GEF

**UNEP/GEF: 12 COUNTRIES PILOT PROJECT
FOR THE DEVELOPMENT OF
NATIONAL IMPLEMENTATION PLANS (NIPs)
FOR THE MANAGEMENT OF
PERSISTENT ORGANIC POLLUTANTS (POPs)**

UNEP

Guidance on Socio-Economic Assessment for National Implementation Plan Development and Implementation under the Stockholm Convention

Draft
March 2017

Contents

Acronyms

CBA	Cost Benefit Analysis
CEA	Cost Effectiveness Analysis
DGEF	Division of Global Environment Facility Coordination
ECHA	The European Chemicals Agency
MEAs	Multilateral Environmental Agreements
OECD	Organization for Economic Co-operation and Development
PCB	Polychlorinated Biphenyls
POP	Persistent Organic Pollutants
PRSP	Poverty Reduction Strategy Paper
SEA	Social and Economic Assessment
SMEs	Small and Medium Enterprises
STEP	Sociological, Technological, Economic and Political
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TEEB	The Economics of Ecosystem Services and Biodiversity
UNEP	United Nations Environment Programme
WTA	Willingness To Accept
WTP	Willingness To Pay

Index of Figures, Tables and Diagrams

1. Introduction

The Conference of the Parties, in its decision SC-1/12 requested the Secretariat of the Stockholm Convention, in collaboration with other relevant organizations and subject to resource availability, to develop additional guidance on Social and Economic Assessment (SEA), and in doing so to take into consideration the particular circumstances of developing countries and countries with economies in transition.

In response to the above request, the Secretariat developed in 2007, and updated in 2017, the present guide for socio-economic assessment for national implementation plan under the Stockholm Convention in cooperation with the United Nations Environment Programme (UNEP) Division of Global Environment Facility Coordination (DGEF), as part of the Global Environment Facility-funded project entitled “12 Country Pilot Project to Develop National Implementation Plans for the Management of Persistent Organic Pollutants”.

The guide has three main objectives:

1. To give **guidance** on Socio-Economic Assessment and provide a compelling rationale for its adoption in the development and execution of national implementation plans for the Stockholm Convention on persistent organic pollutants
2. To **familiarize** the teams responsible for developing and executing national implementation plans with the process and methods of conducting Socio-Economic Assessment (SEA) such that they are able to oversee the work of specialists;
3. To provide a **practical toolkit** setting out how collection of relevant socio-economic data and their analysis can be set alongside analysis of technical and other issues in order to inform decision-making within the planning and executing of a national implementation plan.

Regarding the first objective the guide sets out the conceptual framework of the importance of social and economic indicators in the context of the plan implementation. The second objective describes in order to carry out a SEA, the various methods and tools, with reference to the kinds of data that provide insight, both for baseline and impact evaluation analyses.

With respect to the third objective, the guide systematically positions the SEA within the process of decision-making at any stage of the development of the national implementation plan and within the planning cycles to take action on persistent organic pollutants.

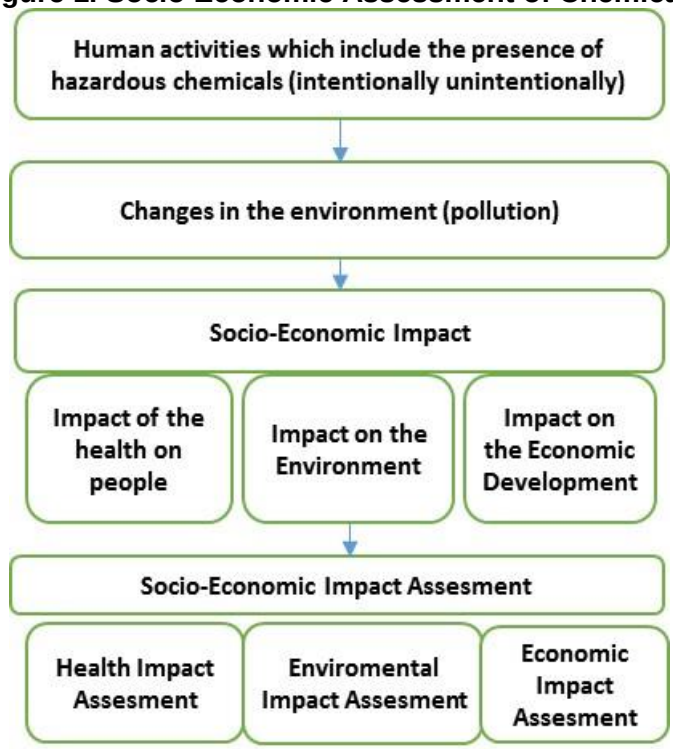
In response to Decision SC-7/10 with the request made by the Parties to continue updating of the guidance including on the basis of the comments received from Parties and others, thanks to the generous financial support from the European Union, the current guidance document was revised and updated incorporating such inputs.

2. Socio Economic Assessment

Socio-Economic Assessment (SEA) is a systematic appraisal of the potential social and economic impacts on different sectors of society, including local communities and groups, civil society organizations, private sector and government. It analyses and manages the social and economic impacts, both positive and negative, of planned interventions, policies, programs, projects, and any change processes invoked by the interventions.

This kind of assessment plays an important role in decision-making on risk management actions for chemicals under Multilateral Environmental Agreements (MEAs). SEA is one of the key components of the management process of persistence organic pollutants. It represents the analytical base, the body of scientific and professional knowledge, needed to initiate the risk management process in assessing the environmental pollution (Brnjas, Z, et al 2015).

Figure 1. Socio Economic Assessment of Chemicals



Source: Brnjas, Z, et al 2015

Figure 1 presents the process to include socio-economic assessment in chemical management (OECD, 2000; Brnjas, Z, et al 2015), following the next steps:

1. Identify anthropogenic activities in which these chemicals are present
2. Determine environmental quality changes
3. Identify the changes that provoke adverse impacts on human health, on the environment and on economic development such as:
    a. deterioration of human and environmental ecosystem health,

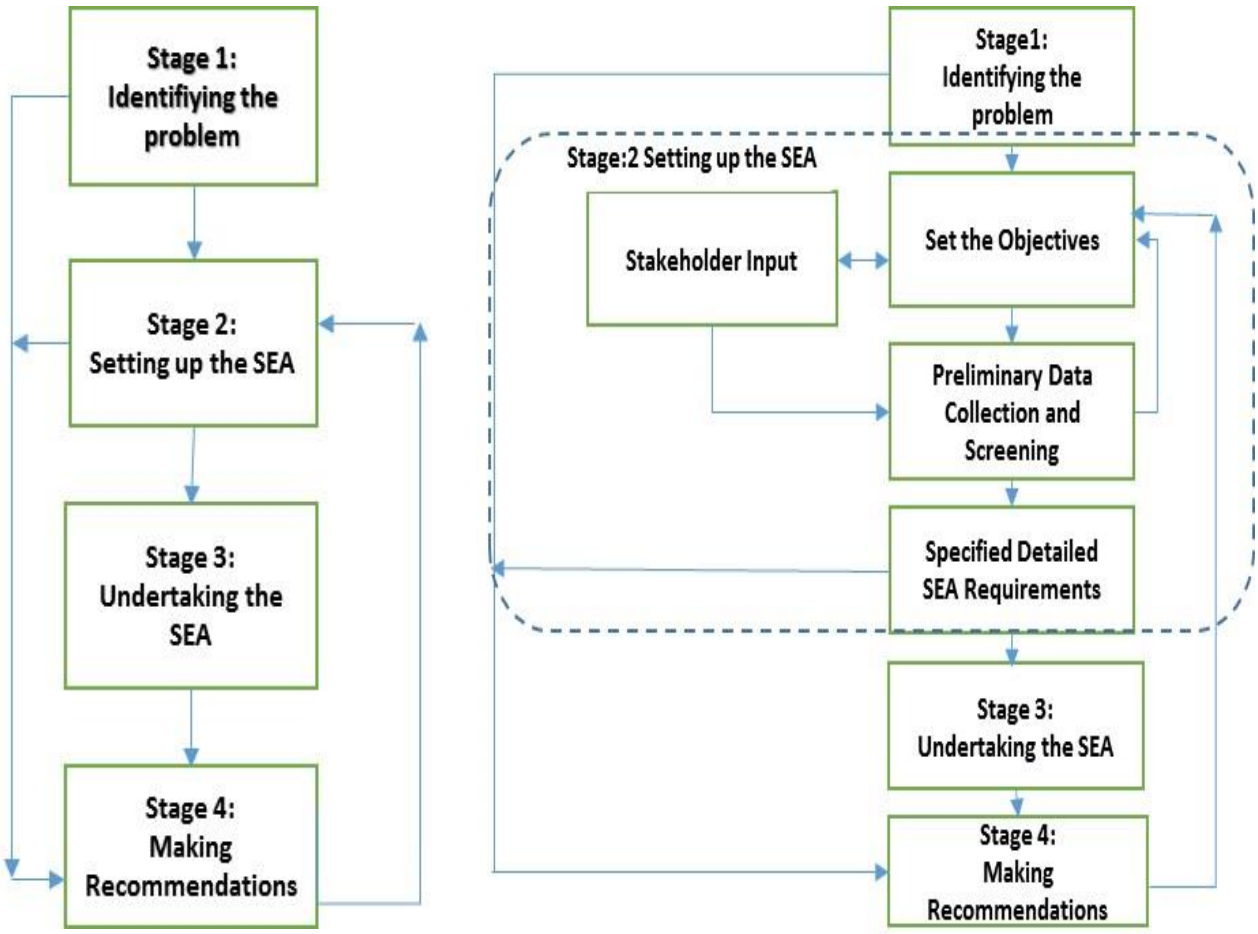
   b. workers productivity loss,
   c. changes in cost of living,
   d. levels of child labour used,
   e. changes in income distribution,
   f. opportunities for enterprise development including Small and Medium Enterprises (SMEs),
   g. and changes in demand of health public services.

4. Select the specific methods and indicators for measuring the effects on people, the environment and the economy. Focus first on their quantification and afterwards seek to obtain a monetary measure for them.

So far, Zhu, J., et al.(2015) present in their research that there is no unified definition of SEA in chemicals risk management. Their paper presents, for example, that the OECD describes SEA in chemicals management as "*one of the tools most commonly used in determining whether a risk management measure is justified*" (OECD, 2000). The socio-economic impacts must include compliance costs, human health benefits, environmental benefits and equity considerations (OECD, 2002). The European Chemicals Agency (ECHA) defines SEA as "*an approach to analyse all relevant impacts (i.e., both negative and positive changes) in one scenario against another. Relevant impacts include human health, environmental, economic, social, as well as wider economic ones*" (ECHA, 2008).

To provide a general framework to undertake a SEA, Figure 2 presents the stages and steps set out in the OECD Framework for integrating Socio-Economic Assessment in Chemical Risk Management Decision Making, (OECD, 2000).

Figure 2. Framework for SEA in Chemical Risk Management



Source: OECD, 2000

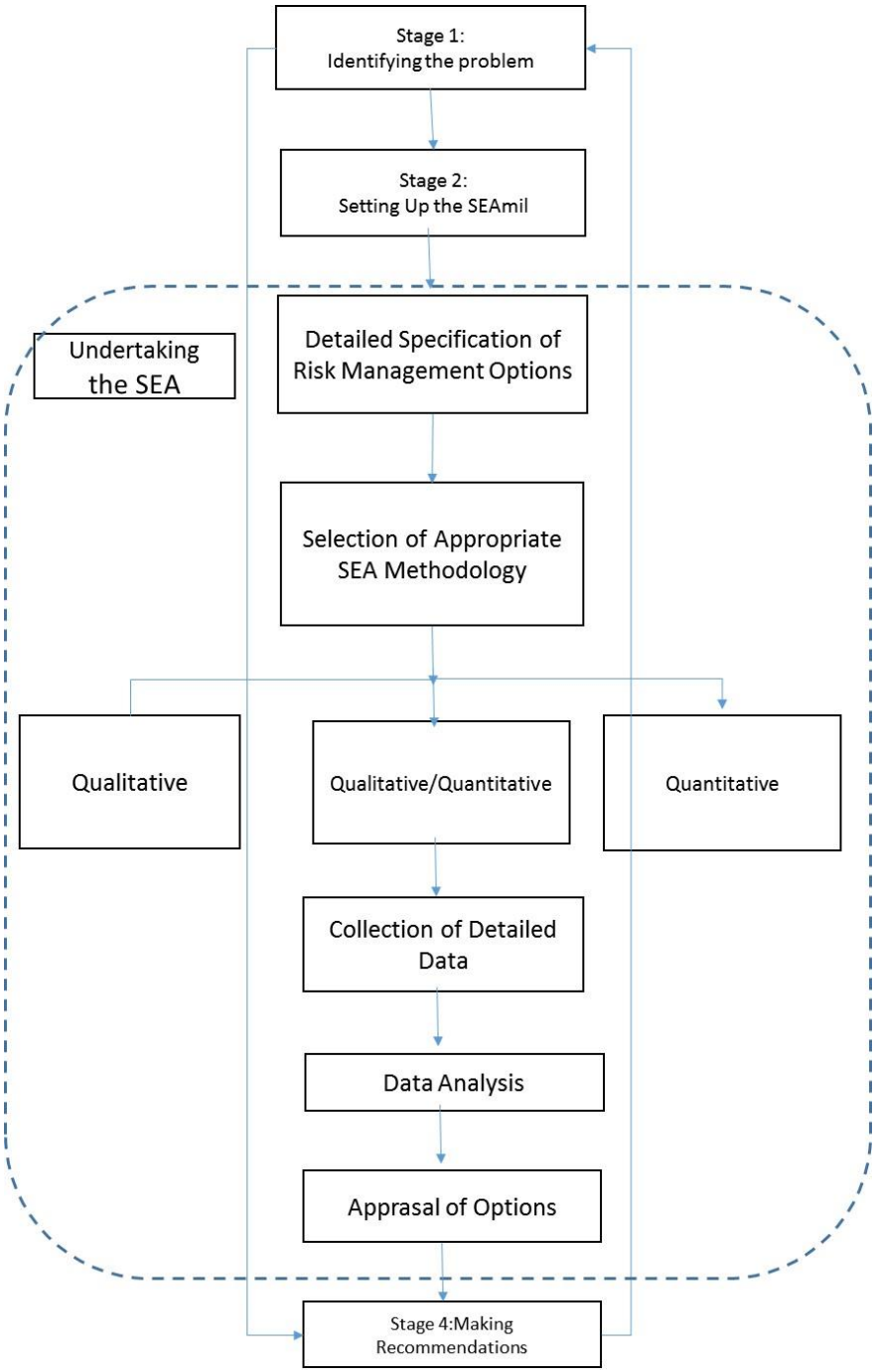
STAGE 1: *Identify the problem:* it is related to the factors which give rise to the need to consider risk management.

STAGE 2: *Setting up the SEA*: the objectives of risk management are set in this stage, which also includes the identification and involvement of the relevant stakeholders.

STAGE 3: *Undertaking the SEA*: the measures of risk management are identified; the costs and benefits data of each measure are collected; evaluation of the predicted costs and benefits and the role of the stakeholders is important for the inputs and feedback.

STAGE 4: *Making Recommendations*: the results of the SEA include a comparative analysis of alternative measures, a peer or expert review of results analysis, and involvement of stakeholders in order to provide a comprehensive set of recommendations to decision makers; it also incorporates the implementation of any decision and monitoring of its success, and opportunities for improvement.

Figure 3. Undertaking SEA in Chemical Risk Management



Source: OECD, 2000

Step 1. *Specification of the key risk management options:* it is important to set the management options and consider the key parameters which will affect the assessment of costs, risks and benefits. For example, it may be necessary to specify parameters such as the timing of different options, the risk-generating activities that would be affected, any sub-options available in terms of how a measure could be implemented, any restrictions which would be placed on the way the risk generators responded to a measure, etc.

Step 2. *Selection of the appraisal methodology* to be used within the SEA. In selecting the methodology which will provide the basis for the SEA, a number of factors should be considered:

- the objectives of the SEA and the requirements of decision makers with regard to having quantitative versus qualitative information;
- the costs and benefits to estimate, and whether any specific health or environmental targets or thresholds have to be met for an option to be acceptable;
- the information available, and
- the period of time and resources (staff and money) available for the analysis.

Depending on the requirements, the SEA may take one of three possible forms:

- a systematic qualitative analysis, where the magnitude, significance and relative importance of the risks, costs and benefits are described but not quantified;
- a partial quantitative analysis, where some aspects of the risks, costs and benefits are assessed in quantitative terms while others are treated qualitatively, or
- a full quantitative analysis, where costs and benefits are all quantified in physical/natural units and/or, in some cases, in monetary terms.

Step 3. Data collection activities. The type of data that are generally considered are:

- Information on the number of companies using a substance, levels of use, and expected trends in use.
- Details of the implications of the proposed measure in terms of any changes required to existing processes (technologies used, chemicals used, level of treatment, etc.), reporting, monitoring, enforcement or other requirements.
- Data on the capital and/or recurrent costs (and/or savings) associated with the introduction of a proposed measure.
- Information on rates of, and potential for, technological change in the sector of concern.
- Impacts on trade and the competitiveness of industry.
- Impacts to small and medium-sized enterprises.
- Impacts on consumers, in terms of increased product prices, changes in the quality of end products, reduced availability of particular products, etc.
- Impacts on ecosystem services benefits.
- Predictions of future benefits, in terms of reduced impacts on human health and the environment associated with a reduced or more controlled use of the chemical in question.
- Any increased risks arising from the proposed measure – for example, where it leads to the adoption of a substitute chemical, or where increased effluent treatment leads

to a shift in risks from the aquatic environment to the terrestrial environment with higher concentrations of the chemical.

- Any wider implications of a proposed measure in terms of its impacts on employment, the activity other industrial sectors, etc. and thus over the economy more generally.
- Socio economic conditions of the most vulnerable communities of the population.

Step 4. Analysis of the data. The methodological framework chosen for the SEA will determine the manner in which the data are analyzed, and thus the manner in which the alternative options are comparatively assessed. The key issues are:

- The specification of the baseline for the analysis, where this defines the levels and nature of chemical use in the absence of the risk management actions being proposed.
- The specification of the time horizon over which predictions of likely impacts are to be made.
- The reliability of predictions concerning the likely magnitude of costs and benefits, with this being relevant to both qualitative and quantitative assessments.
- The explicit assessment of alternatives, and assumptions made concerning their availability, efficiency/efficacy and associated risks.
- The management of uncertainty, whether scientific or value related within the analysis.

Step 5. Comparative appraisal of the options. The findings have to be presented in a summary of the tradeoffs associated with adopting one option over another. The information on the trade-offs involved in selecting one option over another should include:

- the associated risks, benefits and costs for each option,
- the risks associated with the use of substitutes,
- the key parameters affecting the decision, key uncertainties, and the sensitivity of the end results to these the relative impacts across different control options

2.1 Main tools used in SEA

The tools described below are of two main types, those for gathering SEA information and those which help to analyse it and integrate it into general project and programme planning.

Table 1. The type and purpose of Socio-Economic Assessment tools in the national implementation plan

ool	Purpose	Where used
Stakeholder Analysis	To identify stakeholder groups and describing the nature of their stake, roles and interests. It helps to identify entry points and actions.	At most stages in any SEA.
STEP Analysis	Acronym for Sociological, Technological, Economic and Political Analysis. Used to consider the changes and trends relevant to the development of the national implementation plan.	Early on in SEA and in planning cycles.
Social Risk analysis	Aims to establish thresholds or limits within which social groups can mitigate risk and withstand external shocks.	First stage of identification of problem (national implementation plan Phase I) but also at each level of analysis and also in logical framework development.
Consultation tools	To find out how stakeholders perceive the impact of POPs management practices. They are useful for assessment, baseline data gathering, planning, tailoring and delivering information, monitoring and evaluation.	This tool is one of the most widely used throughout planning, data gathering, review and evaluation (all stages of the Stockholm Convention national implementation plan cycle).
Livelihoods analysis	Analysis of how different stakeholders live with impact of POPs now, the strategies they adopt now and those they may adopt in face of changing policies and practices.	After stakeholder analysis in particular to help envision impact of mitigation options and draw out the chain of reactions caused by a change in supply or usage of persistent organic pollutant.
Cost Benefit Analysis	Analytical approach to analyse the policy options comparing the costs and benefits of an action against the status quo or an alternative action. Used to put financial or numerical value on costs and benefits.	Due to the detail required it is best used when main issues are already prioritised, to help in choice of mitigation option.
Options analysis	A checklist of questions to enable the data from different analyses from SEA and other angles, to be compared pending choice of persistent organic pollutants management strategies.	Particularly helpful in final stages of designing/reviewing a national implementation plan and to lead into logical frame analysis
Logical Framework Analysis	ts This framework is a highly effective and useful tool for organising a project or a group of activities around one common or single activities	To formalise and standardise plans for mitigation actions in the national implementation plan cycle.

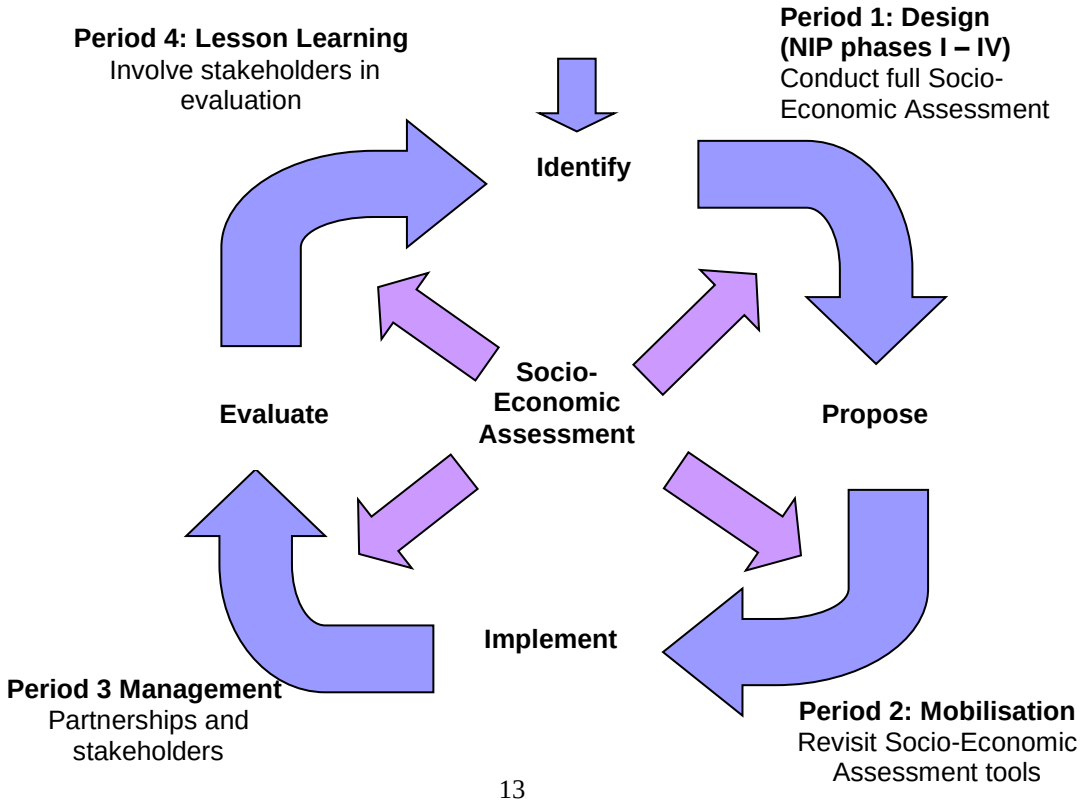
3. SEA in the context of the national implementation plan for the Stockholm Convention

The Conference of the Parties, in its decision SC-1/12 requested the Secretariat of the Stockholm Convention, in collaboration with other relevant organizations and subject to resource availability, to develop additional guidance on SEA, and in doing so, to take into consideration the particular circumstances of developing countries and countries with economies in transition (see Annex A: References to the Stockholm Convention where Socio-Economic Assessment can significantly improve chances of successful Compliance)

Taking into account article 7 of the Stockholm Convention that mentions that Parties shall cooperate with the main stakeholders in order to facilitate the development, implementation and updating of their implementation plans (see Annex B: The phases of the national plan implementation process). National implementation plans do not in themselves readily translate into practical action, and activities to reduce the social impacts of persistent organic pollutants are probably best considered as an Impact-Reduction project for managing persistent organic pollutants in the environment.

Figure 4 below sets out the process of a Programme Cycle for managing persistent organic pollutants. It shows the interrelationship between SEA and the individual periods in the Programme Cycle: design, project mobilisation, project management and lesson learned.

Figure 4. How Socio-Economic Assessment is central to the Programme Cycle for managing persistent organic pollutants



Each period is broken down into stages as illustrated below:

Period 1. Design: A complete SEA takes place in Period 1 of the programme cycle. There are 4 stages in the SEA presented in figure 4. These will take place during the development of the national implementation plan, specifically in Phases I-IV (see Annex A).

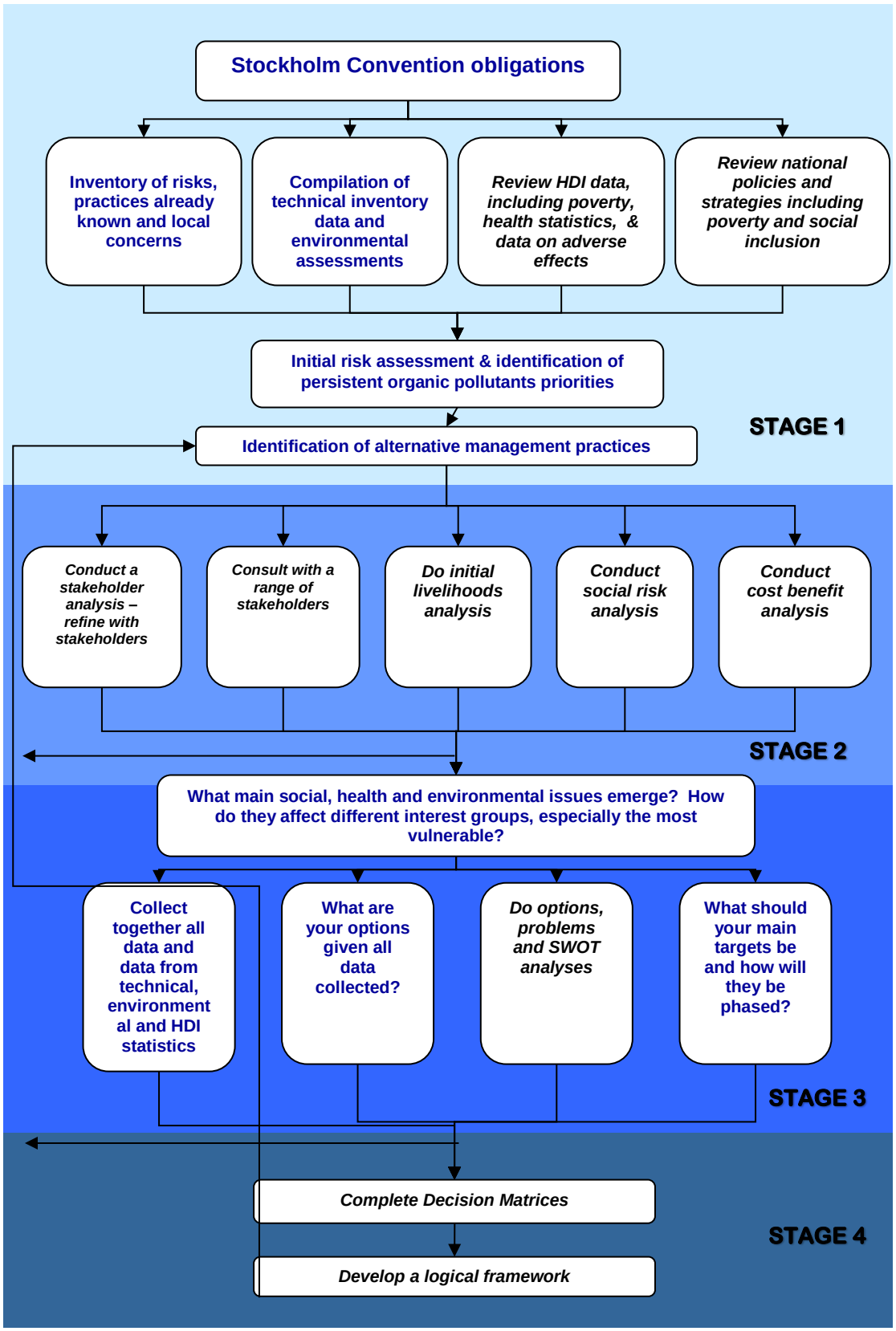
Period 2. Mobilisation: It is the proposal, allocation of resources, assembling of the management team, adjustment to the logical framework, development of Terms of Reference (ToR) and identification of partners and possible funders through the stakeholder analysis and linkages with other government policies.

Period 3. Management: Includes the implementation actions and the use of SEA tools to ensure positive outcomes for most vulnerable stakeholder groups. Must revisit stakeholder analysis to ensure implementation involves relevant stakeholder groups at appropriate times.

Period 4. Lesson Learned: Evaluation. It is the lesson learning period that will shape fresh initiatives in a modified national implementation plan. The different stakeholder groups identified in the Socio-Economic Assessment will need to be consulted to assess impact of persistent organic pollutants management action.

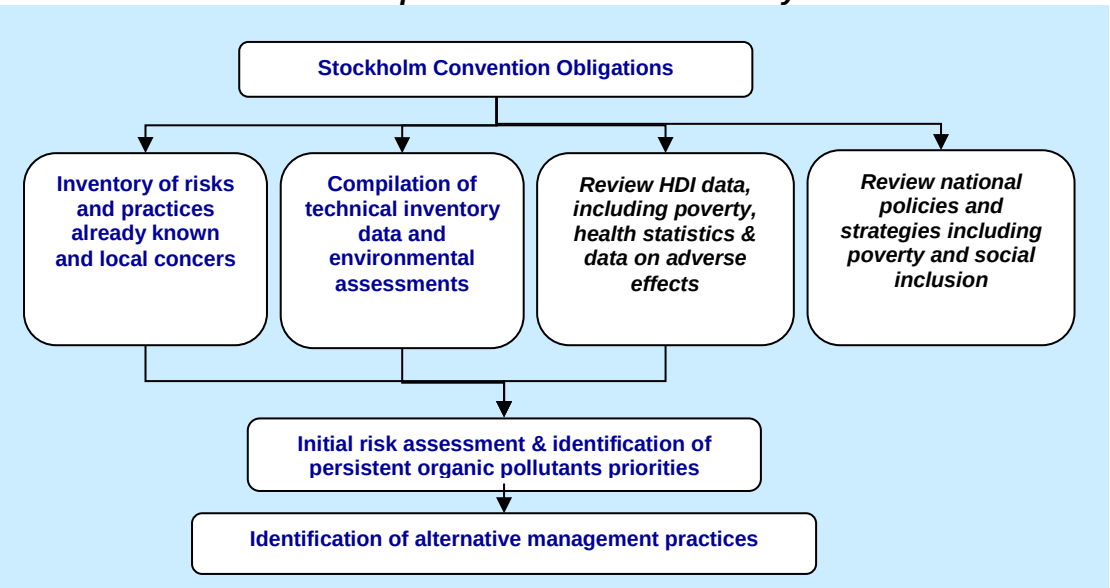
Figure 5 shows period 1 where the phases of the national implementation plan fit in relation to the stages of SEA process. In the diagrams below the feedback loop is not shown but assumed. Questions to prompt the assessment team are in blue. The tools that require to answer the questions are in italics and coloured back.

Figure 5. Period 1 phases of the national implementation plan and the SEA process



Stage 1. Represents the initial part of any project, seeking to implement priority actions set out in the national implementation plan (phases I, II and III). According to this actions, a SEA has to be conducted to quantify of qualify the impact of the management practices.

Figure 6. ***Design - Stage 1 of the Socio-Economic Assessment process: Identification of problem and Situation Analysis***



The assumption in Stage 1 is that, no national priorities have been set with regard to POPs. Information on some aspects of the production, trade, use and disposal of POPs in the country may be available in the public domain and at this point inventories of chemicals will be started.

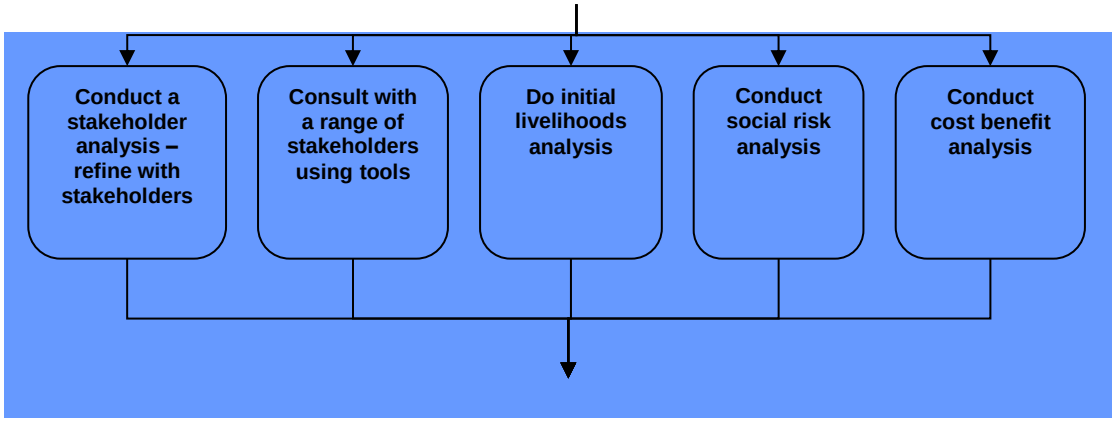
To conduct a SEA it is important to ensure that the assessment team gathers additional information from all sectors including government, non-governmental and civil society as well as business. The team will need to undertake the chemical inventory as well as to search through national policies such as the poverty reduction strategy paper (PRSP), other social inclusion documents, regional trade agreements and others to understand existing national and regional priorities. This combined information represents the '*baseline' situation appraisal against which future actions will be planned and evaluated.*

The best possible situation appraisal is produced by country teams that include members who can add a layer of socio-economic analysis into any analytical and decision-making process that occurs during the development and execution of the national implementation plan.

The assessment team should seek to conduct an initial risk assessment at the end of this stage. Taking into account the scale of risk determined, technical and socio-economic

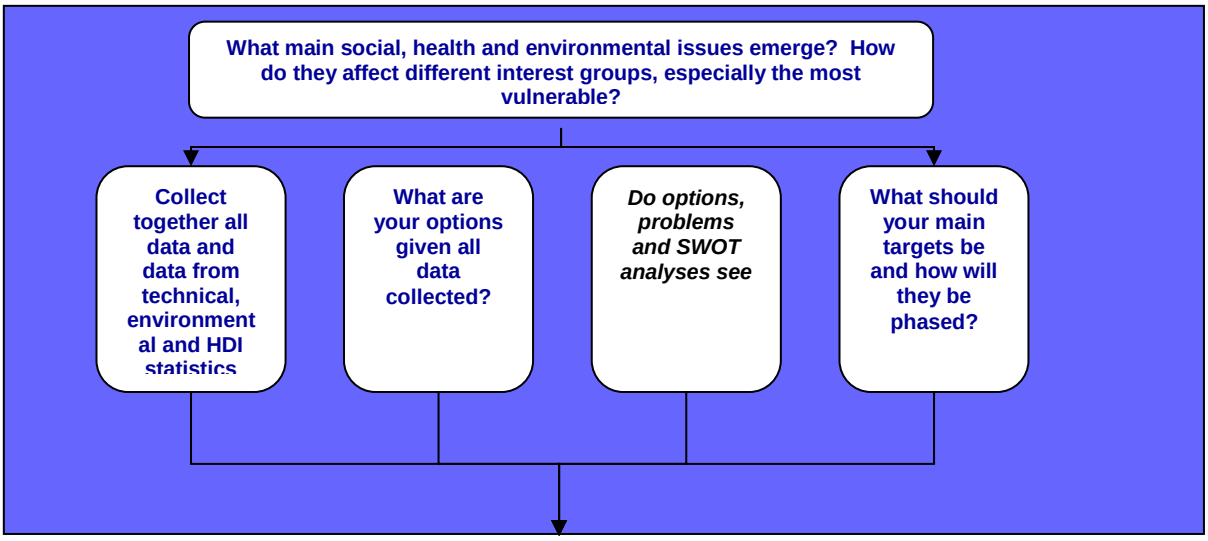
considerations and relevant national policies, strategies and programmes, the team can begin to identify priorities for action. It may also identify alternative practices to manage the highest ranking risks.

Figure 7. *Stage 2 Process: Undertaking the Socio-Economic Assessment*



Stage 2. The assessment team will focus on collecting primary data. The data needs to be considered alongside institutional, regulatory, technical and scientific information. The assessment team is likely to start with a stakeholder analysis, which has a subset of tools to analyse the impacts of the vulnerable community members to contribute and highlight their interests. The team will use tools such as social risk analysis, mapping, including transect walks, ranking of preferences, initial livelihoods analyses and cost benefit analysis.

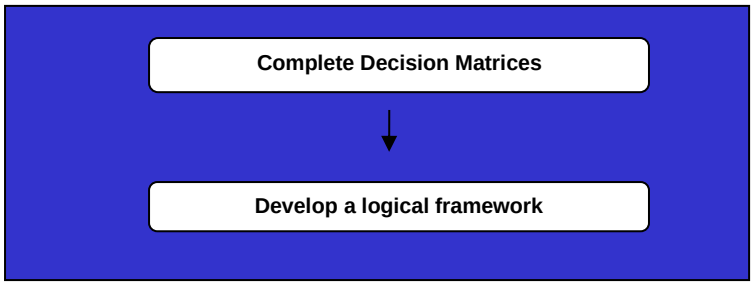
Figure 8. Stage 3 Options Analysis



Stage 3 Options analysis is a collection of tools to evaluate the chemical management options and design initiatives to reduce or phase-out banned persistent organic pollutants.

The team will work with effective coordination and communication to ensure that significant details shared between the social and economic analyses. The tools such as problem and options analysis are useful to analyse options and moving forward. The next step is to construct a formal national implementation plan proposal.

Figure 9. Stage 4. Action Planning



Stage 4 the tools used for this stage are widely applied in project management and project cycle analysis.

- Problems and Options analysis
- SWOT analysis
- Decision-making matrices
- Logical framework

The team may decide that one or more of the tools are not needed at all for a specific situation. However, together, the tools should enable the team to provide with a powerful insight into the needs of the citizens and economy to address the risks posed by persistent organic pollutants and ensure that these needs have equal exposure alongside the economic technical aspects of tackling the problem. At this point there should be a well-argued proposal that can be presented to funders for support.

Finishing period 1 of the management cycle**,** period 2 involves revisiting the SEA (essentially similar to Stages 3 & 4 in Period 1 above), both to verify that the initial assessment is still accurate but more to focus the questions towards the practical aspects of the proposal.

This period ends with the country team constructing a logical framework (as in Stage 5 above), and drawing up Terms of Reference for the various partners in the implementation. The Terms of Reference will clarify roles and responsibilities, targets and time frames as well as the resources available.

The logical framework and Terms of Reference emerging from Period 2 provide the framework in which implementation actions can be undertaken in period 3. In addition to the actions the team has to receive feedback information and adjust plans in real time. Thus the structures and timetable for Monitoring (continuous) and Review (periodic) will be the main

output of this stage. The country teams should choose SEA tools need according to the information they seek and adjust their use in relation to the specific issues being explored.

The last period is Lesson Learned, in which lessons have to be collected. There, the lessons learned will be combined with any new work planning, arising, for example, from the addition of new persistent organic pollutants to the Convention, and adjustments to national priorities and policies.

3.1 How Socio-Economic Assessment will contribute to plan interventions.

The Stockholm Convention asks for the phase-out and substitution of chemicals that can cause harm to human health, wildlife, and disrupt other life-sustaining processes. However, current use of these chemicals is deeply embedded in the economic activities of certain sectors and regions. Any intervention with the purpose of reducing their use will have an effect on social and economic activities, and as such, it must be assessed. On the other hand, these interventions will provide benefits throughout the economy, and to garner the political support to act, these benefits also should come to light.

A transparent socio-economic analysis can help inform decision makers and stakeholders of what will be involved in terms of positive and negative effects, both across social groups (by income, ethnicity, gender) and across the economy (sectors, size of firms, linkages). Options for interventions can have different time horizons, depth, or breadth, and as such will be assessed regarding which one will be best. Also, identifying overall net gains, together with the distribution of benefits and burdens over different social groups or economic activities, can be the basis for the necessary cross-compensations that will allow everyone to be at least as well off as before the intervention. This will ensure cooperation and help towards greater ambition in goals and implementation.

3.2 Some examples of SEA implementation

There is a significant international interest and various ongoing initiatives related to assessing the socioeconomic impacts of chemical management frameworks. The European Chemicals Agency (ECHA, 2016)[1] hosted a workshop to share experiences on this topic that will support the longer term goal of developing harmonised methodologies for estimating the economic costs and benefits of managing chemicals.

[1] This workshop was hosted as part of the work of the OECD's Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology and the OECD's Environment Policy Committee's Working Party on Integrating Environment and Economic Policies.

There are some concrete examples of cost and benefit assessment that support the discussion of SEA implementation. In terms of information and methodologies, Chiu, W (2017) outlines the type of information available in a typical chemical risk assessment, and review existing methodologies and information requirements for translating the results of a chemical risk assessment into attributable health or environmental impact(s) of a given chemical as input for an economic evaluation.

Other examples regarding the use of different valuation methodologies highlighting the strengths, weaknesses and uncertainties of them have been published recently (Alberini, 2017; Navrud, S, 2017).

The conduct of a SEA for chemicals is challenging for both science and economics. There are important gaps in the lack of information not only in the impacts of chemicals on human health and the environment, but also, the value to assign the identified impacts.

Socioeconomic evidence can be a powerful tool to support policy-makers in regulatory decision-making and aid in the communication and justification of actions. It can also facilitate transparency in the decision-making process. Therefore, even with the associated challenges and uncertainties in conducting SEA, it is important to continue the practice and improve the methodologies and information associated in doing so.

4. How to guide SEA tools

4.1 Stakeholder analysis

This is a central tool of a SEA and it is a collection of tools or processes for identifying stakeholder[2] groups and describing the nature of their stake, roles and interests in persistent organic pollutants risk reduction and management. It helps to identify entry points and actions. This analysis should, ideally, be carried out as part of the initial preparation of the national implementation plan, and again before implementation of the plan gets underway. It can be used to explore the perceptions of the social and economic impact of the chemicals and of the actions or policy options to reduce or eliminate them.

This type of analysis helps to:

- Identify the groups to be consulted and engaged with, as part of the national implementation plan preparation process and/or proposed persistent organic pollutants-reducing initiatives.
- Identify winners and losers, those with rights, interests, resources, skills and abilities to take part or influence the course of the process.
- Improve the national implementation plan scope to the perceived needs of those affected.
- Reduce or hopefully remove negative social and economic impacts on vulnerable and disadvantaged groups
- Enable useful alliances which can be built upon thereafter.
- Identify and reduce risks; for example identifying areas of possible conflicts of interest and expectation between stakeholders so that real conflict is avoided before it happens
- Enable understandable and timely information disclosure
- Improve opportunities for access funding

4.1.1 How to do a Stakeholder Analysis

Step 1.Stakeholder Identification – drawing up a stakeholder table

a Thinking as broadly as possible, make a list of possible stakeholders that may be affected in a positive or a negative way due to the persistent organic pollutants reduction initiative. In period 1, regarding to the national implementation plan, a table

[2] Stakeholder is any person, group or institution that has an interest in a development activity, project or programme. This definition includes intended beneficiaries and intermediaries, winners and losers, and those involved or excluded from decision-making processes http://www1.worldbank.org/publicsector/anticorrupt/PoliticalEconomy/PDFVersion.pdf. The role Stakeholders play in any participatory process may differ for any number of reasons but all may bring legitimate perspectives to the table.

that determines the stakeholders for each persistent organic pollutants family might be used. In Period 2, this stage would be to determine the groups for any initiative, policy, measure or action that had been decided upon. The list has to include not just the usual suspects, but also the vulnerable and marginalised groups who might not normally be consulted but who are nevertheless affected by the chemicals and/or their phase-out.

b Identify, as much as possible, all their interests in relation to the initiative and its objectives.

Example: Continuing use of a particular pesticide may have detrimental long-term effects on the health of farmers – but, How will a potential fall in crop yield as a result of not using the pesticide affect the income and status of subsistence farmers?

Make a preliminary assessment of the impacts of the policy options on each stakeholder's interests. Use symbols as follows

+ potential positive impact on interest
- potential negative impact on interest
+/- possible positive and negative impacts in different circumstances

In the example of the pesticides above, a stakeholder group may be impacted in both ways (positive and negative) by the policy options proposed.

d After listing all stakeholders, rank them in order of priority by the outcomes of the national implementation plan or programme.

-

Table 2. Stakeholder table example

Stakeholders	**Interests**	**Likely impact of the initiative**	**Priority of interest**
Working children	Safe working environment, social protection, alternative source of income	+/-	1
Poor women	Malaria protection. Healthy babies and children, income	+/-	1
Farmers	Healthy crops, better health, habits related to perceived status	-/+	1
Private sector companies with agricultural base	Improved product/ greater public awareness of alternative products	-	4

Other lists can include information of stakeholders which may be relevant to the process. The following is an example of a Stakeholder list for a PCB Management initiative:

Table 3. Stakeholder analysis example. PCB management

Stakeholder	Characteristics Goal, Social, economic Structure, organizations, status attitudes	Interest & expectations -expected results	Issues of concern environment issues, cooperation with other stakeholders	Potential & deficiences -resource endowment - knowledge, experience - potential contributions	Implications and conclusions of the project -possible action required
Ministry of Environment	Centralised decisions in terms of resources - Ministry council decides, after a while, which projects to undertake - Better environment	- Lead role in the project - Improved image in the community -Lead role in all chemical related projects	Environment main issue of concern - Cooperates well with all ministries except with Agriculture	- No financial resources available - Expertise available (experts trained on PCB management) - Planning capacities	- Take advantage of expertise available - Review central allocation of resources and enquire if resources are available for PCB management
Ministry of Industry	- Decentralised structure - Industry associations as a partner - Improved industry performance	- Lead role in training industries for PCB disposal - competitive (nationally and internationally) industries - Lead role in all industry training activities	- Industry performance and respect of environment main issue of concern - Relations with Ministry of Environment could be improved -Never worked with NGOs	- Financial resources may be available through industry associations - expertise available	- PCB management policy required -detailed updated inventory of PCBs -industry sectors dealing with PCB well identified - enquiry industry sectors willing to participate
Electrical facilities	- Centralised decisions - Projects supported at the national level - funding restricted to change of equipment - Any project need to create financial opportunities - Environment is not a priority	-Workers well trained on PCB management - Needs provision of temporary storage facility until destruction - Fewer human health risks -Economic benefits in front -collaboration with other counterparts	- Maintenance of PCB equipment neglected - relations with Ministry of Environment could be improved - Potential benefits for the sector not clear	- Resources available very limited - knowledge of the problem can be shared - expertise needed	- Little knowledge on alternative technologies to PCBs - enquiry which facilities are willing to participate
NGOs	- Flexible economic and social structure - Protection of health and environment as a main objective	-Safe environment - less PCB in the country	- Cooperation with other sectors may be not easy and may take time - concerns about public access to information	- Resources needed to operate - Experience in training communities	Sensitization of public on PCB management and health/ environment risks

Source: UNEP, DGEF, (2005)

Step Two. Assess the Influence and Importance of Stakeholders

How 'key' stakeholders can influence or are important to the success of an initiative.

- **influence** is the power which stakeholders have over the 'project'. How much can stakeholders (whether individual, group or organization) persuade or coerce others into making decisions or doing things?
  importance is the priority given by the 'project' to satisfying the needs and interest of each stakeholder.

- The diagram 1 below combines influence and importance and positions stakeholders in relative terms by using a matrix. It can help to do this as a team exercise.

Quadrant A	Quadrant B
Quadrant D	Quadrant C

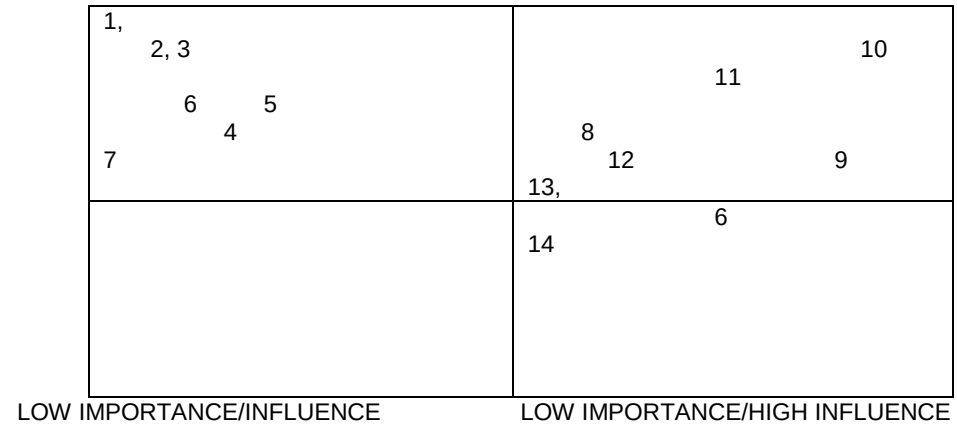
Quadrant A. Stakeholders of high importance to the project, but with low influence. They require special initiatives if their interests are to be protected.

Quadrant B. Stakeholders of high importance to the project, but who are also of high importance for its success. Project managers and donors will need to construct good working relationships with these stakeholders to ensure an effective coalition of support for the project.

Quadrant C. Stakeholders with high influence, who can therefore affect the project outcomes, but whose interests are not the target of the project. These stakeholders may be a source of risk; relationships will be important and will need careful monitoring. These stakeholders may be able to 'block' the project, and if this is probable, the risk may constitute a 'killer assumption', i.e. one that means it is too risky to go ahead with the project at all.

Quadrant D. Stakeholders in this box are of low priority but may need limited monitoring and evaluation. They are unlikely to be the subject of project activities and management.

Diagram 1. An Example of an Influence/Importance Matrix



STAKEHOLDERS

1 Children - all
2 Working children
3 Street children who live by transformers
4 Women
5 Pregnant women
6 Farmers
7 Market traders
8 Private sector electricity company
9 Health workers
10 NGOs
11 National government
12 Community leaders
13 Religious leaders
14 National media

Step Three. Identify appropriate stakeholder participation

a Based on the Stakeholder Table, draw up a Summary Participation Matrix to clarify the role that all key stakeholders should play at different stages of the implementation plan.

b Discuss with individual stakeholders the role they should play; i.e. where they should be placed in the matrix.

Table 4. Summary Participation Matrix

Type of participation / Stage in initiative	Inform	Consult	Partnership	Control
Identification				
Planning				
Implementation & Monitoring				
Evaluation				

Again, the format for this stage may vary widely. However, the process should serve to create an outline communication strategy for the initiative, ensuring that engagement with key stakeholders (particularly those more marginalized or vulnerable groups, whose voices often go unheard) is ongoing.

4.2 STEP analysis

STEP analysis is a dynamic, strategic planning tool that can be used at the outset of any management initiative for persistent organic pollutants and facilitates a review of the circumstances in which the initiative will take place. It is an acronym for Sociological, Technological, Economic and Political and is an invitation to consider the changes and trends that are apparent, relevant to the development of the national implementation plan.

This type of analysis helps to:

- provide a good framework for reviewing strategy, position and direction of the national implementation plan to ensure that it matches national priorities or the agendas of potential funders.
- get stakeholders discussing the significance of issues contributing to the planning environment early on in the process.
- make early connections between key technical, social, economic and political aspects.
- draw out interests and motivations of different stakeholders.

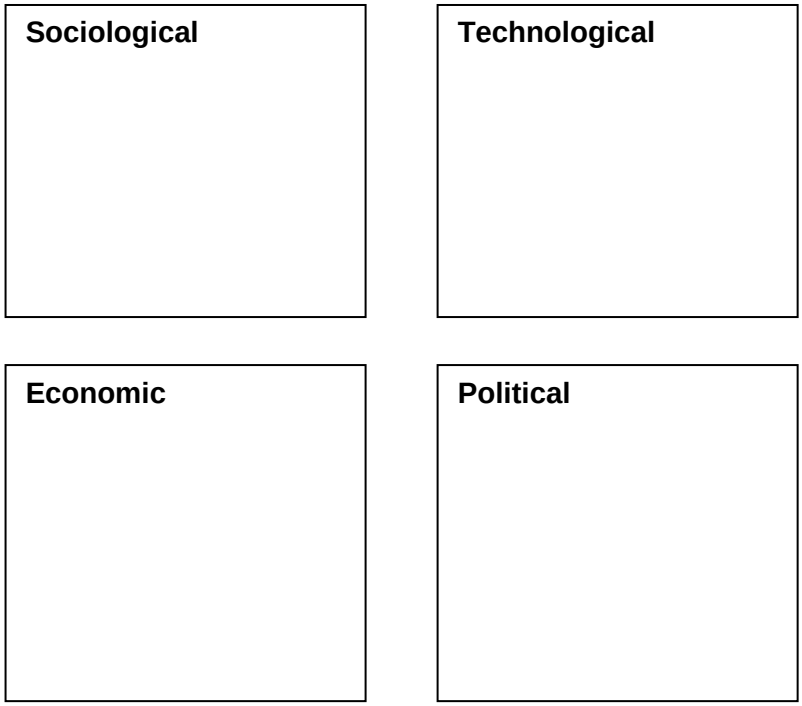
4.2.1 How to do a STEP analysis

Step 1: In this step, the stakeholders will make a list and identify (see Figure 10) the policies, economic, technological and social trends in which the national implementation plan will be operating.

Step 2. Review the lists, highlight the important items and delete the ones that no longer need to be included.

Step 3: Identify the links between persistent organic pollutants and the list of items and how can those links be used to support the national implementation plan in the stakeholder negotiation.

Figure 10. STEP analysis boxes



4.3 Social Risk Analysis

Social Risk Analysis aims to establish thresholds or limits within which social groups can mitigate risk and withstand external shocks (Swaney, J, 1995). It facilitates an assessment of all major risks to the population, especially the poorest and most vulnerable groups.

This type of analysis helps to:

- identify those who will be adversely affected by the proposed persistent organic pollutants-reducing initiatives, through the creation, reinforcement or deepening of inequity and/or social conflict.
- understand the local perception on risk, health and safety.
- recognise the importance of belief systems, education, identity and worldviews of the affected people.
- determine how local communities perceive the risk of persistent organic pollutants in the environment.
- improve the national implementation plan's sensitivity to the vulnerability of those affected.
- reduce negative social and economic impacts on vulnerable and disadvantaged groups.
- identify and reduce risks; for example identifying areas of possible conflicts of interest and expectation between stakeholders so that the interests of those whose health and livelihood is damaged by persistent organic pollutants are not overturned by those who have an economic interest in the status quo
- enable useful alliances which can be built upon thereafter.
- enable understandable and timely information disclosure.
- improve opportunities for accessing funding.
- enable the successful implementation of chemicals management strategies and initiatives, with particular emphasis upon mitigation measures.

4.3.1 How to Do a Social Risk Analysis

Step 1: Analysis of vulnerability and perceptions of the groups exposed to a risk

In this step, a questionnaire for stakeholders will be use to gather the perceptions of the groups and it would be useful to double-check using other tools as far as possible, such as with other consultation tools The scope of the questions will be:

- Relative number of and types of people involved in the risk.
- Resilience of groups – ie what are their particular vulnerabilities, such as what choices they feel they have to change, e.g. what trends re persistent organic pollutants usage are they experiencing and what trend reversal would mean.

- History and experience of people in the area regarding interventions that have been imposed before.
- Public perception of persistent organic pollutants elimination
- Willingness – and ability – to pay for alternatives to current practices
- Ethical considerations for research (see annex C) should be taken into account regarding consultation, interviews or using any other type of methods to obtain information from the communities affected.

b Carry out a ranking exercise, to list the perceptions of stakeholder groups at risk

Step 2: Assess level of risk to affected populations

Draw up a table for each stakeholder and identify the potential risks that need to be assessed; their level of probability and impact. These can be assessed in a number of ways, but it is common to express these as High (H), Medium (M) and Low (L). Mitigating measures should be built into the national implementation plan as activities

Table 5. Example of a Social Matrix

Stakeholder Group	Potential Risk of persistent organic pollutants management action	Probability	Impact	Mitigating measure	Level of priority for managing risk
ethnic minority group a	Loss of livelihood selling fertilizer	H	H	Small Enterprise project	High
Working children	Lack of income	L	M	Provision of vocational education and training	High
Women	Loss of income – greater susceptibility to malaria	M	H	Private sector/government provides alternatives	High
farmers	No available or affordable fertiliser	H	H	Enterprise project	High

4.4 Consultation tools

Consultation tools find out how stakeholders perceive the impact of chemical management practices. The consultation techniques are essentially visual, designed to be used with interest groups at all levels, from communities to policy makers. They are useful for assessment, baseline data gathering, planning and delivering information, monitoring and evaluation.

An important issue are the ethical considerations for research (see annex C) that should be taken in to account regarding consultation, interviews or using any other method to gather information from the communities or stakeholders affected.

This type of analysis helps to:

* involve stakeholders in the early stages of an SEA.
* emphasize local knowledge and enable local people to make their own appraisal, analysis, and selection of options.
* enable the inclusion of diversely interested groups of people, which helps lay the foundation for community ownership of development planning.
* facilitate information sharing, analysis, and action among stakeholders.
* enable development practitioners, government officials, and local people to work together to plan context appropriate programmes and make decisions about alternative options.
* understand the interaction between poverty and the impact of pesticides in particular, or other persistent organic pollutants.
* enable to cross information of qualitative data to ensure that is valid and reliable
* enable planning and execution plans which are suitable for diverse stakeholders.

The principal consultation tools are:

- **Semi-Structured Interviews** are the cornerstone of community consultation techniques in any phase of national implementation plan. Rather than focus on questionnaires or surveys, semi-structured interviews rely on highly skilled people who talks to key informants around a checklist of subjects that need to be addressed. They ask questions, discuss, probe and try to get to the bottom of issues, such as social risks, groups real agendas, and livelihood issues without exposing the participant to feelings of discomfort. Responses could be crossed using other tools.

- **Information mapping,** is an inexpensive tool which can be used to gather descriptive and diagnostic information. Mapping exercises are multi-purpose and can be used at the planning, forecasting, review and evaluation stages of the national

implementation plan and are useful at beginning of a process to motivate people to become involved.

A variation of this kind of maps are the social maps in which people show the location of their households, and the relevant factors of wealth and poverty. Health mapping is one type of social map, which uses symbols to show people with different living conditions and highlight the sources of health risks and care.

This kind of map particularly helps to understand the interaction between poverty and the impact of persistent organic pollutants. It should also help to identify vulnerability issues regarding any changes, such as whether poorer people live closer to the site of pollution and which authorities would need to be involved in mitigating the effects of a wholesale removal of that population from a contaminated site.

- **Transect Walks** allow the people and interest groups to get a feeling for the area as they walk across it. Importantly they allow community members to point out or draw the team's attention to features of their environment and the team to informally ask specific questions about things that they notice along the way.

This is particularly useful for rooting out continued use of persistent organic pollutants, understanding persistent organic pollutants usage practices which are localized and/or not easy to spot from large scale surveys, unexpected impacts of persistent organic pollutants reduction activities, etc.

- **Matrix ranking, quantifying and scoring.** These are techniques to finding out individuals or group's knowledge, criteria, preference rankings and preferences about an issue (e.g. effects of persistent organic pollutants use or importance of a pesticide in stakeholders' livelihoods).

The techniques are useful for participatory planning and for taking forward into Options Analysis. They are complementary with semi-structured (informal) interviews by generating information leading to more focused and direct questions. These techniques present the assessment, perceptions, preferences and ranking of local people which are often different from those of planners, researchers and other outsiders. Ranking is placing things in order relative to one another and scoring is giving things a number based on a criterion scale may be used as part of an interview or as a separate exercise.

4.4.1 How to Do a Semi Structured Interview

There are 3 main activities involved for the interview: 1) Observation: keep the eyes open and take all observable information; 2) Conversation: dialogue, talk with people and listen to them; and 3) Recording: take notes discreetly to be written up in full later.

Step 1 Prepare a checklist or guide.

Prepare a checklist of questions that relate to the subject/s of the visit. This list might be quite extensive if the SEA team is visiting a location to obtain the stakeholder interests, priorities, perceptions of risk, livelihoods etc. However, the aim is to develop a two-way discussion, or a flowing 'chat' rather than a formal interview so that interviewers must be prepared for subjects to shift and change and not keep to a hard and fast schedule. In all the steps, ethical considerations should be taken into account.

Step 2 Conduct an informal interview

The interviewer should remember to:

- Be sensitive to informants' needs and ideas,
- Listen attentively,
- Ask open-ended questions starting with: WHO? WHAT? WHEN? WHERE? WHY? HOW?
- Probe answers carefully.
- Judge responses: are they facts, opinions or rumours?
- Verify answers through cross-checking
- Generate new ideas and questions as you proceed.

Step 3 Post interview recording and verification

After the interview the team should record responses and observations fully and then cross check with other informants' responses. The information from the semi-structured interview can now be incorporated into other analyses.

4.4.2 How to Do a Social Map

Step 1. Making the map.

Stakeholders make a map of the current/existing situation in the locality using materials such as paper, but can also be using a stick to draw in sand, starting with a layout of the place marking out the following:

- paths and roads
- dwelling /compounds

- key infra-structural facilities - water supply, religious centres, schools, clinic, granary, mill, agricultural suppliers, factories etc.

Step 2. Add social and economic information of households

Stakeholders add detail to the map, depending upon the reason for the mapping, such as:

- Health: identify the health conditions of the members of different families, obtain the geographical location of households, number of people with an specific disease and the need of a treatment in a hospital.
- Income level: map the income level of the population
- Identify who in the community might use which local resources, eg people living where use the community grain store, which people might buy supplies from the agrochemicals shop and is that grain put into the community grain store.
- Population: number of adults/male/female/children; number of household members; number of children go to school etc.

4.4.3 How to do a transect walk

Step 1: Decide on the factors to be drawn in the transect e.g. land use, facilities, whereabouts of shops which may have stocks of old persistent organic pollutants, potential producers of persistent organic pollutants or what remains of them, problems, opportunities

Step 2: Discuss the route to be taken.

Step 3: Walk the transect interviewing people along the way. Observe, ask, listen, note, Sketch distinguishing features. In this step, ethical considerations should be taken into account.

Step 4: Draw the transect – do not be too detailed. This can be done with/by a community.

Step 5: Cross-check the transect information with other community members during further primary investigation.

Table 6. Example of a transect walk

Factors drawn in the transect							
Physical Resources (Infrastructure) Poor housing this end of village	Mining equipment in relatively sound condition	Roads in poor state of repair	Housing stock improved School		Improved roads	Best housing at this end of community.	Modern car
Natural Resources		Forests for timber	Pasture land	Lake with fish Water source			
Social Resources	Women's group formed to look after elderly in poorest end of village. Church		Man is union representative – has political power School is meeting place	Fisherfolk meet to share news. raises Women come to collect water		Mosque	
Human Resources		Interviewed man – a miner. Has worked in mine all of his life. Wants to acquire carpentry skills	School has committed teachers, but not enough of them. Average attendance 78% male, 62% female	Men with fishing skills	Women with college qualifications in business admin	Koranic School	
Financial Resources I	Smart Church Poor housing					Expensive new Mosque	Evidence of affluence

4.4.4 How to do a Matrix Ranking/Scoring

Step 1. Choose any individual or a group

- Ask people to choose a class of objects (tree species, crop varieties, vegetables, pesticides etc.) or choose from issues of concern regarding persistent organic pollutants identified from earlier interaction - issues/objects which are important to them and about which they know a lot.
- Ask them to name the most important. The list can be anything from 2 to 7 or 9.

Step 2. Elicit criteria by which respondents judge or distinguish between the items; e.g. what's good or bad about them? what are they useful for? why do people evaluate the items in the way they do?.

Step 3. . List all criteria. Turn negative criteria (e.g. vulnerable to pests) into positive ones (not vulnerable to pests) so that all are positive. This is very important if there is to be any hope of your overall ranking being valid; it is often not done.

Step 4. Draw up a matrix with objects across the top and criteria down the side.

Step 5. For each criteria the items can be either ranked or scored.

- For ranking, ask which object is best by each criterion. With six objects one can use the following sequence.
  - which is best?
  - which is next best?
  - which is worst?
  - which is the next worst?
  - of the two remaining, which is better?

  Usually with Ranking each item is assigned it's own rank, though when respondents cannot distinguish between two items in relation to one criterion, it is possible to assign them the same rank, e.g. 2=; the next ranked item would then be 4. Record the rankings for each criterion directly onto the matrix.
- For scoring, make up a scale as appropriate; for example
  - 1=extremely useful; used every day
  - 2=very useful; used once a week
  - 3=fairly useful; used once a month
  - 4=not very useful; used only occasionally
  - 5=not useful at all; hardly ever used

  With Scoring, many items can be given the same score; and for some scores there may be no item.

Step 6. Ask the respondent for a final choice, "If you could only have one of these, which one would you choose? Which next? Until all are ranked. Record these.

Be very careful with the last question, in some circumstances the information could be totally spurious data. Sometimes addition of the values may be valid. Where criteria 'compound' each other, it may be more valid to multiply values. In some situations, neither may be valid. Remember one of the principles of these consultation techniques is appropriate imprecision; we are generally only seeking trends or relative approximations. Do not conjure up a masquerade of precision either when it is not needed or, especially, when it may not be valid!

4.5 Livelihoods analysis

Livelihoods[3] Analysis is a tool that helps to understand the way and means of living of any stakeholder group and the major influences that shape them. This type of analysis is carried out using a checklist relating to the livelihood characteristics, in combination with other tools and methods such as stakeholder analysis, consultation tools, step analysis etc, to gain this insight. It is always essential to go beyond a static snapshot to explore trends over time and how people adapt to these, especially from the persistent organic pollutants management perspective, when attempting to forecast the impact of alternative management options. In all the steps, ethical considerations (see Annex 3) should be taken into account, as well as the rights of indigenous people.

This tool which can be used in the planning, forecasting, monitoring and lesson learning periods in the national implementation plan cycle. The unique aspects of livelihoods analysis are that it gives an opportunity for policy makers to build upon the resources and knowledge that already exist in the community. This situation makes the people of the community to take the main role rather than only have the efficiency use of the resources as a key.

At an early, baseline information gathering phase, a livelihoods analysis could ascertain the resources, policies, processes and strategies of the risk-related issues surrounding the production or usage practice of a persistent organic pollutant. This information would help highlight the current shocks and stresses associated with the livelihood strategies. A livelihoods analysis then feeds into a risk analysis.

At a later, options analysis phase, a livelihood analysis can help to pinpoint policy changes that will be helping or hindering to vulnerable groups. It can also show how, depending upon how a good persistent organic pollutants reduction policy is implemented, a helping or further hindering environment can be visited upon a vulnerable community. An example of this is banning the use of a persistent organic pollutant pesticide without investing in an alternative. A chain of reaction through the reduction of capital resources and increase of vulnerability through hunger etc, can be mapped. Mitigation activities can then be planned to remove the negative aspects of the process. In all the steps, ethical considerations should be taken into account.

This type of analysis help to:

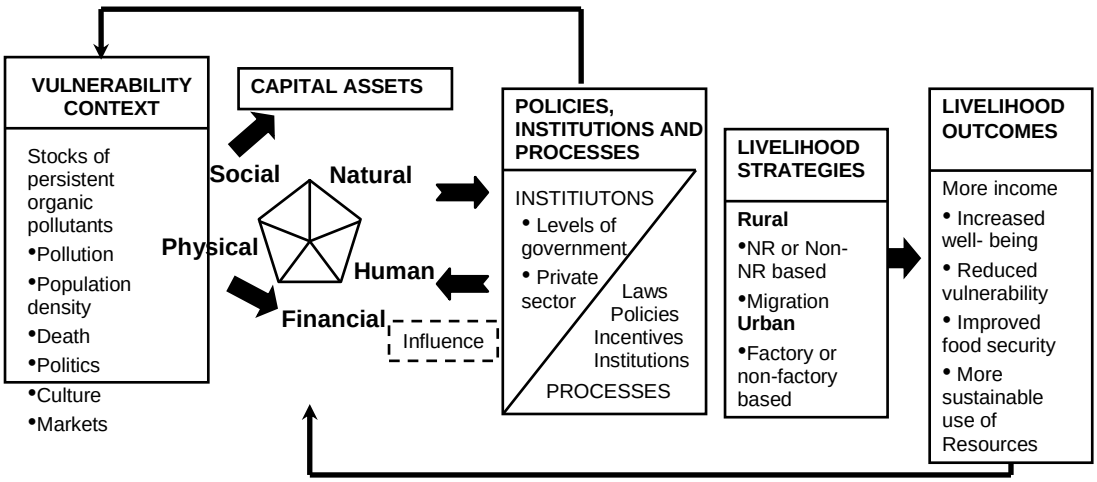
[3] Livelihood is the total means of living that any person has. These include the resources at our disposal, including our own health and that of those around us, our education (human capital) our networks and ability to influence both within our group and between our interest group and others (social capital), as well as the finance, physical infrastructure and natural phenomena (financial, physical and natural capital), available to us. However these are also modulated by the context of vulnerability.

- Understand how changes in policy can impact on vulnerable stakeholders to adapt to the required change.
- Show where in the livelihoods 'system' a 'bottleneck' can result in impoverishment and increased risk and vulnerability to certain stakeholders.
- Recognize where in the 'system', a mitigation or developmental activity could yield a net benefit.
- Demonstrate the differing impacts of good laws which are poorly enacted, upon poor and/or vulnerable groups.
- Forecast the impact of a proposed change (e.g. of policy).

4.5.1 How to do a livelihood analysis

Step 1: Using social risk analysis questions, other consultation tools and stakeholder analysis the SEA team designs questions and elicits responses that will enable a livelihood model to be built like, like the illustration below. A model like this can be used for any stage of the SEA or any stage of the national implementation plan.

Figure 11. Sustainable Livelihood Framework



Carney, Diana (ed.) (1998), *Sustainable Rural Livelihoods; What contribution can we make?,* DFID, London**.**

Step 2. Examples of livelihoods analyses tables follow: for Periods 1, 2 and 3 of the national implementation plan

Table 7. Example of a livelihood matrix in Period 1 Baseline Situation

Rural community dependent upon persistent organic pollutants pesticides and firewood fires

Resources	Level and type of resources	Policy and cultural Environment	Vulnerability
Human Resources	Low levels of qualifications and skills (only school teachers and few who have gone beyond primary school) especially among girls	School costs money	High incidence of ill health – high incidence of respiratory disease, cancers , maternal mortality, infant mortality and birth defects,
Social Resources	Strong family bonds	Strong cultural bonds Policies do not affect this directly.	Emigration to town means fewer people available to help those suffering from above and keep farming
Financial Resources	Low levels of available cash Spent on agricultural inputs, such as pesticides, which are likely to contain persistent organic pollutant contaminants for some pest problems. Money buys food during hungry season (limited food supplies bought)	Chemicals company representatives evident, encouraging use of pesticides in general	Illness or crop failure reduces stakeholder ability to cope
Natural Resources	Firewood Crops and fields, water, sunlight	Min of Agriculture undergoing reform. Advisers rarely seen in villages but when they are, use traditional 'modern' advice – use hybrid seeds, use chemical not traditional inputs for pest control	Trend: Necessity to register land or risk losing it. But then have to pay tax on it and use according to registered use If inputs not used, crops don't thrive – hunger rife.
Physical Resources	Housing – made from traditional materials, few lead roofs	Encouraging of registering certificates of occupancy	Taxes on registered houses with Certificates of occupancy – lead people into debt when crop fails due to illness, lack of inputs

Table 8. Example of a livelihood matrix in Period 1 or Period 2 Options Analysis Option to ban use of persistent organic pollutant pesticides – forecast 5 years after implementation

Resources	Level and type of resources	Policy and cultural Environment	Vulnerability
Human Resources	Low levels of qualifications and skills Fewer school leavers as proportion of population Migration to town picking up	School costs money	Slightly lower incidence of acute ill health due to pesticide pollution (from baseline of 5 years previous)– continuing high incidence of respiratory disease, cancers continue, mortality and birth defects continue and illness/non-productive days up, especially in hungry season
Social Resources	Family bonds breaking down	Strong cultural bonds	Emigration to town means fewer people available to help those suffering from above and keep farming
Financial Resources	Lower levels of available cash spent on more expensive, legal, inputs which are still available.	Chemicals company representatives still evident, encouraging use of pesticides in general	Crop failure rates higher and less money circulating in community. Higher incidence of 'hungry season' mortality and morbidity rates Increased incidence of debt due to lower yields, increased hunger/lower productivity
Natural Resources	Firewood Crops and fields, water, sunlight	Policies still encourage use of hybrid seeds, use of chemical over traditional inputs for pest control	Lower crop yields and incidence of post-harvest crop infestation Increased length of hungry season
Physical Resources	Housing – made from traditional materials, few lead roofs	Encouraging of registering certificates of occupancy	Taxes on registered houses with Certificates of occupancy – lead people into debt when crop fails due to illness, lack of inputs or post harvest pest infestation

= Which mitigation measures are needed to avoid the flashpoints of hunger and its impact on human resources and potentially increased vulnerability?

Table 9. Example of a livelihood matrix in Period 3 or 4 – Monitoring/Review and lesson learning

5 years after with mitigation projects in place (small rural business start-up, efficient stoves and traditional pesticide extension practices)

Resources	Level and type of resources	Policy and cultural Environment	Vulnerability
Human Resources	Low levels of qualifications and skills Fewer school leavers as proportion of population Migration to town picking up	School costs money	more ill health anecdotally ascribed to persistent organic pollutants (reflection on new improved baseline data collection), continuing respiratory disease
Social Resources	Family bonds breaking down	Strong cultural bonds	Emigration to town means fewer people available to help those suffering from above and keep farming
Financial Resources	Higher levels of available cash for project participants	Chemicals company representatives still evident, encouraging use of pesticides in general	Crop failure rates higher but more money circulating in community. Lower incidence of 'hungry season' mortality and morbidity rates Increased incidence of debt due to lower yields, increased hunger/lower productivity
Natural Resources	Firewood – less harvested per unit of cooking Crops and fields, water, sunlight	Policies no longer encourage use of hybrid seeds, use of chemical over traditional inputs for pest control	Stable crop yields and incidence of post-harvest crop infestation Increased length of hungry season
Physical Resources	Housing – made from traditional materials, few lead roofs	Encouraging of registering certificates of occupancy	Taxes on registered houses with Certificates of occupancy – lead people into debt when crop fails due to illness, lack of inputs or post harvest pest infestation

4.6 Cost Benefit Analysis

Being able to compare different courses of action using a single metric is very attractive. If all the complexity of an issue could be summarized into a single number, then ordering the options according to which one of them brings the most net gains to society would be a simple exercise. The "best" option would be self-evident for all, and the right decision would have no challengers; it would be almost automatic. In a sense, this is the central idea behind the Cost-Benefit (CBA) and Cost-Effectiveness analysis (CEA). Using a monetary measure for what is gained and lost, in the case of the CBA, or just for the costs of achieving a certain goal, for the CEA, then all options can be properly ordered.

Obviously, recognizing that not everything can be measured in monetary terms, CBA or CEA can be entered into a multidimensional criteria analysis as just one more piece of the puzzle, not the definitive one. Subjective weights other than a money metric would have to come into play, but that is the central topic of a multicriteria analysis, as can be seen elsewhere in this document. The purpose of this section is therefore to sketch and illustrate the necessary steps of a cost-benefit and cost-effectiveness analysis so they can play a role, either a central or a multidimensional one, in choosing between different programs and policies that phase out persistent organic pollutants.

Actually, using money as a common metric is very attractive for several reasons. The first one is that in market economies, the preferences and possibilities of consumers are expressed in their demand for products and services, and that this demand interacts with their supply to determine a market outcome. Supply itself also summarizes the cost of inputs, technologies and firms' organization, which represent societies' needed efforts to produce a good and send it to the market. So, in a sense, a market price is a brilliant summary of what people would and could be willing to pay for something, a measure of its benefits, interacting with what firms and producers in general would need to provide such goods, a measure of its costs. That is why for many private and public projects, measuring costs and benefits is a great decision tool. For some, the only one.

However, as we have read elsewhere in the document, the fight against pollution and the purpose of having a cleaner environment for humans and ecosystems, is something that not necessarily markets have been able to deliver. Local and national governments and international cooperation have had to step in to provide solutions that the decentralized action of the market has been slow or ineffective in providing. This is not to say that once public action and rules are in place the market does not react. It does, and firms and consumers provide again the energy to achieve the goals. But the lack of market means

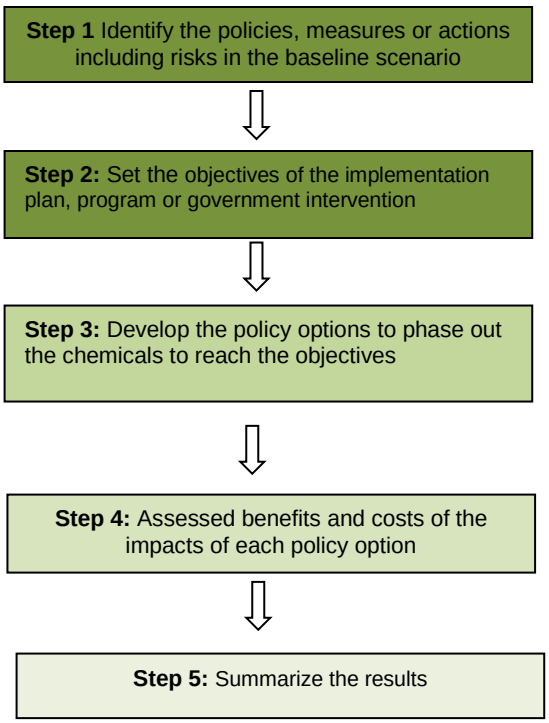
many of the things valued have no market price, and that would stop CBA and CEA right in their tracks.

The good news is that over the past two decades, the discipline of economics has made important advances in one of keys question for the wider use of CBA in environmental policy: how to value in monetary terms this benefits and costs of things that do not necessarily have an existing market. There is no market for clean air or wildlife protection, and markets for clean water are related to the private goods, not the public benefits of a base line of pollution-free accessible resource. However, with creativity, economists have developed methods that tease out the relative importance of these environmental services and goods for people. Wherever one can observe an individual or collective choice, there is an implicit economic evaluation, even if there is no money involved. The lists of these methods, and some examples, are presented in this section.

4.6.1 How to undertake a Cost-Benefit Analysis

The following 5 steps outline the process of selecting the best option and conducting an impact analysis of persistent organic pollutants (Figure 12).

Figure 12. Steps to conduct a Cost Benefit Analysis



Adapted from Canadian Cost-Benefit Analysis Guide (2002)

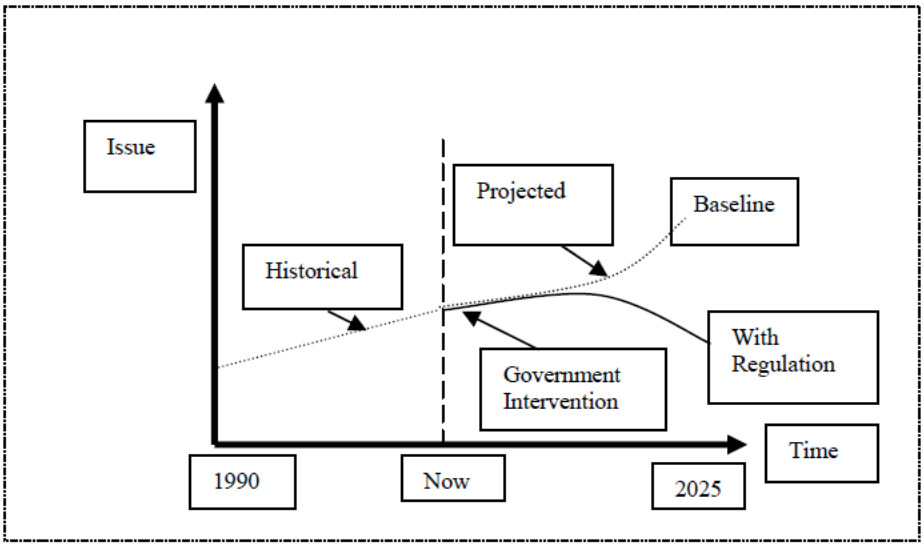
Step 1: Identify the policies, measures or actions including risks and the baseline scenario

For this stage, the regulator must identify a range of alternative policy options, measures or actions to be analysed, being always open to suggestions and proposals from stakeholders. At least three options must be considered: first, an inertial one, the "do nothing" option, secondly a non-regulatory or voluntary one, a "soft" option, and thirdly a regulatory option, which would force through several means: taxes, prohibitions, standards, etc., a determined outcome. Multiple options can be considered, however the 'business as usual' option will always provide the base case against which the incremental costs and benefits of each of the alternatives are determined. And in some cases, doing nothing might be the best option available, at least for a time. All options are open for an objective, sound, cost-benefit analysis.

An important element of the assessment is ensuring that the baseline scenario is properly defined. The baseline situation does not necessarily mean that nothing will happen to the current situation over time, even if the policy is not implemented. Over the years, there will be innovation and technological progress, increase in usage, population shifts and income growth, among other things. Some of these changes may improve in the baseline scenario, while others may exacerbate the problem. Cost-benefit analysis must consider a prediction of these most likely future scenarios. And, in the case of health or environmental issues, there is often associated risk; the fact that the real outcome may vary and some of the consequences would be harder on particular groups of people than on others. Therefore, a dynamic risk assessment is often required, even including the consideration of "unknown unknowns"[4], which is what *true uncertainty* (Sumpter and Johnson, 2008) is.

[4] Sumpter, John P., and Andrew C. Johnson. "10th Anniversary perspective: reflections on endocrine disruption in the aquatic environment: from known knowns to unknown unknowns (and many things in between)." *Journal of Environmental Monitoring* 10, no. 12 (2008): 1476-1485.

Figure 13. Comparison between the Baseline and "With Regulation" Scenarios



Source: Treasury Board of Canada Secretariat (2007), Cost-Benefit Analysis Guide. Regulatory Proposals[5]

Step 2. Set the objectives of the implementation plan, program or government intervention.

The objectives of the intervention can have an economic, environmental, and social dimension linked to the reduction of pollutants and people's exposure to it. Setting them would involve specifying the degree of tolerance of risk, the costs of government action, and private compliance. The voice of the stakeholders is very important in this stage; it is important to define a set of indicators that can measure the objectives has been achieved and communicate them to the people whose livelihoods and health improvements are the final objectives.

Step 3: Develop the policy options to phase out the chemicals to meet the objectives.

The selection of policy options or measures is based on a preliminary analysis of their characteristics. When regulating, one should consider alternative regulatory options within the regulatory framework, non-regulatory options, and the combination of regulatory and non-regulatory instruments. This is because the recommended regulatory policy has to be proven superior not only to other regulatory options, but also to the non-regulatory alternatives and their combination.

[5] Treasury Board of Canada Secretariat (2007), Cost-Benefit Analysis Guide. Regulatory Proposals, https://www.tbs-sct.gc.ca/rtrap-parfa/analys/analys-eng.pdf

Step 4: Assess benefits and costs of the impacts of each policy option

The impacts of the policy options should be analyzed by:

1. Identifying all possible impacts for each of the regulatory and non-regulatory options.
2. Determining how these impacts are related to the fundamental variables that will determine their magnitude over time, e.g. growth in real income, relative price changes, and technological trends.
3. Making projections of these fundamental variables and use these values to make projections over time of the benefits and costs produced by the potential interventions.

The impacts can first be identified in qualitative terms. Then, moving to express them in monetary terms would provide a common metric to help compare the trade-offs faced by society. As mentioned at the beginning of this chapter, this is useful to order the options, and provides a natural weight to them, but in some analysis it must be part of a full multicriteria analysis, and not the only consideration to take.

For some policies qualitative benefits and costs would be difficult to express directly in monetary terms, as they have no market to generate a price out of the interaction of suppliers and consumers. As mentioned, the discipline of economics has developed a set to methods to estimate the monetary expression of non-market goods and ecosystem services (King and Mazzotta, 2006). Table 11 provides an overview of the toolbox available to those teams undertaking cost-benefit analyses that have social and environmental dimensions that do not have direct price expressions.

- **Estimating Benefits**

The Benefit Valuation approach entails a vast range of techniques for each context, for completeness. It should be noted that these are not to be used by adding them up. Instead, individual techniques have to be selected according to the nature of goods (i.e. market/non-market, quantifiable), the socio-economic structure (e.g. proportion of population affected by the potential change), and the environmental situation of the location (i.e. the level of pollution/risk, etc.).

The Willingness To Pay (WTP) and Willingness To Accept (WTA) estimates represent the interaction of available income and subjective preferences for “states of nature”. Monetary valuations of non-market goods and services, such as quality of air, water, soil and ecosystems, are estimated in terms of this *willingness to pay* -defined as the maximum amount of money a person is able and would be willing to pay in order to obtain some level of the good or service-, or in terms of *willingness to accept,* -representing the minimum amount of income a person would require in order to voluntarily accept a negative situation-.

.

Table 10. Economic Valuation Methods: Revealed preference

Revealed preference methods			
Method	**Description**	**Advantages**	**Disadvantages**
Market Price Method	Applied to direct use values, especially for products or services. Uses prices for goods and services traded in domestic or international markets.	Market prices reflect the private willingness to pay for the services provided by the products that contain or generate the pollutants, and for their alternatives in production and consumption. They may be used to construct financial accounts to compare alternatives from the perspective of the household or firm concerned with private profit and losses. Price data are directly obtained.	Market imperfections and/or policy failures may distort market prices, which will fail to reflect the full economic value of goods or services to society as a whole. Seasonal variations and other effects on prices need to be considered when market prices are used in economic analysis.
Efficiency (shadow) prices method	Use of market prices, but adjusted for transfer payments, market imperfections and policy distortions. May also incorporate distribution weights, where equality concerns are made explicit. Shadow prices may also be calculated for non-marketed goods.	Efficiency prices reflect closer to the economic value or opportunity cost, to society as a whole, of goods and services that are traded in domestic or international markets.	Derivation of efficiency prices is complex and may require substantial data. Decision-makers may not accept „artificial" prices.
Avoided Cost	Use of estimates of current damages or costs incurred to reduce, adapt or cope with them.	Provides an intuitive upper bound, close to people's current experience of what would be gained by the policy. The households and the health system share the costs of the health impact of the persistent organic pollutants. Making clear the current division of burdens helps to mobilize.	Data or resource limitations may be present, and only looking at some of the burden might make the intervention look not to be worthwhile. To avoid this, mentioning the qualitative effects is key, even if they still have no monetary expression.

Source: Adapted from TEEB (2010), Chapter 5 The economics of valuing ecosystem services and biodiversity. OECD (2006), Cost-Benefit Analysis and the Environment Recent Developments.

Table 10 continued

Revealed preference methods			
Method	**Description**	**Advantages**	**Disadvantages**
Travel Costs	Derives willingness to pay for environmental improvements by using information on the amount of money and time that people spend to travel, either to gain benefits or avoid damages.	Widely used to estimate the value of recreational sites in developed countries, and to estimate the value of access to clean water or fuelwood in poorer regions. Observing reactions to restrictions or impacts of pollutants that include mobilization would be reflecting important costs and benefits.	Data intensive, difficult to differentiate multifunctional trips. Sensitive to specifications of the demand relationship.
Production function approach.	Estimates monetary value by looking at the changes in economic activity brought by the environmental damage or benefit. Linked to the "invisible" or unaccounted for environmental services.	Widely used to estimate the impact of natural resource damage on production activities and for health related falls in productivity.	Requires explicit modelling of the „dose-response" relationship between the environmental variable and economic results. Vulnerable to challenges. Becomes complicated with multiple systems.
Hedonic Pricing.	Decomposes the market prices of goods into shadow prices of their characteristics; one of them being the exposure to environmental damage. Hedonic prices for riskier-healthier jobs and hedonic prices for housing with different levels of exposure can be constructed.	Strong base of evidence and true preferences and willingness to pay, or to accept, by individuals and households.	The expression of value critically depends on information. Requires large variations in the price variable linked to salient changes in environmental values.

Source: Adapted from TEEB (2010), Chapter 5 The economics of valuing ecosystem services and biodiversity. OECD (2006), Cost-Benefit Analysis and the Environment Recent Developments.

Table 11. Economic Valuation Methods: Cost Based Valuation

Cost Based Valuation Methods			
Method	**Description**	**Advantages**	**Disadvantages**
Cost-based valuation	The value of an environmental benefit is at least equal to the costs of providing it.	It is easier to measure the costs of the project producing benefits than the benefits themselves, when goods, services and benefits are non-market. Approaches are less data and resource-intensive. Robust if there was a democratic process or consensus that the project should be carried out.	Costs and benefits are by construction always equal. Might underestimate benefits and thus the potential to expand ambition.
Restoration cost (RSC)	The value of a clean environment is equal to the costs of restoring it.	Readily available information. Relevance to policy action.	Costs of restoration could be extremely high. True restoration can only be demonstrated in the long term.
Relocation cost (RLC)	The value of a clean environment is at least equal to the costs of relocating communities with high exposure, to a cleaner site.	When accidents or new developments displace people, information about costs is generated and it can be used to value risk or new projects.	New locations might not provide equal well-being to people than the original location.
Preventive expenditure (PE)	The value of a clean environment is at least equal to the costs of preventing damage or further degradation.	Relies on available information regarding prevention technologies and actions. Policy relevant.	Prevention can be more or less expensive, depending on the decision regarding current production. Might reinforce status quo.
Replacement Cost	It uses the cost of artificial substitutes for environmental goods or services.	Useful in estimating indirect use benefits when ecological data are not available for estimating damage functions with first-best methods.	Difficult to ensure that net benefits of the replacement do not exceed those of the original function. May overstate willingness to pay if only physical indicators of benefits are available

Source: Adapted from TEEB (2010), Chapter 5 The economics of valuing ecosystem services and biodiversity. OECD (2006), Cost-Benefit Analysis and the Environment Recent Developments.

Table 12. Economic Valuation Methods: Stated Preference and Benefit transfer

Stated Preference Methods			
Method	**Description**	**Advantages**	**Disadvantages**
Constructed market technique.	Measure of willingness to pay by directly eliciting consumer preferences.	Directly estimates Hicksian welfare measure – provides best theoretical measure of willingness to pay.	Practical limitations of constructed market techniques may detract from theoretical advantages, leading to poor estimates of true willingness to pay.
Contingent Valuation	Construct a hypothetical market to elicit respondents‟ willingness to pay.	Only method that can measure option and existence values and provide a true measure of total economic value.	Potential sensitivity to sources of bias in survey design and implementation.
Simulated market (SM). Choice experiment	Constructs an experimental market in which choices with trade-offs are made.	Controlled experimental setting permits close study of factors determining preferences.	Real choices difficult to implement. Fictional markets might not frame decisions adequately.
Contingent ranking (CR)	Ranks and scores relative preferences for amenities in ordinal terms before using a conversion of this ranking into monetary measures.	Generates value estimate for a range of products and services without having to elicit willingness to pay for each. Elicitation similar to normal decision process.	Does not elicit willingness to pay directly, hence lacks theoretical advantages of other approaches. Qualitative results are difficult to communicate.
Benefit transfer methods			
Benefit Transfer	Estimates the value of an environmental benefit or damage by transferring an existing valuation estimate from a similar situation, accounting for the difference in statistical terms.	Benefit (or value) transfer (BT henceforth) is an approach to overcome the lack of system specific information in a relatively inexpensive and timely manner.	Extrapolation can only be done for situations with the same characteristics. Lack of detail of the original study's benefit or cost function can make extrapolation biased or impossible.

Source: Adapted from TEEB (2010), Chapter 5 The economics of valuing ecosystem services and biodiversity. OECD (2006), Cost-Benefit Analysis and the Environment Recent Developments.

- **Estimating Costs**

Estimating costs follows the same approach. Some goods and services do have observable market prices, and as such should be used. The key is in the completeness of the search. For example, a regulation would entail compliance costs incurred by the private sector, but also the administrative costs incurred by government in setting, monitoring and enforcing the regulation. Without the latter it is not certain that the observed level of compliance would be maintained over time. For goods and services that do not have observable market prices, then the analyst should apply a method using revealed preferences or stated preferences, and rely on dose-response models and benefit transfers to make them relevant to the case.

Use of the discount rate to calculate the net present value of the project or policy over time.

The effects of implementing a project or policy are actually a stream of costs and benefits becoming a reality at different periods over time. Despite that it would be simple enough to just sum them up, there is no reason why costs or benefits accruing at a future period should have the same weight as those being present at an earlier date. Society in general, and individuals in particular, do value more those income streams that are closer to the present than those that appear later in the future. The market for credit actually generates a price for this: the interest rate. In social terms, governments also recognize the fact of having different weights over time through using a "social discount rate", one that would reflect the opportunity cost of resources in different periods, even when isolating the discounting from the expected volatility of markets.

The net present value of a project or policy is calculated by discounting the costs and benefits in each future time period, and them summing them up. A discount rate should be decided upon, be it the market interest rate, the future expectations of this rate, or the social discount rate used by the government for certain types of investments. Then, it should be used to weight the value of future benefits and costs, that is, dividing it by the factor $(1+d)^t$, where d is the discount rate, and t is the time period in which the costs or benefits appear. The longer the time frame, the higher the discounting, and the smaller will be the impact of any given year on total net benefits (King and Mazzotta, 2006). The sum over time is still important, though. Projects that have initially high costs but then enjoy a long period of benefits, even if discounted, could indeed be worthwhile for society.

It is important to be aware that, for those projects and policies that render most of their benefits in the far future, as is the case for environmental issues like Climate Change and

Biodiversity Conservation, the normal discounting can create a strange phenomenon. A typical market rate that would work fine for decision in periods, lets say, of less than 2 or 3 decades, would discount any benefits happening more than 5 decades in the future in such a way as to render them almost insignificant. Such is the power of compound interest. Reduced value is fine, and corresponds to real decisions, but perhaps not having a zero value. This has prompted relevant calls by academia and organizations to use a lower discount rate (Heal, 2007). The current best alternative is to use what is identified as an "*hyperbolic discount rate*" (see Guerriero and Cairns,for an application on hazardous waste sites). This type of discounting basically follows a pattern that uses near market levels for the first decade or so, but gradually falls over time, although never quite becoming zero. This type of discounting is used whenever is important to recognize that far future benefits should never loose importance for society, that there is a positive present value for the welfare of the next generations, even if they will be living deep into the future.

Step 5. Summarizing Results

The results summarized have to adopt the format that is best suited for a specific policy. The purpose is to highlight key components of the benefits and costs associated with the policy and the total net outcome of the analysis (Table 14).

Table 13. Summarize results of Cost-Benefit Analysis for Each Option

Category	Year 1	Year 2	Year 3	….	Total NPV	Annualized Value
A. Cost-Benefit Analysis						
Monetized						
Benefits						
Costs						
Net Benefits						
Quantified but Unmonetized						
Benefits						
Costs						
Unquantified						
Benefits Described					n/a	n/a
Costs Described					n/a	n/a
B. Cost-Effectiveness Analysis						n/a
Benefits (quantified but unmonetized)						n/a
Costs (monetized)						n/a
Cost-Effectiveness Ratio						n/a
PART II: DEALING WITH RISK/UNCERTAINTY						
Category	**Values of risk variable**			**Type of probability distribution**		
Key Parameters:						
Risk Variable 1:						
Risk Variable 2:						
Monte Carlo Simulation		**Statistic Values of the Project Outcome**				
Results						
	Expected Value:					
	Range of the Outcome:					
	Variance					

Source: Treasury Board of Canada Secretariat (2007), Cost-Benefit Analysis Guide. Regulatory Proposal

4.7 Options analysis

Options analysis is a collection of tools to enable the filtering of concepts and ideas, gaining a better understanding, building stakeholder ownership and refining and ultimately rejecting proposals that, for whatever reason, are inappropriate. It is the mechanism by which the decision-making process concludes.

One way of doing an option analysis is drawing a problem tree. Essentially, this involves mapping the focal problem against its causes and effects. Once the tree is constructed, a hierarchy emerges and the focal problem can be moved up or down the chain or cause and effect.

This type of analysis help to:

- Understand the whole picture.

- Build stakeholder ownership
- Improve transparency and accountability if more and more stakeholders have more information and increase their decision making power.
- Improve equity as stakeholders' needs and interests are taken into account
- Establish the scale or response

Another methodology to evaluate options is the SWOT. It is a dynamic strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a situation requiring a decision. The SWOT analysis provides a good framework (the four headings) for reviewing strategy, position and direction implementation plans. It helps by evaluating each option in turn and ranking the different aspects in each box for importance, enabling viability of options to be cross- checked.

This type of analysis helps to:

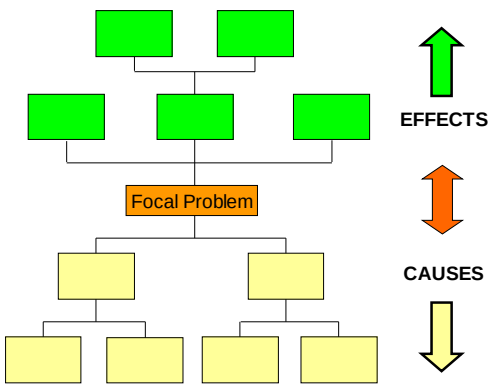
- facilitate workshops with key stakeholders
- refine technical and social risk assessments
- refine options – as part of the options analysis

The last tool for evaluating options are the decision matrices, which enable decision-makers to summarise and prioritise all the information collected during SEA and to agree on a way forward to take into logical framework analysis. The components of the matrix are:

- discussion around a key set of questions
- policy options summary sheet
- final Decision Summary sheet

4.7.1 How to Do a Problem Tree

Diagram 2. Develop the Problem Tree



Step 1: Discuss and define the focal problem to be addressed, which sould be positioned in the middle of the chart/paper as shown above.

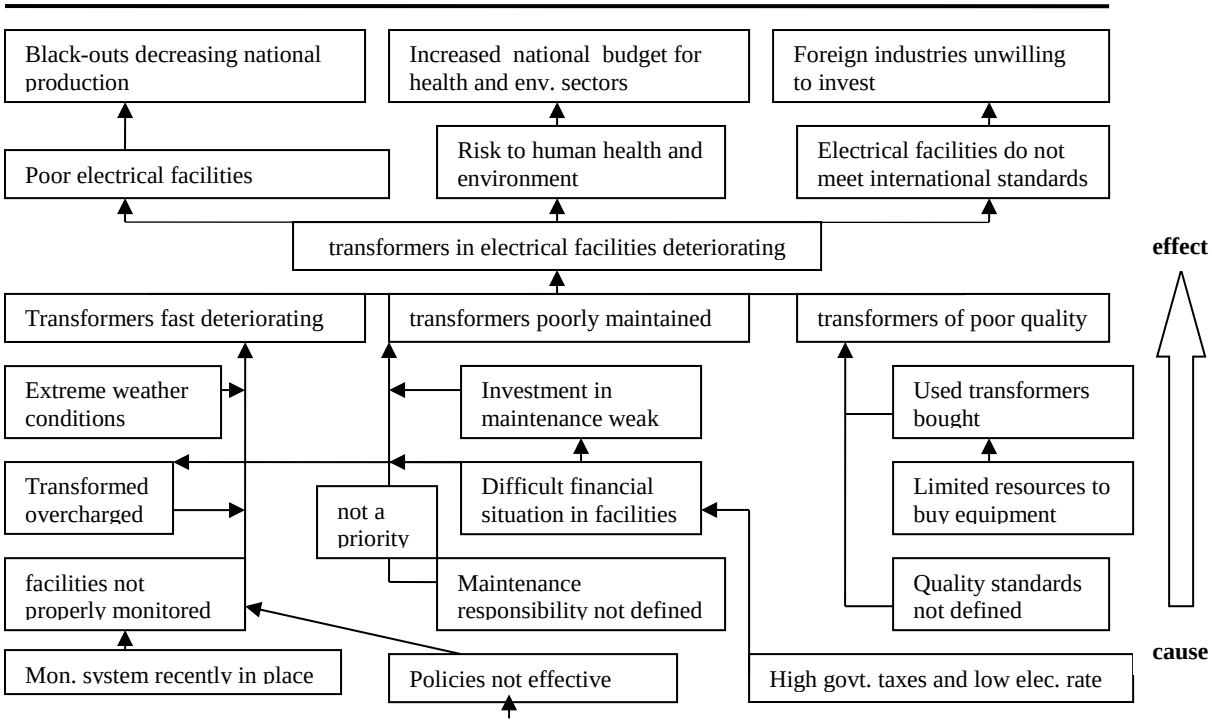
Step 2: Identify and determine the direct causes of the problem. In the diagram that corresponds to the first level below the focal problem.

Step 3: Identify the next level causes from each of the direct causes asking 'but why?' Position accordingly drawing connecting lines to show the relationships.

Step 4: Repeat the process for the effects (positioned above the focal problem) starting with the direct/immediate effects of the problem and then the medium/longer-term effects above those.

An example of a problem tree is shown below:

Figure 14. Transformers Management: Problem Tree



(adapted from UNEP/DGEF, 2005)

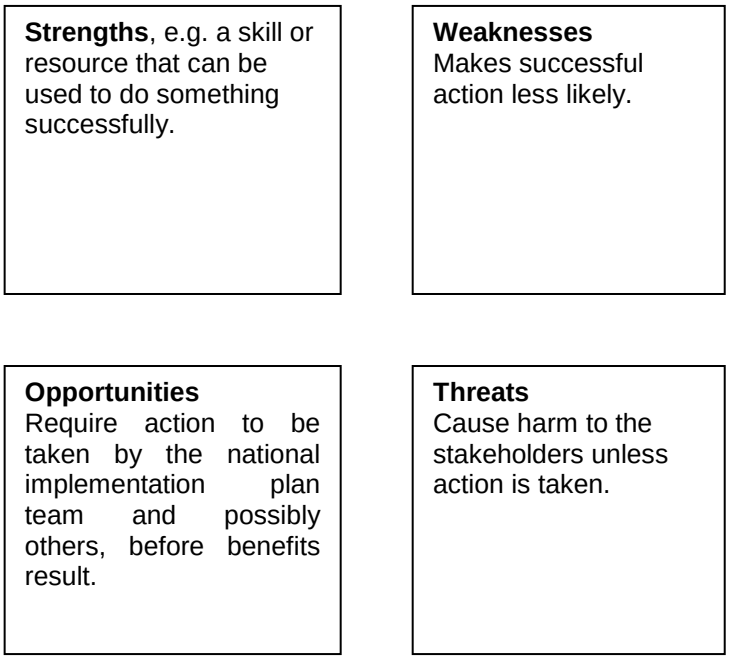
A problem tree at this level can be used to bring information on the practices together, risks and impacts of a sub-group of persistent organic pollutants in order to assess potential management options. A lower order problem tree can focus in on one aspect in more detail.

4.7.2 How to do a SWOT Analysis

Step 1: Set up a template. The SWOT analysis is normally presented as a table,

comprising four sections, one for each of the SWOT headings: Strengths, Weaknesses, Opportunities, and Threats.

Figure 15. SWOT Template



Step 2: The stakeholders have to identify the strengths, weaknesses, opportunities and threats through these questions: Which are the strengths and weaknesses of the policy/option? What are the opportunities and threats coming up? Within these boxes can be some of the results of Cost Benefit Analyses, social and stakeholder analyses and any other tools used in the SEA. Thus the tool can help to finalise options before actions are finally planned.

Step 3: Review the lists and ask for any evidence that the items listed really exist.

Step 4: Rank in order of importance the strengths you have listed. Indicate each item's ranking in the appropriate column (1 = most important, 2 = second most important, etc). Rank weaknesses, opportunities and threats in the same way.

4.7.3 How to use Decision Matrix

Step 1: Agree with participants the criteria for assessing the various options. Key factors here could include[6]:

- Degree of fitting with overall goals
- What are the expected benefits? To whom?
- What is the feasibility and probability of success?
- Risks and assumptions? Who is carrying the risk?
- Social criteria – costs and benefits, livelihood issues, socio-cultural constraints; who carries social costs
- Environmental criteria – what are the environmental costs and gains?
- Technical criteria – appropriateness, availability of resources, market factors
- Institutional criteria – capacity, capacity building, technical assistance
- Economic criteria – economic returns, cost effectiveness
- Financial criteria – costs, cashflows, financial sustainability, foreign exchange needs.
-

Step 2: Complete a summary action sheet, which focuses on particular stakeholders and the alternatives based on an overall risk rating.

Table 14. Summary sheet

persistent organic pollutants Family/action	persistent organic pollutants obligation	Links to other government Policies and commitments	Long or short term	Funding support
Stakeholder group	Impact			
	Benefit	Costs	Level of risk	Mitigation alternatives
1. 2. 3. 4. 5. . 6.				

Step 3: Use the results and complete a summary with all the options (see Table 16).

[6] Based on Sartorius, R. (Social Impact) in DFID *Tools for Development*

Table 15. Summary decision sheet

	Action alternative	Long or short term	Stakeholders on whom action will impact negatively (including costs to government	How?	Mitigating measures	Stakeholders on which action will impact Positively	How?	Partners	Possible Funding from	Convent-ion reference	Links to other government policies and commitments	Score (?)
1												
2												
3												
4												
5												

4.8 Logical Framework Analysis

The logical framework, often abbreviated to logframe, is a highly effective and useful tool for organising a project or a group of activities around one common, single, purpose. This tool provides the basis for planning, monitoring and evaluating a persistent organic pollutants reduction programme. There are essentially 16 boxes which need to be developed. This is best done with a selection of key stakeholders – it should not be done in a room with consultants only.

This type of analysis helps to:

- Take key stakeholders through a common process
- Provide a logic to the intervention which is easily understood
- Ensure projects are easily understood and assessed by funders/donors
- Feed in key important data from Socio-Economic Assessment
- Envision a future desirable situation
- Set up the monitoring and lesson learning agenda
- Analyse the potential of unintended outcomes and risks and assumptions not yet covered by other analyses

4.8.1 How to do a logical framework

Figure 16. The logical framework

.*Start here* (NOT with the Activities!)

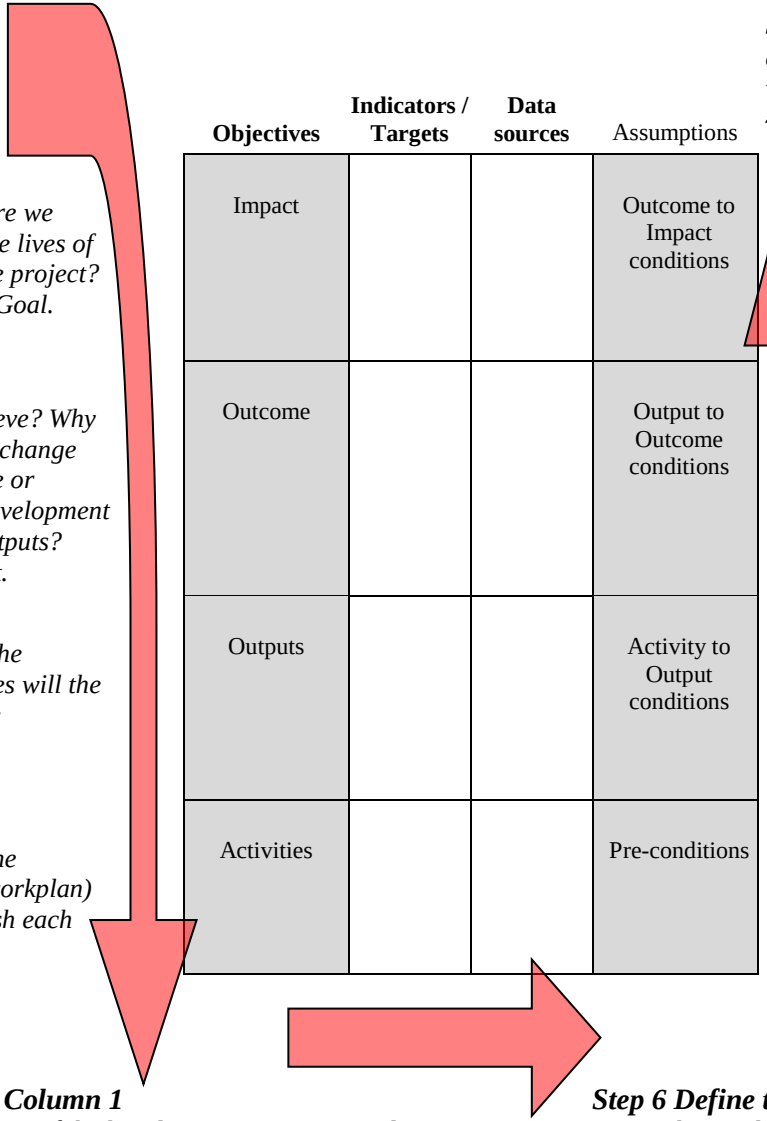
Prior Steps *Use appropriate and proportionate processes before starting on the logframe itself* ***e.g*** *stakeholder, problem, objectives and options analyses.*

Step 1 Define the Impact / Goal
To what national or sector level priorities are we contributing? What long-term benefits on the lives of the poor will happen partly as a result of the project? Several interventions may share a common Goal.

Step 2 Define the Outcome
What immediate change do we want to achieve? Why is the intervention needed? How will others change their behaviour as a result of the use, uptake or implementation of the Outputs? How will development conditions improve on completion of the Outputs? Limit the Outcome to one succinct statement.

Step 3 Define the Outputs
What will be the measurable end results of the planned activities? What products or services will the project be directly responsible for, given the necessary resources?

Step 4 Define the Activities
What needs to be actually done to achieve the Outputs? This is a summary (not detailed workplan) showing what needs to be done to accomplish each Output.



Objectives	**Indicators / Targets**	**Data sources**	Assumptions
Impact			Outcome to Impact conditions
Outcome			Output to Outcome conditions
Outputs			Activity to Output conditions
Activities			Pre-conditions

Step 7 Re-check the design logic *e.g if the conditions are in place and we do the activities, will we deliver the Outputs? And so on up columns 1 and 4. Move on to Step 8 overleaf.*

Step 6d
With the Outcome achieved, what conditions are needed to contribute to the Impact / Goal?

Step 6c
With the Outputs delivered, what conditions are needed to achieve the Outcome?

Step 6b
With the Activities completed, what conditions are needed to deliver the Outputs?

Step 6a
What conditions need to be in place for the Activities to be done successfully?

Do a robust risk analysis*.*

At each level, identify risks by asking what can stop success. For each risk, evaluate its seriousness and probability; and identify mitigatory measures.
Manage the risks *by adding mitigatory measures planned within the project to Column 1 (mainly as Activities, possibly as an Output). The conditions that remain are the Assumptions in Column 4.*
Avoid mixing Assumptions and Risks.

Step 5 Check the vertical logic back up Column 1
Apply the If/then test to check cause and effect. <u>If</u> the listed Activities are carried out, <u>then</u> will the stated Output result? Is what is planned <u>necessary</u> and <u>sufficient</u>? Are we planning to do too much or too little? And so on up Column 1.

Step 6 Define the assumptions at each level
Do a robust risk analysis to determine the Assumptions in the project design.

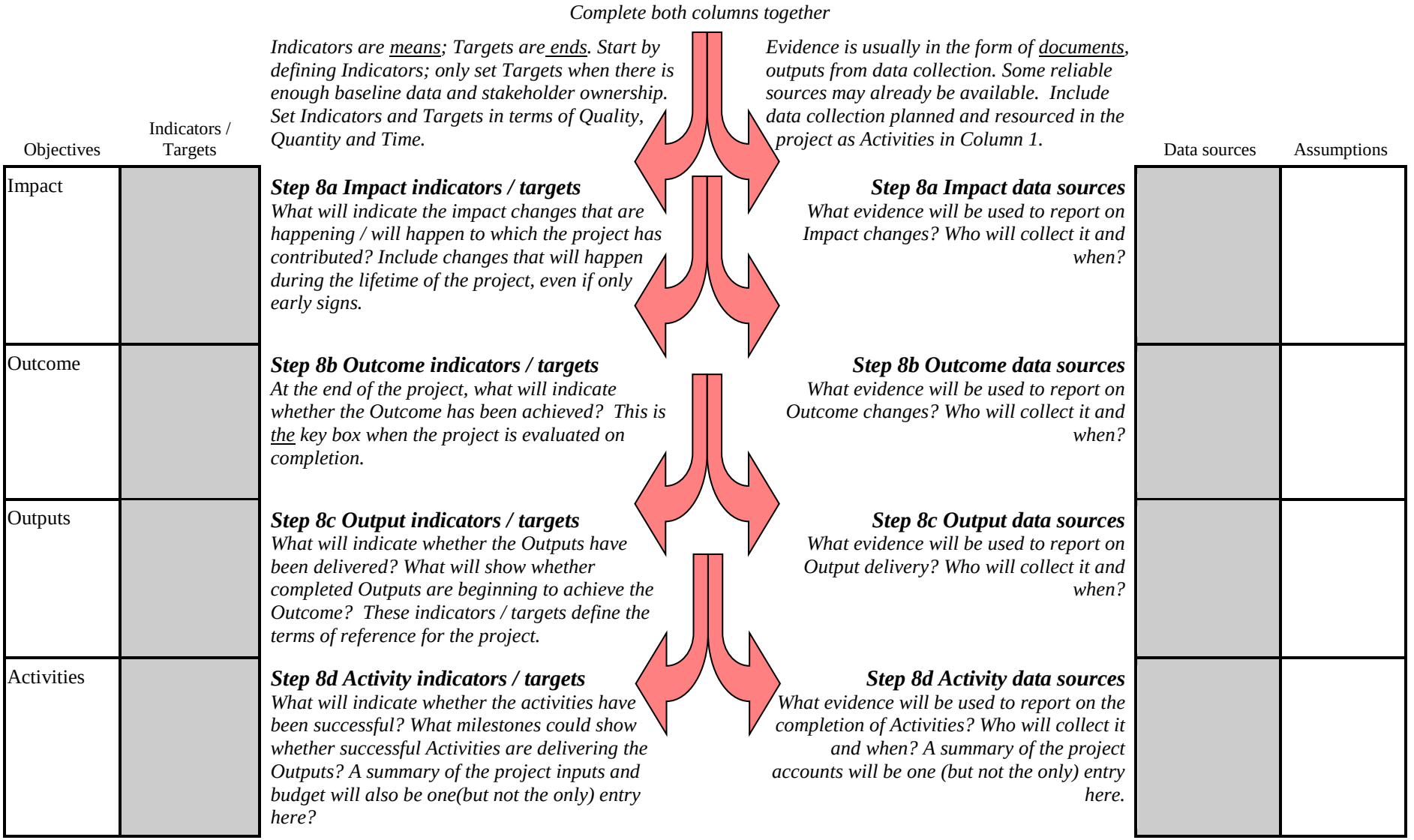


Figure 17. Define the Performance Indicators and Data Sources / Evidence

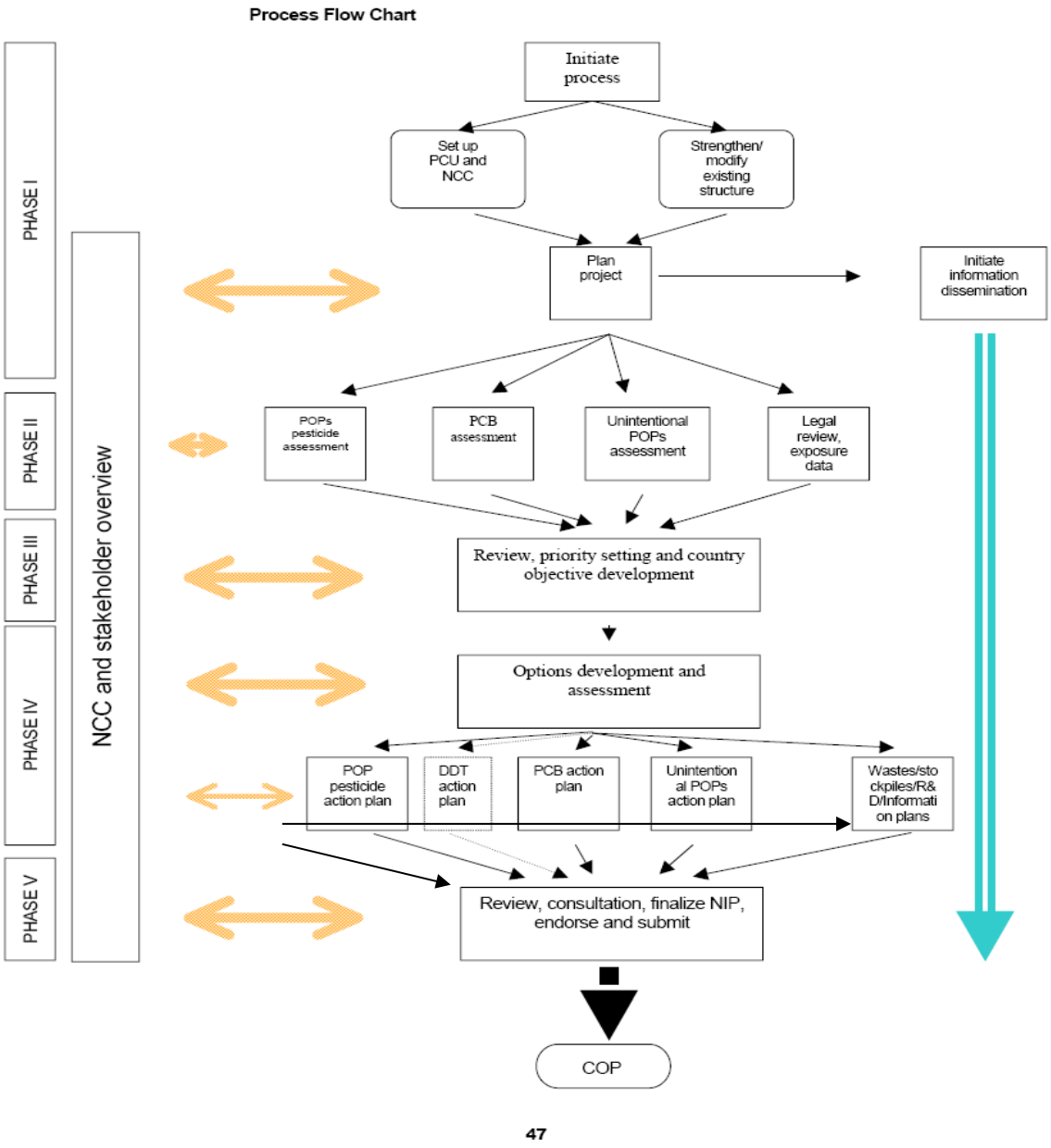
Annex 1. References to the Stockholm Convention where Socio-Economic Assessment can significantly improve chances of successful compliance.

Reference in the Stockholm Convention		Importance of Socio-Economic Assessment
Preamble Para. 2	"Aware of the health concerns, especially in developing countries, resulting from local exposure to persistent organic pollutants, in particular impacts upon women and, through them, upon future generations".	It is not possible to draw conclusions from health statistics about the causes of health concerns related to persistent organic pollutants. Socio-Economic Assessment therefore needs to be undertaken in order to gain a more accurate picture of the scale and modality of the health impacts arising from exposure of populations to persistent organic pollutants.
Para. 7	"Recalling also the pertinent provisions of the Rio Declaration on Environment and Development and Agenda 21".	Agenda 21 emphasises the importance of involving stakeholders in environmental decision-making as seen in" UNCED, 1992, Agenda 21, Preamble Section 23.2. "The need for new forms of participation has emerged. This includes the need of individuals, groups and organizations...to know about and participate in decisions, particularly those which potentially affect the communities in which they live and work." In this Socio-Economic Assessment guidance, stakeholder analysis is the key tool and central to the process of consensual and workable decision making with regard to the conflicts that arise in the management of persistent organic pollutants.
Para. 17	"**Reaffirming Principle** 16 of the Rio Declaration ….which states that national authorities should endeavour to promote the internalization of environmental costs and the uses of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment;"	This guidance offers Cost-Benefit Analysis which addresses the principle of 'the polluter pays'.
Preamble Para. 18	"Determined to protect human health and the environment from the harmful impacts of persistent organic pollutants".	The WHO regional office for Europe defines environmental health as comprising.." those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that can potentially affect adversely the health of present and future generations" (2nd European Conference on Environment and Health, Helsinki, 1994.) The definition of human health and the environment is broad and includes the well-being of people. In protecting human health and
Article 1	**Objective** "….to protect human health and the environment from persistent organic pollutants".	

Reference in the Stockholm Convention		Importance of Socio-Economic Assessment
Article 3 Para.2.b (iii) a.	**Measures to reduce or eliminate releases from intentional production and use.** "Protect human health and the environment by taking the necessary measures to minimize or prevent releases"	environment from the impacts of persistent organic pollutants, well-being must be protected or enhanced by management or replacement activities. Socio-Economic Assessment of the impacts of persistent organic pollutants and their management need to be undertaken to ensure that human health is not compromised.
Article 7 Para. 2	**Implementation Plans.** "The Parties shall, where appropriate, cooperate directly or through global, regional and sub regional organizations, and consult their national stakeholders, including women's groups and groups involved in the health of children, in order to facilitate the development, implementation and updating of their implementation plans"	The specific inclusion of women's' groups and groups involved in the health of children signifies the importance placed on ensuring that national implementation plans reflect the health priorities and needs of these groups. Socio-Economic Assessment tools and skills are needed to facilitate this. Use of the same tools ensures that *all* relevant interest groups are consulted and involved in the development and implementation of national implementation plans. Thus the two mentioned interest groups become a symbol of all relevant interested stakeholder groups.
Article 9. Para. 1.(b)	**Information exchange.** "Each party shall facilitate or undertake the exchange of information relevant to… Alternatives to persistent organic pollutants, including information relating to their risks as well as to their economic costs"	Socio-Economic Assessment tools help in the facilitation of information exchange. Further, information exchange entails information moving in many directions – particularly to decision-makers from interested/affected Parties as well as from decision-makers to other stakeholders.
Article 10 Para. 1(b) Para. 1(c) Para. 2 Para. 4 Para.1(d)	**Public information, awareness and education.** "Provision to the public of all available information on persistent organic pollutants…" "Development and implementation, especially for women, children and the least educated, of educational and public awareness programmes on persistent organic pollutants, as well as on their health and the environmental effects and on their alternatives" "Each party shall….ensure the public has access to the public information referred to in Para. 1 and that the information is kept up to date" "In providing information on persistent organic pollutants and their alternatives, Parties may use safety data sheets, reports, mass media and other means of communication, and may establish information centres at national and regional levels" "Public participation in addressing persistent organic pollutants and their health and environmental effects and in developing adequate responses, including opportunities for providing input at the national level regarding implementation of this Convention"	"Individuals, groups and organisations should have access to information relevant to environment and development held by national authorities, including information on products and activities that have or are likely to have a significant impact on the environment, and information on environmental protection measures" UNCED, 1992, Agenda 21, Preamble Section 23.2. Socio-Economic Assessment, particularly stakeholder involvement tools, can help to tailor information so that it is relevant to and understood by those for whom it is intended. Other Socio-Economic Assessment tools can help involve those stakeholders in the creation of educational materials which are suitable for them. The nature of the information is likely to be broader than purely scientific and technical if Socio-Economic Assessment is undertaken. Like technical information, it will need constant updating. Socio-Economic Assessment information is less likely to appear as statistics than technical or scientifically researched information. Organizing public participation so that it is effectively able to contribute to developing adequate responses requires a set of skills that are specific outcomes of Socio-Economic Assessment. In particular consulting with communities regarding the impacts, alternatives, social risks and growing stakeholder involvement

Reference in the Stockholm Convention		Importance of Socio-Economic Assessment
		associated with persistent organic pollutants can enhance opportunities for providing relevant input at national level.
Para. 1(e)	"Training of workers, scientists, educators and technical and managerial personnel"	The Convention here recognises the need for a multidisciplinary response to the technical issues of pollution by persistent organic pollutants in the devising of alternative management options. Socio-Economic Assessment is multidisciplinary by nature and Socio-Economic Assessment specialists can provide useful inputs in training programmes.
Article 11 Para 1(e)	**Research, Development and Monitoring.** "The Parties shall…encourage and/or undertake appropriate research, development, monitoring and cooperation pertaining to persistent organic pollutants, and, where relevant, to their alternatives including … socio-economic and cultural impacts"	This article specifically mentions socio-economic and cultural impacts, where this Socio-Economic Assessment guidance is the proposed set of tools and methodologies to accomplish effective research, development and monitoring of those impacts.
Para. 2 (a)	"In undertaking action….Support and further develop, as appropriate, international programmes, networks and organizations aimed at defining, conducting, assessing and financing research, data collection and monitoring, taking into account the need to minimize duplication of effort"	In the persistent organic pollutants management cycle, Socio-Economic Assessment tools contribute to supporting cross frontier activities to improve practice whilst minimizing duplication.
Article 12 Para. 2	**Technical assistance.** "The Parties shall cooperate…..to develop and strengthen their capacity to implement their obligations under this Convention	Capacity building in Socio-Economic Assessment tools and methodologies can in this circumstance be regarded as contributions to fulfilling obligations under the Convention.
Para. 3	"Further guidance in this regard shall be provided by the Conference of the Parties"	The Conference of the Parties at its first and second meetings, recommended that Socio-Economic Assessment guidance be developed as soon as possible to help build capacity to fulfil obligations under the Convention
Article 13 Para.4	**Financial Resources and Mechanisms.** "The extent to which the developing country Parties will effectively implement their commitments under this Convention will depend on the effective implementation by developed country Parties of their commitments under this Convention relating to financial resources, technical assistance and technology transfer. The fact that sustainable economic and social development and eradication of poverty are the first and overriding priorities of the developing country Parties will be taken fully into account, giving due consideration to the need for the protection of human health and the environment.	The obligations under the Stockholm Convention are indivisible from the pursuit of poverty eradication in developing countries. Developed countries are obliged under the Convention to offer technical assistance, financial resources and mechanisms to ensure progress towards developing countries' goals in this regard. Socio-Economic Assessment helps Parties to highlight where the management of persistent organic pollutants and poverty reduction activities are in close alignment (synergistic) and/or are likely to be in direct or indirect opposition (antagonistic) to the goals of poverty reduction and offers opportunities to analyse better alternatives.
Annex E	Information Requirements for the Risk Profile	Helpful in identifying risk criteria
Annex F	Information on Socio-Economic considerations	The underlying rationale for undertaking Socio-Economic Assessment

Annex 2. Implementation plan (example)



Ref: http://www.pops.int/documents/implementation/National Implementation Plans/guidance/guidances/docdirec_en.pdf)

Annex 3. Ethical socio-economic research encompasses the following principles[7]:

These guidelines outline a set of basic principles that anyone commissioning or conducting research should aim to address when making balanced ethical decisions.

The research aims of any study should both benefit society and minimise social harm. Researchers should endeavor to ensure that research is commissioned and conducted with respect for:

- balance professional integrity with respect for national and international law.
- and awareness of, gender differences
- for all groups in society, regardless of race, ethnicity, religion and culture
- under-represented social groups and that attempts are made to avoid their marginalisation or exclusion.
- the concerns of relevant stakeholders and user groups are addressed.
- an appropriate research method is selected on the basis of informed prof-essional expertise.
- that the research team has the necessary professional expertise and support
- that the research process does not involve any unwarranted material gain or loss for any participants.
- factual accuracy and avoid falsification, fabrication, suppression or misinterpretation of data.
- to reflect on the consequences of research engagement for all participants, and attempt to alleviate potential disadvantages to participation for any individual or category of person
- that reporting and dissemination are carried out in a responsible manner.
- that methodology and findings are open for discussion and peer review.
- that any debts to previous research as a source of knowledge, data, concepts and methodology should be fully acknowledged in all outputs.
- that participation in research should be voluntary.
- that decisions about participation in research are made from an informed position.
- that all data are treated with appropriate confidentiality and anonymity.
- that research participants are protected from undue intrusion, distress, indignity, physical discomfort, personal embarrassment, or psychological or other harm.

[7] http://www.respectproject.org/ethics/guidelines.php

References

Alberini, A. (2017), “Measuring the economic value of theeffects of chemicals on ecological systems and human health”, OECD Environment Working Papers, No. 116, OECD Publishing, Paris. http://dx.doi.org/10.1787/9dc90f8d-en

Anglo American – Socio-Economic Assessment Manual.

Anglo-American (2003) Socio-Economic Assessment Toolbox, Anglo-American, UK.

Anderson, M.B. and Woodrow, P.J. (1998) Rising from the ashes: development strategies in times of disaster, ITDG Publishes,, London, UK.

Australian institute of Aboriginal Studies, Guidelines for Ethical Research in Australian Indigenous Studies 2012, http://aiatsis.gov.au/sites/default/files/docs/research-and-guides/ethics/GERAIS.pdf

Brnjaš Z, Ćurčić M, Stošić I, (2015), Assessment of the Socio-economic Impact of the Chemicals Environmental Contamination, Faculty of Business Economics and Entrepreneurship, International Review (2015 No.1-2).

Centre for Social Justice and Community Action (CSJCA) and National Coordinating Centre for Public Engagement (NCCPE) (2012), Community-based participatory research: A guide to ethical principles and practice. Centre for Social Justice and Community Action, School of Applied Social Sciences, Durham University, Elvet Riverside 2, New Elvet, Durham. DH1 3JT.

Chiu, W. (2017), “Chemical risk assessment and translation to socio-economic assessments”, OECD Environment Working Papers, No. 117, OECD Publishing, Paris. http://dx.doi.org/10.1787/a930054b-en

ECHA, 2008. Guidance on Socio-economic Analysis Restrictions. European

Chemicals Agency, Helsinki, Finland.

EPA (2004) Toolkit for Assessing Potential Allegations of Environmental Injustice, United States Environmental Protection Agency, USA.

EPA (2003) Beyond RCRA; Waste and Materials in the year 2020, United States Environmental Protection Agency, USA.

Feng, H and Swann, I. (1998). Responsible Care and persistent organic pollutants management by industry. Accessed on 23.10.06 at

http://www.chem.unep.ch/pops/pops_inc/proceedings/bangkok/rampy2/sld013.htm

Frank, R and Sunstein, C (2001) Cost-Benefit Analysis and Relative Position, *University of Chicago Law Review*, Vol. 68, No. 2, Spring 2001, pp. 323–374.

Geneve Institute, Graduate Institute Research Ethics Guidelines, consulted 26 march 2017 http://graduateinstitute.ch/files/live/sites/iheid/files/sites/research/research%20support/docs/Graduate_Institute_Research_Ethics_Guidelines.pdf

Guerriero, Carla, and John Cairns. Cost-Benefit Analysis of the Clean-Up of Hazardous Waste Sites. INTECH Open Access Publisher, 2011.

Heal, Geoffrey. "Discounting: a review of the basic economics." The University of Chicago Law Review (2007): 59-77.

Hussen, Ahmed (2004) *Principles of Environmental Economics, 2e*. New York, NY: Routledge.

King, D and Mazzotta, M (undated) Ecosystem Valuation, *http://www.ecosystemvaluation.org/, accessed on 17th October, 2006.*

Lambert, A (2006) Payment for Environmental Services: Some Thoughts, Conservation Finance Alliance, Vol 2 Number 2.

Mahnaz Sanjari, Fatemeh Bahramnezhad, Fatemeh Khoshnava Fomani, Mahnaz Shoghi, Mohammad Ali Cheraghi, Ethical challenges of researchers in qualitative studies: the necessity to develop a specific guideline

J Med Ethics Hist Med. 2014; 7: 14. Published online 2014 Aug 4.

National Centre for Environmental Decision Making Research (NCEDR) (2006) NCEDR Interactive, *http://www.ncedr.org/default.html, accessed on 19th October, 2006.*

Navrud, S. (2017), "Possibilities and challenges in transfer and generalisation of monetary estimates for environmental and health benefits of regulating chemicals", OECD Environment Working Papers, No. 119, OECD Publishing, Paris. http://dx.doi.org/10.1787/95c2b371-en

OECD (1999) Guidance for Conducting Retrospective Studies on Socio-Economic Analysis, OECD Environmental Health and Safety Publications, No 11, Paris: Organisation for Economic Co-operation and Development.

OECD (1999) Indicators for the Second Cycle of Environmental Performance Reviews; Discussion Paper, OECD Working Group on the State of the Environment, Paris, France.

OECD (2000) FRAMEWORK FOR INTEGRATING SOCIO-ECONOMIC ANALYSIS IN CHEMICAL RISK MANAGEMENT DECISION MAKING OECD Environmental Health and Safety Publications, Series on Risk Management No. 13,Paris, France.

OECD, 2000. Guidance for Conducting Retrospective Studies on Socio-economic Analysis. ENV/JM/MONO (99)27. Organization for Economic Co-operation and Development, Paris, France.

OECD, 2002. Technical Guidance Document on the Use of Socio-economic Analysis in Chemical Risk Management Decision Making. ENV/JM/MONO (2002)10. Organization for Economic Co-operation and Development, Paris, France.

OECD (2006), Cost-Benefit Analysis and the Environment Recent Developments: Recent Developments OECD Publishing (2006).

Pearce, D (1998) Cost Benefit Analysis and Environmental Policy, *Oxford Review of Environmental Policy*, Vol. 14, No. 4.

Provention Consortium (2004) Measuring Mitigation – Methodologies for assessing natral hazard risks and the net benefits of mitigation – a scoping study, Provention Consortium, Geneva, Switzerland.

Respect project , http://www.respectproject.org/ethics/guidelines.php and report.

Sartorious, R (Ed) 2000. Tools for Development. DFID. London.

Sunstein, C (2000) Cost-Benefit Default Principles, *Working Paper* 00–7, Washington, DC: AEI-Brookings Joint Center for Regulatory Studies, October 2000.

Swaney, J. (1995). Social Economics and Risk Analysis. Review of Social Economy, 53(4), 575-594. Retrieved from http://www.jstor.org/stable/29769821

TEEB (2010), The Economics of Ecosystems and Biodiversity Ecological and Economic Foundations. Edited by Pushpam Kumar. Earthscan, London and Washington.

Treasury Board of Canada Secretariat (2007), Cost-Benefit Analysis Guide. Regulatory Proposals, https://www.tbs-sct.gc.ca/rtrap-parfa/analys/analys-eng.pdf

Turner, R. (1993) *Environmental Economics: An Elementary Introduction*, Baltimore, MD: Johns Hopkins University Press.

UNEP (2001) Stockholm Convention on persistent organic pollutants (persistent organic pollutants) – text and annexes, UNEP, Switzerland.

UNEP (2001) Ridding the world of persistent organic pollutants: a guide to the Stockholm Convention on persistent organic pollutants.

UNEP (2002) PIC –Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade – text and annexes – UNEP, Switzerland.

UNITAR(2004) Thematic workshop on synergies for capacity building under international agreements addressing chemicals and waste management, Final Report October 2004, UNITAR, Switzerland.

UNITAR (2006) Action Planning Guidance Notes.

Voorhees, A; Sakai, R; Araki, S and Sato, H (2001) Cost-Benefit Analysis Methods for Assessing Air Pollution Control: Programs in Urban Environments — A Review, *Environmental Health and Preventive Medicine* No. 6, 63-73.

Watkins, T (undated) An Introduction to Cost-Benefit Analysis, San Jose State University, *http://www.sjsu.edu/faculty/watkins/cba.htm, accessed on 17th October, 2006*

Winpenny, J (1991) Values for the Environment: A Guide to Economic Appraisal. London: Overseas Development Institute, Her Majesty's Stationery Office.

World Bank PSIA Manual

World Bank/ICCM SE Manual

Zhu, J, Liu, J, Hu, J, Yi, S Socio-economic analysis of the risk management of hexabromocyclododecane (HBCD) in China in the context of the Stockholm Convention, Chemosphere (2015).