

# Improving Rural and Agricultural Statistics through Harmonization<sup>1</sup>

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## **Abstract**

*This paper focuses on the selection of indicators using the logical framework in the context of rural and agricultural statistics. A dynamic planning and management tool, the logical framework lays out the project inputs, outputs, outcomes, and impact. The paper presents the outcome and impact indicators as well as the measurement of results and impact. The paper concludes with reference to harmonization at the international level.*

**Key Words:** *Statistics harmonization, Indicators, Monitoring and Evaluation*

## **Résumé**

*Cet article met l'accent sur le choix des indicateurs à l'aide du cadre logique dans le contexte des statistiques rurales et agricoles. En tant qu'outil dynamique de planification et de gestion, le cadre logique met en relief les intrants, les extrants, les résultats et l'impact du projet. L'article présente les indicateurs de résultats et d'impact ainsi que l'évaluation des résultats et de la mesure de l'impact. La conclusion de l'article fait référence à l'harmonisation au niveau international.*

**Mots clés :** *Harmonisation statistiques, Indicateurs, Suivi-évaluation*

## 1. INTRODUCTION

Harmonization is central to the process of monitoring development goals at the international level, and particularly for agriculture and rural development goals. Although some of the indicators are already available in the United Nations Food and Agricultural Organization (FAO) statistical database, for several countries, the series are either non-existent or partial. In an attempt to address this problem, the paper presents a framework

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<sup>1</sup> This paper draws on *Tracking Results in ARD in Less-Than-Ideal Conditions: A Sourcebook of Indicators for Monitoring and Evaluation* by Donor Platform, FAO, 2008.

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for indicators which allows for performance and results monitoring before referring to harmonization at the international level.

## 2. A LOGICAL FRAMEWORK FOR INDICATORS

The way in which a poverty monitoring system is formulated remains essentially the same, although its contents may vary from one country to the next. The approach is not limited to poverty monitoring but can be applied to any sector for which statistical information needs to be collected and analyzed.

The procedure is based on the idea of the logical framework, which describes the project development in terms of inputs which are combined together to produce outputs, which in turn produce outcomes, and finally result in a project impact. The logic of this approach is that if the inputs are not available in the right quantities at the right time, then the delivery of the outputs will be adversely affected. Similarly, if the outputs are not generated according to plan, then the expected outcomes will not be forthcoming, and this in turn will affect the overall impact. It is therefore necessary to ensure that there are appropriate monitoring activities for each of the levels.

The logical framework is generally used for project design and is a practical tool to better comprehend the logic that characterizes the development process. In addition, it provides a structure for developing a project monitoring and evaluation (M&E) system that includes all stages of the project from identification to completion. There is a belief that the process of monitoring progress, or the lack thereof, at each of the levels will be facilitated once the logic of the project has been defined using the logical framework. With that logic, the information needed for monitoring the project's success is likely to be reduced to a relatively small number of key indicators.

The process of developing a monitoring and evaluation program/intervention involves four steps, which are designed to address the following questions:

1. What information is needed?
2. What tools do we have? What tools do we need?
3. What outputs should the system generate? Who will produce them?
4. What resources are needed to implement the program?

This approach should help to guarantee that core data needs have been identified, a work program established, and an institutional framework defined.

Therefore, during the project's life, the M&E system should be producing well-timed reports on project progress. Ultimately, enough information should be collected for an evaluation to be conducted to inform the appropriate stakeholders on whether the project has achieved its expected objectives and to highlight any unexpected outcomes.

A substantial part of the literature has been devoted to the selection of appropriate indicators, and a number of lists have been prepared on possible indicators for monitoring different types of projects. However, these documents are difficult to apply in general. The list of indicators is exhaustive and the underlined data usually cannot be secured with the necessary precision or regularity. The starting point in the selection of indicators should be the issue of measurement. This provides a framework in the process of identifying a minimum list that requires the lightest of monitoring and evaluation arrangements. Still, with the broad needs of the users, the number of possible indicators is important. The actual selection of indicators should be a participatory activity involving the key stakeholders. This paper outlines a systematic approach that can be used to help harmonize the most critical indicators that need to be selected.

### 3. IDENTIFYING THE REQUISITE INDICATORS

With the application of the logical framework approach, the requisite information can be grouped into four general categories. Information is needed for:

- *Input monitoring* to monitor the level of resources being assigned to services and programs intended to reduce poverty;
- *Output monitoring* to monitor the delivery of the sectoral services designed to reduce poverty (e.g. the delivery of such services as agricultural extension advice);
- *Beneficiary monitoring* to measure which population groups have access to poverty alleviation programs and projects, the extent to which they make use of them, and the degree to which these programs and projects meet the beneficiaries' needs;
- *Impact evaluation* to measure the overall impact of policies on welfare conditions and poverty levels.

### 3.1 Performance monitoring

Performance (inputs and outputs) is the “implementation” or “efficiency,” and measures actual against expected results; it is a measure of the quality of management. In general, it covers all four levels of the logical framework causal chain. However, it focuses mostly on the bottom-end inputs and outputs and on how efficiently the project can convert inputs into outputs.

Performance indicators are measures that describe how well a project/program is achieving its objectives. Whereas a results statement identifies what the project/program hopes to accomplish, indicators tell specifically what to measure to determine whether the objective has been achieved.

Indicators are usually quantitative measures but may also be qualitative observations. They define how performance will be measured along a scale or dimension, without specifying a particular level of achievement. (Planned levels of achievement – targets – are separate from the indicators themselves.)

Performance indicators are at the heart of a performance monitoring system; they define the data to be collected to measure progress and enable actual results achieved over time to be compared with planned results. Thus, they are an indispensable management tool for making sound performance-based decisions about program strategies and activities.

Performance monitoring is in large measure a financial monitoring exercise, such as is carried out in a public expenditure review. It also involves monitoring the availability of human and material resources. The main sources of information are project information. Similarly, program monitoring draws information primarily from relevant project information, statistics, and makes no special demands on the national statistical service for information. In other words, it is the tracking of human and financial resources and the recording of how they are translated into outputs (project goods and services). Consequently, it includes financial monitoring and the analysis of financial records.

In addition to generating financial reports, the recorded data are used for cost-benefit analysis and analysis of costs per unit of output, etc. Cost data can easily be aggregated and merged with other data sets at higher levels. Input and output indicators are mostly used for monitoring the performance of the projects. It is therefore relatively simple to integrate

performance monitoring indicators into higher-level (regional or global) tracking systems. Input and output indicators are usually simple to construct, and most of the information is available in project accounts and records. Because they track project interventions at a relatively detailed level, they also tend to be very numerous. This is useful for the project manager but such an amount of detail is really not needed further up the management chain. Significant parts of the indicators, particularly output indicators, are non-financial.

It is the top two levels – impact evaluation and beneficiary monitoring – which make the greatest demands on special data collection exercises. Moreover, it is at the level of beneficiary monitoring that the demand for harmonization and core indicators is strongest. A results-based system attaches the highest importance to providing feedback on outcomes and goals, rather than on inputs and outputs. Table 1 presents the chief characteristics of the different classes of indicators below.

### **3.2 Results monitoring**

The change in emphasis from performance monitoring to results monitoring has important implications for M&E. With performance monitoring, the data are relatively easily available from internal institutional information systems; however, results monitoring turns to the targeted beneficiaries (clients) for information on the project and how it has affected them.

A critical objective of monitoring outcomes (results) is to underscore who is benefiting from the development intervention, and how. At the same time, it is also important to collect information about the clients who are *not* benefiting and to comprehend why. This process of data collection needs to be done while the development intervention is being implemented in order to activate corrective action.

To make the task easier, it has now become general practice to separate the short-term indicators from the medium- to long-term indicators (which equate more closely to indicators that would be used to measure impacts). For the short-term indicators, rapid reporting now becomes a critical factor, which in turn affects the choice of indicator. Indicators that change slowly are not good indicators for measuring short-term outcomes, nor are those that are subject to extreme random fluctuations, that exhibit a long time-lag; or that take time and are expensive to measure.

**Table 1: Characteristics of Different Classes of Indicator**

	<b>Logical Framework Levels</b>	<b>M&amp;E Activity</b>	<b>Characteristics of Indicator</b>	<b>Frequency of Reporting</b>
<b>Results</b> <i>Changes resulting from the presence of the project or program</i>	IMPACT	Evaluate results	Indicators may move slowly and be difficult to measure. They must show evidence of change, while analysis must establish the extent to which change is attributable to project/program being evaluated. They are derived from ongoing monitoring activities plus dedicated evaluation studies.	5 years and over
	OUT-COMES	Assess results	Indicators should respond quickly and be easy to measure. They should measure the extent to which beneficiaries have changed behavior due to the project. Typical indicators include access, use and satisfaction with project services. Sources include surveys of beneficiaries and service providers and service delivery data from surveys and administrative records	1-5 years
<b>Performance</b> <i>(Efficiency of the project or program)</i>	OUTPUTS	Track delivery of goods & services	Indicators are at the heart of a performance monitoring system. Outputs are generated by the project/program. Outputs may include physical outputs, services, training, advice, etc. Sources include Management Information System and administrative records.	6-18 months
	INPUTS	Monitor resources and activities	These indicators relate to physical, human and financial resources. Sources include Management Information System and administrative records.	Quarterly to annual

*Source: Adapted from Tracking Results in ARD in Less-Than-Ideal Conditions: A Sourcebook of Indicators for Monitoring and Evaluation, Donor Platform, FAO, World Bank 2008.*

What is needed are indicators that respond quickly and that are easy to collect. Again, it should be possible for them to be disaggregated and presented for different subgroups of the population (e.g. women) and also be aggregated upward and used to calculate indicators at the national, regional, or global level.

### 3.3 Impact evaluation

The impact evaluation objective is to determine the impacts of an agriculture and rural development project/program. To that end, a comparison group is needed to measure what would have happened to the project beneficiaries had the program not taken place. The process of identifying this specific group, collecting the needed data, and conducting the relevant analysis requires a lot of careful, thorough planning.

The task of identifying a comparison group is challenging. A number of countries are now moving to household surveys that do not involve the collection of consumption data, but which instead collect easy-to-measure indicators of household wellbeing. Such indicators may include, inter alia: asset ownership, the mean number of persons per room and the number of unemployed adults. These data are used to create a composite poverty index, later used to rank households and group them into poverty deciles. Once this point has been reached, comparisons can be made between deciles. The point is that it is possible to identify and isolate those comparison groups that are at the bottom end of the distribution – and to observe whether they are deriving any direct benefit from the various agriculture and rural development programs.

Good impact evaluation gives the basis for fine policymaking. It provides evidence as to whether or not the project has achieved its impact, how large the impact is, and who has benefited (or not). Impact evaluation can be used as a results-based tool in addition to providing hard evidence which can be used to weigh and justify policy priorities. As the evaluation progresses alongside the intervention, it can be used to test features of the project and, where necessary, to modify design and improve effectiveness over time. Among other things, impact evaluations can help policymakers to examine the effect of a pilot, compare different delivery modes, and examine the impact of the project for different segments of population.

Overall, impact evaluation allows us to learn which projects work in which contexts, and to use these lessons to inform the next generation of policies not only in the project country, but also across countries. Finally, the exercise of carrying out an impact evaluation helps to build and sustain national capacities for results-based policymaking.

There is no standard approach to conducting an impact evaluation. Each impact evaluation has to be tailored to the specific project/program, country and institutional context, and the actors involved. That said, there are

some general aspects and actions that bear on the success of any impact evaluation.

A good impact evaluation is not an isolated exercise; rather, M&E are parallel and complementary activities. It is important to understand that monitoring is an activity that takes place at the beginning of the project, whereas evaluation takes place at the end. Wherever and whenever there is a monitoring activity, there needs to be a regular process of review – of questioning what the data mean, and of thinking through the implications for policy and for the future. Hence, both monitoring and the evaluation are continuous activities throughout the life of the project. On one side, the impact evaluation implies a familiarity with the project, the country, and the institutional context, the design options that are being considered, and the details of the rollout and execution. On the other side, key stakeholders need to embrace the logic of the evaluation, and to identify which project design and implementation elements will be critical in order to carry out an evaluation that will contribute to the success of the project.

It is generally thought that impact evaluation has to be multifaceted and data-demanding. This is not the case: there are a range of available types and methods of evaluation that do not require much in the way of additional data, including project reviews, interviews with key stakeholders, focus group meetings, performance audits, etc. However, as one progresses up the results chain, impact evaluation can become more and more challenging, and therefore require more data. Early in the implementation, impact evaluation may be no more than the annual review of inputs and outputs to guide the allocation of further resources during the next year. The problems appear further up the chain.

Impact evaluation and impact analysis are analytical tasks that extend way beyond the analysis of simple indicators. Impact analysis may be undertaken at any level, including project, sector, or country. Ideally, it requires information on key indicators at three stages: before (baseline data), during, and after the specific intervention or reform. It may involve the setting up of a quasi-experimental design that controls for sample characteristics and permits testing against counterfactual hypotheses so as to compare both the before/after situation and the with/without situation. The complete evaluation should also identify any unexpected or unanticipated outcomes.

To protect flexibility, the impact evaluation must be planned as early as possible. While there may be considerable uncertainty regarding the project

interventions at the early stages, by understanding the potentially large set of design options, the evaluation impact team will be in a better position to identify evaluation options. Flexibility also demands close attention to the political environment. The evaluation team needs to identify and communicate with relevant constituencies who may support or oppose the evaluation; they also need to keep an eye on how these constituencies may shift during the life of the evaluation.

There may be some concern about achieving the objectives of the evaluation within the timeframe of the project. Even though a number of the impacts should be observable early on, others may only be captured beyond the project life. Constructing a sufficient results framework that takes the project timeline into account will help craft a realistic evaluation. Therefore, the identification and collection of outcomes and indicators that make known the timing of the project and the evaluation will be essential. A financial strategy that allows for evaluation beyond the project life will be critical for longer-term outcomes.

It is important that, where an impact evaluation is being planned, the expected path that the analysis will take is mapped out as early as possible. In this way, the data requirements can be assessed and addressed accordingly. The process that has just been described for the selection of outcome indicators is in itself a preparation for an impact analysis further down the road. It sets out a specific conceptual framework and identifies channels through which the program/project services are to be transmitted. It is also important for consideration to be given in advance to the way indicators are to be selected, so that the impact on gender and on the environment can be extracted and evaluated.

If careful thought is given at the very start of the project to the selection of indicators to be monitored, and if they are selected so that they capture the most critical stages of the expected transmission mechanisms, then the additional data demands of the evaluation can be minimized.

A number of lessons have been learned for those operating in difficult conditions. They include the following:

- Some projects/interventions do not need complete impact evaluations and such evaluations should focus on the eventuality of lessons to be learned.
- Routinely monitoring data collected may serve for the evaluation purposes.

- Future data needs can be anticipated at the beginning of the program.
- Since most projects/interventions align toward a particular common goal, it is useful to consider certain aspects in the evaluation of impacts at the sectoral or country level rather than at the project level.
- Qualitative studies should serve where quantitative data are not available.
- Where there is a clear need for serious evaluation, this needs to be planned well in advance, to include both qualitative and quantitative studies, and to take into account both expected and unexpected outcomes. This will almost certainly involve combining data from various different sources, and reaching a considered view about the impact of a particular intervention. The implications of such a research agenda, with respect to the data needs, are considerable.

#### **4. IDENTIFYING AND PRIORITIZING A SET OF INDICATORS**

The objective here is to identify and prioritize appropriate indicators by bringing together all the indicators that have been discussed to this point and linking them to the indicators for monitoring national development objectives.

It is important to standardize and effectively monitor how the project/intervention is being implemented, since this is critical to the performance evaluation and to the assessment of whether the objectives of the project/intervention are being met. The examination of indicators on an annual basis will also track progress toward the achievement of wider national development objectives. Monitoring will also help to inform decisions regarding any steps that may be required to review policies and implementation measures.

Performance indicators were identified and the results indicators were grouped into different indicators for monitoring results. Subsequently, the focal point was on the outcome indicators, although there is a different set of outcome indicators that is equally important. This different set of outcome indicators comprises those not directly project-specific and those linked to several projects. These consist of macro- and national-level indicators and indices. These indicators shift as a result of broad policy changes or as a result of the combined effects of several programs or interventions. They include agricultural exports, food production, fertilizer use, imports, and price indices. They also include some of the more common

multisectoral indicators to contrast rural and urban areas, and to assess the results of the combined package of policies and programs identified in national development strategies. Such indicators might include: GDP per capita; the percentage of population living in poverty; urban/rural assessment of multisector indicators such as prevalence of underweight children under 5 years of age; the ratio of girls to boys in primary and secondary education; and the percentage of population with sustainable access to improved water supply, etc.

It is certainly not an easy task to come up with an identified set of indicators that meets everyone's requirements because different countries and users at different stages not only have diverging information needs, but also their own specific goals. The selection approach can be guided, however, by drawing on the experience of what other countries have done in the past. In that context, Annex 1 offers a set of choices of indicators that different countries and users can use to help them prioritize and select the most functional indicators for their development stage needs. The annex includes examples of good practices taken from different countries around the world.

Harmonization is critical for monitoring development goals at the international level, particularly for agriculture and rural development goals. In that context, a subset of 19 essential indicators has been selected from Annex 1 and chosen as priority indicators (highlighted in bold in the Annex). Some of these indicators are already available in the FAO statistical database (FAOSTAT). However for a number of countries, the series are either non-existent or partial, in addition to having significant gaps or figures that have been filled by imputation. Clearly, the international series are in need of urgent upgrading, but an important point is that the quality of the series can only be improved if all countries commit to maintaining the same indicators at national level, and also agree on common standards. These 19 essential indicators represent the minimum set that all countries need to maintain and update on a regular basis. Without this minimal guarantee at the national level, it will be very difficult to improve the quality of M&E at the international level. But this exercise of committing to maintaining a minimal set should not be seen as an additional load, since the same selected set of indicators serves not only to monitor at the international level, but also at a national level.

The selected set of indicators on their own are not sufficient to meet all monitoring and evaluation data needs; rather they should be viewed as an essential subset that needs to be incorporated in all national M&E

interventions. Table 2 presents 19 key harmonized indicators to track progress against identified goals, long-term outcomes and the achievement of objectives in agriculture and rural development intervention. Generally, it is essential to keep data collection to the minimum; thus, where possible, readily available published sources should be used alongside nationally sourced statistics, such as those published by the National Statistics Office. Where required, these will need to be supplemented by local surveys, including the established annual housing and non-residential development surveys undertaken by the countries.

The 19 priority indicators set out in Table 2 have been chosen on grounds of comparability, availability, and relevance. The table provides six indicators that are useful for measuring general sector performance of agriculture and rural development. One specific indicator each is incorporated for crop, livestock, fishery and aquaculture, forestry, rural finance, agricultural research extension, irrigation, and the agribusiness subsectors. Four indicators are included for thematic areas related to agriculture and rural development, four for community-based rural development, and one for land policy and administration.

It is not enough, however, simply to develop a list of desirable indicators without at the same time identifying the data needed to calculate them. Thus, linked to the concept of the priority indicators is the idea of maintaining a set of core statistical data series to underpin the indicators. Once these statistics are added together, the modest list of data requirements starts to grow very rapidly, with significant implications for the National Statistical System (NSS). This “shopping list” of data needs provides the basis for a dialogue with the suppliers. For most of the outcome indicators, this will be the National Statistical Office. It may also include other agencies that make up part of the NSS. The objective of the dialogue is to negotiate arrangements for a program of survey activities that will ensure the delivery of the appropriate data according to the timeline specified.

Table 2: List of 19 Priority M&amp;E Indicators

	<b>General Agriculture and Rural Development</b>
1	Public spending on agriculture as % of GDP from agriculture sector
2	Public spending on agricultural subsidies as % of total public spending on agriculture
3	Prevalence (%) of underweight children under 5 years of age in rural areas
4	Food production index
5	% annual growth in agricultural value added
6	Rural poor as a proportion of total poor population
	<b>Crops (inputs and services related to annual and perennial crop production)</b>
7	% change in yields of major crops of the country
	<b>Livestock</b>
8	% annual growth in value added of livestock
	<b>Fisheries and Aquaculture</b>
9	Fish production as % of existing stock (or a rating of state of major capture fish stocks relevant to exports and local food)
	<b>Forestry (developing, caring for, or cultivating forests; management of timber production)</b>
10	% of land area covered by forest
	<b>Rural Micro and SME Finance</b>
11	% of the rural population using financial services of formal banking institutions
	<b>Agricultural Research and extension</b>
12	Public investment in agricultural research as a % of GDP from agriculture sector
	<b>Irrigation and Drainage (services related to water use in agriculture)</b>
13	% of users who report significance increase in crop yields as a result of provision of irrigation and drainage services
	<b>Agribusiness (agricultural marketing, trade and agro-industry)</b>
14	% change in sales/ turnovers of target agro-enterprises
	<b>Community-based Rural Development</b>
15	% of target farmers who are members of producer organizations
16	Agricultural withdrawal as % of total freshwater withdrawal
17	Ratio of area protected to maintain biological diversity to surface area of the country
18	% change in soil loss from project watersheds
	<b>Land Policy and Administration</b>
19	% land area for which there exists a legally recognized form of land tenure

Source: Adapted from Tracking Results in ARD in Less-Than-Ideal Conditions: A Sourcebook of Indicators for Monitoring and Evaluation, *Donor Platform, FAO, World Bank, 2008*.

## 5. CONNECTING INTERVENTIONS, OUTCOMES, AND IMPACTS

The decisions on what and how to monitor cannot be made independently from the definition of goals, objectives, interventions, and targets; these should all relate to one another in a logical way. Establishing these logical relationships is a large part of developing an effective M&E system.

In particular, it can be difficult to establish cause and effect relationships between the outcomes of interventions (the direct results of the project's activities) and impacts, in terms of the project's larger goals and objectives. This is because impacts not only take time to emerge, but also because progress on the ground can rarely be attributed to a single intervention. Usually, it is the product of multiple interventions – not all of which lie within the project's scope of action – which are often too numerous and/or complex to feasibly monitor. That said, there are various approaches that can be adopted to get around this impasse, by:

- Making initial assumptions regarding causal links explicit and regarding these as hypotheses that the M&E will test;
- Identifying interventions outside the project that could influence impacts and choosing which ones to monitor based on the likelihood and potential degree of weight;
- Setting and monitoring short-, medium-, and long-term targets; and, most importantly,
- Developing an M&E system that is geared toward learning and adaptation.

## 6. CONCLUSION

In M&E, it is important to develop indicators to monitor all the key links in a chain of results or logical hierarchy. Without developing and analyzing indicators together in the context of a logical chain of results, it is difficult to identify the problem when goals and objectives are not reached. A good M&E system will also take into account possible tradeoffs and unintended consequences involved in any course of action. The key point here is that indicators cannot be identified in isolation: they must emerge from agreed goals and objectives, and the actions needed to achieve them.

## REFERENCES

Baker, J. L. (2000), *Evaluating the Impacts of Development Projects on Poverty: A Handbook for Practitioners*. Washington, DC: World Bank.

Casley, D. J. and K. Kumar (1987), *Project Monitoring and Evaluation in Agriculture*. Washington, DC: World Bank.

Food and Agriculture Organization (2008), *Tracking Results in ARD in Less-Than-Ideal Conditions: A Sourcebook of Indicators for Monitoring and Evaluation*. Washington, DC: FAO, Donor Platform, World Bank.

Kusek, J. and R. Rist (2004), *10 Steps to a Results-based Monitoring and Evaluation System: a Handbook for Development Practitioners*. Washington, DC: World Bank.

Valadez, J. and M. Bamberger (1994), *Monitoring and Evaluating Social Programs: A Handbook for Policymakers, Managers, and Researchers*, Washington, D.C.: World Bank.

**Website:**

FAO database on food and agriculture: <<http://faostat.fao.org/>>

## NOTE TO ANNEX 1: EXTENDED LIST OF INDICATORS

### **Background**

Annex 1 that follows provides an extended list of 87 indicators for measuring early outcome, medium-term outcome and long-term outcome, to serve as a menu for M&E professionals working in agriculture and rural development. Along with each indicator in the menu, related core data requirement, data sources, and technical notes and further references have been provided. For reference to the thematic group of agriculture and rural development, Annex 1 includes the 19 priority indicators which have already been presented in Table 2 – these are highlighted in bold in the Annex. The Annex indicators have been split in three categories:

- A. *Sector-Wide Indicators for Agriculture and Rural Development*
- B. *Specific Indicators for Agriculture and Rural Development: Crops, Livestock, Fisheries and Aquaculture, Forestry, Rural Micro and SME Finance, Agriculture Research and Extension, Irrigation and Drainage, and Agribusiness*
- C. *Indicators for Thematic Areas related to Agriculture and Rural Development: Community-based Rural Development, Natural Resources Management, Land Policy and Administration, and Policies and Institutions.*

## ANNEX 1: AN EXTENDED MENU OF INDICATORS

SI. No.	Indicators	Core Data Requirements	Data Sources
<b>Priority Indicators</b>			
<b>A SECTOR-WIDE INDICATORS FOR AGRICULTURE AND RURAL DEVELOPMENT</b>			
<i>1. Early outcome</i>			
1	<b>Public spending on agriculture as a % of GDP from agriculture sector</b>	Budget level items; Government spending level items; disbursements; national agriculture value added data	Ministry of Finance; National Accounts; National Planning Commission; donor county reports
2	<b>Public spending on agricultural subsidies as a percentage of total public spending on agriculture</b>	Budget level items; Government spending level items; disbursements	Ministry of Finance; National Planning Commission; donor county reports
3	<b>Prevalence (%) of underweight children under 5 years of age in rural areas</b>	Anthropometric data	Anthropometric surveys
4	Indicators of access, use, satisfaction with transport and communications services		Ministry of Transportation; national transportation statistics; transport/communication services providers; association; user surveys
5	% of population who consider that they are better off now than 12 months ago		Special household surveys
<i>2. Medium-term Outcome</i>			
6	<b>Food production index</b>	Crop area; production and yield data for major crop; livestock numbers and yields; felling rate; fishery production statistics	Fishery statistical system. Disaggregated data used for compilation of National Accounts Statistics.
7	<b>% annual growth in agricultural value added</b>		National Accounts arm of National Statistics Office

SI. No.	Indicators	Core Data Requirements	Data Sources
<i>3. Long-term Outcome</i>			
8	<b>Rural poor as a proportion of total poor population</b>	Household income and consumption estimates	Household income and consumption surveys
9	% change in proportion of rural population below USD1 (PPP) per day or below national poverty line	Incomes or consumption data (whenever possible consumption is preferred to income for measuring poverty)	Household budget surveys; other surveys covering incomes and expenditure; World Bank Development Research Group
10	% of the population with access to safe/ improved drinking water		Administrative or infrastructure national and subnational statistics; household surveys, Multiple Indicator Cluster Survey; demographic and health surveys, living standard measurement surveys; joint monitoring program for water supply & sanitation data (WHO & UNICEF) <http://www.wssinfo.org>
11	Consumer price index for food items		National Statistics Office
12	Agricultural exports as % of total value added in agriculture sector	Trade statistics; National Accounts statistics	National trade data; UN Statistics Division Key Development Data & Statistics
13	Proportion of under-nourished population	Data from household budget surveys	FAO national food security statistics; <http://www.fao.org/faostat/foodsecurity/index_en.htm>
14	Producer price index for food items	Prices received by domestic producers of food items	Prices surveys: <http://faostat.fao.org>
15	Ratio [or proportion] of arable land area to total land area of the country	Land use data	National Agricultural Statistics (Ministry of Agriculture, National Statistical Offices); FAO agricultural resources statistics <http://faostat.fao.org>
16	% change in unit cost of transportation of agricultural products		Unions of transport providers; national transportation companies.

SI. No.	Indicators	Core Data Requirements	Data Sources
17	% of rural labor force employed in agriculture		Labour force surveys; population census; agricultural census; International Labor Organization : < <a href="http://laborsta.ilo.org/">http://laborsta.ilo.org/</a> >
18	% of rural labor force employed in non-farm activities	Activity status rural household members, time worked in each activity	Farm labor data from National Census of Agriculture
19	% of the labor force underemployed or unemployed	Total and economically active population; employment and unemployment data; hours of work	National labor statistics; labor force surveys, International Labour Organization: < <a href="http://laborsta.ilo.org/">http://laborsta.ilo.org/</a> >
20	Annual growth of household income in rural area from agricultural activity (%)		Annual income-expenditure surveys
21	Annual growth of household income in rural area from non-agricultural activity (%)		
<b>B SPECIFIC INDICATORS FOR SUBSECTORS OF AGRICULTURE AND RURAL DEVELOPMENT</b>			
<b>B1 Crops (inputs and services related to annual and perennial crop production)</b>			
<i>1. Early Outcome</i>			
22	Indicators of access, use and satisfaction with services related to sustainable crop production practices, technologies and inputs, e.g., (i) % of small scale farmers who know about sustainable crop production practices (ii) % of farmers who applied/purchased the recommended package of inputs last season (iii) % of target farmers who adopted sustainable crop practices in their farms		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
<i>2. Medium-term Outcome</i>			
23	<b>% change in yields of major crops of the country</b>	A time series of crop yields per unit of land area for major crops or crops covered by a specific program	Objective crop yield measurement surveys or other forms of assessment

SI. No.	Indicators	Core Data Requirements	Data Sources
<i>3. Long-term Outcome</i>			
24	Yield gap between farmers' yields and on-station yields for major crops of the country	Yield expected to be achieved with recommended package of inputs, and actual yield as estimated through agricultural statistics system.	Crop surveys; claims of the agricultural research and extension system
25	& of total land area under permanent crops		Census of agriculture; current agricultural surveys
<b>B2 Livestock</b>			
<i>1. Early Outcome</i>			
26	Indicators of access, use, satisfaction with livestock services, e.g., <ul style="list-style-type: none"> <li>• % of livestock owners in contact with livestock officer in the last month</li> <li>• % of livestock owners using veterinary services within the last month</li> <li>• % of livestock owners satisfied with the quality of livestock services</li> </ul>		
<i>2. Medium-term Outcome</i>			
27	<b>% annual growth in value added in the livestock subsector</b>	Values of input used in livestock sector and output produced	National Accounts arm of National Statistics Office
<i>3. Long term Outcome</i>			
28	Livestock birth rate	.	Livestock surveys; estimates prepared by livestock specialists
29	% increase in yield per livestock unit	Per animal yield of milk, meat, wool etc., separately for each species	Livestock surveys; FAO yield livestock data: <http://faostat.fao.org/>
30	% change in livestock values	Livestock number and unit prices of livestock by species and breed	Department of Livestock, National Accounts arm of National Statistics Office

SI. No.	Indicators	Core Data Requirements	Data Sources
<b>B3 Fisheries and Aquaculture</b>			
<i>1. Early outcome</i>			
31	Indicators of access, use, satisfaction with fisheries/aquaculture services, e.g., <ul style="list-style-type: none"> <li>• % of fishing communities in contact with Fisheries Officer in last month</li> <li>• % of rural communities having constructed a fishpond in the last year</li> <li>• % of fishermen satisfied with the quality of fisheries services</li> </ul>		Stakeholders surveys. Information available from extension wing of Department of Fisheries and Aquaculture
32	Water use per unit of aquaculture production	Production from aquaculture; water used in aquaculture production; number of aquaculture units and their water-holding capacity	Department of Fisheries; special surveys of aquaculture production units
<i>3. Long-term Outcome</i>			
33	<b>Capture fish production as % of existing stock (or a rating of state of major capture fish stocks relevant to exports and local food)</b>	Scientific estimates of fish stocks and exploitation rates; or perceptions/assessment of community of fishermen about increasing/ decreasing of fish stock	Institutions involved in estimation of fish resources; stakeholder survey on perceived state of fish stocks
34	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 National Statistics Office
35	Fishing quota (% of total permitted catch) earmarked for local fishing communities as rights		Fishing regulatory bodies.
36	Annual change (in %) in production from aquaculture farms	Quantity and average unit price of different products from aquaculture.	Department of Aquaculture; National Statistics Office

SI. No.	Indicators	Core Data Requirements	Data Sources
<b>B4 Forestry (developing, caring for, or cultivating forests; management of timber production)</b>			
<i>1. Early outcome</i>			
37	Indicators of access, use, satisfaction with forestry service: <ul style="list-style-type: none"> <li>• % of rural population aware of the activities of forestry services in their area</li> <li>• % of communities involved in sustainable forest management</li> <li>• % of communities planning to expand area under sustainable forest management</li> </ul>		Stakeholders' surveys
38	Employment in forestry-related activities (full-time equivalents)	Data on paid employment and self-employment. Time series if available	Ministry / agency responsible for forestry; National Statistics Office; special surveys
39	Value of removals of wood and non-wood forest products (selected currency)	Authorizations and licenses granted, statistics on removals, trade statistics. Time series if available	Ministry / agency responsible for forestry; special surveys
40	Value of services from forests (selected currency)	Value of carbon sequestration, tourism, water supply, etc. Time series if available	Ministry / agency responsible for forestry; Ministry of Environment; special surveys
<i>2. Medium-term outcome</i>			
41	Area of forest under sustainable forest management (hectares)	For example, 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
<i>3. Long Term Outcome</i>			
42	<b>Proportion of land area covered by forest (%)</b>	Area of forest, land area	Ministry / agency responsible for forestry; geographical institute
43	Annual growth or % change in rural household income from forest related activities	Composition of rural household incomes	Household income surveys for rural areas
44	Growing stock per hectare (m <sup>3</sup> /ha) of forest	Area of forest, growing stock (volume). Time series if available	Ministry / agency responsible for forestry

SI. No.	Indicators	Core Data Requirements	Data Sources
45	Rate of deforestation (%)	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
<b>B5 Rural Micro and SME Finance</b>			
<i>1. Early outcome</i>			
46	<b>% of the rural population using financial services of formal banking institutions</b>		Central Bank or lead commercial banks active in an area; population census; special survey
47	Indicators of access, use, satisfaction with rural finance services, e.g., <ul style="list-style-type: none"> <li>• % of the rural population eligible to obtain business loan</li> <li>• % of users satisfied with banking services</li> </ul>		Central Bank or lead commercial banks active in an area; special survey
48	% of bank branches that are located in rural areas		
<i>3. Long-term Outcome</i>			
49	% of total savings mobilized from rural areas		
50	Rate of rural credit		Central Bank or lead commercial banks or refinance institutions active in the area
<b>B6 Agricultural Research and Extension</b>			
<i>1. Early outcome</i>			
51	<b>Public investment in agricultural research as a % of GDP from agriculture sector</b>	Budget allocations to agriculture research institutions; GDP for agriculture	Ministry of Finance; National Accounts Statistics

SI. No.	Indicators	Core Data Requirements	Data Sources
52	<p>Indicators of access, use, satisfaction with research and extension advice, e.g.,</p> <ul style="list-style-type: none"> <li>• % of target farmers having knowledge of a specific technology;</li> <li>• advice being disseminated by extension system</li> <li>• % of target farmers trying the specific technology advice from extension systems on their farms</li> <li>• % of target farmers who were satisfied with the specific technological recommendations of the extension system and judged it beneficial, with or without adaptation</li> </ul>		Special surveys
<b>3. Long-term outcome</b>			
53	% change in yields resulting from use of improved practices, for major crops of the country	Crop yield data for major crops	Current agricultural statistics or assessments based upon interviews of target farmers
54	Change in farmer income as a result of new technologies (by gender)	Average 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.
<b>B7 Irrigation and Drainage (services related to water use in agriculture)</b>			
<i>1. Early outcome</i>			
55	% of users who report significance increase in crop yields as a result of provision of irrigation and drainage services		Agricultural census; other crop-related surveys; water user survey

SI. No.	Indicators	Core Data Requirements	Data Sources
56	Indicators of access, use, satisfaction with irrigation and drainage services, e.g., <ul style="list-style-type: none"> <li>• % change in proportion of target farmers with access to functioning (reliable and adequate) irrigation and drainage network</li> <li>• % change in the number of users</li> </ul>		Agricultural census; other crop-related surveys or water user survey
57	Proportion of service fees collection to total cost of sustainable WUA activities and functions		Special studies on financial aspects of Water Use Association (WUA)
<i>3. Long-term Outcome</i>			
58	% change in average downstream water flows over project period during dry season		Project authorities' records
59	% 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
60	% of irrigation schemes that are financially self-sufficient		Ministry of Water Resources
61	% increase in cropping intensity	Area equipped for irrigation data; crop yields in irrigated area	Census of agriculture; current agricultural surveys; project related surveys
<b>B8 Agribusiness (Agricultural Marketing, Trade and Agro-industry)</b>			
<i>1. Early Outcome</i>			
62	Indicators of access, use, satisfaction with agribusiness and market services, e.g., <ul style="list-style-type: none"> <li>• % of target farmers aware of market price and information services</li> <li>• % of target farmers using market price and information services</li> <li>• % of target farmers who are satisfied with agribusiness and market services</li> </ul>		Stakeholders' surveys

SI. No.	Indicators	Core Data Requirements	Data Sources
63	% change in number and value of activities managed by agro-enterprises		Enterprise survey.
64	Proportion or % of agro-enterprises adopting improved /certified hygiene/food management system	Number of agro-enterprises by type of business; number of certified agro-enterprises	Ministry of Industry; hygiene and food management certification bodies
<i>2. Medium-term Outcome</i>			
65	<b>% change in sales/ turnovers of target agro-enterprises</b>	Benchmarks and subsequent data on enterprises covering sales, cost structures, and gross and net profits	Direct data collection through special surveys including targeted enterprises and a control group of enterprises
<i>3. Long-term Outcome</i>			
66	% change in number of agricultural inputs outlets	Number of retail dealers for each type of inputs.	Ministry of Agriculture; companies marketing agricultural inputs
67	% increase in private sector investments in rural areas	Private capital formation in agriculture and non-agriculture sector in rural area.	National Accounts statistics; special surveys to assess private capital formation in an area
68	% increase in market share of cooperatives/agribusiness enterprises		Ministry of Industry; special studies
<b>C INDICATORS FOR SPECIFIC AREAS RELATED TO AGRICULTURE AND RURAL DEVELOPMENT</b>			
<b>C1 Community-based rural development</b>			
<i>1. Early outcome</i>			
69	<b>% of target farmers who are members of producer organizations</b>		Special surveys to directly ask the households; or indirectly compiled on the basis of the membership record of community/producer organizations and demographic information
70	Indicators of access, use, satisfaction with services provided by community-based rural development organizations, e.g., • % of members of community/producer associations reporting increased production or profits as a result of membership		Special surveys to directly ask the households; or indirectly compiled on the basis of the membership record of producer organizations and demographic information. The satisfaction would need to be measured through a survey of members

SI. No.	Indicators	Core Data Requirements	Data Sources
71	Proportion of community/producer organizations capable of meeting the production and marketing needs of their members		Stakeholders' surveys and assessments
72	Proportion of POs/NGOs with functional internal system of checks and balances		National Registry of NGOs; by-laws and accounts of NGOs
73	% change in number of community associations exercising voting power in local government budget allocation		Survey of Community Associations
<i>3. Long-term Outcome</i>			
74	% increase in number of local enterprises in rural area		Enterprise survey, special survey
<b>C2 Natural Resource Management</b>			
<i>2. Medium-term Outcome</i>			
75	<b>Agricultural withdrawal as % of total fresh-water withdrawal</b>	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
76	<b>Ratio of area protected to maintain biological diversity to surface area of the country</b>	Information on area declared as biodiversity park or reserve forest; total land area of the country	Ministry of Environment and Forests
77	<b>% change in soil loss from project watersheds</b>	Area which has become uncultivable or witnessed substantially reduced yields due to soil erosion, and total area of watershed.	Watershed project authorities

SI. No.	Indicators	Core Data Requirements	Data Sources
<i>3. Long-term Outcome</i>			
78	Change in % of farm land under risk of flood/drought		Ministry of Agriculture; Ministry of Environment
<b>C3 LAND POLICY AND ADMINISTRATION</b>			
<i>1. Early Outcome</i>			
<i>2. Medium-term Outcome</i>			
79	% of land area inventorized		Census of Agriculture; land/cadastral register
80	Proportion of land area formally established as protected areas (%)	Information on land area of formally protected areas; total land area of the country, or project area. Time series if available	Ministry of Environment
<b>81</b>	<b>% land area for which there exists a legally recognized form of land tenure</b>		Agricultural census; land registration authorities
<i>3. Long-term Outcome</i>			
82	Share of land over which disputes exist (%)		Land/cadastral register; land dispute settlement authorities/courts
83	% of agricultural households that have legally recognized rights to land	Information on land tenure	Population census and agricultural census; special survey in project area
84	% change in number of formal land transactions		Land registration authority; land/cadastral register
85	% change in land access for women, minority groups	% of land owned or under owner-like possession by different groups including women and minority groups	Census of agriculture; land/cadastral register
<b>C4 Policies and Institutions</b>			
<i>3. Long-Term Outcome</i>			
86	Ratio of average income of the richest quintile to the poorest quintile (%) in rural areas		Household budget or income surveys

Source: Adapted from Tracking Results in ARD in Less-Than-Ideal Conditions: A Sourcebook of Indicators for Monitoring and Evaluation, Donor Platform, FAO, World Bank 2008.