

ANNEX 1: A LIST OF CORE INDICATORS

Annex 1 should be used in conjunction with Chapter 2 of the Sourcebook to help with the selection of appropriate indicators for monitoring ARD programmes. The list has been created through a participative process involving a number of different specialists and players. Initially, subject matter specialists were asked to use their expert knowledge to come up with the first basic list of indicators, paying particular attention to early outcomes indicators. Their suggestions were reviewed and merged to form the basic documentation for the five country reviews. In each country, a national workshop was organized in which national monitoring and evaluation (M&E) practitioners and statisticians were brought together to review the contents of the Sourcebook and to make recommendations based on their own practical experiences in the field. As a result of the workshops and feedback, the guidelines were extensively revised and the list of indicators updated.

The list contains 86 indicators, 19 of which are termed “priority indicators” (in green). They are the key indicators used for monitoring ARD programmes at the global level and to which all countries are encouraged to subscribe – not just for the purposes of feeding into the international monitoring systems, but also for serving as a standard core for monitoring the national ARD activities. The remaining indicators in the list constitute the extended list. They are not mandatory, but are intended to serve as a reference list that countries can use when deciding on what indicators they specifically wish to include in their own M&E systems, in addition to the priority indicators. The extended list therefore serves as a menu from which choices can be made. It provides suggestions and examples of indicators that can be used for monitoring and evaluation of a broad range of ARD activities.

The indicators are primarily outcome and impact indicators. Input and output indicators are not included. Each indicator includes the following items of information:

- sector/subsector, which shows the specific ARD activity for which the indicator is designed to be used
- class of indicator, which may be (i) early outcome; (ii) medium-term outcome; or (iii) long-term outcome, and indicate suitability for monitoring over different time periods;
- core data requirements, which are the data needed to construct the indicator;
- data sources – they may vary from country to country, but the list shows the most common source of information;

- technical notes to explain the critical concepts related to defining indicators.

Among the early outcome indicators are the service delivery indicators (access, use and satisfaction). The methodology for selecting and adapting these indicators to different subsector programmes is described in Chapter 2. The list in the Annex does not include all such indicators, but offers a few selective examples adapted to specific subsectors.

A large number of indicators come from survey data, which is disaggregatable. Although not specifically stated in the list of indicators itself, it should be standard practice that wherever possible, the indicators are disaggregated and shown by gender, by type of community (urban/rural) and by some measure of wealth ranking.

SI. Indicators No.	Core Data Requirements	Data Sources	Technical Notes
A Sector-Wide Indicators for Agriculture and Rural Development			
<i>Early outcome</i>			
1	Public spending on agriculture as a percentage of GDP from the agriculture sector Government budget allocations, disbursements and spending on items related to agriculture; national agriculture value-added data	Ministry of Finance, National Accounts, National Planning Commission, country reports prepared by donors	This indicator demonstrates commitment to promoting agriculture. Before establishing a system to regularly compile the indicator, it would be necessary to clearly specify the related concepts, i.e. the items of public expenditure that would constitute the expenditure on agriculture. The definition for public spending on agriculture should follow the United Nations Classification of Functions of Government (COFOG) for agriculture. For further information, see: www.unstats.un.org/unsd/cr/registry/regcs.asp?Cl=4&lg=1&Co=4.2 .
2	Public spending on agricultural input subsidies as a percentage of total public spending on agriculture Government budget allocations, disbursements and spending on items related to subsidies on agricultural inputs as well as total spending on agriculture	Ministry of Finance, National Planning Commission, country reports prepared by donors	Agricultural inputs should cover fertilizer, seeds, pesticides, water, etc. Direct cash subsidies paid to farmers and/or to input suppliers are more available and easier to estimate. Often, calculation of subsidies to agriculture is made with reference to border prices of inputs. Using border price criterion, the total subsidy paid by the government could be split into the portions going to farmers and non-farmers. The volatility of international prices makes such a comparison difficult over time. There may also be hidden subsidies due to differential prices for different sectors and cross-subsidization. Estimation of subsidies in big projects such as canal water supply schemes that supply water to agriculture at a nominal cost or no cost may require an in-depth study of the cost and price structure.
3	Prevalence (percentage) of underweight children under five years of age in rural areas Anthropometric data	Anthropometric surveys	A high prevalence of underweight children in an area is an indicator of food insecurity in the area. Similar indicators based on "height for age" and "weight for height" are also commonly used.
4	Percentage of population who consider themselves better off now than 12 months ago Data from specific household surveys	Special household surveys	This is an indicator of perception; hence "to be better" can mean different things to different people. This type of survey usually consists of completely open questions and does not refer only to "economic betterment".

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
<i>Medium-term outcome</i>				
5	Food Production Index	Area, production and yield data for major crops, livestock numbers and yields, felling rate, fishery production statistics	Statistical systems for crop, livestock, fishery and aquaculture. National Statistics Office and/or Ministry of Agriculture	The category of food production includes commodities that are considered edible and that contain nutrients. Accordingly, coffee and tea are excluded along with inedible commodities because, although edible, they have practically no nutritive value. Separate indices for crop, livestock and fish production could be combined into a single Food Production Index on the basis of value of output. Before combining, the indices of value of output for each of the subsectors would need to be deflated to base year prices using suitable deflators. It will also be useful to disseminate the indices of production separately for crop, livestock and fish compiled on the basis of physical quantities. Yet another version of this indicator could be “ <i>Per capita food production index</i> ”, which could be easily derived using population in the denominator. In countries where fibre (e.g. wool or jute) and biomass are important agricultural commodities, the index could be generalized to include food, fibre and biomass production. The commodities covered in the computation of indices of agricultural production by FAO are all crops and livestock products (www.fao.org). All products are covered, with the main exception of fodder crops. The fodder for the animal is a product of agriculture, but is also an input used within agriculture.
6	Annual growth (percentage) in agricultural value added	Values of inputs and outputs of agricultural commodities	National accounts wing of the National Statistics Office or CB	Once the time series on value added in agriculture sector is available, it may be preferable to use the trend growth rate, which is less affected by random factors operating in different years. Year-to-year growth rates are known to be affected more by base year figures. Calculations based upon triennium ending moving averages could also provide a good option. A comparison of annual growth and trend growth could provide a measure of impact of programmes. A variant of this indicator would be “ <i>Annual growth (percentage) in agricultural value added per capita.</i> ” For calculating per capita, the base could be taken as the population dependent on agriculture. Another variant of this indicator is “ <i>Value added in the agricultural sector per agricultural worker</i> ”, which could be calculated taking agricultural labour force as denominator.
<i>Long-term outcome</i>				
7	Rural poor as a proportion of the total poor population	Household income and consumption estimates	Household income and consumption surveys	Countries should select the concept for poverty measurement (relative or absolute) that better suits their specific conditions.

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
8	Percentage change in proportion of rural population below US\$1 (Purchasing Power Parity) per day or below national poverty line	Income or consumption data (whenever possible, consumption is preferred to income for measuring poverty)	Household budget surveys and other surveys covering incomes and expenditure; World Bank Development Research Group	Proportion of population below US\$1 per day is the percentage of the population living on less than \$1.8 a day at 1993 international prices. The one dollar a day poverty line is compared to consumption or income per person, and it includes consumption from own production and income in kind. This poverty line has been fixed for measuring purchasing power across countries or areas and is often called an "absolute poverty line" or measure of extreme poverty. The international poverty line is based on the purchasing power parity (PPP) concept. The line is currently being revised using the 25 release of the International Comparison Programme on PPPs. For more information, see www.ddp-ext.worldbank.org/ext/GMIS/gdmis.do?siteId=1&contentId=Content_2&menuId=LNAV1HOMEZ .
9	Percentage of the population with access to safe/ improved drinking water	Total number of households; number of which: (i) are connected to water pipelines; (ii) have access to public water facilities; (ii) have protected wells, spring or rainwater	Administrative or infrastructure statistics from national and sub-national bodies, household surveys, Multiple Indicator Cluster Survey, Demographic and Health Surveys, Living Standard Measurement Surveys, Joint Monitoring Programme for Water Supply & Sanitation data from WHO and UNICEF. See www.wssinfo.org .	A population will have access to safe drinking water if a safe and dependable source is located within a reasonable distance. The reasonable distance should be quantified as per local conditions. Sources of safe drinking water will include piped water, public tap, borehole or pump, protected well, protected spring or rainwater. Improved water sources do not include vendor-provided water, bottled water, tanker trucks or unprotected wells and springs.
10	Consumer Price Index for food items	Consumer price index disaggregated by categories	National Statistics Office	Consumer price indices are grouped by type of items and "food" is usually one of them. The current practices of each country concerning what must be considered inside this category should be preserved. Nevertheless, some broad indication must be made to allow international comparisons; for example, "the food group must contain food and beverage goods".
11	Agricultural exports as a percentage of total value added in agriculture sector	Trade statistics, national accounts statistics	National Trade data; United Nations Statistics Division Key Development Data & Statistics, FAO, FAOSTAT database (www.faostat.fao.org)	To allow international comparisons, the definition of "Agricultural goods" in FAOSTAT metadata should be adopted.

SI. Indicators No.	Core Data Requirements	Data Sources	Technical Notes
12	Proportion of under-nourished population	Data from household budget surveys	Undernourishment is defined as a condition that results from consuming too little food over a period of time. Like malnutrition – the result of a diet that is lacking in certain nutrients (such as protein or vitamins) – undernourishment is common in poor countries. The number of undernourished people is estimated on the basis of national norms of daily calorie consumption using data from consumption surveys. Norms in the country may vary according to rural and urban areas or gender.
13	Producer Price Index for food items	Prices received by domestic producers of food items	Wholesale prices of agricultural commodities are often available. There may be a need to adjust these prices to obtain the producer's price. To build an index of these prices, due consideration should be given to the weight to be assigned to different commodities and the base year. The scope of such an index could be all agricultural commodities including food and non-food crop and livestock products. The National Statistics Office should be involved in the process of building such an index.
14	Ratio (or proportion) of arable land area to total land area of the country	Land use data	Special attention must be given to the definition of arable land. The category as defined in the FAO WCA 21 could be adopted. See para. 11.22 of FAO Statistical Development Series No. 11.
15	Change (percentage) in unit cost of transportation of agricultural products	Cost and volumes of agricultural products transported by mode of transport and region	This cost will usually be calculated per km, per tonne. It may vary significantly depending upon mode of transport, region of transport and the distance travelled.
16	Percentage of rural labour force employed in agriculture	Total number of days/persons (rural household members) worked in agriculture, by type of work (paid/unpaid; permanent/occasional) during a specified period.	An important component of the labour force for agriculture includes family workers who are mostly unpaid and often not counted. One way to measure the rural labour force is through a household survey that specifically collects information on the number of days or average hours each household member works on its own holding without explicit wages and the number of days or hours they work for wages, separately for farm and non-farm activities. Many will do both, i.e. work on their own holding and somewhere else for wages. It is also important to know the demographics of the rural labour force; to answer questions like "how a programme to improve school attendance will affect the rural labour force. This would need data on labour force by age.

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
17	Percentage of rural labour force employed in non-farm activities	Activity status of rural household members, time worked in each activity	Farm labour data from national Census of Agriculture	See Technical Notes on Indicator at Serial No.16.
18	Percentage of the labour force underemployed or unemployed	Economically active population, employment and unemployment data on hours/ days of work	National Labour Statistics, labour force surveys, International Labour Organization (www.laborsta.ilo.org)	See Technical Notes on Indicator 16. Countries usually follow their national definition for measuring “underemployment” and “unemployment”. For international comparison, these definitions would need to follow concepts proposed by the International Labour Organization. The definitions related to employment usually follow an approach based on “Current/daily Status”, “Weekly Status” or “Usual Status”. See also www.laborsta.ilo.org for details.
19	Annual growth rate of household income in rural areas from agricultural activity (percentage)	Household income by source and groups of activities	Annual income-expenditure surveys	In the absence of this indicator, a comparison of wage rate for agricultural workers and non-agricultural workers in rural areas could provide a proxy (not a substitute) indicator. In some situations, the incomes from the two subsectors may show a completely different trend since incomes also depend on the duration of employment in addition to wage rate.
20	Annual growth rate (percentage) of household income in rural areas from non-agricultural activity	Household income by source and groups of activities	Annual income-expenditure surveys	See Technical Notes on indicator at Serial No. 19.
B Specific Indicators for Subsectors of Agriculture and Rural Development				
1. Crops (inputs and services related to annual and perennial crop production)				
<i>Early outcome</i>				
21	Indicators of access, use and satisfaction with respect to services related to sustainable crop production practices, technologies and inputs, for example: (i) percentage of small-scale farmers who know about sustainable crop production practices (ii) percentage of farmers who applied/purchased the recommended package of inputs last season (iii) percentage of farmers who adopted sustainable crop practices in their farms	Total number of farmers and area of their holdings; number of farmers who know/use sustainable crop production practices; total area under sustainable crop practices	Agricultural extension services; sustainable crop production certifying bodies; agricultural/environmental services; analysis and studies made on the basis of data available from agricultural census and surveys	From among a number of local crop production practices, certain practices will be classified by the national agricultural research and extension system as being “sustainable”. Usually, there would be an attempt by the extension system to promote such practices among farmers. The special survey to collect data for this indicator will be directed towards use of such practices. In addition to asking a direct question on sustainability in a special survey, one could also derive these types of indicators using information on input use, crop rotation practices, etc. available in a regular agricultural survey.

SI. Indicators No.	Core Data Requirements	Data Sources	Technical Notes
<i>Medium-term outcome</i>			
22	Change (percentage) in yields of major crops of the country A time series of crop yields per unit of land area for major crops or crops covered by a specific programme	Objective crop yield measurement surveys or other forms of assessment	Because of high year-to-year fluctuations, particularly in rainfed areas, statistically significant trends may not be discernible until an 8-9 year series is established. In agricultural statistics, the concept of yield has been generally used to represent the average amount of produce obtained per unit of crop area. In some cases of tree crops, the concept of yield covered the average amount of produce per tree. For further information, see FAO Economic and Social Development Paper No. 22, para. 61-63: "Estimation of crop areas and yields in agricultural statistics".
<i>Long-term outcome</i>			
23	Yield gap between farmers' yields and on-station yields for major crops of the country Yield expected to be achieved at farmers' field with recommended package of inputs and actual yield as estimated through the agricultural statistics system	Crop surveys and information on potential yield of a crop variety indicated by agricultural research and extension system	Under normal weather conditions, yield-gap is an indicator of available potential for growth. The potential may remain unrealized due to various factors, such as unaffordability/ unavailability of inputs and/or the difference between controlled conditions in a research institution and uncontrolled environment on the farmers' fields.
24	Percentage of total land area under permanent crops Land use data	Agricultural census and current agricultural surveys	One could also extend this indicator to monitor composition of total arable agricultural land, which includes land under permanent crops, temporary crops and permanent meadows, as well as growth of any of the individual constituents of total arable land.
2. Livestock			
<i>Early outcome</i>			
25	Indicators of access, use, satisfaction with respect to livestock services, for example: • Percentage of livestock owners in contact with livestock officer in the last month • Percentage of livestock owners using veterinary services within the last month • Percentage of livestock owners satisfied with the quality of livestock services	Veterinary extension services; analysis and studies made on the basis of data available from livestock census and current surveys; specific livestock surveys	A number of veterinary services, e.g. dipping, vaccination and artificial insemination are provided by government agencies responsible for livestock development. These services could also be purchased from the private sector. In designing the survey, care needs to be taken to specify to which particular service or sector the survey refers – public, private or both.

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
<i>Medium-term outcome</i>				
26	Annual growth (percentage) in value added in the livestock sector	Values of input used in livestock sector and output produced	National Accounts wing of the National Statistics Office	Standard concepts used for national income accounting should be followed. Gross value added is the value of all goods and services produced during a production period but not immediately used up in the production process of that period. Hence, gross value added represents the value of all goods and services available for the different uses other than intermediate consumption. (Intermediate consumption consists of the goods and services consumed in the production process, excluding the consumption of fixed assets.) Gross value added = output – intermediate consumption. The formula for estimating the output of livestock in general is based on the following relationship: Output of live animals + Imports = Animal slaughtered or died of natural causes + exports + change in animal stock. For more details, see System of National Accounts (1993, para. 6.94-6.1): www.unstats.un.org/unsd/sna1993/introduction.asp and A System of Economic Accounts for Food and Agriculture (FAO, 1996; www.fao.org/docrep/W1E/W1E.htm).
<i>Long-term outcome</i>				
27	Livestock birth rate	Number of births during the last year and number of female animals of reproductive age for each species	Periodic livestock surveys and estimates prepared by livestock specialists	To be compiled separately for each species.
28	Percentage increase in yield per livestock unit	Per animal yield of milk, eggs, meat, wool etc., separately for each species	Livestock surveys; FAO Yield Livestock data (www.faostat.fao.org)	Yield refers to milk, eggs, meat or wool per livestock. As there may be more than one product from same animal, this indicator needs to be compiled separately for each species and product. However, the yield of the product that is the main purpose of production is the most relevant yield. Seasonality in yield is important in some products. Therefore, for comparison of growth, the use of comparable periods, which would vary from country to country, must be stressed.
29	Percentage change in livestock values	Livestock number and unit prices of livestock by species and breed	Department of Livestock, National Accounts wing of the National Statistics Office	The value of stocks of different type of livestock is considered capital stock or intermediate stocks, depending on the purpose of rearing. Such data is usually estimated during the preparation of National Accounts.

SI. Indicators No.	Core Data Requirements	Data Sources	Technical Notes	
3. Fisheries and Aquaculture				
<i>Early outcome</i>				
30	<p>Indicators of access, use, satisfaction with respect to fisheries/aquaculture services, for example:</p> <ul style="list-style-type: none"> • Percentage of fishing communities in contact with a fisheries officer in the last month • Percentage of rural communities that constructed a fish pond in the last year • Percentage of fishers satisfied with the quality of fisheries services 	<p>Stakeholders surveys; Extension wing of the Department of Fisheries and Aquaculture</p>	<p>In some countries, small-scale fish ponds are advocated for households instead of community aquaculture pond. In such cases, “<i>Number of households having established a private fish pond</i>” will be a substitute indicator.</p>	
31	<p>Water use per unit of aquaculture production</p>	<p>Production from aquaculture, water used in aquaculture production, number of aquaculture units and their water holding capacity</p>	<p>Special surveys of aquaculture production units; Department of Fisheries</p>	<p>This indicator will not be relevant for aquaculture activities carried out in running water or the sea. The indicator purports to measure resource use efficiency of water used for aquaculture. It could be calculated both in terms of physical quantities and values, particularly if more than one product is being produced by the same production unit or when the data from companies engaged in production of different products are to be merged.</p>
<i>Long-term outcome</i>				
32	<p>Capture fish production as a percentage of fish stock (or a rating of the state of major capture fish stocks relevant to exports and local food)</p>	<p>Scientific estimates of fish stocks and exploitation rates or perceptions/assessment of community of fishers on increasing or decreasing fish stock</p>	<p>Institutions involved in estimation of fish resources; stakeholder survey on perceived state of fish stocks</p>	<p>This indicator particularly refers to capture fisheries in natural water bodies and not the culture fisheries that usually follow a well-established culture and catch cycle. For planning an assessment survey, one may use seven levels for the fish stocks state ratings, viz., not known, underexploited, moderately exploited, fully exploited, overexploited, depleted and recovering; For details, see ftp://ftp.fao.org/docrep/fao/7/y5852e/y5852e.pdf. A bi-dimensional rating of state of stocks based on (i) exploitation rate and (ii) stock abundance could also be used. For details, see www.firms.fao.org/firms.</p>

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
33	Share of small-scale fishers in the production of fish	Average fish price, number of small-scale fishers or aquaculture producers, days of fishing, average weight per day of fishing	National fisheries surveys; estimates prepared by National Accounts wing of the National Statistics Office	This indicator could be calculated for both inland and marine fishery. If many different types of fish with varying prices are being produced in the country, it may be appropriate to compile this indicator on the basis of total value of the production. There may not be a universally accepted criteria for defining "small-scale fishing", which is usually done on the basis of type of boat and fishing gear, as well as socio-economic factors such as ownership of boat, crew size and marketing methods. Often, the term "artisanal fishery" is used to describe small-scale fishing.
34	Fishing quota (percentage of total permitted catch) earmarked for local fishing communities as rights	Quantity of catch permitted, by species, season and fishing community, according to local practices and regulations	Fishing regulatory bodies	This may be applicable to both coastal fishing and fishing in inland ponds and lakes controlled by the government.
35	Annual change (percentage) in production from aquaculture farms	Quantity and average unit price of different products from aquaculture	Department of Aquaculture and the National Statistics Office	Aquaculture products include weeds, plants, animals and even ornamental and medicinal products. Efforts should be made to cover all such products being cultured in-land and in the sea. It will be useful to compile this indicator in terms of both quantities and values. The value of a diverse group of products could be pooled to form a single indicator. It would be desirable to compile this indicator at the country, region, and district level, or even at lower levels.
4. Forestry (developing, caring for or cultivating forests; management of timber production)				
<i>Early outcome</i>				
36	Indicators of access, use, satisfaction with respect to the forestry services: <ul style="list-style-type: none"> percentage of communities aware of the activities of forestry services in their area percentage of communities involved in sustainable forest management percentage of communities planning to expand area under sustainable forest management 	Total number of communities; the number of which are aware of forestry services in their area; the number of which are involved in sustainable forest management; area under sustainable forest management and plans for the next year per rural community	Stakeholders surveys	Usually, agricultural surveys and censuses do not have enough information on sustainable forest management; therefore ad hoc surveys are needed.

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
37	Employment in forestry-related activities (full-time equivalents)	Data on paid employment and self-employment	Ministry / Agency responsible for forestry, the National Statistics Office, special surveys	Employment should ideally include both paid employment and self-employment. However, data on the latter is often unavailable in national statistics. For paid employment, data from national statistics (ISIC/NACE Rev. 4 Activity A2) can be used. For definitions, see www.unstats.un.org/unsd/cdb/cdb_dict_xrxx.asp?def_code=388 .
38	Value of removals of wood and non-wood forest products (selected currency)	Authorizations and licenses granted, statistics on removals, trade statistics	Ministry / Agency responsible for forestry, special surveys	The value of the removals of a product indicates its socio-economic importance, as long as they are harvested within the framework of sustainable management.
39	Value of services from forests (selected currency)	Value of carbon sequestration, tourism, water supply, etc.	Ministry / Agency responsible for forestry, Ministry of the Environment, special surveys	Forests provide a number of environmental services, many of which are difficult to assess in terms of value. However, these services can be of great importance, particularly for individual projects, and in such cases, efforts should be made to assess them.
<i>Medium-term outcome</i>				
40	Area of forest under sustainable forest management (hectares)	Area with forest certification, area with forest management plan, local (documented) knowledge, time series if available	Ministry of Environment, Ministry/ Agency responsible for forestry, certification bodies	Although there is not yet any internationally agreed definition of "sustainable forest management", this information is required by many international agencies like CBD, UNFF, ITTO and FAO. When this indicator is compiled, the criteria used for its estimation should be documented.
<i>Long-term outcome</i>				
41	Proportion (percentage) of land area covered by forest	Area of forest, land area	Ministry/Agency responsible for forestry, geographical institute	Forest is defined as "land spanning more than .5 hectares with trees higher than 5 metres and a canopy cover of more than 1 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use." (FAO).
42	Annual growth (or percentage change) in rural household income from forest-related activities	Composition of rural household incomes	Household income surveys for rural areas	Only such forest-related activities that are a source of livelihood for the rural population should be considered. In the absence of this indicator, a comparison of wage rate for workers in forest-related activities and other workers in rural areas could provide a proxy (not a substitute) indicator.
43	Growing stock per hectare (m ³ /ha) of forest	Area of forest, growing stock (volume)	Ministry/Agency responsible for forestry	Growing stock is the volume of the standing trees and it can be converted to biomass and carbon stocks using conversion factors provided by IPCC. The growing stock per hectare indicates if the forests in a given area have lost or accumulated stocks.

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
44	Rate of deforestation (percentage)	Information on area under forest cover, area reforested (additions to forest stock) and deforestation (deletion from forest stock) during the year	Ministry of Environment and Forests	Deforestation is the conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 1 percent threshold. It implies the long-term or permanent loss of forest cover and the transformation into another land use. It includes areas of forest converted to agriculture, pastures, water reservoirs and urban areas. It also includes areas where the impact of disturbance, over-utilization or changing environmental conditions affects the forest to an extent that it cannot sustain a tree cover above 1 percent threshold. However, it excludes areas where the trees have been removed as a result of harvesting or logging, and the forest is expected to regenerate naturally. See www.fao.org/faoterm . Another related indicator would be “ <i>Ratio of land area forested during the last year to total land area</i> ”.
5. Rural Micro and SME Finance				
<i>Early outcome</i>				
45	Indicators of access, use, satisfaction with respect to rural finance services, for example: <ul style="list-style-type: none"> percentage of the rural population eligible to obtain a business loan percentage of users who are satisfied with the banking services 	Total number of rural households; number of which are eligible to benefit from rural finance services by type of loan requested; and number of which are satisfied with the quality of banking services.	Central Bank or Lead Commercial Banks active in an area; special survey	In addition to eligibility criterion, access to banking services could be measured in terms of the extent of the network of banking institutions or distance at which a banking branch is located. While the statistics on use of banking services would be available from a banking institution, a survey of users may be desirable for assessing satisfaction of services. For planning such a survey, a list of customers available with banking institutions could serve as a sampling frame. See also Indicator of use at Serial No. 46.
46	Percentage of the rural population using financial services of formal banking institutions	Total number of rural households; number of which requested/accessed credit and/or savings from formal banking institutions	Central Bank or Lead Commercial Banks active in an area, population census, special survey	Use of financial services refers to loans, credit cards and deposit accounts of different types, etc. The agricultural census and surveys are often a source of information for this indicator with reference to households of agricultural holders. Agricultural censuses usually have a section on agricultural credit where access and use by type of credit institution are reported.
47	Percentage of bank branches that are located in rural areas	Spatial distribution of bank branches	Central Bank or Lead Commercial Banks active in an area	GIS and agricultural atlases can be useful in collecting and representing such data.
<i>Long-term outcome</i>				
48	Percentage of total savings that are mobilized from rural areas	Mobilization of savings from different areas	Central Bank or Lead Commercial Banks active in an area	Standard banking concepts should be followed.

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
49	Percentage of rural population using non-bank financial services	Total number of rural households; number of which requested/accessed non-banking financial services	Insurance and leasing companies and special surveys	Non-banking financial services refer to leasing and insurance.
50	Recovery rate of rural credit	Volume of loans by type of credit and rate of recovery in a specific period	Central Bank or Lead Commercial Banks or refinance institutions active in the area	Rate of repayment is a common indicator used by banking institutions for management of their operations. Usually, the recovery rate may be different for different institutions as well as for different category of loans. However, a range of recovery rates by types of credit is a useful indicator for monitoring purposes.
6. Agricultural Research and Extension				
<i>Early outcome</i>				
51	Indicators of access, use, satisfaction with research and extension advice, e.g. <ul style="list-style-type: none"> percentage of farmers having knowledge of a specific technology being disseminated by extension system percentage of farmers trying the specific technology advice from extension systems on their farms percentage of farmers who were satisfied with the specific technological recommendations of the extension system and judged it beneficial, with or without adaptation 	Total number of farmers; number of which had knowledge of a specific technology disseminated by the extension services; number of which applied the technologies suggested by extension services; and number of which were satisfied with the quality of the extension services	Special surveys	Although research and extension services are well connected, a distinction must be made between them in order to measure the quality of service. It may also be important to make a distinction between different channels of extension information as well as different service providers, e.g. public and private. Visits of extension workers to farmers lead to two-way communication. The examples given here actually refer to technological advice rather than the service provided by extension workers in bringing this advice to the farmers. A survey of the farmers to assess the services offered by the extension system would include indicators such as: (1) percentage of target farmers visited by extension workers in last two weeks; and (2) percentage of farmers satisfied with extension services in general. It should be noted that during the visits, not only is the new technology extended to the farmers, but also, feedback on the technology is obtained. Since indicator (1) is to measure the “degree of activity” of the extension system, the number of contacts of extension workers with the farmers should be taken into account, without considering the purpose of the visit.
52	Public investment in agricultural research as a percentage of GDP from the agriculture sector	Budget allocations to agriculture research institutions, GDP for agriculture	Ministry of Finance; National Accounts Statistics	Since the same agency is very often involved in both research and extension, public expenditure on these two activities is often reported together. Care needs to be taken to separate the two types of expenditures. In the absence of any other method, one could apportion the expenditure in the ratio of number of research and extension personnel.

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
<i>Long-term outcome</i>				
53	Percentage change in yields resulting from improved practices, for major crops of the country	Crop yield data for major crops	Current agricultural statistics or assessments based on interviews of farmers	It is often difficult to isolate the effect of several factors contributing to yield, e.g. variety of seed, fertilizer, water and weather. In order to establish if the observed increase in yield was caused by the improved practices, some type of experimental design for counterfactual comparison must be set. This indicator would refer to a specific project where the beneficiary farmers could be directly asked about their assessment of gain in yield.
54	Change in farmer income as a result of new technologies (by gender)	Yield before and after introduction of new technology, prices of outputs, distribution of agricultural land, area dedicated to new technology	Special studies on improved agricultural practices	Wherever detailed income surveys are not being conducted, this indicator may be compiled on the basis of the assessment and opinions of a target group of farmers.
7. Irrigation and Drainage (services related to water use in agriculture)				
<i>Early outcome</i>				
55	Indicators of access, use, satisfaction with respect to irrigation and drainage services, for example: <ul style="list-style-type: none"> percentage change in the proportion of farmers with access to a functioning (reliable and adequate) irrigation and drainage network percentage change in the number of users 	Total number of farmers; number of which have access to a reliable/adequate irrigation and drainage network; number of which use the irrigation and drainage network	Agricultural census; other crop related surveys or water user survey	See Technical Notes on indicators at Serial No.56 and 57. The actual number of beneficiaries from a canal depends upon the extent to which it is a reliable source of water. The adequacy of irrigation should be measured in the cropping season when irrigation is most needed.
56	Irrigated land as percentage of crop land	Total crop land area; irrigated crop land area	Agricultural census and current agricultural surveys	Irrigation refers to purposely providing land with water other than rain for improving pasture or crop production. Irrigation usually implies existence of infrastructure and equipment such as canal, pumps, sprinklers or a localized watering system. It also includes manual watering of plants using buckets, water cans or other devices. Uncontrolled land flooding by overflowing or rivers or streams is not considered irrigation. For further information, see <i>FAO Statistical Development Series No. 11</i> (para. 11.68-11.9): <i>A system of integrated agricultural censuses and surveys</i> , Vol. 1. Countries should formulate a precise definition of irrigated and drained land by referring to FAO statistical guidelines. Land area that receives at least one controlled irrigation a year may be considered irrigated. The concept of “command area for irrigation canals” often leads to an over-estimate of the number of beneficiaries

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
57	Percentage of users who report a significant increase in crop yields as a result of the provision of irrigation and drainage services	Crop yield data for irrigated crops; crop yield data for the same crops cultivated in similar conditions without irrigation	Agricultural census; other crop-related surveys or water user survey	See Technical Notes on indicators at Serial No. 55, 56 and 62.
58	Service fees collected as a percentage to total cost of sustainable Water User Association (WUA) activities and functions	Total WUA budget; part of which came from collected fees.	Special studies on financial aspects of WUA	Usually, a considerable proportion of WUA's income should come from service fees, the information on which should be available in administrative records
<i>Long-term outcome</i>				
59	Percentage change in average downstream water flows during dry season	Monthly average downstream water flows	Records of project authorities	Regional records are usually also available.
60	Percentage change in agricultural value added created by irrigated agriculture	Area benefiting from a project, area under major crops of the command area of the project, yield of crops before and after availability of irrigation, prices of the crops sown in the command area	Special studies	The study may need to confine to command area of an irrigation project.
61	Percentage of irrigation schemes that are financially self-sufficient	List of irrigation schemes, their running costs and revenue collected	Ministry of Water Resources	Financial self-sufficiency here refers only to operation and maintenance costs.
62	Percentage increase in cropping intensity	Area equipped for irrigation data, crop yields in irrigated area	Census of Agriculture; current agricultural surveys and related surveys	This indicator is aimed at judging the effects of irrigation projects. There are other possible proxy indicators for monitoring effects of an irrigation project, viz., yield of crops sown in the area or changes in choice of crops itself. See, for instance, Indicators at Serial No. 23 and 57. It should be noted, however, that the cropping intensity is highly positively correlated with the extension of irrigation facility, whereas gains in yield and choice of crops could be attributed to other factors as well.

SI. Indicators No.	Core Data Requirements	Data Sources	Technical Notes
8. Agri-business (agricultural marketing, trade and agro-industry)			
<i>Early outcome</i>			
63	<p>Indicators of access, use and satisfaction with respect to agribusiness and market services, e.g.</p> <ul style="list-style-type: none"> percentage of farmers aware of market price and information services percentage of farmers using market price and information services percentage of farmers who are satisfied with agri-business and market services 	<p>Total number of farmers; number of which are aware of market prices and information services; number of which used market price information and/or market services; and number of which were satisfied with market information services received.</p>	<p>Stakeholders surveys</p> <p>Surveys could be complemented by studies on the means of communication for each region, their audience, etc.</p>
64	<p>Percentage change in number and value of activities managed by agro-enterprises</p>	<p>Number and value of transactions managed by agro-enterprises, by type of business</p>	<p>Enterprise survey</p> <p>In order to get the information from an enterprise survey on a regular basis, it may be necessary to review the definition of enterprise so as to include small-scale rural enterprises. This indicator could be compiled on the basis of information that is usually maintained as a sampling frame for the enterprise survey.</p>
65	<p>Proportion (percentage) of agro-enterprises adopting improved/certified hygiene/food management system</p>	<p>Number of agro-enterprises by type of business. Number of agro-enterprises certified as following specified phytosanitary measures and food quality standards</p>	<p>Ministry of Industry; hygiene and food certification bodies</p> <p>A precise description of “improved/certified hygiene/food management system” is needed. This may be done following national standards for food safety and processing.</p>
<i>Medium-term outcome</i>			
66	<p>Change (percentage) in sales/turnovers of agro-enterprises</p>	<p>Benchmarks and subsequent data on enterprises covering sales, cost structures, and gross and net profits</p>	<p>Standard accounting concepts should be followed.</p> <p>Direct data collection through special surveys, including enterprises and a control group of enterprises</p>

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
<i>Long-term outcome</i>				
67	Percentage change in number of agricultural inputs outlets	Number of retail dealers for each type of inputs	Ministry of Agriculture; companies marketing agricultural inputs	Such information is usually maintained by the marketing division of input supplier companies. However, a system of reporting may need to be established to compile this information on a periodic basis.
68	Percentage increase in private sector investments in agriculture	Private capital formation in agriculture and non-agriculture sector in rural areas	National accounts statistics; special surveys to assess private capital formation in an area	The investment in rural areas is done by both the public sector and the private sector. Public sector investment stimulates private sector investment. Estimates of both public and private capital formation are compiled by the organization responsible for National Accounts. Often, however, it may be difficult to find these estimates at the subnational level or disaggregated by rural and urban areas, whereas project monitoring tends to focus on a specific area. In such a situation, it may be necessary to carry out a special survey, e.g. Rural Investment Climate Survey (RICS) focusing on households and enterprises in the specified area. See an example of RICS in Indonesia at www/worldbank.org . Such indicators could also be generated using multipurpose surveys such as Living Standard Measurement Studies (LSMS).
69	Percentage increase in market share of cooperatives/agribusiness enterprises	Time series of value of transactions of cooperatives/agribusiness enterprises, by product or group of products.	Ministry of Industry, special studies	This may be compiled for specific product or for a group of products. The activities to be covered in the agri-business sector would need to be precisely defined.
C Indicators for Thematic Areas Related to Agriculture and Rural Development				
1. Community-based Rural Development				
<i>Early outcome</i>				
70	Indicators of access, use, satisfaction with respect to services provided by community-based rural development organizations, for example: <ul style="list-style-type: none"> percentage of members of community/producer associations reporting increased production or profits as a result of membership received. 	Total number of farmers who are members of community-based rural development organizations; number of which reported increased production or profits as a result of membership, and number of which were satisfied with the with services received.	Special surveys of households and/or members of the organization	The increase in production/profits directly ascribed to membership is difficult to measure. The indicator should be estimated from subjective perception of surveyed farmers. The membership records of community organizations and demographic information would provide a sampling frame for the survey,

Sl. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
71	Percentage of farmers who are members of community/producer organizations	Total number of farmers; number of farmers who are members of community/producer organizations	Special surveys to directly ask households or indirectly compiled on the basis of the membership record of community/producer organizations and demographic information	Community/producer organizations such as cooperatives or self-help groups may be working in one or more of the activities related to production and marketing. Their activities may include: input supply, water use, credit supply and marketing of produce, among others. Indicators on groups/associations/organizations for specific activities will also result in useful indicators for monitoring community development as will the development of the specific ARD subsector. For example, information on “self-help groups working in micro-credit” will be an indicator for the rural credit subsector.
72	Proportion of community/producer organizations capable of meeting the production and marketing needs of their members	Total number of community/producer organizations; number of which were rated by their members as meeting their needs, by type of membership.	Stakeholders surveys and assessments	In order to qualify the organization as meeting the production and marketing needs of its stakeholders, it would be necessary to establish some quantitative lower bound on the percentage of stakeholders who confirm this capacity. For example, if more than 8 percent of surveyed stakeholders admit that “Organization A” is capable of meeting their production/marketing needs, then “Organization A” qualifies.
73	Proportion of community organizations (POs)/NGOs with functional internal system of checks and balances	Total number of community organizations; number of which meet the pre-established standards	National Registry of NGOs; governing laws, procedures and accounts of NGOs	This would need special studies that will make a subjective assessment of each of the NGOs based on their accounts, rules and laws of management.
74	Percentage change in number of community associations exercising voting power in local government budget	Time series of total number of community associations; number of which exercised voting power in local budget allocation	Survey of community associations	It should be useful to stratify the community organizations according to size of their budget (large, medium, small).
<i>Long-term outcome</i>				
75	Percentage increase in number of local enterprises in rural area	Series of total number of local enterprises, by region	Enterprise survey, special survey	A local business would be defined that is mainly owned by residents of the area. These businesses would usually be family-owned enterprises operating in rural areas and agro-industries. The framework would need to be more precisely defined at the time of planning the survey. The scale of operation of the enterprise to be covered by the survey should be fixed at the national level.

SI. Indicators No.	Core Data Requirements	Data Sources	Technical Notes
2. Natural Resource Management			
<i>Medium-term outcome</i>			
76	Withdrawal of water for agricultural as a percentage of total freshwater withdrawal Area equipped for irrigation; area under different crops under irrigated and rainfed conditions; irrigation intensity and water requirement ratios of different crops; number of irrigations actually provided by farmers in season (on an average in an area); estimates for per capita water consumption by humans and animal; information on lift water irrigation devices (e.g. wells), etc.	National Ministry of Water Resources; special studies using crop and irrigation data from agricultural census/ surveys to estimate use of water in agriculture, per capita consumption by humans and consumption by industries	In order to ensure comparability over time, it would be necessary to clearly specify the related concepts prior to establishing a system to regularly compile data for the indicator. This indicator should take into account the use of both surface and groundwater. It may be necessary to establish the methodology through a working group of local experts and consulting internationally established methods. See also: www.fao.org/nr/water/aquastat/water_use/index.stm ; and www.fao.org/nr/water/aquastat/data/query/index.html .
77	Proportion (percentage) of land area formally established as protected area Information on land area of formally protected areas; total land area of the country or project area	Ministry of Environment	IUCN defines six categories of protected areas, ranging from strict nature reserves to managed resource protection areas. Countries usually assign their protected areas to one of these categories. Depending on the objectives of an evaluation, all or a subset of these categories can be used.
78	Change (percentage) in soil loss from watersheds Area that has become uncultivable or has witnessed substantially reduced yields due to soil erosion and total area of watershed	Watershed authorities	Soil erosion is one type of soil degradation. According to FAO WCA 21, "Soil erosion is the displacement of soil material by running water, rainfall, wind or other factors resulting in decline of arable layers" (see para. 11.65). This indicator should be compiled on the basis of a quantitative measure of area affected by soil loss.
<i>Long-term outcome</i>			
79	Change (percentage) of farm land and under risk of flood/drought Time series of information on drought/flood-prone areas of farm land and total farm land area	Ministry of Agriculture, Ministry of Environment	The basis of this indicator will be national assessments of drought/flood-prone areas.

SI. Indicators No.	Core Data Requirements	Data Sources	Technical Notes
3. Land Policy and Administration			
<i>Early outcome</i>			
80	Percentage of land area inventoried	Total land area and total registered land area	Census of Agriculture, Land/Cadastral Register
81	Percentage of land area for which there is a legally recognized form of land tenure	Total land area and area over which holders have a well-defined right to access and use	Agricultural census; Land Registration Authorities It is important to consider the date of the cadastre. In some countries where cadastral registers are outdated, the indicator should be accompanied by references to the date of cadastral register to avoid confusion. There may be many types of land tenure forms recognized by a local court of law for adjudication. Such land tenure forms would be considered "legal". What is "legal" in one country may be "non-legal or illegal" in another. The intention here is to assess the area of land over which owners or tenants have a stable right to access and use. For more details, see concepts recommended in the FAO World Programme for Agricultural Census 21 (pp. 8-81) at: www.fao.org/es/ess/census/wca21.asp . Note that the information obtained from agricultural census would refer only to the land operated by the agricultural holders. Such land which is not being operated for agriculture will not be covered in the data obtained from agricultural census.
<i>Long-term outcome</i>			
82	Share (percentage) of land over which there are disputes	Total area under dispute on a precise reference date; total land area at that date	Land/Cadastral Register; Land Dispute Settlement Authorities/Courts This is an indicator of the state of functioning of the land regulation laws and the related administrative system. In the absence of area under disputes, the number of disputes could be a substitute indicator.
83	Percentage of agricultural households that have legally recognized rights to land	Information on land tenure	Population Census and Agricultural Census, special survey in project area An agricultural household is one whose primary source of income is agriculture. An agricultural operational holder is one who manages some land or livestock as his/her own enterprise. Most agricultural holdings need land to carry out their operations, except perhaps for nomadic livestock holdings. The indicator thus gives the percentage of such household whose main source of income is agriculture and who operate the land with a legal right (legal or customary ownership or legal tenancy). Another complementary indicator would be " <i>change in population of landless agricultural household</i> " or " <i>landless agricultural labour</i> ". For calculating these indicators, one would need to fix the cut-offs on size of land below which the household would be considered landless. Such a cut-off may be decided on the basis of data available from agricultural census.
84	Percentage change in number of formal land transactions (quarterly or yearly basis)	Series of quarterly/yearly formal land transactions; estimate of total number of land transactions.	Land registration authority; land/cadastral register Since it is difficult to assess the total number of non-formal land transactions, the indicator focuses only on formal transactions.

SI. No.	Indicators	Core Data Requirements	Data Sources	Technical Notes
85	Change (percentage) in land access for women and minority groups	Percentage of land owned or under owner-like possession by different groups including women and minority groups	Agricultural Census, land/cadastral register	Usually, the agricultural census has information about the operational holder and not the owner of the land.
4. Policies and Institutions				
<i>Long-term outcome</i>				
86	Ratio of average income of the richest quintile to the poorest quintile (%) in rural areas	Average income per quintile in rural areas	Household budget or income surveys	A comparison of this indicator for rural and urban areas, at least at the national level, as well as by gender could provide meaningful insight into income inequalities.