



**FAO-OEA/CIE-IICA WORKING GROUP ON AGRICULTURAL AND
LIVESTOCK STATISTICS FOR LATIN AMERICA AND THE CARIBBEAN**

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**FAO Statistical Initiatives in Measuring Investment in Agriculture:
Global Investment dataset and Country Investment profiles**

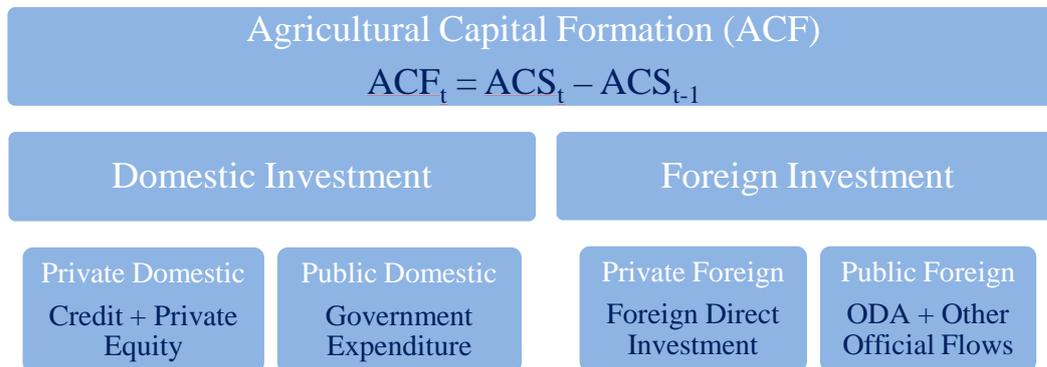
Session 6: Recent advances in agricultural economic statistics

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I. INTRODUCTION: WHY MONITOR INVESTMENT FLOWS TO AGRICULTURE?

Creating a climate conducive to investments that both raise productivity levels and realise structural changes for generating additional food supplies and the incomes necessary for access to food continues to be a principal policy challenge.¹ To support analysis of the related resource flows, FAO Statistics Division is developing a global Investment Dataset comprised of four main elements (Credit to Agriculture, Government Expenditure on Agriculture and Rural Development, Official Development Assistance to Agriculture, Foreign Direct Investment in Agriculture). Taken together, these resource flows and the overall manner in which they are mobilized directly impact *inter-alia* investment in the accumulation of agricultural capital stocks — as estimated by FAO — and the effectiveness of public or private and external or internal sector-based agricultural development activities, as reflected in the evolving FAO Score Cards initiative. This paper reviews strengthened efforts to monitor resource requirements for — and commitments to — agriculture at the global level. A key feature of this initiative is the harmonization of FAO work with that of other international organizations that are compiling relevant datasets, as presented in the following sections. The FAOSTAT's framework of agricultural investment flows is illustrated in the following hierarchical chart.

Figure 1. FAOSTAT's Agricultural Investment Data Framework

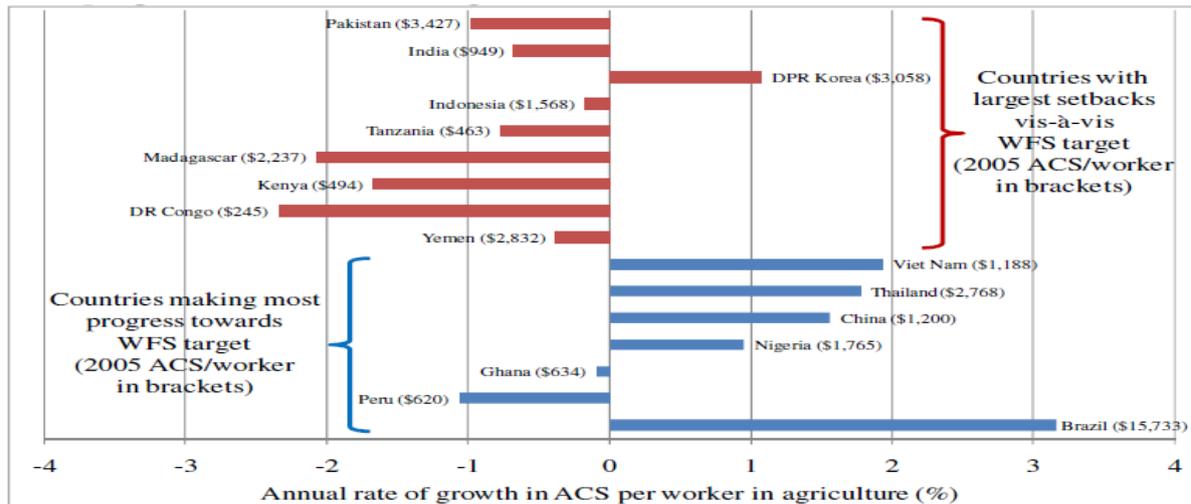


II. AGRICULTURAL CAPITAL STOCK (ACS)

Low capital stock per worker is reflected in low productivity per agricultural worker in agriculture, a defining characteristic of low-income countries. For agricultural labour productivity to grow, the amount of capital available for each worker (the capital-labour ratio) must grow. In many instances the gaps between high-income and low-income countries are widening as a result of low investment rates and/or growing labour forces in countries with low levels of agricultural capital per worker. As shown in Figure 2, there exists a strong correlation between investment, i.e. capital accumulation, in agriculture and hunger reduction in developing countries.

¹ For a review of the magnitude of, trends in, and data gaps pertaining to investment in agriculture, see ESA Working Paper No.11-19 Financial Resource Flows to Agriculture (<http://www.fao.org/docrep/015/an108e/an108e00.pdf>) and the 2012 State of Food and Agriculture (<http://www.fao.org/publications/sofa/en/>)

Figure 2: Annual rates of ACS growth (1990-2005): best and worst performing countries



Source: Von Cramon-Taubadel et al. (2009)

The graph shows that all countries with the largest setback vis-à-vis the WFS goal (except DPR Korea) have a negative annual growth rate in **Agricultural Capital Stock (ACS)** per worker in agriculture for the period 1990-2005, while, an opposite patterns is shown for the countries with the highest progress.²

BOX 1: FAO ACS Methodological Enhancements

FAO ACS data are constructed using several sources of information and their quality is only as good as the underlying data. FAO Statistics Division is therefore undertaking several actions to improve the quality of ACS data. The most important are:

- Extending, when possible, the use of national accounts data in the estimation of fixed capital.¹
- A revised and more detailed questionnaire on Agricultural Machinery and Equipment based on HS 2012 was sent to countries.
- Use, in future, of the Cost of Production questionnaire being implemented by FAO for improving the input data.
- Develop a methodology for obtaining the aging profile of machinery.
- Improve the estimation methodology for the present value of future revenues from permanent crops.
- Obtain country-level information on the price of arable and irrigated land.

In order to take into account the varying capital intensity and technology levels of the agricultural sectors in the different countries, data on capital stock per agricultural worker are essential. FAO has developed a comprehensive database on **ACS**, based on FAOSTAT's physical inventories. For the FAO approach to measuring ACS data, the concept of

² International data on Private Domestic Investment (PDI) are not available. Therefore, the Agricultural Capital Stock data are crucial to estimate PDI as a residual after accounting for government and foreign investment flows (including both ODA and FDI).

agriculture refers specifically to the activity of crop and animal husbandry for primary agriculture and includes the following components: land development, plantation crops, machinery and equipments, livestock, and structures for livestock. These data notably exclude the forestry and fishery subsectors as well as greenhouse production structures, mainly due to lack of information, which the Investment Dataset initiative will seek to address. As a result, current global FAO ACS estimates (Annex II) may under represent actual capital intensity when compared with the investments which encompass agriculture, forestry, and fishing activities more broadly.³ FAO Statistics Division staff are investigating the availability and relevance of existing series that could support establishing linkages with the other data sets as highlighted in Annex I and discussed — with reference to only the agriculture component for Dominican Republic in 2007 — in Section VII, Building Country Profiles.

III. CREDIT TO AGRICULTURE

Agriculture sector growth through credit (investment oriented loans provided by the banking sector) directly relate to the rate at which ACS is being accumulated and food security is enhanced over time. There is a diversity of areas of credit flows to agriculture. Inclusive credit flows aimed at improving the productivity of land, water, livestock and labour owning families as well as those aimed at enhancing the skills of agricultural workers on marginal holdings have been shown to support income generation. While in some countries many farmer households may be outside the formal financial system, data on credit extended to agriculture — including finance to corporations and firms for onward financing to farmers under agriculture (emerging farmers, commercial farmers as well as to agricultural cooperatives and agri-related businesses) — is generally available through monetary and financial statistics and can often serve as a benchmark indicator of private sector (primarily domestic) investment activity. FAO Statistics Division is developing a comprehensive credit to agriculture dataset that supports analysis of the destination (working or investment credit) of these flows world-wide. This dataset is constructed by harvesting official data from the Central Banks websites. While better data is needed in order to show whether its distribution is aligned with need, the amount of credit extended may also be influenced by flows pertaining to Government Expenditure on Agriculture and Rural Development, Official Development Assistance to Agriculture, and Foreign Direct Investment in Agriculture, each of which are discussed below.

IV. GOVERNMENT EXPENDITURES ON AGRICULTURE

Although most investments may be primarily mobilised by the farmers themselves, the public sector — general government units and public (financial and nonfinancial) corporations — has a critical role. The efficiency of these expenditures, whether measured in relation to agricultural GDP, to total government outlays, or the agricultural labour force, remains a key element of the overall policy mix. Well targeted government expenditures can create a conducive environment for private investment (economic incentives) and can ensure

³ In Annex II we show the evolution of gross capital stock in the various regions from 1975 to 2007 and the differences between developing and developed countries in the composition of capital stock

sufficient availability of public goods (basic rural infrastructure and market openness). This is particularly important because the role of government in economic activity may be scaled down in some countries over the coming decade owing to structural and fiscal reforms.

The share of **government expenditures on agriculture (GEA)** is not related in any simple way to the size of the agricultural sector, and depends *inter alia* on the overall importance given to economic functions in governments' budgets. By bringing together the data on agriculture's shares in GDP and overall government expenditure we can construct an "**agricultural orientation index**" which reflects the extent to which government expenditures on agriculture reflect (or not) the importance of agriculture in the overall economy. To construct the index, the share of agricultural expenditure in total government expenditure is divided by the share of agriculture in GDP. For these and other reasons, monitoring government outlays on agriculture and rural development remains important. Despite the clear need for comprehensive time series, data on government expenditures on agriculture and rural development remain scarce, making addressing key public policy issues a challenge.

To address the paucity of observations for developing and emerging market countries and to ensure comparable data that are aligned with international standards, the FAO Statistics Division in collaboration with the IMF Statistics Department has developed a questionnaire based on the *Government Finance Statistics Manual, 2001 (GFSM 2001)* methodology, in particular Table 7: Outlays by Function of Government from the IMF's annual questionnaire on fiscal statistics. FAO Statistics Division launched the questionnaire in 2012, designed to collect key data series for tracking the allocation of government expenditures to agriculture and rural development and related metadata, requesting a General Government (and its subsectors) time series for the period 2001 to 2011. These data will support better analysis of governments' policy toward agriculture, forestry, fisheries, and environmental protection. Annex I — with reference to only budget execution data for Dominican Republic in 2007 — presents the FAO GEA template and its potential for establishing linkages with the other Investment Datasets, as discussed in Section VII, Building Country Profiles.

V. EXTERNAL OFFICIAL FLOWS TO AGRICULTURE

Governments can often raise additional domestic resources through fiscal reforms, including reforms in the tax systems geared toward ensuring a friendly investment environment for both foreign and domestic private investors. However, a number of low-income, food deficit countries will still have to rely on external transfers and drawing on some measure of official finance resources to generate funds for agriculture.

Official Development Assistance to Agriculture (ODA-Agri) by the major bilateral and multilateral donors is an important complement to domestic resources. Among countries with the highest prevalence of undernourishment, external assistance to agriculture may account for much of gross domestic investment and government expenditures. Developing countries that are particularly in need ODA may particularly benefit when an increasing share is directed towards the agricultural sector and other related areas, in particular rural

development and infrastructure, research, extension and training, and environmental protection. These flows could be either official or private — comprised of loans (financial transactions) and/or grants (concessional transfers) — and, over time, there can be dramatic change in the composition of these resources. Understanding the dynamics underlying the share of Agricultural and Rural Development (both the broad and the narrow definitions) in total ODA therefore requires a dataset that captures all contributions made by bilateral donors as well as multilateral assistance, where the share and geographic distribution of flows of concessional assistance in total commitments and disbursement for agriculture and the share of grants in total commitments may be compared/analysed.

The OECD Creditor Reporting System (CRS), which records ODA and Other Official Flows (OOF) at the project level, is currently the most comprehensive when considering the allocation of assistance to agriculture as well as other relevant sectors by recipient country and region. FAO Statistics Division, in consultation with OECD, is developing a comprehensive CRS-based dataset that supports analysis of the destination of these flows world-wide in order to show whether its distribution is aligned with need or concentrated in a small number of countries. The existing FAO database on External Assistance to Agriculture (EAA) includes all CRS donors and gathers information on some additional relevant multilateral donors using annual reports or official websites. The EAA classification system is more detailed than OECD CRS on some agricultural activities/purposes and it refers to both narrow and broad definitions of agriculture.

Given that most of the donors report their aid activities to the OECD, FAO has decided to abandon its existing EAA classification and to adopt the CRS list of purposes. However, FAO will augment the CRS data by continuing to collect and maintain data for the activities related to agriculture provided by non-CRS reporters included in the FAO broad definition of agriculture. Annex I — with reference to data for Dominican Republic in 2007 — presents the new FAO EAA template and its potential for establishing linkages with the other Investment Datasets, as discussed in Section VII.

VI. FOREIGN DIRECT INVESTMENT RESOURCES

In the poorest countries, where financial markets are underdeveloped, external aid still accounts for much of gross domestic investment (and for government expenditures). Nonetheless, a host of factors — spikes in food and fuel prices, a desire by countries dependent on food imports to secure food supplies in the face of uncertainty, and speculation on land and commodity price increases — has recently prompted a sharp increase in investment involving significant use of agricultural land, water, and forested areas in developing and transition countries. While **Foreign Direct Investment in Agriculture (FDI-Agri)**, may bring tax income, new technologies, higher land productivity as well as foreign currency, the allocation of FDI, particularly in primary agriculture and related secondary activities may not be distributed according to where needs arise or where opportunities exist and investors may refuse to honour investment commitments and exploit weak domestic legal infrastructure. Recognizing that FDI-Agri by private and public sector

agents may become an increasingly important source of finance for agricultural development, FAO, IFAD, the UNCTAD Secretariat and the World Bank Group have developed a set of Principles for Responsible Agricultural Investment that Respects Rights, Livelihoods and Resources.⁴ Agreement was also reached that a consultative approach be developed for monitoring that encompasses all countries from which investment initiatives are emanating and towards which such investments are directed.

FAO and UNCTAD are collaborating to strengthen data on FDI-Agri, elaborating a questionnaire that would disaggregate the sector/industry series currently collected by UNCTAD, based on ISIC Revision 4, as indicated in Annex I (with reference to data for Dominican Republic in 2007). This will improve data that support analysis aimed at maximizing the economic value-added and job creation potential of agriculture arising from external private sector investment in primary and secondary sector value chains. The disaggregation also strengthens the potential for establishing linkages with the other Investment Datasets, as discussed in the next section. In combination, the information may help inform policy aimed at avoiding asymmetric rights in favour of the investor to the detriment of the host state's food security. To better inform the feasibility of the FAO / UNCTAD questionnaire, which would be formally launched in 2013, FAO Statistics Division will survey to selected member countries requesting their views on the feasibility of providing the proposed data in time series format.

VII. BUILDING COUNTRY INVESTMENT PROFILES — DOMINICAN REPUBLIC 2007

An example of preliminary work on collecting and combining the five datasets described above is illustrated in the Investment Dataset for Dominican Republic (2007) presented in Annex I. As shown in Table 1⁵, Dominican Republic was chosen because it had the more complete time-series on investment flows among the countries considered for the analysis.

Table 1. Data availability in LAC Countries

Countries	WB_c	FAO_id	ACS	ODA	FDI	GEA	CRED
Barbados	BRB	14	75-07	78-80	.	01-07	89-11
Chile	CHL	40	75-07	91-11	06-11	01-11	.
Dominican R.	DOM	56	75-07	73-11	93-11	01-10	01-10
Ecuador	ECU	58	75-07	74-11	86-11	08-11	08-12
Jamaica	JAM	109	75-07	74-11	98-10	01-11	01-11
St. Kitts	KNA	188	75-07	spotty	.	03-10	02-12

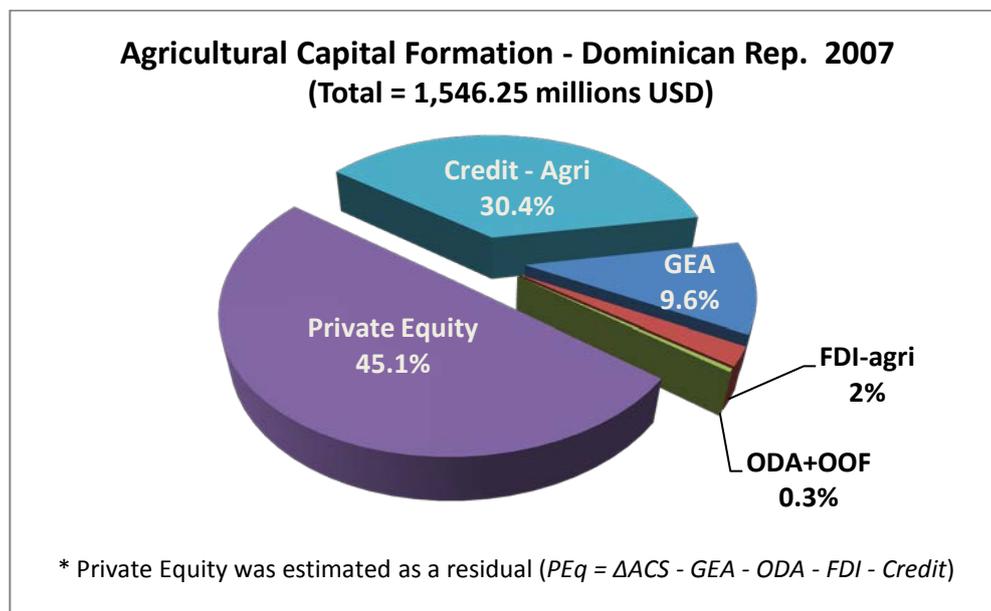
This example illustrates both the strengths and the challenges of obtaining a comprehensive and internationally comparable Investment dataset. In 2007, the FAOSTAT database would

⁴ See <http://archive.unctad.org/Templates/Page.asp?intItemID=6123&lang=1>

⁵ Table 1 includes only the list of LAC countries with better investment data in FAOSTAT.

indicate that Agricultural Capital Formation⁶ (ACF) (excluding forestry and fisheries), when measured in nominal terms, increased in Dominican Republic by 1,546 millions USD. This was achieved through a combination of agriculture investment oriented loans provided by the banking sector (516 million USD), a portion of the GEA for only agriculture (totalling 297 million USD, of which the capital component is estimated at 149 million USD)⁷, a portion of the ODA-Agri (totalling 5 million USD for the agriculture specific component), and a portion of the total amount (30 million USD) from FDI-Agri inflows. As shown in Figure 3 below, we estimate Private Equities (697 millions USD) in agriculture as a residual by subtracting the total of the four above mentioned flows to agriculture from the FAOSTAT ACF. The example illustrates that if national authorities provide the desired disaggregation of agriculture, forestry, and fisheries data, including current and capital figures (or proxies) where relevant, a robust analysis of the dynamics of capital stock accumulation could be achieved for a majority of countries.

Figure 3. Components of Agricultural Investment Flows in Dominican Republic (2007)



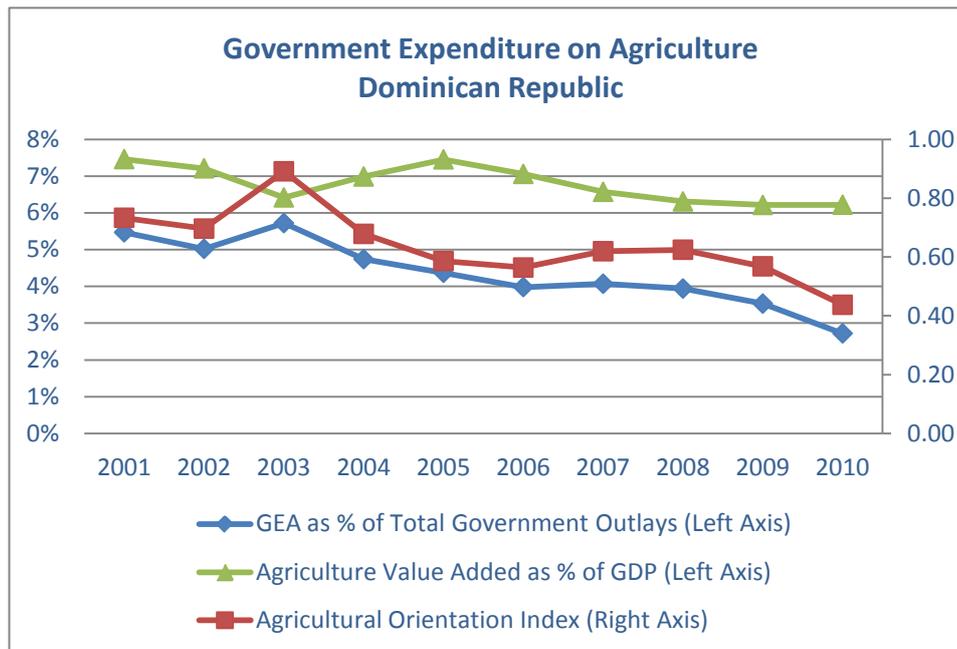
Going forward, FAO Statistics Division will work with countries to ensure that data needed to complete the Template in Annex I become available according the FAO broad definition of agriculture. In the short to medium-term, this will entail FAO staff compiling time series from data (and metadata) made available by national authorities on national websites (ministries of finance, central banks, and national statistical offices, among others). Modalities will need to be found for engaging in dialogue to address data gaps and ensure a timely flow of annual data series that support this initiative.

⁶ ACF in 2007 is measured as $ACS_{2007} - ACS_{2006}$.

⁷ As in SOFA 2012, we assume that 50% of government spending can be considered capital accumulation.

BOX 2: Analysis of Government's Orientation towards Agriculture in the Dominican Republic

The *Agricultural Orientation Index* shows the extent to which government expenditures on agriculture reflect (or not) the importance of agriculture in the overall economy. It is defined as the ratio between the share of *GEA* over *Total Government Outlays* (source: FAOSTAT) and the share of *Agricultural Value Added* over *GDP* (source: World Bank's World Development Indicators). The graph shows that the share of governments spending in agriculture has declined from 5.5% in 2001 to 2.7% in 2010, while the *agricultural orientation index* has declined from 0.73 to 0.44 for the same years.



VIII. CONCLUSIONS AND POINTS FOR DISCUSSION

Well channelled investment has individual and collective economic rewards as it enables the rural population to better contribute, in the short and long-term, to economic growth and the prosperity of the national and global community. In this respect, the information and analyses supported by the evolving Investment Dataset will help to ensure that policies followed create favourable incentive environments supporting effective investment by farmers and other stakeholders.

Participants are asked to express their views regarding the Investment Dataset initiative and FAO activities pertaining to, *inter alia*:

- **Suitability of the proposed dataset to monitor and enhance investment in member countries** through advocacy, capacity development, the promotion of multi-stakeholder dialogue, etc.
- **ACS estimates disseminated on FAOSTAT** would be improved by the incorporation of data on private investment, where available, and data on capital stocks for forestry and fisheries, where relevant. How could such data be made more widely available and provided to FAO?

- **The availability of national and/or international guidelines pertaining to allocations of ODA and FDI to Agriculture** in terms of recurrent (wages and salaries, use of goods and services, etc) and capital (acquisition of nonfinancial assets) purposes?
- **Relevance and analytical interpretation of these data** for the Food Security Commitment and Capacity Scorecard initiative.
- **Scope of guidelines to be developed for the analytical interpretation of these data** for review and endorsement by the regional meetings.

Annex II. Global Agricultural Capital Stocks

