

APPENDIX A

Methodology

Enabling the Business of Agriculture 2017 (EBA 2017) presents indicators and data that measure regulations that affect the business in and around agriculture. In the project's third year, the team collected data in 62 countries in the following 12 topic areas: seed, fertilizer, machinery, finance, markets, transport, water, information and communication technology (ICT), land, environmental sustainability, gender, and livestock. Eight of the topics were scored this year and are presented below. The other four will be expanded, refined and potentially scored in future years.

EBA Methodology

EBA 2017 data are collected in a standardized way. The team designs questionnaires for each topic area and administers them to experts in each country. The questionnaires use a hypothetical, standardized case scenario to ensure comparability across countries. The standard business case with assumptions about the legal form of the business, its size, its location and the nature of its operations for each topic applied for all countries. Assumptions guiding respondents through their completion of the survey questionnaires vary by topic and are presented in more detail in appendix B. In addition, in the interest of comparability, the values in the assumptions are not fixed values but proportional to the country's gross national income (GNI) per capita.

Once the data are collected and analyzed, several follow-up rounds address and resolve any discrepancies in the answers the respondents provide, including through conference calls, written correspondence and

country visits. For the *EBA 2017* data collection, the team traveled to 14 countries to verify data and recruit respondents. The data in this report are current as of June 30, 2016.

Legal indicators

Legal indicators emerge from a reading of the laws and regulations. In a few instances, the data also include some elements which are not in the text of the law but relate to implementing a good regulatory practice—for example, the online availability of a fertilizer catalogue. The team identified good regulatory practices for each topic area. The individual questions or regulatory dimension are assigned numerical scores ranging from 0 to 1 (see topic data notes, below, for details). The scores of the different indicators within one topic are also averaged into a topic score.

Efficiency indicators

Efficiency indicators reflect the efficiency of the regulatory system—for example, the number of procedures and the time and cost to complete a process such as certifying seed for sale in the domestic market. Data of this type are built on legal requirements, and the cost measures are backed by official fee schedules, when available. Time estimates often involve an element of judgment by respondents who routinely administer the relevant regulations or undertake the relevant transactions. To construct the time estimates for a particular regulatory process, such as completing the requirements to import fertilizer, the process is broken down into clearly defined steps and procedures. The time to complete these steps is verified with expert

Country assumptions and characteristics

Region and income group

EBA 2017 uses the World Bank regional and income group classifications, available at <http://data.worldbank.org/about/country-and-lending-groups>. While the World Bank does not assign regional classifications to high-income countries, regional averages presented in figures and tables in the report include countries from all income groups. For the report, high-income Organisation for Economic Co-operation and Development (OECD) countries

are assigned the “regional” classification as *OECD high income*.

Gross national income (GNI) per capita

EBA 2017 uses 2015 income per capita as published in the World Bank's *World Development Indicators 2016*. Income is calculated using the Atlas method (current U.S. dollars). For cost indicators expressed as percentage of income per capita, 2014 GNI in U.S. dollars is used as the denominator.

respondents—through conference calls, written correspondence and visits by the team—until there is convergence on a final answer. The specific rules followed by each topic on defining procedures, time and cost estimates are described below.

Distance-to-Frontier and Topic Rankings

About distance-to-frontier score

EBA 2017 presents two aggregate measures per topic: (i) the distance-to-frontier scores and (ii) the topic rankings that results from ordering distance-to-frontier scores.

The distance-to-frontier score benchmarks economies with respect to regulatory best practice in each topic, showing the absolute distance to the best performance on each EBA indicator.

The distance-to-frontier score captures the gap between a country's performance and a measure of best practice across the entire sample of 27 indicators for eight EBA topics (land, environmental sustainability, livestock and gender indicators are excluded). For transport, for example, the Russian Federation has the shortest time (1 day) to obtain a cross-border license required for domestic trucks in the partner country; Denmark has the highest number of regulatory good practices in terms of trucking licenses and operations (10.8 out of 11).

The complete list of indicators is presented in table A.1, below. EBA indicators are divided into legal and efficiency indicators. In efficiency indicators, the time, cost and documents required to conduct a specific administrative procedure (such as the registration of a new fertilizer product) are combined to build a single indicator.

Calculation of the topic distance-to-frontier score

Calculating the topic's distance-to-frontier score for each country involves two main steps. In the first step individual component indicators are normalized to a common unit where each of the 27 component indicators is rescaled using the linear transformation $(\text{worst}-y)/(\text{worst}-\text{frontier})$. In this formulation the frontier represents the best performance on the indicator across all countries. The best performance and the worst performance are established based on the data collected as of June 2016. For legal indicators such as branchless banking indicator in the finance topic, or the plant protection indicator in the markets topic, the frontier score is set at the highest possible value and the worst performance corresponds to the worst possible score. For efficiency indicators, a score of 0 is assigned in cases of "No practice" and "N/A" (see topic data notes).

To mitigate the effects of extreme outliers in the distributions of the rescaled data for efficiency indicators (for example, very few economies need more than 954 days to complete the procedures to register a fertilizer product), the worst performance is calculated after the removal of outliers. The definition of outliers is based on the distribution for each component indicator. To simplify the process two rules were defined: the 95th percentile is used for the indicators with the most dispersed distributions (including the time and cost indicators), and the 99th percentile is used for the number of documents (for example, the number of documents required to export agricultural products). No outlier is removed for legal indicators scores (such as seed quality control and assurance, tractor testing and standards, or producer organizations).

In the second step for calculating the distance-to-frontier score, the scores obtained for individual indicators for each country are aggregated through simple averaging into one distance-to-frontier score for each topic: fertilizer, seed, machinery, finance, markets, transport, water, and ICT. *EBA 2017* uses the simplest method: it gives equal weight to each of the topic components or indicators. The only exception are efficiency indicators, where the distances to frontier associated with the time, cost and documents are combined and averaged to build a single efficiency indicator. In the area of registration of a new seed variety, the team has made sure that countries are not penalized by their geographical conditions, and different distance-to-frontier scores are established for countries with one or two cropping seasons.

If no data could be obtained for a specific data point, such data point was excluded from the corresponding DTF indicator score in that country. If more than half of the data points could not be obtained for a particular legal or efficiency indicator, that indicator was excluded from the calculation of the DTF topic score in that country.

A country's distance-to-frontier score is indicated on a scale from 0 to 100, where 0 represents the worst performance and 100 the frontier. The difference between a country's distance-to-frontier score in 2016 and future score will illustrate the extent to which the country has closed the gap to the regulatory frontier over time. And in any given year the score measures how far a country is from the best performance at that time.



Table A.1 | What is the frontier in regulatory practice?

	INDICATORS	FRONTIER	WORST PERFORMANCE
SEED	Plant breeding index (0–10)	10	0
	Variety registration index (0–8)	8	0
	Seed quality control index (0–12)	12	0
	Time to register new varieties (days)	298 ^a ; 166 ^b	860 ^a ; 716 ^b
	Cost to register new varieties (% income per capita)	0.0	969.7 ^a ; 268.3 ^b
FERTILIZER	Fertilizer registration index (0–7)	7	0
	Quality control of fertilizer index (0–7)	7	0
	Importing and distributing fertilizer index (0–7)	7	0
	Time to register a new fertilizer product (days)	11	954
	Cost to register a new fertilizer product (% income per capita)	0.0	845.8
MACHINERY	Tractor operation index (0–5)	5	0
	Time to register a tractor (days)	1	27
	Cost to register a tractor (% income per capita)	0.0	37.0
	Tractor testing and standards (0–8)	8	0
	Time to obtain type approval (days)	4	279
	Cost to obtain type approval (% income per capita)	0.5	560.9
	Tractor import (0–5)	5	0
FINANCE	Branchless banking		
	Agent banking index (0–5)	5	0
	E-money index (0–4)	4	0
	Movable collateral		
	Warehouse receipts index (0–5)	5	0
	Doing Business getting credit index (0–8)	8	0
	Non-bank lending institutions		
	Microfinance institutions index (0–7)	7	0
	Financial cooperatives index (0–7)	7	0
	MARKETS	Producer organizations index (0–13)	13
Plant protection index (0–8)		8	0
Agricultural trade index (0–9)		9	0
Documents to export agricultural goods (number)		0	4
Time to export agricultural goods (days)		0	11
Cost to export agricultural goods (% income per capita)		0.0	5.2
TRANSPORT		Trucking licenses and operations index (0–11)	11
	Time to obtain trucking licenses (days)	1	80
	Cost to obtain trucking licenses (% income per capita)	0.0	31.8
	Cross-border transportation index (0–9)	9	0
	Time to obtain cross-border licenses (days)	1	60
	Cost to obtain cross-border licenses (% income per capita)	0.0	60.3
WATER	Integrated water resource management index (0–29)	29	0
	Individual water use for irrigation index (0–20)	20	0
ICT	Information and communication technology index (0–9)	9	0

Note: a. For countries with one cropping season. b. For countries with two cropping seasons.

The report team welcomes feedback on the methodology. All the data and sources are publicly available at <http://eba.worldbank.org>.

APPENDIX B

Topic data notes

Seed

The seed indicators aim to identify obstacles affecting the timely release and production of high-quality seed by the formal seed supply system, by examining the regulatory environment for plant breeding, registration of new varieties and seed quality control.

Three indicators have been developed:

1. Plant breeding.
2. Variety registration.
3. Seed quality control.

The seed topic has four types of respondents: (i) seed producers and seed companies; (ii) national and regional seed associations; (iii) government authorities (for example, the Ministry of Agriculture); and (iv) academics. The data are collected through surveys sent to contributors from Washington, DC, and completed with calls, emails and interviews that are conducted with respondents during country visits. Responses from contributors are crosschecked by reviewing the applicable laws and regulations. Desk research and literature review are also performed to verify certain data points.

To make the data comparable across countries, several assumptions about the new variety to be registered are used. Furthermore, only certain procedures are captured by EBA data, and specific rules are used to calculate time and cost. More detail on each issue, including the scoring methodology for each data point (table B.1) and specific terms, is set out below.

Assumptions about the variety

The variety:

- Is a maize variety developed by the private sector.
- Is being registered for the first time in the entire country.
- Has not been registered in any other country.

Note: In exceptional cases when maize varieties are not being developed by the private sector in the country, we consider imported maize variety, which may have been previously registered elsewhere.

Procedures

A procedure is defined as any interaction of the seed company's owner, manager or employees with external parties, including any relevant government agencies, lawyers, committees, public and private inspectors and

technical experts. All procedures are counted that are legally or in practice required for the seed company to release a new variety of seed. Procedures are consecutive but can be simultaneous.

Time

Time is recorded in calendar days and captures the median duration of each procedure. The time span for each procedure starts with the first filing of the application or demand, and ends once the last procedure required to release a new seed variety on the market has been fulfilled, such as the listing in the national catalog or gazette. Any tests performed by the seed company prior to filling an application are not counted. The minimum time for each procedure is one day. The calendar days for distinctiveness, uniformity and stability (DUS) and value for cultivation and use (VCU) tests are determined based on the number of testing seasons required by the authority and the number of cropping seasons existing in the country, as follows:

Countries with two cropping seasons per year:

- If one season is required by law to perform the tests, 135 days are counted for the testing procedure.
- If two seasons are required by law to perform the tests, 275 days are counted for the testing procedure. This accounts for the two seasons of 135 days each and 5 days to account for the time needed to plow and prepare the land before the next cropping season ($135+5+135 = 275$ days).

Countries with one cropping season per year:

- If one season is required by law to perform the tests, 182 days are counted for the testing procedure.
- If two seasons are required by law to perform the tests, 547 days are counted for the testing procedure. This accounts for the full calendar year including one season (365 days) and an additional testing season (182 days).

Cost

Only official costs are recorded, including fees and taxes. In the absence of fee schedules, a government officer's estimate is taken as an official source. In the absence of government officer's estimate, estimates by seed companies are used. If several seed companies provide different estimates, the median reported value is applied. Professional fees (for example, notary fees)



are only included if the company is required to use such services. All costs are recorded as a percentage of the country's income per capita.

Specific terms

Basic/foundation seed has been produced under the responsibility of the maintainer according to the generally accepted practices for the maintenance of the variety and is intended for the production of certified seed. Basic or foundation seed must conform to the appropriate conditions set by regulations, and the fulfillment of these conditions must be confirmed by an official examination.

Breeder/pre-basic seed is directly controlled by the originating or sponsor plant breeding institution, firm or individual, and is the source for the production of seed of certified classes.

Distinctiveness, Uniformity and Stability (DUS) testing is performed to compare candidate varieties for registration with varieties already listed in seed register, on these qualities:

- **Distinctness** (UPOV definition): A variety shall be deemed distinct if it is clearly distinguishable in at least one character from any other variety whose existence is a matter of common knowledge at the time of filing the application for registration.
- **Uniformity** (UPOV definition): A variety shall be deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics.
- **Stability** (UPOV definition): A variety shall be deemed stable if its relevant characteristics remain unchanged after repeated propagation by the method that is normally used for the particular variety.

Post-control tests are performed to ensure that the variety is true to its varietal identity and that the plants must conform to the characteristics of the variety listed by the national catalog at the time of its registration.

Seed certification (Organisation for Economic Cooperation and Development [OECD] definition) is the quality assurance process during which seed intended for domestic or international markets is controlled and inspected by official sources to guarantee consistent high quality for consumers.

Traceability is the ability to document the history of the origin, production, participants and handling steps involved in the seed production.

UPOV is the International Union for the Protection of New Varieties of Plants, an intergovernmental

organization based in Geneva, Switzerland. Its mission is to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants for the benefit of society. To be a member, the law of a country must conform to the standards of the 1991 Act of the UPOV Convention. The country can also have an observer status after having officially expressed an interest in becoming a UPOV member and in participating to the sessions of the Council. To date, 74 states have member status and 57 states have observer status.

Value for Cultivation and Use (VCU) testing is performed to assess whether a variety has characteristics and properties that affect improvement in the cultivation or in the utilization of the harvest or its products in comparison to the existing listed varieties.

Variety (UPOV definition) is a plant grouping within a single botanical taxon of the lowest known rank, which, irrespective of whether the conditions for the grant of a breeder's right are fully met, can be:

- Defined by the expression of the characteristics resulting from a given genotype or combination of genotypes;
- Distinguished from any other plant grouping by the expression of at least one of the said characteristics; and
- Considered as a unit with regard to its suitability for being propagated unchanged.

Variety catalog is a list of varieties that have been registered and released by a national authority and can be produced and marketed in a country or region as certified seed.

Variety release committee (VRC) decides whether a new variety can be registered and introduced on the domestic market.

Note: In addition to the initial consultations with seed experts, the team received technical support from Joseph Cortes and Adelaida Harries. The World Seed Project, which is a combined effort from the OECD Seed Scheme, the Food and Agriculture Organization (FAO), International Seed Testing Association (ISTA), ISF (International Seed Federation) and UPOV, also provided technical expertise for the development of the indicator methodology.

Fertilizer

The fertilizer indicators measure regulatory bottlenecks limiting access to fertilizer. The indicators also focus on operational and economic constraints, as well as the implementation of legislation affecting the fertilizer industry.

Three indicators have been developed, as follows:

1. Fertilizer registration.
2. Importing and distributing fertilizer.
3. Quality control of fertilizer.

The fertilizer topic area has three main types of respondents: i) fertilizer companies, ii) relevant government authorities (for example, the ministry of agriculture), and iii) agricultural input dealer associations. The questionnaire targets all three groups of respondents, whereby the time and motion component is typically answered by the private sector. Data was collected through face-to-face, by phone, or email interviews with respondents.

To make the data comparable across countries, several assumptions about the company and the fertilizer product are used. Furthermore, only certain procedures are captured by EBA data, and specific rules are used to calculate time and cost. More detail on each issue, including the scoring methodology for each data point (table B.2) and specific terms, is set out below.

Assumptions about the fertilizer company

The fertilizer company:

- Is a private entity (company, a nongovernmental organization [NGO] and/or a farmer organization or cooperative);
- Is registered in the country;
- Imports fertilizer to sell in the country;
- Has registered at least one new fertilizer product in the country.

Assumptions about the registered fertilizer

The fertilizer:

- Is a new chemical fertilizer product—a fertilizer product is any product containing nitrogen, phosphorus, potassium or any recognized plant nutrient element or compound that is used for its plant nutrient content.
- Is produced in a foreign country.
- Is being registered for marketing purposes.

Procedures

A procedure is defined as any interaction of the company's owners, managers or employees with external parties, for example, government agencies, lawyers, auditors, notaries and customs or border authorities. It includes all procedures that are officially required for the business to legally perform its described activities, such as registering and importing fertilizer. Interactions among owners, managers and employees are not counted as procedures.

Time

Time is recorded in calendar days and captures the median duration of each procedure. The time span for each procedure starts with the first filing of the application or demand, and ends once the company

has received the final document, such as the fertilizer registration certificate. It is assumed that the company's owners, managers or employees have had no prior contact with any of the officials.

Cost

The cost captures official fees and taxes associated with the relevant licenses, permits and certificates, along with their required documents. All costs are recorded as a percentage of the country's income per capita.

Specific terms

Fertilizer registration is the process of registering a fertilizer product or blend with the public sector, during which fertilizer intended for markets is controlled and inspected by official sources to guarantee consistent high quality and safety for consumers.

Fertilizer product is any product containing nitrogen, phosphorus, potassium, or any recognized plant nutrient element or compound that is used for its plant nutrient content.

Importer registration is a government-issued license authorizing a company to import. The import registration is not to be confused with a sales license, which authorizes the company to sell fertilizer.

Import permit is a document issued by a government agency authorizing the importation of fertilizer products into its territory. An import permit can either be a blank permit with no restrictions, or impose volume, shipment or time limits.

Machinery

The machinery indicators measure regulatory barriers and associated practices limiting access and use of agricultural tractors by farmers. In particular, the indicators capture the requirements for tractor import, registration and inspection, tractor testing, the prevailing approval process, as well as tractor performance and operator safety standards.

The following three indicators were developed:

1. Tractor imports.
2. Tractor operation.
3. Tractor testing and standards.

The machinery topic area has five types of respondents, namely: i) tractor companies (tractor manufacturers, local dealers and distributors); ii) industry associations; iii) tractor testing centers; iv) government authorities, such as the ministry of agriculture or the ministry of transport; and, v) national agricultural research institutes. Data were collected through interviews with respondents.



To make the data comparable across countries, several assumptions about the machinery company and the machinery product are used. Furthermore, only certain procedures are captured by EBA data, and specific rules are used to calculate time and cost. More detail on each issue, including the score assigned to each data point (table B.3) and specific terms, is set out below.

Assumptions about the importing business

The business:

- Is a private sector company (manufacturer, dealer or distributor of agricultural machinery).
- Is registered as a business in the country.
- Does not operate in an export processing zone or in an industrial estate with special import or export privileges.
- Uses the most-used seaport for importation of tractors in the country. If the country is land-locked, it is assumed that the most-used border posts are used.

Assumptions about the machinery product:

The machinery product:

- Is a two-axle or four-wheel drive agricultural tractor.
- Has more than 20 engine horsepower.
- Is designed to furnish the power to pull, carry, propel or drive implements.
- All self-propelled implements are excluded.

A tractor is used as a proxy to assess the enabling regulatory framework and the practices impacting access and use of agricultural tractors for farm mechanization.

Procedures

Procedures capture any required company interaction with external parties, such as ministries, government agencies, testing centers, accredited labs and so on to obtain a tractor type approval/homologation. Internal interactions among owners, managers and employees within the company do not count as procedures.

Time

Time is recorded in calendar days and captures the average duration of the company interaction with relevant agencies to obtain the tractor type approval or to obtain required licenses, permits and certificates.

Cost

Cost captures official fees and taxes associated with the tractor type approval/homologation or the licenses, permits and certificates, along with their required documents. All costs are recorded as a percentage of the country's income per capita.

Specific terms

Falling-object protective structures (FOPS) are a system attached to the tractor to protect the operator from falling objects such as branches, rocks, and other falling objects.

Roll-over protection structures (ROPS) are attached to the tractor frame and come as either two-post fixed or foldable, four post, or as an integral part of a ROPS cab. They generally will limit a side overturn to ninety degrees (90°) and will provide an important safety zone for the operator provided the operator is wearing a seat belt. Seat belts should not be used when a foldable ROPS is down or when a fixed ROPS is removed.

Type approval (also called *homologation*) is the official recognition given by a national authority or agency that certifies that the tractor conforms to the country's prevailing regulatory, technical and safety requirements. Before the tractor can be sold on the market and before reaching the hands of the farmer, the manufacturer (or an agency on behalf of the manufacturer) must complete its type approval/homologation procedure and be certified by third-party verification that its design, construction and performance respect the country's regulations and standards.

Finance

The finance indicators measure laws and regulations that promote access to a range of financial services, with a focus on areas that are particularly relevant for potential customers in rural areas. These customers are partially or fully excluded from traditional financial services due to factors such as their geographical location or available type of collateral.

Three indicators have been developed:

1. Non-bank lending institutions.
 - Operation and prudential regulations of micro-finance institutions (MFIs).
 - Operation and governance of financial cooperatives.
2. Branchless banking.
 - Agent banking.
 - Electronic money (e-money).
3. Movable collateral.
 - Warehouse receipts.
 - *Doing Business*—Getting Credit.

Data for the finance indicators are obtained from three main types of respondents: financial sector supervisory authorities, financial lawyers, and legal officers of financial institutions. Data collections include interviews conducted during country visits directly with respondents, followed by rounds of follow-up communication via email and conference calls with respondents as well as with third parties. Data are also verified through analyses of laws and regulations, including a review of public information sources on banking law, warehouse receipt law, financial institutions law and others. More detail on each indicator, including the scoring methodology for each data point (table B.4) and specific terms, is set out below.

1. Non-bank lending institutions

This indicator measures regulations relevant to deposit-taking MFIs and financial cooperatives. Countries with a high level of financial inclusion will be scored only based on data on financial cooperatives, while the rest of the countries will be scored based on data on both MFIs and financial cooperatives. Finance indicators are designed to measure laws and regulations that promote access to financial services for potential customers that are partially or fully excluded from traditional financial services. In particular, the MFI and agent banking indicators focus on supporting the provision and proliferation of financial services to those who are excluded from traditional banking system. These indicators are not applicable to countries with a high level of financial inclusion where agribusinesses and smallholder farmers have few obstacles accessing the formal financial sector. Therefore, those countries are not measured under these indicators and the corresponding data for those countries are shown as “N/A” (not applicable).

The threshold used to establish what countries fall under those with a high level of financial inclusion has been determined as the average of the normalized values (0–1) of two variables, namely: “account at a financial institution (% of rural adult population),” and “account at a financial institution (% of adult population) based on the World Bank Findex database. Following this approach, those countries with a number higher than 0.8 on the average of normalized values of the above-mentioned two variables will be identified as countries with high level of financial inclusion. Countries under this classification are Denmark, Greece, Italy, Korea, the Netherlands and Spain.

To make the data comparable across countries, several assumptions about the financial institutions are used, as follows:

Assumptions about the financial institutions

Microfinance institutions (MFIs): MFIs are financial institutions that specialize in the provision of small-volume financial services (such as credit, deposits and loans) to low-income clients. MFIs can take deposits, lend, and provide other financial services to the public and are licensed to operate and are supervised by a public authority.

Financial cooperatives: Financial cooperatives are member-owned, not-for-profit, cooperatives that provide savings, credit, and other financial services to their members. There are typically two types of financial cooperatives, namely: i) small financial cooperatives that provide services only to their members; are typically supervised by either the central bank, the department of cooperatives, or the ministry of finance; and are referred to as savings and credit cooperatives

(SACCOs) in some countries; and, ii) cooperative banks that take deposits from and lend to the public, and are regulated under the main financial institution laws and supervised by the central bank. The financial cooperative indicator does not measure cooperative banks but only small financial cooperatives to be consistent with the topic’s emphasis on small-scale lending and financial inclusion.

2. Branchless banking

The second indicator includes aggregated data related to agent banking and e-money. In this case, countries with a high level of financial inclusion will be scored only based on data on e-money, whereas the rest of the countries will be scored based on both agent banking and e-money.

3. Movable collateral

For the third indicator all countries will be scored on data on warehouse receipts. Data points from the *Doing Business-Getting Credit* indicator, including data on security interest granted to movable assets and future assets, collateral registry, and credit information from non-bank institutions, will be added to this indicator.

Specific terms

Agent banking is the delivery of financial services through a partnership with a retail agent (or correspondent) to extend financial services to locations where bank branches would be uneconomical.

Capital adequacy ratio (CAR) is a measure of the amount of a bank’s total capital expressed as a percentage of its risk-weighted assets.

Effective interest rate is the annual interest rate plus all fees associated with the administration of the loan to the client. It is a symbol of the total cost of the loan to the client. Proxies for the effective interest rate are the annual percentage rate or the amortization table/schedule for the loan.

E-money refers to money that is stored and exchanged through an electronic device. E-money is regulated and does not necessarily need to be associated with a deposit account at any financial institution. Examples include electronic funds transfers and payments processed through mobile phones or prepaid cards.

Deposit-taking MFIs are financial institutions specializing in the provision of small-volume financial services (for example, credit, deposits and loans) to low-income clients, which can take deposits, lend and provide other financial services to the public and are licensed to operate and supervised by a public authority.





Negotiable receipt allows the transfer of ownership without having to physically deliver the commodity.

Non-financial institution businesses are those that do not hold a financial institution license, including telecoms, post offices, or other businesses licensed by the central bank/financial supervisory authority to issue e-money.

Provisioning rules determine how much money banks must set aside as an allowance for bad loans in their portfolios. The share of a loan that must be covered by provisioning can either be the full loan amount or the part that is not secured by collateral (unsecured share).

Ratios to ensure financial stability can include the liquidity ratio, capital adequacy ratio, solvency ratio, credit to deposit ratio, assets to liabilities ratio, stable funding ratio, net loan receivables to total assets, and others. Countries address the issue of stability of financial cooperatives using different criteria, therefore all the above ratios can be included in this measure.

Warehouse receipts are documents issued by warehouse operators as evidence that specified commodities are of a stated quantity and quality, deposited or stored at particular locations by named depositors and owned by the beneficiary of the receipt issued. Where supported by an appropriate legal framework, warehouse receipts can serve as a form of collateral to obtain a loan from financial institutions and facilitate future sales.

Markets

The markets indicators monitor and analyze laws and regulations that can impact smallholder producers and agribusinesses when accessing domestic and foreign agricultural markets for their products.

Three indicators have been developed:

1. Agricultural trade.
2. Plant protection.
3. Producer organizations.

Markets indicators have five main types of respondents: (i) government agencies responsible for agricultural trade, plant protection and cash crops; (ii) private-sector agribusinesses producing and trading agricultural products in domestic and/or international markets, and related trade/export associations; (iii) farmers' organizations, including unions, federations, cooperatives and other similar entities; (iv) chambers of commerce; and (v) lawyers. Data were collected from these respondents using three different surveys: one for the public sector and two for the private sector. Data were collected through interviews conducted

during country visits directly with respondents and by email and teleconference calls from Washington, DC.

Details on the methodology for each indicator, including the score assigned to each data point (table B.5) and specific terms, are set out below.

1. Agricultural trade

To make the data on agricultural trade more comparable across countries, several assumptions about the business, the agricultural products, trading partner and shipment are used. Furthermore, only certain requirements are captured by EBA data, and specific rules are used to calculate time and cost.

Assumptions about the business

The business:

- Performs general agricultural trading activities.
- Does not directly engage in agricultural production, processing or retail activities.
- Does not operate in a special export processing zone.

Assumptions about the traded product and trading partner

A theoretical product and trading partner are selected for each country based on official export statistics in accordance with the following rules:

- The traded products are defined and grouped as cash crops, cereals, fruits and vegetables according to the Harmonized Commodity Description and Coding System 1996 version (HS 96).
- All data are sourced from the UN Comtrade Database, using the export data from 2009–13.
- For each country, the combination of the product and the partner country selected represents the highest five-year average export value (in US dollars). For example, cereal exports to Zimbabwe is selected for Zambia. In addition, the HS 4-digit product within the category that is exported the most to the partner country is used for studying the specific legal and regulatory requirements. For example, coffee exports (the top product within the cash crop category) to the United States is selected for Colombia.

Assumptions about the shipment

The shipment:

- Is transported via a 20-foot full container-load.
- Weighs 10 metric tons or costs US \$10,000, whichever is most appropriate.
- All packing material that requires fumigation (such as wood pallets) is assumed to be treated and marked with an approved international mark certifying that treatment.

Requirements to trade

A "requirement" for purposes of the study is any legally required qualification or document that must be obtained by the business to buy or sell the selected

product in the domestic market or export the product to the trading partner. These requirements may apply to the trader (for example, a selling/buying license, periodic export registration, mandatory memberships, and so on) or to the export consignment on a per shipment basis (for example, phytosanitary certificate, quality certificate, and so on). These requirements involve interactions with external parties, including government agencies, inspectors and other relevant institutions. Buyer-driven requirements such as private laboratory tests are not considered for purposes of the study.

The following principles apply to the requirements recorded:

- Only requirements specific to the product group (or the top exported sub-product within that group) and agricultural products more generally are captured. Customs, commercial and shipping documents that are not specific in this way are not measured (for example, certificate of origin, export declaration, bill of lading, letter of credit, and so on).
- Mandatory membership of a public or private entity is included if it is required to obtain and exercise the right to export the selected product or agricultural products more generally.
- Trader-level licenses include any document or action that is required to obtain and exercise the right to buy or sell the product in the domestic market or export overseas, including registration or accreditation requirements and traditional licenses.
- Documents are collected on a per shipment basis, and one document includes both application and completion of the process (for example, obtain a phytosanitary certificate or obtain a quality certificate).
 - > Where multiple documents are obtained simultaneously, they are recorded as separate documents but time is adjusted to reflect their simultaneity.
 - > The mandatory documents required by both the country studied and the selected trading partner are included.
 - > Both public and private fumigation certificates are excluded if they are not required by the laws of either the country studied or the selected trading partner. Only fumigation that is required for the product itself is captured, and separate fumigation for packaging prior to its purchase/use is not included.

Time

Time is recorded in calendar days and captures the median duration to obtain each mandatory document to export on a per shipment basis. Time to complete membership requirements or to obtain trader-level licenses is not captured. The time span for each document starts with the first filing of the application or demand, and ends once the company has received the final document, such as the phytosanitary certificate.

If time is obtained only in working days, the data are converted to calendar days based on the assumption that there are five working days per week and the procedure starts on a Monday. It is assumed that the company's owners, managers or employees have had no prior contact with any of the officials and that the company completes each procedure to obtain the document without delay on its side.

The following principles apply to how time to obtain documents is measured:

- It is assumed that the minimum time required for each document is one day, except for documents that can be fully obtained online, for which the time required is recorded as half a day.
- Although multiple documents may be obtained (and related processes completed) simultaneously, the process to obtain each document cannot start on the same day (that is, simultaneous processes start on consecutive days).
- If the process to obtain a document can be accelerated for an additional cost and is available to all types of companies, the fastest legal process is chosen and the related costs are recorded. Fast-track options applying only to firms located in an export processing zone or to certain accredited firms under authorized economic operator programs are not taken into account.

Cost

The cost includes all official fees and fees for legal or professional services if such services are required by law to complete the qualification requirement or obtain a document. Service fees (for example, those charged by fumigation companies) are only included if the company is required by law to use such services. Traditional (scheduled) border taxes/tariffs are not captured. Other special charges or taxes that apply to the export product or sub-product, or the export of agricultural products generally, are included only where they result in the issuance of a stand-alone mandatory document to export or are conditional to obtain another mandatory document to export.

Where possible, laws, regulations and fee schedules are used as sources for calculating costs. In the absence of fee schedules, estimates by the public/private sector respondents are used. If several respondents provide different estimates, the median reported value is applied. In all cases the cost excludes bribes. All costs are recorded as a percentage of the country's income per capita.

2. Plant protection

Plant protection encompasses regulations, policies and institutional frameworks that affect plant health in a country, including domestic pest management measures as well as phytosanitary controls at the



border. In cases where relevant regulations are specific to a product or product group, those applicable to the selected traded product are used.

3. Producer organizations

Producer organizations are also known as agricultural cooperatives, farmers' cooperatives, farmers' organizations or producer associations. A producer organization is defined as a formal, voluntary, jointly-owned and democratically controlled organization established for the economic benefit of agricultural producers by providing members with services that support farming activities, such as bargaining with customers or providing inputs, technical assistance, or processing and marketing services.

To render data on producer organizations comparable across countries, the following case study is used to select the most appropriate legal form in each country:

Several agricultural producers wish to pool their production within a producer organization to sell it on the spot market or through long-term sales contracts with buyers ("the transaction"). The principal function of the organization is to pool and sell the members' production, and the organization takes ownership of the produce in question.

The following principles also apply:

- Voluntary and open membership;
- Democratic member control ("one member, one vote");
- Joint-ownership by members; and,
- Created to support and promote the economic interests of its members through joint economic activity.

If different forms of producer organizations exist in a country's laws, the one which obtains the highest aggregated score under the producer organizations indicator is selected for inclusion in the dataset.

Specific terms

Definitions below are adapted from the International Plant Protection Convention (IPPC) website (<http://www.ippc.int>) and the International Standards for Phytosanitary Measures No. 5 *Glossary of Phytosanitary Terms*, adopted by the IPPC.

Electronic phytosanitary certificate (ePhyto) is the electronic version of a phytosanitary certificate in XML format. All the information contained in a paper phytosanitary certificate is also in the ePhyto. ePhytos can be exchanged electronically between countries or the data can be printed out on paper.

Pest risk analysis (PRA) is defined as "[t]he process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures

to be taken against it." It consists of three stages: initiating the process for analyzing risk; assessing pest risk; and managing pest risk.

Phytosanitary measures include "[a]ny legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests."

Regulated quarantine pest refers to "[a] pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled."

Transport

The transport indicators measure regulatory and administrative constraints affecting the provision of reliable and sustainable commercial road transport services.

The following two sub-indicators have been developed:

1. Truck licensing.
2. Cross-border transportation.

Data were collected through interviews conducted during country visits directly with respondents, by email and teleconference calls from Washington, DC, and by local staff in the different target countries. The topic mainly targeted private sector respondents including trucking associations, trucking companies and lawyers; and to a lesser extent, public sector respondents including ministries of transport, road transport regulatory authorities and ministries of infrastructure. Even though the questionnaire targeted both groups of respondents, time and cost information was typically answered by the private sector.

To make the data comparable across countries, several assumptions about the trucking company, its environment and scope of cross-border operations are used. Furthermore, only certain procedures are captured by EBA data, and specific rules are used to calculate time and cost. More detail on each issue, including the scoring methodology for each indicator (table B.6) and specific terms, is set out below.

Assumptions about the business

The business:

- Is a private entity or natural person whose core business is transporting goods by road for commercial purposes;
- Has met all formal requirements to start a business and perform general industrial or commercial activities;
- Is located in the country's largest business city;

- Has a maximum of five trucks; each truck has two axles and a maximum loading capacity of 15 MT (metric tons);
- Transports agricultural products within the country, including perishable products, and it does not transport fertilizers, pesticides, hazardous products or passengers;
- The trucks were first registered in the largest business city less than six months ago; the “trucks” comprise a tractor unit and a trailer;
- All employed drivers have the domestically required driver’s license to drive a 15 MT vehicle; and,
- Carries out cross-border transport services with its largest agricultural border-adjacent trading partner.

Assumptions about the “reference” product

The “relevant” product selection was based on UN Comtrade’s 2009–13, five-year average export value of major plant product groups, and mirror data in cases where data were not sufficient. For example, cereals constitute the reference-product for Bolivia and tomatoes are the ones for Morocco. A list of each country’s reference product is available in the Country Data tables.

Assumptions about the cross border trading partner

This partner selection was based on UN Comtrade’s 2009–13, five-year average trade value of major plant product groups (and mirror data when needed), as well as on a border-adjacent criterion. The partner selection methodology was used as a proxy for defining the largest trading partner by truck, in the absence of transport data disaggregated by mode of transport (sea, air, rail or road). It is also assumed the agricultural products being shipped to and from the largest trading partner were produced locally, not imported. For instance, the largest trading partner of Burundi is Tanzania. A list of each country’s largest trading partner is available in Country Data tables.

Time

Time was recorded in calendar days and captures the median duration of obtaining the required company or truck license, excluding preparation time. The timespan starts once all required documents have been submitted to the relevant authority and ends once the company has received the final document. It is assumed that the company’s owners, managers or employees have had no prior contact with any of the officials.

Cost

Costs capture only official costs required by law, including fees and taxes. Fee schedules in transport laws and regulations have been used as legal basis when available, and an estimation from qualified contributors in the alternative scenario. It is assumed that all documents have been submitted in the timely and correct form. All costs are recorded as a percentage of the country’s income per capita.

Validity

Validity is measured for domestic and cross-border truck licenses. Validity is expressed in years.

Specific terms

Backhauling rights: For example, when a truck registered in country A is able to transport agricultural goods into country B for sale, load other goods in country B and carry them back to country A.

Bourse de fret: A platform in which freight supply and demand are made publicly available for the purposes of freight access and allocation, often in the form of online service offered by a private company.

Certificate of good repute or equivalent: An official document issued by a competent judicial or administrative authority certifying that the trucking company was not convicted for a serious criminal offence or had not incurred in a penalty for a serious infringement of rules relating to road transport.

Cabotage rights: For example, when a truck registered in country A is able to pick up agricultural goods in country B and deliver them to a different point in country B.

Company-level license or permit: A special authorization required for established companies or individuals to legally transport goods (different from general business registration). It allows the company to operate several trucks under the same license.

Consignment note: A transport document attesting the nature and quantity of the goods transported when taken into charge by the carrier and attesting the delivery to the consignee.

Government registry or notification certificate, or equivalent: An official document issued by a competent administrative authority certifying registration in a road transport body.

Queuing system: A practice by which freight is sequentially allocated by trucking associations/unions or the government.

Transit rights: For example, when a truck registered in country A is able to travel through country B to deliver agricultural goods into country C (assuming foreign country B is the final destination of the foreign truck).

Transport/Import rights: For example, when a truck registered in country A is able to transport agricultural goods produced in its country into country B for sale.

Triangular rights: For example, when a truck registered in country A is able to pick up agricultural goods in country B and transport them to be delivered into



country C (assuming foreign country B is the final destination of the foreign truck).

Truck-level license or permit: This is a special authorization required for a truck to legally transport goods (different from vehicle registration or technical inspection certificates). A truck-level license regime requires an individual transport license or permit for each truck.

Water

The water indicators measure laws and regulations that promote sustainable, inclusive and efficient governance of water resources, with a particular focus on the use of water for irrigation.

Two indicators have been developed:

1. Integrated water resources management.
2. Individual water use for irrigation.

Water indicators have three main types of target respondents: (i) lawyers specialized in water law and environmental law, both from private practice and the public sector; (ii) technical specialists in the field of water resources management, typically from the public sector; and (iii) academic experts. The questionnaire targets all three groups of respondents, whereby the legal questions are typically answered by lawyer respondents, and implementation questions are typically answered by technical specialists and academic experts. Data collection includes interviews conducted directly with respondents during country visits, followed by rounds of follow-up communication via email and conference calls with respondents, as well as with third parties. Data are also verified through analysis of laws and regulations and a review of publicly-available sources of information on water management and permits.

To make data for the *individual water use for irrigation* indicator comparable across countries, several assumptions about the water user and water source are used. More detail, as well as the score assigned to each data point (table B.7) and specific terms, is set out below.

Assumptions about the water user

The water user:

- Is a farm that grows crops.
- Is a medium-sized farm for the country, with land area that falls between 2 and 10 hectares.
- Uses mechanical means to individually abstract water for irrigation.
- Is not located in a broader irrigation scheme.

If medium-sized farms in the country, as prescribed in any official farm-size classification system, deviate significantly from this given range, it is assumed that

the case study farm does not qualify for any exemption from permit requirements that may otherwise apply to small farms (such as exemptions for smallholders or subsistence farmers).

Assumptions about the water source

The water source:

- Is a river located 300 meters away from the farm; or
- Is a groundwater well located on the farm.

The choice between surface water and groundwater as a source for irrigation water is made based on the predominant irrigation water source for the country, determined using Food and Agriculture Organization (FAO) 2016 AQUASTAT data. The majority of EBA countries predominantly use surface water for irrigation; those with predominant groundwater use for irrigation are: Bangladesh, Denmark, India, Jordan, Nicaragua and the Netherlands.

Specific terms

Abstraction and use permit refers to the right to abstract and use a certain defined quantity of water resources. Depending upon the country context, permits may alternatively be referred to as authorization, license, right, concession and so on. For consistency, the term “permit” shall be used here.

Basin institutions are specialized entities that deal with the water resource management issues in a particular river basin, lake basin, or aquifer.¹

Charges refers to a fee or tax to abstract a certain volume of water as a natural resource, rather than a service charge for provided water or a one-time administrative application fee.

Water conservation refers to preservation and maintenance of the quantity and quality of water (surface and/or groundwater).

Water efficiency means to minimize water wastage in order to use the minimum amount of water required to perform a specific function.

Water stress “occurs when the demand for water exceeds the available amount during a certain period or when poor quality restricts its use.”²

Transfer refers to when holders of water abstraction and use permits may sell, assign, trade, lease or otherwise transfer to a third party their permit.

ICT

The information and communication technology (ICT) indicator measures laws, regulations and policies that promote an enabling environment for the provision

and use of ICT services, with a particular focus on rural areas. The ICT indicator focuses on the regulations and policies to improve access to ICT services.

The ICT topic area has three main types of respondents, as follows: i) mobile operators; ii) ICT and/or telecommunication regulatory authorities; and iii) telecommunication lawyers. The questionnaire targets all three groups of respondents. Data were collected through interviews conducted during country visits directly with respondents and also by email and teleconference calls from Kuala Lumpur, Malaysia and Washington, DC.

The data points below (table B.8) measure the legal requirements to operate as a mobile service provider that offers core mobile services which include voice, SMS (Short Message Service) and/or data.

Specific terms

Active infrastructure sharing requires operators to share elements of the active network layer including, for example, radio access nodes and transmission.

Digital dividend is the amount of spectrum made available by the transition of terrestrial television broadcasting from analog to digital.

Operating license is a license that authorizes the provision of telecommunications services.

Passive infrastructure sharing is the sharing of space or physical supporting infrastructure which does not require active operational coordination between network operators.

Service neutral is any service that can be offered in the used frequency band.

Technology neutral is any available technology to date that can be employed to provide a certain service in the used frequency band.

Voluntary spectrum trading is a mechanism whereby rights and any associated obligations to use spectrum can be transferred from one party to another by way of a market-based exchange for a certain price.

1 See for example, Global Water Partnership. 2013. River basin organizations. <http://www.gwp.org/en/ToolBox/TOOLS/INSTITUTIONAL-ROLES/Creating-an-Organisational-Framework/River-basin-organisations/>.
2 European Environment Agency. Water Stress. <http://www.eea.europa.eu/themes/water/wise-help-centre/glossary-definitions/water-stress>.



Table B.1 | Scoring methodology for seed indicators

INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
PLANT BREEDING	This indicator measures the regulatory good practices identified as supporting the plant breeding process.	1. There is a regulation governing plant breeders' rights	A score of 1 if yes A score of 0 if no
		2. The duration (in years) of the plant breeders' rights (PBR)	A score of 1 if the protection lasts at least 20 years A score of 0 if the protection lasts less than 20 years
		3. Conditions to benefit from plant breeders' rights do not differ between national and foreign applicants	A score of 1 if conditions do not differ A score of 0 if conditions differ
		4. A list of protected varieties is publicly available	A score of 1 if yes A score of 0 if no
		5. Companies are legally allowed to produce breeder/pre-basic seed of local public varieties for use in the domestic market	A score of 1 if yes A score of 0 if no
		6. Companies are legally allowed to produce foundation/basic seed of local public varieties for use in the domestic market	A score of 1 if yes A score of 0 if no
		7. Companies are obtaining access to germplasm preserved in publically managed gene banks	A score of 1 if yes A score of 0 if no
		8. Plant breeding rights can be licensed to another party for production and sale of the variety	A score of 1 if yes A score of 0 if no
		9. There are public research institutes in the country that license public varieties to companies for production and sale in the domestic market	A score of 1 if yes A score of 0 if no
		10. Companies importing germplasm for the development of new varieties are required to undergo government testing (other than phytosanitary tests)	A score of 1 if government testing is not required A score of 0 if yes, government testing is required
VARIETY REGISTRATION	This indicator measures the regulatory good practices identified as supporting the efficient registration and release of a locally developed new seed variety into the domestic market. It also measures the efficiency of the registration process through case studies.	1. DUS testing data from other countries' authorities are accepted as official data for the purpose of registration	A score of 1 if yes A score of 0 if no
		2. The law establishes a variety release committee (VRC) in the country	A score of 1 if yes A score of 0 if no
		3. The composition of the legally mandated VRC includes the private sector	A score of 1 if governmental and nongovernmental representatives (that is, seed associations, seed companies) constitute one-half or more of the VRC A score of 0.5 if nongovernmental representatives are included in the committee but constitute less than one-half A score of 0 if nongovernmental representatives are not included in the VRC or the VRC does not exist
		4. The frequency of VRC meetings	A score of 1 if the VRC meets on demand or at least once per cropping season A score of 0 if the VRC meets less than once per cropping season, or if the VRC does not meet at all
		5. A variety can be commercialized immediately after the decision of the VRC	A score of 1 if yes A score of 0 if no
		6. A catalog listing new registered varieties is publicly available online	A score of 1 if yes A score of 0.5 if the variety catalog is not available online A score of 0 if the variety catalog does not exist
		7. The variety catalog specifies agro-ecological zones suitable for the variety.	A score of 1 if yes A score of 0 if no
		8. The frequency with which the variety catalog is updated	A score of 1 if the catalog is updated each cropping season A score of 0 if the catalog is updated less than once a year
		9. Time to register a new maize variety	Total time required for all legally mandated procedures is aggregated and presented in calendar days. A score of 0 if there is no requirement to register or if the registration is not done in practice
		10. Cost required to register a new maize variety	Total cost for all legally mandated procedures is aggregated and presented in % of income per capita. A score of 0 if there is no requirement to register or if the registration is not done in practice

(continued)



INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
SEED QUALITY CONTROL	This indicator measures legally mandated processes and practices of seed certification.	1. There is an official fee schedule for seed certification activities performed by the competent public authority	A score of 1 if yes A score of 0 if no
		2. Plant breeders are required to ensure the traceability of the plant reproductive material used	A score of 1 if the plant breeder is required to retain: (i) records of the plant reproductive material or (ii) both records of the plant reproductive material and of their suppliers A score of 0.5 if the plant breeder is required to retain records of their suppliers A score of 0 if neither are required
		3. Time in years during which plant breeders are legally obliged to keep the traceability records	A score of 1 if more or equal to two years A score of 0.5 if less than two years A score of 0 if no obligation
		4. There is a legal framework for the accreditation of private seed companies and/or third parties for the performance of certification activities	A score of 1 if yes A score of 0 if no
		5. Private seed companies and/or third parties (non-governmental institutions) are accredited in practice for the performance of certification activities	A score of 1 if yes A score of 0 if no
		6. The following seed certification activities can be performed by an accredited seed company/third party: a. Field inspection b. Sampling c. Lab testing d. Labelling	A score of 0.25 for each of the listed activities
		7. The competent public authority is required to perform post-control tests on certified seed	A score of 1 if both laboratory and field post-control tests are required or if only field post-control tests are required A score of 0.5 if only laboratory post-control tests are required A score of 0 if neither are required
		8. A minimum percentage of certified seed must be subject to post-control tests	A score of 1 if yes A score of 0 if no
		9. The competent public authority is required to take measures in the case of noncompliance with the varietal purity standards	A score of 1 if the law imposes the withdrawal of the seed and a formal request to comply with applicable standards, or if the law only provides for a formal request to comply with applicable standards A score of 0.5 if the law imposes the withdrawal of the seed A score of 0 if none are required
		10. Seed containers must be labeled	A score of 1 if yes A score of 0 if no
		11. Seed container labels must provide the following information: a. Name and address of seed producer b. Crop species c. Class of seed d. Net weight e. Lot number f. Certificate number g. Germination (minimum %) h. Purity (minimum %) i. Year of production j. Repacking or relabeling k. Chemical treatment on the seed	A score of 1 if 8 or more of the label requirements must be included in the label: A score of 0 if less than 8
		12. There is a penalty for the fraudulent sale of mislabeled seed bags	A score of 1 if yes A score of 0 if no



Table B.2 | Scoring methodology for fertilizer indicators

INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
FERTILIZER REGISTRATION	Fertilizer registration (legal)	This indicator measures the legal requirements to register a fertilizer and the extent to which public information on registered products is available through fertilizer catalogues.	1. Private entities are required to register new fertilizer products to sell them in the country	A score of 1 if yes A score of 0 if no
			2. The following type(s) of fertilizer products must be registered: a. Chemical or mineral fertilizer products b. Organic fertilizer products	A score of 0.5 for each category that must be registered
			3. Field testing is not required to register a fertilizer product	A score of 1 if field testing is not required A score of 0 if field testing is required
			4. A lab sample analysis is required to register a fertilizer product	A score of 1 if yes A score of 0 if no
			5. The validity of the chemical fertilizer product registration is not time-limited	A score of 1 if yes A score of 0.8 if time-limited and validity is equal to or greater than 10 years A score of 0.4 if time-limited and validity is less than 10 years A score of 0 if fertilizer products are not required to be registered by law or if the private sector is not allowed to register fertilizer products
			6. An official catalogue listing all registered fertilizer products in the country is publicly available online	A score of 1 if yes
			7. Re-registration of a fertilizer product is not required in the country if it has already previously been registered in another country that is part of an agreement or approved in the regional catalogue	A score of 1 if re-registration is not required
IMPORTING AND DISTRIBUTING FERTILIZER	Fertilizer registration in practice (efficiency)	Building up on legal requirements to register fertilizer, this indicator captures the time and cost needed to comply with the legal requirements to register a fertilizer.	1. Total time to register a fertilizer product	Total time required for all legally mandated procedures is aggregated and presented in calendar days A score of 0 if there is no requirement to register or if the registration is not done in practice
			2. Total cost to register a fertilizer product	Total cost required for all legally mandated procedures is aggregated and presented in % of income per capita A score of 0 if there is no requirement to register or if the registration is not done in practice
IMPORTING AND DISTRIBUTING FERTILIZER	As fertilizer production is concentrated in only a few countries, requiring most others to rely on imports, these data focus on the private sector's role and the requirements for importing and distributing fertilizer.		1. Private entities are allowed to import fertilizer products into the country to sell them	A score of 0 if any of the restrictions apply A score of 1 if yes, or the time limit is greater or equal to 10 years A score of 0.5 if importer registration is time-limited and the time is greater or equal to 5 years A score of 0 if the company doesn't have to register as an importer or if the company has to register and registration is time-limited to less than five years
			2. Private entities are required to register as importers to import fertilizer products but the registration is not time-limited	A score of 0 if the company doesn't have to register as an importer or if the company has to register and registration is time-limited to less than five years
			3. Private entities are not required to obtain an import permit to import fertilizer products. If an import permit is required, the permit is a blank import permit without a volume restriction	A score of 1 if no permit is required A score of 0.5 if a blank permit is required A score of 0 if a permit is required with per shipment or volume restrictions
			4. If an import permit is required, the time validity of the import permit is at least 12 months	A score of 1 if no permit is required A score of 0.5 if validity is equal or greater than 12 months A score of 0 if validity is less than 12 months

(continued)



INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
QUALITY CONTROL OF FERTILIZER			5. The official cost to obtain an import permit is equal or less than 50% income per capita	<p>A score of 1 if no permit is required</p> <p>A score of 0.5 if the cost is equal or less than 50% of income per capita</p> <p>A score of 0 if the cost is more than 50% of income per capita</p>
			6. The time it takes to obtain the import permit is less or equal to 14 calendar days	<p>A score of 1 if no permit is required</p> <p>A score of 0.5 if less or equal to 14 calendar days</p> <p>A score of 0 if more than 14 calendar days</p>
			7. Private entities are allowed to distribute fertilizer products in the country	A score of 1 if yes
		These indicators focus on labeling requirements, legislation on the sale of mislabeled and open fertilizer containers, and practices in monitoring fertilizer quality.	1. The law requires labeling of fertilizer containers	A score of 1 if yes
			2. The law requires that labeling must be in at least one of the country's official languages	A score of 1 if yes
			3. The law establishes that the label must provide the following: <ul style="list-style-type: none"> a. brand name b. net weight or volume c. content description d. name of the manufacturer e. contact information of the manufacturer f. country of origin g. name of the importer h. contact information of importer i. manufacturing date j. expiration date k. safety instructions l. storage instructions m. registration number 	<p>A score of 1 if 10 or more label requirements are included in the label</p> <p>A score of 0.5 if between 5 and 9 label requirements are included in the label</p> <p>A score of 0 if less than 5 label requirements are included in the label or if no label is required</p>
			4. If the fertilizer law prohibits the sale of mislabeled fertilizer bags	A score of 1 if yes
			5. If the law establishes a penalty for the sale of mislabeled fertilizer	A score of 1 if yes
			6. If the fertilizer law prohibits the sale of fertilizer products from opened bags or containers	A score of 1 if yes
			7. If the law establishes a penalty for the sale of fertilizer products from opened bags or containers	A score of 1 if yes



Table B.3 | Scoring methodology for machinery indicators

INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
TRACTOR IMPORTS	Tractor imports	This indicator examines the private machinery sector's ability to import agricultural tractors, importer registration and renewal requirements, and import permit requirements.	1. Companies are not required to register as importers of agricultural tractors. If the registration is required, the validity is indefinite or greater than 10 years	A score of 1 if companies are not required to register as importers A score of 0.5 if the registration is required but the validity is indefinite or greater than or equal to 10 years A score of 0 if the registration is required and the validity is less than 10 years
			2. If registration is required and limited to a certain number of years, the registration is automatically renewed	A score of 1 if the registration is not required or the registration is automatically renewed A score of 0 if registration renewal is required
			3. An import permit is not required to import agricultural tractors. If a permit is required, the cost is less than 25% of income per capita	A score of 1 if import permit is not required A score of 0.5 if the import permit is required and the cost is smaller or equal to 25% of income per capita A score of 0 if the import permit is required and the cost is greater than 25% of income per capita
			4. If an import permit is required, it is a blank import permit without volume or other restrictions	A score of 1 if the permit is a blank permit, or if the import permit is not required A score of 0 if the import permit is required for each tractor shipment or the permit is limited to a certain number of tractors annually
			5. If an import permit is required, it is valid for a period of at least 12 months	A score of 1 if the import permit has unlimited validity or if the import permit is not required A score of 0.5 if the permit has a validity of 12 months or longer A score of 0 if the permit has a validity of less than 12 months
TRACTOR OPERATIONS	Tractor operations (legal)	This indicator evaluates the requirement of tractor registration, roadworthiness inspections of in-use tractors, and provision of after-market parts and services.	1. According to the law, tractors must be registered once imported if they will be used on public roads	A score of 1 if registration is required for use on public roads only A score of 0.5 if registration is required for all usage A score of 0 if registration is not required
			2. According to the law, in-use tractors have to be inspected for roadworthiness/road-fitness and if the cost of inspection is affordable	A score of 1 if the roadworthiness inspection is required and the cost is less than or equal to 2% of income per capita A score of 0.5 if the roadworthiness-inspection is required and the cost is greater than 2% of income per capita A score of 0 if the roadworthiness-inspection is not required or it is not done in practice
			3. The roadworthiness inspection is required for all types of tractors	A score of 1 if inspection is required for all types of tractors A score of 0.5 if inspection is required for specific types of tractors A score of 0 if no inspection is required
			4. If the roadworthiness inspection is required, the results are valid for more than two years but less than four years	A score of 1 if yes A score of 0.5 if renewal is required and the period between roadworthiness tests is less than two years or greater than four years A score of 0 if renewal is not required
			5. Tractor dealers must provide tractor after-market service and parts	A score of 1 if both tractor after-market service and parts must be provided A score of 0.5 if either tractor after-market service or parts must be provided A score 0 if neither tractor after-market nor parts must be provided
	Tractor registration in practice (efficiency)	Building on the legal indicator with regards to tractor registration, this indicator measures the time and the cost required to register a tractor.	1. Total time to register a tractor	Total time required for all legally mandated procedures is aggregated and presented in calendar days A score of 0 if there is no requirement to register or if the registration is not done in practice
			2. Total cost to register a tractor	Total cost for all legally mandated procedures is aggregated and presented in % of income per capita A score of 0 if there is no requirement to register or if the registration is not done in practice



INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED		
TRACTOR TESTING AND STANDARDS	Tractor testing and standards (legal)	This indicator examines national and international tractor standards, the legal framework applicable to testing and the type of approval of tractors, and safety standards.	1. National and/or international tractor standards are used in the country	<p>A score of 1 if international standards are used</p> <p>A score of 0.5 if national standards are used</p> <p>A score of 0 if no standards are used</p>		
			2. If national and/or international tractor standards are used in the country, the following standards are included: <ul style="list-style-type: none"> > operator safety standards > tractor performance standards > engine emission standards 	<p>A score of 0.33 is assigned to each of the standards that is included.</p> <p>A score of 0 if none of the three standards are used or there are not national and/or international standards used in the country</p>		
			3. Tractors are required to obtain the type approval before they can be marketed in the country	<p>A score of 1 if yes</p> <p>A score of 0 if no</p>		
			4. To obtain the type approval, the following procedures are required: <ul style="list-style-type: none"> > tractor testing in a test laboratory > the issuance of the test report > the publication of the test report 	<p>A score of 0.33 is assigned to each requirement</p> <p>A score of 0 if the type approval is not required or it is not done in practice</p>		
			5. The country recognizes the tractor type approvals issued by authorities in other countries	<p>A score of 1 if yes</p> <p>A score of 0 if no</p>		
			6. The country recognizes tractor test reports by the tractor manufacturer for the issuance of the type approval	<p>A score of 1 if yes</p> <p>A score of 0 if no</p>		
			7. The type approval has unlimited validity provided that the specifications of the tractor do not change	<p>A score of 1 if yes</p> <p>A score of 0.5 if limited to five or more years</p> <p>A score of 0 if less than five years or the type approval is not required</p>		
			8. The national regulations/standards require tractors to be equipped with protective structures, such as roll-over protection (ROPS) structures or falling object protection (FOPS) structures, and seatbelts	<p>A score of 1 if ROPS or FOPS are required in combination with seatbelts</p> <p>A score of 0.33 if neither ROPS or FOPS nor seatbelts are required</p> <p>A score of 0 if ROPS or FOPS are required and seatbelts are not required</p> <p>A score of 0 if seatbelts are required and ROPS or FOPS are not required</p>		
			Tractor testing in practice (efficiency)	Building on the legal indicator with regards to tractor testing and the type approval, this indicator measures the time and the cost required to test an agricultural tractor and obtain a tractor type approval.	1. Time to obtain the tractor type approval	<p>Total time for all legally mandated procedures to obtain the type approval is aggregated and presented in calendar days</p> <p>A score of 0 if there is no requirement to obtain type approval or if the tractor type approval is not done in practice</p>
					2. Cost to obtain the tractor type approval	<p>Total cost for all legally mandated procedures to obtain the type approval in % of income per capita</p> <p>A score of 0 if there is no requirement to obtain type approval or if the tractor type approval is not done in practice</p>



Table B.4 | Scoring methodology for finance indicators

INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
NON-BANK LENDING INSTITUTIONS	Operation and prudential regulation of MFIs (operations) ^a	This indicator measures the regulatory framework for deposit-taking MFIs.	<ol style="list-style-type: none"> 1. The country allows and regulates deposit-taking MFIs 2. There is a minimum capital requirement to establish an MFI 3. The regulated minimum capital adequacy ratio for MFIs is at least equal to, or no more than 2 percentage points higher, than the capital adequacy ratio for commercial banks^b 4. Loan sizes of MFIs are: not limited to a specific amount; or are greater than 10 times the gross national income (GNI) per capita if there is a specific amount; or are a percentage of capital, equity or deposits^c 5. MFIs must disclose the effective interest rate or a proxy to loan applicants 6. MFIs are required to fully provision a delinquent, unsecured loan after the same number of days required for commercial banks, or within half the number of days required for commercial banks 7. MFIs are required to subscribe to a deposit insurance system 	A score of 1 if yes for each question
	Operation and governance of financial cooperatives (operations)	This indicator measures the regulatory framework for financial cooperatives.	<ol style="list-style-type: none"> 1. There is a law regulating financial cooperatives, or there is a specific section of a general cooperatives law that regulates the governance and operation of financial cooperatives 2. There is a minimum capital requirement to establish a financial cooperative 3. A minimum number of members is required to establish a financial cooperative 4. Ratios are defined in the law to ensure the financial stability of financial cooperatives 5. Financial cooperatives must disclose the effective interest rate or a proxy to loan applicants 6. Financial cooperatives must subscribe to a mandatory deposit insurance system 7. Two or more financial cooperatives may merge or amalgamate into a new financial cooperative 	A score of 1 if yes for each question
BRANCHLESS BANKING	Agent banking (operations) ^d	This indicator measures the entry and operational requirements for agent banking.	1. There exists a legal framework to regulate agent banking activities	A score of 1 if yes
			2. Whether there are minimum standards to qualify and operate as an agent in the following areas: 1) can either be an operating/established business or an individual; 2) has to have financial soundness; 3) has no criminal record; 4) has to have real-time connectivity to a commercial bank; and 5) location	A score of 0.2 for each standard
			3. Agents can enter into both exclusive and non-exclusive contracts with financial institutions	A score of 1 if yes A score of 0.5 if only non-exclusive contracts are allowed A score of 0 is assigned if only exclusive contracts are allowed
			4. The types of services that agents can offer on behalf of a bank includes: <ol style="list-style-type: none"> a. cash deposits; b. cash withdrawals; c. transfer of funds to other customers' accounts; d. bill payments; e. balance inquiry; f. opening a deposit account; g. collection/processing of loan application documents; h. know your customer (KYC) and customer due diligence (CDD) procedures 	A score of 0.125 for each service that can be offered
			5. Commercial banks are liable for the acts of commission and omission of agents providing financial services on their behalf	A score of 1 if yes

(continued)



INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
Electronic money (e-money) (operations)		This indicator measures the legal framework for e-money, in particular, the entry and operational requirements for non-financial institution e-money issuers.	1. E-money is defined and regulated	A score of 1 if yes for each question
			2. Non-financial institution businesses are allowed to issue e-money	
			3. Non-financial institution e-money issuers are required to keep customer's funds safeguarded and deposited in a trust at a fully prudentially regulated financial institution under which funds are held on behalf of clients	
			4. There are four requirements for non-financial institution businesses to receive a license to issue e-money: <ul style="list-style-type: none"> a. an initial capital requirement; for the initial capital requirement, countries are divided into four groups (1, 2/3, 1/3 and 0) based on the country's capital requirement as a multiple of its income per capita 	A score of "1*1/4" if the capital requirement is less than 101 times the GNI per capita, but greater than 0 A score of "2/3*1/4" if the minimum capital is equal to or greater than 101 times the income per capita, but less than 501 A score of "1/3*1/4" if the minimum capital is equal to or greater than 501 times the income per capita, but less than 901 A score of 0 if the minimum capital requirement is equal to or greater than 901 times the income per capita or if there are no provisions on the minimum capital requirement
			<ul style="list-style-type: none"> b. interoperability with other existing electronic money payment/transfer systems c. existence of internal control mechanisms to comply with Anti-Money Laundering and Combatting Financing of Terrorism (AML/CFT) laws, standards and measures d. consumer protection measures such as consumer recourse mechanisms, consumer awareness programs, and so on 	A score of 1/4 if the law states the requirement and 0 if it does not

(continued)

- a Countries with a high level of financial inclusion are not measured under the operation and prudential regulation for MFIs sub-indicator.
- b The methodology adopts the Basel Committee recommendation in "Microfinance activities and the Core Principles for Effective Banking Supervision" and the International Development Bank's Jansson et al. (2004) "Principles and Practices for Regulating and Supervising Microfinance" report in establishing a CAR that falls within 2-3 percentage point of commercial banks or in the range of 10% to 15%.
- c In some countries, the maximum loan an MFI can extend is limited to a percentage of deposits or a percentage of core capital. This language is included in risk management regulations, intended to limit the exposure of the institution to a single borrower. For countries with this type of loan limitation, *EBA 2017* considers it "no limit" because the currency value corresponding to that percentage is so high as to present no effective limit to borrowers.
- d Countries with high level of financial inclusion are not measured under the agent banking sub-indicator.





INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
MOVABLE COLLATERAL	Warehouse receipts (operations)	This indicator measures the regulatory framework facilitating the use of agricultural commodities as collateral.	<ol style="list-style-type: none"> 1. There is a law regulating the operation of warehouse receipts or the regulation of warehouse receipts is included in other general legislation 2. Warehouse operators are required to file a bond with the regulator, pay into an indemnity fund to secure performance by him of his obligations as a warehouse operator, or are required to insure the warehouse or the stored goods against fire, earthquakes, theft, burglary or other damage 3. Warehouse receipts are negotiable 	A score of 1 if yes for each question
			<ol style="list-style-type: none"> 4. The types of warehouse receipts that are legally valid: paper-based, electronic or both 	<p>A score of 1 is assigned if the law allows both paper-based and electronic warehouse receipts, and if electronic warehouse receipts are explicitly mentioned in the regulation</p> <p>A score of 0.5 is assigned if the law allows only paper-based receipts</p> <p>A score of 0 is assigned if warehouse receipt is not recognized or used</p>
			<ol style="list-style-type: none"> 5. Information that must be listed on a warehouse receipt for it to be valid. There are four details measured, namely: <ul style="list-style-type: none"> > date of issuance or serial number > location of storage > description of goods in storage, (for example, type, quality and harvest) > information on security interest over the goods (for example, a certificate of pledge) 	A score of 0.25 for each piece of information that needs to be listed
	Doing Business–Getting Credit (operations) ^e	This indicator measures the legal rights of borrowers and lenders with respect to secured transactions and the reporting of credit information. A total of eight data points from the indicator’s sub-indices (five data points from the strength of legal rights sub-index and three data points from the credit information sub-index) are included.	<ol style="list-style-type: none"> 1. There is a legal framework for secured transactions that grant security interest in movable assets 2. The law allows businesses to grant a non-possessory security right in a single category of movable assets without requiring a specific description of collateral 3. The law allows businesses to grant a non-possessory security right in substantially all of its assets, without requiring a specific description of collateral 4. Security rights are granted to future or after-acquired assets, and they extend automatically to the products, proceeds or replacements of the original assets 5. Existence of a collateral registry for movable assets in operation for both incorporated and non-incorporated entities, that is unified geographically and by asset type, with an electronic database indexed by debtor’s name 6. The credit information is distributed from retailers or utility companies—in addition to data from banks and financial institutions 7. Credit information includes data on loan amounts below 1% of income per capita 8. There is a legal framework that allows borrowers to access their data in the credit bureau or credit registry 	A score of 1 if yes for each question

e Doing Business–Getting Credit data are used as secondary data.

Table B.5 | Scoring methodology for markets indicators

INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
AGRICULTURAL TRADE	Agricultural trade (legal)	This indicator measures regulatory requirements applicable to the domestic trade and export of agricultural products.	1. There are no price controls in the sector of the selected product (explicit price control regulations are considered, including those that apply only to government purchases. Recommended prices are not included)	A score of 1 if price controls do not exist A score of 0 if price controls exist
			2. Sales and purchases of the selected product do not have to occur at an auction or a fixed (electronic or physical) marketplace	A score of 1 if sales and purchases do not have to occur at an auction or a fixed market A score of 0 if sales and purchases have to occur at an auction or a fixed market
			3. Traders do not have to obtain a trader-level license to buy/sell the selected product or agricultural products more generally in the domestic market	A score of 1 if the license is not required A score of 0 if the license is required
			4. Exporters do not have to be a member of a specific association or organization to obtain the right to export the selected product or agricultural products more generally	A score of 1 if membership is not required A score of 0 if the membership is required
			5. Exporters do not have to obtain a trader-level export license to export the selected product or agricultural products more generally to the selected trading partner	A score of 1 if the license is not required A score of 0 if the license is required
			6. Phytosanitary certificate applications may be submitted electronically	A score of 1 if yes
			7. Phytosanitary certificates may be generated, issued and sent in an electronic form (for example, an ePhyto system is in place)	A score of 1 if yes
			8. Phytosanitary certificates may be issued on-site where the selected product is produced, processed, packaged, stored and so on	A score of 1 if yes
			9. The official fee schedule for the phytosanitary certificate is publicly available	A score of 0.5 is assigned to each of the following: <ul style="list-style-type: none"> > The official fee schedule is available on a government website. > The official fee schedule is available in legislation.
			Agricultural trade (time and motion)	This indicator measures the number, time and cost of agriculture- and product-specific documents to export agricultural products.
11. Total time to obtain the mandatory documents required to export the selected product to the selected trading partner	Total time required to obtain the mandatory, agriculture-specific documents is aggregated and presented in calendar days			
12. Total cost to obtain the mandatory documents required to export the selected product to the selected trading partner	Total cost required to obtain the mandatory, agriculture-specific documents is aggregated and presented in % income per capita			

(continued)



INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
PLANT PROTECTION		This indicator examines the strength of the domestic plant protection framework by considering the legal obligations applicable to domestic pest management.	1. A specific government agency or unit is designated by law to conduct pest surveillance on plants	A score of 1 if yes
			2. The government or national plant protection agency maintains a list of regulated quarantine pests	A score of 1 if yes
			3. The list of regulated quarantine pests is publicly available on a relevant government website and uploaded to the IPPC website	A score of 0.5 is assigned to each of the following: <ul style="list-style-type: none"> > The list of regulated quarantine pests is uploaded to the IPPC website. > The list of regulated quarantine pests is made available on a relevant government website.
			4. A pest database that contains details on the pests present in the country is available on a government website and contains the following features: <ul style="list-style-type: none"> a. pictures b. host information c. current status d. potential treatment methods 	A score of 0.25 is assigned to each of the features available in the pest database
			5. Land owners/users are obligated to report pest outbreaks to the government, and penalties are in place for non-compliance	A score of 1 if yes A score of 0.5 if land owners/users are obligated to report pest outbreaks to the government, but there are no penalties for noncompliance A score of 0 if land owners/users are not obligated to report pest outbreaks to the government
			6. A specific government agency or unit is designated by law to conduct pest risk analysis (PRA) for imports of plant products	A score of 1 if yes
			7. The PRA reports are publicly available online	A score of 1 if yes
			8. Phytosanitary inspections on imports of plant products may be carried out on a risk basis	A score of 1 if yes

(continued)



INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
PRODUCER ORGANIZATIONS		This indicator measures the laws applicable to the creation of producer organizations, their growth, efficiency and inclusiveness.	1. There is no minimum capital requirement to establish a producer organization	<p>A score of 1 if there is no minimum capital requirement</p> <p>A score of 0.5 if the minimum capital requirement is equal to or less than 1 time the income per capita</p> <p>A score of 0 if the minimum capital requirement is greater than 1 time the income per capita</p>
			2. Foreign natural persons may be members of a producer organization	A score of 1 if foreign natural persons are explicitly allowed to be members or if there is no prohibition on their membership (for example, the law is silent)
			3. Domestic and foreign legal persons may be members of a producer organization	<p>A score of 1 if both domestic and foreign legal persons may be members</p> <p>A score of 0.8 if all domestic legal persons are allowed to be members but foreign legal persons are prohibited</p> <p>A score of 0.6 if only certain domestic legal persons are allowed to be members and foreign legal persons are not prohibited</p> <p>A score of 0.4 if only certain domestic legal persons are allowed to be members and foreign legal persons are prohibited</p> <p>A score of 0 if legal persons are not allowed to be members</p>
			4. The government may not own shares in a producer organization	A score of 1 if government shares in a producer organization is prohibited
			5. There is no cap on the dividends paid on member shares	A score of 1 if there is no cap on dividends
			6. Profits may be distributed in the form of shares	A score of 1 if yes.
			7. Nonmembers may own shares in a producer organization and there is no cap on dividends	<p>A score of 1 if nonmember shares are allowed and there is no cap on dividends</p> <p>A score of 0.8 if nonmember shares are allowed and there is a cap on dividends</p> <p>A score of 0 if nonmember shares are not allowed or if the law is silent on the issue of nonmember participation</p>
			8. An application to register a producer organization must be reviewed and decided upon within an explicit time limit set out in the law	<p>A score of 1 if there is a time limit and it is equal to or less than 10 days</p> <p>A score of 0.75 if there is a time limit and it is equal to or less than 30 days</p> <p>A score of 0.5 if there is a time limit and it is equal to or less than 60 days</p> <p>A score of 0.25 if there is a time limit and it is more than 60 days</p> <p>A score of 0 if there is no time limit</p>
			9. The designated regulating authority must explain its reasons for rejecting an application to establish a producer organization	A score of 1 if yes
			10. The open membership principle applies to producer organizations	A score of 1 if yes

(continued)





INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
PRODUCER ORGANIZATIONS (continued)			11. Women's membership in a producer organization is not restricted by any additional requirements, such as: <ol style="list-style-type: none"> a. legal ownership over land b. only one member per household c. a married woman has to receive her husband's authorization before joining a producer organization d. other legal restrictions that might apply to female members and limit their participation in producer organizations 	A score of 1 if none of the listed restrictions exist A score of 0 if any of the listed restrictions exist
			12. A quota or other mechanism is established by law to promote women in producer organizations, such as: <ol style="list-style-type: none"> a. a gender quota for the board of directors of producer organizations b. a gender quota for the supervisory committee of producer organizations c. other gender-related quotas or mechanisms applicable to producer organizations 	A score of 1 if any of the listed quotas exist
			13. The constitution and the law on producer organizations contain provisions on non-discrimination and both mention gender as a specifically protected category ^f	This question is scored in two parts: For the constitution: A score of 0.5 if the constitution contains a clause on nondiscrimination and it mentions gender A score of 0.3 if the constitution contains a clause on nondiscrimination, but it does not mention gender A score of 0 if the constitution does not contain a clause on nondiscrimination For the law on producer organizations: A score of 0.5 if the law requires producer organizations to comply with the principle of nondiscrimination and it mentions gender A score of 0.3 if the law requires producer organizations to comply with the principle of nondiscrimination, but it does not mention gender A score of 0 if the law does not require producer organizations to comply with the principle of nondiscrimination

f The 2016 data of Women, Business and the Law – Accessing Institutions are used as secondary data. The specific data points included: (1) whether the constitution contains a clause on nondiscrimination or not; and (2) if it exists in the constitution, whether the nondiscrimination clause mentions gender or not.

Table B.6 | Scoring methodology for transport indicators

INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
TRUCK LICENSING	Truck licensing (legal)	This indicator measures the regulatory and normative framework and associated efficiency to access and operate domestically within the road freight transport service market. Overall, the indicators determine the extent to which legal foundations provide for a clear, transparent and efficient system for accessing the market, guarantee a level playing field for competition, and dedicate special legal provisions for transporting agriculture and food products.	1. Type of license legally required to transport goods commercially in the domestic market: <ul style="list-style-type: none"> a. License at the company level b. License at the truck level c. Both at the company and truck level licenses d. No license required 	<p>A score of 1 if only the company-level license is required</p> <p>A score of 0.5 if both company-level and truck-level licenses are required or only the truck license is required</p> <p>A score of 0 if no license is required</p>
			2. Validity of the relevant domestic license(s) is at least five years <i>Note: If the country does not require a domestic license, the score of this question will read "N/A" (not applicable)</i>	<p>A score of 1 if yes</p> <p>A score of 0 if the validity is less than five years or N/A</p> <p><i>Note: If a country has "both" licenses, a score of 1 if both licenses have a validity of at least five years, and a score of zero if otherwise</i></p>
			3. Citizenship requirements do not apply to obtain a license (foreign nationals or businesses are allowed to obtain the relevant licenses) <i>Note: If the country does not require a domestic license, the score of this question will read "N/A"</i>	<p>A score of 1 if yes</p> <p>A score of 0 if no or N/A</p>
			4. The law does not establish any of the following additional requirements to obtain a license: <ul style="list-style-type: none"> a. Maximum number of trucks covered under the license b. Maximum transported tonnage c. Geographical operational limitations d. Minimum number of trucks under the license e. Licenses are only issued to members of a truckers' association or professional body f. Licenses cannot be issued to women g. Obtain government registry or notification certificate <i>Note: If the country does not require a domestic license, the score of this question will read "N/A."</i>	<p>A score of 1 if no additional requirements</p> <p>A score of 0 if any additional requirement or "N/A"</p>
			5. Documents required by law when transporting goods by road domestically include: <ul style="list-style-type: none"> a. Written contract describing the conditions of carriage, including carrier's liability for loss, damage or delay b. Consignment note, packing list, bill of lading, waybill, commercial invoice or any other official document describing the goods shipped, their origin and destination 	<p>A score of 1 if documents listed under both (a) and (b) are required</p> <p>A score of 0.5 if yes only to either (a) or (b)</p> <p>A score of 0 if no documents are required by law when transporting</p>
			6. The law establishes specific regulations related to the transport of perishable agriculture products or foodstuffs, or related to the reference product	<p>A score of 1 if yes</p> <p>A score of 0 if no</p>
			7. The law considers the following aspects as part of regulations for the transport of agri-food products: <ul style="list-style-type: none"> a. Special conditions related to covering/roofing and flooring/insulation to protect loads from external and internal contaminants b. Vehicle cooling, refrigeration or controlled-temperature aspects c. Prohibition of co-mingling of certain items d. Specific packaging, sealing and stowage conditions for the goods transported e. Loading and unloading specific procedures f. Mandatory cleaning and disinfection protocols and routines of truck container <i>Note: If the country has no specific regulations for agricultural or food products, the score of this question will read "N/A"</i>	<p>A score of 0.166 for each aspect regulated</p> <p>A score of 0 for each aspect not regulated</p> <p>A score of 0 if "N/A"</p>

(continued)

INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
TRUCK LICENSING (continued)			8. There is a public registry of licensed transport operators <i>Note: If the country does not require a domestic license, the score of this question will read "N/A"</i>	A score of 1 if the registry is available online or by other means (official gazette, phone, certified agent, billboards at public authority, and so on) A score of 0 if no or "N/A"
			9. Public availability of requirements that companies must fulfill to obtain or renew a road transport license <i>Note: If the country does not require a domestic license, the score of this question will read "N/A"</i>	A score of 1 if the requirements are published on a government website or available by other means (official gazette, phone, certified agent, billboards at public authority, and so on) A score of 0 if no or "N/A"
			10. The application or renewal for a license can be submitted electronically <i>Note: If the country does not require a domestic license, the score of this question will read "N/A"</i>	A score of 1 if yes A score of 0 if no or "N/A"
			11. Freight is allocated through direct contracting between a producer or trader and a trucking service provider	A score of 1 if yes
Truck licensing (time and cost)		This indicator measures the procedural efficiency (time and cost required) of the licensing systems in place in a country, as perceived by the relevant road transport operators.	12. Total time required to obtain a domestic license	Total time required to obtain the relevant license is presented in calendar days A score of 0 if there is no license required <i>Note: If "both" licenses are required, their times and costs are aggregated.</i>
			13. Total cost required to obtain a domestic license <i>Note: If the country does not require a domestic license, the score of this question will read "N/A"</i>	Total cost to obtain the relevant license is presented in % of income per capita A score of 0 if there is no license required <i>Note: If "both" licenses are required, their times and costs are aggregated.</i>

(continued)



INDICATOR	SUB-INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
CROSS-BORDER TRANSPORTATION	Cross-border transport license (legal)	This indicator measures the completeness of the legal and regulatory framework governing cross-border transport between a given country and its largest trading partner. Overall the indicators aim to assess whether a country's national regulatory environment encourages cross-border transport.	1. Transport rights are granted to foreign transport companies or trucks registered in the trading partner	A score of 1 if yes A score of 0 if no
			2. Backhauling rights are granted to foreign transport companies or trucks registered in the trading partner	A score of 1 if yes A score of 0 if no
			3. Triangular rights are granted to foreign transport companies or trucks registered in the trading partner	A score of 1 if yes A score of 0 if no
			4. Transit rights are granted to foreign transport companies or trucks registered in the trading partner	A score of 1 if yes A score of 0 if no
			5. Cabotage rights are granted to foreign transport companies or trucks registered in the trading partner	A score of 1 if yes A score of 0 if no
			6. Transport rights are not specific to certain transit routes or corridors.	A score of 1 if transit rights are not specific A score of 0 if transit rights are specific
			7. A cross-border license is required for foreign trucks to operate in your country.	A score of 1 if yes A score of 0 if no
			8. The validity of the cross-border license required when operating in trading partner is at least five years. <i>Note: If the country does not require a cross border license, the score of this question will read "N/A."</i>	A score of 1 if yes A score of 0 if the validity is less than five years, N/A, or if the license constitute a "single-entry" permit
			9. The law does not establish an official limit or quota on the number of cross-border licenses granted. <i>Note: If the country does not require a cross-border license, the score of this question will read "N/A."</i>	A score of 1 if yes A score of 0 if no or "N/A"
Cross-border licensing (time and cost)	This indicator measures the procedural efficiency (time and cost required) of the licensing systems in place in a country, as perceived by the relevant road transport operators. This license refers to trucks going from the home country to the largest trading partner.	10. Total time required to obtain a cross-border license	Total time required to obtain the cross border license is presented in calendar days A score of 0 if there is no license required or if licensing does not apply in practice <i>Note: If the country is considered an "island country",^a this question is not taken into account for the final score.</i>	
			11. Total cost required to obtain the cross-border license in income per capita	Total cost required to obtain the cross-border license is presented in % of income per capita A score of 0 if there is no license required or if the licensing is not applied in practice <i>Note: If the country is considered an "island country",^a this question is not taken into account for the final score.</i>

Note: The truck licensing indicator refers exclusively to domestic operations. In contrast, the cross-border transport indicator refers to transport operations undertaken between a given country and its largest neighboring agricultural trading partner.

^a "Island countries" include Korea, the Philippines and Sri Lanka.



Table B.7 | Scoring methodology for water indicators

INDICATOR	DESCRIPTION	WHAT IS MEASURED?	HOW IT IS SCORED
INTEGRATED WATER RESOURCES MANAGEMENT	This indicator measures legal mandates to undertake the core activities and features that comprise modern water management, including the establishment of basin-level institutions, water planning, the development of information systems, and source protection.	1. The establishment of basin institutions is provided for in the law.	A score of 1 if yes
		2. Number of basin institutions existing	A score of 1 if at least one basin institution exists
		3. A specific government agency or unit is designated by law to manage groundwater	A score of 1 if yes
		4. Basin institutions have the following remits: a. special purpose government b. advisory c. stakeholder consensus	A score of 1 if the law provides for all of the listed remits A score of 0.5 if the law provides for at least one of the listed remits A score of 0 if the law provides for none of the listed remits
		5. The internal organizational structure for basin institutions is set out in the law	A score of 1 if yes
		6. Water users must be represented in basin institutions	
		7. A national water plan is required	
		8. Individual basin plans are required	
		9. The following specific components must be included in basin plans: a. resource description and categorization b. uses c. pollution sources d. protected areas e. drought/ flood plan f. economic analysis g. long-term objectives	A score of 1 if the legal framework requires all of the listed components A score of 0.5 if at least three of the listed components are required A score of 0 if none of the listed components are required
		10. Water users must be consulted during the development of basin plans	A score of 1 if yes
		11. Basin plans must be periodically updated in accordance with a mandatory timeline provided for in the law	
		12. Number of basin plans completed	A score of 1 if at least one plan has been completed
		13. An order of priority for water allocation between different types of users is required	A score of 1 if yes
		14. A water resources monitoring plan is required, including the following components: a. criteria for monitoring locations b. criteria for monitoring frequency c. monitoring objectives d. reference test/ measurement methods	A score of 1 if the legal framework requires the development of a water resources monitoring plan and provides for each of the listed components: A score of 0.5 if the legal framework requires the development of a water resources monitoring plan and provides two of the listed components A score of 0 if the legal framework does not require the development of a water resources monitoring plan
		15. Monitoring plans must be periodically updated in accordance with a mandatory timeline provided for in the law	A score of 1 if yes
		16. Public monitoring of water resources quantity and quality is required	A score of 1 if the legal framework requires monitoring both water resources quantity and quality A score of 0.5 if the legal framework requires monitoring of only one aspect or the other (quality or quantity) A score of 0 if the legal framework does not require monitoring of water resources

(continued)



INDICATOR	DESCRIPTION	WHAT IS MEASURED?	HOW IT IS SCORED
INTEGRATED WATER RESOURCES MANAGEMENT <i>(continued)</i>		17. There is a legal obligation to make monitoring results publicly available 18. Monitoring results are publicly available in practice (online) 19. There is a legal obligation to create an inventory of water resources 20. The inventory of water resources must be periodically updated in accordance with a mandatory timeline provided for in the law 21. There is a legal obligation to make water inventory data publicly available 22. Water inventory data are publicly available in practice (online) 23. There is a legal obligation to create a registry of water users 24. There is a legal obligation to make the water users registry publicly available 25. The water users registry is publicly available in practice (online) 26. Special measures may be imposed in cases of water stress	A score of 1 if yes for each question
		27. The following special measures may be imposed in cases of water stress: <ul style="list-style-type: none"> a. restricted issuance of new water use permits b. curtailment of existing water use permits c. restricted issuance of new construction / activity permits with impacts on water resources 	A score of 1 if all of the listed measures may be imposed by the government A score of 0.5 if at least one of the listed measures may be imposed by the government A score of 0 if none of the listed measures may be imposed by the government
		28. Water conservation and efficiency are promoted through the following features in the law: <ul style="list-style-type: none"> a. mandate for the government to promote conservation and efficiency b. incentives c. obligation to adopt improved water use practices d. promotion of less water-intensive crops e. obligation to implement a mechanism to quantify efficiency 	A score of 1 if the legal framework promotes water conservation and efficiency and provides all of the features listed. A score of 0.5 if the legal framework provides at least two of the listed features A score of 0 if the legal framework does not promote water conservation and efficiency
		29. Water quality standards for use in irrigation are set out in the law and include the following parameters: <ul style="list-style-type: none"> a. coliforms b. salinity c. nitrates d. phosphates 	A score of 1 if the legal framework prescribes all the listed water standards for use in irrigation A score of 0.5 if the legal framework includes at least two of the listed parameters A score of 0 if the legal framework does not prescribe water quality standards for use in irrigation

(continued)



INDICATOR

DESCRIPTION

WHAT IS MEASURED?

HOW IT IS SCORED

**INDIVIDUAL
WATER USE
FOR
IRRIGATION**

This indicator measures legal requirements for water abstraction and use permits, as well as the depth and quality of these permit requirements by examining public notice requirements, transfers, water use charges, and obligations and enforcement.

30. A permit or declaration before abstracting and using water for irrigation is required	A score of 1 if a permit is required A score of 0.5 if only a declaration is required A score of 0 if neither are required
31. Permit issuance must comply with an applicable basin plan	A score of 1 if yes for each question
32. Detailed procedures to acquire a new abstraction and use permit are set out in the law	
33. There is a public notice obligation for new permit applications	
34. A minimum time length applies to public notice	
35. Public notice for new permit applications must be via a specific medium (for example, a newspaper, government website, billboard and so on)	
36. Water abstraction and use permits are subject to a maximum time duration set out in the law	
37. Legal framework specifies streamlined renewal procedures	
38. Legal framework allows permit transfer	
39. Notification or approval by the government is required before a permit can be transferred	A score of 1 if notification is required A score of 0.5 if approval is required A score of 0 if neither notification nor approval is required
40. Detailed procedures for permit transfer are set out in the law	A score of 1 if yes
41. Charges apply based on the amount of water resources abstracted for irrigation	
42. A specific government agency or unit is designated by law to set charges for water abstraction	
43. A method for calculating the water abstraction charge is provided in the law	
44. A specific government agency or unit is designated by law to collect charges for water abstraction	A score of 1 if the legal framework specifies all of the listed conditions. A score of 0.5 if only three of the listed conditions are specified A score of 0 if none of the listed conditions are specified
45. Standard permit conditions include the following: a. volume/rate of withdrawal b. place of abstraction c. place of use d. purpose of use e. return flows f. quality of returned water	
46. Record keeping on the quantity of water abstracted is required	
47. The government has certain inspection powers to ensure permit compliance, including: a. demand users to produce relevant documentation b. enter premises c. take measurements	
48. Specific offenses in violation of permit-related obligations are prescribed in the law, including: a. using water without a required permit or declaration b. failure to comply with permit conditions c. misrepresenting or omitting information to regulators d. hindering investigators or disabling monitoring equipment e. constructing water abstraction points without permission	
49. Before it can curtail permits, the government is required to make a formal declaration of drought or emergency	



Table B.8 | Scoring methodology for ICT indicator

INDICATOR	DESCRIPTION	WHAT IS MEASURED	HOW IT IS SCORED
ICT	These data measure countries' ICT licensing framework, validity and transparency of associated costs. The data also cover spectrum management and infrastructure sharing.	1. Operators offering core mobile services do not require a license to operate or a simple notification to the regulatory agency is allowed	A score of 1 if a simple notification is required or an operating license is not required A score of 0 if an individual license is necessary to operate
		2. The licensing framework for mobile operators offering core mobile services is technology and service neutral	A score of 1 if yes A score of 0.5 if technology or service neutral A score of 0 if neither technology nor service neutral
		3. The validity (in years) of the operating license for mobile operators offering core mobile services is equal to or greater than 15 years	A score of 1 if yes A score of 0 if no
		4. The operating license costs, including first-time fee and/or annual fees, if applicable, are publicly available	A score of 1 if available online or if license not required A score of 0.5 if available in hard copy A score of 0.25 if available upon individual written request A score of 0 if not publicly available
		5. The renewal conditions for operating and spectrum licenses for mobile operators offering core mobile services are stated in laws and/or regulations	A score of 1 if yes, for both operating and spectrum licenses A score of 0.5 if yes, for operating or spectrum licenses A score of 0 if neither operating nor spectrum licenses
		6. Digital dividend has been licensed in practice to mobile operators	A score of 1 if yes A score of 0 if no
		7. Low frequency spectrum (below 1 GHz [gigahertz]) has been licensed in practice to mobile operators	A score of 1 if yes A score of 0 if no
		8. Voluntary spectrum trading among operators is allowed by law	A score of 1 if yes A score of 0 if no
		9. Infrastructure sharing between mobile operators is legally allowed	A score of 1 if both passive and active infrastructure sharing A score of 0.75 if active infrastructure sharing A score of 0.5 if passive infrastructure sharing A score of 0 if neither passive nor active infrastructure sharing



APPENDIX C

Additional ways of presenting the data

This appendix highlights two additional ways of presenting certain components of the EBA dataset.

Good practices related to nondiscriminatory measures and access to information are included in EBA topic scores. For example, the private sector's eligibility to import fertilizer products is included in both the nondiscriminatory measures and the fertilizer topic score. Similarly, the existence of an online seed variety catalog is captured by both the access to information and the score of the seed topic.

Nondiscriminatory measures

The data on nondiscriminatory measures were collected across six EBA topics (table C.1). The total score of the 29 questions reflects the number of good practices related to nondiscrimination. These questions are also part of the corresponding topic and are scored based on the same methodology detailed in the data notes.

Access to information

The data on access to information were collected across seven EBA topics (table C.2). The total score of the 21 questions reflects the number of good practices related to access to information. These questions are also part of the corresponding topic and are scored based on the same methodology detailed in the data notes.



Table C.1 | Data on nondiscriminatory measures by topic

GOOD PRACTICES BY TOPIC	
SEED	Conditions to benefit from plant breeders' rights do not differ between national and foreign applicants
	Companies are legally allowed to produce breeder/pre-basic seed of local public varieties for use in the domestic market
	Companies are legally allowed to produce foundation/basic seed of local public varieties for use in the domestic market
	Companies are obtaining access to germplasm preserved in publically managed genebanks
	There are public research institutes in the country that license public varieties to companies for production and sale in the domestic market
	The composition of the legally mandated variety release committee (VRC) includes the private sector
	Private seed companies and/or third parties (nongovernmental institutions) are accredited in practice for the performance of certification activities
	The following seed certification activities can be performed by an accredited seed company/third party: (a) field inspection; (b) sampling; (c) lab testing; (d) labelling
FERTILIZER	Private entities are required to register new fertilizer products to sell them in the country
	Private entities are allowed to import fertilizer products into the country to sell them
	Private entities are allowed to distribute fertilizer products in the country
FINANCE	A minimum number of members is required to establish a financial cooperative
	There is a minimum capital requirement to establish a financial cooperative
	Nonfinancial institution businesses are allowed to issue e-money
MARKETS	There is no minimum capital requirement to establish a producer organization
	Foreign natural persons may be members of a producer organization
	Domestic and foreign legal persons may be members of a producer organization
	The open membership principle applies to producer organizations
	Women's membership in a producer organization is not restricted by any additional requirements
	A quota or other mechanism is established by law to promote women in producer organizations
	The constitution and the law on producer organizations contain provisions on nondiscrimination and both mention gender as a specifically protected category
TRANSPORT	Citizenship requirements do not apply to obtain a license (foreign nationals or businesses are allowed to obtain the relevant licenses)
	The law does not establish requirements regarding minimum number of trucks or gender to obtain a license
	Transport rights are granted to foreign transport companies or trucks registered in the trading partner
	Backhauling rights are granted to foreign transport companies or trucks registered in the trading partner
	Triangular rights are granted to foreign transport companies or trucks registered in the trading partner
	Transit rights are granted to foreign transport companies or trucks registered in the trading partner
	Cabotage rights are granted to foreign transport companies or trucks registered in the trading partner
WATER	Water users must be represented in basin institutions



Table C.2 | Data on access to information by topic

GOOD PRACTICES BY TOPIC	
SEED	A list of protected varieties is publicly available
	A catalog listing new registered varieties is publicly available online
	There is an official fee schedule for seed certification activities performed by the competent public authority
FERTILIZER	An official catalogue listing all registered fertilizer products in the country is publicly available online
FINANCE	Financial cooperatives must disclose the effective interest rate or a proxy to loan applicants
MARKETS	Phytosanitary certificate applications may be submitted electronically
	Phytosanitary certificates may be generated, issued and sent in an electronic form (for example, an ePhyto system is in place)
	The official fee schedule for the phytosanitary certificate is publicly available
	The list of regulated quarantine pests is publicly available on a relevant government website and uploaded to the IPPC website
	A pest database that contains details on the pests present in the country is available on a government website and contains features including pictures, host information, current status and potential treatment methods
	The pest risk analysis (PRA) reports are publicly available online
	The designated regulating authority must explain its reasons for rejecting an application to establish a producer organization
TRANSPORT	There is a public registry of licensed transport operators
	The application or renewal for a license can be submitted electronically
WATER	Water users must be consulted during the development of basin plans
	Monitoring results are publicly available in practice (online)
	Water inventory data are publicly available in practice (online)
	The water users registry is publicly available in practice (online)
	Public notice for new permit applications must be via a specific medium (for example, a newspaper, government website, billboard and so on)
	A method for calculating the water abstraction charge is provided in the law
ICT	The operating license costs, including first-time fee and/or annual fees (if applicable), are publicly available



APPENDIX D

Other research

Fertilizer

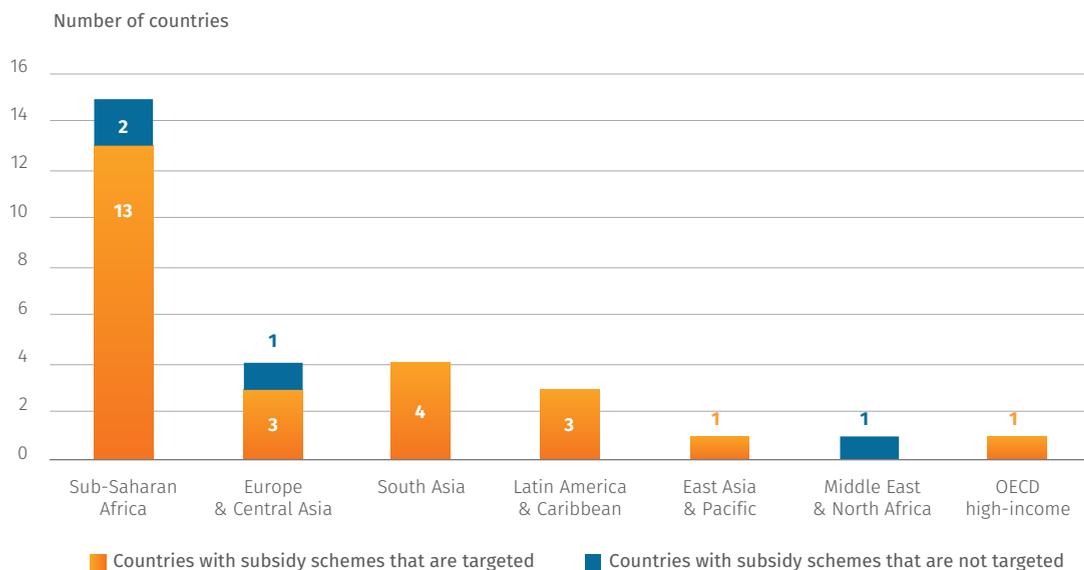
The fertilizer topic collected data on additional areas including competition, import and sale restrictions, subsidies and extension services. These areas were not scored since the evidence was anecdotal or no best practices could be identified to generate scores and trends at the global level.

Several questions were asked on competition issues, particularly if entities other than private companies are allowed or required to follow the same procedures as private companies to register, distribute or import fertilizer products. Evidence showed that in most instances the required procedures were uniform across countries for the private sector and other entities such as nongovernmental organizations (NGOs) and producer organizations/cooperatives. Different requirements existed only under special circumstances, most notably under subsidy programs, or where producer organizations were owned by the government and thus enjoyed the same privileges as the public sector.

Information on import and sale restrictions was also collected, including import bans on specific fertilizer types or products and country of origin. In addition, EBA looked at temporal import restrictions, company-level import quotas, restrictions on sales based on the type of products and geographical restrictions. In terms of specific fertilizer types or product restrictions, EBA found that most restrictions were based on health hazards that could be related to organic or bacterial content in the fertilizer product. EBA also found that some countries restrict fertilizers based on the country of origin and that subsidy programs often included specific conditions on imports. In general, no other restrictions were found in terms of products, geography or time of import.

Data were collected on subsidies, including the existence of subsidy schemes, subsidy targets (such as crops, products, farmer type or gender), subsidy administration models (reduced prices or vouchers) and timely duration of implementation (exit strategy). Although the data were not scored since there is no established best practice, EBA aims to contribute to

Figure D.1 | The majority of subsidy schemes are targeted and located in Sub-Saharan Africa



Source: EBA database.



Produce market in Guatemala. Photo: Maria Fleischmann / World Bank.

the overall policy discourse by disseminating the information collected thus far.

Twenty-eight out of 62 countries surveyed have a subsidy scheme in place, among which half are in Sub-Saharan Africa (figure D.1) The concentration of subsidy schemes in Sub-Saharan Africa is undoubtedly linked to the fact that countries in the region are among the lowest consumers of fertilizer overall.¹ As part of the debate on the effectiveness of subsidies, some countries are moving towards “smart” subsidies that have clear goals and targets.² Targeted fertilizer subsidy schemes often include more than one type of target. Of the 15 Sub-Saharan African countries, 12 target subsidies by crop and 11 target by specific type of fertilizer product. Ten of the countries also target the schemes based on the type of farmers, and four target based on the region. For example, in Malawi, subsidies target beneficiaries such as maize and tobacco farmers, and there is an exclusive poverty reduction objective through a program that focuses on smallholder farmers with food security issues. In Senegal, subsidies target small-scale family production of rice, maize, sorghum, millet, fonio, groundnuts, sesame, onion, tomato and watermelon.³

Machinery

Data were collected on additional areas that are critical to the machinery sector but that were ultimately not included in the topic scoring either because only anecdotal evidence was found, international best practices for these areas are not fully developed or government regulation is not always of direct relevance. Tractor hire and rental services, financing, taxes and duties on

tractors and spare parts were all investigated, but not included in the final score.

Tractor hiring and rental services are crucial aspects of agricultural mechanization, given that not all farmers have the resources to invest in agricultural machinery, nor the need given the small size of their plots. Renting and hiring services therefore become the most realistic option for many farmers. In the majority of cases, these services are provided by private machinery owners and public hiring services have been largely unsuccessful.⁴ The data collected show that most of the countries studied have some form of tractor hiring or rental services available, either offered by public operators, private companies or individual tractor owners. The services offered typically include plowing, harrowing, planting and harvesting, with plowing being the service that is available in most countries. Given that tractor hiring and renting is generally not regulated by government, this aspect of agricultural mechanization was excluded from the topic scoring.

Access to finance is another major impediment to improving agricultural productivity in developing countries. Most farmers cannot afford to buy a tractor without financial assistance and many banks are reluctant to finance agricultural businesses due to associated risks. EBA findings on available tractor financing mechanisms are largely perception based and therefore have not been included in the scored indicators for this year’s machinery topic. However, the data collected indicate that of the three categories of financial assistance considered—(i) banks (private or public); (ii) leasing companies; and (iii) supplier credit—supplier credit stands out as the most restricted across regions. According to respondents, access to credit from banks

and leasing companies is also a major impediment in East Asia and Pacific and Sub-Saharan Africa regions, and respondents in other regions indicated moderate availability of these financing mechanisms.

Taxes and import duties imposed on agricultural machinery and spare parts have a direct bearing on the cost of tractors and create an unproductive financial burden on tractor maintenance. The data show that about one-fourth of countries studied levy low or no import duties on agricultural tractors, but high duties on replacement parts. This process has an adverse effect on the maintenance and repair of tractors because it increases operational costs and, in turn, hinders tractor utilization among farmers. The data collected also indicate that the prevailing tax regulations often lead to ambiguity and confusion over which tractor parts are tax exempted, as some parts are also used in the automotive industry, which typically attracts higher import duties.

Finance

This year the finance topic collected data on additional areas that are critical to agricultural finance, but for which international best practices are not fully developed. Partial credit guarantee systems (PCGSs) and agricultural lending quotas are two areas the finance topic studied, but did not score.

PCGSs can be a powerful tool to increase credit to agriculture. They reduce the risk that financial institutions take when lending to farmers and agribusinesses by acting as a collateral substitute, wherein “if the borrower fails to repay, the lender can resort to partial repayment from the guarantor.”⁵ However, the simple existence of a PCGS does not guarantee increased agriculture sector lending; rather, PCGS design and implementation have direct effects on program sustainability and effectiveness. Because there is no “one-size-fits-all” design for PCGSs, the team chose not to score this data. The data collected show that 18 of the 62 countries studied have a PCGS specific to agricultural loans issued by commercial banks. Only two high-income countries (Italy and Korea) have PCGSs. Sub-Saharan Africa is the region with the highest number of countries (6) with PCGSs, followed by Latin America and the Caribbean (4). Among the 18 countries with PCGSs for loans issued by commercial banks, only 8, most of which are located in Sub-Saharan Africa, also allow microfinance institutions (MFIs) to participate in the credit guarantee system—namely Bolivia, Colombia, Ethiopia, Mali, Mexico, Niger, Nigeria, and Rwanda. The finance topic also collected data on the implementation of mandatory quotas to encourage credit in the agricultural sector. There is strong evidence that suggest lending quotas for agriculture lead to low profitability for banks and high nonperforming

loans, as well as misallocation of credit and distorted market dynamics.⁶ Nevertheless, some countries employ such interventions to support agri-finance. Data collected show that seven countries have policies requiring commercial banks to lend a percentage of their portfolio for the purpose of promoting agricultural activities—namely, Bangladesh, Bolivia, India, Nepal, the Philippines, Sri Lanka and Zimbabwe. The required percentage ranges from 2.5% of a bank’s total loans each year in Bangladesh, to 25% of total loans per year in Bolivia and the Philippines. Bolivia is the only country that also requires MFIs to lend a percentage of all loans to agriculture.

Transport

The transport topic collected data on other areas of relevance to the transport sector, including exclusions from licensing, electronic platforms, and quality criteria to address social and environmental concerns, although these areas could not be scored due to the absence of global best practices or low variance among countries.

Countries often allow for various exceptions to transport licensing requirements, such as in cases where vehicles have a loading capacity less than 3.5 tons and where operators are transporting goods less than 10 kilometers or on their own account.⁷ Too many licensing requirements may generate high compliance costs for operators and lead to increased informality. Data show that out of 39 countries having at least one exception to regular licensing requirements, 20 exempt operators who transport goods on their own account, 15 exempt certain vehicles based on loading capacity and 7 exempt transporting goods over short distances. Because the need for these exceptions depends significantly on the specific country context, the data were not scored.

Electronic platforms can streamline processes and facilitate the authorization of transport licenses, particularly cross-border licenses, by allowing transport operators to apply for licenses and process payments remotely. Such systems can also reduce transport costs and contribute to transparency. Only two countries, Denmark and Spain, have electronic platforms in place for processing cross-border licenses.

The use of certain quality and safety criteria to obtain a trucking license and access the market may also be used by governments to counteract market failures and address negative externalities for society and the environment. The International Road Transport Union (IRU) states that “quality criteria of the access to the profession should always remain the core of any relevant legislation.”⁸ Such requirements can include the obligation for managers and drivers to obtain specialized training, demonstrate financial standing or possess a certificate of good repute. Good vehicle





standards include valid vehicle technical or emissions inspections certificates, third-party liability insurance and a vehicle registration certificate.

Bosnia and Herzegovina, Morocco and Thailand have strong legal frameworks that establish conditions to qualify for a truck license and operate a truck in public roads, including regular technical and emissions inspections, professional standards for truck owners or mandatory third-party insurance. While some countries such as Burkina Faso, Côte d'Ivoire and Serbia have embarked on a series of reforms to improve the qualifications of their truck operators and thereby the quality of trucking services, others such as Sudan or Zimbabwe do not have trucking regulations that ensure certain minimum standards are met to guarantee the formality or professionalism of operators. Countries with comprehensive licensing systems tend to have better quality control mechanisms for operators, suggesting that countries can promote market entry while improving standards in the sector. Countries such as Guatemala, Kyrgyzstan and Tajikistan do not have a minimum set of basic requirements such as third-party liability insurance or technical inspections. Guatemala is the only country in which technical inspections are not mandatory for heavy trucks, while Georgia established them in early 2016, bringing its regulatory framework in line with other countries in the Eastern Europe and Central Asia region.

Technical inspections are an important component of transport operations since they ensure safety and roadworthiness, and reduce negative externalities particularly related to the environment. If technical inspection certificates are valid only for a short period of time, however, this can increase costs for truck operators and may amount to rent-seeking in a country. Across the 61 countries mandating periodic vehicle technical inspections, 43 require inspections to be repeated annually, 13 require every 6 months, and the remaining six have various other validity periods. Given the different standards and procedures involved in each country's vehicle inspections, there is no internationally accepted best practice in terms of the validity of technical inspection certificates. For example, some countries may impose a relatively low maximum age requirement for the truck at the time of applying for a license, and in such cases the validity of the technical inspections tends to be longer than in countries where trucks are generally older and require more frequent checking.

Markets

This year the markets topic continued to collect data on regulations impacting contract farming arrangements, but determined not to assign any scores due to

methodological constraints and the lack of recognized regulatory best practices.

The concept of contract farming covers many different types of arrangements. Typically, a farmer or a group of farmers commits to provide, at a future date, an agreed quantity of a specific product that meets certain quality standards. In turn, the buyer commits to buy the product and, usually, to support production through the supply of farm inputs, the provision of credit, land preparation and/or the provision of technical advice.⁹

Evidence suggests that contract farming has been in use since at least the 19th century across various countries and sectors. Over time, contract farming has become more widespread and several studies indicate that it now governs more than one-third of agricultural production in the United States, three-quarters of Brazil's poultry production and 40% of Vietnam's rice sales; it has also emerged as a growing practice in China, India, Latin America and several African countries.¹⁰ The global spread of contract farming stems from a range of factors, but particularly from changes in consumer preferences and needs prompted by rising incomes and increased urbanization. This trend has led agricultural buyers to demand more from producers in terms of supply regularity, as well as safety and quality standards. Contract farming serves as a coordination model whereby the supply of agricultural products is timely, in sufficient quantity and of sufficient quality, and farmers can secure an outlet for their products and receive the inputs, credit and technical assistance necessary to meet buyer requirements.¹¹ From a development perspective, contract farming has sparked the interest of donors, multilateral organizations and governments of developing countries as a way to link small-scale farmers to domestic and foreign markets, thereby contributing to poverty reduction.¹²

The main challenge involved in developing a global indicator on contract farming relates to the lack of consensus on regulatory best practices, and this stems from the diverse and complex nature of contract farming arrangements in each country context. For example, Morocco's law on *contrats d'agrégation agricole* provides for highly formalized contract farming arrangements concluded between a contractor ("agrégateur") and several producers ("agrégés") around a value-addition unit ("unité de valorisation") for designated products.¹³ By contrast, in Cambodia, individual producers and buyers can conclude agricultural production contracts for any type of crop or animal product, and those contracts may take the form of market-specifications contracts, production-management contracts or resource-providing contracts.¹⁴ These contract farming laws differ in scope as they pursue policy goals that are context-specific, such as the focus on value-addition investments in the case of Morocco.



Local fruit stand, Armenia Photo: Flore de Prêneuf / The World Bank.

Furthermore, only a minority of countries has adopted laws and regulations that specifically address contract farming arrangements: 9 of the 62 countries analyzed this year have such rules, while the remaining 53 rely solely on general contract law and default rules that fill contractual gaps.¹⁵ There is no evidence to indicate that contract farming arrangements do better or worse depending on whether specific regulations exist. Proponents of the general contract law approach argue that the parties themselves are best-placed to define the contractual terms in their business relationships.¹⁶ In this context, soft law instruments, such as recommendations or codes of practices, may be more suitable than government regulations to promote fair and efficient contractual practices between producers and buyers of agricultural products.¹⁷ However, comparing and assessing those types of private sector- or civil society-led soft law instruments go beyond the scope of EBA's focus on regulatory indicators.

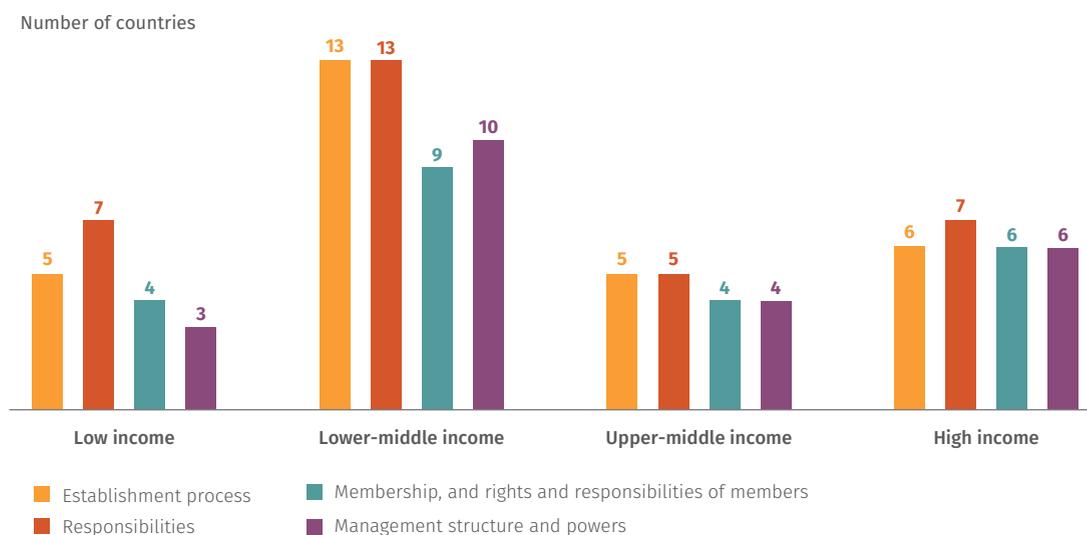
Among the nine countries that have adopted contract farming regulations, certain "better" practices were identified. For example, all countries but Zimbabwe explicitly require contracts to be in writing, although in Zimbabwe the obligation on buyers to submit detailed schedules of their contractual agreements to the Agricultural Marketing Authority could serve the same purpose as written contracts.¹⁸ By contrast, of the 53 countries where contract farming arrangements are governed by general contract law, only 8 require that the agricultural production contract be made in writing and 6 have the same requirement for contracts above a certain amount. Written contracts can improve the clarity, completeness, and enforceability of the parties' rights and obligations, and they serve an important evidentiary purpose in the context of any related court proceedings.¹⁹

Another key issue in the contract farming context relates to contract duration. Because agricultural production contracts may require significant investments and the crop production cycle may require a long-term relationship, a legal obligation to comply with a minimum duration can make up for a lack of or unclear contractual agreement on the timeframe to carry out certain performance obligations.²⁰ Only 3 of 62 countries studied in *EBA17* establish a minimum duration for agricultural production contracts and all of them have adopted laws that specifically address contract farming arrangements. In Morocco,²¹ for example, aggregation contracts must be concluded for a duration of at least five years, with the possibility to terminate them, while in India (Maharashtra),²² the mandatory minimum duration is set at one cropping season, without the possibility to terminate.

Four of the nine countries with specific contract farming rules have also established special commodity- or sector-specific institutions that offer alternative dispute resolution mechanisms to enforce agricultural contracts. Such tailored mechanisms can be particularly beneficial due to the sector-specific knowledge and expertise developed by the institution.²³ In Cambodia, for example, the Contract-based Agricultural Production Committee, which is composed mostly of public sector representatives, is mandated to help solve any conflict or problem in the implementation of agricultural production contracts.²⁴ In Zimbabwe, the Grain and Oilseeds Technical Committee, in which private sector stakeholders are largely represented, determines any disputes arising from grain and oilseeds contracts, and its decisions can be appealed to the Agricultural Marketing Authority Board.²⁵



Figure D.2 | Strongest regulation of water user organizations (WUOs) evident in lower-middle-income countries



Source: EBA database.

Water

This year, the EBA water topic collected exploratory data on collective water use in irrigation schemes and, although it will not be scored this year, this information will inform the future development of a collective water use indicator, to mirror the current individual water use indicator. Across countries, many farms rely on large-scale, publicly provided irrigation schemes to supply water, and one trend in this realm is the development of water user organizations (WUOs). Alternatively known as irrigation associations, user associations, or water user associations, WUOs may be defined as “non-governmental organizations that farmers and other water users form to manage an irrigation system at the local or regional level.”²⁶ Among the countries studied, 14 have enacted specific independent legislation to govern WUOs and another 31 have at least some mention of WUOs in their broader legal frameworks. Further information was collected on the establishment process, responsibilities, powers and membership requirements for decentralized management of irrigation infrastructure (figure D.2).

Moving forward, the water topic aims to further explore issues related to transboundary waters that span national borders and the interface between customary practices and legislative requirements for water management and use by smallholders. As a starting point, this year the water topic collected data on exemptions from permit requirements for smallholders. This area will be explored for possible expansion in coming years.

ICT

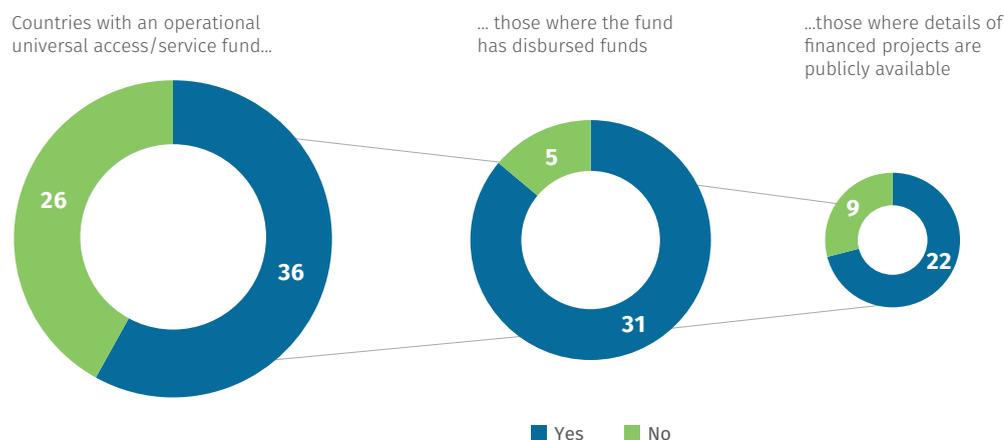
This year the information and communication technology (ICT) topic collected data on additional areas that impact access to ICT in rural areas, but ultimately these areas were not scored due to the importance of country context or because government regulation is not always of direct relevance. Universal access or service funds, programs aimed at reducing the cost of smartphone devices, and tariff plans to address the usage needs of rural subscribers were some areas that the ICT topic investigated.

The “last mile” of telecommunication infrastructure in rural areas is typically provided at a very high cost, which, in some cases, may not be commercially justifiable based on projected use and potential economic impact.²⁷ Mobile and broadband service providers in rural areas often face high capital requirements and operating expenses, and have few incentives to invest given the relatively low rate of return as compared with more densely populated areas. One of the key challenges for governments, therefore, is to put in place appropriate financing mechanisms to support ICT development in rural areas.

Universal access/service funds are one of the most popular mechanisms for generating funds from multiple sources, including contributions from mobile operators, international organizations and government budgets. Mobile operators contribute to the universal access/service funds as part of their mandatory universal service obligations. In most countries, universal



Figure D.3 | Universal Access/Service Fund exists in 36 countries



Source: EBA database.

access/service funds are created for ICT development projects that differ from country-to-country, depending on overarching policy goals.

Well-managed universal access/service funds help to expand ICT coverage in otherwise commercially unviable areas, but it is critical that the funds collected through the universal access/service funds are directed towards the development of ICT projects.²⁸ Failures to disburse money point to weak governance and accountability structures in fund management and resource allocation.²⁹ Efficient management of universal access/service funds is demonstrated by disbursing the money collected in a meaningful and transparent manner.³⁰ Similar to this, details on a universal access/service fund’s projects and procedures should be provided to the public. Of the 62 countries studied, 36 have established a fund. Among these, five countries (Bangladesh, Burkina Faso, Cameroon, Egypt, and Niger) have operational funds that have never disbursed money for ICT development projects (figure D.3). Nine of the 36 countries with such funds (Guatemala, Mali, Morocco, Mozambique, Nepal, Sri Lanka, Sudan, Turkey and Zambia) do not make any information on projects financed by the fund public.³¹

Affordability greatly impacts the uptake of ICT technologies in the agriculture sector. The high costs of ICT solutions, including the costs of mobile devices (particularly smartphone devices) and mobile service charges, can be prohibitive for smallholder farmers,³² reducing their ability to capitalize on the benefits of mobile agriculture. Although countries differ in their needs and approaches to tackle affordability gaps, targeted interventions to alleviate costs can be critical in expanding farmers’ access to ICT.³³ This is particularly the case in countries with large rural populations and high poverty levels.³⁴

Although governments often take the lead in initiatives to stimulate ICT access for underserved communities, the private sector can also play a significant role. In Malaysia, for example, to accelerate the uptake of mobile broadband services, the Malaysian Communications and Multimedia Commission introduced the “Smart Device with Internet Package” initiative in 2014. The program aims at offering smartphones for subscribers in rural areas at a lower-than-retail price along with a mobile data subscription for one year.³⁵ In India, the private sector has taken a greater role in expanding coverage to rural areas. Given the high proportion of the population living in rural areas and the proportionately low mobile internet market penetration, mobile operators have an incentive to unlock a high potential subscribers’ market. In a recent effort to increase coverage in remote areas, in 2008 Bharti Airtel Limited and the Indian Farmers Fertilizer Cooperative Limited (IFFCO) launched a joint venture that offers daily services tailored to farmers, including unique value-added services (for example, mobile applications) on commodity prices, farming techniques, weather forecasts, dairy farming, animal husbandry, rural health initiatives and fertilizer availability. Within the framework of this venture, Bharti Airtel provides lowered calling rates for calls between IFFCO members.³⁶ As a result an estimated 200,000 new rural connections are activated per month.³⁷ Similarly, in 2015 telecommunications operator BSNL Maharashtra developed the Maha Krishi Sanchar plan—a specifically designed, prepaid mobile tariff plan covering all farmers and employees of the State Department of Agriculture.





NOTES

- 1 FAOSTAT database.
- 2 Minde et al. 2008.
- 3 Druilhe and Barreiro-Hurlé 2012.
- 4 Kienzle et al. 2013.
- 5 Zander, Miller and Mhlanga 2013.
- 6 Rani and Garg 2015.
- 7 “Own account” designates a company transporting its own goods and using its own means to do so, as opposed to offering the service commercially to third parties.
- 8 International Road Transport Union 2007.
- 9 UNIDROIT, FAO and IFAD 2015.
- 10 Da Silva 2005.
- 11 UNIDROIT, FAO and IFAD 2015.
- 12 FAO 2013.
- 13 Dahir n°1-12-15 du 25 chaabane 1433 (17 juillet 2012) portant promulgation de la loi n°04-12 relative à l’agrégation agricole; Arrêté conjoint du ministre de l’agriculture et de la pêche maritime, du ministre de l’intérieur et du ministre de l’économie et des finance n°3073-14 du 12 kaada 1435 (8 septembre 2014) fixant les formes et les modalités d’approbation des projets d’agrégation agricole et de délivrance des attestations d’agrégation agricole.
- 14 Sub-Decree on Contract Farming, No. 36 of 24 February 2011; A “market-specification contract” specifies marketing information about demand, quality, timing, and price, a “production-management contract” covers those specifications and also specifies the cultivation practices necessary to achieve quality, timing, and price, and a “resource-providing contract” covers those specifications and also includes the provision of credit, inputs and/or extension services (FAO 2013).
- 15 UNIDROIT, FAO and IFAD 2015.
- 16 World Bank 2014.
- 17 UNIDROIT, FAO and IFAD 2015.
- 18 Agricultural Marketing Authority (Grain, Oilseed and Products) By-laws, 2013 (Statutory Instrument 140 of 2013), Art. 9(2)b.
- 19 UNIDROIT, FAO and IFAD 2015.
- 20 *Ibid.*
- 21 Arrêté n°3073-14 du 8 septembre 2014 fixant les formes et les modalités d’approbation des projets d’agrégation agricole et de délivrance des attestations d’agrégation agricole.
- 22 Maharashtra Agricultural Produce Marketing Act (1963) (as amended).
- 23 UNIDROIT, FAO and IFAD 2015; World Bank 2014.
- 24 Sub-Decree on Contract Farming, No. 36 of 24 February 2011.
- 25 Agricultural Marketing Authority (Grain, Oilseed and Products) By-laws, 2013 (Statutory Instrument 140 of 2013).
- 26 Vapnek et al. 2009.
- 27 World Bank 2011.
- 28 ITU 2013.
- 29 Williams 2016.
- 30 GSMA 2013.
- 31 Magiera 2009.
- 32 GSMA 2015a.
- 33 FAO and ITU 2016.
- 34 GSMA 2015b.
- 35 EBA data, <http://www.skmm.gov.my/Sectors/Universal-Service-Provision/Distribution-of-all-projects-by-State.aspx>.
- 36 EBA data, http://www.airtel.in/about-bharti/media-centre/bharti-airtel-news/corporate/pg_iffco+and+bharti+airtel+-join+hands+to+usher+in+the+second+green+revolution+to+benefit+millions+of+rural+consumers.
- 37 GSMA 2016a.

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