Report of
Meeting to Establish a Suitable Methodology for
Case Studies of Social and Economic Value of RCA Projects
Vienna, Austria
1 – 4 July 2019

1. Introduction

The Technical Cooperation (TC) programme supports sustainable socioeconomic development by assisting IAEA Member States to build, strengthen and maintain capacities in the safe, peaceful and secure use of nuclear technologies.

The TC Divisions for Asia-Pacific (TCAP) and Programme Support and Coordination (TCPC) have jointly proposed to undertake case studies of the social and economic value of a small number of TC projects drawn from the Regional Cooperative Agreement (RCA) programme.

A meeting was held in Vienna, Austria from 1-4 July 2019 to establish a methodology and work plan for performing these case studies. The adopted Agenda of the Meeting is in **Annex 1**.

The Meeting had eight (8) participants comprising representatives from TCAP, TCPC, CPR and NZE. The List of Participants is in **Annex 2**.

2. Opening of the meeting

Ms Jane Gerardo (DIR-TCAP) opened the meeting and welcomed participants to Vienna. She noted the focus of TCAP on socio-economic development of the Region, and the importance and complexity of measuring the impact of RCA projects on socio-economic development.

The DIR-TCAP noted that, despite the complexity of this socio-economic impact assessment, the RCA provides an excellent opportunity for performing case studies. This is because: the region hosts intellectual capability and top educational facilities; the region shows expanding application of nuclear techniques; 22 countries part of RCA in a region that accommodates one-third of world's population in Asia-Pacific region; and RCA is a mature agreement with concrete operating rules and tools to support such case studies.

3. Overview of the RCA programme and expected outcomes of the meeting

Dr Sinh van Hoang (RCA Focal Person) provided an overview of the RCA programme and its projects.

The main purposes of the meeting were to:

- To review methodologies/approaches and methods/tools to conduct social and economic impact assessment of development programmes/projects, and compare the advantages and disadvantages of each method;

- To share actual experiences in social and economic impact assessment of some specific programmes/projects; and

- To discuss and agree on Terms of Reference (ToR) for the case study social and economic impact assessments of a small number of RCA projects.

The expected outputs of the meeting are:

- Agreed ToR for case studies for assessing the social and economic value of RCA projects, including:
    - assessment objectives and scope;
    - assessment questions;
    - assessment methodology/approach;
    - instruments for data collection, analysis and reporting; and
    - key deliverables and timeline.

4. Measuring socio-economic impact of the TC Programme

Ms Eloisa de Villalobos (TCPC Quality Assurance Section) summarised the approaches and challenges of social and economic impact assessment within the TC programme. Her presentation is included as **Annex 3**.

The current monitoring in TC is presently focussed on 'outcome monitoring', not impact evaluation (although an Impact Assessment expert meeting took place last year). The current outcome monitoring system is supported by the TC-Reports platform and include the Project Performance Assessment Reports (PPARs), and the Project Achievement Reports (PAR) which are both self-reporting tools. Since the system was launched in 2017, the PPAR submission rate has increased to 80% and ensures the inclusion of inputs from all project's team members.

It was noted that monitoring the TC programme can serve the dual purpose of gaining knowledge to improve the TC programme's function, and to demonstrate the benefits from its projects. It may be challenging however to assess such a disperse, diverse and large project portfolio, or to identify the optimal focus of the analysis. The methods and frameworks needed will be different if the aim is to evaluate the single project, the country portfolio, or a specific thematic areas. Even more complex approaches will be needed if the intention is to draw conclusion on the value of the TC programme as a whole.

In order to overcome the specific challenges of assessing the social and economic value of TC projects, the chosen method should:

- be able to evaluate long-term effects, because there is often a long lag between project completion and the realisation of social and economic impacts.

- be able to capture unexpected outcomes, instead of just looking for the expected outcomes, because these can be as impactful as the project's originally stated target outcomes.

- be able to measure the intangibles value of TC P contributions, such as networking, in addition to the outcomes that are more amenable to numeric metrics.

- be able to deal with the complexity of attribution (or at least contribution), because it is recognised that one outcome may arise from many contributions (of which the RCA project may be only one), and conversely one project may contribute to many different outcomes or impacts.

Finally, it was recognized that these challenges mirror those the RCA programme is facing in assessing its value and socio-economic impact. The methodologies and approaches that will be used and/or tested over its portfolio will therefore be excellent case studies to inform TCP impact monitoring approaches.

5. Overview of recent efforts to assess the social and economic value of RCA projects

Dr Chris Daughney (NZE), Chair of the Working Group for Coordination of the RCA Medium Term Strategy (WG MTSC) summarised the recent efforts to assess the social and economic value of RCA projects. His presentation is included as **Annex 4**.

First, the WG MTSC attempted to apply the evaluative approach of the OECD Development Assistance Committee (OECD-DAC) in a pilot project on the RCA air pollution projects completed over the past ca. 15 years The OECD-DAC approach was not successful because the required documents (e.g. Project Design Documents, Project Achievement Reports, etc.) were not available or did not provide a sufficient level of detail to support the methodology.

As a result, the WG MTSC's second attempt applied a simpler outcome harvesting method. This method was applied using report templates completed by National Project Coordinators (NPCs) prior to the Final Coordination Meeting of the air pollution project RAS7029, and then face-to-face at the Final Coordination Meeting.

The outcome harvesting approach produced some positive results. NPCs were eventually able to grasp the concepts, methods and need for evaluation. Some very good outcomes were elicited.

However, these initial pilot efforts also revealed challenges to wider implementation across the RCA programme and projects. Many NPCs struggled to understanding of concepts of outcome or impact evaluation, there was difficulty of obtaining data/evidence, there were challenges in categorising, comparing, and quantifying the outcomes that were reported, and it was difficult to identifying regional outcomes when reporting was done by individual GPs.

6. Social and economic impact assessment: overview of approaches and tools

Invited experts Dr Julian King (NZE) and Ms Kate McKegg (NZE) summarised and compared approaches and tools for social and economic impact assessment, along with some examples of their application to assessing impacts from development programmes. Their presentation is provided as **Annex 5**.

It was noted that the RCA is a complex environment for evaluation. There are diverse countries and stakeholder groups, long-term investments of decades with contexts that are continuing to evolve, and multiple outcomes sought across a range of thematic areas, including a variety of intangibles like socio-economic wellbeing and sustainable developed (not easily represented by numbers).

Several challenges were reiterated with respect to assessing social and economic value within the RCA, such as evidencing outcomes and impacts, determining attribution (i.e. the contribution of RCA), and determining the value of the RCA contribution (which is different from determining its contribution).

A definition of evaluation was introduced. Evaluation is the systematic determination of the merit, worth or significance of something. This is not just 'evidence', but also 'valuing'. Both are required for evaluation.

The strengths and weaknesses of different valuation methods were compared, focussing on cost-benefit analysis on one hand vs. evaluative reasoning on the other hand.

A description was provided for a combined method that uses both of the above. Eight steps were presented for the methodology, of which the first four steps address the design of the evaluation, and the final four steps are about implementation of the evaluation:

1) Understand the theory of change for the programme or project.
2) Develop performance criteria, e.g. 'improved human health'.
3) Develop performance standards for each performance criterion, e.g. narratives that explain 'excellent, very good, etc.
4) From the criteria and standards, select and identify the evidence needed, e.g. measurements of incidences of lung disease diagnosis.
5) Gather evidence, for example a stock-take of environment regulatory changes, or trend analysis of atmospheric visibility data. Note that the evidence needed and the means of gathering it need to be tailored to the circumstances of the project.
6) Analyse the evidence.
7) Synthesise and judge the evidence, according to the agreed definitions of good value (i.e. the performance criteria from Step 2 and the performance standards from Step 3).
8) Reporting, based on the criteria and performance levels decided in advance.

The term *rubric* was introduced, this being a matrix or table of the performance criteria and standards (levels of performance). It was noted that sometimes there is a weighting approach that is agreed for combining performance levels for different criteria.

For all of the above, it is recommended to take a participatory approach with participants and stakeholders, noting which needed to be involved at a deep level or at a more cursory level. Ideally this should be done at the start of the project, so that the project is evaluable when the time comes.

Key messages from this discussion include:

- Evaluation assesses quality, value and importance – it's not just collecting data and describing facts;
- Evaluation combines facts with values, so must start with defining value, quality and importance;
- The focus of evaluation effort should be on those areas that we need important answers for – the areas that matter most; and
- In order to judge, it is necessary to have a set of criteria and performance levels for valuing. Only then should the evidence needed be defined.

7. A proposed process/method for assessing the RCA projects related to mutation breeding

Dr Luxiang Liu (CPR and Lead Country Coordinator) summarised RCA projects on mutation breeding (RAS5040, RAS5045, RAS5056) and proposed approaches for evaluating their social and economic outcomes. His presentation is provided in **Annex 6**.

Several economic outcomes from this series of RCA projects were identified and discussed. Examples include:

- Dissemination areas of the mutant crop varieties produced through the projects. For example, for mutant wheat variety LY502 the area cultivated was 0.5 Mha within the project timeframe, but by just two years post-project it had more than doubled.

- Crop yields, for example LY502 has more than 10% higher yield than the national control. Given this and the dissemination area, calculation indicates economic benefits of more than $1.3B USD compared to output from the 'standard' national wheat variety.

- Another example was given with a mutant rice variety Dhan-14 disseminated in Bangladesh that has a shorter growth time to maturity compared to the local rice variety, which therefore allows farmers to plant a second crop for harvest within a single season.

Several social outcomes were also discussed:

- Increased resilience to climate change, diversity of food types, resistance to disease, etc., as means to enhance national and regional food security;

- New mutant varieties can also be indirectly used as germplasms in conventional breeding programmes – and this increased variation in the breeding stock leads to more/better/faster production of enhanced varieties through conventional breeding;

- Reduced demand for pesticides and other agricultural inputs. This has economic benefits but also health and environmental benefits.

Dr Liu proposed a template for GPs to report social and economic outcomes from these mutation breeding projects:

- Section 1 summarises the GP's baseline: number of staff involved in mutation breeding, number of mutant varieties officially released, number of lab/field programmes on mutant breeding, etc.
- Section 2 addresses performance indicators fully/partially/not completed, compared to outputs/outcomes planned (e.g. number of trained personnel, number of mutant varieties produced, and number of mutant varieties released).
- Section 3 is a social and economic impact assessment, including:
    - Public awareness and degree of application of mutation techniques;
    - Direct dissemination of mutant varieties officially released with statistics like number of mutant varieties, area over which they have been released, change in yield compared to control varieties, etc.;
    - Extension dissemination of mutant varieties, e.g. incorporation into conventional breeding programmes;
    - Economic benefits of the above, e.g. revenue from enhanced yields or reduced inputs like irrigation, pesticides, etc. compared to control varieties.
- Section 4 provides a space for freeform reporting of additional information that could be relevant.
- Section 5 is a conclusion, which just rates the outcomes as e.g. good, significant, poor and does not attempt to compare or rank between GPs or between different RCA projects (which all have different contexts and baselines, and which will be using different crop types like rice vs wheat vs fruit/vegetables).

8. Discussion and formulation of ToR for case study social and economic impact assessments of RCA projects

The meeting spent two days developing the ToR for the case studies, including discussing assessment objectives and scope, assessment questions, assessment methodology/approach, instruments for data collection, analysis and reporting, key deliverables and timeline. The ToR is included in **Annex 7**.

Key points from the ToR and selected methodology proposed to be applied in the case study are as follows:

- It is proposed that the project be undertaken under the guidance of the Director TCAP and the Director TCPC. It is also proposed that the project will be implemented analogously to other TC projects, with a Project Management Officer (PMO) from TCAP and Technical Officers (TOs) from TCPC given that the expertise on monitoring and evaluation methods sits in TCQAS.

- The case studies to assess the social and economic value of RCA projects will apply the eight-step methodology for evaluative reasoning proposed by Dr Julian King and Ms Kate McKegg. The specific approaches, evidence, etc. will be tailored to suit the RCA projects being assessed.

- The proposed project schedule indicates that at least one case study will be completed, and if sufficient resources are available, it is feasible to complete up to three additional case studies in time for presentation at the celebration of 50th anniversary of the RCA in 2022. Each case study will assess a different sub-thematic area, ideally covering the four main thematic areas within the RCA (agriculture, industry, environment, human health).

- The main deliverable for each case study will be a ca. 20 page report for a general audience, focussing on a series of related projects covering a ca. 10-20 year timeframe. Each report will showcase the breadth of near-term (intermediary) outcomes delivered and provide more in-depth assessment of 1-3 highlighted (longer-term) successes from the projects. The reports will assess the value added by the RCA, as a regional programme. The reports will also assess the future potential and directions of the sub-thematic area under discussion.

- The project timing allows for each report to be further developed into additional communications products such as brochures, videos, etc. Assistance will be sought from the RCA Regional Office for these tasks.

- The first case study will assess the mutation breeding sub-thematic area. This is in recognition of the excellent results from the projects and the groundwork already undertaken by Dr Liu to identify specific highlighted outcomes of the projects that can be assessed in detail.

- The second case study will assess the air pollution sub-thematic area. This is in recognition of the results from outcome harvesting already available through the WG MTSC.

- The sub-thematic areas for the third and fourth case studies have not yet been identified, but will be drawn from the thematic areas of industry and human health.

- The project plan includes a final report that will draw together the learnings from the case studies, and provide suggestions for how the methodologies may be extended to other projects and programmes within TC. This is expected to include consideration of how project designs and current RCA project modalities may be altered to make social and economic assessments easier and more robust in the future.

9. Closing

The DIR-TCAP reiterated the importance of this project, noting the need to understand, quantify and communicate the benefits that the RCA programme delivers to the region.

The DIR-TCAP highlighted the need for the learnings from this project to be embedded into the routine operations of the RCA. The RCA NRs will play a key role in retaining the knowledge and practices from the project. The NLOs will play a similar role.

The DIR-TCAP repeated the acknowledge need for a quantum leap in the RCA, following the successes it has already achieved in its first 50 years. She noted that this project will be instrumental in starting this quantum leap, given it will deliver knowledge of the RCA impacts, which will galvanise stakeholder action, and also generate significant learning for the whole RCA programme.

The DIR-TCAP thanked the meeting participants for their excellent contributions and wished them a safe journey home.