

Who invests in agriculture and how much?

An empirical review of the relative size of various investments in agriculture in low- and middle-income countries

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Abstract

Investment in agriculture is widely recognized as crucial for economic growth, poverty reduction and improved food and nutrition security. Although several estimates have been made of how much investment is needed in agriculture to achieve production or food security goals, no source to date has attempted to estimate the total amount of public and private investment that is actually made in agriculture. This paper does so using the most up to date and comprehensive international datasets available. It provides estimates of the relative size of investments from different sources for 76 low- and middle-income countries. Comparing the relative magnitudes of agricultural investment flows shows that the private sector is by far the largest investor in agriculture. This has important implications for policy: while funding of public investment in agriculture remains essential, in order to spur agricultural development, the focus of governments and international organizations must broaden. In addition to considering public investment in terms of dollar amounts, the international community and domestic governments must consider policies that help create the enabling environment that fosters more socially and environmentally sustainable private investment in agriculture.

JEL Codes: E22, E62, F21, F35, H59, Q14, Q16 and Q18.

Keywords: Investment in agriculture; agricultural capital stock; agricultural finance; government spending on and investment in agriculture; official development assistance to agriculture; public spending on agricultural research and development; and foreign direct investment in agriculture.

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Introduction

Investment in agriculture is widely recognized as crucial for economic growth, poverty reduction and improved food and nutrition security (African Union, 2003; World Bank, 2007a; G8, 2009).

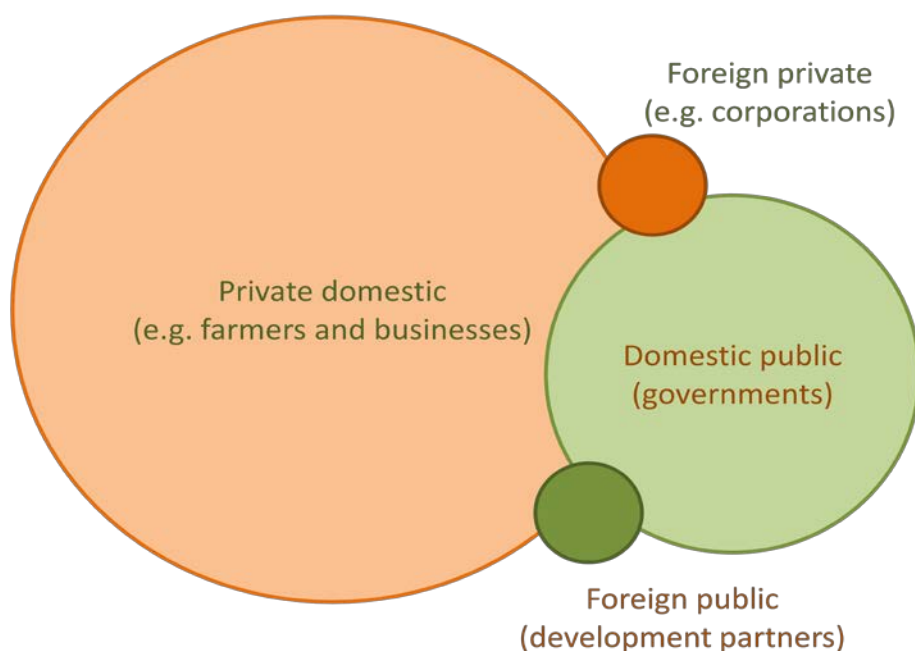
Several estimates have been made of how much investment is needed in agriculture to achieve various production and food security goals (FAO, 1947; Schmidhuber, Bruinsma and Bödeker, 2009; Schmidhuber and Bruinsma, 2011). However, no source to date has attempted to estimate the total amount of public and private investment that is actually made in agriculture. Using the most up to date and comprehensive international datasets available, newly compiled and analyzed for the *State of Food and Agriculture 2012: Investing in agriculture for a better future*, this paper assesses the relative size of various types of public and private investment in agriculture. It provides estimates of public and private sector investments in agriculture in roughly comparable terms for 76 low- and middle-income countries.

Who invests in agriculture?

Investors in agriculture² can be categorized as public or private and foreign or domestic. The majority of private domestic investors are farmers and they are by far the largest source of investment in agriculture in low- and middle-income countries. Domestic public investors, primarily national governments, are the next largest source of investment in agriculture, followed distantly by foreign public investors such as development partners and by foreign private investors, such as corporations. These investors - public and private, domestic and foreign - invest in different things and for different reasons. Their investments are often complementary, sometimes overlapping, and not generally substitutable for each other (Figure 1). The best available data permit a rough comparison of the relative magnitudes of these investment flows. The comparison highlights the central importance of farmers as the largest investors in agriculture. This has important implications for policy (see Conclusions).

² Unless otherwise specified, in this paper, “agriculture” refers to crops, livestock, aquaculture and agro-forestry.

FIGURE 1
Agricultural investors: public or private, domestic or foreign



Source: FAO.

Basic concepts: Investment versus expenditures

Broadly speaking, investment involves giving up something today in order to accumulate assets that generate increased income or other benefits in the future. Farmers make investments on their farms by acquiring farm equipment and machinery, purchasing animals or raising them to productive age, planting permanent crops, improving their land, constructing farm buildings, etc. Governments may invest in, inter alia, rural roads and large-scale irrigation infrastructure, assets that generate returns in terms of increased productivity over a long period of time. Determining whether an expenditure, public or private, constitutes an investment can be difficult both conceptually and empirically, and in some cases it is not clear-cut. Investment is generally defined as activities that result in the accumulation of capital (which may be physical, human, intellectual, natural, social or financial) that yields a stream of returns over time.

In agriculture, a distinction is usually made between investments and spending on inputs, based rather arbitrarily on the length of time required to generate a return. Thus, planting trees is typically considered an investment because it takes more than a year to generate a return, but applying fertilizer to a maize crop is not considered an investment because it generates a return during the current crop cycle.

Perspective also matters for what is perceived as investment. From a farmer's point of view, the purchase of land may represent an important investment in his productive capacity; from the perspective of society it simply involves a change in ownership of an asset rather than a net increase in capital stock, as occurs for instance when land improvements are undertaken.

Farmers and governments invest to build capital that allows the agricultural sector to become more productive in the future. Some of the most important types of capital for agriculture are not necessarily tangible. Governments invest extensively in agricultural research and development (R&D), which generates intellectual capital, a crucial input for raising the long-run productivity of agriculture. Both governments and individuals invest in education, which raises the productivity of the beneficiaries and generates long-term returns. Farmers spend time and resources developing producer associations, a form of social capital that can reduce risk and enhance productivity. All of these activities are investments and they build capital, but the value of the capital is difficult to measure.

Public investments help create an appropriate enabling environment and thereby influence the incentives for farmers to invest and directly create other forms of capital that support the development of a thriving agricultural sector. Some government investments are specific to agriculture and directly aim at enhancing primary production in the crop, livestock, aquaculture and forest sectors as well as in upstream and downstream activities. These can be referred to as investments *in* agriculture. Some government investments in other sectors (such as transport and communications infrastructure, energy, general education, health and nutrition, ecosystem services, market institutions and broader legal and social institutions) can also have a positive impact on agricultural production and productivity and on farm incomes. These can be considered as investments *for* agriculture.

This paper focuses on private and public investment in agriculture. It does not consider investment in upstream and downstream private enterprises. Investments by input suppliers and agro-processors, for example, are crucial to support on-farm investment and agricultural development because they influence the opportunities and incentives perceived by farmers. Unfortunately, comprehensive data are not available for these sectors and they are therefore outside the scope of the analysis.

From concepts to measurement

Moving from a conceptual understanding of agricultural investment to an empirical analysis poses a number of challenges because the available data provide only rough proxies for the components we want to measure. Despite some limitations, the data compiled and analysed for this report provide the most comprehensive and comparable estimates of investment in agriculture in low- and middle-income countries that have been prepared to date.

Four key categories of investment and five internationally comparable data sets are analyzed. The four categories of investment are domestic private, domestic public, foreign private and foreign public.

Indicators of domestic private investment

Domestic private investment comes primarily from farmers, and the most comprehensive data available are estimates of on-farm agricultural capital stock calculated by FAO (2012). Data are available for 204 countries (and former sovereign states) for the years 1979 – 2007, and estimates are reported in constant 2005 USD.

For the agricultural capital stock data, the concept of agriculture refers to the activity of crop and animal husbandry (i.e. the estimates do not include forestry and fishery sub-sectors or greenhouse production structures). The physical assets include assets used in the production process, covering land development, livestock, machinery and equipment, plantation crops, and structures for livestock. These are defined as follows.

- **Land Development** is the result of actions that lead to major improvements in the quantity, quality or productivity of land, or prevent its deterioration. Activities such as land clearance, land contouring, creation of wells and watering holes are integral to the land improvement.
- **Livestock** includes fixed assets (breeding stock) and inventories (young livestock and those kept for slaughtering) of cattle and buffalo, camels, horses, mules, asses, pigs, goats, sheep and poultry.
- **Machinery and equipment** includes tractors (with accessories), harvesters and threshers, milking machines and hand tools.
- **Plantation crops** refers to trees yielding repeated products (including vines and shrubs) cultivated for fruits and nuts, for sap and resin and for bark and leaf products, etc.
- **Structures for Livestock** include sheds constructed for housing cows, buffalo, horses, camel and poultry birds. Structures are provided for only part of the total stocks which are held by commercial concerns.

Indicators of domestic public investments

Domestic public investment by governments is measured by 2 datasets: (i) government expenditures in and for agriculture from the SPEED database (IFPRI, 2012a) and (ii) public expenditures on agricultural R&D from the ASTI database (IFPRI, 2012b); both are produced by IFPRI.

The SPEED database was compiled primarily using the IMF Government Financial Statistics Yearbook, supplemented with information from country publications from the IMF, Public Expenditure Reviews by the World Bank and Country publications from various government agencies. It provides estimates for 120 low-, middle- and high-income countries spanning the

years from 1980 to the most recent year available which varies from 2005 – 2009, according to country. Values are provided in constant 2005 US dollars.

The agricultural sector includes, agricultural crops and livestock and includes, in so far as possible, the categories considered by the IMF. These are:

- Administration of agricultural affairs and services
- Conservation, reclamation or expansion of arable land
- Agrarian reform and land settlement
- Supervision and regulation of the agricultural industry
- Construction or operation of flood control, irrigation and drainage systems, including grants, loans or subsidies for such works
- Operation or support of programs or schemes to stabilize or improve farm prices and farm incomes
- Operation or support of extension services or veterinary services to farmers, pest control services, crop inspection services and crop grading services
- Production and dissemination of general information, technical documentation and statistics on agricultural affairs and services
- Compensation, grants, loans or subsidies to farmers in connection with agricultural activities, including payments for restricting or encouraging output of a particular crop or for allowing land to remain uncultivated

(IMF, 2001)

Spending on agricultural R&D is excluded from and reported separately from government expenditures on agriculture (see below). Development projects and programmes that serve multiple purposes, including agricultural development, are also excluded.

The ASTI data on public investment in agricultural R&D are available for 66 low- and middle-income countries from 1981 to 2002 or more recent years and measured in constant 2005 PPP dollars. They include estimates of spending on research related to

- Crops, livestock, forestry, fisheries, natural resources
- Socioeconomic aspects of primary agricultural production
- On-farm postharvest activities and food-processing

Indicators of foreign public investment

Foreign public investment by donors and international organizations is measured by data on Official Development Assistance (ODA) to agriculture collected by the OECD (2012). Data are reported for 153 countries and former sovereign states from the year 1973 to 2010 and measured in constant 2009 US dollars. Sectors covered are as follows

- Agrarian reform
- Agricultural policy and administrative management
- Crop production, land and water resources
- Agricultural inputs, education, research, extension and training

- Plant and post-harvest protection and pest control
- Financial services
- Farmers' organizations and cooperatives
- Livestock production and veterinary services
- Forestry policy and administrative management
- Production of fuelwood and charcoal
- Forestry development, education and training, research and services
- Fishing policy and administrative management
- Fisheries development, education and training, research and services

Indicators of foreign private investment

The best available measure of private foreign investment in agriculture and related sectors comes from data on Foreign Direct Investment (FDI) compiled by UNCTAD (2011). These data cover the years 1990 to 2008. Country coverage varies, but in recent years estimates are available for 44 countries measured in current US dollars. They include investments in the following:

- Crops, gardening and horticulture
- Livestock
- Mixed crops and livestock
- Agricultural and animal husbandry services, excluding veterinary activities
- Hunting, trapping and game propagation
- Forestry and logging
- Fishing, fish hatcheries and fish farms

Adjustments for comparability across datasets

Taken in the form provided, the data are not directly comparable. In order to make them as comparable as possible we made several adjustments described below.

Investments in agricultural capital – moving from stock to flow

All of the data, with the exception of agricultural capital stock, are measured in terms of flows. We must first therefore convert estimates of agricultural capital stock to estimates of investment in agricultural capital. This is done following the method used by Von Cramon-Taubadel *et al.* (2011). Net investment is calculated as the change in the value of capital stock from year to year. Gross investment is estimated by adjusting net investment using a hypothetical 5 percent rate of depreciation.

Government investment in rather than government spending on agriculture

Data on government spending do not allow us to distinguish between government investment in agricultural capital and recurrent spending. Public expenditure reviews (PERs) are an important tool to assess and analyze public expenditures. The contents and format of such reviews vary significantly, due to differences in purpose, approach and sectoral coverage. Some PERs for the agricultural sector provide information on the breakdown of agricultural expenditures, including by capital and current expenditures³. A survey of a number of agricultural public expenditure reviews (Table 1) shows that there are significant differences in the share of capital expenditures in total agricultural expenditures, ranging from as little as 9 percent in Tanzania to 84 percent in Laos and Mozambique. In some cases, a clear difference is also recorded between budgeted and actual expenditures. The simple average of the share of capital expenditures in total agricultural expenditures for all observations found through the survey of 12 countries is 42 percent. We use this as the basis for our assumption that about 50 percent of government spending on agriculture constitutes investment.

³ The terms “current (or recurrent) expenditures” and “capital expenditures” are frequent in the economics literature analyzing public expenditures, including public expenditure reviews, but are not used in the formal manuals and guides on government statistics. The IMF Government Statistics Manual (2001) distinguishes between expenses and expenditures on (non-financial) assets and public capital formation. The two sets of concepts are close, but not identical.

Table 1: Share of capital expenditures in overall agricultural expenditures from selected public expenditure reviews

Country	Notes	Period	Capital share of agricultural expenditures
			(Percentage)
Ghana ⁽¹⁾	Development, total (a)	2005	17
	MoFA, actual		24
	MoFA, budgeted		46
Honduras ⁽²⁾	..	2006	66
Kenya ⁽³⁾	..	2004/05	30
Lao People's Democratic Republic ⁽⁴⁾	..	2004/05	84
Mozambique ⁽⁵⁾	Total (b)	2007	84
	MINAG		9
Nigeria ⁽⁶⁾	Budgeted	2001-05	58
	Actual		44
Nepal ⁽⁷⁾	(c)	1999-2003	46
Philippines ⁽⁸⁾	(d)	2005	26
Uganda ⁽⁹⁾	..	2005/06–2008/09	24
United Republic of Tanzania ⁽¹⁰⁾	..	2011	9
Viet Nam ⁽¹¹⁾	..	2002	77
Zambia ⁽¹¹⁾	..	2000	24
Simple Average			42

Notes: (a) Development as opposed to recurrent expenditures. Covers all government expenditure, as opposed to only those made by MoFA (Ministry of Food and Agriculture), the latter accounts for about 25 percent of total government expenditure in this sector. (b) 84 percent refers to total government expenditure; 9 percent is for MINAG (Ministry of Agriculture) only. (c) Includes irrigation and agriculture expenditures. (d) Consolidated Department of Agriculture expenditure figures.

.. = data not available.

Sources: (1) Kolavalli *et al.*, 2010; (2) Anson and Zegarra, 2008; (3) Akroyd and Smith, 2007; (4) Cammack, Fowler and Phomdouangsy, 2008; (5) World Bank, 2011a; (6) World Bank, 2008; (7) Dillon, Sharma and Zhang, 2008; (8) World Bank, 2007b; (9) World Bank, 2010; (10) World Bank, 2011b; (11) Akroyd and Smith, 2007.

Comparable monetary units

Data on most of the financial stocks and flows (agricultural capital stock, government spending on agriculture and public spending on agricultural R&D) were available measured in constant 2005 dollars. Data obtained on ODA to agriculture was measured in constant 2009 US dollars; we converted them to constant 2005 US dollars using the DAC deflators provided by the OECD. Foreign direct investment is measured in current US dollars; expressing it in constant 2005 US dollars would not change values for recent years greatly, so we chose not to deflate it.

Time period

We are interested in determining which sources provide the largest amount of investment in agriculture. Should we try to look at the evolution of the relative size of investments over time we would have to exclude some countries for reasons, such as hyperinflation, which

make their data less reliable over time. We therefore focus on estimates for the three most recent years available. Our key dataset is that of agricultural capital stock which runs through 2007; most of the other datasets have data through 2007, so we chose to look at the average for the years 2005 – 2007. For some countries and datasets other than agricultural capital and ODA observations were not available for 2005 – 2007. In these cases we used observations from previous years. No observations prior to the year 2000 were used for any of the flows.

For government spending on agriculture and public spending on agricultural R&D when data were not available for the years 2005 – 2007, we either used an average of the most recent observation(s) or, if three observations were not available, we used a single value from the most recently reported year⁴. FDI is more volatile by nature and we therefore used averages of the most recent values whenever possible⁵.

Country and year coverage

Country coverage varies among the datasets. Coverage is greatest for data on agricultural capital stock as well as ODA followed by government expenditures on agriculture. Fewer countries are covered by data on public spending on agricultural R&D as well as FDI in agriculture. To allow comparison we focus on a subset of 76 low- and middle-income countries for which we have recent data on agricultural capital stock and government spending. Seventy of those 76 countries are included in the ODA dataset, 42 of them appear in the agricultural R&D estimates and 36 are included in the FDI figures. The full list of countries included in the analysis (together with relevant country level estimates) is shown in the Appendix.

Sector composition

Data on the various sources of investment in agriculture measure different types of investment; agricultural capital stock estimates and government spending focus on crops and livestock, excluding forestry and fisheries, whereas public spending on agricultural R&D as well as FDI and ODA data report on spending on fisheries and forestries as well as other sectors. No information is available to allow for a reasonable adjustment.

⁴ In Cameroon and Mali government spending on agriculture in 2007 was approximated as the value of government spending on agriculture in 2006. For Burundi, Central African Republic, Cote d'Ivoire, Guinea-Bissau and Tonga the value of government spending on agriculture in 2005 was used instead of the average for 2005 - 2007. Public spending on agricultural R&D in 2007 was estimated as equal to the value reported for 2006 for Argentina, Brazil, Chile, Costa Rica, Dominican Republic, El Salvador, Guatemala, Mexico, Panama and Uruguay. For Iran the 2005-2007 average was estimated as the amount spent in 2004, for Indonesia, Jordan and Syria it was estimated as the level in 2003, for Malaysia, Morocco, Papua New Guinea and the Philippines it is the level in 2002 and for Malawi the level spent in 2001.

⁵ The average FDI from 2005 - 2007 is approximated as the average for the years 2003 - 2005 in Jamaica and Kazakhstan, for Malawi it is the average for 2002 - 2004, for India and the Ukraine it is the average for 2003 and 2004, for Fiji the average for 2000 and 2001, and for Ethiopia it is the value in 2000.

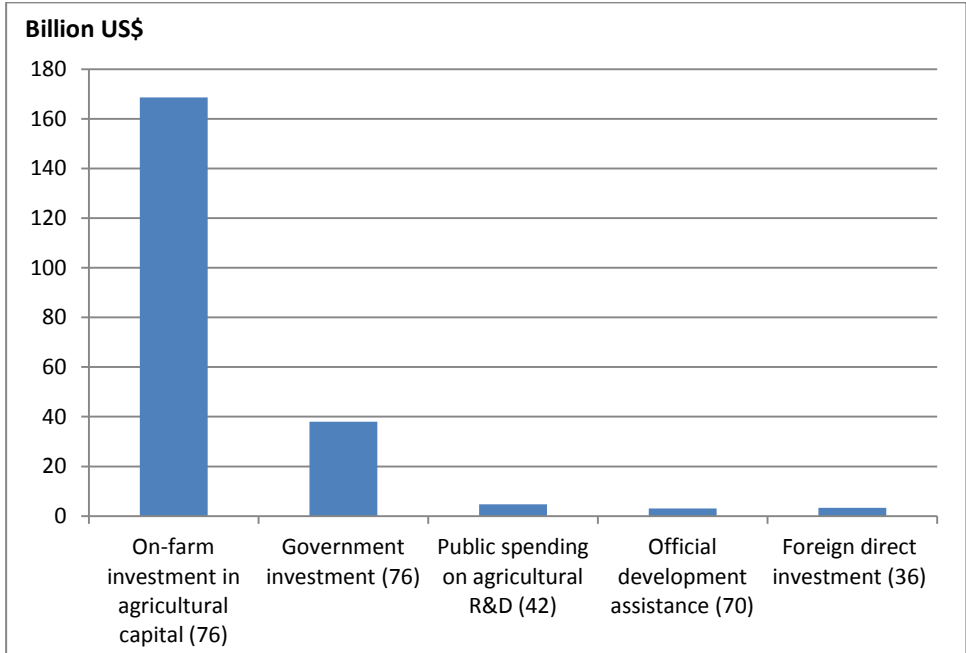
Relative size of investments in low- and middle-income countries

Given the data limitations and conceptual problems described above, our estimates of the relative size of investments in agriculture should be taken as indicative only. They are not exact estimates of public and private investments in agriculture, but are, rather the best and most comprehensive attempt made to date to assess the broad order of relative magnitude of different sources of investment in agriculture.

The results clearly show that in the 76 low- and middle-income countries considered farmers are by far the largest investors in agriculture (Figure 2). On-farm investments are more than three times as large as all other sources of investment combined. Annual investment in on-farm agricultural capital stock exceeds government investment by more than 4 to 1 and other resource flows by a much larger margin. Investment in agricultural capital measures only the most tangible forms of investment by farmers in agricultural crops and livestock. Because it excludes investment in fisheries and forestry as well as other forms of investment (for example, education, training, and participation in social networks), it represents a conservative estimate of farmers' investments. Government investment is that portion of public expenditures that can be considered as investment in agricultural crops and livestock.

Figures reported here for agricultural R&D, ODA and FDI are not adjusted to distinguish between investment and current expenditures and in that sense represent a more generous estimate of these sources of investment for the countries included. However, data on R&D and FDI were only available for a subset of the 76 countries (42 and 36 countries, respectively); the totals are in that sense conservative estimates. Official development assistance to agriculture is only available for 70 of the 76 countries, but the six countries that are excluded (see Appendix 1) likely receive small amounts of ODA, if any. Some official development assistance is provided directly to governments and reported in their spending on agriculture and/ or agricultural R&D. Thus, for many countries, there may be some double counting between official development assistance and government spending on agriculture and/ or on agricultural R&D.

FIGURE 2
Average annual investment in agriculture in selected low- and middle-income countries, by source



Notes: See Appendix for country level information. The number of countries covered is shown in parenthesis next to the relevant type of flow. All flows are reported in constant 2005 US dollars with the exception of FDI inflows which are reported in current US dollars. Data are the average for the years 2005 - 2007 or for the most recent year(s) available prior to that period. There may be some overlap between data on ODA on the one hand and government investment in agriculture and/ or expenditure on agricultural R&D on the other hand.
Sources: On-farm investment in agricultural capital is calculated using data on agricultural capital stock from FAO (2012). Government investment is estimated using data from IFPRI (2012a), public spending on agricultural R&D is from IFPRI (2012b), official development assistance is estimated using data from OECD (2012) and foreign direct investment data are from UNCTAD (2011).

Relative size of investments in low- and middle-income countries, by region

The results differ across regions, although the key finding holds for all regions. That is, in low- and middle-income countries of all regions, investment in on-farm agricultural capital is larger than all other types of investment combined.

For low and middle income countries as a whole, on-farm investment was found to be more than 4 times the size of government investment. In East Asia and the Pacific on-farm investment in agricultural capital is more than two times the size of all other investments combined. This largely reflects the data from China where government investment is half the size of on-farm investment. In East Asia and the Pacific, excluding China on-farm investment in agricultural capital is more than 5 times the size of government investment. For the region of the Middle East and North Africa, private investment is about 3.5 times the size of investment by government.

In all other regions, private investment is far more than 3 times larger than government investment in agriculture, but there is wide variation among countries. In Europe and Central Asia private on-farm investments are more than 5 times the magnitude of government

investments, in South Asia they are nearly 8 times larger, in Latin America and the Caribbean they are nearly 9 times larger and nearly 10 times as large in sub-Saharan Africa.

Inspection of the regional data also reveals that in Latin America and the Caribbean public spending on agricultural R&D has been quite large relative to government investment in agriculture; this is not the case in the other regions. Furthermore, ODA to agriculture is quite small relative to public investment in all regions except sub-Saharan Africa, where ODA totals 1 billion and government investment totals 2 billion US dollars. Lastly, most FDI was made in countries in East Asia and the Pacific; Europe and Central Asia; and Latin America and the Caribbean. Negligible amounts of FDI went to agriculture in South Asia and sub-Saharan Africa.

Table 2
Investment in agriculture in selected low- and middle-income countries, by source and region, most recent year

	On-farm investment in agricultural capital (76)	Government investment (76)	Public spending on agricultural R&D (42)	Official development assistance (70)	Foreign direct investment (36)
Millions of US dollars					
East Asia and the Pacific	51,675	20,607	1,693	682	1,675
East Asia and the Pacific, excluding China	17,297	3,194	369	522	998
Europe and Central Asia	21,791	4,138		78	383
Latin America and the Caribbean	26,483	2,910	1,356	213	1,225
Middle East and North Africa	12,864	3,594	427	194	67
South Asia	36,726	4,715	703	912	10
Sub-Saharan Africa	19,038	1,993	539	1,027	20
Low- and middle-income countries	168,577	37,957	4,718	3,106	3,380

Notes: See Figure 2.

Sources: On-farm investment in agricultural capital is calculated using data on agricultural capital stock from FAO (2012). Government investment is estimated using data from IFPRI (2012a), public spending on agricultural R&D is from IFPRI (2012b), official development assistance is estimated using data from OECD (2012) and foreign direct investment data are from UNCTAD (2011).

Conclusions

In conclusion, conservative estimates of investment in on farm agricultural capital stock show that they are the largest source of investment in agriculture, followed by government investments. On-farm investments in agricultural capital are more than 4 times the size of government spending in low- and middle-income countries. Official development assistance to agriculture, FDI in agriculture and public spending on agricultural R&D have all been much smaller than either investment in on farm capital stock, or government spending on agriculture.

This has important implications for policy: while funding of public investment in agriculture remains essential, in order to spur agricultural development, the focus of governments and international organizations must broaden. In addition to considering public investment in terms of dollar amounts, the international community and domestic governments must

consider policies that help create the enabling environments which foster more socially and environmentally sustainable private investment in agriculture.

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Appendix 1: Average annual investment in agriculture in low- and middle-income countries, by source and country, 2005 – 2007 or most recent year

	On-farm investment in agricultural capital (76)	Government investment (76)	Public spending on agricultural R&D (42)	Official development assistance (70)	Foreign direct investment (36)
Millions of US dollars					
Low- and middle-income countries	168,577	37,957	4,718	3,106	3,380
East Asia and the Pacific	51,675	20,607	1,693	682	1,675
Cambodia	365	148.9		56.5	87.0
China, Mainland	34,379	17,412.4	1,324.0	160.4	677.1
Fiji	49	13.6		5.8	0.5
Indonesia	5,546	696.1	82.8	142.7	182.0
Malaysia	1,090	742.7	204.4	2.0	671.2
Mongolia	1,552	14.9		18.9	
Papua New Guinea	123	13.5	9.2		
Philippines	1,491	325.7	55.9	59.8	1.3
Thailand	2,128	873.8		17.1	4.7
Tonga	7	3.2		0.8	
Vanuatu	42	1.5		3.0	
Viet Nam	4,903	360.4	16.6	215.2	51.4
Europe and Central Asia	21,791	4,138		78	383
Azerbaijan	666	70.0		13.8	
Belarus	670	532.6		0.5	
Bulgaria	258	105.8			50.0
Georgia	320	16.4		13.1	
Kazakhstan	2,599	212.5		0.5	-0.4
Kyrgyzstan	317	9.5		24.8	0.0
Lithuania	555	157.7			11.7
Republic of Moldova	208	25.4		10.0	1.4
Romania	2,128	701.3			67.7
Russian Federation	5,400	507.7			187.7
Turkey	6,727	1,377.5		9.5	7.3
Ukraine	1,943	421.7		5.6	57.3
Latin America and the Caribbean	26,483	2,910	1,356	213	1,225
Argentina	4,217	55.9	183.7	12.3	367.9
Bolivia (Plurinational State of)	629	14.9		96.4	0.4
Brazil	10,879	305.2	714.9	42.0	420.9
Chile	1,011	157.5	59.9	2.6	49.5
Costa Rica	135	44.5	16.3	8.4	30.9
Dominican Republic	629	68.8	10.4		
El Salvador	99	2.1	0.3	7.9	0.3
Guatemala	860	55.7	4.1	12.6	
Jamaica	149	31.7		12.7	0.0
Mexico	6,167	2,089.8	328.3	7.7	54.9
Panama	206	47.9	5.7	3.8	
Saint Vincent and the Grenadines	2	1.6		6.2	
Uruguay	1,499	34.2	31.9	0.8	300.3

Appendix 1 (continued)

	On-farm investment in agricultural capital (76)	Government investment (76)	Public spending on agricultural R&D (42)	Official development assistance (70)	Foreign direct investment (36)
Millions of US dollars					
Middle East and North Africa	12,864	3,594	427	194	67
Algeria	873	365.7		5.3	
Egypt	2,272	453.7		97.9	50.9
Iran (Islamic Republic of)	5,529	1,114.5	176.9	0.7	
Jordan	86	44.3	5.8	1.9	
Lebanon	142	9.1		3.0	
Morocco	1,287	206.7	70.6	33.3	2.8
Syrian Arab Republic	1,350	1,113.0	147.0	4.3	6.3
Tunisia	647	248.1	26.3	27.4	7.3
Yemen	679	39.3		20.0	
South Asia	36,726	4,715	703	912	10
Bangladesh	4,597	191.5	46.2	74.1	3.6
Bhutan	20	16.0		7.0	
India	22,506	4,043.6	581.4	554.9	6.0
Maldives	-2	4.2		2.4	
Nepal	544	37.0	6.1	86.8	
Pakistan	8,720	283.2	55.1	147.9	
Sri Lanka	341	139.7	14.6	38.9	
Sub-Saharan Africa	19,038	1,993	539	1,027	20
Botswana	159	57.8	11.2	2.9	
Burundi	148	0.6	2.9	19.9	
Cameroon	384	55.2		44.7	
Cape Verde	20	6.4		7.1	
Central African Republic	147	3.7		17.9	
Côte d'Ivoire	459	74.9	23.5	19.9	
Ethiopia	4,849	227.0	18.8	119.3	14.5
Ghana	481	7.3	26.6	126.7	
Guinea-Bissau	115	0.5		4.8	
Kenya	880	71.7	61.4	146.0	
Lesotho	72	12.4		1.6	
Madagascar	1,298	40.6	2.0	62.4	-0.2
Malawi	286	13.9	6.2	76.8	4.8
Mali	1,099	141.2	12.3	172.7	
Mauritius	14	22.7	12.2	11.7	0.7
Namibia	166	50.6	15.7	6.0	
Niger	994	22.4	2.5	27.6	
Nigeria	4,309	190.1	130.4	25.0	
Seychelles	0	8.1		2.4	
South Africa	2,206	837.6	183.7	19.1	
Swaziland	35	26.2		13.0	
Uganda	582	33.3	25.5	56.3	
Zambia	335	88.4	4.4	43.5	

Notes: The number of countries covered is shown in parenthesis next to the relevant type of flow. All flows are reported in constant 2005 US dollars with the exception of FDI inflows which are reported in current US dollars. Data are the average for the years 2005 - 2007 or for the most recent year(s) available prior to that period. There may be some overlap between data on ODA on the one hand and government investment in agriculture and/ or expenditure on agricultural R&D on the other hand.

Sources: On-farm investment in agricultural capital is calculated using data on agricultural capital stock from FAO (2012). Government investment is estimated using data from IFPRI (2012a), public spending on agricultural R&D is from IFPRI (2012b), official development assistance is estimated using data from OECD (2012) and foreign direct investment data are from UNCTAD (2011).

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