

Assessing the impact of the Standing Committee on Agricultural Research (SCAR). A tentative assessment framework

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Abstract: *The Standing Committee on Agricultural Research (SCAR) represents 37 countries from EU Member States, Candidate and Associated Countries. It aims at promoting and coordinating research and innovation policies in the fields of agriculture and wider bioeconomy. Through its initiatives, SCAR became a influential source of policy advice for the EU, and an arena for confrontation and collaboration for policy-makers, but also for experts and other stakeholders.*

In the context of the Coordination and Support Action CASA, it has been decided to design an impact assessment framework (IAF) to guide future assessments able to highlight the SCAR impacts and to identify possible weaknesses and opportunities to increase and improve them. The IAF aims at increasing SCAR impact by designing IAs capable to promote reflections among SCAR members and to act as catalyst of new inputs and ideas for individual and collective stakeholders.

This paper, developed after the first phase of the IAF elaboration process, describes rationale and key elements of the IAF, highlighting the challenges for the identification of the multi-dimensional and multi-level impact of SCAR. The nature of SCAR as a high-level policy coordination initiative with a wide range of expected impacts leads to identify five target areas, upon which the framework should be structured: Advice, Alignment, Joint implementation Awareness and Inclusiveness. These areas should be investigated on the base of pertinent evaluation questions through desk analysis, interviews and questionnaires, focus groups. Findings should be aggregated according to different levels of analysis: overall SCAR, single countries, single SCAR initiatives.

Keywords: SCAR, Impact assessment framework, Research policy, Bioeconomy

Introduction

Research and innovation in agriculture and bioeconomy occurs at the interface between different economic sectors (Ronzon et al. 2017, p.14), social environments and knowledge systems. These are contexts where public policies play a relevant role, such as, among others, in promoting biomass availability and for the research funding (Ronzon et al. 2017, p.9; Philippidis et al. 2016). In a multi-national integrated space like the EU, the complexity of the issues at stake is a key concern for the Standing Committee on Agricultural Research (SCAR), whose mandate is to promote research and innovation policies in the fields of agriculture and wider bioeconomy, while strengthening coordination and alignment between national strategies.

SCAR provides a space where different, sometimes competing perspectives can be confronted and combined. The overall challenge is to coordinate different national priorities

and agendas towards the common aim to develop a sustainable bioeconomy and agriculture and to make the EU a cohesive and pro-active actor in the global arena of research and innovation in agriculture.

Through its activities, SCAR became a influential source of policy advice for the EU, but also an arena for confrontation and collaboration between countries, as well as among policy-makers, researchers, experts and business sector. However, there is room to improve the efficacy and efficiency of its action, and the full awareness of SCAR actual and potential impacts has not been achieved yet.

For this reason, in the context of the CSA CASA¹ supporting SCAR, it has been decided to design an impact assessment framework (IAF) to guide future assessment exercises able to highlight the impacts of SCAR. The IAF aims at providing methodology, guidelines and tools to assess current performances and to identify areas of improvements of SCAR as an arena of dialogue between policy makers, researchers and business sector. The IAF is meant to guide systematic impact assessment exercises with elements of programme evaluation (useful to identify recommendations), covering all relevant fields according to available resources (flexibility), while minimising useless/redundant information.

The definition of the IAF is based on an overview of SCAR activities and expected outcomes, and by a preliminary recognition of existing impact assessments and programme evaluations of similar entities and initiatives. Impact assessment can be conducted at various levels and structured according to a range of parameters and criteria. This complexity requires clear and flexible guidelines to frame the assessment exercises.

SCAR addresses the research coordination towards innovation in agriculture and bioeconomy development, in a sustainability perspective. The SCAR approach to research and innovation policy focuses on multi-actor involvement within the emerging complex systemic model of Agricultural Knowledge and Information Systems (AKIS).

The development of AKIS is mentioned among the strategic outputs expected from SCAR (section 2). According to Röling and Engel (1991), an AKIS is *“a set of agricultural organizations and/or persons, and the links and interactions between them, engaged in the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information, with the purpose of working synergistically to support decision making, problem solving and innovation in agriculture”*.

As Leeuwis and van den Ban (2004) assert, the concept of AKIS was originated by an interventionist approach to agricultural policy based on the idea that innovation transfer should be strongly coordinated to accelerate agricultural modernization. Innovation was actually pursued in many countries through a strong national-level integration of public research, education and extension bodies, often under the control of the ministries of agriculture (Brunori et al., 2009; Knickel et al., 2009).

The increasing concern with environmental impacts of industrial agriculture, quality of life of rural population as well as new societal expectations from agriculture led to a new, and more complex, approach to innovation. In a more traditional view, innovation results from a top-down linear process based on new knowledge and technology coming out from research, applied to the production process and then adopted by farmers and practitioners through knowledge transfer. Nowadays, European policies focus more on innovation as an endogenous multi-actor process and, as well, the result of the interaction between actors, technologies and natural resources, and characterized by feedbacks and co-existence of different development trajectories at different scales and levels (Brunori et al., 2009; Knickel et al., 2009).

According to SCAR, AKIS describes a system of innovation emphasizing on the organizations involved, the links and interactions among them, the institutional infrastructure with its incentives and budget mechanisms, network characteristics and market structure.

¹ Coordination and Support Action CASA, supported by the European Commission and funded by Horizon 2020.

The core of the interactive innovation is the cooperative learning process aimed at co-developing solutions and generating co-ownership. In this context, the role of intermediate actors, such as farm advisors and innovation brokers, is particularly emphasized as they may play an important facilitating role in connecting AKIS actors, bridging between science and practice, and between specific in-depth knowledge and a holistic entrepreneurial approach.

This multi-actor and multi-level approach is indeed reflected in the SCAR organization, based on the networking of different countries and in the involvement of external experts and stakeholders in the activity of foresight groups and working groups. The prevailing presence of agricultural ministries in the SCAR Plenary is another feature that confirms the strong linkage between SCAR and AKIS approach.

The need for an integration of policy action, business sector and territories is thus intrinsic to this systemic approach. This is even truer if we enlarge the view from agriculture to bioeconomy.

There are different definitions for the bioeconomy, or bio-based economy (OECD, 2009; EuropaBio, 2011). Still in 2013 a distinction was identified between the ways in which the terms "bioeconomy" and bio-based economy" were used, although both were often "used as a buzzword for the challenge of the transition away from fossil fuels (Staffas et al., 2013). This distinction, seems to have blurred in more recent years. According to the EU Bioeconomy strategy, bioeconomy "encompasses the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy" (EC, 2012, p.3).

Bioeconomy is developing throughout Europe with the development of more flexible biorefineries and new biomass supply chains. Already in 2014 the total economic turnover of the whole bioeconomy in Europe was estimated at about EUR 2,2 trillion (around 9% of all sectors of the economy), with around 18.6 million jobs involved (Ronzon et al., 2017), features that are expected to increase in the next future.

Bioeconomy is perceived as a win-win strategy for economy and environment in the EU (O'Brian et al., 2015). This is true, however, as long as we move towards a socially and ecologically sustainable bioeconomy, integrated with circular economy, with awareness of possible costs and trade-offs between different bioeconomy impacts, like for example the pressure on land use (Wesseler et al., 2010; O'Brian et al. 2015). Besides, the development of bioeconomy is linked to design and adoption of radical innovations involving the socio-economic sphere alongside the technological one. These challenges and this transition can require the presence of markets and user demands that are not always available, as underlined by the transition school (Schot and Geels 2008), for which the public hand can play a key role. Thus, public strategies and policies are needed, and must consider this manifold complexity, to make bioeconomy a pillar of a sustainable development perspective (Ramcilovic-Suominen and Pülzl, 2017). As argued by Staffas et al. already in 2013, "*we foresee a need for considerable support in the forms of policies and/or financial instruments introduced for making the required investments economically feasible and manageable by industrial stakeholders as a major challenge.* (ibid., p. 2766).

At the EU level the Bioeconomy strategy (EC 2012), now under revision, aims at improving the knowledge base for the bioeconomy, encouraging innovation towards sustainable natural resources use and climate change adaptation and mitigation. The objective is the development of a comprehensive and coherent approach to bioeconomy development identifying synergies between different policies, initiatives and sectors (Mc Cormick and Kautto, 2013, p.2592). Synergies can be also sought with other EU strategies interpreting emerging fields of interventions deeply linked to the bioeconomy, like circular economy (EC 2015) and biodiversity (EC, 2011).

The action plan of the Bioeconomy strategy is articulated in three pillars: investments in research, innovation and skills; reinforced policy interaction and stakeholder engagement (also through the establishment of a stakeholder panel and an observatory on bioeconomy); enhancement of markets and competitiveness in bioeconomy sectors. The EU Bioeconomy strategy has been positively evaluated highlighting the fact a growing number of MS has

implemented national strategies², the strong evidence of major investments in research, innovation and skills, , the enhancement of markets in the main bioeconomy sectors (Eu Commission, 2017b). The current strategy has also received some criticism: for example Schmid et al. (2012) argue that an “industrial perspective” dominates the European bioeconomy policy framework, with the role of farmers and small agricultural enterprises overlooked. Other criticisms embedded in the new vision³ regard the need to include all the three pillars of sustainability (Economic, Environmental, Social), the inclusion of more focused actions and removal of overlaps, increased policy coherence.

This is the complex scientific, and policy environment in which SCAR operates and in which it is expected to have a significant impact. The paper presents the results of the first phase in the design of the IAF, highlighting the challenges related to the assessment the wide range of expected impacts of a structure like the SCAR, aimed at coordinating research strategies and policies and thus acting at the borders of different realms like science, policy, practice.

SCAR: history, mandate, structure

SCAR was established in 1974 through a Regulation of the EU Council (EC, 1974), with the aim to coordinate agricultural research policies at EU level between member states and associate countries (MS/AC). In 2005 the SCAR was re-launched with a renewed mandate reflecting the changes in the agricultural research agenda and the development of the bioeconomy as a new framework for the development of agriculture and related sectors (SCAR, 2015).

Currently SCAR “represents 37 countries, mainly through ministries or organisations such as research councils, from all EU Member States and observers from Candidate and Associated Countries” (SCAR, 2015, p.7). The Committee operates through a range of groups having specific responsibilities and objectives but which ultimately report to the plenary meeting of the SCAR delegates.

In the recent Reflection paper on the role of SCAR (SCAR, 2015, p.10), it is stated that SCAR enhances cooperation, coordination, and information exchange between the Member States through four main initiatives: providing strategic policy advice; carrying out foresight processes to reflect on future scenarios, developing common research agendas within EU countries, mapping research capacities in bioeconomy within the EU.

The relations between the four initiatives are represented in Fig.1, which shows how Strategic Policy advice is the ultimate goal of SCAR, pursued through the three other initiatives.

² See for example a comparative analysis of four regional bioeconomy strategies in Charles et al. 2016.

³ https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-975361_en

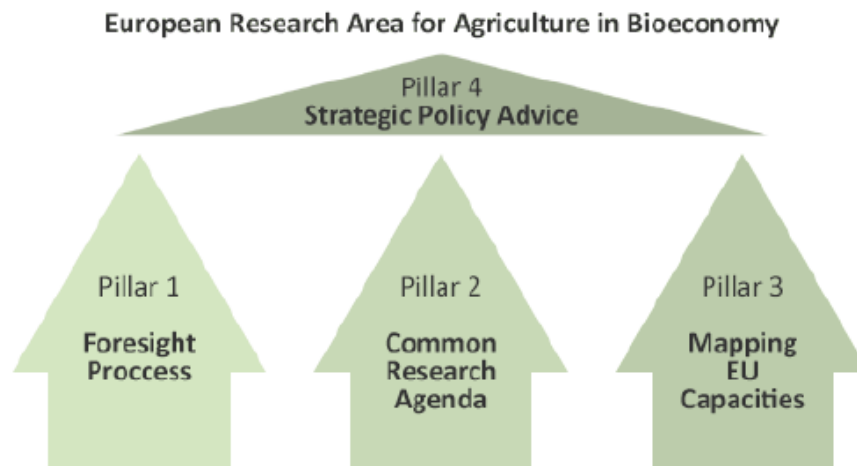


Figure 1. The four main SCAR initiatives (source: SCAR 2015, p.10)

The Reflection paper lists the different outputs and deliverable SCAR is expected to deliver based on the four main activities shown in Fig. 1. In short, SCAR is asked to provide and share information about current state of art of the research in agriculture and bioeconomy, to envisage future scenarios, to suggest priorities and development pathways, to promote research uptake and alignment, to foster networking and international cooperation. All these elements have been considered in the design of the IAF and conveyed into a set of target areas the future IAs will investigate.

To implement these activities SCAR is organized as in Fig.2.



Figure 2. SCAR organization (source: <http://www.scar-europe.org/index.php/home-scar/organisation>)

The Plenary is the SCAR ‘governing body’, deciding on the creation of dedicated working groups and any other initiative proposed by the Commission or the SCAR Steering Group⁴ (SG), which is the executive body of the Committee.

Strategic and collaborative working groups (WGs/ CWGs) are fora where members (policy officers, researchers, stakeholders) discuss matters of common interest in a specific research area, with a view to a possible multilateral collaboration between research funders. Ad hoc groups or task forces are occasionally set-up by the SCAR to take on an initiative

⁴ This and the following short descriptions of SCAR bodies are taken from the SCAR website <http://www.scar-europe.org/index.php/home-scar/organisation>.

additional to its regular activities. Finally, the Foresight Group is in charge of carrying out the foresight activities above described.

Rationale of the SCAR impact assessment

Improving the SCAR effectiveness means enhancing its capacity to provide policy alignments and priorities uptake by MS/AC as well as improving SCAR knowledge among policy-makers, researchers and practitioners. It is worth noting in this regard that SCAR has seldom been mentioned the scientific literature addressing Bioeconomy governance issues (McCormick and Kautto, 2013; Ramcilovic-Suominen and Pülzl, 2017; Wesseler et al., 2010).

In this perspective, SCAR expressed the need for a systematic assessment of its impact at various levels (from European and global networking to policy coordination, from priorities identification to bioeconomy promotion) and to identify critical points as well as opportunities for improvement.

The IAF here described aims at improving SCAR capacity to impact on agriculture and bioeconomy policies and, ultimately, on agriculture and bioeconomy development by designing IAs that:

- systematically assess SCAR capacity to fulfill its mandate, towards sustainable and coordinated agriculture and bioeconomy development in the EU;
- will act as catalysts of new inputs and ideas for individual and collective stakeholders;
- will lead to further reflections also conducted in a participated way.

The IAF should be developed through the recognition of strengths and weaknesses in the SCAR action and identifying areas for improvement. This exercise applied to a policy coordination initiative in the agriculture and bioeconomy fields presents a high level of complexity, and related challenges, from four different perspectives:

- political: SCAR has multidimensional objectives, from networking to policy alignment, from prioritization of interventions, to promotion and coordination of research funding, in the aim to integrate policy, research and practice
- scientific: bioeconomy covers a range of sectors that increases the complexity of an overall evaluation: from primary production to food processing, from bio-energy to bio-based materials, and is strictly intertwined with other, similarly complex, research field, like circular economy.
- technical: research for innovation is now seen as a complex multi-actor process based on integration of policy, science and practices where different players interact and co-evolve.
- geographical: development, potential and policy frameworks for agriculture and bioeconomy differ among MS/ACs, which entails a degree of flexibility in the design of a common framework.

Rationale and methodology of the assessment process aim at accounting for these complexities.

In recent years various frameworks, impact assessments and program evaluations have been developed in the EU context for policy coordination actions and similar initiatives. Each framework, developed by an expert group, has its specificities. These specificities reflect the diverse aims of the exercise (program monitoring and evaluation, impact assessment) and also the various objects of the assessment: a specific policy coordination action like JPIs (Syber Hansen et al., 2013; EC, 2016/a) or EIP-AGRI (EC, 2016/b), the general public-to-public networks and associated projects in an ERA-LEARN document (Amanatidou et al., 2016) a wide-ranging research framework program like Horizon 2020 (EC, 2017).

Generally, they offer a description of aims and methodologies, main findings and related recommendations for improvement. Elements derived from those documents (logical frames, assessment levels and methods, identification of target areas) have inspired the development of the IAF in its first steps.

For the design of the IAF we relied upon the theory of change (ToC) which is a process oriented approach to impact assessment and it could support discovering the impact pathway of the SCAR mandate, evidencing the causal links between SCAR policy action and the expected impact⁵.

The reference to the ToC has two reasons: (i) the ToC lends itself to participatory processes which could better help the SCAR to critically mapping out the logical sequence of its own policy action, from the four areas of activities through to the expected impacts on research and innovation strategies/policies at the different levels; (ii) it could work as a reflective process within the SCAR itself and as a participatory-based analysis to be conducted together with the relevant stakeholders (institutions, organizations, individuals). This could help better capturing stakeholders' expectations, interpretations and motivations while achieving major awareness and common understanding on SCAR mandate (Douthwite, 2016; Stame, 2004; Stern et al, 2012).

Following what argued, the assumptions at the basis of the identification of the more appropriate theoretical framework for the IAF development are the following:

- the IAF should reflect the various levels of complexity above highlighted;
- the intervention logic of SCAR is explicated in its mandate and in the SCAR key documents, which underline its main initiatives and its structure;
- the assessments will be conducted under the responsibility of the SCAR and very possibly with limited resources;
- the IAF should guide the assessments to become a tool for reflexive monitoring and, possibly, for promoting periodic improvements/up-dates/adjustments of the SCAR mandate and of its working groups.

The target areas of investigation

The definition of impact adopted for the IAF follows the debates developed within the CSA CASA, which highlighted the need to focus on the targets that are more under SCAR actual control. Thus, phenomena and indicators describing the overall development of agriculture and bioeconomy in Europe and its relation with research outcomes, have not been considered here, given also the fact that they are already being monitored elsewhere.

The target areas for the impact assessment, described in the following by means of the main evaluation questions articulated in sub-evaluation questions. These are grounded on the basis of the SCAR mandate and result from the synthesis work carried out by the research group⁶.

1. Advice

This area reflects the extent to which the EU and the national strategies and policies adopt SCAR priorities and recommendations and are more/less directly influenced by SCAR

⁵ The ToC provides a description of the link between the action of a program or other initiative and the subsequent changes occurring in the field of intervention. The analysis should start from the long-term goals, or expected impacts, to trace back the connecting outcomes between those impacts and the activities undertaken by the program. The analysis should also explicit the underlying assumptions upon which any intervention relies (Weiss, 1995). Grounding an evaluation or an assessment framework on the theory of change entails the identification of those areas of expected impacts and of the relevant assumptions.

⁶ These areas will be shared with the CASA partners for final validation.

advice. An extensive uptake will also lead to a stronger alignment of the national strategies/ and programs related to the agriculture and bioeconomy. The advice area also accounts for the assemblage of knowledge generated created within the SCAR (for example by the foresight group) as well as conveyed in the SCAR by each MS/AC to influence the documents produced. Explorative studies, policy briefs, technical notes, capacity mapping, SWOT analyses, scenarios design, prioritization are among the contents here considered.

It is worth noting that knowledge creation and sharing have a direct influence on the advice that SCAR can provide, but at the same time they support activities aimed at the two following target areas: alignment and joint implementation.

Main evaluation question: to what extent has SCAR been capable to produce useful advice to feed policy design and coordination for MS/AC and at the EU level?

Sub-questions:

1. To what extent SCAR fields of activity reflect the actual needs and priorities for the development of agriculture and bioeconomy?
2. To what extent national strategies and programs reflects priorities and recommendations identified by the SCAR?
3. To what extent MS/AC have been capable to convey their research needs and priorities and to see them represented in the SCAR documents?
4. To what extent national themes and research priorities identified by the SCAR have been uptaken by the research community?

2. Alignment

This area accounts for the specific influence of SCAR on the alignment and convergence between strategies and policies at two level. i) At the EU level, between the strategies developed for the agriculture and bioeconomy and for related policy areas (CAP, Energy Union, Food 2030, Juncker priorities, etc.) where there is potential to increase synergies and/or reduce duplication. ii) At the global level, between the EU strategies and targets and the global ones in the agricultural innovation and bioeconomy fields (for example with the Sustainable Development Goals, the CoP 21 agreement or the International Bioeconomy Forum agenda).

Main evaluation question: to what extent the SCAR is coordinating the effective alignment of strategies and policies, limiting duplications and strengthening synergies, at EU level and at global level?

Sub-questions:

5. Did MS/AC adopt specific national strategies and programs for bioeconomy?
6. To what extent SCAR promoted instruments and mechanisms allowing for synergies and avoiding duplications between policy areas within the ERA?
7. To what extent SCAR strengthens cooperation and joint undertaking between the EU and other players on the global arena?

3. Joint implementation

The joint implementation accounts for the joint calls, of MS/AC, that are among the more concrete and specific final outcome of the SCAR activity. The number of joint calls, with related resources and funded projects, but also the number and representativeness of the partnerships in charge of the calls are among the features to be investigated.

Main evaluation question: Is the SCAR effectively supporting the design and implementation of joint calls?

Sub-questions:

8. Have been SCAR able to mobilise adequate resources for joint research programs?

9. Are joint calls addressing all the most relevant agriculture and bioeconomy fields?
10. Has the calls design matched researchers and stakeholders' needs and capabilities?

Beyond these three, two additional target areas have been identified as mainly intermediate outcomes, as they can be seen as a pre-condition for the achievement of expected impacts in the three areas above. However, they are also considered as target areas in themselves, for two main reasons: first, the IAs will also contain elements of program evaluation, as these elements are useful to identify areas of potential improvement; second, they can also represent areas of proper impact, as explained below.

4. Awareness

This area describes the knowledge about SCAR existence, its activities and documents among national policy makers, DGs, experts, etc. It also relates to the mutual knowledge of the activities that each SCAR working group is carrying out, and of the related documents.

At a first sight, this looks like an intermediate impact area, as it is a pre-condition for SCAR external impacts to occur. However it can be regarded as an impact area per se, as an adequate awareness of SCAR activities and outputs creates the potential for impacts different from the three above mentioned (for instance: it may influence on documents not directly related to BE, etc.).

Main evaluation question: to what extent the SCAR with its activities and outputs is known by the institutions, organizations and persons whose activity could be benefitted from this knowledge?

Sub-questions:

11. Are SCAR WGs members and experts aware of the SCAR activities in which they are not directly involved?
12. Is the SCAR effectively disseminating its activities and outputs outside the SCAR members and experts at EU and at national level?
13. To what extent SCAR activity is known among stakeholder and research community in the bioeconomy field?

5. Inclusiveness

This area reflects the degree of representativeness and inclusion within the SCAR given by participation to SCAR meetings and SCAR-related events, as well as to ERA-NETs and other building measures, with pro-active attendance and including all countries). Additionally, it accounts for the networks generated by the SCAR but extending beyond it (for example the external links created in occasion of SCAR-related events).

Again, this is an impact in itself alongside an intermediate result. SCAR is a coordination structure: without inclusion and networking there is no coordination. At the same time, like awareness, inclusiveness can be fruitful in directions not fully predictable ex ante.

Main evaluation question: to what extent the SCAR is capable to include all MS/AC in its activities and to promote networks between the relevant stakeholders in the bioeconomy field?

Sub-questions:

14. To which extent all MS/AC are involved in the SCAR activities and joint calls?
15. Are activities aimed at strengthening representativeness and inclusion of MS/AC and other countries adequate and effective?

Figure 3 shows the links between the four SCAR main initiatives and the first three target areas. Awareness and Inclusiveness are less directly linked to the initiatives but are crucial intermediate impact areas as argued above.

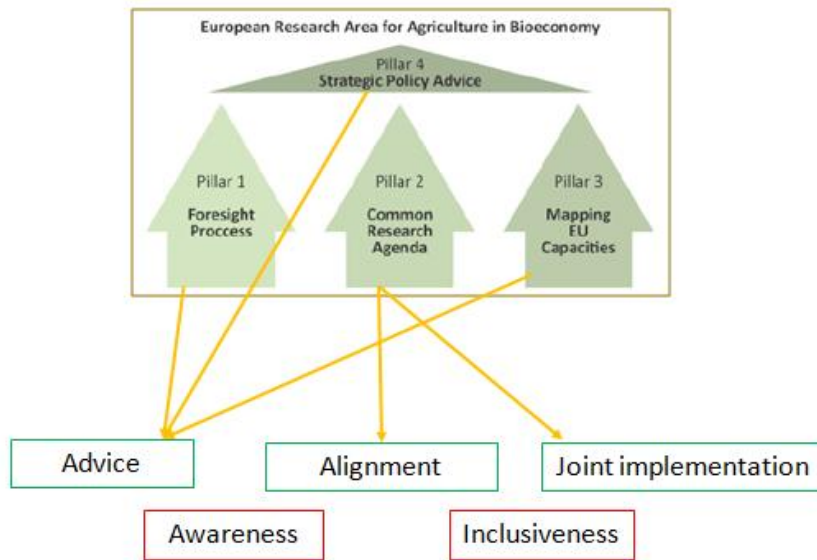


Figure 3. SCAR main initiatives and target areas for the assessment (own elaboration)

Based on the evaluation questions highlighted above, a set of qualitative, semi-quantitative and quantitative indicators will be identified, capable to account for the SCAR impact on research policy in the view of a policy-science-practice integration for different assessment criteria and at different institutional levels.

Logical frame and assessment criteria

We have seen how the overall objectives of the SCAR and its four pillar activities are reflected in the six areas of impact that will be investigated through the IA exercises.

Once these two groups of elements have been identified, a further step is required to structure the IAs. A clear design of any IA requires the definition of a logical frame, which implies identifying strategic elements (inputs, outputs, outcomes, impact) and their causal relationships (OECD, 2010). We refer to the IA of the ERA-LEARN (Amanatidou et al., 2016) which identifies a detailed chain of strategic elements for the evaluation of public to public partnerships: Challenges - Objectives - Inputs - Activities - Outputs - Outcomes - Global impacts.

For the SCAR impact assessment we propose a slightly simplified chain, with categories adapted (in terms of jargon and meaning) to the peculiarity of the SCAR as a multi-level research policy coordination initiative (not a project, not a strategy, not a research program, not a partnership).

These elements are related to the categories previously identified. In particular:

- "challenges" can be derived from the reflection paper, in particular from the already mentioned statement for which "SCAR plays an important role in "establishing a European Research Area with a common agricultural and wider bioeconomy research agenda, which enhances cooperation, coordination, and information exchange between countries" (SCAR 2015, p. 10)⁷. However, they will also be an object of

⁷ In the same document there is another paragraph from which overall expectations can be identified. SCAR is said to be "a respected source of advice on European agricultural and research related to the wider bioeconomy, along with being a major catalyst for the coordination of national research

assessment, as the IAs will also harvest opinions on the current relevancy of SCAR challenges as expressed in the key documents;

- "initiatives" represent the four pillars of SCAR activity, as expressed in the SCAR reflection paper and showed in Fig.1 and 4: the production of foresights, the development of common research agendas, the carrying out of EU capacity mapping and of strategic policy advice;
- "target areas" represent, as shown above, the re-definition of the main initiatives identified in the SCAR reflection paper as areas to be investigated in order to assess SCAR impacts;
- "activities" reflect the organization of SCAR with related working groups and ad hoc groups, as well as the groups meetings, workshops and conferences. It represents the amount of "input" (efforts, resources) mobilised by SCAR;
- "outputs" represent the direct realizations and documents produced through those activities (conferences, position papers and policy briefs, experts involved, foresight exercises, etc.);
- "impacts" represent the overall effects of SCAR activity in the policy research coordination domain.

This logical frame provides the base for the definition of the four assessments criteria.

- *relevancy* (capability of the SCAR mandatory initiatives (and the related target areas here identified) to meet, if achieved, the challenges);
- *effectiveness* (capability of outputs and impacts to meet the SCAR objectives, expressed in the "initiatives and in the related "target areas");
- *efficiency* (adequacy of SCAR structure and activities to achieve expected outcomes and impacts without redundancies and unnecessary efforts);

Figure 4 provides a visualization of the elements of the logical frame and their relations with the assessment criteria. The arrows connect the element of the frame which are relevant for the assessment of each criterion.

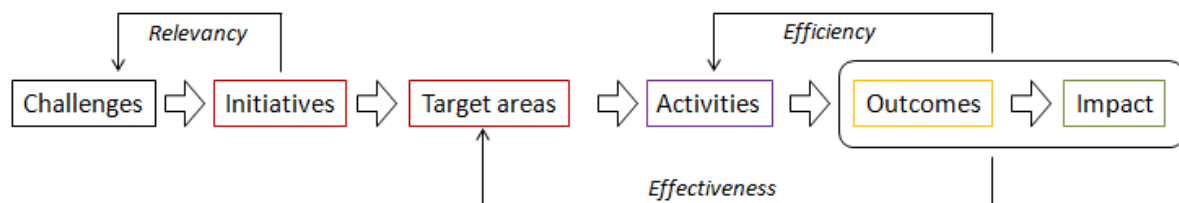


Figure 4. Assessment criteria and logical frame (own elaboration)

These criteria will be the base for structuring the assessment in each target area.

Impact levels and stakeholders identification

The SCAR is a EU-level actor where individual countries are represented, and is at the same time a player in the international and global policy arena. Given the wide scope of SCAR activities, various levels of analysis can be considered in the analysis of the assessment

programmes and in helping shape the European Research Area" , to play a role "in coupling, and removing the barriers to research and innovation" and to aim "to make it easier for public-public and public-private sectors to work together." (SCAR 2015, p.7).

findings. Thus, an additional level of organization for those findings, alongside and in relation to the six target areas, can provide further useful information and suggestions.

Figure 5 shows the various levels of SCAR impacts. They are at the same time geographical levels (with regard to the territories involved) and institutional levels (with regard to the institutions in charge of, or influenced by, the policies).

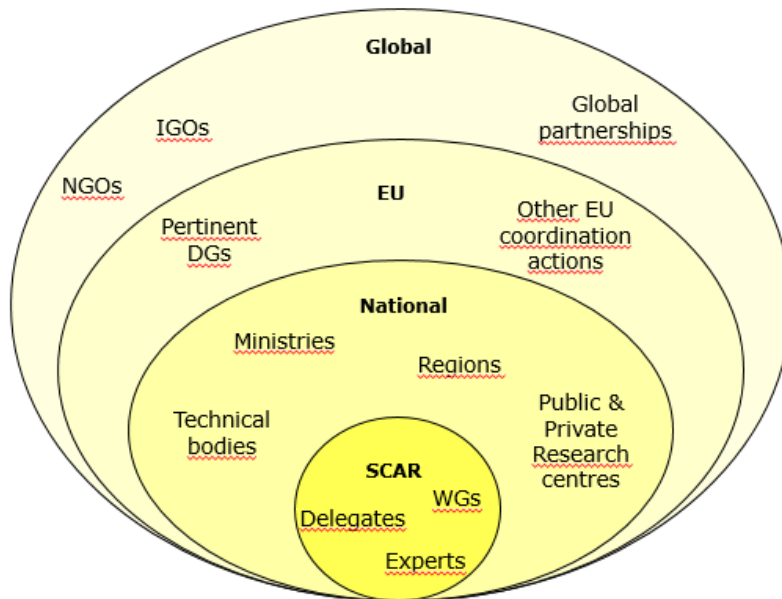


Figure 5. Geographical and institutional impact levels (own elaboration)

Figure 5 also displays, with an exemplary though not exhaustive list, the stakeholders (institutions, organizations, individuals) that can directly influence or be influenced by SCAR, in relation to the most pertinent geographical/institutional level. The most relevant findings of the assessment will be read also in the light of this frame. The variety of stakeholders reflects the relevance of SCAR in the different steps connecting policy, research, business and practice. Regions, research centres and technical bodies are to various degrees and in different forms in charge of the integration among these three spheres. SCAR, acting at a higher coordination level, must be capable to support this integration.

Obviously, the SCAR level (in the inner circle) is not an area of actual external impact. However, it is a level worth investigating, considering the dual nature (impact assessment and program evaluation) of the exercises and the need to consider intermediate results in order to identify areas of improvements and related suggestions.

The consideration of the relevant stakeholders leads to an important methodological issue: the identification of the persons (and related organizations and institutions) to be addressed by the surveys that will be carried out within each IA alongside the desk analysis.

For the identification of the stakeholders whose knowledge and opinions are relevant for the IA, the IAF will suggest, with some adaptation, the methodology adopted for the stakeholders' analysis carried out for the SCAR SWOT analysis in a previous task of the CASA action (Steinberg, 2017), based on the approach developed by Olson et al. (2011). In that document, stakeholders are identified and mapped according to:

- Relevance of the contribution;
- Legitimacy of stakeholder's claim for engagement;
- Willingness to be interviewed;
- Influence given or received;
- Necessity of involvement for a legitimate assessment.

Assessment logic and preliminary list of indicators

What argued in the previous sections lead us to summarize, in Fig. 6, the assessment process from the point of view of the data and information flows for the IAs that will be carried out on the basis of the IAF.

The right side of the scheme indicates the possibility of organizing focus groups, as an additional qualitative method to collect (and share) information, and to carry out specific case studies to identify best practices, exemplary cases (or even interesting failures). These possibilities, and other similar integrations, would be feasible according to the resources available for the actual IA.

The possibility to deepen the analysis of specific case-studies could be explored, in the aim to highlight good practices, interesting failures, exemplary cases or extreme cases, that may require, in the evaluators' judgment or following a specific request by the SCAR, a deeper analysis.

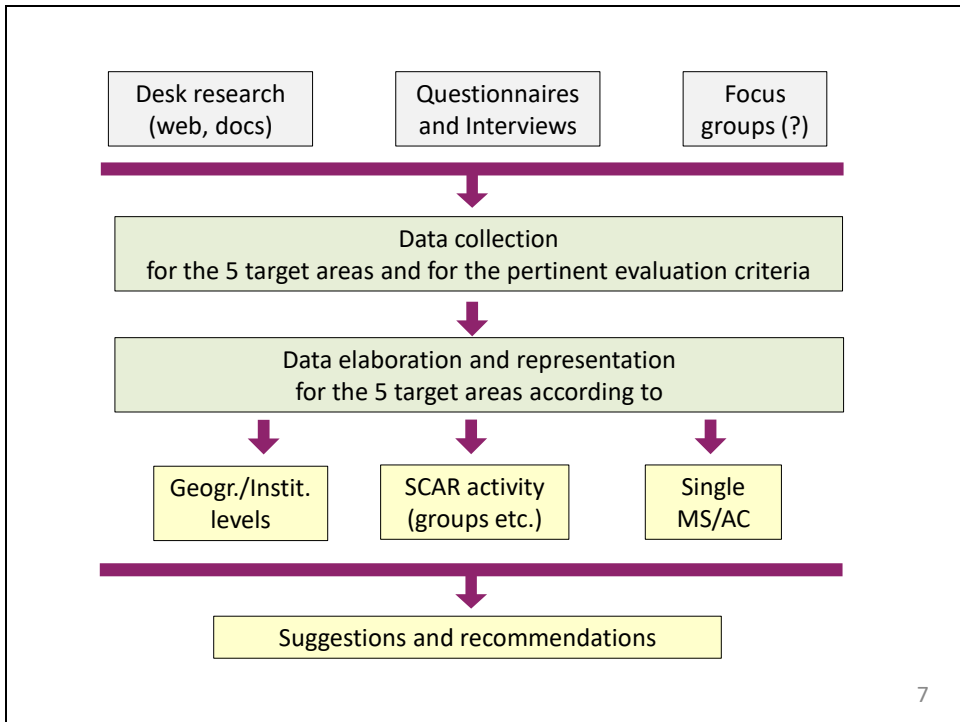


Figure 6. The assessment process /1

Figure 7 represent the same process from a different point of view, highlighting the assessment logic (blue arrows), and evidencing the information and elaboration flows (blue arrows).

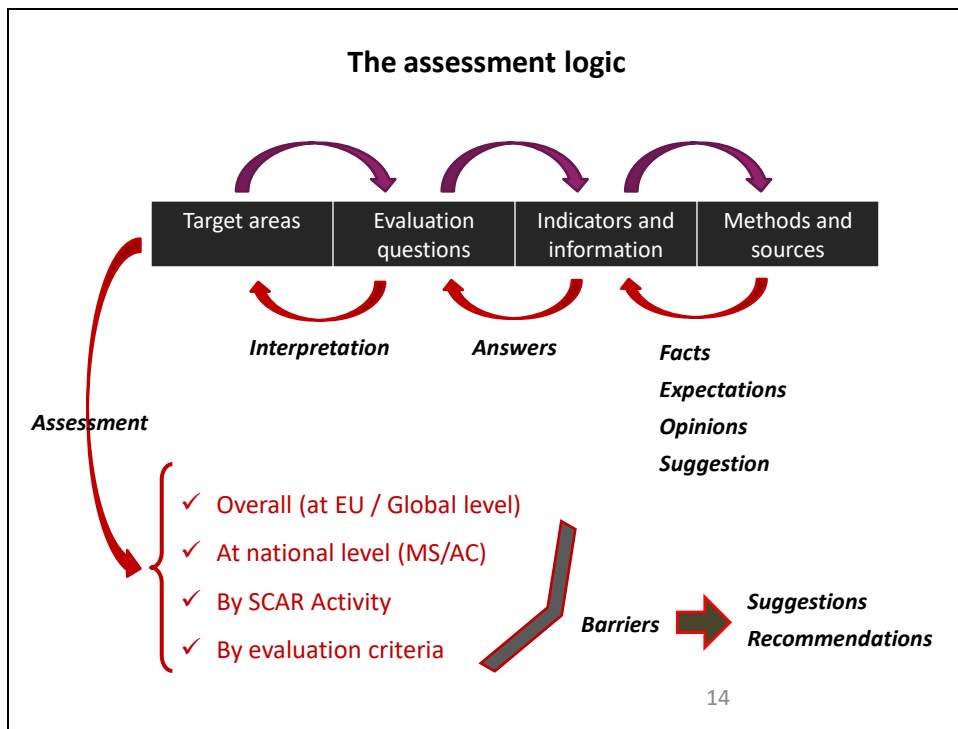


Figure 7. The assessment process /2

Based on the evaluation questions, a set of qualitative, semi-quantitative and quantitative indicators will be identified, capable to account for the SCAR impact on research policy in the view of a policy-science-practice integration for different assessment criteria and at different institutional levels.

The IAF, underlining the definition of impact and the object of evaluation, will indicate the methodology to be followed in the assessment exercises.

This methodology will be based on a combination of desk research and surveys, to be conducted through semi-structured interviews and questionnaires, aimed at harvesting quantitative and qualitative information. Interviews and questionnaires should be also used to ask opinions and expectations, to envisage future developments and possible barriers and to gather suggestions for improvement. These qualitative information will be crucial to interpret quantitative data while also representing in itself a source of reflection.

Figure 8 presents the relation between target areas (implicitly accounting also for their respective main evaluation questions), sub-questions and indicators, using as an example the target area "Advice". For mere example, a first indicative set of possible indicators is displayed in the sheet. This will be finalized according to the refinement of the evaluation questions and to the specific elements that will be eventually identified in the final elaboration of the IAF. Each indicator is listed in the "outcome indicator" or "impact indicator" column, and in line with the pertinent target area and evaluation question.

On the right side of Fig. 8, two additional fields (columns) account for expectations, and for identification of barriers preventing improvements and following suggestions/recommendations.

Target Areas	Sub-questions	Outcome Indicators	Impact indicators	Expectations	Barriers / Suggestions
Advice	1. To what extent SCAR advice reflects the actual needs and priorities for the development of bioeconomy?		I111 Level of coincidence between SCAR fields of activity (WGs, Foresights) and actual bioeconomy research priorities (Likert)	Which challenges you deem more crucial for the future SCAR?	
	2. To what extent national strategies and programs reflects priorities and recommendations identified by the SCAR?	O121 N° of experts and stakeholders engaged in external studies (by type: Foresights, SWOT analyses, Gaps analyses, Inventories, Explorative studies, ...)	I121 N° of national strategies where SCAR outputs are mentioned		
		O122 N° of policy documents produced (by type: Policy briefs, Position papers, Technical notes, Advice letters, ...)	I122 N° of EU-level strategies where SCAR outputs are mentioned		
		O123 N° of external studies produced (by type: Foresights, SWOT analyses, Gaps analyses, Inventories, Explorative studies, ...)	I123 Influence of SCAR advice on national strategies and programs (Likert)		
	3. To what extent MSIAC have been capable to convey their research needs and priorities and to see them represented in the SCAR documents?		I131 Capacity of each state to convey its research priorities in SCAR documents (Likert)		Which barriers prevent MSIAC from better conveying their research priorities to the SCAR?
	4. To what extent national themes and research priorities identified by the SCAR have been uptaken by the research community?	O131 N° Foresights produced	I341 N° of scientific paper or reports mentioning SCAR and SCAR documents		
O132 N° of experts engaged in Foresights					

Figure 8 First set of indicators for a target area and related sub-questions and indicators

Concluding remarks

As argued by McCormick and Kautto (2013, p. 2603), the various decisions to be taken for bioeconomy development, with the related trade-offs (Wesseler et al., 2010), make a multi-actor governance, engaging policy-makers with stakeholders and the general public, crucial.

In this context, the IAs are expected to help the SCAR to be an even more effective promoter in the coordination of inclusive and sustainability-oriented policies, but also to be recognized as such in those environments and in those countries where this role is not yet sufficiently known. Strengthening SCAR role is even more vital if it is acknowledged that government policies will play a decisive role in shaping the future agriculture and bioeconomy by stimulating or blocking development pathways (OECD, 2006), and that the profound transformation required by a transition towards sustainable bioeconomy would "not happen without concerted efforts by governments and industry" (McCormick and Kautto, 2008, p. 2601).

Being aware that SCAR has already proven to be a valuable strategic arena of confrontation and coordination between MS/AC, and among policy-makers, researchers and practitioners, the IA must be capable to adequately analyze outputs, identifying opportunities for improvement and related actions, adapting to changing needs and resources. Further work is needed, in particular the identification of specific indicators and the definition of adequate tools to harvest information, to represent the findings and to achieve an effective communication. In order to fully accomplish its goals the IA should be regarded as a continuous exercise, to be run in parallel with other SCAR activities and adequately financed.

Some elements will require specific attention in the last steps of the production of the IAF, in the aim to have effective IAs.

First, the recommendation to dedicate sufficient resources to the assessment exercises, and the indication that the ambitions of each exercise should be set according to that available budget. Second, the indication of a suggested periodicity for the assessment exercise, considering that frequency and depth of the evaluations depend on future resources and commitment. Third, a reflection on the pros and cons of an internal vs an external assessment. In the first case we may have a internal reflection process also during the assessment exercise, that would become in itself a lever of integration among SCAR actors and between them and the external stakeholders (policy makers, experts, business environments, practitioners). In the second case the assessment would probably less biased, and more innovative recommendation could be possibly encouraged.

Last but not least, the awareness of the limits of the assessments:

- non-exhaustiveness (it will not be possible to investigate all potential impacts of such a complex network-based initiative);

- non-causation for ultimate impacts (in many cases true SCAR impacts are difficult to disguise from influences coming from the other global, EU or national institutions and constituencies);
- non-availability of baseline indicators (at least for the first assessment);
- non-availability of alternative scenarios for a benchmark with the existent situation.

It has been stated that "*International policy coordination is like the Loch Ness monster: much discussed but rarely seen*" (Blanchard et al., 2012). SCAR is *per se* a research policy coordination structure, although in a peculiar international political environment like the EU. The development of an IAF capable to support effective assessments exercises will give SCAR the opportunity to further improve its action.

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