, etc.) and areas of competence for its own interventions in agriculture (R&D, access to inputs, value chain development for prioritized commodities, etc.). To segment on all these criteria is impractical, so a two-step approach is taken here. In the first step farms are segmented on variables that reflect the competencies of the Foundation and its potential to make a significant difference in each segment. The second step is then to screen the selected segments to help identify those segments that rank the highest against the Foundation's goals. Identifying these high priority segments, and having a view into the unique characteristics of farmers in those segments, should help the Foundation achieve maximize impact and achieve its goals.

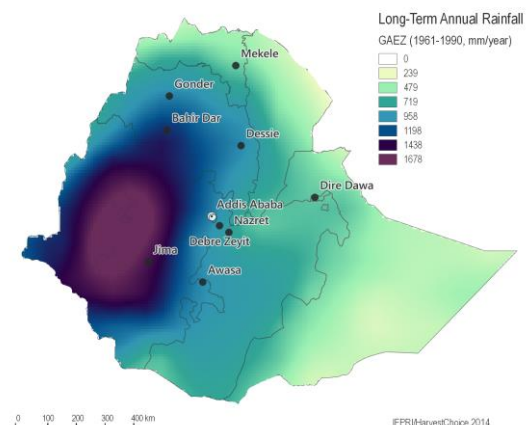
Step 1: Segmenting on Key Indicators

This segmentation looks at a variety of dimensions to group farmers that are highly relevant to the foundation's work, in particular *farming systems*, *agricultural potential*, *population density*, and *market access*.

Farming Systems

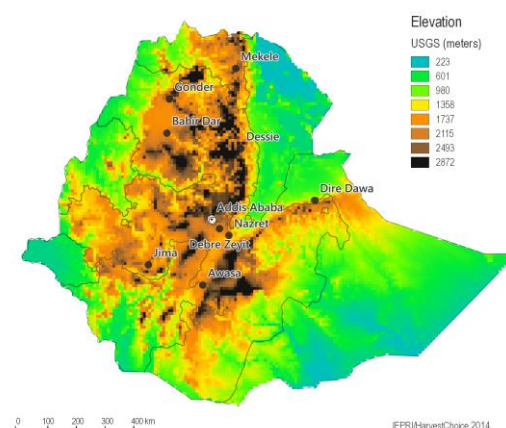
Segmenting by farming system helps identify groups of farms that grow the same major commodities and face similar technology and management constraints, and hence who are likely to have similar research/technology needs and priorities. Farming systems can be defined on the basis of the major commodities grown. Alternatively, standard farming system typologies, such as those developed by FAO, can be used. The commodity based approach has intuitive appeal for value chain approaches but the downside is that commodity mixes may not be robust over time because farmers adjust their growing decision over time according to changes in prices, weather shocks, climate change, etc. The farming

Fig. 1 30-Year mean Annual Rainfall



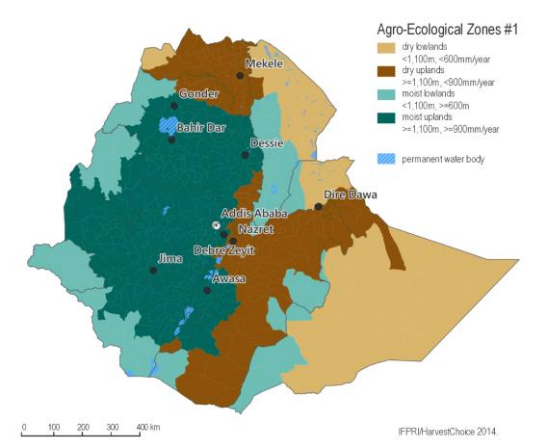
Source: WorldClim

Fig. 2 Elevation



Source: Hydro1k USGS resampled to 5km.

Fig. 3 Agro-ecological Zones across Woredas (Rainfall/Elevation, 4-class)



Lowlands < 1,100m. Low rainfall in lowlands < 600mm/year, low rainfall in highlands < 900mm/year.

systems approach has the advantage that it respects the biological integrity of each farming system in terms of its soil, water and pest management, and unlike definitions based on dominant commodities, is more likely to be robust over time

Agricultural Potential

The highest returns to research and other productivity enhancing investments are likely to be achieved if they are targeted to regions where there is remaining agricultural potential to exploit. For this segmentation we have decided to use a measure of yield gap as opposed to using a measure of biophysical potential. This is because it takes into account what is already being achieved in addition to what is possible. There are many ways to measure this gap, including the difference between the average yield of the top 10% of farmers and the regional average, or between crop model simulated yields and the average. In the case of multiple products, the gap could be calculated as the difference between the total revenue/ha that is possible versus the average revenue/ha observed. Where detailed data are available on all farm outputs and inputs, then the average level of profit might be calculated, and compared with the maximum profit attainable in a region given its endowments of fixed factors and agro-climatic conditions. The latter can be measured through a production function approach.

Market Access

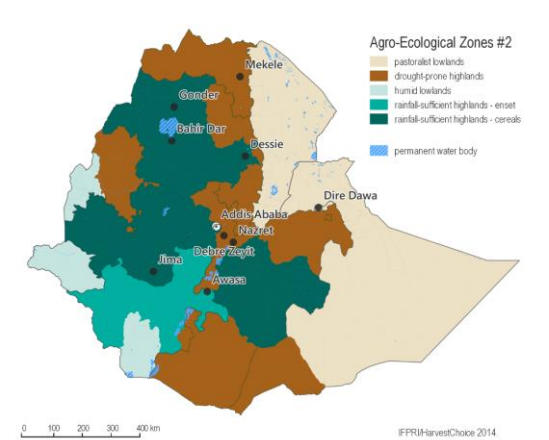
Market access is typically measured using the average distance to a market center, sometimes taking account of the types of roads and transport to be used by converting distances into time estimates.

After defining appropriate measures of each of the three segmenting variables, intervals for each variable are defined to arrive at a finite number of segments. For example, if there are two farming systems, and if agricultural potential and market access are both split into high and low categories, then this would lead to a total of 8 segments.

Step 2: Identifying and Characterizing Potential High Priority Segments

Once step 1 has been completed, the next step is to identify and characterize potential high priority segments according to foundation goals. For example, one of the goals is to increase agricultural productivity, so segments with the highest productivity gaps and greatest access to markets would be attractive targets. Since the foundation has already identified priority commodities for its own work, then this would suggest prioritizing segments with farming systems in which those commodities are important. These choices can be made using the outputs from step 1.

Fig. 4 Alternate Agro-ecological Classification (5-class)



Source: ESSPII, EDRI 2009

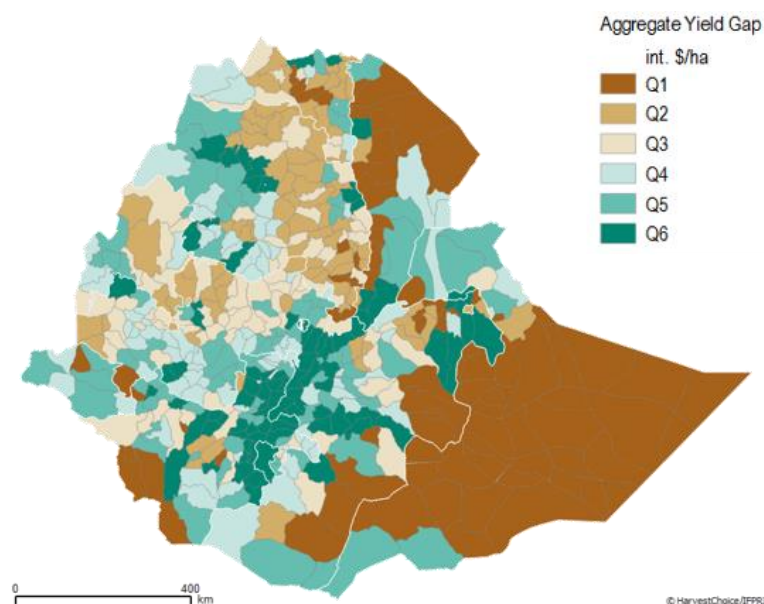


Fig. 5 Aggregate Yield Gap across Woredas, Ethiopia (low to high quantiles, int. \$/ha, 2005)

In this illustration we measure Ethiopia's agricultural potential using aggregate yield gaps at the country level. The gap is measured as the wedge between actual and potential yields (for both rainfed and irrigated systems) in kg/ha for each of 42 commodity groups. We then construct an aggregate yield gap in value terms. Potential yields are derived from GAEZ 2009. Actual yields are from IFPRI SPAM 2005. Figure 1 shows low-to-high agricultural potentials across Woredas.

Source: HarvestChoice/IFPRI, 2014

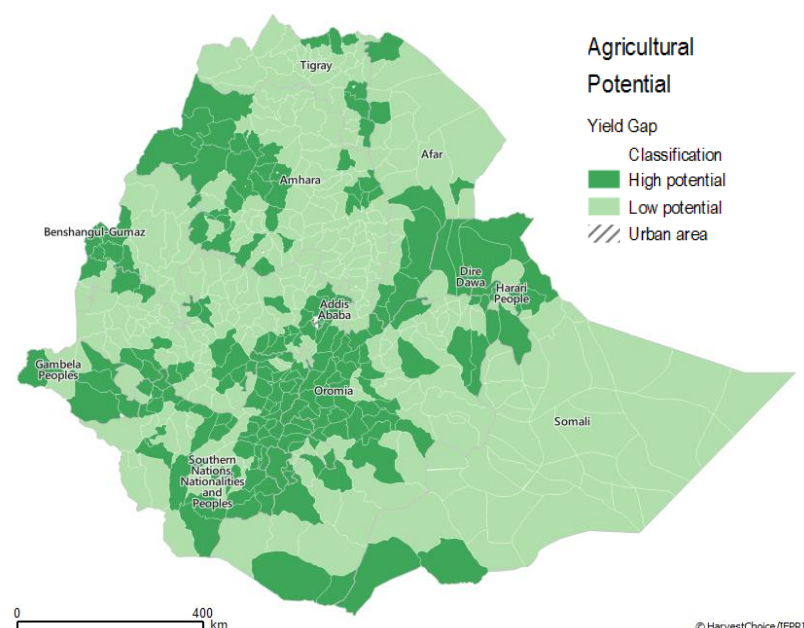


Fig. 6 Low/High Agricultural Potential Zones, Ethiopia (2005)

We then define low (high) yield gaps for Woredas with aggregate yield gap below (above) 500\$/ha. This corresponds to the median yield gap value across all Woredas. The mean value is at 1,090/ha.

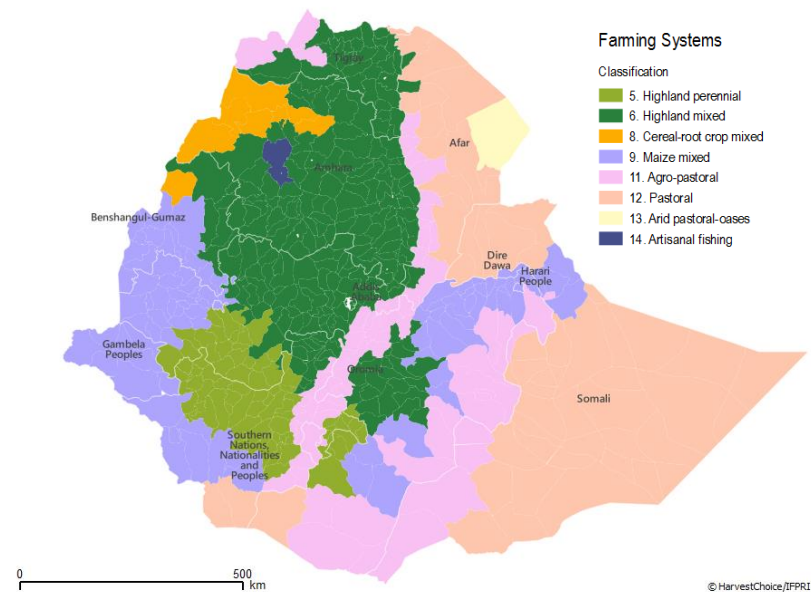
Source: HarvestChoice/IFPRI, 2014

Tab. 1 Distribution of High/Low Agricultural Potential Zones, Ethiopia

Yield Gap	Total Area (share)	Harvested Area (share)	'05 Rural Population (share)	'05 Rural Poverty (\$1.25/day)	Time to Market (hrs)	Yield Gap (int. \$/ha)
Low	36%	48%	45%	38%	7	291
High	39%	52%	54%	38%	6	1927
Undefined	25%	0%	2%	40%	11	n/a

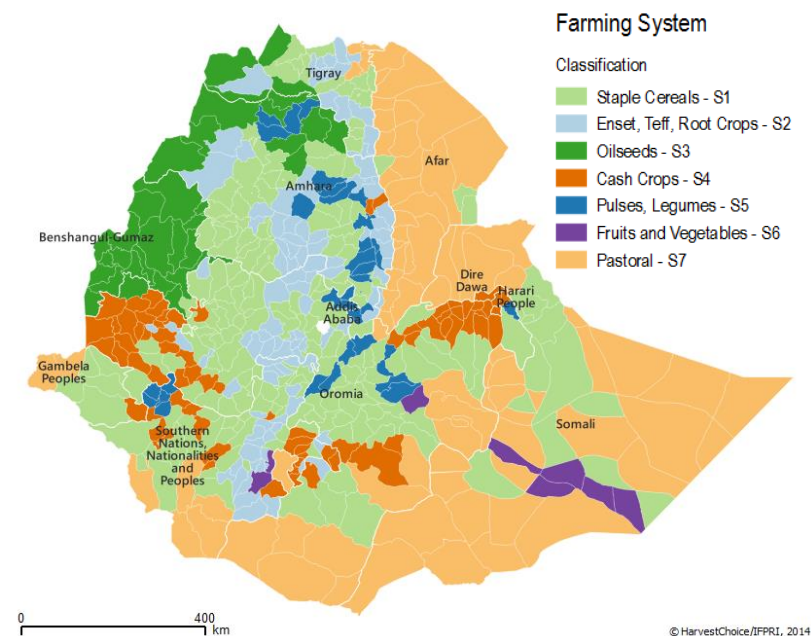
Farming systems are derived from Garrity, Dennis, Dixon, John and Boffa, Jean-Marc (2012) [1].

Fig. 7 Farming Systems, Ethiopia (Dixon et al, 2012)



In the most recent release Dixon et al. identify thirteen systems for Africa based on a combination of biophysical variables (water, land, grazing areas, forest, length of growing period and altitude) and household livelihood characteristics (dominant agricultural productions and intensification level). Eight of these farming systems are found in Ethiopia, of which two (arid pastoral-oases and artisanal fishing) account for very little land area and population.

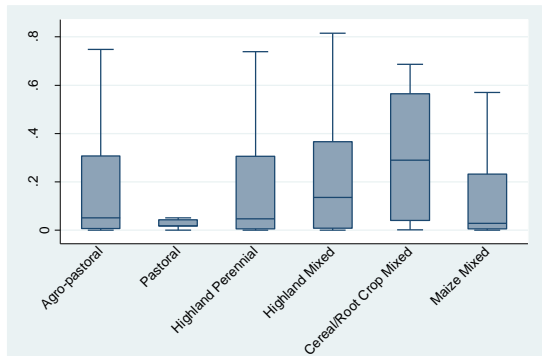
Fig. 9 Farming Systems, Ethiopia (2011/12 AgSS, ATA 2014, USAID 2011)



Source: USAID Atlas of Ethiopian Livelihoods [2]

Fig. 8 Farm Technical Efficiency across Farming Systems, Ethiopia (2011)

Technical efficiency is a measure of performance of farmers against the most efficient farmers. Efficient farmers are those whose input use yields the maximum possible output in light of the current technology. Efficiencies range from zero to one. Thus, households are evaluated based on how far they are to one. The lower the number, the lower the efficiency.



Source: Authors, Ethiopia ERSS, 2011 (exclude out-side values).

Explained Variance of Selected Variables when Controlling for FAO Farming Systems (2011)

Variable	Percent
Total value of production	14%
Elevation - best predictor of potential	56%
Technical efficiency	10%
Income	7%

Source: Authors, Ethiopia ERSS, 2011.

Tab. 2 Distribution of Farming Systems, Ethiopia

Farming System	Total Area (share)	Harvested Area (share)	Time to Market (hrs)	Yield Gap (int. \$/ha)	'05 Rural Population (share)	'05 Urban Population (share)	Rural Poverty HCR (\$1.25/day)
Highland perennial	7%	14%	8	1,117	17%	10%	39%
Highland mixed	25%	61%	6	1,003	54%	60%	39%
Cereal-root crop mix	3%	2%	7	965	2%	3%	39%
Maize mixed	17%	13%	8	859	14%	11%	33%
Agro-pastoral	15%	8%	6	2,995	11%	12%	38%
Pastoral	32%	0%	9	715	1%	3%	44%
Arid pastoral-oases	1%	0%	6	n/a	0%	0%	43%
Artisanal fishing	0%	0%	2	1,254	0%	1%	40%

Tab. 3 Selected Demographic Indicators across Farming Systems, Ethiopia (2011)

Farming System	Age (years)	Education (years)	Household Size	Adult Dependency Ratio	Non-farm Income (percent)
Highland Perennial	43.06	2.02	5.29	1.42	24.26
Highland Mixed	45.20	2.13	4.89	1.20	34.01
Cereal/Root Crop	41.83	1.50	5.08	1.12	37.45
Maize Mixed	44.38	2.04	5.43	1.43	27.51
Agro-pastoral	45.01	2.43	5.85	1.43	23.25
Pastoral	42.64	1.19	4.84	1.28	31.97

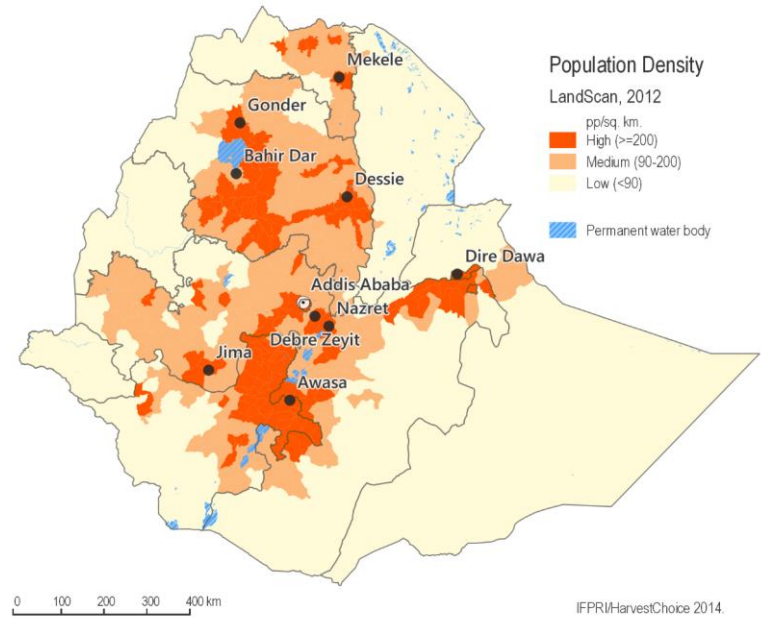
Tab. 4 Selected Food Security Indicators across Farming Systems, Ethiopia (2011)

Farming System	Household worries about food (share)	Average Number of Meals (adults/day)	Average Number of Meals (kids/day)
Highland Perennial	36.17	2.79	3.33
Highland Mixed	42.67	2.75	3.48
Cereal/Root Crop	2.15	2.94	3.96
Maize Mixed	6.65	2.78	3.42
Agro-pastoral	12.26	2.76	3.90
Pastoral	0.1	2.85	3.45

Sources: Authors, Ethiopia ERSS, 2011.

Fig. 10 Population Density across Woredas (2012)

Source: LandScan 2012, resampled to 5km and averaged across woredas.



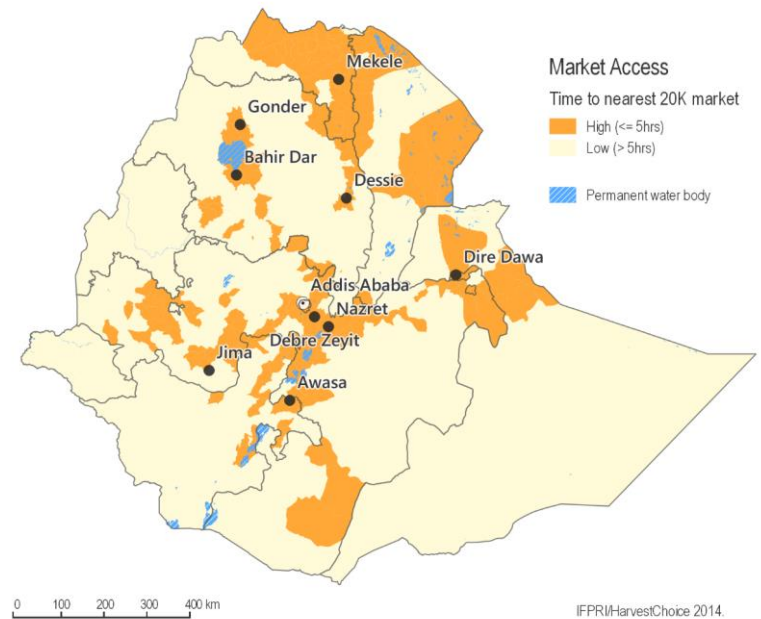
Tab. 5 Distribution of High/Low Market Access Zones across Segments, Ethiopia

Market Access	Total Area (share)	Harvested Area (share)	Time to Market (hrs)	Yield Gap (int. \$/ha)	'05 Rural Population (share)	'05 Urban Population (share)	Rural Poverty (\$1.25/day)
Low	91%	80%	8	952	79%	37%	38%
High	9%	20%	3	2,408	21%	63%	39%

Fig. 11 Time to Nearest 20K Market (2007)

The time to market measure is further documented at <http://harvestchoice.org/labs/travel-time-major-market-cities>. Note that instead of using a country-wide definition of high/low market access, we plan to further revise this segmenting dimension to capture most of the farm variability within each farming system.

For Ethiopia we define low (high) market access for areas further (closer) than 5hrs to the nearest 20K town .



Source: HarvestChoice 2014 [3].

But the Foundation also has a number of other social goals, including helping poor and women farmers, improving diets, and reducing food insecurity, so segments might also need to be prioritized against these goals. Where the data exists then the analyst can characterize the typical or average farm household in each segment for key variables like size of holding, gender of household head, incidence of poverty, etc. and these attributes can be included when decision makers are prioritizing the segments from step 1. Where sample sizes allow, it is also possible to explore some of the variability within each segment and to identify subgroups of households that might warrant special attention.

Given multiple goals, a difficulty quickly arises in that choices have to be made. If different segments score highly on different goals, then one may end up with too many prioritized segments to be useful. In some cases segments may score highly on some goals but low on others, in which case tradeoff choices have to be made. It has to be recognized that the segmentation approach developed here is not a decision making tool, but merely seeks to develop and present pertinent information in ways that can help inform decisions by foundation staff.

Proposed Segmentation Scheme

The retained segmentation scheme is consistent with several other attempts to segment Ethiopia's agricultural areas, including schemes used by the Ethiopian Government, the Agricultural Growth Program (AGP), and the Agricultural Transformation Agency (ATA). Much of the policy discourse in Ethiopia has long been structured around "Three Ethiopias"; rainfall-sufficient highlands, drought-prone highlands, and humid (mostly pastoral) lowlands, and the idea of subdividing the highlands into cereal and enset dominated categories is not new [4]. Research in several countries, including Ethiopia, has also shown that agricultural potential (often represented by agro-climatic conditions), market access and population density are powerful determinants of the kinds of activities (crop, livestock, nonfarm) in which farmers and rural communities have comparative advantage, and hence are best able to compete in the market [5].

Another attractive feature of these three segmenting variables is that detailed household survey data are not required to measure them, and the analyst can rely solely on secondary data defined at spatial units such as pixels or low level administrative areas like woredas, using data from available censuses, remote sensing, and other secondary sources (e.g. soil maps and weather station data).

Given this segmentation, a key question is how to prioritize segments so as to best target the Foundation's investments. Several considerations are suggested:

A primary goal for the Foundation is to target areas that have good potential for leveraging productivity gains. The best opportunities for increasing productivity do not necessarily arise in areas that have already achieved high agricultural productivity, since many such areas may have already exploited the best available technologies. The aggregate yield gap column in Table 1 measures the remaining potential yield gap in value terms, and this is calculated as an index across all the crops grown in each segment assuming optimal plant growing conditions (e.g. water constraints are relaxed through irrigation investments). This variable is measured in \$/ha, and hence is also a reasonable proxy of the potential to raise income. Of course, this says little about the ease with which that potential can be tapped, or the cost of doing so. Often it is easier to make judgments on the basis of the yield gaps for specific crops, but farmers typically grow a mix of crops, and some investments like small-scale irrigation or improved soil management are not so crop specific anyway. Another criterion in terms of raising farm income is the level of technical efficiency that farmers are currently

achieving. Higher scores indicate segments where there is potential to raise productivity simply by helping farmers better manage the resources and technologies they already have.

The relative importance of different segments in terms of their shares in the total cropped area or total value of production is a useful guide to the scope for scaling up successful interventions.

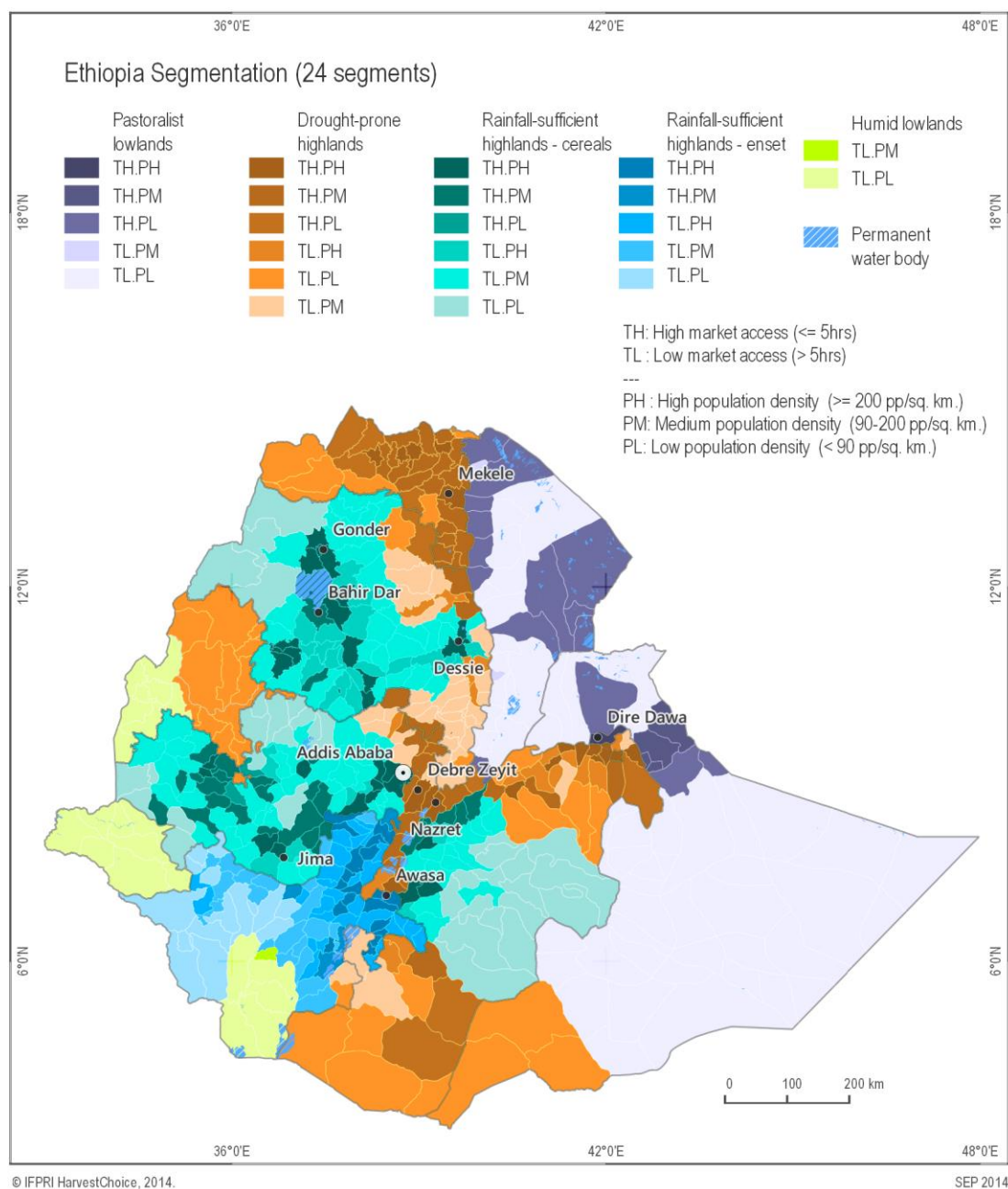
Another criterion is poverty. In a country like Ethiopia where poverty is widespread and there is a well-established safety net program (the PNSP), it may be better to prioritize segments where lots of poor people live (high density) rather than areas with the highest incidence (ratio) of poor people. The difference can be important as the incidence of poverty tends to be higher in marginal areas where relatively few people live.

Values for all these variables are reported by segment in Table 1. Based on the above considerations, 11 segments look particularly promising and are indicated with a check mark in the 1st column of Table. These segments have good productivity growth potential, are home to high densities of poor people, and account for significant shares of the value of national agricultural production. Three are in drought prone highlands, five are in rainfall-sufficient highland areas dominated by cereals, and three are in rainfall-sufficient highland areas dominated by enset.

The Foundation has already prioritized 5 of the segments in Table 1, and these are highlighted in yellow. They all belong to the more promising segments identified above, but are limited to the rainfall-sufficient segments dominated by cereals. It is informative to compare these segments with the areas already prioritized by the AGP and ATA (Maps 2 and 3). The AGP selected clusters of woredas based on their access to markets, natural resource endowment, potential for development of small-scale irrigation facilities, institutional capacity, commitment to participate, and not being recipients of support from the PSNP. Many of the selected areas fall within the 5 segments prioritized by the Foundation, but the AGP also targets some of the promising areas identified in Table 1 located in the drought-prone highlands, and the rainfall-sufficient highlands dominated by enset.

The ATA has adopted many of the same criteria for prioritizing woredas as the AGP; in fact it began its activities in the same woredas as the AGP, but has now added some more of its own. When the current phase of the ATA program rollout is completed the teff initiative will be operating in 209 woredas, the wheat initiative in 95 woredas, and the maize initiative in 132 woredas. These target woredas are located in high-potential areas in the Tigray, Amhara, Oromia, and Southern Nations, Nationalities, and Peoples regions. As can be seen in Map 3, most of these areas also fall within the 5 segments prioritized by the Foundation, but there are also important clusters in the drought-prone highlands where teff is grown.

In sum, the Foundation has arrived at 5 prioritized segments that make good sense from the point of view of its goals, and which overlap with the spatial priorities of both the AGP and ATA. That said, there are 6 other promising segments in Table 1 that might be equally good, but which are located in the drought-prone highlands, or the enset dominated rainfall-sufficient highlands. Other partners such as the AGP and ATA are already active in some of these areas.

Fig. 12 Proposed Segmentation Scheme (24 segments)

Segments are defined along Ethiopia's woreda boundaries.

Fig. 13 Overlay of AGP's priority areas with the 5 BMGF priority segments

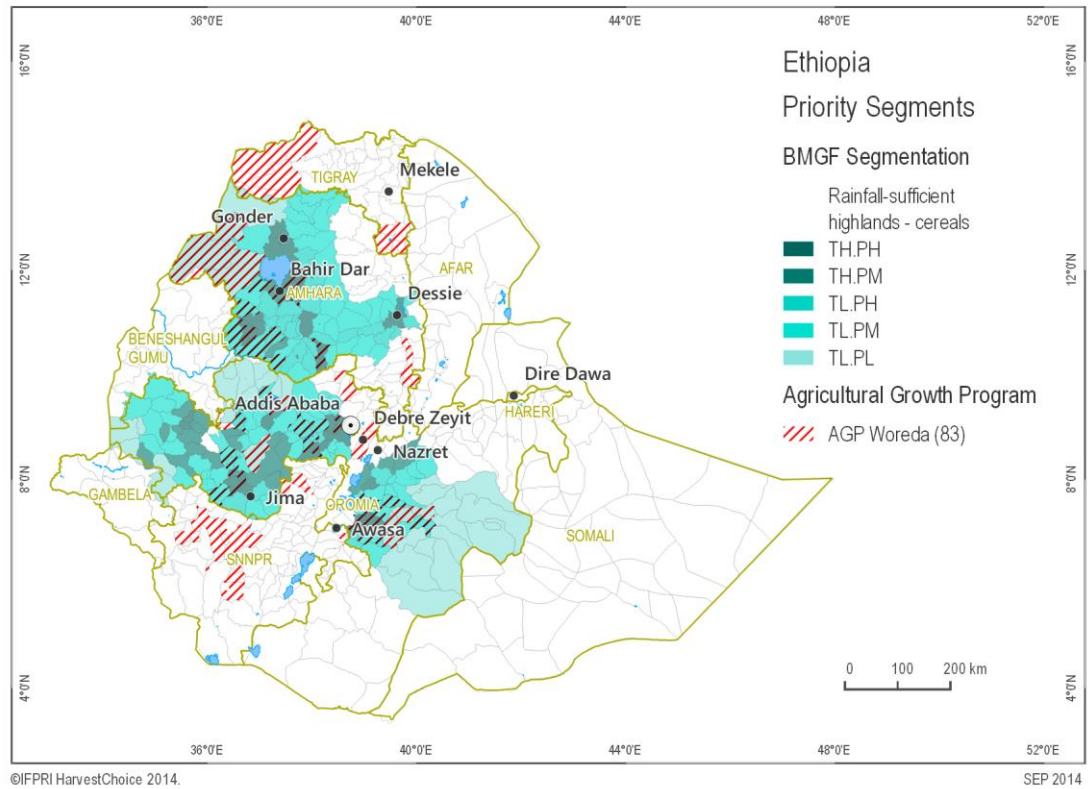
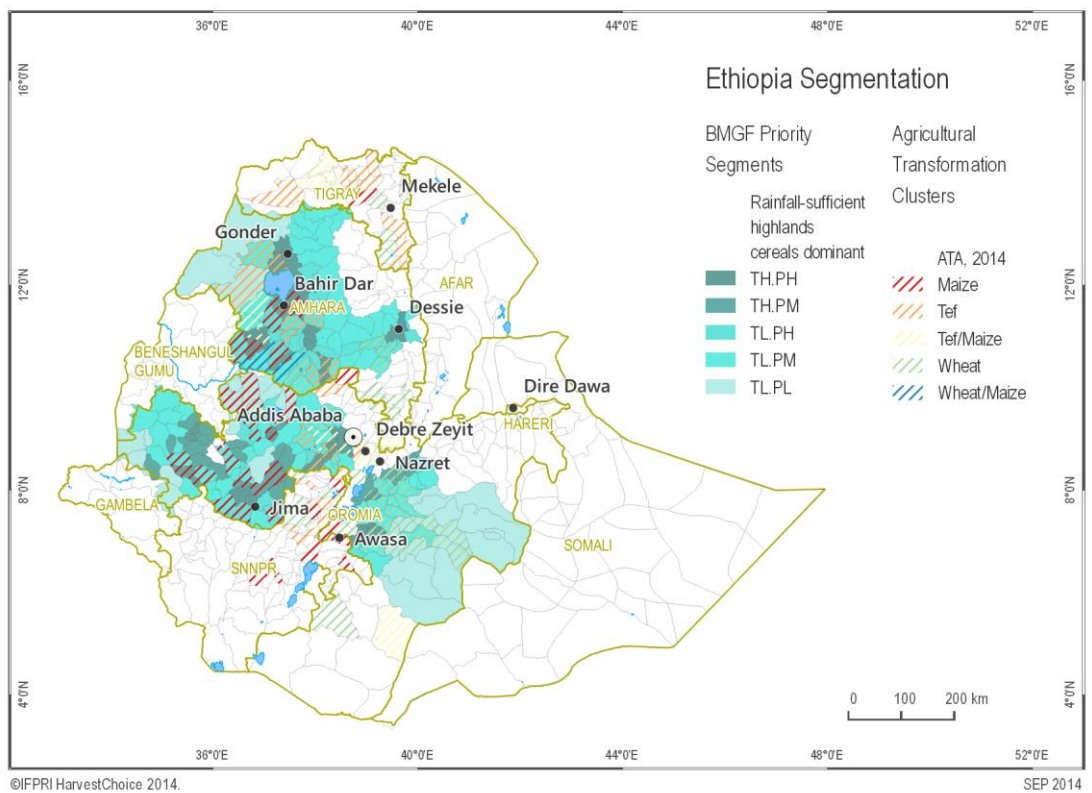


Fig. 14 Overlay of ATA's priority areas with the 5 BMGF priority segments



Characterization of Ethiopia's Farm Households across Segments

In the following maps, tables and charts we combine the proposed segmentation scheme with results from nationally representative household surveys; the Ethiopia Rural Socioeconomic Survey (ERSS) 2011/2012 [6], the Agricultural Sample Survey (AgSS 2005 E.C.) [7], and the 2011 Ethiopia Demographic and Health Survey (DHS) [8]. We also overlay area, production and yield statistics from IFPRI Spatial Production Allocation Model [9].

Fig. 15 Maize Production across Segments

Source: SPAM 2005

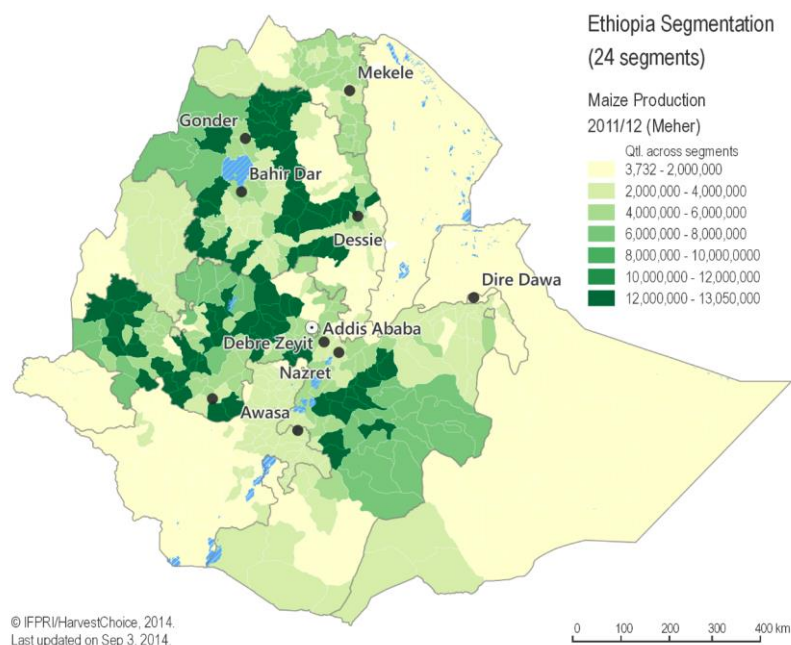


Fig. 16 Maize Intensity across Segments

Source: SPAM 2005.

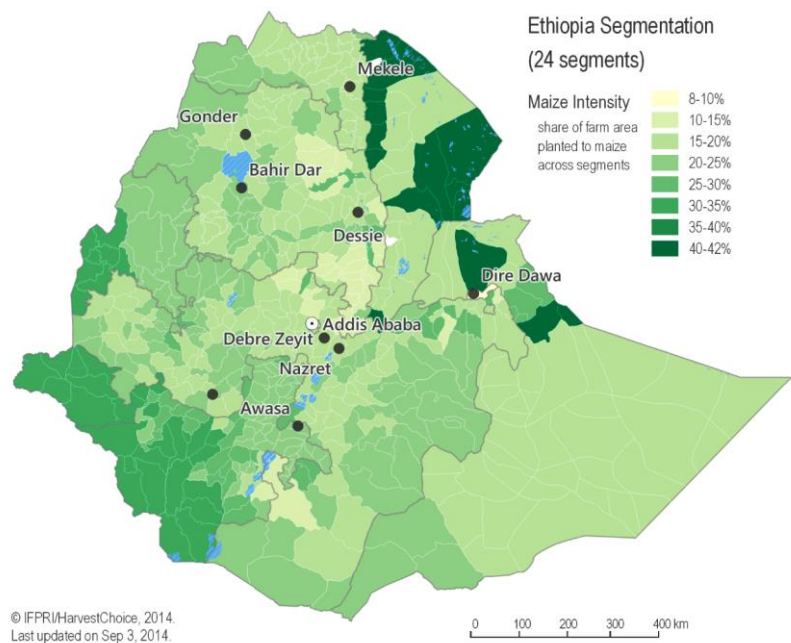


Fig. 17 Teff Production across Segments

Source: SPAM 2005

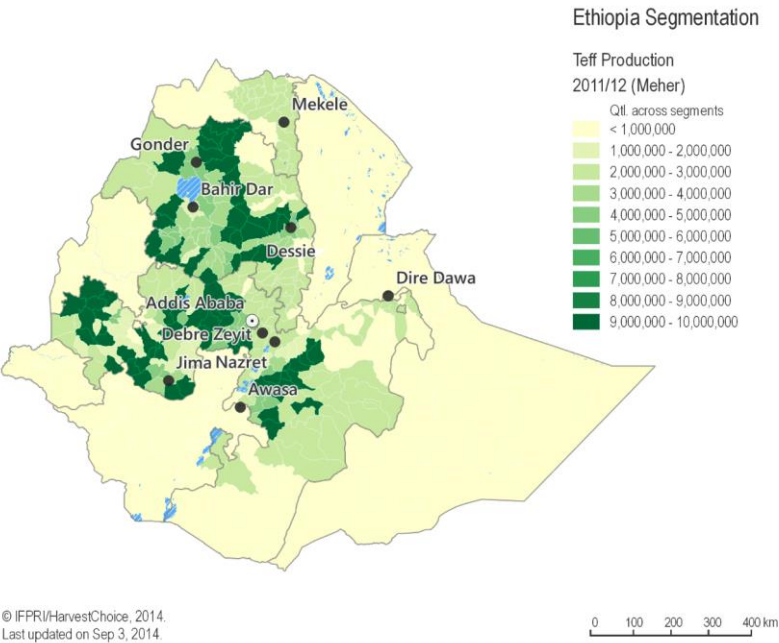
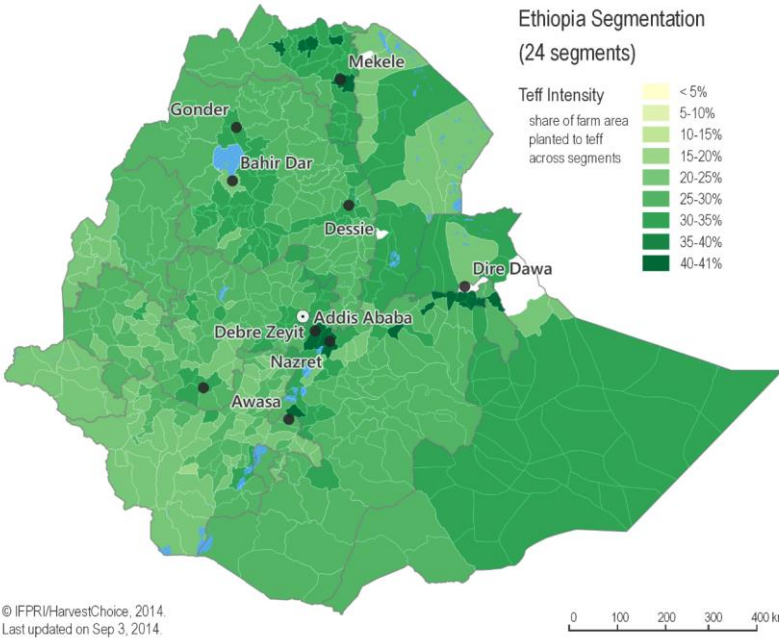
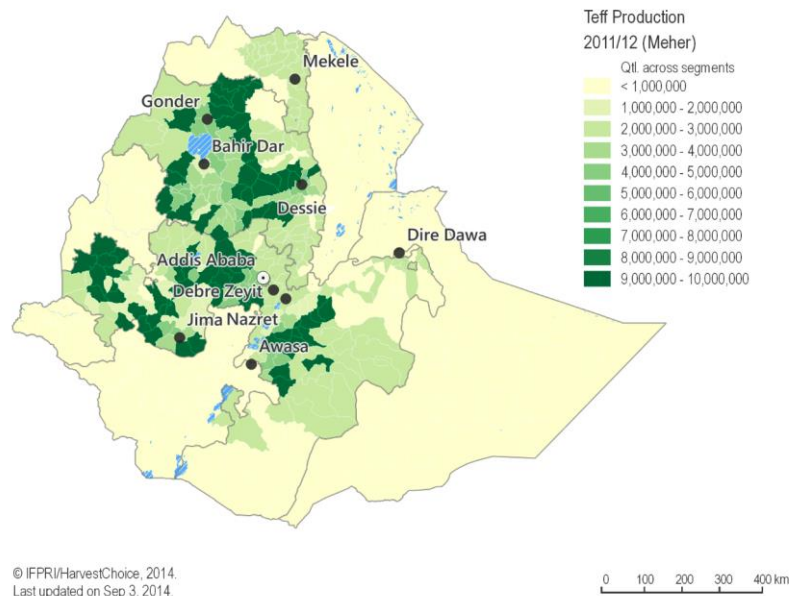


Fig. 18 Teff Intensity across Segments

Source: SPAM 2005.



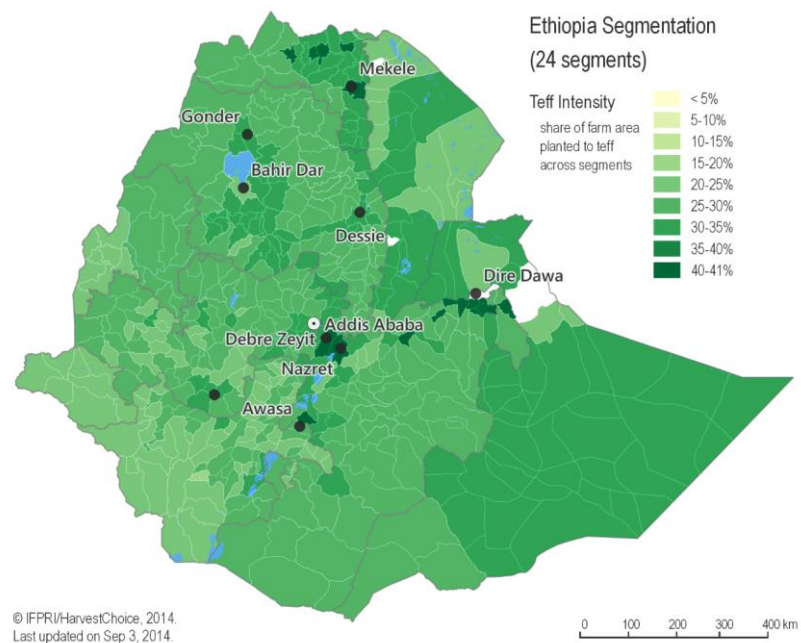
Ethiopia Segmentation

**Fig. 19 Teff Production across Segments**

Source: SPAM 2005

Fig. 20 Teff Intensity across Segments

Source: SPAM 2005.



Tab. 6 Key Characteristics of the Proposed 24 Segments

Segment	Rural Population (%)	Poverty Headcount		Aggregate Yield Gap (\$/ha)	Crop Area*** (%)	Aggregate Value of Production (%)	Technical Efficiency (index)
		Ratio* (%)	Rural Poor** (%)				
DPH-TH-PH	4.37	67	4.34	3549	4.13	5.13	0.23
DPH-TH-PL	1.19	53	0.94	4720	7.55	1.34	0.11
DPH-TH-PM	7.67	57	6.87	2161	1.69	6.65	0.16
DPH-TL-PH	5.14	69	5.30	2096	3.87	4.34	0.17
DPH-TL-PL	5.36	76	6.19	645	7.06	4.48	0.21
DPH-TL-PM	6.62	69	7.25	995	4.95	6.79	0.16
HL-TL-PL	2.08	59	2.07	882	0.06	0.74	0.10
HL-TL-PM	0.22	92	0.45	347	1.15	0.06	0.02
PL-TH-PH	0.23	70	0.23	5447	0.08	0.08	0.15
PL-TH-PL	0.72	68	0.80	806	0.3	0.34	0.06
PL-TH-PM	0.2	50	0.15	1317	0.52	0.41	0.24
PL-TL-PL	0.68	58	0.52	1665	0.66	0.53	0.12
RSH-C-TH-PH	5.73	79	5.78	2612	8.62	8.67	0.24
RSH-C-TH-PL	0.42	67	0.40	436	6.08	0.12	0.10
RSH-C-TH-PM	5.12	48	3.10	1471	0.14	6.45	0.09
RSH-C-TL-PH	5.8	65	5.97	1939	6.89	6.84	0.16
RSH-C-TL-PL	4.77	52	3.83	855	24.02	8.95	0.15
RSH-C-TL-PM	18.51	69	20.28	886	10.13	21.58	0.21
RSH-E-TH-PH	10.79	71	11.19	3022	3.05	5.55	0.20
RSH-E-TH-PM	1.31	90	1.58	3561	0.6	0.70	0.30
RSH-E-TL-PH	8.23	56	7.09	2637	4.26	6.30	0.18
RSH-E-TL-PL	0.86	55	0.89	1451	2.51	1.56	0.24
RSH-E-TL-PM	3.94	83	4.78	2033	1.66	2.37	0.27
Ethiopia	99.6	66	100.00	1804	100.00	100.00	0.17
5 Priority segments	39.93	65	40	1553	50	52.00	0.13

Source: IFPRI calculations based on ERSS (2011/12) and Ethiopia's Agricultural Census (2011/12)

* Below \$2/day. ** Computed as the share of rural poor households in a given segment relative to the total number of rural poor households in Ethiopia.

*** Crop area corresponds to 80 percent of total farm area in Ethiopia.

Tab. 7 Area and Production across Segments (Ethiopia 2011/12, Meher season, Private Peasant Holdings)

Segment	Private Farms (total)	Holders (total)	Female Holders (share)	Area (total, ha)	Std. Err. (ha)	Land Ownership (share owned)	Production (total, qtl)
DPH.TH.PH	607,951	607,951	21%	651,120	25,494	92%	12,018,102
DPH.TH.PM	1,052,634	1,052,947	24%	1,293,151	36,081	88%	20,278,149
DPH.TH.PL	221,585	221,585	18%	278,979	13,462	83%	3,755,447
DPH.TL.PH	625,668	625,668	16%	664,612	40,214	93%	12,519,356
DPH.TL.PM	1,010,343	1,010,343	17%	1,235,868	34,835	91%	17,098,593
DPH.TL.PL	643,299	643,299	19%	860,497	28,363	85%	13,008,452
HL.TL.PM	17,477	17,477	14%	10,506	1,331	94%	193,362
HL.TL.PL	279,232	279,232	23%	206,088	8,798	93%	2,575,671
PL.TH.PH	22,916	22,916	12%	15,786	736	93%	183,105
PL.TH.PM	39,733	39,733	16%	60,666	5,700	95%	950,404
PL.TH.PL	137,273	137,295	17%	105,164	5,360	90%	1,270,010
PL.TL.PL	169,395	169,395	17%	109,760	9,035	83%	1,557,858
RSH-C.TH.PH	1,068,219	1,068,219	18%	1,493,446	44,107	90%	23,321,680
RSH-C.TH.PM	568,105	568,105	15%	1,088,333	39,708	87%	15,531,925
RSH-C.TH.PL	14,633	14,633	15%	24,076	3,759	85%	383,181
RSH-C.TL.PH	999,698	999,698	21%	1,184,480	35,809	88%	18,884,765
RSH-C.TL.PM	2,714,639	2,715,231	19%	4,129,245	69,689	87%	61,088,244
RSH-C.TL.PL	891,201	891,201	18%	1,774,202	48,590	86%	24,036,282
RSH-E.TH.PH	1,062,265	1,062,265	20%	580,605	16,154	97%	13,673,672
RSH-E.TH.PM	94,120	94,120	17%	100,350	9,221	96%	2,316,440
RSH-E.TL.PH	1,299,605	1,299,605	21%	857,030	21,897	96%	16,758,094
RSH-E.TL.PM	485,215	485,215	18%	468,751	14,986	94%	7,143,049
RSH-E.TL.PL	253,551	253,551	18%	288,472	14,667	94%	4,469,889
Ethiopia, 2011/12 (Meher)	14,278,756	14,279,683	19%	17,481,186	108,993	90%	273,015,731

Note: area include grazing lands and other land uses (e.g. fallows)

Tab. 8 Area and Production across Segments (Ethiopia 2011/12, Meher season, Private Peasant Holdings)

Segment	Plots (mean)	Crops Grown (mean)	Area (mean, ha)	Production (mean, kg)	Area (median, ha)	Production (median, kg)	Farms <.5ha (share)
DPH.TH.PH	10	7	1.07	1,977	0.72	1,279	36%
DPH.TH.PM	9	6	1.23	1,926	0.81	1,156	32%
DPH.TH.PL	7	5	1.26	1,695	1.06	1,308	27%
DPH.TL.PH	10	7	1.06	2,001	0.68	1,192	38%
DPH.TL.PM	12	8	1.22	1,692	0.85	1,171	33%
DPH.TL.PL	7	6	1.34	2,022	0.95	1,153	32%
HL.TL.PM	13	10	0.60	1,106	0.46	854	54%
HL.TL.PL	8	7	0.74	922	0.47	574	53%
PL.TH.PH	8	5	0.69	799	0.58	608	41%
PL.TH.PM	5	5	1.53	2,392	1.23	1,818	13%
PL.TH.PL	3	2	0.77	925	0.38	-	55%
PL.TL.PL	8	6	0.65	920	0.42	536	53%
RSH-C.TH.PH	12	8	1.40	2,183	1.09	1,538	26%
RSH-C.TH.PM	14	10	1.92	2,734	1.57	2,053	14%
RSH-C.TH.PL	16	12	1.65	2,619	1.46	2,292	11%
RSH-C.TL.PH	11	8	1.18	1,889	0.97	1,316	28%
RSH-C.TL.PM	12	9	1.52	2,250	1.16	1,680	23%
RSH-C.TL.PL	10	7	1.99	2,697	1.55	2,026	19%
RSH-E.TH.PH	12	9	0.55	1,287	0.38	795	62%
RSH-E.TH.PM	13	9	1.07	2,461	0.65	1,460	42%
RSH-E.TL.PH	13	9	0.66	1,289	0.45	845	55%
RSH-E.TL.PM	13	10	0.97	1,472	0.68	993	40%
RSH-E.TL.PL	12	9	1.14	1,763	0.93	1,385	28%
Ethiopia, 2011/12 (Meher)	11	8	1.22	1,912	0.83	1,262	34%

Note: area include grazing lands and other land uses (e.g. fallows)

Tab. 9 Area and Production across Commodity Groups (Ethiopia 2011/12, Meher)

Crop	Private Farms (total)	Holders (total)	Female Holders (share)	Area (total, ha)	Std. Err. (ha)	Land Ownership (share owned)	Production (total, qtl)
Maize	8,921,266	8,921,266	18%	2,049,392	24,785	92%	60,556,134
Wheat	4,104,473	4,104,473	16%	1,434,190	23,207	84%	29,075,740
Sorghum	4,912,063	4,912,063	14%	1,923,441	27,145	86%	39,506,902
Millet	1,488,848	1,488,848	11%	430,625	9,806	80%	6,486,662
Enset	4,249,817	4,249,817	19%	312,158	5,420	97%	7,288,454
Teff	5,954,391	5,954,704	14%	2,726,521	31,601	80%	34,920,798
Rice	88,879	88,879	7%	30,649	3,278	77%	886,185
Other Cereals	4,028,968	4,028,968	16%	982,655	16,641	88%	16,386,117
Cassava	6,389	6,389	17%	72	28	96%	-
Groundnuts	262,780	262,780	10%	64,477	3,455	83%	1,034,788
Coffee	3,903,705	3,904,037	15%	515,480	11,841	97%	3,765,716
Cash Crops	5,622,948	5,622,948	16%	268,112	6,307	97%	12,393,054
Legumes	7,266,244	7,266,244	16%	1,618,362	20,395	88%	23,148,922
Oilseeds	4,550,618	4,550,618	16%	837,015	19,282	88%	6,246,328
Fibres	134,499	134,499	15%	9,887	1,939	91%	-
Fruits	3,559,260	3,559,282	17%	75,322	3,283	97%	5,477,408
Vegetables	7,206,720	7,206,720	17%	557,277	10,834	95%	8,309,104
Roots & Tubers	5,873,681	5,873,681	17%	229,334	5,574	95%	17,533,419
Others	13,506	13,506	20%	403	249	96%	-
Grazing Land	8,516,721	8,516,721	17%	2,889,513	40,272	96%	-
Other Land Uses	14,053,612	14,053,612	19%	526,301	8,899	95%	-
Ethiopia, 2011/12 (Meher)	14,278,756	14,279,683	19%	17,481,186	108,993	90%	273,015,731

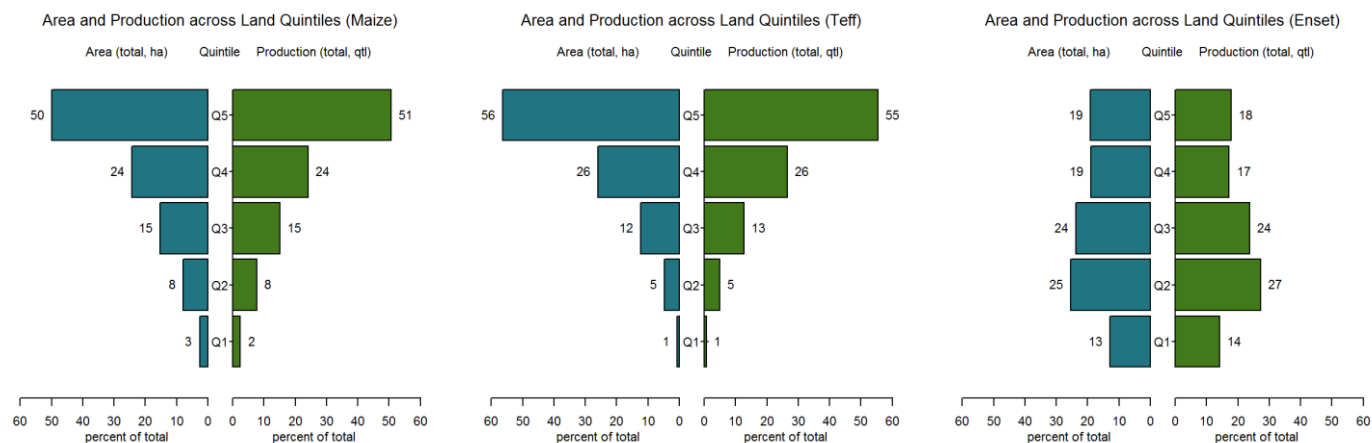
Tab. 10 Area and Production across Commodity Groups (Ethiopia 2011/12, Meher)

Crop	Plots (mean)	Area (mean, ha)	Production (mean, kg)	Area (median, ha)	Production (median, kg)	Farms <5ha (share)
Maize	1.9	0.23	679	0.11	271	25%
Wheat	1.8	0.35	708	0.21	331	16%
Sorghum	2.0	0.39	804	0.26	445	18%
Millet	1.4	0.29	436	0.20	272	9%
Enset	2.0	0.07	172	0.04	64	43%
Teff	1.9	0.46	586	0.30	337	12%
Rice	2.0	0.34	997	0.23	491	7%
Other Cereals	1.8	0.24	407	0.13	170	19%
Cassava	1.3	0.01	-	0.00	-	65%
Groundnuts	1.6	0.25	394	0.13	196	11%
Coffee	2.3	0.13	96	0.04	24	35%
Cash Crops	1.9	0.05	220	0.01	15	28%
Legumes	2.2	0.22	319	0.11	124	22%
Oilseeds	1.6	0.18	137	0.04	21	20%
Fibres	1.2	0.07	-	0.01	-	26%
Fruits	2.5	0.02	154	0.01	47	34%
Vegetables	1.8	0.08	115	0.01	33	27%
Roots & Tubers	2.1	0.04	299	0.01	92	28%
Others	1.3	0.03	-	0.00	-	50%
Grazing Land	2.4	0.34	-	0.13	-	24%
Other Land Use	1.4	0.04	-	0.02	-	34%
Ethiopia, 2011/12 (Meher)	11	1.22	1,912	0.83	1,262	34%

Tab. 11 Quintiles of Farm Size (Ethiopia, ha)

	Q1	Q2	Q3	Q4	Q5
Probability	20%	40%	60%	80%	100%
Quintiles (ha)	0.27	0.62	1.10	1.91	46.41
Private Farms	2,855,747	2,855,367	2,855,951	2,855,650	2,856,042

Fig. 21 Area and Production across Quintiles of Farm Size (Maize, Teff, Enset)



Tab. 12 Distribution of Private Farms across Segments and Quintiles of Farm Size

Segment	Q1	Q2	Q3	Q4	Q5
DPH.TH.PH	120,233	142,075	147,474	116,787	81,383
DPH.TH.PM	187,251	231,523	227,844	207,138	198,878
DPH.TH.PL	35,125	32,956	45,882	60,623	46,998
DPH.TL.PH	122,066	164,745	156,711	111,433	70,712
DPH.TL.PM	192,975	200,239	213,886	203,373	199,870
DPH.TL.PL	144,024	90,032	124,277	132,477	152,491
HL.TL.PM	4,897	5,431	4,742	2,288	119
HL.TL.PL	92,043	75,052	50,901	40,945	20,291
PL.TH.PH	5,324	7,117	6,932	2,702	841
PL.TH.PM	1,626	5,730	9,732	13,343	9,301
PL.TH.PL	62,649	16,511	22,294	21,308	14,512
PL.TL.PL	71,104	32,094	33,028	18,928	14,242
RSH-C.TH.PH	175,595	152,711	209,586	249,715	280,612
RSH-C.TH.PM	43,248	56,483	96,354	153,888	218,132
RSH-C.TH.PL	1,052	1,445	1,999	5,728	4,409
RSH-C.TL.PH	156,529	195,430	198,057	261,386	188,296
RSH-C.TL.PM	375,014	388,809	534,081	644,604	772,131
RSH-C.TL.PL	113,217	83,432	121,744	220,666	352,142
RSH-E.TH.PH	400,043	342,913	199,619	84,538	35,151
RSH-E.TH.PM	23,587	20,956	20,716	12,928	15,933
RSH-E.TL.PH	388,055	433,733	271,506	141,038	65,273
RSH-E.TL.PM	105,140	121,693	106,426	82,925	69,030
RSH-E.TL.PL	34,950	54,257	52,161	66,887	45,296

Tab. 13 Harvested Area across Segments and Quintiles of Farm Size (ha)

Segment	Q1	Q2	Q3	Q4	Q5
DPH.TH.PH	16,196	62,004	124,464	168,373	280,082
DPH.TH.PM	21,233	102,088	191,506	297,110	681,214
DPH.TH.PL	3,248	14,509	39,060	89,998	132,164
DPH.TL.PH	16,950	72,604	129,703	159,689	285,666
DPH.TL.PM	22,304	87,567	180,449	297,517	648,030
DPH.TL.PL	13,520	39,249	105,512	194,386	507,830
HL.TL.PM	757	2,252	4,016	3,199	281
HL.TL.PL	12,474	31,995	42,709	59,281	59,629
PL.TH.PH	606	3,265	5,738	3,813	2,363
PL.TH.PM	183	2,637	8,158	19,874	29,814
PL.TH.PL	3,206	7,170	18,923	30,586	45,279
PL.TL.PL	5,289	14,500	27,126	27,786	35,059
RSH-C.TH.PH	20,011	67,722	175,992	368,772	860,949
RSH-C.TH.PM	4,758	25,720	83,192	232,974	741,690
RSH-C.TH.PL	158	763	1,837	8,683	12,635
RSH-C.TL.PH	15,958	88,000	170,340	382,363	527,819
RSH-C.TL.PM	42,882	174,201	452,216	951,521	2,508,424
RSH-C.TL.PL	9,491	36,563	105,410	328,879	1,293,859
RSH-E.TH.PH	58,199	143,971	162,630	119,352	96,453
RSH-E.TH.PM	3,270	9,098	17,404	18,016	52,561
RSH-E.TL.PH	61,661	183,210	223,252	197,992	190,914
RSH-E.TL.PM	14,783	51,742	89,742	119,409	193,075
RSH-E.TL.PL	4,474	23,799	43,949	94,838	121,412

Tab. 14 Production across Segments and Quintiles of Farm Size (quintal=100kg)

Segment	Q1	Q2	Q3	Q4	Q5
DPH.TH.PH	351,714	1,185,025	2,436,335	3,014,614	5,030,414
DPH.TH.PM	318,130	1,715,009	3,139,867	5,028,679	10,076,464
DPH.TH.PL	51,863	254,003	613,293	1,278,927	1,557,363
DPH.TL.PH	390,498	1,628,894	2,685,407	3,008,281	4,806,276
DPH.TL.PM	409,457	1,531,498	3,009,732	4,307,497	7,840,409
DPH.TL.PL	191,106	601,295	1,607,521	3,077,365	7,531,165
HL.TL.PM	19,205	56,713	71,697	41,548	4,199
HL.TL.PL	203,998	497,127	593,835	685,602	595,109
PL.TH.PH	6,305	47,414	71,330	39,444	18,613
PL.TH.PM	1,986	47,661	161,350	363,054	376,353
PL.TH.PL	20,834	75,167	221,120	486,482	466,406
PL.TL.PL	80,732	249,285	430,380	364,873	432,588
RSH-C.TH.PH	423,757	1,224,121	2,919,851	5,938,063	12,815,888
RSH-C.TH.PM	74,187	362,865	1,315,991	3,394,650	10,384,232
RSH-C.TH.PL	3,038	12,464	36,903	149,137	181,640
RSH-C.TL.PH	413,712	1,879,059	2,818,324	5,903,523	7,870,147
RSH-C.TL.PM	784,378	3,082,956	7,984,256	15,263,288	33,973,365
RSH-C.TL.PL	150,379	518,690	1,518,025	4,981,157	16,868,032
RSH-E.TH.PH	1,831,318	4,322,841	3,816,626	2,320,465	1,382,422
RSH-E.TH.PM	75,657	270,066	455,271	380,540	1,134,906
RSH-E.TL.PH	1,626,908	4,231,115	4,558,276	3,500,648	2,841,147
RSH-E.TL.PM	309,385	988,947	1,415,251	1,766,424	2,663,042
RSH-E.TL.PL	96,856	448,820	728,659	1,453,947	1,741,607

Source: Authors, ERSS 2011

Tab.15 Household Population across Segments

Segment	Households (total)	Farm Households (total)	Female-headed Hhld (share)	Female-headed Hhld (total)
DPH,TH,PH	489,810	477,194	0.16	77,972.69
DPH,TH,PL	155,828	131,012	0.25	39,695.58
DPH,TH,PM	924,549	840,251	0.31	290,383.05
DPH,TL,PH	587,778	546,276	0.18	103,297.68
DPH,TL,PL	637,479	600,156	0.23	148,151.75
DPH,TL,PM	825,870	752,569	0.22	180,460.23
HL,TL,PL	268,968	255,440	0.21	55,909.75
HL,TL,PM	36,231	36,231	0.25	9,057.67
PLS,TH,PH	25,145	24,463	0.15	3,706.82
PLS,TH,PL	94,177	87,452	0.15	14,087.36
PLS,TH,PM	26,267	23,372	0.22	5,825.44
PLS,TL,PL	72,883	65,729	0.22	16,024.18
RSHC,TH,PH	635,892	517,481	0.20	124,580.90
RSHC,TH,PL	44,798	44,798	0.17	7,466.27
RSHC,TH,PM	585,057	500,893	0.18	107,240.93
RSHC,TL,PH	694,538	662,589	0.14	99,623.81
RSHC,TL,PL	565,293	531,654	0.20	113,786.26
RSHC,TL,PM	2,322,349	2,123,296	0.20	458,311.99
RSHE,TH,PH	1,178,663	1,161,447	0.13	148,757.45
RSHE,TH,PM	130,239	128,740	0.08	10,320.24
RSHE,TL,PH	977,449	920,048	0.23	220,833.57
RSHE,TL,PL	121,741	121,003	0.25	30,446.83
RSHE,TL,PM	439,964	425,533	0.21	91,639.24
Ethiopia	11,840,968	10,977,625		

Tab. 16 Livestock Ownership across Segments (mean per farm)

Segment	Cattle	Sheep	Goats	Other Large Ruminants	Chicken
DPH.TH.PH	3.1	0.81	1.8	0.82	3.3
DPH.TH.PL	3	2.1	5	1.5	1.9
DPH.TH.PM	4.2	1.6	1.2	0.87	3.8
DPH.TL.PH	3.6	1.3	1.4	0.83	2.4
DPH.TL.PL	5.8	2.8	6.6	1.6	4.3
DPH.TL.PM	3.3	3.1	1.2	0.75	3.6
HL.TL.PL	2.6	1.1	1.9	0.47	5.3
HL.TL.PM	2.4	4.9	0	0.2	3.2
PLS.TH.PH	2.4	2.5	8.5	1.2	4.5
PLS.TH.PL	11	8.9	15	1.6	0
PLS.TH.PM	3.2	2.6	3.9	1.1	1.6
PLS.TL.PL	5.2	12	16	3.4	1.4
RSH C.TH.PH	4.3	1.6	0.7	0.92	4.7
RSH C.TH.PL	5.9	3.9	0.56	0.56	3
RSH C.TH.PM	6.1	1.7	1.8	0.97	9.2
RSH C.TL.PH	3.3	1	0.58	0.4	4.5
RSH C.TL.PL	5.4	1.1	1.2	0.76	3.3
RSH C.TL.PM	4.8	2.4	1.2	0.84	4.8
RSH E.TH.PH	2.5	0.72	0.35	0.2	2.4
RSH E.TH.PM	4.9	0.81	0.73	0.6	3.6
RSH E.TL.PH	2.8	1.1	0.39	0.46	1.5
RSH E.TL.PL	2.9	1.2	1.2	0.051	2.1
RSH E.TL.PM	4.7	1.9	1.5	0.31	4.4

Tab. 17 Percent of Livestock Products Consumed on the Farm (mean per farm)

Segment	Milk	Butter	Cheese	Beef	Goat	Eggs	Hides	Skin	Honey	Wax	Arera	Aguat
DPH.TH.PH	60	69			97	25	97		85		100	
DPH.TH.PL	57	87	99		100	29	76				99	99
DPH.TH.PM	58	67	87	31	99	33	31	63	69		98	99
DPH.TL.PH	53	59	100		89	23	12				88	88
DPH.TL.PL	87	83	100		92	27	38	70	63		89	98
DPH.TL.PM	46	51	96	37	99	33	27		33		93	81
HL.TL.PL	49	61	89	45	100	36	80				78	100
HL.TL.PM	14	82										
PLS.TH.PH	69				90	3	60					
PLS.TH.PL	85	94			97		89				94	
PLS.TH.PM	63											
PLS.TL.PL	95	85			86	71	85	84			92	
RSHC.TH.PH	39	61	96		100	24	39		57		45	90
RSHC.TH.PL	2	35				3					100	
RSHC.TH.PM	35	76	87		100	46	91		63	25	52	26
RSHC.TL.PH	55	84	93		93	38	32		44		82	99
RSHC.TL.PL	71	64	91	49	96	53	48		62	27	80	47
RSHC.TL.PM	53	75	96		94	25	44	71	40	36	73	82
RSHE.TH.PH	29	59	55		100	26					72	91
RSHE.TH.PM	40	54	66			21					65	100
RSHE.TL.PH	29	62	62		100	39	65		77		54	93
RSHE.TL.PL	59	71	75		62	41	-		25		31	91
RSHE.TL.PM	40	62	76		99	32	12		17		38	86

Tab. 18 Average Sales Value of Major Livestock Groups (BIRR, mean per farm)

Segments	Cattle	Sheep	Goats	Other Ruminants	Chicken
DPH.TH.PH	1,405.93	110.52	65.31	0.32	18.44
DPH.TH.PL	631.94	71.42	398.87	429.12	26.30
DPH.TH.PM	804.12	126.51	97.07	337.20	56.06
DPH.TL.PH	1,810.74	117.06	90.61	22.12	9.41
DPH.TL.PL	1,539.46	129.36	372.92	946.11	24.55
DPH.TL.PM	2,040.47	135.05	108.44	47.67	21.54
HL.TL.PL	242.43	13.80	3.29	-	2.44
HL.TL.PM	200.00	10.00	-	-	-
PLS.TH.PH	452.32	134.94	404.30	21.22	11.21
PLS.TH.PL	780.84	2,127.34	520.46	-	-
PLS.TH.PM	145.82	269.57	222.51	-	-
PLS.TL.PL	219.77	1,585.01	348.89	3.31	0.21
RSHC.TH.PH	1,213.64	192.44	218.93	97.64	51.66
RSHC.TH.PL	1,000.00	138.89	38.89	133.33	27.78
RSHC.TH.PM	1,831.71	68.66	25.42	31.39	55.06
RSHC.TL.PH	1,250.25	53.92	47.96	36.88	26.14
RSHC.TL.PL	1,303.15	43.83	34.95	32.50	14.41
RSHC.TL.PM	899.06	210.96	52.97	77.35	39.87
RSHE.TH.PH	684.64	57.35	18.20	33.58	8.81
RSHE.TH.PM	284.25	26.77	120.23	24.25	11.29
RSHE.TL.PH	1,139.93	84.39	29.26	35.43	8.72
RSHE.TL.PL	805.37	165.43	42.22	-	8.64
RSHE.TL.PM	760.08	120.59	52.34	48.52	8.42

Source: Authors, ERSS 2011

Tab. 19 Access to Information and Services (share of households)

Segment	Household owns a mobile phone	Households who receive credit	Households who receive credit from bank or MFI	Household with access to extension services
DPH,TH,PH	0.42	0.19	0.11	0.41
DPH,TH,PL	0.37	0.29	0.13	0.39
DPH,TH,PM	0.35	0.43	0.28	0.48
DPH,TL,PH	0.17	0.27	0.15	0.09
DPH,TL,PL	0.27	0.20	0.09	0.30
DPH,TL,PM	0.18	0.14	0.05	0.12
HL,TL,PL	0.36	0.28	0.11	0.24
HL,TL,PM	0.08	-	-	0.42
PLS,TH,PH	0.23	0.19	0.02	-
PLS,TH,PL	0.38	0.04	0.00	0.01
PLS,TH,PM	0.39	-	-	-
PLS,TL,PL	0.27	0.08	-	-
RSHC,TH,PH	0.17	0.65	0.45	0.34
RSHC,TH,PL	-	0.17	0.08	0.08
RSHC,TH,PM	0.38	0.37	0.10	0.23
RSHC,TL,PH	0.33	0.32	0.16	0.60
RSHC,TL,PL	0.34	0.32	0.07	0.44
RSHC,TL,PM	0.14	0.22	0.12	0.49
RSHE,TH,PH	0.24	0.32	0.04	0.19
RSHE,TH,PM	0.25	0.39	0.05	0.52
RSHE,TL,PH	0.25	0.34	0.09	0.17
RSHE,TL,PL	0.50	0.33	0.02	0.15
RSHE,TL,PM	0.10	0.21	0.12	0.31
Ethiopia	0.25	0.30	0.13	0.33

Tab. 20 Average Annual Income across Segments and Income Quintiles (BIRR)

Segment	per Adult Eq.	Lowest	Q2	Q3	Q4	Highest
DPH,TH,PH	855	273.84	413.12	604.16	899.58	18787.33
DPH,TH,PL	1,022	227.62	418.1	626.69	898.55	2123.77
DPH,TH,PM	1,056	225.19	410.53	603.62	921.68	2299.05
DPH,TL,PH	856	186.9	398.27	618.98	868.63	2365.25
DPH,TL,PL	700	190.77	397.34	602.39	853.59	1912.64
DPH,TL,PM	790	174.73	388.02	619.4	922.61	2302.02
HL,TL,PL	934	220.66	384.89	599.71	923.59	2523.52
HL,TL,PM	340	171.76		651.74	754.93	
PLS,TH,PH	901	221.64	403.05	588.14	903.85	8104.17
PLS,TH,PL	942	222.85	390.75	609.6	848.27	3468.45
PLS,TH,PM	1,469	161.44	474.57	584.33	937.36	2145.72
PLS,TL,PL	1,146	212.76	427.05	558.07	853.5	2208.08
RSHC,TH,PH	727	180.76	410.66	600.1	882.41	2217.49
RSHC,TH,PL	864	189.36	375.34	610.68	954.17	2270.85
RSHC,TH,PM	1,294	260.05	397.97	606.93	903.23	2342.95
RSHC,TL,PH	951	211.04	396.98	619.62	881.52	3501.52
RSHC,TL,PL	1,352	208.44	391.65	640.36	922.4	2387.83
RSHC,TL,PM	926	185.68	398.69	598.84	889.17	2473.48
RSHE,TH,PH	970	198.77	411.77	603.38	911.02	3061.26
RSHE,TH,PM	538	137.98	357	620.27	883.52	2152.37
RSHE,TL,PH	1,288	186.68	431.57	610.53	875.93	2783.09
RSHE,TL,PL	934	187.61	393.09	638.38	960.92	2723.89
RSHE,TL,PM	704	198.29	392.94	597.43	894.96	3305.38

Source: Authors, ERSS 2011 (income based on consumption)

Tab. 21 Distribution of Households across Segments and Income Quintiles

Segment	Lowest	Q2	Q3	Q4	Highest
DPH.TH.PH	34,003	87,985	96,843	168,352	102,173
DPH.TH.PL	14,552	11,949	31,591	55,620	34,651
DPH.TH.PM	162,427	152,218	139,687	201,502	268,714
DPH.TL.PH	70,822	126,750	146,397	147,062	91,587
DPH.TL.PL	150,784	132,388	123,766	127,005	90,444
DPH.TL.PM	221,482	180,008	147,201	134,005	143,034
HL.TL.PL	48,243	49,756	38,258	72,938	55,332
HL.TL.PM	24,154		9,058	3,019	
PLS.TH.PH	3,062	3,959	7,195	4,892	5,715
PLS.TH.PL	14,449	15,772	25,883	21,768	11,763
PLS.TH.PM	1,483	1,483	1,483	5,860	11,581
PLS.TL.PL	7,579	13,321	8,245	17,271	24,978
RSHC.TH.PH	174,849	102,267	123,014	155,842	79,919
RSHC.TH.PL	7,466	7,466	11,199	11,199	7,466
RSHC.TH.PM	40,706	78,970	109,591	128,245	227,158
RSHC.TL.PH	115,711	101,114	98,131	206,930	169,688
RSHC.TL.PL	72,841	52,130	115,792	78,347	240,953
RSHC.TL.PM	519,481	507,351	446,392	325,324	523,493
RSHE.TH.PH	248,391	218,351	263,616	244,958	203,036
RSHE.TH.PM	39,891	30,785	26,344	26,978	6,240
RSHE.TL.PH	160,649	153,924	136,634	202,157	323,867
RSHE.TL.PL	30,783	15,155	23,856	30,815	20,915
RSHE.TL.PM	179,732	101,384	70,493	40,443	47,912
Ethiopia, 2011	2,343,540	2,144,486	2,200,669	2,410,532	2,690,619

Tab. 22 Distribution of Farm Households across Segments and Commodity Groups
(Ethiopia, 2011/12, Private Peasant Holdings) 1/3

Segment	Maize	Wheat	Sorghum	Millet	Enset	Teff	Rice	Other Cereals
DPH.TH.PH	454,654	184,646	285,341	61,788	70,313	254,545	33	156,804
DPH.TH.PM	628,398	447,133	433,132	115,511	47,661	534,848	2,060	453,893
DPH.TH.PL	161,015	12,272	139,939	79,287	-	95,066	-	33,468
DPH.TL.PH	438,143	115,809	355,424	52,531	68,338	149,569	-	174,676
DPH.TL.PM	495,459	361,782	399,295	11,457	153,355	467,366	540	416,297
DPH.TL.PL	441,697	68,960	318,954	116,263	12,726	141,672	18,055	70,730
HL.TL.PM	3,474	4,015	4,176	-	17,120	1,380	-	9,701
HL.TL.PL	193,484	10,741	149,902	25,664	64,081	32,562	459	26,708
PL.TH.PH	5,053	151	20,426	-	-	-	-	202
PL.TH.PM	31,262	13,693	29,245	-	-	-	-	5,542
PL.TH.PL	38,078	3,393	30,775	-	-	161	-	860
PL.TL.PL	72,679	37,262	54,908	15,916	17,159	48,205	-	51,788
RSH-C.TH.PH	786,752	337,819	240,217	162,643	256,845	570,072	32,048	308,398
RSH-C.TH.PM	508,401	182,756	240,455	111,836	173,965	321,272	562	142,842
RSH-C.TH.PL	14,045	6,998	9,133	805	2,142	11,656	-	5,304
RSH-C.TL.PH	683,635	419,185	213,280	94,352	130,793	532,837	14,174	321,640
RSH-C.TL.PM	1,770,246	1,031,578	1,076,179	424,321	557,254	1,480,536	11,465	966,155
RSH-C.TL.PL	669,508	257,862	305,021	111,526	79,759	374,080	6,081	215,265
RSH-E.TH.PH	542,699	216,695	177,401	14,467	900,315	256,453	375	148,633
RSH-E.TH.PM	55,361	23,888	30,709	-	63,681	42,755	-	25,086
RSH-E.TL.PH	537,471	267,652	190,383	31,220	1,149,775	314,592	324	306,858
RSH-E.TL.PM	264,301	66,567	149,697	10,963	333,673	219,467	-	119,128
RSH-E.TL.PL	125,450	33,613	58,070	48,298	150,860	105,295	2,703	68,988

Note: these results are all statistically significant due too small sample sizes

**Tab. 23 Distribution of Farm Households across Segments and Commodity Groups
(Ethiopia, 2011/12, Private Peasant Holdings) 2/3**

Segment	Cassava	Groundnuts	Coffee	Cash Crops	Legumes	Oilseeds	Fibres
DPH.TH.PH	-	39,751	102,237	310,126	305,928	120,339	703
DPH.TH.PM	-	35,884	47,873	282,402	480,835	164,763	4,620
DPH.TH.PL	-	8,136	1,613	17,927	66,314	72,277	1,529
DPH.TL.PH	-	12,020	178,317	333,602	309,800	190,950	3,856
DPH.TL.PM	-	6,845	199,192	375,391	599,650	324,361	14,246
DPH.TL.PL	272	56,306	67,340	144,684	232,238	248,057	6,907
HL.TL.PM	-	-	7,843	10,090	11,840	4,946	-
HL.TL.PL	-	15,269	64,578	61,217	95,797	97,988	3,913
PL.TH.PH	-	1,139	4,030	12,528	7,943	2,503	-
PL.TH.PM	-	5,008	-	20,470	6,320	2,403	-
PL.TH.PL	-	38	455	5,218	752	90	82
PL.TL.PL	-	-	23,753	52,545	56,882	32,232	558
RSH-C.TH.PH	1,393	2,972	202,680	444,438	548,487	372,072	11,391
RSH-C.TH.PM	597	3,715	259,593	233,109	329,903	244,100	7,618
RSH-C.TH.PL	-	537	6,011	8,584	12,993	10,192	268
RSH-C.TL.PH	-	8,220	113,262	499,837	596,109	396,507	16,222
RSH-C.TL.PM	-	29,580	580,574	1,072,926	1,527,498	1,061,206	19,510
RSH-C.TL.PL	-	24,529	199,113	288,420	370,867	428,408	8,830
RSH-E.TH.PH	2,132	1,591	632,759	558,510	512,681	272,616	1,382
RSH-E.TH.PM	-	-	43,719	34,141	48,774	22,875	15,055
RSH-E.TL.PH	-	4,303	766,005	519,664	678,874	275,164	2,939
RSH-E.TL.PM	1,996	5,404	284,101	200,425	318,561	104,968	13,301
RSH-E.TL.PL	-	1,534	118,656	136,692	147,199	101,603	1,569

**Tab. 24 Distribution of Farm Households across Segments and Commodity Groups
(Ethiopia, 2011/12, Private Peasant Holdings) 3/3**

Segment	Fibres	Fruits	Vegetables	Roots & Tubers	Grazing Land	Other Land Use
DPH.TH.PH	703	105,464	159,488	178,813	275,941	582,698
DPH.TH.PM	4,620	145,795	307,293	228,691	433,942	1,038,251
DPH.TH.PL	1,529	5,128	79,389	6,802	57,889	221,585
DPH.TL.PH	3,856	126,856	232,363	245,731	346,699	591,553
DPH.TL.PM	14,246	131,695	428,927	409,906	537,667	997,346
DPH.TL.PL	6,907	89,354	221,396	125,246	259,339	619,599
HL.TL.PM	-	7,257	10,361	14,209	12,417	17,477
HL.TL.PL	3,913	124,387	132,934	92,583	111,148	272,252
PL.TH.PH	-	7,015	2,716	3,931	8,221	22,633
PL.TH.PM	-	934	3,818	1,493	21,035	39,733
PL.TH.PL	82	15,957	44,776	5,516	38,367	136,200
PL.TL.PL	558	20,367	50,877	51,968	68,216	168,526
RSH-C.TH.PH	11,391	192,071	586,497	464,528	697,979	1,063,484
RSH-C.TH.PM	7,618	206,405	387,849	295,867	415,576	538,215
RSH-C.TH.PL	268	6,852	11,281	11,957	10,675	14,437
RSH-C.TL.PH	16,222	123,434	492,730	426,682	659,237	994,679
RSH-C.TL.PM	19,510	487,063	1,460,408	1,222,559	1,613,440	2,685,756
RSH-C.TL.PL	8,830	165,524	474,347	288,154	480,655	887,404
RSH-E.TH.PH	1,382	567,842	729,221	479,626	861,448	1,053,378
RSH-E.TH.PM	15,055	38,422	58,906	54,085	54,473	93,595
RSH-E.TL.PH	2,939	628,422	864,197	738,629	1,074,844	1,290,739
RSH-E.TL.PM	13,301	271,553	289,132	349,810	309,966	481,749
RSH-E.TL.PL	1,569	91,462	177,815	176,894	167,547	242,322

Tab. 25 Average Input Uses across Segments (share of farms in segment)

Segment	Fertilizer	Purchased Seeds	Herbicide	Pesticide
DPH.TH.PH	0.93	0.62	0.17	0.13
DPH.TH.PL	0.75	0.35	0.17	0.08
DPH.TH.PM	0.83	0.50	0.30	0.07
DPH.TL.PH	0.47	0.61	0.03	0.06
DPH.TL.PL	0.45	0.42	0.14	0.06
DPH.TL.PM	0.70	0.45	0.12	0.10
HL.TL.PL	0.49	0.44	0.02	0.09
HL.TL.PM	0.42	0.17	0.17	-
PLS.TH.PH	0.40	0.17	-	0.03
PLS.TH.PL	0.04	0.67	-	0.01
PLS.TH.PM	0.44	0.46	-	-
PLS.TL.PL	0.04	0.18	-	-
RSHC.TH.PH	0.79	0.74	0.21	0.04
RSHC.TH.PL	0.17	0.33	0.50	0.08
RSHC.TH.PM	0.88	0.79	0.76	0.10
RSHC.TL.PH	0.80	0.67	0.38	0.14
RSHC.TL.PL	0.83	0.66	0.65	0.03
RSHC.TL.PM	0.87	0.55	0.35	0.12
RSHE.TH.PH	0.93	0.72	0.16	0.10
RSHE.TH.PM	1.00	0.31	0.39	0.39
RSHE.TL.PH	0.94	0.64	0.26	0.03
RSHE.TL.PL	0.61	0.44	0.08	0.02
RSHE.TL.PM	0.66	0.45	0.23	0.01
Ethiopia, 2011	0.78	0.58	0.28	0.09

Tab. 26 Area Shares across Segments (percent of area for farms growing crop) 1/2

Segment	Maize	Wheat	Sorghum	Millet	Enset	Teff	Rice	Other Cereals	Cassava
DPH.TH.PH	20.0%	27.1%	31.1%	15.6%	7.5%	40.2%	0.6%	18.5%	
DPH.TH.PL	19.3%	27.1%	40.2%	19.0%	6.8%	32.8%	5.9%	23.3%	
DPH.TH.PM	15.1%	26.1%	43.7%	30.6%		25.9%		17.6%	
DPH.TL.PH	25.2%	16.5%	39.3%	9.5%	15.7%	26.6%		19.3%	
DPH.TL.PL	13.9%	20.3%	37.7%	14.9%	24.1%	29.9%	10.5%	17.4%	
DPH.TL.PM	21.4%	24.0%	37.2%	25.3%	19.1%	27.2%	16.5%	22.3%	3.8%
HL.TL.PL	21.9%	25.2%	11.6%		22.9%	17.3%		25.6%	
HL.TL.PM	31.4%	17.8%	39.9%	15.2%	13.8%	21.9%	1.0%	23.8%	
PLS.TH.PH	8.7%	5.9%	63.8%					10.2%	
PLS.TH.PL	29.1%	26.0%	35.4%					19.7%	
PLS.TH.PM	41.1%	7.7%	37.6%			22.5%		4.1%	
PLS.TL.PL	16.3%	23.7%	53.2%	14.3%	19.5%	31.3%		29.4%	
RSHC.TH.PH	19.7%	23.0%	27.3%	19.1%	13.0%	31.0%	33.2%	20.1%	0.1%
RSHC.TH.PL	21.0%	16.8%	17.1%	15.0%	1.8%	24.8%	15.7%	13.6%	0.1%
RSHC.TH.PM	26.3%	7.1%	10.7%	7.5%	0.3%	27.7%		13.0%	
RSHC.TL.PH	20.3%	23.5%	32.7%	13.9%	9.7%	31.5%	47.5%	18.7%	
RSHC.TL.PL	19.2%	25.9%	27.0%	18.0%	4.7%	29.6%	4.6%	20.4%	
RSHC.TL.PM	20.7%	23.1%	26.7%	19.2%	5.7%	27.7%	7.8%	16.8%	
RSHE.TH.PH	20.9%	26.0%	13.6%	4.6%	19.6%	27.2%	0.3%	13.7%	0.8%
RSHE.TH.PM	16.7%	20.6%	25.9%		12.3%	32.3%		16.7%	
RSHE.TL.PH	20.3%	19.7%	13.6%	5.5%	20.2%	22.8%	26.3%	19.0%	
RSHE.TL.PL	26.5%	19.9%	26.2%	6.9%	10.1%	25.9%		13.2%	4.4%
RSHE.TL.PM	32.8%	12.1%	30.4%	25.6%	13.1%	22.2%	18.2%	15.5%	

Tab. 27 Area Shares across Segments (percent of area for farms growing crop) 2/2

Segment	Groundnuts	Coffee	Cash						Roots	Grazing	Other
			Crops	Legumes	Oilseeds	Fibres	Fruits	Vegetables			
DPH.TH.PH	19.5%	6.9%	16.1%	17.6%	4.6%	1.3%	5.5%	3.5%	6.4%	13.7%	8.2%
DPH.TH.PL	16.6%	8.2%	5.5%	17.4%	5.7%	2.8%	6.0%	3.5%	4.0%	19.6%	9.4%
DPH.TH.PM	25.1%	0.3%	10.5%	19.4%	18.0%	4.7%	0.8%	3.4%	10.0%	20.1%	15.1%
DPH.TL.PH	7.8%	9.7%	15.2%	14.3%	5.3%	1.0%	3.2%	7.1%	7.9%	18.9%	6.5%
DPH.TL.PL	7.6%	26.1%	5.5%	22.5%	5.5%	2.3%	3.9%	6.9%	4.4%	21.8%	7.0%
DPH.TL.PM	18.1%	12.5%	6.3%	14.3%	24.3%	2.4%	3.2%	10.0%	3.2%	32.5%	14.5%
HL.TL.PL		4.1%	6.8%	13.3%	5.5%		2.8%	6.1%	7.0%	22.4%	6.3%
HL.TL.PM	10.2%	14.8%	4.9%	11.4%	16.2%	8.0%	4.1%	17.0%	6.1%	27.6%	9.3%
PLS.TH.PH	14.6%	5.3%	13.7%	8.4%	5.6%		2.9%	3.9%	3.6%	15.9%	21.0%
PLS.TH.PL	24.4%		21.7%	11.6%	1.7%		1.0%	2.4%	1.8%	31.2%	6.3%
PLS.TH.PM	10.3%	3.8%	19.4%	6.8%	0.8%	0.1%	8.5%	72.2%	12.7%	34.1%	44.9%
PLS.TL.PL		12.5%	3.1%	11.9%	7.5%	7.6%	2.6%	4.6%	5.9%	23.0%	28.5%
RSHC.TH.PH	1.0%	20.3%	4.3%	18.6%	6.6%	2.0%	1.4%	5.3%	4.1%	21.2%	6.4%
RSHC.TH.PL	1.2%	22.9%	1.8%	8.7%	10.6%	0.6%	1.4%	4.7%	2.5%	24.1%	4.4%
RSHC.TH.PM	2.4%	6.6%	1.5%	10.8%	4.7%	0.3%	0.7%	4.0%	1.3%	20.8%	1.3%
RSHC.TL.PH	16.1%	11.0%	3.4%	20.0%	7.4%	2.5%	3.3%	7.4%	3.4%	19.6%	6.8%
RSHC.TL.PL	9.6%	11.7%	2.5%	17.3%	10.8%	0.9%	1.7%	5.2%	3.0%	20.5%	5.6%
RSHC.TL.PM	17.8%	17.5%	6.4%	12.6%	25.1%	14.2%	1.8%	8.2%	3.0%	22.6%	8.2%
RSHE.TH.PH	5.0%	16.4%	11.5%	13.6%	2.7%	2.4%	3.8%	5.7%	8.3%	22.0%	6.0%
RSHE.TH.PM		3.6%	2.6%	15.8%	2.1%	22.7%	15.3%	5.9%	11.0%	17.2%	7.9%
RSHE.TL.PH	2.5%	14.1%	6.9%	13.2%	2.4%	2.9%	3.5%	5.2%	11.1%	26.1%	6.0%
RSHE.TL.PL	13.1%	6.3%	3.7%	15.0%	2.7%	5.8%	3.4%	8.2%	8.6%	22.6%	9.4%
RSHE.TL.PM	0.9%	9.7%	1.9%	19.2%	7.1%	0.3%	2.3%	7.1%	5.4%	18.5%	7.8%

Tab. 28 Average Yields across Major Crop Groups and Segments (kg/ha) 1/2

Segment	Beans	Chickpea	Banana		Barley	Coffee	Groundnut	Maize	Millet	Other Cereals
			Plantains							
DPH.TH.PH	582	858	2,862		1,229	64	641	1,680	941	986
DPH.TH.PL	323	478	189		880	-	61	1,271	1,291	722
DPH.TH.PM	472	570	1,376		986	75	368	1,486	964	830
DPH.TL.PH	444	645	2,377		1,037	159	609	1,289	676	860
DPH.TL.PL	243	210	1,004		433	75	291	774	678	365
DPH.TL.PM	407	531	1,213		950	62	699	1,249	948	773
HL.TL.PL	352	176	2,403		438	113	399	964	809	387
HL.TL.PM	408	295	3,643		932	279	36	998	1,197	666
PLS.TH.PH	581	-	6,745		-	382	-	988	-	-
PLS.TH.PL	68	19	1,842		39	230	32	481	3	119
PLS.TH.PM	170	160	10,046		401	90	-	412	-	479
PLS.TL.PL	45	35	1,842		62	73	23	258	-	93
RSHC.TH.PH	680	780	2,065		1,277	226	839	2,037	1,113	942
RSHC.TH.PL	606	614	3,359		898	429	472	1,578	554	671
RSHC.TH.PM	541	679	3,362		876	420	612	1,511	613	720
RSHC.TL.PH	570	694	1,253		1,146	150	859	1,713	1,272	885
RSHC.TL.PL	343	366	1,563		548	206	324	957	370	413
RSHC.TL.PM	491	562	1,964		934	201	652	1,387	782	734
RSHE.TH.PH	680	398	4,599		1,069	457	21	1,801	1,399	756
RSHE.TH.PM	472	383	4,969		847	282	24	1,504	1,181	708
RSHE.TL.PH	492	331	4,087		830	357	35	1,282	1,149	641
RSHE.TL.PL	331	275	3,442		501	354	143	717	964	464
RSHE.TL.PM	393	288	4,096		679	373	76	954	1,056	558
Ethiopia, 2005	483	545	2,188		921	196	532	1,399	886	730

Tab. 29 Average Yields across Major Commodity Groups and Segments (kg/ha) 2/2

Segment	Rice	Sesame	Sorghum	Vegetables	Wheat
DPH.TH.PH	1,154	658	1,224	3,571	1,442
DPH.TH.PL	2,036	173	1,363	3,212	814
DPH.TH.PM	664	507	1,181	2,793	1,193
DPH.TL.PH	461	512	914	2,069	1,133
DPH.TL.PL	953	100	618	1,352	443
DPH.TL.PM	303	464	943	1,791	988
HL.TL.PL	898	24	653	1,869	441
HL.TL.PM	106	41	521	2,375	1,036
PLS.TH.PH	-	449	1,015	1,665	-
PLS.TH.PL	5	3	221	395	33
PLS.TH.PM	-	-	410	4,319	554
PLS.TL.PL	-	10	132	426	86
RSHC.TH.PH					
RSHC.TH.PL	491	668	1,502	3,246	1,596
RSHC.TH.PM	41	377	1,086	2,656	1,042
RSHC.TL.PH	915	443	983	2,863	1,012
RSHC.TL.PL	286	587	1,256	2,307	1,351
RSHC.TL.PM	257	254	652	1,509	665
RSHE.TH.PH	446	466	994	2,215	1,106
RSHE.TH.PM	26	80	1,070	4,225	1,432
RSHE.TL.PH	52	40	901	2,705	895
RSHE.TL.PL	52	61	743	2,915	1,099
RSHE.TL.PM	151	10	412	2,344	564
Ethiopia, 2005	95	25	580	2,557	774

Source: SPAM 2005

Tab. 30 Average Aggregated Yield Gap across Segments (intl. dollar)

Segment	Yield Gap (intl.\$)
DPH.TH.PH	3,549
DPH.TH.PL	4,720
DPH.TH.PM	2,161
DPH.TL.PH	2,096
DPH.TL.PL	645
DPH.TL.PM	995
HL.TL.PL	882
HL.TL.PM	347
PLS.TH.PH	5,447
PLS.TH.PL	806
PLS.TH.PM	1,317
PLS.TL.PL	1,665
RSHC.TH.PH	
RSHC.TH.PL	2,612
RSHC.TH.PM	436
RSHC.TL.PH	1,471
RSHC.TL.PL	1,939
RSHC.TL.PM	855
RSHE.TH.PH	886
RSHE.TH.PM	3,022
RSHE.TL.PH	3,561
RSHE.TL.PL	2,637
RSHE.TL.PM	1,451
Ethiopia, 2005	2,033

Source: HarvestChoice/IFPRI, 2005

Tab. 31 Child Anthropometrics across Segments (percent prevalence) DHS, 2011

Segment	Stunted Low	Stunted Moderate	Stunted Severe	Wasted Low	Wasted Moderate	Underweight Severe	Child Mort. (per 1,000)	Infant Mort. (per 1,000)	DHS Obs.
DPH.TH.PH	69	45	17	33	9	8	132	87	3,421
DPH.TH.PL	65	40	19	36	12	12	122	88	875
DPH.TH.PM	76	49	20	33	10	10	142	85	3,273
DPH.TL.PH	69	48	22	37	14	12	141	96	667
DPH.TL.PL	74	48	22	45	15	13	135	88	3,090
DPH.TL.PM	74	53	26	22	6	7	85	60	1,272
HL.TL.PL	67	45	26	27	10	13	183	119	4,459
HL.TL.PM	57	35	17	39	13	10	121	78	2,176
PLS.TH.PH	63	44	24	44	18	15	125	69	2,291
PLS.TH.PL	53	29	12	32	10	7	125	83	671
PLS.TH.PM	61	41	20	59	28	19	129	73	2,380
PLS.TL.PL	77	63	47	33	13	26	58	27	159
RSHC.TH.PH	65	41	18	32	9	9	96	65	3,252
RSHC.TH.PL	61	35	13	45	13	9	128	63	126
RSHC.TH.PM	65	42	16	28	8	6	118	84	490
RSHC.TL.PH	71	47	23	31	10	8	165	119	1,420
RSHC.TL.PL	65	43	21	34	11	12	108	78	1,489
RSHC.TL.PM	67	40	15	36	12	8	119	83	3,048
RSHE.TH.PH	69	45	24	25	8	10	108	63	1,901
RSHE.TH.PM	47	27	11	15	-	4	100	56	216
RSHE.TL.PH	69	44	21	25	8	10	115	81	2,005
RSHE.TL.PL	68	47	29	29	12	13	119	85	359
RSHE.TL.PM	69	43	21	26	9	13	164	108	1,008
Ethiopia,2011	69	44	20	32	10	9	122	82	40,048

Tab. 32 Female Health across Segments (percent prevalence) DHS, 2011

Segment	BMI (index)	BMI Normal	BMI Over.	BMI Under.	Anemia Normal	Anemia Mild	Anemia Severe	Age (years)	Weight (kg)	Height (cm)	Children (count)
DPH.TH.PH	20.2	59	11	28	15	5	0	35	51	158	5
DPH.TH.PL	19.5	63	8	26	17	2	0	35	48	156	5
DPH.TH.PM	19.5	68	1	30	13	3	0	35	48	156	6
DPH.TL.PH	19.7	73	4	22	25	6	1	33	49	157	6
DPH.TL.PL	19.6	65	3	31	16	6	1	33	48	156	5
DPH.TL.PM	20.5	73	4	21	14	2	-	35	51	157	6
HL.TL.PL	20.3	71	4	23	10	2	0	35	49	155	6
HL.TL.PM	20.9	55	14	23	21	13	2	34	52	158	4
PLS.TH.PH	19.3	52	5	40	27	14	3	32	49	159	5
PLS.TH.PL	20.6	54	12	21	19	11	1	30	57	162	6
PLS.TH.PM	18.8	46	8	44	23	15	5	35	49	160	6
PLS.TL.PL	20.1	76	-	24	18	2	-	35	50	158	5
RSHC.TH.PH	20.4	65	9	23	15	2	0	35	50	156	4
RSHC.TH.PL	19.2	56	1	44	21	-	-	35	46	157	5
RSHC.TH.PM	20.4	72	7	22	19	4	2	34	50	156	4
RSHC.TL.PH	20.0	73	2	24	21	4	0	35	48	155	6
RSHC.TL.PL	20.4	73	6	19	15	10	2	34	51	158	6
RSHC.TL.PM	19.8	69	2	29	16	2	0	35	49	156	6
RSHE.TH.PH	20.1	72	4	23	12	2	-	35	49	157	6
RSHE.TH.PM	22.0	70	17	10	5	3	-	33	55	158	5
RSHE.TL.PH	20.0	72	5	22	11	2	1	35	49	157	6
RSHE.TL.PL	20.7	73	4	23	4	0	2	35	49	156	6
RSHE.TL.PM	20.4	79	4	16	8	3	0	35	49	155	6
Ethiopia, 2011	20	71	5	23	15	4	1	35	49	156	6

Strategic Implications

This “first mover” strategy would appear to have several major advantages:

- It offers the best “catch up” potential in the short term for raising productivity within the constraints of existing institutional capacities and infrastructure.
- The strategy is concentrated in areas where the greatest numbers of poor people live.
- It can contribute to securing national food supplies and lowering food prices for all Ethiopians
- The chosen commodities can be produced on a competitive basis with imports (and exports in some cases), i.e. a cost analysis shows that they are competitive.
- The chosen commodities face strong and growing demand at home or abroad.
- The chosen commodities can generate significant additional agricultural employment.
- The chosen commodities can leverage significant value addition and employment along value chains

The objectives of the ATA and AGP are highly complementary to each other and to those of the Foundation. Since they also have a high level of buy-in by the Government and several key donors (e.g. the World Bank and USAID), it would make considerable sense for the Foundation to align its activities with these ongoing programs. Since neither the AGP nor ATA have yet achieved a scale of investment that is making a marked impact on the country’s agricultural transformation, additional funding from the Foundation could help make a difference. An obvious question is why the Foundation would want to limit its involvement to the cereal dominant areas of the rainfall-sufficient highlands, thereby missing out on some important opportunities for leveraging equal if not greater productivity growth, income growth and poverty reduction?

The Foundation has already drafted a number of priority activities to support the work of the ATA and others, and these generally look good. We have the following suggestions.

Privatization

An important frustration for most donors and investors in Ethiopia is the Government's reluctance to create more space for the private sector and PPPs in agricultural markets (both inputs and outputs). This is slowly changing, and IFPRI's experience suggests the Government does allow greater privatization when presented with hard evidence and tested models, whether from pilots within Ethiopia or from experiences in other successfully transforming countries (e.g. China). This is definitely an area where the Foundation could do useful work, and which would complement the activities of the ATA and several other key donors as they try to influence privatization policies. However, it is an issue that requires patience, subtle persuasion, and realistic expectations, and is best undertaken by an agency that is not passionately committed to any one paradigm. The limited ability of the World Bank and USAID to change minds in this area is a salutary lesson.

High Value Agriculture

An important way to leverage productivity, income, and employment in the agricultural sector is through promotion of high value crops and livestock. A consistent theme running throughout the various agricultural strategies developed by the Government is the promotion of high value agricultural exports and the need to develop the relevant value chains. The AGP and ATA are both working on developing value chain models that link small farms to export markets, as well as promoting agro-processing clusters. This is all to the good, but missing is any consideration of the potential growth opportunities in the domestic market for high value foods.

Experience in other countries shows that the demand for high value products grows quickly with per capita incomes and urbanization, basically because many of these products have high-income elasticities (see for example the experience in India). Importantly, the markets for high value products are mostly local and regional, and unlike export markets and high-end domestic urban markets, are easily accessible to many small farmers and women farmers. High value products also generate high levels of income and employment per hectare compared to food staples, and can provide a viable pathway out of poverty for many small farms. An increased supply of high value foods at lower prices (through productivity gains) in local and regional markets is also a good way to improve diets.

The real value of high value crops produced in Ethiopia is already growing faster than cereals; it grew by 51% between 2003/4 – 2007/8 and 2008/9 – 2012/3 (Table 1), equivalent to an annual average growth rate of about 9%. The growth rate was particularly high for vegetables (13%). The area base for high value crops is still small, 407,000 Ha in 2008/9 – 2012/3 (or 3.3% of the total cropped area), and total revenue was 2,520 million Birr (US\$126 million - Need to check these figures). Livestock production is also growing. In 2011-2012, for example, Ethiopia produced 3.3 billion liters of milk, but only about 5% of this was sold in commercial markets [10]. High value products are also important in current household food consumption. In 2004/05, cereals accounted for only 41% of the average household's food budget (43% rural and 27% urban) [11].

Rising Demand for High-Value Products, India

In India, the high value sector grew rapidly in the post Green Revolution period, as shown by the following average growth rates in the value of output:

	1980's	1990's
Food staples	3.0%	1.8%
High value agriculture	3.9%	4.6%
- Fruits and veg	2.2%	6.3%
- Livestock products	4.6%	3.7%

In India, fruits and vegetables still account for only 5% of the total cropped area, but they produce 17% of the total value of production.

Table 2: Changes in production of high value crops in Ethiopia

Commodity	Average 2003/4 – 2007/8		Average 2008/9 – 2012/3		Change (%)	
	Area ¹	Value ²	Area ¹	Value ²	Area ¹	Value ²
Vegetables	102	3,919	156	7,377	53	88
Root crops	172	9,659	195	13,455	14	39
Fruit crops	50	3,166	56	4,416	12	40
Total	324	16,744	407	25,248	26	51

1/ Area in '000s ha

2/ Value in '000s Birr at 2012 prices

Supermarkets and other large players have already entered and can be expected to eventually dominate many value chains serving the high end domestic markets in Ethiopia, but value chains serving local and regional markets are likely to remain much less formal and dominated by small trading, processing, wholesaling and retailing firms. Interventions are needed to ensure that there are adequate cold storage and transport facilities available (many high value products are highly perishable), in organizing farmers into marketing groups, providing supporting technologies, credit and the like. Livestock expansion has been constrained by inadequate nutrition, disease, a lack of support services, and inadequate information on how to improve animal breeding, marketing, and processing. Though the growth in domestic demand for high value foods may lag growth in food staples production at this stage of the transformation, the enabling conditions for growth of regional and national markets for these commodities needs to be put in place at an early stage. This seems to be a wide open area of opportunity for the Foundation.

The Rural Non-Farm Economy

As with high value agriculture, the Government, AGP and ATA are also putting a lot of emphasis on developing agro-processing and agro-dealership systems (whether coop or private based) as a way to service the agricultural sector, add value, and promote rural nonfarm employment. Again, this is fine, but missing is any recognition of the role of the broader rural nonfarm economy. A vibrant non-farm sector is crucial for servicing the full range of needs of a growing agriculture. It is also a sector that can generate important secondary rounds of growth in rural incomes and employment as a result of the spending patterns of rural people when their incomes go up. Cross-country studies have shown that the rural nonfarm economy can leverage between \$0.5 and \$0.8 of additional nonfarm income for every dollar of income generated in agriculture through productivity growth [12].

Sadly, the rural nonfarm economy is poorly developed in Ethiopia compared to other densely populated countries in Asia and Africa. A recent World Bank study, for example, paints a picture of a rural nonfarm economy that is predominantly made up of small one person firms engaged in trade and services, often on a part time basis, using little capital and no hired labor, and serving small, local and fragmented markets [13]. There are hardly any rural firms that employ 3 or more workers or which engage in formal manufacturing. Although providing an important supplementary source of income for about 25% of all rural households, especially women, this is not the kind of dynamic and diversified sector that can be found in, for example, rural Kenya or rural India. In such countries, the nonfarm economy accounts for 40% or more of household income, and 20-30% of total rural employment.

According to the World Bank study, rural nonfarm entrepreneurs consider a lack of demand, poor transport, and inadequate access to credit their most important problems. Market fragmentation limits demand and helps explain the heterogeneity in the returns to capital and labor, as well as why firms do not invest and expand. Firms do best in small towns rather than rural areas, and where agriculture is dynamic. The ATA needs to go beyond agro-processing and support to agro-dealers and seed firms to promote small and medium sized rural firms more generally. This is a fitting topic for the Foundation to take more direct action of its own.

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