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Issues in the collection of FAO data[1]

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Abstract

This paper reports on the performance in reporting agricultural data to FAO by the countries in the Asia and Pacific, focusing on its APCAS members. Its purpose is to identify trends in response rates and data quality with respect to the six questionnaires sent to countries by the FAO statistics division – agricultural production, producer prices, land use, fertilizers, pesticides use, and government expenditures in agriculture; and agricultural trade flows compiled from customs data reported by countries. The analysis finds APCAS members tend to perform better than the region and the world as a whole, but low response rates and data quality/ completeness in many domains remain a concern. There is a need to improve data reporting and data completeness to ensure credible, consistent and internationally comparable statistics.is presented, based at its simplest, default level on utilization of a full set of environmental and economic data and indicators within FAOSTAT.

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I. Introduction

The post-2015 Development Agenda has increased the world's policy focus on food and agriculture. On the one hand, agriculture is increasingly recognized as an engine for poverty reduction and the elimination of hunger, two of the 17 Sustainable Development Goals (SDGs). On the other hand, agriculture has significant implications for sustainable resource use, given its impact on land degradation, water use, pollution from fertilizers and pesticides, greenhouse gas emissions, etc.

This results in a substantial increase in data requirements on agriculture statistics, underlined by the increasing use of statistics to monitor national and international policy targets, including those underlying the 17 SDGs . Both national and international statistical agencies are, therefore, pressed to collect and disseminate more timely, relevant and comprehensive statistics, making the agricultural information system one of the most important building blocks for the formulation of development plans and policies.

FAO contributes to the world's agricultural information system as the primary multilateral agency providing internationally comparable food and agriculture statistics. FAO's contribution covers most of the pertinent sectors, and includes: outputs, such as crops and livestock; inputs, like labour, machinery, pesticides and fertilizers; environmental resource use and impacts, such as land, water and greenhouse gas emissions; costs, such as producer prices and deflators; key macroeconomic statistics, such as agriculture value-added, capital stock and gross fixed-capital formation; and investment financing, such as government expenditures, development assistance, and domestic bank credit. FAOSTAT, the FAO corporate statistical database, has become an essential global public good that offers free and easy access to these data for 245 countries and territories from 1961 through to 2014. About 200,000 visitors worldwide from academia, international organizations, national governments and the private sector access FAOSTAT every month.

FAO's statistical activities represent a core element of the Organization's mandate, with Article I of the FAO Constitution stating: "The Organization shall collect, analyze, interpret and disseminate information relating to nutrition, food and agriculture." Priority areas for data collection and dissemination are determined regularly and jointly with FAO member states through various forums, including the Asia and Pacific Conference on Agriculture Statistics (APCAS). Since its inception, the joint agreements achieved in these forum support FAO in its endeavours to maintain the best possible capacity to collect, compile, process, validate, harmonize and analyse incoming data and generate relevant, timely, accurate and comparable global databases on food and agriculture statistics.

The quality of data disseminated by FAO depends strongly, however, on the completeness, accuracy and comparability of the national data collected and reported by countries. In order to increase countries' capacity to collect and disseminate basic agricultural and rural statistics, FAO works to strengthen national statistical institutions, developing the technical skills and competencies of national statisticians, and improving country methods for the collection, processing, analysis, and dissemination of relevant and timely information.

In order to assess country-level performance in the collection and reporting of food and agricultural statistics to FAO, this paper provides an overview of the current situation with regards to response rates and data quality and highlights areas for improvement. While a

number of technical divisions in FAO regularly collect country data, this paper focuses on data collected by or reported to the FAO Statistics Division (ESS).

This paper also seeks to create a discussion on major causes of non-response and incompleteness of FAO questionnaires in the region, along with other data quality issues. The purpose of this discussion is to understand the source of these issues, and to seek viable solutions to improve data quality and availability, including addressing the statistical capacity development needs of the region.

In order to highlight the data collection issues and generate a discussion on possible remedial actions, the paper has the following structure. Section 2 describes the main issues facing FAO in collecting and processing country data, and the methodology behind the ESS evaluation of seven key FAOSTAT domains. Section 3 describes the status of data reporting and data quality in the region based on the questionnaires received. Section 4 presents potential causes for low response rates and/or poor data quality. Section 5 proposes possible solutions for discussion. The paper ends with questions and invitations to APCAS members.

II. FAO's statistical challenges, and ESS methodology in data evaluation

In response to the new and increasing demands for a reliable evidence base for agricultural and food policy, FAO expanded its range of statistical activities, strengthened its data processing approaches, improved its dissemination platforms, modified the content of its questionnaires, and moved towards more efficient data collection methods by harvesting, where possible, data collected and processed by other international organizations. This does not always meet with satisfactory results. In part, this state of affairs reflects the fact that in the face of increased and more complex data needs, "many countries, especially in the developing world, lack the capacity to produce and report even the minimum set of agricultural data necessary to monitor national trends or inform the international development debate. " In part, it reflects the increasing demand on countries to respond to multiple - and sometimes overlapping - data requests from an increasing number of agencies and organizations.

As the international agency responsible for the dissemination of internationally comparable food and agricultural statistics, FAO invests significant resources in the harmonization and validation of data received from national statistical institutions. In the standardization process, for example, national data are converted to common units of measure, definitions and classifications. For validation, all datasets go through domain-specific and iterative validation procedures that involve crosschecking with external databases and internal peer-review of FAO experts. Data of low quality may be replaced and data gaps filled with a variety of imputation techniques tailored to the specific data domain and information context.

Imputation of missing data is a necessary step for all international organizations to be able to compile world and regional aggregates, as well as to estimate derived indicators or analytical reports, like the Supply Utilization Accounts and Food Balance Sheets.

As a consequence of the processing and validation activities, inconsistencies may be found between national and international databases, and sometimes across international organizations. These inconsistencies may arise from differences in methodology or classification systems, correction of errors not found earlier, or introduction of new errors. The FAO Statistics Division tries to minimize these inconsistencies through coordination of

statistical activities in the UN system; through active engagement between FAO and country officials as a result of APCAS meetings and the role of FAO's regional statistician; through a period for internal peer review of data between uploading into FAOSTAT and final dissemination; and by providing metadata explaining methodological differences.

Inconsistencies could be further reduced if countries adopted international guidelines more closely; their officials reported the most complete data and metadata possible, preferably in standardized physical units of measure; countries undertook imputations to fill data gaps where data collection was irregular or incomplete; and ESS involved countries in validation and peer review processes. Furthermore, these solutions, when fully implemented, would improve the accuracy of imputations and improve the timeless of FAOSTAT data releases.

To examine and evaluate the current trends in its statistical data, this paper examines data availability and quality for seven of ESS's key statistical domains published in FAOSTAT: agricultural production, trade flows, producer prices, land use, pesticides use, fertilizers, and government expenditures in agriculture (GEA).2 It examines trends at the regional, sub-regional and national levels, for reference years 2008 through 2014, in order to identify where problems exist and to discuss and explore potential solutions for improvement.

Response rates, used to measure data availability, are compiled as responses to ESS questionnaires or, in the case of agriculture trade flows, the reporting by a country of its customs records. For six domains, annual questionnaires serve as the primary mechanism to obtain country data: agricultural production, producer prices (or prices received by farmers), fertilizers, pesticides use, land use, and government expenditures in agriculture (GEA). For agricultural trade flows, countries report customs records to FAO and/or the UN COMTRADE. Where customs records are reported only to the UN COMTRADE, these data have been shared with FAO through a Memorandum of Understanding.

Ideally, a country should be considered a respondent (i.e. reporting to FAO) for a specific domain if they responded to a questionnaire. This includes providing data in the questionnaire; responding with a link to an official site that provides free access to the required official data and metadata; or, in instances where a country did not collect the data in question, it informed ESS and submitted a questionnaire with updated metadata, such as contact information. Ideally, of course, in the absence of data collection, the country would complete the questionnaire with imputed data, and provide metadata to this effect.

A country should also be classified as a respondent if it instructs and supports FAO to obtain available data from another multilateral agency that leads in compilation of data reported by countries, such as trade data compiled by UN COMTRADE, or government expenditures compiled by the IMF. This approach would take into account countries' request for coordination across multilateral agencies in order to minimize their burden, reduce duplication of efforts across organizations, improve efficiency, and reduce inconsistencies. In all other cases, the country should be treated as a non-respondent (see Figure 1a below for the logic flow).

[2] For data on agricultural trade flows FAO uses country-level electronic trade data/customs files. Increasingly, however, FAO relies on other international agencies, such as the United Nations Statistics Division (UNSD), who also receive this data files, and have expanded their activities to meet a wider range of user needs. This reflects the increased trend across international organizations to specialize their statistical activities in areas of comparative advantage, reducing country-level response burden, and increasing efficiency.

Data completeness , used to measure data quality, is estimated by the proportion of total FAOSTAT records that are official records, where missing (and unreliable) data replaced by FAO imputations are treated as non-official. Ideally, a record is considered official if it is received through a questionnaire, through a lead international organization as official data, or through an official national website or publication. A record should also be considered official if it is a result of a unit of measure conversion calculated from official records, such as: currency conversions to US and/or international dollars; conversions to standardized weights (e.g. from pounds to kilograms); and calculations such as shares of total, and period-over-period growth rates. All imputations by ESS, as well as those by other international organizations, should be considered as unofficial (Figure 1b).

While this paper tried to follow this approach, it was not always possible. Challenges occurred, for instance, when data obtained from a multilateral agency was not differentially flagged as official and imputed, or if domains applied flags inconsistently. Nonetheless, it establishes a logic flow that ESS will look to implement in the future.

Figure 1a: Determining response and non-response status, by domain

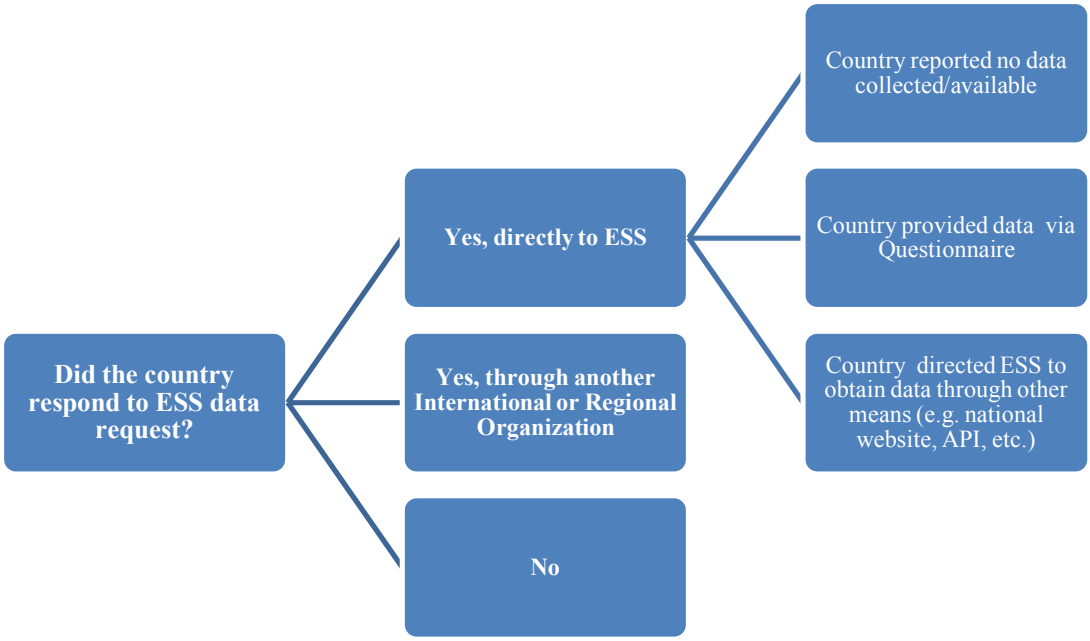
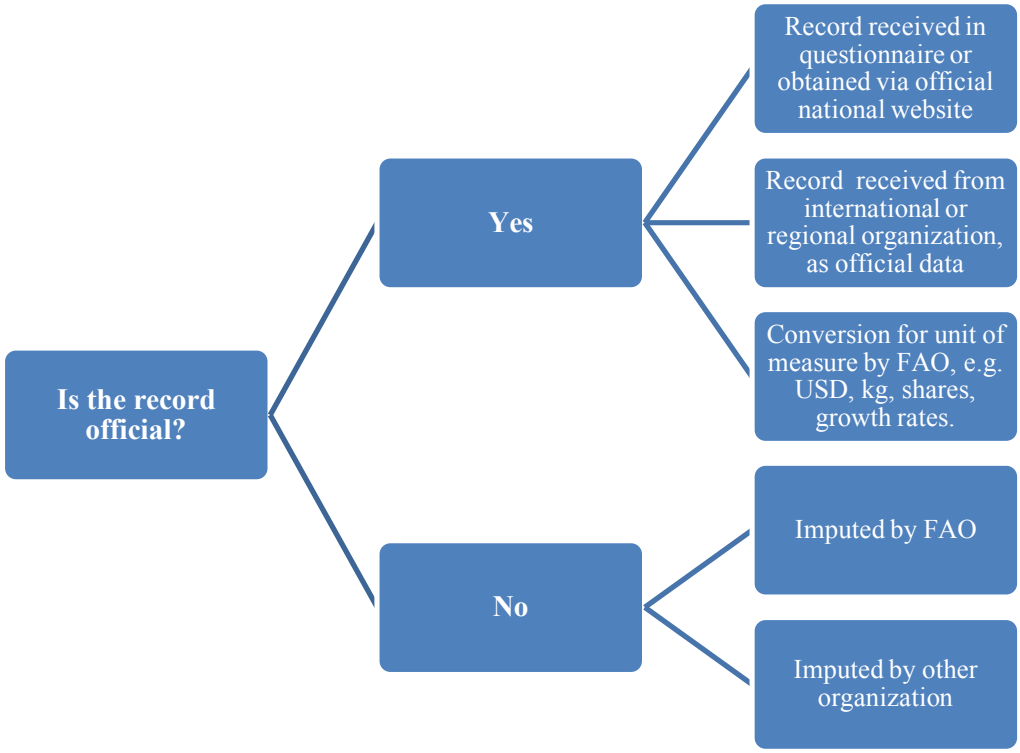


Figure 1b: Identifying official records in FAOSTAT



In using these indicators, it is important to consider them jointly, as a respondent may supply incomplete data, while for a non respondent official data may be found on a website. Even for responding countries, incoming data are often incomplete and sometimes inconsistent, either over time and/or with respect to other national data sources. In some cases, national data are not collected according to international standards, making them difficult to compare with data reported by other countries. Lack of metadata increases the difficulty of converting such data to standardized measures, often requiring assumption-based adjustments and imputations. In other cases, data are not reported in their entirety, compounded by a lack of metadata to indicate if missing records arise because the record is not relevant to the country, or not collected. This results in time-consuming estimations and imputations by ESS that would be better conducted by country officials with a deeper knowledge and expertise of the subject and their nation's agricultural sector.

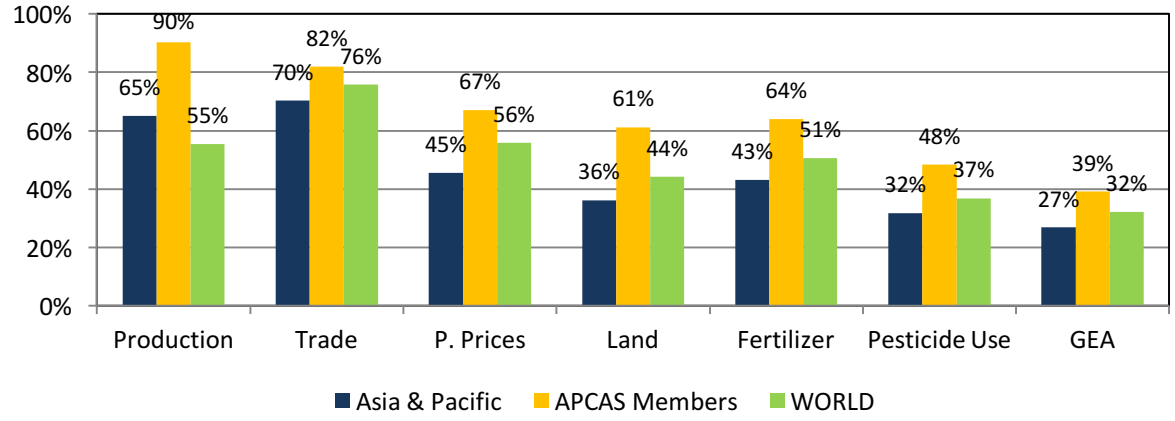
When using these indicators jointly, however, it should be noted that non-respondents will also perform poorly in measures of data completeness. Since imputations are inevitably higher for non-respondents, particularly if missing data cannot be found through an alternative official national source, such as an official website or publication, the two measures may be highly correlated for some countries.

III. Data availability and quality in the region

This section describes the main patterns in national response rates and data quality for each of the seven statistical domains for countries in the region of Asia and the Pacific (RAP), excluding Western and Central Asia; at the regional, sub-regional and national levels; and for its APCAS members.

Historical patterns of reporting for reference years 2008 to 2014 show heterogeneous results in data availability for both RAP and its APCAS member states. For RAP countries, only agricultural trade flows have average response rates over 70%, compared to APCAS members in the region, who have response rates over 80% for agricultural production and at 90% for trade flows (Figure 2). At the other extreme, response rates for GEA remain below 30% for RAP and 40% for APCAS members reflecting, in part, the relative newness of this questionnaire, which was introduced globally for the 2011 reference year. In the remaining 5 domains, average response rates range from 30% to 45% for RAP, and 50% to 70% for APCAS members.

Figure 1: Average 2008-2014 response rates, by domain



Compared to the world, RAP countries have a higher response rate in production, and lower rates in the remaining six domains. APCAS members, however, outperform the world in all domains (Figure 2). On the one hand, this may reflect the benefits of membership, such as the support received by member countries from the FAO regional statistician. On the other hand, it may reflect a selection bias, in that countries that join APCAS do so because of the priority they place on and/or resources they provide for agricultural statistics, while non-members may lack these priority, resources and/or capacity.

3.1 Overall patterns and trends in response rates, by domain

Across domains for the 2008-2014 period countries, APCAS members perform best in responding to requests for data on agricultural production and trade flows, with over 60% of countries reporting data every year in both domains and an average of 6.3 responses out of 7 for production, and 4.9 responses out of 6 for trade flows. This is followed by producer prices (26% report data every year, and 4.7 out of 7 average responses); fertilizers (28% and 3.8 out of 6); land use (33% and 3.7 out of 6); pesticides use (13% and 2.4 out of 5); and government expenditures (17% and 1.2 out of 3)[3] (Tables 2 and 3). Non-members do not perform as well in any domain, reducing the region's response rates.

[3] For each domain, a respondent is excluded from this analysis if it did not receive a FAO questionnaire.

Table 2: Average response rates by domain and membership status, 2008-2014

	APCAS members			All RAP countries			
	Average responses	Average response rate	Number of recipients	Average responses	Average response rate	Number of recipients	**Maximum data requests**
Production	6.3	90%	22	4.6	65%	38	7
Trade flows	4.9	82%	24	4.2	70%	41	6
Producer Prices	4.7	67%	23	3.1	44%	39	7
Fertilizers	3.8	64%	25	2.6	43%	46	6
Pesticides Use	2.4	48%	24	1.6	32%	46	5
Land Use	3.7	61%	24	2.2	36%	47	6
GEA	1.2	39%	23	0.8	26%	41	3

* APCAS had a maximum of 25 potential respondents, while the region as a whole had 48.

Table 3: Number always reporting, by domain and membership status, 2008-2014

	Always Reported, #		Always Reported, %	
	APCAS members	**Non members**	**APCAS members**	**Non members**
Production	14	0	64%	0%
Trade flows	15	3	63%	18%
Producer Prices	6	1	26%	6%
Fertilizers	7	0	28%	0%
Pesticides Use	3	1	13%	5%
Land Use	8	0	33%	0%
GEA	4	0	17%	0%

Since the last APCAS meeting, between reference years 2011 and 2013, response rates for member countries increased for producer prices (61% to 74%), GEA (22% to 43%) and land use (67% to 75%); remained the same for pesticide use (50%); declined slightly for production (95% to 91%); and fell for trade (88% to 75%) and fertilizer use (68% to 60%) (Figure 3a). In comparison, the region saw slight declines in response rates for production and trade, no change in fertilizer use, and increases in the other four domains (Figure 3b).

APCAS members saw a large decline in production response rates, which fell from 91% in 2013 to 64% in 2014, while the region saw response rates fall from 61% to 37%. This reflects a notable time lag in responses to the production questionnaire, and changes in ESS to the domain, including questionnaire revisions. However, as Table 1.1 of the Annex shows, this phenomenon was not evident in all regions, with world response rates rising from 58% in 2013 to 63% in 2014. This should be particularly troublesome for RAP given the importance of and demand for timely agricultural production statistics.

For producer prices and GEA, for which 2014 data collection is also advanced and still underway, the decrease in producer price response rates for both APCAS members and non-members can still be reversed, and the improvements in GEA response rates increased. ESS encourages countries to respond to these questionnaires if they have not yet done so.

Figure 3a: Response rates by APCAS members by domain, 2008-2014

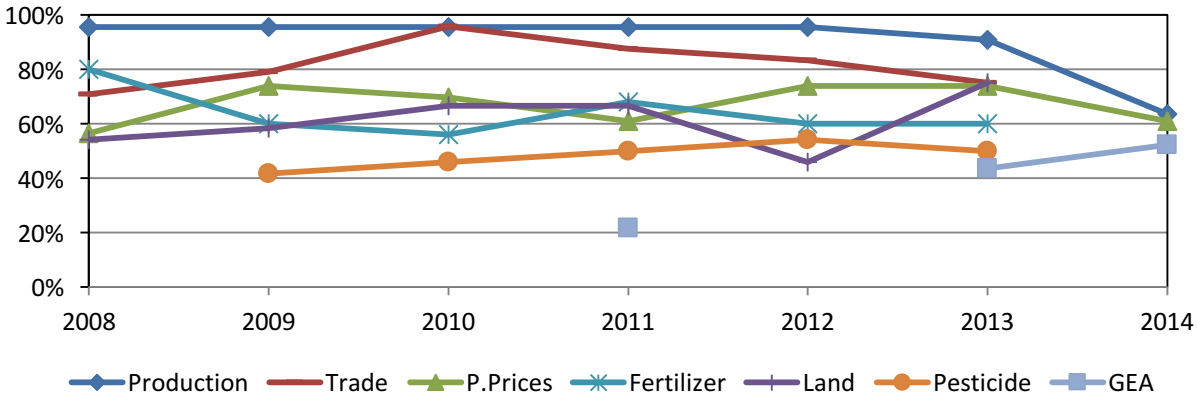
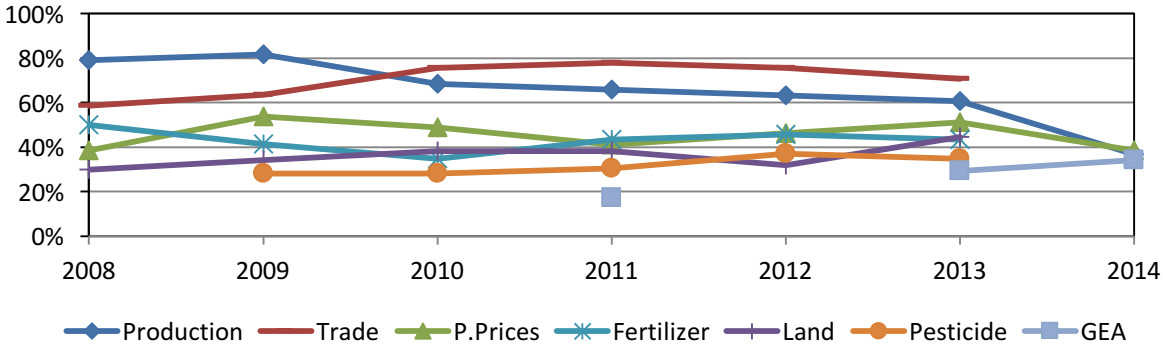
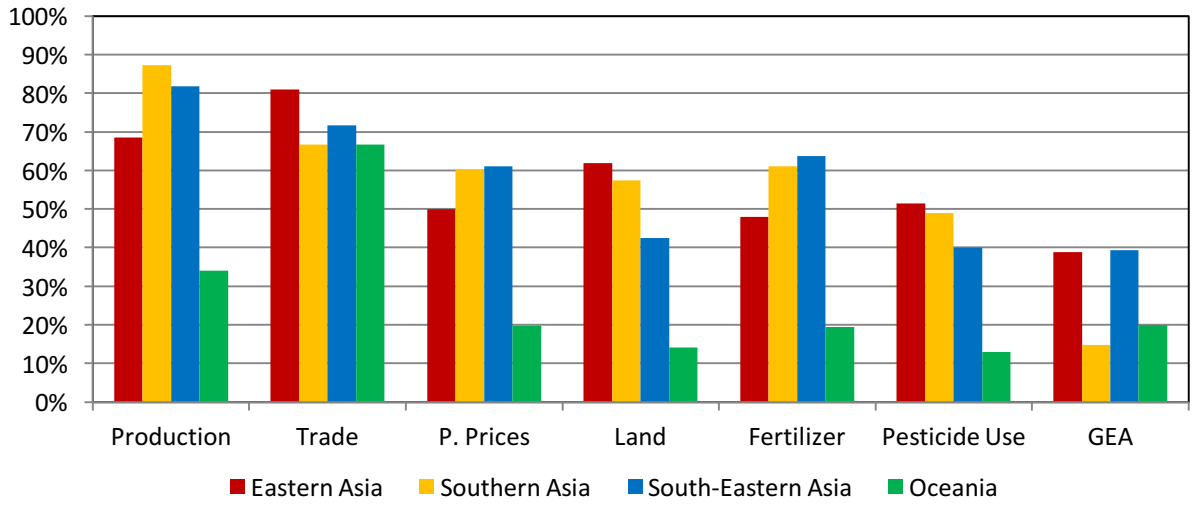


Figure 3b: Response Rates in the Asia and Pacific Region by domain, 2008-2014



Regional averages continue to mask differences between sub-regions. Considering all countries in RAP, all sub-regions performed better in production and trade than in other domains (Figure 4a). Across sub-regions, however, no one region consistently outperformed others across all domains. Overall, Oceania was the weakest in all domains except government expenditures, where it ranked second last. For the remaining three sub-regions, results were heterogeneous across domains.

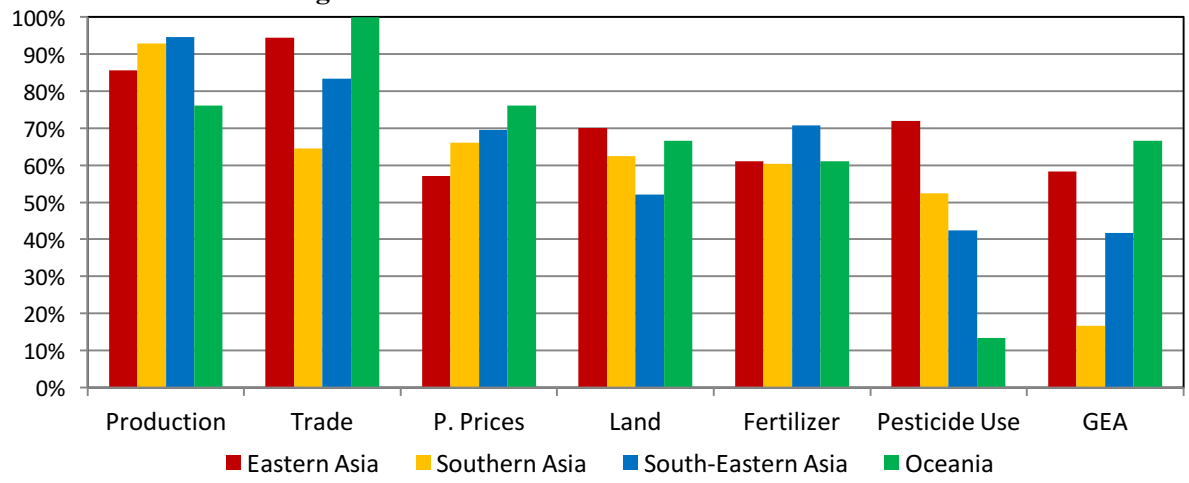
Figure 4a: RAP response rates by sub-region & domain, 2008-2014 average



APCAS members performed better in all sub-regions than non-members, regardless of domain. In Oceania, while the region as a whole performed poorly, among its APCAS members, it had the highest sub-regional response rates for trade flows, producer prices and GEA, ranked second in the four regions for land use and fertilizers, and last only in production and pesticides (Figure 4b). Among the remaining three sub-regions, rankings vary by domain.

Within sub-regions, the most striking contrast between members and non-members comes from Oceania. This can be explained by the fact that the APCAS members from Oceania – Australia, Fiji and New Zealand – include two advanced economies with strong resources and statistical capacity, and policy importance place on their agricultural sectors. Non-members, on the other hand, include many small-island developing states, which face limited resources and statistical capacity, and seem to have enormous difficulties in providing statistical information in all data domains, even in reporting on agricultural production.

Figure 4b: APCAS member response rates by sub-region and domain, 2008-2014 average



According to the frequency of responses to FAO questionnaires, countries receiving a questionnaire/data request are divided in three groups, classified per domain as per Table 4.

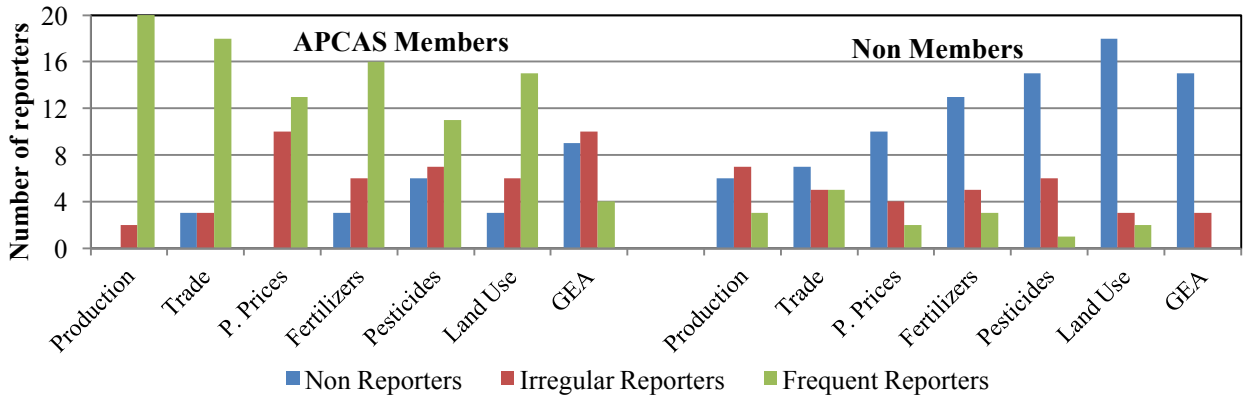
a) Non-reporters: countries that have never reported data the reference period in question and, for this reason, may lack the capacity to produce relevant data.
b) Irregular reporters: countries that report to FAO irregularly. The reasons for this behaviour may be linked to institutional or communication issues.
c) Frequent reporters: countries that report to FAO regularly and for this reason, may not have major problems in participating in FAO data collections. They may still, however, experience problems in reporting complete data.

Table 4: Reporting Status, by domain

Domain	Number of mail-outs for 2008-2014 reference	Frequency of responses		
		Never	Irregular	Frequent
Production	7	0	1 – 4	5 – 7
Trade Flows	6	0	1 – 3	4 – 6
Producer Prices	7	0	1 – 4	5 – 7
Fertilizers	6	0	1 – 3	4 – 6
Pesticides use	5	0	1 – 3	4 – 5
Land use	6	0	1 – 3	4 – 6
GEA	3	0	1 – 2	3

Comparing APCAS members and non-members (Figure 5), members are more likely to be frequent reporters in all domains except GEA, while non-members are more likely to never report data in all domains except production. Between 11 and 20 of the 25 APCAS members[4] are regular reporters across all domains except in the case of GEA, where only 4 are regular reporters. Between 0 and 9 members have never reported data, depending on the domain. Between 1 and 5 of the 23 non-members are regular reporters across all domains except for GEA, which has no regular reporters, while in other domains, between 6 and 18 never reported.

Figure 5: Reporters by domain, type and Membership status, 2008-2014



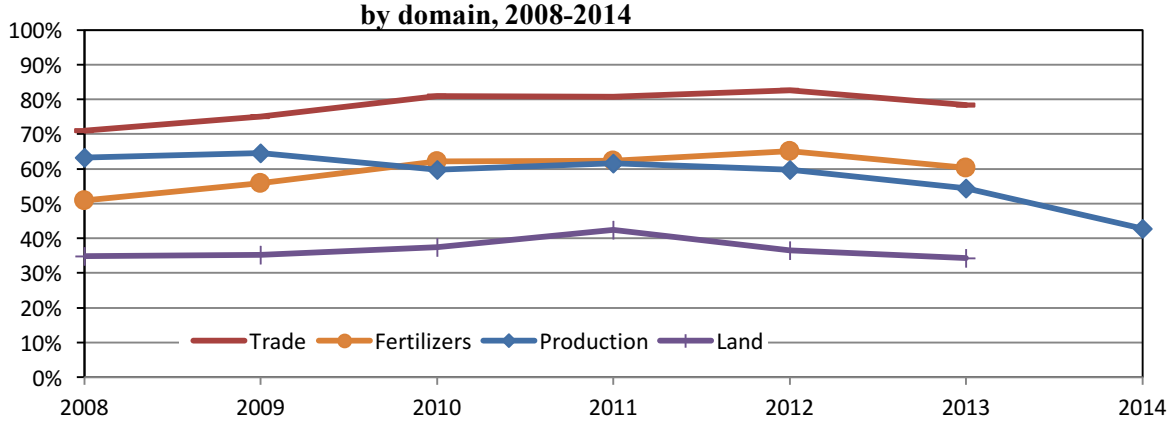
Response rates do not sufficiently address issues in data reporting, however, as the quality or completeness of the data also matters in compiling global databases. The proportion of records published in FAOSTAT that are official records is used to measure completeness.

From this perspective, Figure 6a demonstrates relatively strong rates of data completeness by APCAS members for trade flows, which reached over 80% in recent years, an improvement from the 71% rate of 2008. Completeness rates also improved for fertilizers, rising from 51% in 2008 to 60% in 2013; remained low but relatively stable, at around 35%,

[4] This analysis , for the People's Republic of China, treats its mainland, special administrative regions (SAR) and provinces as four separate reporters: Mainland, Hong Kong SAR, Macau SAR, and Taiwan, since each separately administer their data collection and FAO reporting activities. Though there are 22 APCAS countries in the region, this results in a potential maximum of 25 respondents.

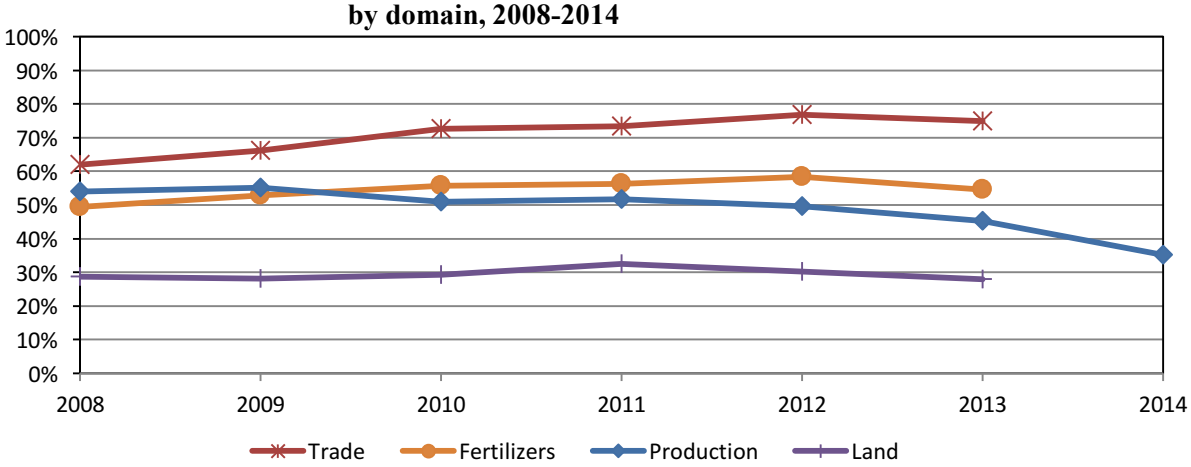
for land use, after peaking to 42% in 2011; and fell for agricultural production from 63% in 2008 to 54% in 2013 and 43% in 2014, with 2014 results, in part, due to lower response rates.

Figure 6a: Proportion of official records in FAOSTAT for APCAS members, by domain, 2008-2014



Completeness rates are lower in all domains for the entire region (Figure 6b), but mirror similar trends as for APCAS members. Trade flows saw relatively high completeness rates (75% in 2013) with improvements since 2008; fertilizers saw much lower rates, between 49% and 58%, with some improvements since 2008; land use experienced low but relatively stable completeness rates of around 30%; and production saw a deterioration of completeness rates from about 55% down to 45% in 2013 and 35% in 2014.

Figure 6b: Proportion of official records in FAOSTAT for Asia and Pacific, by domain, 2008-2014



These indicators of completeness are not provided for producer prices, pesticides use, or government expenditures, as they publish either limited or no imputations/estimations. However, questionnaire/data completeness is also a problem in these domains - globally, in the RAP region, and for its APCAS members. If and when these imputations are published, it will be easier to measure the extent of this problem.

3.2 Agricultural Production

Agriculture production is one of the most important datasets in FAOSTAT and a key input for the compilation of Supply Utilization Accounts/Food Balance Sheets. The annual

questionnaire collects information on crop production, area harvested, livestock and select processed commodities.
Since the previous APCAS meetings in 2014, response rates for APCAS member countries in the Asia and the Pacific declined from 95% in 2012, to 91% in 2013 and 64% in 2014, just ahead of the 2014 global response rate of 63%. The response rate for production was lower in 2014 compared to previous years because some countries may have experienced delays in reporting due to delays in receiving the new questionnaire, which was sent out later than previous years. This includes Afghanistan, Bangladesh, China (Mainland), Iran, Mongolia, Pakistan, and the Philippines, many of whom had reported data every year until 2014. Non-APCAS members also experienced similar trends, including significant declines in 2014, driving regional response rates down from 63% in 2012 to 37% in 2014.

Below is the distribution of Asia and Pacific countries in the three groups classified according to their response rate:

APCAS members	**Non APCAS members**
0 Non Reporters 2 Irregular Reporters = People's Rep. of China (mainland), Fiji. 20 Frequent Reporters = Afghanistan, Australia, Bangladesh, Bhutan, Cambodia, India, Indonesia, Iran (Islamic Republic of), Japan, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, Rep. of Korea, Sri Lanka, Thailand, Vietnam. FAO will explore sending questionnaires to the three administrative regions of the People's Rep. of China (Hong Kong SAR, Macao SAR, Taiwan), which have not yet been included in Production mail-outs.	6 Non Reporters = Brunei Darussalam, Democratic People's Rep. of Korea, Kiribati, Niue, Papua New Guinea, Tuvalu. 7 Irregular Reporters = Maldives, Nauru, Samoa, Solomon Islands, Timor-Leste, Tonga, Vanuatu. 3 Frequent Reporters = Mongolia, New Caledonia, Singapore. FAO will explore sending questionnaires to the following countries that have not yet been included in Production mail-outs: American Samoa, Cook Islands, Federates States of Micronesia, French Polynesia, Marshall Islands, Northern Mariana Islands, Palau.

It should be highlighted that questionnaire completeness has also fallen, with the number of fields completed within a questionnaire generally decreasing in most countries. The few exceptions are notably Nepal and Sri Lanka.

3.3 Agricultural Trade Flows

Agricultural trade flows exhibit one of the strongest response rates among domains, with an average 2008-2013 response rate of 76% for the world, 82% for APCAS members, and 70% for the Asia and Pacific region. It is also note worthy that improved response rates in 2010-2011 were not sustained in 2012 and 2013. APCAS members experienced a record high 96% response rate in 2010, which deteriorated steadily to 75% in 2013, while the region as a whole experienced a peak of 78% in 2011, which fell steadily to 71% in 2013

For APCAS members in 2013, South-Eastern Asia performed best among sub-regions, attaining a 100% response rate, followed by Eastern Asia and Oceania, at 67% each, and Southern Asia at 38%. Both Eastern and Southern Asia saw deterioration relative to 2012.

Apart from 10 countries in the region that never reported data, 3 of which are APCAS members, the most significant challenge faced in this domain are the countries, including frequently reporters, who do not report every year. This is particularly surprising given the use of electronic administrative data.

APCAS members	**Non APCAS members**
3 Non Reporters = Bangladesh, Myanmar, Vietnam. 3 Irregular Reporters = Afghanistan, Bhutan, Iran (Islamic Republic of). 18 Frequent Reporters = Australia, Cambodia People's Republic of China (Mainland, Hong Kong SAR, Macao SAR, Taiwan), Fiji, India, Indonesia, Japan, Malaysia, Nepal, New Zealand, Pakistan, Philippines, Rep. of Korea, Sri Lanka, Thailand. FAO encourages Lao People's Democratic Republic to share their trade files.	7 Non Reporters = Cook Islands, Federated States of Micronesia, Mongolia, Palau, Papua New Guinea, Timor-Leste, Tuvalu. 5 Irregular Reporters = Brunei Darussalam, Kiribati, Samoa, Solomon Islands, Tonga. 5 Frequent Reporters = French Polynesia, Maldives, New Caledonia, Singapore, Vanuatu. FAO encourages the following countries to share their customs records/trade files: American Samoa, Democratic People's Rep. of Korea, Marshall Islands, Nauru, Niue, Northern Mariana Islands .

The trade dataset has among the highest percentages of official data, at around 80% since 2010 for APCAS members and over 70% for the region as a whole.

3.4 Agricultural Producer Prices

The questionnaire on agricultural producer prices, known as the Prices Received by Farmers, was completed by an average of 61% of APCAS members between 2008 to 2014, above the world average of 51% and the regional average of 38%. Since 2010, Oceania had the highest response rate among APCAS members, at 100% every year, and the lowest in the region as a whole, at an average under 20%. For the region as a whole, no one sub-region had consistently better response rates than another.

Among APCAS members, all provided data at least once and over half provided data at least 5 of the 7 years. Given that data collection for reference year 2014 is not yet closed, there is still an opportunity for APCAS members to improve their data reporting. The list below groups countries according to the frequency with which they report their data to FAO.

APCAS members	**Non APCAS members**
0 Non Reporters 10 Irregular Reporters = Afghanistan, Bangladesh, Cambodia, People's Republic of China (Hong Kong SAR), Fiji, India, Indonesia, Lao People's Democratic Rep., Pakistan, Rep. of Korea. 13 Frequent Reporters = Australia, Bhutan, People's Republic of China (Mainland), Iran (Islamic Republic of), Japan, Malaysia, Myanmar, Nepal, New Zealand, Philippines, Sri Lanka, Thailand, Vietnam. FAO will explore sending questionnaires to the two administrative regions of China (Macao SAR, Taiwan) which have not yet been included in Producer Prices mail-outs.	10 Non Reporters = American Samoa, Brunei Darussalam, Cook Islands, Democratic People's Rep. of Korea, New Caledonia, Niue, Papua New Guinea, Samoa, Solomon Islands, Tuvalu. 4 Irregular Reporters = Maldives, Timor-Leste, Tonga, Vanuatu. 2 Frequent Reporters = Mongolia, Singapore. FAO may explore sending questionnaires to the following countries that have not yet been included in the Producer Prices mail-out: Federated States of Micronesia, French Polynesia, Kiribati, Marshall Islands, Nauru, Northern Mariana Islands, Palau.

The rate of completeness of the producer price questionnaires is declining, though the measure of this does not come from the proportion of official records in FAOSTAT. Though FAOSTAT does not currently publish most of the producer price imputations, these imputations are critical in compiling both national agricultural producer price indices (PPIs) and the value of agricultural production (VOP) indicator, both of which are published in FAOSTAT. As the organization expands its price statistics to include regional and global PPIs for key commodity groups, incompleteness in data reporting and the use of FAO imputations will become more and more problematic.

Other problems with producer prices include use of non-standard units of measure, and data inconsistency across time. The first requires conversion by FAO statisticians, which is particularly problematic when the unit of measure used is not clearly reported, or difficult to convert to kilograms or tons. Inconsistency occurs when significant time series changes occur between two periods, sometimes differing by a factor of 5, without sufficient evidence or information to explain the break. In these cases, it is difficult to understand if there was an error in converting data to the standard unit, a change in the price concept, a change in the

variety observed, a major methodological revision, or a combination of all these factors. Better reporting of metadata will certainly help to explain the cause of these changes and identify data quality issues.

3.5 Agricultural Inputs

Response rates by APCAS members to FAO questionnaires on agricultural inputs were generally around 60% for land use and fertilizers, and around 50% for pesticides. The land use questionnaire saw erratic results, however, with record high response rates of 75% in 2013, following a drop to 46% in 2012, after holding steady at 67% in 2010 and 2011. APCAS members perform consistently better than the region and world as a whole in all three input domains.

It should be noted that response rates were not estimated for 2014 since data processing is not yet complete. Furthermore, the Pesticides questionnaire was not mailed out in 2008, and the analysis of this section takes these factors into account.

For fertilizers data, APCAS members had a response rate of 60% for reference year 2013, led by South Eastern Asia (75%) and Eastern Asia (67%).

For APCAS members, 60% of 2013 fertilizer records in FAOSTAT were official data provided by countries, a decline from the previous three years, which saw rates of between 62% and 65%. This may reflect challenges related to confidentiality constraints related to industry, in particular when a limited number of fertilizer producers exists in a country. In those specific cases, a solution should be sought to facilitate communication of confidential data in appropriate aggregated formats (i.e., products or regional aggregates).

Fertilizers	
APCAS members	**Non APCAS members**
3 Non Reporters = People's Republic of China (Taiwan), Fiji, India. 6 Irregular Reporters = Bangladesh, Cambodia, People's Republic of China (Hong Kong), Lao People's Democratic Rep., Myanmar, Sri Lanka. 16 Frequent Reporters = Afghanistan, Australia, Bhutan, People's Republic of China (mainland), China- Macao, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea, Thailand, Viet Nam. For some *non reporters* fertilizers data from alternative sources were nonetheless available, either online or in national publications. FAO intends to clarify if these	13 Non Reporters = Federated States of Micronesia, French Polynesia, Kiribati, Marshall Islands, Mongolia, Nauru, Niue, Palau, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu. 5 Irregular Reporters = Cook Islands, Democratic People's Rep. of Korea, Samoa, Singapore, Timor-Leste. 3 Frequent Reporters = Brunei Darussalam, Maldives, New Caledonia. FAO may explore sending questionnaires to the following countries that have not been included in the mail-out of questionnaires for Fertilizers for the reference years 2008 to 2014: American Samoa and Northern Mariana Islands.

countries would support use of data from these sources, currently collected by FAO outside the questionnaire process, as valid official data. If so, these countries could be considered as reporting in future analyses.	

For Pesticides use, the response rate for the reference year 2013 was 38% globally, while for APCAS members it was considerably higher, at 50%, and for the Asia and Pacific region as a whole, slightly lower at 35%. Within this region, APCAS members saw higher rates in South-Eastern Asia and Southern Asia (63%); whereas Oceania had a 33% response rate; and Eastern Asia a 20% rate. The overall trend of the response rate for APCAS members was positive, rising steadily from 42% in 2008 to 54% in 2012, before declining slightly to 50% in 2013.

Questionnaire completeness was not estimated for this domain, because FAOSTAT contains almost no estimations or imputations for pesticides use.

Pesticides use	
APCAS members	**Non APCAS members**
6 Non Reporters = Afghanistan, Australia, Cambodia, New Zealand, Philippines, Viet Nam. 7 Irregular Reporters = Fiji, India, Indonesia, Nepal, Pakistan, Republic of Korea, Thailand. 11 Frequent Reporters = Bangladesh, Bhutan, People's Republic of China (mainland, Hong Kong SAR, Macao SAR), Iran (Islamic Republic of), Japan, Lao People's Democratic Rep., Malaysia, Myanmar, Sri Lanka. People's Republic of China (Taiwan) was not included in the mail-out of questionnaires for Pesticides use for the reference years 2009 - 2014.	15 Non Reporters = American Samoa, Democratic People's Rep. of Korea, Federated States of Micronesia, Kiribati, Marshall Islands, Mongolia, Nauru, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tuvalu, Vanuatu. 6 Irregular Reporters = Brunei Darussalam, Cook Islands, Maldives, New Caledonia, Timor-Leste, Tonga. 1 Frequent Reporters = French Polynesia. Singapore was not included in the mail-out of questionnaires for Pesticides use for the reference years 2009 - 2014.

For Land use data, response rate from 2008 to 2013 improved: global response rates rose from 42% to 48%; regional rates rose from 30% to 45%; and APCAS member rates rose from 54% to 75%. Among APCAS members, sub-regional trends saw response rates rise in South-Eastern Asia (from 50% to 88%), Southern Asia (from 50% to 63%), and Eastern Asia (60% to 80%), while they remained the same at 67% for Oceania. Revisions to the Land use questionnaire in 2011 may have had temporary impacts on response rates in Southern Asia and South-Eastern Asia, where rates fell briefly in 2012.

Data completeness rates, however, are quite low with the proportion of official FAOSTAT records standing at 34% for APCAS members in 2013, falling from a 2011 peak of 42%. For the region as a whole, completeness rates were at 28% in 2013, falling from a peak of 33% in 2011. This indicates on-going problems for countries in completing this questionnaire.

Land use	
APCAS members 3 Non Reporters = Cambodia, People's Republic of China (Hong Kong SAR), Fiji. 6 Irregular Reporters = Indonesia, Lao People's Democratic Rep., Nepal, Pakistan, Sri Lanka, Viet Nam. 15 Frequent Reporters = Afghanistan, Australia, Bangladesh, Bhutan, People's Republic of China (mainland, Macao SAR), India, Iran (Islamic Republic of), Japan, Malaysia, Myanmar, New Zealand, Philippines, Republic of Korea, Thailand. People's Republic of China (Taiwan) was not included in the mail-out of questionnaires for Land use for the reference years 2008 - 2014.	**Non APCAS members** 18 Non Reporters = American Samoa, Brunei Darussalam, Cook Islands, Democratic People's Rep. of Korea, Federated States of Micronesia, French Polynesia, Kiribati, Marshall Islands, Nauru, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu. 3 Irregular Reporters = Maldives, Singapore, Vanuatu. 2 Frequent Reporters = Mongolia, New Caledonia.

3.6 Government Expenditures on Agriculture

Government Expenditures on Agriculture (GEA) is a relatively new FAO domain, with global data collection starting in 2011. The second global mail-out for the 2013 reference year started an annual data collection cycle, and the 2014 reference year mail-out is still in progress. The GEA questionnaire first focused on Africa to collect essential statistics to monitor regional initiatives and commitments, then expanded globally with a questionnaire developed in partnership with the IMF.

FAO's GEA questionnaire uses the IMF methodological framework, and while the IMF requests data on aggregate government spending on agriculture, forestry and fishing (ISIC Rev 3.1 Section A and B, or ISIC Rev 4 Section A), the FAO questionnaire seeks disaggregated information for each of the three subsectors, as well as breakdowns on recurrent versus capital expenditures. These details help better meet user needs, who have expressed considerable interest in expanding the questionnaire to include government expenditures on rural development.

Due to these developments, 2011 saw a low 22% response rate for APCAS members and a 17% response rate in the region as a whole, below the 25% global average. Though the regional response rates increased in 2013 and 2014 to 25% and 32%, respectively, they remain below the global averages of 32% in 2013 and 39% in 2014. Conversely,

improvements by APCAS members saw their response rates of 4% in 2013 and 52% in 2014 exceed the global average.

Nonetheless, these response rates remain low, as does the degree of data completeness, which may arise, in part, from problems at country level in compiling the appropriate data, and problems experienced by FAO in obtaining the correct contact points in each country. This is supported by the large number of those among both APCAS members and non-members who never reported between 2008 and 2014.

Sub-regionally among APCAS members, response rates were highest in Oceania (67% in 2013 and 2014), followed by Eastern Asia (50% in 2013 and 2014), South-eastern Asia (38% in 2013 and 63% in 2014). They were lowest in Southern Asia, remaining at a steady 11% in all years. However, as the data collection for the 2014 reference year is not yet complete, further improvements remain possible.

APCAS members	**Non APCAS members**
9 Non Reporters = Afghanistan, Bangladesh, Bhutan, Cambodia, Fiji, India, Iran (Islamic Republic of), Lao People's Democratic Rep., Thailand. 10 Irregular Reporters = People's Republic of China (Mainland, Hong Kong SAR), Indonesia, Japan, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka. 4 Frequent Reporters = Australia, New Zealand, Republic of Korea, Viet Nam. FAO will explore sending questionnaires to the two administrative regions of China (Macao SAR, Taiwan) which have not yet been included in Producer Prices mail-outs.	15 Non Reporters = Brunei Darussalam, Cook Islands, Democratic People's Rep. of Korea, Federated States of Micronesia, Kiribati, Maldives, Mongolia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu. 3 Irregular Reporters = Nauru, Singapore, Vanuatu. 0 Frequent Reporters. FAO may explore sending questionnaires to the following countries not yet included in the Producer Prices mail-out: American Samoa, French Polynesia, Marshall Islands, New Caledonia, Northern Mariana Islands.

Though no estimations or imputations are currently published for government expenditures, data incompleteness remains a key problem. ESS complements its data collection with information reported to the IMF, and additional data found from official country websites and publications. However, many policy uses require detailed sub-sector information separately on agriculture, on forestry and on fishing, requested in the ESS questionnaire, as well on capital versus recurrent expenditures, which are often not provided by countries, and certainly not collected by the IMF. The absence of details create similar challenges, particularly in the face of increasing demands for more information, such as public expenditures on rural development

Data completeness and response rates improvements in this domain are also increasingly important as FAO rolls-out its new investment statistics domain. The purpose of this domain is to provide a global database on physical investment in agriculture, forestry and fisheries (aggregated and at the sub-sector level), as well as the sources of financing (domestic/foreign, public/private), in order to support policy analysis, research and development, as well as providing an evidence base for mobilizing and/or targeted donor funding. The absence of

information on financing sources for a country, such as GEA, makes it difficult for policy researchers and policy-makers to include that country in their comparative analysis. A further challenge factor will arise when FAO revises the GEA questionnaire to align with the revised updated IMF methodology on government finance statistics, issued in 2014, for those countries using this new methodology.

IV. Understanding the possible causes underneath incomplete data provision

The previous section described the response and quality of country data reported to FAO. The purpose of this section is to help understand the causes behind low country-level participation in FAO data collection, and discuss possible ways to improve it.

Low response rates may be an indirect measure of country capacity to collect the required food and agricultural statistics, particularly when countries never report to FAO. For example, they may reflect an absence of data collection, or a lower than annual frequency of data collection, the latter of which would show up in inconsistent response rates over time.

Even when data are collected annually at country level, it is important to bear in mind that not all data are reported to FAO because of inadequacy of existing reporting mechanisms, lack of centralized country-level data collection and reporting, and/or insufficient knowledge by FAO of the appropriate national institutions and individuals to contact.

However, the situation of declining response rates and deteriorating questionnaire completeness can be improved. As FAO implements a new statistical working systems, this paves the way to pilot and introduce efficient multi-mode data collection, including the use of APIs and on-line questionnaires, the latter of which may reduce reporting burden while building in automated data edits/checks. It still remains with countries, however, to provide appropriate contacts, to indicate when and where training and support is required, to provide the best quality data and metadata possible, and to collaborate and to pilot new approaches to data reporting and country-level imputation of missing data.

Listed below are questions for which FAO seeks feedback from APCAS members.

a) Data sent to FAO are sometimes in conflict with other national sources or are inconsistent over time. To address this, could APCAS members document any change in time series (different units, different concepts and/or different methodology) with appropriate metadata?
b) Questionnaire revisions, while often necessary to improve data quality, seem difficult to manage by countries. What are the reasons for this? Are there better ways to test and manage changes, such as improved explanations?
c) In domains with decreasing response rates and/or completeness, what are the causes of this trend? How can this be addressed jointly (e.g. updated contact information, improved communication, additional training, capacity development, etc.)?
d) Could countries provide domain-specific information on data availability, and data collection cycles and frequencies, possibly through a data calendar, to help ESS better manage the FAO data collection process?
e) For all domains, incomplete or absent metadata impact the ability to interpret results provided by country. How can FAO facilitate improved metadata reporting?
f) APCAS members are invited to:
    - Clarify challenges in reporting; inform FAO of any non-standard units of measure used; share updated focal/contact points; provide complete metadata.
    - For producer prices, inform FAO of the actual price concept monitored.
    - For fertilizer use, to propose solutions for improving data reporting when confidentiality issues exist (e.g. provision of aggregates).

- For production, producer price and GEA 2014 non-respondents, to complete and submit the 2014 questionnaires.

V. Measures currently undertaken and possible strategies for the future.

Insufficient data availability and lack of completeness has an important consequence that deserves attention. FAO Statistics Division is forced to impute missing data to be able compile derived indicators, regional and world aggregates, or analytical reports such as the Supply Utilization Accounts/Food Balance Sheets. This is a common practice among statistical departments of international organizations, which can create misunderstandings between the organizations and the countries who do not recognize or disown national statistics published in international databases. Moreover imputation work is massive and may be based on a weak information base. To ensure some methodological rigour in imputation, FAO has developed a number of imputation techniques for each dataset, though a description of these methods is not within the scope of this paper. These techniques, however, require significant time and effort, and may lack the level of knowledge and expertise of country officials about country-specific trends and issues.

The crucial point is that three aspects of data validation and imputation do not actively involve member countries: the imputing of data, the peer review of applied methodologies, and the peer review of the final published data. In other words, the current situation is the following: a) countries do not all agree with imputation methods used; and b) imputations are not computed by the countries themselves, who have a wider information basis and more country-specific and event-specific information to use as proxies and rationales.

Improving data, establishing validation processes, building country capacity and strengthening international statistical governance are long processes that need years to develop in order to produce sustainable results. It is therefore necessary to proceed in parallel with actions that generate short-term improvements, and institutional solutions that are more effective but require the long-term to bear fruit.

Short-term solution: enhancing data transmission through greater communication between FAO and countries and strengthening statistical capacities

FAO Statistics Division devotes a significant share of time in providing feedback to countries, up-dating contact lists, searching additional information and crosschecking data. On the one hand, keeping a constant dialogue with countries is essential for a deep understanding of the figures and of the issues at country level. On the other hand, it is a resource-intensive activity.

Countries could effectively help FAO improve data collection both in the preliminary data collection phase and in providing more complete metadata along with the data. An up-to-date list of focal points is a pre-condition to ensure that data requests reach the competent national authority and response rate is at its highest possible rate with the existing data.

A second aspect is the improvement of FAO questionnaires. Country comments on the questionnaires are invaluable to clarify instructions and reduce the difficulties that national officers may have in filling them. Metadata are a necessary support for a deeper understanding and better use of the figures. By informing FAO of the actual availability and frequency of each dataset, and by providing detailed concepts, definitions and methods used, countries will increase the total quality of the data and of the imputation of the missing data.

Country involvement in the imputation process would also improve the quality of imputations, because countries can rely on a wider, deeper and more accurate information basis. Countries are invited to define their capacity development needs express their views on the organization of regional workshops imputation techniques.

Medium-term solution: establish a platform for peer-reviewing country data published by FAO; and improve statistical capacity development activities.
Although in the short-term improving communication with countries is a viable solution, in the longer term the institutional involvement of all member countries is fundamental. Therefore, in order to ensure full country involvement in peer reviewing country data, a more formal mechanism of country consultation should be established, such as a global Committee on Statistics, which is discussed in more detail in another presentation.
To address limited capacities and expertise at country level, there may also be a need to implement more capacity development activities in the areas of data collection, data reporting/compilation, and imputation. Training in data analysis is also essential to improve data quality. With FAO's facilitation, countries with stronger agricultural statistical systems can play an important role in such activities by sharing their knowledge and expertise with others in the process of building new or improving existing statistical programs.

VI. Questions and invitations to APCAS members

APCAS members are requested to express their views and recommendations to FAO on the following:

- To improve response rates and questionnaire completion: a) the FAO regional statistician, FAO HQ, and countries improve coordination mechanisms, such as maintaining up-to-date national focal point(s), endorsing and implementing new methodological guidelines, and peer-reviewing data and methodologies to be published by FAO; b) FAO pilots multiple-mode data collection, such as on-line questionnaires and APIs; c) select member countries volunteer to pilot new data sharing technologies with FAO.

- FAO and member countries explore how best to implement statistical capacity development activities in the areas of data collection, data reporting/compilation, imputation, and analysis.

- To address the specific FAO questionnaire challenges in the region, countries collaborate with FAO through the regional statistician, to request and support targeted capacity development/training workshops.

Annex 1. Data availability and quality

Table 1. APCAS Member response rates to FAO questionnaires, by Domain and Region, 2008-2014

Table 1.1 Agricultural Production

Region	# of countries	Quest. sent	Response rate						
			2008	2009	2010	2011	2012	2013	2014
Eastern Asia	6	3	67%	67%	100%	100%	100%	100%	67%
Southern Asia	8	8	100%	100%	100%	100%	100%	100%	50%
South-Eastern Asia	8	8	100%	100%	100%	100%	100%	88%	75%
Oceania	3	3	100%	100%	67%	67%	67%	67%	67%
APCAS Members	**25**	**22**	**95%**	**95%**	**95%**	**95%**	**95%**	**91%**	**64%**
WORLD	**227**	**190**	**47%**	**46%**	**50%**	**61%**	**62%**	**58%**	**63%**

Table 1.2 Agriculture Trade flows

Region	# of countries	Data reported	Response rate						
			2008	2009	2010	2011	2012	2013	2014*
Eastern Asia	6	6	83%	100%	100%	100%	100%	83%	
Southern Asia	8	8	50%	63%	88%	75%	63%	50%	
South-Eastern Asia	8	7	71%	71%	100%	86%	86%	86%	
Oceania	3	3	100%	100%	100%	100%	100%	100%	
APCAS Members	**25**	**24**	**71%**	**79%**	**96%**	**88%**	**83%**	**75%**	
WORLD	**227**	**186**	**78%**	**77%**	**78%**	**75%**	**73%**	**74%**	

*** 2014 Trade data processing has been postponed**

Table 1.3 Agriculture Producer Prices

Region	# of countries	Quest. sent	Response rate						
			2008	2009	2010	2011	2012	2013	2014
Eastern Asia	6	4	75%	75%	75%	50%	50%	50%	25%
Southern Asia	8	8	50%	75%	75%	63%	63%	75%	63%
South-Eastern Asia	8	8	38%	63%	75%	63%	100%	75%	75%
Oceania	3	3	100%	100%	33%	67%	67%	100%	67%
APCAS Members	**25**	**23**	**57%**	**74%**	**70%**	**61%**	**74%**	**74%**	**61%**
WORLD	**227**	**185**	**54%**	**52%**	**56%**	**57%**	**60%**	**61%**	**51%**

Table 1.4 Land use

Region	# of countries	Quest. sent	Response rate						
			2008	2009	2010	2011	2012	2013	2014*
Eastern Asia	6	5	60%	40%	80%	80%	80%	80%	
Southern Asia	8	8	50%	75%	75%	75%	38%	63%	
South-Eastern Asia	8	8	50%	50%	50%	50%	25%	88%	
Oceania	3	3	67%	67%	67%	67%	67%	67%	
APCAS Members	**25**	**24**	**54%**	**58%**	**67%**	**67%**	**46%**	**75%**	
WORLD	**227**	**203**	**42%**	**42%**	**44%**	**44%**	**44%**	**48%**	

Table 1.5 Fertilizers

Region	# of countries	Quest. sent	Response rate						
			2008	2009	2010	2011	2012	2013	2014*
Eastern Asia	6	6	83%	33%	50%	67%	67%	67%	
Southern Asia	8	8	75%	63%	50%	75%	50%	50%	
South-Eastern Asia	8	8	88%	75%	63%	63%	63%	75%	
Oceania	3	3	67%	67%	67%	67%	67%	33%	
APCAS Members	**25**	**25**	**80%**	**60%**	**56%**	**68%**	**60%**	**60%**	
WORLD	**227**	**191**	**52%**	**49%**	**49%**	**50%**	**52%**	**51%**	

Table 1.6 Pesticides use

Region	# of countries	Quest. sent	Response rate						
			2008	2009	2010	2011	2012	2013	2014*
Eastern Asia	6	5		80%	100%	80%	80%	20%	
Southern Asia	8	8		25%	63%	63%	50%	63%	
South-Eastern Asia	8	8		50%	13%	38%	50%	63%	
Oceania	3	3		0%	0%	0%	33%	33%	
APCAS Members	**25**	**24**		**42%**	**46%**	**50%**	**54%**	**50%**	
WORLD	**227**	**197**		**34%**	**37%**	**38%**	**38%**	**38%**	

Table 1.7 Government Expenditures in Agriculture

Region	# of countries	Quest. sent	Response rate						
			2008	2009	2010	2011	2012	2013	2014
Eastern Asia	6	4				25%		75%	75%
Southern Asia	8	8				0%		13%	38%
South-Eastern Asia	8	8				25%		50%	50%
Oceania	3	3				67%		67%	67%
APCAS Members	**25**	**23**				**22%**		**43%**	**52%**
WORLD	**227**	**175**				**25%**		**32%**	**39%**

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Table 2. Number of responses to FAOSTAT questionnaire by country in RAP and latest reference year (2008-2014)[5]

Country		Production		Trade		Producer prices		Land use		Fertilizers		Pesticides use		GEA	
		# received (max=7)	Last received	# (max=6)	Last received	# (max=7)	Last received	# (max=6)	Last received	# (max=5)	Last received	# (max=6)	Last received	# (max=3)	Last received
Afghanistan	Y	6	2013	3	2011	3	2013	4	2011	4	2012	0		0	
American Samoa	N					0		0				0			
Australia	Y	7	2014	6	2013	5	2013	6	2013	6	2013	0		3	2014
Bangladesh	Y	6	2013	0	2007	4	2014	6	2013	2	2012	4	2013	0	
Bhutan	Y	7	2014	2	2012	7	2014	4	2013	5	2013	5	2013	0	
Brunei Darussalam	N	0		1	2013	0		0		4	2013	2	2013	0	
Cambodia	Y	5	2012	4	2013	1	2012	0		3	2013	0		0	
People's Republic of China	Y														
Mainland		4	2013	6	2013	6	2013	5	2013	5	2013	4	2012	1	2013
Hong Kong SAR				6	2013	1	2008	0		1	2008	4	2012	1	2013
Macao SAR				5	2012			6	2013	6	2013	4	2012		
Taiwan				5	2013					0					
Cook Islands	N			0		0		0		3	2013	1	2009	0	
Democratic People's Republic of Korea	N	0				0		0		1	2011	0		0	
Federated States of Micronesia	N			0				0		0		0		0	
Fiji	Y	2	2009	6	2013	4	2014	0		0		2	2013	0	
French Polynesia	N			6	2013			0		0		5	2013		
India	Y	7	2014	6	2013	1	2009	5	2013	0		1	2010	0	
Indonesia	Y	7	2014	6	2013	4	2012	2	2013	5	2013	1	2013	2	2014
Iran (Islamic Republic of)	Y	6	2013	3	2011	7	2014	6	2013	6	2013	4	2013	0	
Japan	Y	7	2014	6	2013	7	2014	6	2013	6	2013	5	2013	2	2014
Kiribati	N	0		3	2012			0		0		0		0	
Lao People's Democratic Republic	Y	7	2014			3	2014	2	2013	1	2008	4	2013	0	
Malaysia	Y	7	2014	6	2013	6	2014	4	2013	5	2013	4	2013	2	2014
Maldives	N	3	2010	5	2013	1	2013	1	2013	4	2013	1	2013	0	
Marshall Islands	N							0		0		0			
Mongolia	N	6	2013	0	2007	5	2013	5	2013	0		0		0	
Myanmar	Y	7	2014	0		5	2014	4	2013	3	2010	5	2013	1	2011
Nauru	N	1	2010					0		0		0		1	2014
Nepal	Y	7	2014	5	2013	5	2014	2	2011	4	2013	2	2013	2	2014
New Caledonia	N	6	2013	5	2013	0		4	2012	5	2012	3	2012		
New Zealand	Y	7	2014	6	2013	7	2014	6	2013	5	2012	0		3	2014

[5] Cells are highlighted for those countries that received no questionnaire during 2008-2014.

Country		Production		Trade		Producer prices		Land use		Fertilizers		Pesticides use		GEA	
		# received (max=7)	Last received	# (max=6)	Last received	# (max=7)	Last received	# (max=6)	Last received	# (max=5)	Last received	# (max=6)	Last received	# (max=3)	Last received
Niue	N	0				0		0		0		0		0	
Northern Mariana Islands	N							0				0			
Pakistan	Y	6	2010	6	2013	4	2014	2	2013	6	2013	1	2011	1	2014
Palau	N			0	0			0		0		0		0	
Papua New Guinea	N	0		0	0	0		0		0		0		0	
Philippines	Y	6	2013	6	2013	7	2014	6	2013	6	2013	0		2	2014
Republic of Korea	Y	7	2014	6	2013	2	2010	4	2013	4	2013	1	2010	3	2014
Samoa	N	2	2009	2	2013	0		0		2	2013	0		0	
Singapore	N	6	2013	6	2013	7	2014	3	2013	3	2012			2	2014
Solomon Islands	N	2	2009	3	2013	0		0		0		0		0	
Sri Lanka	Y	7	2014	6	2013	6	2013	1	2009	2	2009	4	2013	1	2014
Thailand	Y	7	2014	6	2013	7	2014	6	2013	6	2013	3	2013	0	
Timor-Leste	N	4	2011	0		1	2009	0		1	2013	1	2009	0	
Tonga	N	2	2009	3	2013	1	2010	0		0		2	2013	0	
Tuvalu	N	0		0	2006	0		0		0		0		0	
Vanuatu	N	2	2009	4	2011	1	2009	1	2012	0		0		2	2013
Viet Nam	Y	7	2014	0		6	2014	1	2013	5	2013	0		3	2014

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Table 3. Data completeness in the RAP region: proportion of official data in the FAOSTAT database by domain,[6] sub-region and year, 2008-2014

Table 3.1 Agricultural Production

	2008	2009	2010	2011	2012	2013	2014	Average (2008-2014)
Eastern Asia	56%	55%	50%	52%	53%	47%	32%	49%
Southern Asia	71%	70%	69%	67%	66%	61%	42%	64%
South-Eastern Asia	61%	61%	60%	57%	56%	53%	48%	57%
Oceania	23%	29%	18%	25%	19%	14%	15%	20%
Asia and Pacific	**54%**	**55%**	**51%**	**52%**	**50%**	**45%**	**35%**	**49%**
APCAS Members	**63%**	**65%**	**60%**	**62%**	**60%**	**54%**	**43%**	**58%**

Table 3.2 Agriculture Trade flows

	2008	2009	2010	2011	2012	2013	2014	Average (2008-2014)
Eastern Asia	73%	86%	86%	85%	89%	84%		84%
Southern Asia	60%	53%	74%	71%	70%	62%		65%
South-Eastern Asia	64%	65%	68%	71%	76%	82%		71%
Oceania	52%	62%	64%	67%	74%	72%		65%
Asia and Pacific	**62%**	**66%**	**73%**	**73%**	**77%**	**75%**		**71%**
APCAS Members	**71%**	**75%**	**81%**	**81%**	**83%**	**78%**		**78%**

Table 3.3 Land use

	2008	2009	2010	2011	2012	2013	2014	Average (2008-2014)
Eastern Asia	35%	36%	40%	42%	41%	36%		38%
Southern Asia	38%	39%	44%	49%	40%	36%		41%
South-Eastern Asia	26%	21%	23%	28%	23%	23%		24%
Oceania	21%	22%	19%	20%	24%	22%		21%
Asia and Pacific	**29%**	**28%**	**29%**	**33%**	**30%**	**28%**		**29%**
APCAS Members	**35%**	**35%**	**37%**	**42%**	**36%**	**34%**		**37%**

Table 3.4 Fertilizers

	2008	2009	2010	2011	2012	2013	2014	Average (2008-2014)
Eastern Asia	48%	60%	56%	58%	64%	69%		59%
Southern Asia	56%	55%	71%	71%	71%	59%		64%
South-Eastern Asia	49%	55%	47%	50%	50%	48%		50%
Oceania	44%	43%	48%	46%	49%	46%		46%
Asia and Pacific	**49%**	**53%**	**56%**	**56%**	**58%**	**54%**		**55%**
APCAS Members	**51%**	**56%**	**62%**	**62%**	**65%**	**60%**		**59%**

[6] This indicator of data completeness is not reported for three domains that either do not impute missing data (pesticides use, GEA), or do not publish most of their imputations in FAOSTAT (producer prices).

Table 4. Average percent of official data in FAOSTAT by country and domain, 2008-2014

Country	Production	Trade	Land use	Fertilizers
Afghanistan	68%	44%	77%	56%
American Samoa			42%	
Australia	51%	88%	45%	63%
Bangladesh	61%	0%	16%	29%
Bhutan	55%	30%	41%	57%
Brunei Darussalam	10%	18%	15%	37%
Cambodia	26%	81%	8%	29%
People's Republic of China				
Mainland	31%	95%	40%	74%
Hong Kong SAR	2%	97%	15%	43%
Macau SAR	17%	92%	100%	22%
Taiwan	78%	99%	30%	73%
Cook Islands			25%	73%
Democratic People's Rep. of Korea	16%	0%	0%	
Federated States of Micronesia			29%	
Fiji	23%	93%	3%	27%
French Polynesia	16%	95%	0%	33%
India	62%	88%	36%	84%
Indonesia	77%	91%	10%	73%
Iran (Islamic Republic of)	37%	66%	64%	49%
Japan	69%	92%	53%	53%
Kiribati	6%	51%	0%	
Lao People's Democratic Rep.	49%		21%	
Malaysia	72%	89%	8%	58%
Maldives	18%	78%	31%	57%
Marshall Islands			29%	
Mongolia	67%	2%	45%	11%
Myanmar	59%	1%	75%	5%
Nauru			40%	
Nepal	84%	70%	33%	77%
New Caledonia	33%	82%	25%	32%
New Zealand	32%	93%	68%	68%
Niue			25%	
Northern Mariana Islands			25%	
Pakistan	82%	88%	49%	77%
Palau			0%	
Papua New Guinea	1%	3%	10%	10%
Philippines	74%	86%	32%	52%
Republic of Korea	65%	89%	49%	90%
Samoa	3%	29%	10%	30%
Singapore	20%	91%	29%	58%
Solomon Islands	3%	50%	0%	

Country	Production	Trade	Land use	Fertilizers
Sri Lanka	85%	90%	17%	41%
Thailand	60%	89%	12%	59%
Timor-Leste	38%	6%	0%	
Tonga	2%	42%	22%	34%
Tuvalu			40%	
Vanuatu	6%	88%	0%	
Viet Nam	58%	5%	36%	58%

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