

Experts' consultation for the development of a methodology  
for the diagnosis of agricultural innovation systems (AIS)

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13 - 15 June, 2018  
CIRAD 42 Rue Scheffer, 75116 Paris, France

**Technical report of the meeting**

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September 2018

## Background

The Food and Agriculture Organization of the United Nations (FAO) and the Centre de Cooperation Internationale pour la Recherche et le Developpement Agricole (CIRAD) entered in agreement in December 2017 to support the development of a methodology for the diagnosis of agricultural innovation systems (AIS). The purpose of the letter of agreement was to contribute to FAO's strategic objective 2: Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner by delivering the following outputs:

- One expert consultation workshop (including preparation of the list of experts, remote consultation of experts, a short report based on a literature review and remote consultation preceding the workshop)
- Outline of a methodology for the diagnosis of agricultural innovation systems including macro level indicators of AIS, and subsectors with a rural advisory services system.

To achieve these outputs the following activities were agreed jointly:

1. Remote consultation with experts and a rapid comprehensive review of method and macro level indicators for the diagnosis of agricultural innovation systems and identification/mapping of indicators, comprehensive analysis, data sources and identification of possible data gaps;
2. Organization and facilitation of consultation with experts to review AIS diagnosis methodology and indicators for the characterization of AIS properties/parameters, and of subsectors including rural advisory services system;
3. Support in finalizing the agricultural innovation systems diagnosis and sub-sectoral (RAS) assessment methodology;
4. Support in presenting the diagnosis methodology during the 1<sup>st</sup> International Symposium on Innovation for Smallholders and Family Farmers (November 2018).

This report is a summary record of the expert workshop convened by CIRAD and FAO on the development of a methodology for assessing agricultural innovation systems. The meeting was held from 13-15 June 2018 at CIRAD HQ in Paris. It brought together 30 experts<sup>1</sup> from academia, research, extension, the private sector, development agencies, and government representatives<sup>2</sup>. The general objective of the meeting was to provide insights to design and develop a methodology for AIS diagnosis. The specific objectives were to:

- outline the methodology for AIS diagnosis including indicators, methods and tools;
- reach agreement on a set of national high-level indicators for AIS performance assessment/diagnosis;
- provide guidance and recommendations to FAO for the operationalization of the diagnosis at country level.

The expected outputs were:

- an outline of AIS diagnosis methodology (key recommendations, framework, components, indicators, methods, tools, steps and processes for data collection, etc.),
- an agreement on a set of national high-level indicators for AIS performance assessment
- recommendations and practical guidelines for the operationalization of the diagnosis at country level.

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<sup>1</sup> See annex 1 for the list of participants

<sup>2</sup> See annex 2 for the categorization of participants

The meeting was organized around 7 interactive sessions with plenary and group discussions<sup>3</sup>. Figure 1 below presents the flow chart of the different sessions.

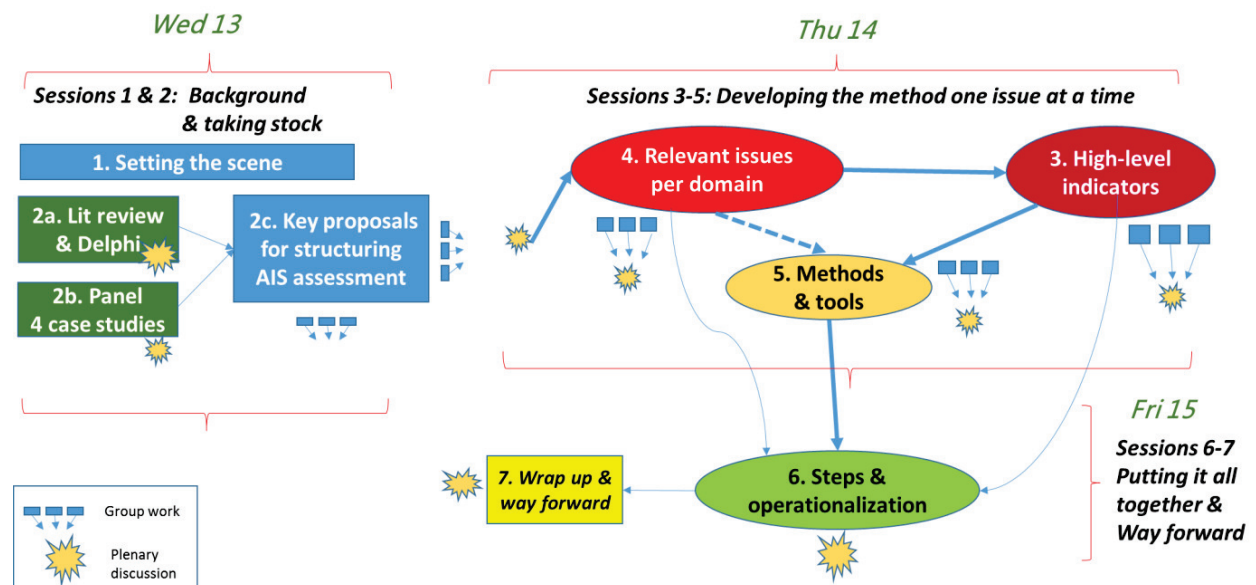


Figure 1: Flow chart of the expert consultation sessions

## Deliberations, conclusions and main recommendations

### Session 1. Setting the scene

Session 1 aimed at achieving a shared vision and common understanding of the meeting objectives, FAO expectations, and the participants' roles as well as expectations. Guy Faure, Director of UMR Innovation (CIRAD) welcomed the participants. He provided an overview of the meeting. In his presentation, Samy Gaiji, Head of the Research and Extension Unit (FAO/AGDR) shared background information on the development of the diagnostic tool for AIS<sup>4</sup>. He recalled that AIS assessment emanated from the recommendations of the 25<sup>th</sup> session of the Committee on Agriculture (COAG)<sup>5</sup> of FAO held in September 2016. COAG encouraged FAO to assist countries in the development of an agricultural innovation strategy through a proper diagnostic. FAO's expectations in this regard were that: (a) the methodology should be practical and useful, not too academic, (b) should help countries and provide relevant data and information to support and guide the development of their national innovation strategy, (c) methodology should combine high level indicators, and to some extent allow cross-country comparison, (d) the assessment of AIS should result in an understanding of the strengths and weaknesses of the innovation system, (e) the methodology should be a living tool that can be adapted to country specific needs and the status of development of their innovation systems, (f) that the methodology should get a strong buy in and endorsement of the experts.

The presentations stimulate discussions among participants. The main topics discussed were 1° the clarification of the, objectives of the assessment, 2° the intended users and 3° the linkages between the assessment of AIS and AIS high indicators and global innovation index mentioned by Samy Gaiji in his presentation.

<sup>3</sup> See annex 3 for the detailed agenda

<sup>4</sup> See annex 4 for FAO's PowerPoint presentation

<sup>5</sup> <http://www.fao.org/3/a-mr949e.pdf>

Participants mentioned three potential objectives of an AIS assessment : 1) to compare countries and provide recommendations, 2) to support policy makers to improve AIS, and 3) to support collective action to strengthen AIS. They emphasized that these three objectives cannot be achieved through a 'one size fits all' assessment methodology due to the inherent complex nature of AIS and its development status at country level. Participants suggested that a more realistic objective would be to design a process that aims at building consensus among AIS actors about understanding of strengths and weaknesses and identifying technical and policy interventions to improve its performance. Participants also recommended not to go too deep into research questions and to pay attention to the feasibility of the assessment.

Participants mentioned that the method can be used by all the actors of the AIS to support collective action for innovation. Actors may include decision makers (in the broader sense). FAO specified that the main intended users are stakeholders of key ministries such as agriculture, livestock, environment, science, technology and innovation. However, the process of AIS assessment should be inclusive of all actors and integrate their demands and needs.

Participants mentioned that the family farmers are the main final beneficiaries of the strengthening of AIS through the improvements of the performances of the agricultural sector (growth, sustainability, equity, etc.) in the countries. This is the reason why, various actors have to be involved in the diagnostic with specific emphasis on farmers' organizations.

Participants discussed the role of the global index in the assessment. FAO team specifies that the aim of the high level and global innovation index is to enable cross-country comparison on status on innovation and also to allow countries benchmarking and identify gaps and constraints to innovation that can be overcome through cross- country cooperation. Indicators are needed to enable decision makers to position their country in the global environment and to identify potential difficulties or gaps. Global and national indexes could be included in the assessment methodology.

## **Session 2. Stocktaking of AIS assessment methods and tools**

Guy Faure presented the main findings of an online survey and literature review<sup>6</sup> that were undertaken by CIRAD in preparation of the expert consultation. In summary, the findings of the two activities revealed that AIS is complex by nature but is also context-specific. The literature on agricultural innovation systems is rich of empirical studies on methods, approaches, and tools to characterize and assess the performance of AIS within and across sectors and at different levels (e.g. national, local, value chain, sector). Different views of AIS assessment have been reported in the literature: structural, functional, process and capacity, depending on the objective of the assessment and the research question and/or hypothesis. Given the context-specific nature of AIS, there is no single recipe/method to assess AIS across innovation systems and/or across countries. Findings highlighted that any AIS assessment should be designed carefully (i.e. the process is as important as the methods and tools to be used), be inclusive to build consensus about the performance of the innovation system (against a clearly defined objective) and to identify and prioritize the investments needed to support and unlock the capacity to innovate within the AIS framework.

Following the presentation of the main findings, a panel discussion<sup>7</sup> was organized to share experiences and enrich the deliberations. The panel discussion provided relevant insights on

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<sup>6</sup> See annex 5 for the PowerPoint presentation

<sup>7</sup> Panel was composed of Gert-Jan Stads (ASTI), Catherine Moreddu (OECD), Laurens Klerkx (WUR), Aurelie Toillier (CIRAD). Panelists were asked the following questions: (a) what are the strengths and weaknesses of your methodology, (b) how useful is your methodology for supporting policy makers in the design of innovation

conceptual, methodological and operational considerations for AIS assessment at value chain, local, sector and/or national levels that can benefit and be included during the assessment.

Aurelie Toillier (CIRAD) presented a methodological proposal based on the analysis of the findings of the online survey and the literature review<sup>8</sup>. Three types of AIS assessment were proposed based on three baseline scenarios. During the group discussions<sup>9</sup> participants suggested to go beyond the three models presented and also made the following recommendations on principles and operationalization of AIS assessment.

In fact, participants suggested five recommendations focused on AIS assessment main principles: 1° Adapt the method to address the specific objective and/or research question; 2° Understand objective/function of AIS and design the assessment methodology and process backward with a clear acknowledgement and understanding of the research questions/objectives; 3° Find a good balance between the depth and the purpose of the assessment; 4° The assessment should be demand-driven and led by AIS stakeholders/policy makers. It should be inclusive (i.e. involve key stakeholders including decision makers) to ensure uptake of the results; 5° Develop and strengthen capacities at country level.

Additionally, participants formulated six recommendations on the operationalization of AIS assessment: 1° Combine qualitative and quantitative methods; 2° Use a case study approaches; 3° Use secondary data; 4° Understand power relationships and dynamics between actors of the AIS; 5° Combine structural (e.g. mapping of actors and linkages) and functional (knowledge flow, funding, knowledge co-creating and diffusion) views; 6° In the case of external assessment, ensure clearer articulation between the supply and demand for information.

### Session 3. High level national AIS indicators

Christian Grovermann<sup>10</sup> introduced this session with a presentation on the potential of a global diagnostic tool for agricultural innovation systems<sup>11</sup>. In his presentation, he emphasized the interest at global level of high level indicators of AIS and thus the relevance and links with the diagnostic. The indicators presented were identified against four main domains of AIS as defined by TAP<sup>12</sup>, i.e. enabling environment, research and education, bridging institutions, and business and enterprise. Although the indicators were found relevant, there remain challenges on scoring and adaptation to different contexts and purposes. Following the presentation, participants discussed in breakout groups (4 groups, one group per domain) the minimum set of high level indicators to be collected at the national level, the usefulness of the set of indicators for cross-country comparison and for the assessment of in-country needs and the feasibility of data collection to measure indicators.

Participants underlined the high level indicators are needed and useful to communicate, track or monitor progress, advocate, inform investments strategies, raise awareness on the performance of innovation system in global context. The high level indicators can be used as dashboard to signal an

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policies and (c) what do you think your method emphasizes specifically that could not possibly be omitted from the AIS diagnostic tool we are trying to come up with and why?

<sup>8</sup> See annex 6 for the PowerPoint presentation.

<sup>9</sup> Group discussions were organized around three main questions: 1) Do you agree with the three types of baseline situations devised based on the specificities of the national context? 2) What are the main elements (“building blocks”) that should be part of an AIS diagnostic, at what scale & with what articulation? How should they interact? 3) What are the main implementation principles the diagnostic should follow?

<sup>10</sup> See annex 7 for the PowerPoint presentation

<sup>11</sup> [http://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2017-chapter2.pdf](http://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2017-chapter2.pdf)

<sup>12</sup> <https://www.cabi.org/Uploads/CABI/about-us/4.8.5-other-business-policies-and-strategies/tap-synthesis-document.pdf>

alarming performance of innovation system, but cannot be used to derive solutions to address the challenges and constraints facing the innovation system. Additionally, indicators may be used by a wide range of audiences including governments, donors, development partners, international organizations.

Qualitative and quantitative indicators are needed. But it is difficult to obtain a unique list of indicators because indicators are social constructions and the selection of indicators depends on the actors' representation of AIS, policy priorities, etc. At the same time, a generic methodology is required that applies to all countries for identifying and prioritizing indicators and to collect data. Up to date, most of the indicators proposed were based on standard methods of data collection, but new ways of collecting data - using "new" data sources, mobile phone data, social networks, satellite data, is required.

The indicators can be categorized according to the four domains. This categorization should be done with caution as it does not take into consideration the dynamic nature and interconnectedness between the domains. Other categories can be added according to the drivers of innovation (what triggers innovation?) and the key characteristics of AIS (e.g. demand driven research and extension systems, etc). By the end the selection of indicators depends on the purpose of the assessment and the relevance of the indicators to the assessment. However, participants underlined key topics for selecting indicators: linkages and interrelations between the domains, overall system level indicators, indicators that connect to the SDGs, indicators on social values, and indicators to measure the health and performance of the overall system in addition to measuring the separate components of the system.

Some challenges, are still remaining to the use of the high level indicator. For instance, the interpretation and scoring of indicator should be done with caution because they depend on the category of actors; in fact the actors could interpret the indicators differently (as positive or negative). Also, participants support the ownership of the assessment process by the national stakeholders but some countries may require technical support to strengthen capacities for data collection and analysis of indicators.

#### **Session 4. Structural, functional, processes and capacity characteristics of AIS**

Guy Faure presented the different views (structural, functional, process and capacity) of AIS which emerged from the literature review<sup>13</sup>. The participants reviewed in breakout groups discussion (four groups for four domains) key characteristics to take into consideration when undertaking the assessment based on the different views<sup>14</sup>. Participants identified key questions and topics for the analysis of the four domains<sup>15</sup>. Plenary deliberations highlighted four main conclusions.

The first conclusion is related to the demand for AIS assessment. Participants emphasized that the assessment process should be well anchored into existing national framework. For that to happen, the demand for AIS assessment has to emerge from the countries/governments. In fact, this assessment supposed the entire enrolment of key national actors in its conception and realisations. The Ministry of Agriculture is the primary interlocutor and direct counterpart of FAO for the assessment. However,

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<sup>13</sup> See annex 8 for the PowerPoint presentation

<sup>14</sup> The groups discussed the following questions: 1° What are the relevant specific diagnostic questions that need to be addressed for your domain and are useful for policy innovation; 2° Do include questions related to the interlinkages between your domain and other domains, to diagnose whether sufficient linkages exist among domains to enable innovation. Similarly, discuss what information would be needed to characterize such linkages among domains? 3° For each question formulated: what information is needed to answer this question?

<sup>15</sup> See annex 9 for the details of the questions per domain

several line ministries should be involved (inclusiveness). One challenge will be to get the Ministry of Agriculture, Ministry of Education/Science, Ministry of Finance and other Ministries to have a constructive discussion around AIS diagnostic priorities. During the inception/ initial stakeholders' consultation workshops, the different aspirations of the policy maker and other stakeholders should be clarified. During the inception workshop, the performance profile of the country (what the country actually wants to achieve) and the common vision of the future of agriculture in the country should be specified.

The second conclusion cautioned the sole categorization of actors across the four AIS domains. This categorisation does not take into account the systemic and evolving nature of AIS characterized by multiple linkages and interrelations, and knowledge flows between actors. For example, the frontier between bridging institutions and the enabling environment<sup>16</sup> is not clearly identifiable. Many actors (in the private sector, researchers, etc.) may also play a bridging role. Advisory services are not always dedicated to bridging activities. The analysis of AIS through the four domains doesn't put enough emphasis on the interactions among actors from different domains. Therefore, participants recommended that the entry points for a diagnostic should not solely focus on the domains but include and consider also the innovation processes and the interactions among actors at local or national level. The AIS framework based on the four domains should only be used as an analytical tool once the main issues related to AIS have been identified. In this way, structural (e.g. mapping of actors and linkages) and functional (knowledge flow, funding, knowledge creation and diffusion) features should be combined, during assessment.

In the same line, participants suggested to think beyond the national level particularly for the research domain and the education domain. In fact, participants considered research capacity as a global public good which can be available at a broader level than the national one particularly in a context of strong funding mobility. Participants encouraged the development of a regional way of thinking of AIS. For example, some countries are too small to support a strong national research system, then they need to envisage to mobilize external research competencies.

Participants suggested that a toolbox with various existing tools as case study analysis, organizational diagnostic, network analysis, historical analysis, is needed to study the various domains. However, the main challenge is to identify the best mechanisms to translate assessment results to inform policy processes (how to translate the results to policy makers?).

## Session 5. Methods and tools for AIS assessment

The aim of this session was to discuss methods, tools and steps that can be used and that are relevant and necessary for data collection during AIS diagnostic. The participants were divided into three groups<sup>17</sup>. The first group reviewed the high level indicators, the second group worked on methods that can be useful at the national level, and the third group worked on the subnational level (local, value chain, and territory).

The group that focussed on high-level indicators using the list provided by FAO document (see the presentation of C. Grovermann) formulated two main observations. First, some indicators are not relevant such as the number of researchers (the evaluation of quality is more important) or the amount of funding. Second, there is a need to question the relevance of the high level indicators per domain

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<sup>16</sup> The experts discussed and agreed that an enabling environment most often relates to policies, to governments and to markets.

<sup>17</sup> Each group was asked to answer the following questions: what are the sources (existing databases and statistics, or new ad hoc data collection)? What are the methods & tools needed? that can be used? to collect new data? What are the resources needed (human, funding), challenges and pitfalls?

due to their limitation to provide a systemic analysis and understanding of the AIS. Third, indicators related to social features are missing. It is important to raise policy makers' awareness about this issue, which is one of the key drivers of innovation.

The group that focussed on other data to be collected at the national level formulated observations. As identified previously, the group insisted on the fact that the process of assessment has to be led by the country and external support should be provided depending on the needs and demands of each country: "The country should get ownership of the AIS assessment". Additionally, participants prescribed the realization of a pre-assessment to facilitate discussion with key informants. This pre-assessment includes the review of existing documents to get a better idea of what is happening at the national level. This information help capture the current health of the system through. Additional information is needed. The group suggested to not defined *a priori* the tools which will be used to collect additional data. The aim and the purpose of information to be collected (analysis, visualization, support interaction, and make decision) need to be identified and clarified before tools are selected. These tools should also be selected to ensure the inclusion of smallholders in the reflection. The group emphasize the interest of collectively developing scenarios on a common vision of the future and policies should be aligned with the scenarios built. The group also suggested developing a broader vision of AIS which takes place in the context of the National Innovation System (NIS). Therefore indicators of the NIS are needed and should also be collected.

The group working on the sub-national level highlighted the need to analyse case studies. These case studies will help better understand the innovation processes. In fact, a comprehensive analysis of different innovation processes is needed to better understand and characterize the innovation processes, to identify the challenges and constraints facing selected key innovation and actors, and to take into account the different stages of innovation processes when promoting support mechanisms. These cases studies should be selected with national stakeholders through a participatory approach. In fact, actors of the innovation process should be engaged in the process at onset, not after. However, the group underlined the difficulty to identify and tailor the methods and tools to analyze case studies without clear indications on the specific issues to be addressed in each country and the availability of funds or timing for data collection.

## **Session 6. Steps and practical operationalization of AIS assessment at country level**

Guy Faure summarized the main conclusions and suggestions from the deliberations in the sessions 1, 2, 3, 4 and 5. Building on these conclusions and suggestions, participants discussed the operationalization of AIS assessment at country level in three groups' discussion i.e. Tanzania, Burkina Faso, and Peru. In each group, a representative of the country provided a brief snapshot of AIS. Using a country-based scenario, each group identified steps for undertaking AIS assessment. This session provided two main results: principles to conduct a diagnostic of AIS, principles and identification of steps (Cf. Box 1) of the AIS assessment method.

Participants emphasized the interest of supporting an action-oriented approach of the assessment to ensure AIS assessment is aligned with innovation policy design. In addition to that they emphasized the necessity of a process-based approach which favours the inclusive participation of stakeholders (policy makers and decision makers from different sectors: farms, firms, bridging institutions, research, education, civil society) to build ownership while keeping power relationships in mind. The inclusion suppose that capacity development activities are included into the assessment to enable stakeholders to participate in the diagnostic, the design of innovation policies, and the implementation of strategic actions. Even if the assessment is inclusive, participants advocate a good balance between internal (country led and owned) and external (technically supported by partners) assessment.



Also, the assessment should be adapted to the context, objectives and priorities for AIS and status of AIS at country level. First, the assessment should focus on specific factors that enable or hinder innovation at national, sub-national, and local levels. Second, the adaptation of the method should be based on the use of a mix of tools, combining quantitative and qualitative analyses.

**Box 1.** Skeleton of the AIS assessment steps

**Step 1 : Pre-assessment (before starting the assessment)**

- Raise awareness among the stakeholders
- Collect background information on innovation policies and AIS diagnostic

**Step 2 : Pre-assessment (at the beginning of the assessment)**

- Establish committees for strategic planning and a task-force for the assessment;
- Identify priorities for AIS assessment based on national policy and strategic priorities and objectives;
- Identify key indicators (high level indicators for cross-comparison of countries, indicators adapted to each country)

**Step 3 : Data collection and analysis**

- Analyse a set of sub-AIS
- Understand local innovation processes

**Step 4 : Mapping**

- Map the key organizations that aim to support innovation at national level
- Analyse policy processes and policy instruments for innovation (literature review, interviews, case studies, etc.).

**Step 5: Validation and adjustment of results**

- Share results
- Build scenarios for AIS policy
- Support policy makers and decision makers in designing an innovation policy articulated with policy instruments

**Step 6 : Implementation and monitoring**

- Implement pilots
- Monitor and evaluate for learning purposes

## Session 7. Wrap-up and way forwards: Synthesis, key recommendations for FAO and way forward

The expert meeting formulated key recommendations to take into consideration for undertaking AIS assessment. The first set of recommendations is relating to the interest to taking stock of successful experiences regarding AIS assessment or strengthening. In fact, good case studies should be identified in which AIS has been promoted, invested in and implemented at the national level to share these experiences with other countries. In the same idea, regional learning workshop should be organized. It consists in involving neighboring countries interested in AIS / AIS assessment so they can exchange their experiences about AIS. The second set of recommendations is related to the existing capacities to assess AIS in each country. Participant underlined the need for mapping organizations, platforms, and networks with the capacity to carry out or support AIS assessments. It is important to ensure that the different stakeholder groups in each country interested in an AIS assessment are willing to take ownership of the AIS assessment process, not only the government.

Participants advised that before heading into assessments in many countries at the same time, it would be useful to kick-start the process with a piloting stage, allowing assessments with a handful of voluntary countries. During this pilot stage, the approach could be tested and gradually refined. It would help adapt the method to different contexts, and to refine the “tool box”. Also, they suggested to make use of past experiences to design method and tools and, for example, to update the World Bank AIS Sourcebook published in 2012, and move towards a living toolbox approach.

The last set of recommendation for the establishment of the method is related to the establishment of an international core support team. Such a team could play a number of useful or even critical roles, such as: (1) serving as a clearing house for AIS and assessment related issues, (2) providing methodological training, advice and coaching to AIS assessment teams before and while they implement AIS assessments in their respective countries, (3) monitor and learn from what is happening at the country level, (4) develop generic lessons and recommendations across countries, and (5) kick start a longer term commitment to implementing an AIS approach. This support team should be composed of selected experts from different institutions who have recognized skills in AIS and are available to serve as resource persons for the duration of the assessment. Having such a team in place would reduce the individual country-level learning curve associated with understanding and implementing AIS science and practice. It should help solve the inescapable tension between proposing a fairly standardized (centralized) AIS assessment approach and implementing a more decentralized one, country-owned, country-led and country-adapted, in an optimal manner. It should help develop a regional approach to capacity building on AIS in the different regions, by putting in place a “trainer training” scheme. At the same time, it should contribute to developing South-South collaboration.

## Conclusion

The expert consultation shed light on AIS assessment/diagnostic. Participants cautioned the use of a single methodology (as blueprint), rather they recommended developing guidelines with a toolbox that can be used and adapted to the specific needs and aspirations and the status of AIS in a given country.

Participants at the meeting acknowledged the importance of developing high level indicators of AIS, particularly as a means to allow benchmarking and cross-country comparison of innovation capacities. However participants did not reach consensus on a minimum set of high level indicators at national level. In addition, different views on the relevance and usefulness of indicators had emerged during

the meeting. High-level indicators cannot be the only entry point for AIS assessments aimed at action, particularly because they draw attention to problems but do not provide solutions.

Main drivers of innovation were identified for each domain of the AIS (research and education, bridging institution, firms and farms, environment and policies). Sets of questions to support the characterization of each domain were drawn up. However, the experts concluded that analysis per domain is not pertinent because what really matter are the interactions between the actors and between the domains. The domains provide a relevant frame for categorization, once the problems have been identified. Furthermore, each country is different and the degree of complexity or the development of the AIS will determine whether or not it is appropriate to focus on a specific domain.

The workshop helps identify the main principals and steps of the method. The method will not mobilize one specific tool but the experts suggest the necessity to develop and use a toolbox. The method and the tools need to be adapted to the situation of each country and to the objectives of the policy maker regarding innovation policies.

During the workshop, two types of principles have been identified. The first type includes principles related to the development of capacities and awareness of the decision makers and other actors to enable them to be part of and conduct the assessment. The second type of principles is related directly to the design of the method.