



منظمة الأغذية
والزراعة للأمم
المتحدة

联合国
粮食及
农业组织

Food and
Agriculture
Organization
of the
United Nations

Organisation des
Nations Unies
pour
l'alimentation
et l'agriculture

Продовольственная и
сельскохозяйственная
организация
Объединенных
Наций

Organización
de las
Naciones Unidas
para la
Alimentación y la
Agricultura

Asia and Pacific Commission on Agricultural Statistics

Twenty-fifth Session
Vientiane, Lao PDR, 18-21 February 2014
Agenda Item 4
Issues in the collection of FAO data

Contributed by: *FAO Statistics Division*

1. Introduction

In recent years agriculture has returned to the centre of the international policy agenda. On the one hand, agriculture is increasingly recognized as an engine for inclusive economic growth and poverty reduction, in addition to its primary importance for food security. On the other hand, the world is confronted with more stringent natural resources constraints, with agriculture identified as a source of the problem, given its impact on land degradation, water use, pollution from fertilizers and pesticides, greenhouse gas emissions, etc. Moreover, price volatility has become a structural characteristic of agricultural and food markets.

The substantial increase in data requirements on agriculture statistics is an immediate consequence of this increased complexity and articulation of policy issues. So too is the increased awareness of the link between the solid evidence base provided by sound statistics, and effective policy development, monitoring and evaluation. The importance of statistics is reflected in its increasing use in monitoring national and international policy targets, including the

following uses: FAO's prevalence of undernourishment (PoU) indicator to monitor progress of the first Millennium Development Goal to eradicate extreme hunger and poverty.

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 to the agricultural information system covers almost all pertinent sectors: from agriculture, forestry and fisheries; to agricultural inputs, like pesticides and fertilizers; to environmental resource use and impacts, such as land, water and greenhouse gas emissions. FAOSTAT, the FAO corporate database, has become an essential global public good that offers free and easy access to this data for 245 countries and territories from 1961 through to the most recent year. FAOSTAT is accessed every month by more than 200,000 visitors worldwide from academia, international organizations, national governments and the private sector.

FAO places great importance on the collection, processing and dissemination of relevant, accurate, and timely food and agriculture statistics. 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.*" Since its inception, FAO has endeavoured to maintain the best possible capacity to collect, process, validate, harmonize and analyse incoming data and generate accurate and timely information.

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 the most 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.

Unfortunately, the statistical analysis presented in this paper demonstrates deterioration, over time, in the quality of data provided by Member countries. In order to assess country-level performance in collection and reporting of food and agricultural statistics to FAO, this paper provides an overview of the current situation and highlights areas for improvement. While a number of technical divisions in FAO regularly collect country data, this paper focuses on the questionnaires shipped by the FAO Statistics Division.

This paper also seeks to create a discussion on major causes of non-response to or 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. 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.

2. Increasing Data Requirements And Decreasing Data Availability

In response to the new and increasing demands for a reliable evidence base for agricultural and food policy, FAO has expanded its range of statistical activities, improved its dissemination platforms, modified the content of some of its questionnaires, and moved towards more efficient data collection methods by harvesting, where possible, data collected and processed by other international organizations. This has not always met 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.”*¹

Within the questionnaire-based data collection from FAO’s Statistics Division, data availability and data completeness in Asia and Pacific region is heterogeneous, with most FAO questionnaires facing a high percentage of non-responses, especially in Oceania. For three of its questionnaires, this non-response rate has increased over time. Exceptions to this trend seem to occur following targeted statistical training workshops in the region. 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. The incompleteness, inconsistency, and lack of harmonization have been identified during FAO’s data processing and validation.

¹ Re: *“Global Strategy to Improve Agriculture and Rural Statistics”*, p13, <http://www.fao.org/docrep/015/am082e/am082e00.pdf>

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, common definitions and classifications. For validation, all datasets go through domain-specific and iterative validation procedures that involve cross-checking with external databases and internal peer-review of FAO experts. Data of low quality are then 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 are found between national and international databases, and sometimes across international organizations. A number of countries are increasingly unhappy with these inconsistencies, especially those monitoring progress towards the achievement of the MDGs. In response to these concerns, the United Nations Statistical Commission (UNSC) in 2012 promoted a “Friends of the Chair” Group to improve the coordination of statistical activities in the UN System. FAO participates in this process, and is interested in establishing a platform to provide countries the opportunity to peer-review imputation methodologies and the data published on the FAOSTAT database. This proposal will be further examined in section 5 of this paper.

3. Data quality and availability in Asia and Pacific region

FAO Statistics Division dispatches seven annual questionnaires, covering agricultural production, producer prices, land use, pesticides, fertilizers, machinery, and government expenditure in agriculture (GEA).² This paragraph describes the main patterns and trends in the response rates and completeness rates by data domain, country and sub-region for the annual questionnaires shipped by FAO Statistics Division. Detailed tables are provided in Annex 1.

3.1. Overall patterns and trends in response rates

Response rates among Asia and Pacific countries during 2005-2012 were generally low in most data domains, and were lower than world averages, in the domains of production, trade, fertilizers and government expenditure (Fig. 1). The proportion of Asia and Pacific countries

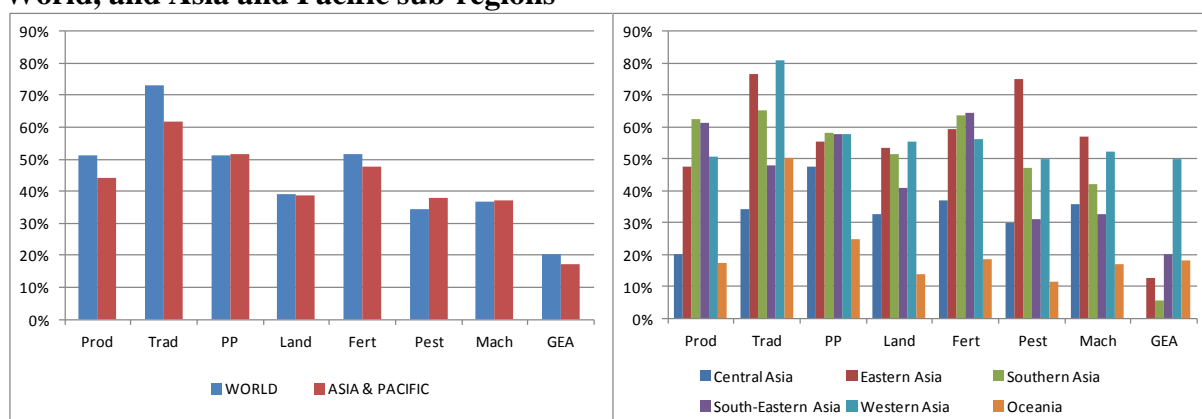
² For data on agricultural trade flows for several domains, FAO uses country-level electronic trade data files. Increasingly, however, FAO relies on other international agencies, such as the United Nations Statistics Division (UNSD), who also receive this data files, and have expanded their activities 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.

responding to FAO questionnaires reached 62% for trade flows, 52% for producer prices, 48% for fertilizers, 44% for production, while for land use, pesticides and machineries was slightly lower than 40%. Government expenditure questionnaire had the lowest response rates, 17% on average, but they have increased from 9% in 2011 to 26% in 2012 (See Table 1 in Annex1 for more details.)

This result, however, masks large differences across sub-regions (Fig. 1). Oceania performs systematically worse than Asian regions in all domains, except government expenditure. This is mainly due to the fact that Oceania is composed by a big number of small island countries. Among the Asian regions, Central Asia has the lowest response rates in all questionnaires except machinery. While no region that outperforms the others in all domains, Eastern, Western and Southern Asia perform better than the world average in most of the domains. South-Eastern Asia performs better than others in fertilizers, but has a low performance in land, pesticides and machineries. No Central Asian country replied to the government expenditure questionnaire.

Table 1 in Annex 1 includes the response rates for the APCAS members, whose response rates are systematically higher than for Asia and Pacific in all domains.

Fig. 1: Average response rates by questionnaire, 2005-2012³: Asia and Pacific and the World, and Asia and Pacific sub-regions



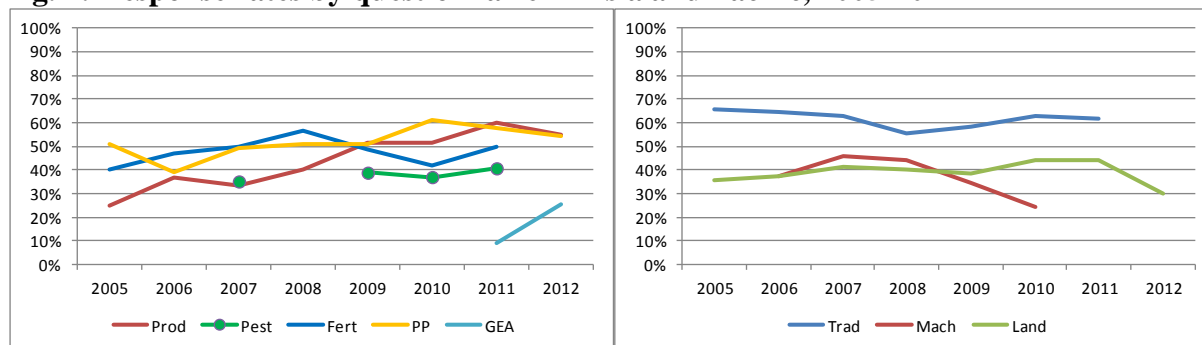
There were no consistent time trends in response rates between 2005 and 2012 (Fig. 2). The 2012 data are available for only four of the questionnaires. The left hand-side graph shows the questionnaires that have a positive trend, while the graph on the right shows the questionnaires that have a negative trend for the same period. The production questionnaire has had the biggest increase going from 25% in 2005 to 55% in 2012. Pesticides⁴ questionnaire has slightly improved compared to the 2007 questionnaire; and roughly comparable for fertilizers. However, response rates were lower for trade, machinery, producer prices and land at the end of the period, compared

³ Machinery response rates refer to the period 2005-2010.

⁴ Pesticide data collection was reintroduced in 2007, and continued in 2009 and every year following.

to the beginning. The significant decline in the response rates for the machinery questionnaire has conducted FAO to review the data collection process.

Fig. 2: Response rates by questionnaire in Asia and Pacific, 2005-2012



Looking at the total number of times in which countries responded to FAO questionnaires in the 8 year period from 2005-2012 (Annex 1, Table 2), trade flows had the highest response rates, with an average of 4.4 responses per country out of a maximum of 7. Government expenditure data were the least available, with an average of 0.2 average responses in 2011 and 2012. Pesticides and machinery also had a low response rate reflecting the lower frequency with which such data are collected by countries.

To assess response rates for this paper, countries were generally divided in three groups according to the frequency of responses to FAO questionnaires⁵:

- **Never reporting:** countries that have never reported data to FAO, and for this reason, are most likely to lack the institutional capacity to collect or produce relevant data.
- **Irregularly reporting:** countries that report to FAO no more than 4 times out of 8 in the 2005-2012 period; or no more than 2 times out of 4 for pesticides and machinery. Reasons may be linked to institutional or communication issues.
- **Frequently reporting:** countries that report to FAO regularly, for at least 5 years out of 8 in the 2005-2011 period (at least 3 years out of 4 for machinery and pesticides), and for this reason, are unlikely to face major problems in participating in FAO data collection activities.

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, yields, livestock and selected processed commodities. Response rates have increased drastically throughout the Asia and Pacific regions, with the exception of Oceania where the increase was smaller, from 15% in 2005 to 23% in 2012. On average, the response rates increased from 25% in 2005 to 60% in 2011

⁵ Pesticide questionnaires were sent out in 2007 and 2009-2011, so irregularly reporting refers to 2 out of 4 times, and frequently reporting refers to 3 or more times. As, machinery questionnaires were sent out and recorded in FAOSTAT only between 2006-2010, irregularly reporting refers to 3 out of 5 times, and frequently reporting refers to 4 or more times. Government expenditures, launched globally in 2012, provide a breakdown only of reporting and non-reporting countries for the 2012 data collection.

and decreased to 55% in 2012, but other questionnaires may still be sent by countries. Below is the distribution of Asia and Pacific countries in the three groups classified according to their response rate:

31% Never reporting countries = Turkmenistan, China- Hong Kong, China- Macao, China- Taiwan, Democratic People's Rep. of Korea, Brunei Darussalam, Georgia, Saudi Arabia, American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Kiribati, Marshall Islands, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tuvalu, Vanuatu.

36% Irregularly reporting countries = Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, China – mainland, Afghanistan, Bhutan, India, Maldives, Cambodia, Lao People's Democratic Republic, Malaysia, Thailand, Timor-Leste, Bahrain, Iraq, Kuwait, Lebanon, Occupied Palestinian Territory, Oman, Qatar, United Arab Emirates, Yemen, Nauru, New Caledonia, Tonga, USA.

32% Frequently reporting countries = Japan, Mongolia, Republic of Korea, Bangladesh, Iran (Islamic Republic of), Nepal, Pakistan, Sri Lanka, Indonesia, Myanmar, Philippines, Singapore, Viet Nam, Armenia, Azerbaijan, Cyprus, Israel, Jordan, Syrian Arab Republic, Turkey, Australia, New Zealand, France, United Kingdom

It should be highlighted that questionnaire completeness has also fallen from 2008 onwards, with the number of fields completed within a questionnaire steadily decreasing in most countries, with a few exceptions (notably Afghanistan, LAO PDR, Azerbaijan, Qatar and New Zealand). Oceania had the lowest completeness on average (21%), while Southern Asia the highest (63%).

In the 2010-2011 biennium, the FAO Statistics Division organized a series of seven regional workshops in different continents, attended by a total of 213 participants from 113 countries. The main purpose of these workshops was to train national statisticians in the compilation of FAO questionnaires and in the use of international standards and methodologies for the collection, production and dissemination of national data. The workshops were also designed to help FAO better understand the key issues that countries face in meeting FAO data reporting requests. The workshop was provided primarily by FAO statisticians working in the production domain.

The expected outcome of these workshops was an increase in the number of responses from countries to FAO questionnaires, which, in turn, translated into an improved accuracy of FAOSTAT data for the benefit of all users. For the APCAS region, two workshop were held in: i) Bangkok, Thailand, from 28 March to 1 April 2011; and ii) Beijing, China, from 23 to 27 May 2012. These workshops had a positive impact on FAO data, however, the positive trend in response rates was not matched in terms of completeness of response to this questionnaire, raising questions about how best to increase the quality of data reported, along with increasing response rates. Indeed, the rate of completeness declined in all sub-regions as well (Annex 1, Table 3.1).

This raises the following questions for discussion:

- ➔ Should FAO conduct workshops regularly, taking into account their cost? Given that training may have increased response rates, but not completeness, are there more efficient ways to improve both questionnaire response *and* completeness?

3.3. *Agricultural Trade Flows*

Trade flows are collected simultaneously by UNSD and FAO, which ask countries for their electronic trade data files. Response rates for trade were stable in the period 2005-11, ranging between 60 and 70%. This constant trend was apparent in all sub-regions. The complete distribution of Asia and Pacific countries in the three groups classified according to their response rate can be found below:

23% Never reporting = Tajikistan, Turkmenistan, Uzbekistan, Democratic People's Rep. of Korea, Brunei Darussalam, Lao People's Democratic Republic, Myanmar, Timor-Leste, Viet Nam, Occupied Palestinian Territory, Federated States of Micronesia, Marshall Islands, Nauru, Niue, Northern Mariana Islands, Palau, Tuvalu.

19% Irregularly reporting = Mongolia, Afghanistan, Bangladesh, Bhutan, Nepal, Cambodia, Iraq, Kuwait, United Arab Emirates, Cook Islands, Kiribati, Papua New Guinea, Solomon Islands, Tonga.

58% Frequently reporting = Kazakhstan, Kyrgyzstan, China – mainland, China- Hong Kong, China- Macao, China- Taiwan, Japan, Republic of Korea, India, Iran (Islamic Republic of), Maldives, Pakistan, Sri Lanka, Indonesia, Malaysia, Philippines, Singapore, Thailand, Armenia, Azerbaijan, Bahrain, Cyprus, Georgia, Israel, Jordan, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Turkey, Yemen, American Samoa, Australia, Fiji, French Polynesia, New Caledonia, New Zealand, Samoa, Vanuatu, France, United Kingdom, USA.

The trade dataset has, however, the highest completion rate on average among questionnaires, as measured by the percentage of official data, though the rate of completeness fell slightly after the 2007, from about 70% to 60% overall.

- ➔ Do APCAS members have any suggestion on how to counteract this negative trend in response rates and completion rates?

3.4. *Agricultural Producer Prices*

The questionnaire on agricultural producer prices is completed by approximately 60% of Asian countries and 25% of countries in Oceania every year (Table 1.3). This low response rate likely overestimates the availability of producer price data, as many countries report wholesale or market prices instead of prices received by the farmers. Asian regions have an homogeneous situation in response rates, both in terms of levels and trends. The list below groups countries according to the frequency with which they report their data to FAO:

28% Never reporting = Turkmenistan, Uzbekistan, China- Taiwan, Democratic People's Rep. of Korea, Kuwait, United Arab Emirates, American Samoa, Cook Islands, Federated States of Micronesia, French Polynesia, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tuvalu.

28% Irregularly reporting = China- Hong Kong, China- Macao, Afghanistan, Bangladesh, India, Maldives, Brunei Darussalam, Cambodia, Lao People's Democratic Republic, Timor-Leste, Viet Nam, Bahrain, Iraq, Lebanon, Oman, Qatar, Saudi Arabia, Yemen, Fiji, Tonga, Vanuatu.

43% Frequently reporting = Kazakhstan, Kyrgyzstan, Tajikistan, China – mainland, Japan, Mongolia, Republic of Korea, Bhutan, Iran (Islamic Republic of), Nepal, Pakistan, Sri Lanka, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, Armenia, Azerbaijan, Cyprus, Georgia, Israel, Jordan, Occupied Palestinian Territory, Syrian Arab Republic, Turkey, Australia, New Zealand, France, United Kingdom, USA.

The rate of completeness of the questionnaires has declined from 50% in 2006 to 35% in 2011. Even when countries report data of FAO the share of official data keeps decreasing. Another problem with producer prices is inconsistency across time. It is not uncommon to detect breaks in time series in which more recent data differing by a significant factor relative to older data. In these cases, it is difficult to understand if the change is genuine, or if it an error arising from converting data to a standard unit, a change in the price concept, a change in the variety observed, a revision in methodology, or a combination of all these factors.

- ➔ APCAS members are invited to identify the causes of the decreasing data coverage, to inform FAO of the actual price concept monitored and of the non-standard units that may be used.

3.5. *Agricultural Inputs*

For the four different questionnaires on agricultural inputs, the pesticide questionnaire was halted for a few years, with data collection in 2007, and then annually from 2009 onwards. A new machinery questionnaire was introduced in 2006 (no data quality information is reported in this paper for the old questionnaire), but due to significantly declining response rates and declining data coverage, the 2011 questionnaire data was not disseminate in FAOSTAT, and the 2012 questionnaire has been put on hold till a better data collection strategy is devised.

In providing data on agricultural inputs, it is also worth noting that some countries face confidentiality constraints, particularly when providing data on fertilizers, given the limited number of fertilizer producers within their borders. FAO has attempted to tackle this problem by signing MoU with such countries to ensure them that data will only be disseminated in aggregated format (i.e. sub-regional aggregates) to protect confidentiality.

In general, there is an equal distribution between never, irregular and frequently reporting countries for the questionnaires on agricultural inputs, with the exception of pesticides where more than half of countries have never responded. The list below groups countries according to the frequency with which they report their data to FAO:

Machinery

32% Never reporting = Turkmenistan, Uzbekistan, China-Taiwan, Democratic People's Rep. of Korea, India, Maldives, Lao People's Democratic Republic, Timor-Leste, Kuwait, Qatar, Saudi Arabia, American Samoa, Federated States of Micronesia, French Polynesia, Kiribati, Marshall Islands, Nauru, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Vanuatu.

32% Irregularly reporting = Tajikistan, China-Hong Kong, Republic of Korea, Bangladesh, Nepal, Pakistan, Sri Lanka, Brunei Darussalam, Cambodia, Indonesia, Singapore, Viet Nam, Bahrain, Iraq, Lebanon, Oman, United Arab Emirates, Yemen, Cook Islands, Fiji, New Caledonia, Tonga, Tuvalu, USA.

35% Frequently reporting = Kazakhstan, Kyrgyzstan, China – mainland, China- Macao, Japan, Mongolia, Afghanistan, Bhutan, Iran, Malaysia, Myanmar, Philippines, Thailand, Armenia, Azerbaijan, Cyprus, Georgia, Israel, Jordan, Occupied Palestinian Territory, Syrian Arab Republic, Turkey, Australia, New Zealand, France, United Kingdom.

Land use

31% Never reporting = Turkmenistan, China- Taiwan, Democratic People's Rep. of Korea, Maldives, Cambodia, Timor-Leste, Bahrain, Kuwait, Saudi Arabia, American Samoa, Cook Islands, Federated States of Micronesia, French Polynesia, Kiribati, Nauru, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu.

34% Irregularly reporting = Kazakhstan, Tajikistan, Uzbekistan, China – mainland, China- Hong Kong, Republic of Korea, Nepal, Pakistan, Sri Lanka, Brunei Darussalam, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Viet Nam, Armenia, Iraq, Lebanon, Oman, Qatar, United Arab Emirates, Fiji, Marshall Islands, New Caledonia, Vanuatu.

35% Frequently reporting countries = Kyrgyzstan, China- Macao, Japan, Mongolia, Afghanistan, Bangladesh, Bhutan, India, Iran (Islamic Republic of), Philippines, Singapore, Thailand, Azerbaijan, Cyprus, Georgia, Israel, Jordan, Occupied Palestinian Territory, Syrian Arab Republic, Turkey, Yemen, Australia, New Zealand, France, United Kingdom, USA.

Fertilizers

31% Never reporting = Turkmenistan, China- Taiwan, India, Timor-Leste, Kuwait, Occupied Palestinian Territory, Oman, Saudi Arabia, United Arab Emirates, American Samoa, Federated States of Micronesia, Fiji, French Polynesia, Kiribati, Nauru, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tuvalu, Vanuatu.

34% Irregularly reporting = Kazakhstan, Tajikistan, Uzbekistan, China- Hong Kong, Democratic People's Rep. of Korea, Mongolia, Republic of Korea, Bangladesh, Maldives, Sri Lanka, Brunei Darussalam, Cambodia, Lao People's Democratic Republic, Malaysia, Singapore, Bahrain, Iraq, Israel, Qatar, Syrian Arab Republic, Yemen, Cook Islands, Marshall Islands, New Caledonia, Tonga.

35% Frequently reporting = Kyrgyzstan, China – mainland, China- Macao, Japan, Afghanistan, Bhutan, Iran (Islamic Republic of), Nepal, Pakistan, Indonesia, Myanmar, Philippines, Thailand, Viet Nam, Armenia, Azerbaijan, Cyprus, Georgia, Jordan, Lebanon, Turkey, Australia, New Zealand, France, United Kingdom, USA

Pesticides

51% Never reporting = Turkmenistan, Uzbekistan, China- Taiwan, Democratic People's Rep. of Korea, Mongolia, Republic of Korea, Afghanistan, Maldives, Nepal, Brunei Darussalam, Cambodia, Indonesia, Philippines, Singapore, Viet Nam, Georgia, Kuwait, Lebanon, Syrian Arab Republic, United Arab Emirates, American Samoa, Australia, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, USA.

27% Irregularly reporting = Kazakhstan, Tajikistan, India, Pakistan, Lao People's Democratic Republic, Malaysia, Thailand, Timor-Leste, Armenia, Bahrain, Cyprus, Iraq, Israel, Occupied Palestinian Territory, Qatar, Saudi Arabia, Turkey, Cook Islands, New Caledonia, France.

22% Frequently reporting = Kyrgyzstan, China – mainland, China- Hong Kong, China- Macao, Japan, Bangladesh, Bhutan, Iran, Sri Lanka, Myanmar, Azerbaijan, Jordan, Oman, Yemen, French Polynesia, United Kingdom.

All questionnaires have low response rates in common (less than 40%, with the exception of fertilizers with less than 50%) as well as a decreasing trends in terms of completeness in 2011.

Also worth noting is that the land use and machinery questionnaires were revised in 2011 to include an annex on land use change and new machinery items, respectively. Both changes were

requested by the user community to better estimate the impact of agriculture on climate change, and capital stock and investments in agriculture, respectively. Despite a peer-review process and pilot tests prior to data collection, the decline in response rates and completeness have implications for questionnaire revisions.

- ➔ APCAS members are invited clarify the reasons for the low response rates, irregular reporting and decreasing data coverage. Detailed information on actual data availability and data collection frequency at country level would also help understanding the capacity issues at country level.
- ➔ APCAS members are encouraged to express their views on questionnaires' revisions and formulate suggestions on a better way to manage them.
- ➔ APCAS members are invited to express their views on FAO proposal to sign an MoU with countries having problems to report their data to FAO for confidentiality issues.

3.6. *Government Expenditure in Agriculture*

The GEA questionnaire was started in 2003 in the Africa region. It expanded to the rest of the world in 2012, with the collaboration of International Monetary Fund (IMF), and request eleven years of data from 2001 through 2011, inclusive. The questionnaire sent to countries in 2012 is referred to as the 2011 questionnaire, as its most recent reference period was 2011.

Response rates only for 2011 and 2012 GEA questionnaire are discussed, given that these are the years for which global data were collected. Because of the history of data collection in the African region and the importance of GEA in CAADP and the Maputo Declaration, it should not come as a surprise that response rates in the region were lower than the world average response rates. It should be considered that the questionnaire was sent to 44 countries out of 77 in the Asia and Pacific region. However, the trend looks to be promising by going from 9% in 2011 to 20% in 2012. Within Asia and Pacific, South-Eastern Asia and Western Asia regions had the highest response rate 38% and 36% in 2012, respectively. Since only 2011 and 2012 data are analyzed, countries are classified in three groups; never reporting, irregularly reporting if they have replied in one year and regularly reporting countries if they have replied in both years.

Completeness rates were generally low for this questionnaire. This was likely due to difficulty in reporting recurrent and capital breakdowns for the sectors and sub-sectors covered: agriculture, forestry, fishing and hunting, the broad agriculture sector (the total of the first three sub-sectors), protection of biodiversity and landscape, and R&D outlays on environmental protection. It may also reflect the difficulty in collecting and reporting data at all three levels of government (local, state, central) along with the consolidated and general totals, and the breakdown of central government outlays by budgetary, extra budgetary and social security funds.

Nonetheless, the capital/current breakdown permits an estimation of the proportion of government expenditures in agriculture going to investment, relative to that going towards consumption.

45% Never reporting = Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, China – mainland, Mongolia, Republic of Korea, Afghanistan, Bhutan, India, Iran, Maldives, Nepal, Pakistan, Sri Lanka, Brunei Darussalam, Cambodia, Lao People's Democratic Republic, Myanmar, Singapore, Thailand, Timor-Leste, Azerbaijan, Cook Islands, Federated States of Micronesia, Fiji, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, France, United Kingdom, USA.

15% Irregularly reporting = Japan, Bangladesh, Indonesia, Malaysia, Singapore, Viet Nam, Israel, Jordan, Oman, New Zealand, Vanuatu.

3% Regularly reporting = Georgia and Australia.

Note: The GEA questionnaire was not sent to 38% of countries: American Samoa, Armenia, Bahrain, China- Hong Kong, China- Macao, China- Taiwan, Cyprus, Democratic People's Republic of Korea, French Polynesia, Iraq, Kiribati, Kuwait, Lebanon, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Occupied Palestinian Territory, Philippines, Qatar, Saudi Arabia, Syrian Arab Republic, Turkey, Tuvalu, United Arab Emirates, Uzbekistan and Yemen

3.7. Country Profiles

Countries with stronger statistical and institutional capacity tend to be the more virtuous in terms of response and completeness in most data domains. Only Japan and Jordan have regularly responded to all FAO questionnaires in the observed period. Iran, Azerbaijan, Australia, New Zealand and United Kingdom are a regular respondent in 7 out of 8 questionnaires; while, Kyrgyzstan, Philippines, Cyprus, Georgia, Israel, Turkey and France in 6 out of 8. The experiences in these four countries in developing their statistical infrastructures, training staff, and reporting data may be instructive for other member countries.

Turkmenistan, Federated States of Micronesia, Niue, Northern Mariana Islands and Palau have never responded to FAO questionnaires in the period examined. Other countries with difficulties in reporting statistical information who responded only to one questionnaire include: China-Taiwan, Democratic People's Rep. of Korea, American Samoa, Kiribati, Papua New Guinea, Samoa and Solomon Islands, who have responded on Trade; Nauru on Production, and Tuvalu on Machinery.

All other Asia and Pacific countries irregularly report data, which makes it difficult for FAO to build consistent times series in each data domain. These include Kazakhstan, Tajikistan, Uzbekistan, China – mainland, China- Hong Kong, China- Macao, Mongolia, Republic of Korea, Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka, Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Singapore, Thailand, Timor-Leste, Viet Nam, Armenia, Bahrain, Ira, Kuwait, Lebanon, Occupied Palestinian Territory, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates,

Yemen, Cook Islands, Fiji, French Polynesia, Marshall Islands, New Caledonia, Tonga, Vanuatu and USA., who replied only intermittently to the various FAO questionnaires in 2005-2012.

4. Possible causes driving incomplete country-level 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.

Listed below are questions for which FAO seeks feed-back from APCAS members.

- a) Are there consistent reasons (e.g. statistical infrastructure, statistical laws, agricultural statistical programs, and training of national statisticians) why Japan, Jordan, Australia, New Zealand, United Kingdom, Kyrgyzstan, Philippines, Cyprus, Georgia, Israel, Turkey and France are better at responding to FAO surveys? Are there lessons to be learned from their experiences?
- b) When countries reply only periodically to (specific) surveys, is it due to problems in the reporting mechanism? Is it a matter of addressing the relevant focal institutions or contact person? Or data are not available on an annual basis (with countries undertaking ad hoc additional analysis and estimations to report data to FAO)?
- c) Response rates are systematically low in some data domains (e.g. machinery and pesticides). Are there different and better ways to collect those data than the annual questionnaires? In fact, should all components of these data be collected annually (production, trade, use)?
- d) Is the decrease in data completeness an indication that FAO questionnaires are too complex and/or long to be completed? Is it a matter of resources and/or capacity?
- e) Countries in Oceania have greater difficulties in reporting data in almost all domains. This includes Federated States of Micronesia, Niue, Northern Mariana Islands, Palau, American Samoa, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Nauru and Tuvalu. Are there institutional or other conditions that explain this phenomenon?
- f) Data sent to FAO are sometimes in conflict with other national sources, or are inconsistent over time. To help understand these differences, what can FAO do to encourage APCAS members to document changes in the time series (different units, different concepts and/or different methodology) with appropriate metadata?
- g) Questionnaire revisions seem difficult to manage by countries. Are these changes too disruptive? Do questionnaires come with insufficient explanations?

5. Measures currently undertaken and possible strategies for the future

The insufficient data availability and 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.

The crucial point is that two aspects of data validation do not actively involve member countries: 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: enhance data transmission through improved communication between FAO and countries and strengthened statistical capacities

FAO Statistics Division devotes a significant share of time in providing feed-back to countries, up-dating contact lists, searching for additional information, and cross-checking data. On the one hand, keeping a constant dialogue with countries is essential for a deeper understanding of the data and country level issues and trends that drive it. On the other hand, this validation approach is a resource-intensive activity, particularly when the statisticians undertaking it are centralized and distant from the underlying agricultural activities and trends taking place.

Countries could effectively help FAO improve data collection both in the preliminary data collection phase and in providing 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 rates and completion rates are at the highest level possible. A second aspect is the improvement of

FAO questionnaires, to simplify and clarify instructions and reduce difficulties that national officers may have in filling them. Improved metadata are also 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.

Perhaps more importantly, understanding the country-level policy uses of data will help ensure FAO disseminates the data, indicators, and analyses in a meaningful way. If this increases the relevance and use of data at country-level, national governments are more likely to invest in the resources that improve both data collection and data reporting.

With respect to imputation of missing data, country level involvement in the imputation process would improve the quality of imputation. This is because countries can rely on a wider information basis, being closer to the phenomenon being measured. Ideally, at least some imputation should occur at country-level, though this requires jointly establishing guidelines and training for how and when to impute missing data. On this front, countries are invited to define their capacity development needs express their views on the organization of regional workshops imputation techniques.

Long-term solution: establish a platform for peer-reviewing country data published by FAO

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 Commission on Statistics.

This FAO technical commission would serve as an intergovernmental platform for exchange and decision-making on all matters and processes relating to food and agricultural statistics. It would provide direct interaction with countries, and stronger country ownership and commitment to food and agriculture statistics at all levels. In particular, countries would also have the opportunity to peer-review data disseminated by FAO, which would ensure greater consistency between national and international statistics. It would also provide a forum for discussion and consultation with countries on methodological and statistical capacity development priorities and officially endorse agricultural statistics standards.

The current FAO governance in Statistics includes only two Regional Commissions on Agricultural Statistics (AFCAS and APCAS) and the IICA-FAO Working Group on Agricultural and Livestock Statistics for Latin America and the Caribbean. This current governance structure only provides partial regional coverage and no global coordination or harmonization. The lack of a formal FAO intergovernmental body on agricultural statistics limits proper country involvement

on statistical matters. Furthermore, it means a weakened position in terms of decision making as matters cannot be passed upwards to the Conference for discussion or endorsement. It is for these reasons, that a more formal governance mechanism is proposed at global level.

6. Questions and invitations to the APCAS members.

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

Recommendations for short-term solutions to improve data quality:

- Member countries assist FAO in identifying the causes of low response rates to questionnaires and inform FAO of the actual data and metadata availability, including data collection frequency, concepts, definitions and methods used in data collection.
- Member countries identify a single country-level focal point to handle all FAO questionnaires, regardless of the national organization responsible for data reporting, and update the focal point, as required.
- Where there is non-reporting of data due to confidentiality issues, Member countries and FAO sign an Memorandum of Understanding (MoU) on data provision and dissemination, that restricts FAO to disclosing data to third parties in accordance with the respondent's national statistical laws.
- FAO involves Member Countries in a consultative process before adapting questionnaires to emerging needs.
- FAO reviews the effectiveness of training workshops to improve response rates, completeness and quality of response, and consider, jointly with Member countries, cost-effective alternatives. Such approaches could include technical workshops on imputation techniques, and on-line or other computer-based training.

Recommendations for medium to long-term solutions to improve data quality:

- FAO consider, jointly with Member countries, medium-term cost-effective alternatives to improve reporting of quality data and metadata, such as the adoption of international classification systems, the use of Statistical Data and Metadata Exchange (SDMX) and Automatic Processing Interfaces (APIs) to speed data access and interpretability, and use of on-line and mobile data collection.
- The action plan of the Global Strategy to Improve Rural and Agricultural Statistics (GS) develop and implement targeted statistical capacity development programs in the region, given the low general availability of data for APCAS countries.
- FAO establish a Commission on Agricultural Statistics at the Global Level in order to: (a) better coordinate and standardize activities and recommendations emanating from Regional Commissions and bodies; (b) provide a global forum for Country Representatives to review and endorse methodological and other normative work; and (c) create a peer-review process for data published and methodologies used by FAO.

ANNEX 1. FAO QUESTIONNAIRE RESPONSE RATES AND DATA QUALITY, 2005-2012

TABLE 1. RESPONSE RATES TO FAO QUESTIONNAIRES, BY DOMAIN AND REGION, 2005-2012

Table 1.1 Agricultural Production, 2005-2012

Region	# Countries	# Quest. requested	Response rate for questionnaires requested (%)							
			2005	2006	2007	2008	2009	2010	2011	2012
Central Asia	5	5	20%	0%	0%	40%	40%	0%	20%	40%
Eastern Asia	8	5	0%	20%	40%	40%	60%	60%	80%	80%
Southern Asia	9	9	11%	67%	56%	56%	67%	89%	89%	67%
South-Eastern Asia	11	10	40%	60%	40%	60%	70%	60%	80%	80%
Western Asia	18	18	39%	50%	44%	39%	56%	56%	67%	56%
Asia, Total	51	47	28%	47%	40%	47%	60%	57%	70%	64%
Oceania	20	13	15%	0%	8%	15%	23%	31%	23%	23%
Asia and Pacific, Total	71	60	25%	37%	33%	40%	52%	52%	60%	55%
APCAS members	28	25	40%	52%	44%	60%	60%	80%	88%	84%
WORLD	227	190	38%	48%	47%	46%	50%	61%	62%	58%

Table 1.2 Agriculture Trade flows, 2005-2011

Region	# Countries	# Quest. requested	Response rate for questionnaires requested (%)							
			2005	2006	2007	2008	2009	2010	2011	2012
Central Asia	5	5	40%	40%	40%	40%	20%	20%	40%	n.a.
Eastern Asia	8	8	88%	88%	75%	63%	75%	75%	75%	n.a.
Southern Asia	9	9	67%	56%	56%	56%	56%	89%	78%	n.a.
South-Eastern Asia	11	11	45%	45%	45%	45%	45%	55%	55%	n.a.
Western Asia	18	18	83%	83%	83%	78%	89%	78%	72%	n.a.
Asia, Total	51	51	69%	67%	65%	61%	65%	69%	67%	n.a.
Oceania	20	19	58%	58%	58%	42%	42%	47%	47%	n.a.
Asia and Pacific, Total	71	70	66%	64%	63%	56%	59%	63%	61%	n.a.
APCAS members	27	27	74%	70%	67%	67%	74%	85%	81%	n.a.
WORLD	227	190	75%	75%	75%	73%	72%	71%	69%	n.a.

Note: Trade data processing 2012 was postponed

Table 1.3 Agriculture Producer Prices, 2005-2012

Region	# Countries	# Quest. requested	Response rate for questionnaires requested (%)							
			2005	2006	2007	2008	2009	2010	2011	2012
Central Asia	5	5	60%	0%	60%	40%	60%	60%	40%	60%
Eastern Asia	8	7	57%	43%	71%	57%	57%	57%	57%	43%
Southern Asia	9	9	56%	44%	67%	67%	44%	67%	67%	56%
South-Eastern Asia	11	11	55%	55%	55%	64%	36%	64%	73%	64%
Western Asia	18	18	56%	44%	44%	50%	67%	67%	67%	67%
Asia, Total	51	50	56%	42%	56%	56%	54%	64%	64%	60%
Oceania	20	9	22%	22%	11%	22%	33%	44%	22%	22%
Asia and Pacific, Total	71	59	51%	39%	49%	51%	51%	61%	58%	54%
APCAS members	28	27	70%	63%	63%	74%	59%	74%	74%	67%
WORLD	227	190	57%	39%	54%	53%	52%	49%	54%	n.a.

Table 1.4 Land use, 2005-2012

Region	# Countries	# Quest. requested	Response rate for questionnaires requested (%)							
			2005	2006	2007	2008	2009	2010	2011	2012
Central Asia	5	5	40%	20%	60%	60%	40%	20%	20%	0%
Eastern Asia	8	7	29%	86%	43%	57%	29%	71%	71%	43%
Southern Asia	9	9	56%	33%	33%	44%	67%	67%	67%	44%
South-Eastern Asia	11	11	36%	45%	73%	36%	45%	36%	36%	18%
Western Asia	18	18	50%	50%	50%	61%	50%	67%	67%	50%
Asia, Total	51	50	44%	48%	52%	52%	48%	56%	56%	36%
Oceania	20	20	15%	10%	15%	10%	15%	15%	15%	15%
Asia and Pacific, Total	71	70	36%	37%	41%	40%	39%	44%	44%	30%
APCAS members	28	27	56%	48%	63%	59%	63%	67%	67%	41%
WORLD	227	204	38%	37%	43%	40%	40%	43%	43%	28%

Note: 2012 numbers are preliminary

Table 1.5 Fertilizers, 2005-2011

Region	# Countries	# Quest. requested	Response rate for questionnaires requested (%)							
			2005	2006	2007	2008	2009	2010	2011	2012
Central Asia	5	5	20%	20%	40%	40%	60%	40%	40%	n.a.
Eastern Asia	8	7	29%	86%	86%	71%	29%	43%	71%	n.a.
Southern Asia	9	9	44%	56%	89%	67%	67%	56%	67%	n.a.
South-Eastern Asia	11	10	70%	60%	50%	90%	70%	50%	60%	n.a.
Western Asia	18	15	53%	53%	53%	67%	53%	53%	60%	n.a.
Asia, Total	51	46	48%	57%	63%	70%	57%	50%	61%	n.a.
Oceania	20	16	19%	19%	13%	19%	25%	19%	19%	n.a.
Asia and Pacific, Total	71	62	40%	47%	50%	56%	48%	42%	50%	n.a.
APCAS members	28	27	59%	63%	78%	85%	67%	63%	74%	n.a.
WORLD	227	186	n.a.	63%	52%	47%	49%	49%	50%	n.a.

Note: 2012 numbers are not available

Table 1.6 Pesticides, 2007-2011

Region	# Countries	# Quest. requested	Response rate for questionnaires requested (%)							
			2005	2006	2007	2008	2009	2010	2011	2012
Central Asia	5	5	n.a.	n.a.	40%	n.a.	20%	20%	40%	n.a.
Eastern Asia	8	5	n.a.	n.a.	60%	n.a.	80%	80%	80%	n.a.
Southern Asia	9	9	n.a.	n.a.	56%	n.a.	22%	56%	56%	n.a.
South-Eastern Asia	11	8	n.a.	n.a.	13%	n.a.	63%	13%	38%	n.a.
Western Asia	18	14	n.a.	n.a.	57%	n.a.	50%	50%	43%	n.a.
Asia, Total	51	41	n.a.	n.a.	46%	n.a.	46%	44%	49%	n.a.
Oceania	20	13	n.a.	n.a.	0%	n.a.	15%	15%	15%	n.a.
Asia and Pacific, Total	71	54	n.a.	n.a.	35%	n.a.	39%	37%	41%	n.a.
APCAS members	28	22	n.a.	n.a.	50%	n.a.	50%	50%	59%	n.a.
WORLD	227	173	n.a.	n.a.	28%	n.a.	36%	36%	37%	n.a.

Note: Pesticides use questionnaire not sent in 2005, 2006 and 2008; 2012 questionnaire not yet dispatched

Table 1.7 Agricultural Machinery, 2006-2010

Region	# Countries	# Quest. requested	Response rate for questionnaires requested (%)							
			2005	2006	2007	2008	2009	2010	2011	2012
Central Asia	5	5	n.a.	40%	40%	60%	40%	0%	n.a.	n.a.
Eastern Asia	8	7	n.a.	86%	71%	57%	29%	43%	n.a.	n.a.
Southern Asia	9	9	n.a.	44%	56%	44%	22%	44%	n.a.	n.a.
South-Eastern Asia	11	11	n.a.	27%	55%	27%	45%	9%	n.a.	n.a.
Western Asia	18	18	n.a.	44%	56%	67%	56%	39%	n.a.	n.a.
Asia, Total	51	50	n.a.	46%	56%	52%	42%	0%	n.a.	n.a.
Oceania	20	20	n.a.	15%	20%	25%	15%	10%	n.a.	n.a.
Asia and Pacific, Total	71	70	n.a.	37%	46%	44%	34%	24%	n.a.	n.a.
APCAS members	28	27	n.a.	52%	78%	56%	44%	33%	n.a.	n.a.
WORLD	227	209	n.a.	n.a.	37%	37%	37%	36%	n.a.	n.a.

Table 1.8 Government Expenditures in Agriculture, 2011-12

Region	# Countries	# Quest. requested	Response rate for questionnaires requested (%)	
			2011	2012
Central Asia	5	4	0%	0%
Eastern Asia	8	4	0%	25%
Southern Asia	9	9	11%	0%
South-Eastern Asia	11	10	10%	30%
Western Asia	18	5	20%	80%
Asia Total	51	32	9%	25%
Oceania	20	11	9%	27%
Asia and Pacific Total	71	43	9%	26%
APCAS Members	28	24	13%	21%
WORLD	227	158	16%	25%

TABLE 2. NUMBER OF RESPONSES TO FAO QUESTIONNAIRES, BY COUNTRY AND LATEST RESPONSE AVAILABLE, 2005-2012

Country	Production		Trade		Producer prices		Land use		Fertilizers		Pesticides		Machinery ⁶	
	Num. received	Last received	Num. received	Last received	Num. received	Last received	Num. received	Last received	Num. received	Last received	Num. received	Last received	Num. received	Last received
Kazakhstan	2	2009	6	2011	6	2012	2	2008	1	2008	1	2007	3	2008
Kyrgyzstan	3	2012	6	2011	7	2012	7	2011	7	2011	4	2011	4	2009
Tajikistan	2	2012	0	n.a.	6	2012	3	2009	4	2011	1	2011	2	2009
Turkmenistan	0	n.a.	0	n.a.	0	n.a.	0	1993	0	n.a.	0	1993	0	n.a.
Uzbekistan	1	2005	0	n.a.	0	n.a.	1	2005	1	2009	0	n.a.	0	n.a.
China - mainland	3	2012	7	2011	6	2012	4	2011	5	2011	4	2011	4	2010
China- Hong Kong	0	n.a.	7	2011	4	2009	1	2006	3	2008	4	2011	2	2007
China- Macao	0	n.a.	7	2011	1	2006	8	2012	7	2011	3	2011	5	2010
China- Taiwan	0	n.a.	5	2011	0	n.a.	0	1969	0	n.a.	0	n.a.	0	n.a.
Democratic People's Rep. of Korea	0	n.a.	0	n.a.	0	n.a.	0	n.a.	1	2011	0	n.a.	0	n.a.
Japan	5	2012	7	2011	8	2012	8	2012	7	2011	4	2011	4	2009
Mongolia	5	2012	3	2007	7	2012	5	2012	2	2007	0	n.a.	3	2010
Republic of Korea	6	2012	7	2011	5	2011	4	2011	4	2011	0	2000	2	2007
Afghanistan	4	2012	3	2011	4	2011	6	2011	5	2011	0	n.a.	5	2010
Bangladesh	5	2012	3	2007	4	2012	7	2012	4	2011	4	2011	2	2008
Bhutan	4	2012	1	2010	7	2012	5	2012	5	2011	4	2011	4	2010
India	4	2011	7	2011	1	2010	5	2012	0	n.a.	2	2010	0	n.a.
Iran (Islamic Republic of)	7	2012	6	2011	7	2012	8	2012	6	2011	3	2011	3	2010
Maldives	2	2010	6	2011	1	2007	0	n.a.	3	2010	0	n.a.	0	n.a.
Nepal	7	2012	3	2011	5	2012	3	2011	6	2011	0	1995	1	2007
Pakistan	5	2011	7	2011	5	2011	2	2008	7	2011	1	2011	2	2008
Sri Lanka	7	2012	5	2011	8	2012	1	2009	4	2009	3	2011	2	2010
Brunei Darussalam	0	n.a.	0	n.a.	1	2007	2	2007	4	2011	0	n.a.	1	2006
Cambodia	4	2012	2	2011	3	2008	0	1995	2	2010	0	n.a.	1	2007
Indonesia	6	2011	7	2011	6	2011	4	2009	6	2011	0	1993	2	2009
Lao People's Democratic Rep.	4	2012	0	n.a.	2	2012	1	2009	1	2008	2	2011	0	n.a.
Malaysia	4	2012	7	2011	6	2012	4	2011	3	2011	2	2011	3	2009
Myanmar	6	2012	0	n.a.	6	2012	4	2011	6	2010	4	2011	3	2009
Philippines	8	2012	7	2011	8	2012	7	2012	7	2011	0	n.a.	3	2010
Singapore	6	2012	7	2011	7	2012	5	2012	4	2009	0	n.a.	1	2006
Thailand	3	2012	7	2011	8	2012	7	2011	6	2011	1	2009	3	2009
Timor-Leste	1	2011	0	n.a.	1	2010	0	n.a.	0	n.a.	1	2009	0	n.a.
Viet Nam	7	2012	0	n.a.	3	2012	2	2007	6	2011	0	2001	1	2007
Armenia	8	2012	7	2011	8	2012	4	2012	6	2011	2	2010	5	2010
Azerbaijan	8	2012	7	2011	8	2012	8	2012	7	2011	4	2011	5	2010
Bahrain	4	2011	6	2011	2	2010	0	2000	2	2010	1	2007	1	2007
Cyprus	6	2012	7	2011	7	2012	8	2012	7	2011	2	2009	5	2010
Georgia	0	n.a.	7	2011	6	2012	6	2012	7	2011	0	n.a.	4	2009

⁶ Though 2010 data were received in the machinery questionnaire sent out in 2012, the response rates and completeness was of such poor quality that this data was not reported in FAOSTAT.

Country	Production		Trade		Producer prices		Land use		Fertilizers		Pesticides		Machinery ⁶	
	Num. received	Last received	Num. received	Last received	Num. received	Last received	Num. received	Last received	Num. received	Last received	Num. received	Last received	Num. received	Last received
Iraq	2	2011	3	2009	1	2010	2	2009	4	2011	1	2007	2	2009
Israel	8	2012	7	2011	7	2012	8	2012	2	2008	1	2011	4	2009
Jordan	6	2012	7	2011	8	2012	7	2012	6	2011	3	2010	4	2010
Kuwait	2	2011	1	2009	0	n.a.	0	2001	0	n.a.	0	1998	0	n.a.
Lebanon	3	2012	7	2011	4	2012	3	2011	5	2011	0	1997	2	2010
Occupied Palestinian Territory	4	2012	0	n.a.	8	2012	7	2012	0	n.a.	2	2009	4	2010
Oman	3	2011	7	2011	1	2012	1	2009	0	n.a.	3	2011	1	2009
Qatar	4	2012	7	2011	2	2006	3	2011	1	2005	2	2011	0	n.a.
Saudi Arabia	0	n.a.	7	2011	3	2011	0	2000	0	n.a.	2	2011	0	n.a.
Syrian Arab Rep.	5	2012	5	2010	6	2012	7	2011	4	2011	0	2001	4	2010
Turkey	5	2010	7	2011	8	2012	8	2012	7	2011	2	2010	4	2009
United Arab Emirates	1	2012	3	2008	0	n.a.	3	2012	0	n.a.	0	n.a.	1	2008
Yemen	4	2010	7	2011	4	2012	5	2011	1	2006	3	2011	1	2008
American Samoa	0	n.a.	6	2011	0	n.a.	0	1992	0	n.a.	0	n.a.	0	n.a.
Australia	6	2012	7	2011	6	2012	8	2012	7	2011	0	1992	5	2010
Cook Islands	0	n.a.	4	2008	0	n.a.	0	2004	1	2009	1	2009	1	2007
Federated States of Micronesia	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.
Fiji	0	n.a.	7	2011	2	2010	1	2007	0	n.a.	0	1992	2	2008
French Polynesia	0	n.a.	7	2011	0	n.a.	0	1990	0	n.a.	3	2011	0	n.a.
Kiribati	0	n.a.	2	2009	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.
Marshall Islands	0	n.a.	0	n.a.	0	n.a.	1	2005	1	2005	0	n.a.	0	n.a.
Nauru	1	2010	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.
New Caledonia	3	2012	6	2011	0	n.a.	4	2012	4	2011	2	2011	2	2009
New Zealand	7	2012	7	2011	8	2012	7	2011	7	2011	0	2001	5	2010
Niue	0	n.a.	0	n.a.	0	n.a.	0	1990	0	n.a.	0	n.a.	0	n.a.
Northern Mariana Islands	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.
Palau	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.	0	n.a.
Papua New Guinea	0	n.a.	1	2009	0	n.a.	0	1971	0	n.a.	0	1995	0	n.a.
Samoa	0	n.a.	6	2011	0	n.a.	0	2002	0	n.a.	0	n.a.	0	n.a.
Solomon Islands	0	n.a.	4	2011	n.a.	n.a.	0	1991	0	n.a.	0	n.a.	0	n.a.
Tonga	1	2009	4	2010	1	2011	0	1996	1	2006	0	n.a.	1	2007
Tuvalu	0	n.a.	0	n.a.	n.a.	n.a.	0	1990	0	n.a.	0	n.a.	1	2008
Vanuatu	0	n.a.	6	2011	1	2010	1	2012	0	n.a.	0	1993	0	n.a.
France	6	2012	7	2011	8	2012	5	2012	5	2011	1	2007	3	2009
United Kingdom	5	2012	7	2011	8	2012	7	2012	6	2011	4	2011	3	2008
USA	4	2012	7	2011	8	2012	6	2012	7	2011	0	0	1	2008

TABLE 3. DATA QUALITY AND COMPLETENESS BY REGION, COUNTRY AND YEAR, 2005-2012**TABLE 3.1 PROPORTION OF OFFICIAL RECORDS IN FAOSTAT, BY DATASET, REGION AND YEAR (%)⁷****Table 3.11 Agricultural Production**

Region	2005	2006	2007	2008	2009	2010	2011	2012	AVERAGE
Central Asia	40%	50%	42%	41%	41%	40%	30%	20%	38%
Eastern Asia	49%	49%	49%	51%	50%	45%	45%	21%	45%
Southern Asia	70%	68%	67%	71%	69%	68%	59%	32%	63%
South-Eastern Asia	58%	58%	58%	64%	64%	62%	55%	36%	57%
Western Asia	67%	69%	70%	69%	65%	61%	53%	42%	62%
Asia, Total	60%	62%	61%	62%	60%	58%	51%	33%	56%
Oceania	25%	21%	27%	23%	27%	16%	18%	12%	21%
Asia and Pacific, Total	55%	55%	56%	56%	55%	51%	46%	30%	51%
APCAS members	65%	63%	63%	65%	65%	61%	58%	38%	60%

Table 3.12 Agricultural Trade

Region	2005	2006	2007	2008	2009	2010	2011	2012	AVERAGE
Central Asia	61%	61%	61%	51%	28%	23%	51%	n.a.	48%
Eastern Asia	83%	92%	78%	60%	72%	70%	66%	n.a.	74%
Southern Asia	70%	61%	62%	56%	50%	70%	65%	n.a.	62%
South-Eastern Asia	67%	66%	67%	54%	53%	60%	58%	n.a.	61%
Western Asia	75%	73%	78%	61%	59%	59%	55%	n.a.	66%
Asia, Total	73%	72%	72%	58%	56%	60%	59%	n.a.	64%
Oceania	65%	67%	66%	41%	49%	50%	53%	n.a.	56%
Asia and Pacific, Total	71%	71%	71%	55%	55%	59%	58%	n.a.	63%
APCAS members	74%	74%	70%	59%	64%	71%	68%	n.a.	69%

Note: Trade data processing 2012 was postponed

Table 3.13 Agricultural Producer Prices

Region	2005	2006	2007	2008	2009	2010	2011	2012	AVERAGE
Central Asia	38%	38%	40%	39%	39%	38%	30%	n.a.	37%
Eastern Asia	43%	45%	44%	54%	54%	55%	44%	n.a.	49%
Southern Asia	45%	42%	39%	36%	36%	36%	20%	n.a.	36%
South-Eastern Asia	48%	48%	39%	41%	40%	36%	28%	n.a.	40%
Western Asia	56%	60%	61%	59%	59%	53%	48%	n.a.	57%
Asia, Total	48%	49%	47%	47%	47%	44%	35%	n.a.	45%
Oceania	56%	55%	56%	46%	43%	22%	33%	n.a.	45%
Asia and Pacific, Total	49%	50%	48%	47%	47%	43%	35%	n.a.	45%
APCAS members	49%	49%	47%	45%	45%	42%	32%	n.a.	44%

⁷ Data for a particular year may have been reported in a questionnaire given in a later year, so these tables do not necessarily coincide with the reference year questionnaire.

Table 3.14 Land use

Region	2005	2006	2007	2008	2009	2010	2011	2012	AVERAGE
Central Asia	45%	34%	41%	36%	36%	38%	33%	n.a.	33%
Eastern Asia	53%	45%	45%	41%	38%	45%	33%	n.a.	38%
Southern Asia	55%	48%	52%	60%	53%	56%	50%	n.a.	47%
South-Eastern Asia	47%	34%	36%	32%	28%	39%	28%	n.a.	30%
Western Asia	52%	54%	54%	55%	54%	59%	39%	n.a.	46%
Asia, Total	51%	46%	48%	48%	45%	51%	37%	n.a.	41%
Oceania	30%	25%	25%	25%	25%	36%	25%	n.a.	24%
Asia and Pacific, Total	46%	41%	43%	42%	40%	47%	34%	n.a.	37%
APCAS members	58%	49%	53%	51%	47%	53%	42%	n.a.	44%

Table 3.15 Fertilizers

Region	2005	2006	2007	2008	2009	2010	2011	2012	AVERAGE
Central Asia	14%	15%	18%	17%	18%	13%	20%	n.a.	16%
Eastern Asia	15%	15%	15%	18%	20%	20%	21%	n.a.	18%
Southern Asia	19%	21%	25%	22%	23%	20%	21%	n.a.	22%
South-Eastern Asia	23%	22%	22%	23%	25%	19%	25%	n.a.	23%
Western Asia	16%	15%	15%	20%	19%	16%	19%	n.a.	17%
Asia, Total	18%	18%	19%	20%	21%	18%	21%	n.a.	19%
Oceania	16%	14%	15%	15%	16%	13%	15%	n.a.	15%
Asia and Pacific, Total	18%	17%	18%	20%	20%	17%	20%	n.a.	18%
APCAS members	21%	20%	21%	22%	24%	22%	25%	n.a.	22%

Table 3.16 Pesticides

Region	2005	2006	2007	2008	2009	2010	2011	2012	AVERAGE
Central Asia	100%	100%	100%	100%	100%	100%	100%	n.a.	100%
Eastern Asia	100%	100%	100%	100%	100%	100%	100%	n.a.	100%
Southern Asia	100%	100%	100%	100%	100%	100%	100%	n.a.	100%
South-Eastern Asia	100%	100%	100%	100%	100%	100%	100%	n.a.	100%
Western Asia	100%	100%	100%	100%	100%	100%	100%	n.a.	100%
Asia, Total	100%	100%	100%	100%	100%	100%	100%	n.a.	100%
Oceania	100%	100%	100%	100%	100%	100%	100%	n.a.	100%
Asia and Pacific, Total	100%	100%	100%	100%	100%	100%	100%	n.a.	100%
APCAS members	100%	100%	100%	100%	100%	100%	100%	n.a.	100%

Note: All reporting countries have consistently reported on the available pesticide items.

Table 3.17 Machinery

Region	2005	2006	2007	2008	2009	2010	2011	2012	AVERAGE
Central Asia	80%	88%	91%	88%	0%	0%	n.a.	n.a.	58%
Eastern Asia	92%	82%	89%	92%	45%	26%	n.a.	n.a.	71%
Southern Asia	93%	67%	64%	61%	45%	31%	n.a.	n.a.	60%
South-Eastern Asia	84%	85%	84%	85%	66%	0%	n.a.	n.a.	67%
Western Asia	76%	71%	72%	65%	33%	53%	n.a.	n.a.	62%
Asia, Total	83%	76%	77%	74%	40%	33%	n.a.	n.a.	64%
Oceania	86%	88%	91%	44%	29%	27%	n.a.	n.a.	61%
Asia and Pacific, Total	84%	77%	79%	69%	38%	32%	n.a.	n.a.	63%
APCAS members	93%	82%	85%	78%	55%	26%	n.a.	n.a.	70%

Table 3.18 Government Expenditures in Agriculture

Region	2005	2006	2007	2008	2009	2010	2011	2012	AVERAGE
Central Asia	0%	0%	0%	0%	0%	0%	0%	n.a.	0%
Eastern Asia	1%	1%	1%	1%	1%	1%	0%	n.a.	1%
Southern Asia	0%	0%	0%	0%	0%	0%	2%	n.a.	0%
South-Eastern Asia	4%	8%	8%	8%	8%	2%	2%	n.a.	5%
Western Asia	15%	17%	17%	17%	17%	17%	18%	n.a.	15%
Asia, Total	4%	5%	5%	5%	5%	4%	4%	n.a.	4%
Oceania	2%	2%	2%	2%	2%	4%	3%	n.a.	2%
Asia and Pacific, Total	4%	5%	5%	5%	5%	4%	4%	n.a.	4%
APCAS members	2%	4%	4%	4%	4%	2%	2%	n.a.	3%

TABLE 3.2 AVERAGE PROPORTION OF OFFICIAL RECORDS IN FAOSTAT, BY COUNTRY AND DATASET, 2005-2012 (%)

Country	Production	Trade	Prices	Land	Fertilizers	Pesticides	Machinery	Government Expenditures
Kazakhstan	53%	74%	39%	25%	25%	100%	61%	
Kyrgyzstan	50%	66%	34%	76%	14%	100%	60%	
Tajikistan	50%	12%	62%	50%	8%	100%	40%	1%
Turkmenistan	14%	14%	0%	3%				
Uzbekistan	15%	5%	0%	19%	18%			
China - mainland	29%	85%	47%	31%	24%	100%	93%	
China- Hong Kong	2%	89%	37%	17%	0%	100%	57%	
China- Macao	25%	71%	0%	100%	2%	100%	54%	
China- Taiwan	67%	64%	0%	41%	22%	100%	53%	
Democratic People's Rep. of Korea	5%	23%	0%	0%				
Japan	63%	88%	60%	73%	23%	100%	74%	6%
Mongolia	58%	35%	53%	53%	5%		68%	1%
Republic of Korea	55%	82%	40%	65%	37%	100%	74%	
Afghanistan	64%	29%	15%	67%	5%		49%	0%
Bangladesh	72%	38%	28%	29%	17%	100%	47%	20%
Bhutan	49%	16%	59%	47%	13%	100%	48%	
India	63%	89%	1%	54%	36%	100%	79%	
Iran (Islamic Republic of)	36%	71%	50%	72%	14%	100%	37%	
Maldives	19%	66%	29%	27%	32%		62%	
Nepal	84%	46%	53%	77%	27%	100%	50%	
Pakistan	77%	91%	30%	49%	37%		72%	1%
Sri Lanka	86%	61%	60%	33%	14%	100%	79%	
Brunei Darussalam	12%	9%	20%	26%	21%		25%	
Cambodia	73%	20%	14%	24%	11%			
Indonesia	74%	86%	35%	29%	31%		66%	22%
Lao People's Democratic Rep.	43%	11%	0%	29%		100%		
Malaysia	53%	85%	62%	25%	31%	100%	79%	6%
Myanmar	60%	8%	40%	81%	13%	100%	81%	
Philippines	75%	82%	55%	33%	21%		56%	
Singapore	23%	87%	30%	37%	21%		73%	16%
Thailand	60%	85%	50%	27%	29%	100%	73%	
Timor-Leste	35%	11%	29%	21%		100%		1%
Viet Nam	48%	15%	71%	38%	25%		74%	34%
Armenia	86%	79%	76%	62%	11%	100%	82%	
Azerbaijan	75%	80%	78%	81%	15%	100%	63%	
Bahrain	34%	80%	0%	22%	12%	100%	23%	
Cyprus	75%	76%	82%	70%	34%	100%	51%	
Georgia	49%	80%	52%	40%	20%		58%	13%
Iraq	44%	7%	67%	3%	8%	100%	97%	
Israel	54%	89%	66%	46%	27%	100%	79%	64%
Jordan	67%	80%	49%	89%	24%	100%	93%	8%

Country	Production	Trade	Prices	Land	Fertilizers	Pesticides	Machinery	Government Expenditures
Kuwait	39%	11%	0%	35%	4%			
Lebanon	46%	84%	45%	50%	18%		63%	
Occupied Palestinian Territory	49%	11%	14%	38%		100%	65%	
Oman	64%	84%	0%	52%	16%	100%	61%	4%
Qatar	61%	59%	0%	22%	6%		47%	
Saudi Arabia	55%	64%	2%	41%	10%	100%	51%	
Syrian Arab Republic	81%	48%	28%	83%	21%		71%	
Turkey	79%	88%	70%	93%	46%	100%	98%	
United Arab Emirates	59%	37%	0%	33%	10%		51%	
Yemen	61%	67%	88%	22%	5%	100%	65%	
American Samoa	0%	6%		37%				
Australia	55%	88%	66%	51%	26%	100%	49%	15%
Cook Islands	0%	6%	0%	30%	25%	100%	47%	
Federated States of Micronesia	0%	29%		27%				1%
Fiji	20%	83%	49%	21%	10%		49%	
French Polynesia	20%	71%	0%	7%	11%	100%	50%	
Kiribati	23%	40%		8%			17%	
Marshall Islands	0%	39%		34%	1%			
Nauru	0%	0%		33%				
New Caledonia	23%	73%		24%	11%	100%	69%	
New Zealand	33%	91%	26%	90%	35%	100%	99%	17%
Niue	0%	1%		32%				
Northern Mariana Islands				19%			50%	
Palau		33%		4%				
Papua New Guinea	1%	11%	0%	23%	10%		46%	
Samoa	0%	13%	0%	23%	5%		69%	
Solomon Islands	3%	39%		13%			75%	
Tonga	0%	34%	0%	22%	16%		67%	1%
Tuvalu	0%	23%		33%			35%	
Vanuatu	8%	60%	100%	13%			45%	7%
France	78%	89%	41%	69%	24%	100%	76%	
United Kingdom	72%	92%	49%	95%	22%	100%	91%	
USA	82%	89%	75%	33%	29%	100%	78%	