INTOSAI
Working Group
on Environmental
Auditing

Environmental Issues associated with Infrastructure

Demands for investment in infrastructure come from the need to replace existing infrastructure and for additional infrastructure to support new ways of working and living for an increasing population and to support economic development and a transition to a low carbon economy. These demands are leading to significant infrastructure development in both developing and developed countries, for example in the energy, transport, health, education and flood relief sectors.

The development of infrastructure involves significant investment in assets which last over a long period and often sits within wider-ranging plans for development. New infrastructure development can bring significant benefits, including the opportunity to build in such a way as to meet the challenges posed by climate change and to enhance sustainability. It can, however, also have significant costs on the environment, both in its construction and use. Some costs can be addressed and reduced through the planning and design processes and opportunities should be sought to maximise both direct and indirect benefits.

In some areas the private sector may deliver the investment required, to meet their own financial objectives. In others it may be for governments to support or undertake investment directly.

Project Objective:

The objective of the project is to provide an overview of the common environmental and sustainability impacts associated with infrastructure, along with the good governance structures that can be put in place to manage them, in order to help the auditor when designing an audit.

The first step will be to develop a generic model of infrastructure development which will be made up of the key stages in its lifecycle. The aim is to develop a model that can be applied to all types of infrastructure. Once the model has been developed, the second step will be to identify the environmental and sustainability impacts that can occur at each key stage in the lifecycle. Following this, the good governance structures that can be put in place to manage the environmental and sustainability impacts will be examined.

The project will build on work published by INTOSAI WGEA relating to aspects of infrastructure. *Towards Auditing Waste Management* published in 2004, briefly examined approaches to identifying environmental risks when auditing waste management. *Auditing Water Issues: Experiences of Supreme Audit Institutions* in 2004 provided case study example of audits carried out by SAIs in the water management and sanitation sectors. The 2004 guidance on auditing water issues will be updated during the 2011-2013 workplan and we will liaise with the USA, who are leading the project, to ensure that the two projects are complementary. *Auditing Sustainable Energy: Guidance for Audit for Supreme Audit Institutions* published in 2010, looked at the social, economic and environmental impacts of energy policy. We will work closely with our colleagues in Morocco who are leading the research paper on land use/land management from an environmental perspective to ensure complementarity of the two projects.

The intention is for the final paper to be used by SAIs to inform the planning and scoping of infrastructure related audits, and to provide informed input to their governments' consideration of infrastructure plans.

Project Scope:

We have defined infrastructure for the purpose of this project, to include the networks and systems in energy, transport, flood protection, telecommunications, water and waste management. Roads, railways, power stations, wind farms, sanitation networks, heating systems, flood barriers, hospitals are all examples of infrastructure. We do not intend to include defence and housing infrastructure in this project.

We will not cover specific types of infrastructure; rather we propose that we develop a generic model of the typical lifecycle of infrastructure development (and use) which could be applied to all types of infrastructure. The proposed generic model would be made up of key stages and could, for example, include the following stages:

The first stage of the project will develop the model and identify the environmental and sustainability impacts that can occur. Examples of environmental impacts that could be incorporated include, amongst others: pollution (air, water, soil, noise etc.); carbon emissions; other greenhouse gas emissions e.g. hydrofluorocarbons; land use change; damage to biodiversity and ecosystems; use of limited raw materials and resources etc. Sustainability impacts could include, amongst others: impacts on the local community including indigenous populations; job creation; long-term affordability of the infrastructure; issues of gender equality; resilience to extreme weather events etc. We recognise that different groups may have different perspectives as to which social impacts should be included within the scope of the project. We will consult and confirm the model and associated environmental and sustainability impacts with the subcommittee members.

We further recognise that there are differences between the various types of infrastructure e.g. energy, telecommunications etc. and that a generic model may not be applicable to all. As part of our work we will test the suitability of the generic model across the different types of infrastructure and where necessary will provide more specific illustrations of the environmental and sustainability impacts tailored to the type of infrastructure.

The second stage of the project will examine various good governance structures which, when in place, can enable Governments to identify, manage and mitigate the environmental and sustainability impacts of infrastructure. The types of governance structures identified and explored could include, amongst others:

- Use of whole-life costing to support improved design and investment decisions (i.e. including costs in use and disposal with the aim of reducing the natural resources used by the infrastructure or users of the infrastructure);

- Use of life-cycle analysis or "footprint" techniques to determine the costs embedded in the infrastructure (i.e. the carbon costs embedded in the steel and concrete etc – for

example carbon costs can be lower from renovation than demolition and new build in some circumstances);

- Analytical approaches designed to identify and deliver benefits from the infrastructure, for example in terms of supporting more sustainable living;
- Issuance of environmental permits;
- Environmental impact assessment (planning type issues & the discipline of formal Environmental Impact Assessment) and consultation on impacts;
- Global commitments, for example the World Heritage Convention;
- Social and economic impact assessment;
- Environmental management systems.

Finally, the research project will pool knowledge on the experience of the INTOSAI WGEA community in auditing infrastructure projects. This will be achieved through the use of illustrative case studies submitted by the subcommittee members. The aim of this project is to give an introduction to SAIs of the environmental and sustainability impacts that can arise from the development of infrastructure, give examples of best practice governance and disseminate the audit work of other SAIs in this area.

The final report will have four sections.

Section 1: Introduction

Section 2: Presentation of a generic model of infrastructure delivery and use with key stages and the associated environmental impacts

Section 3: Discussion of good governance systems for ensuring environmental and sustainability impacts are considered at all stages of the development and delivery of infrastructure

Section 4: Case studies of SAIs experience in auditing infrastructure projects and environmental impacts.

Planned Methodology and Participants:

1. Literature Review

The aim of the literature review is to help in identifying common environmental and sustainability impacts faced in the development and use of infrastructure of all types. This information will be used to build a generic model of infrastructure development, use and disposal. The review will further attempt to identify common good governance structures that can be used to recognise, manage and mitigate environmental impacts of infrastructure development, delivery, use and disposal.

This will involve reviewing:

- Academic literature

- Best Available Technique (BAT) reference documents from the European Integrated Pollution Prevention and Control Bureau
- Work and papers from international organizations such as the World Bank, the UNEP etc.
- The INTOSAI WGEA database to identify work and audits carried out by the INTOSAI community on infrastructure
- Completed audit reports from the SAI members of the subcommittee
- Any reports recommended by the SAIs

Expected contributions from other SAIs
SAIs that have finalised audit reports on infrastructure will be requested to provide a summary of these audits if not yet on the WGEA web site. SAIs that are participating in the subcommittee for this paper will also be requested to submit articles and any literature in areas of particular interest and importance to them.

2. Development and consultation on the generic model of infrastructure development

We will develop an initial draft version of the generic model of infrastructure development which we will circulate to the subcommittee members for consultation and feedback. The final model will be developed as a collaborative process based on the input and suggestions from the subcommittee members.

3. Collection of case studies and case examples

Case studies and examples of audit work/experience undertaken will be collected. Initially case studies will be collected by the SAIs within the project subcommittee but, following the 14th meeting of the INTOSAI WGEA in 2011, and interest shown by other SAIs, we propose to extend the collection of case studies into the wider INTOSAI WGEA community. The purpose of collecting case studies is to provide examples of auditing infrastructure projects and where possible to illustrate how environmental impacts associated with infrastructure are managed across the INTOSAI WGEA community.

Expected contributions from other SAIs
- SAI members of the subcommittee will be asked to submit case studies of audits or other experience they have in the infrastructure sphere
- The wider INTOSAI WGEA community may also be asked to submit case studies of audits or other experience they have in the infrastructure sphere

4. Workshop session

We propose to have a workshop session in combination with the 14th meeting of the INTOSAI WGEA in 2011. The aim of the workshop will be to present back to the subcommittee members any findings collected up to that point and to get their feedback. It will entail a discussion of the generic model for the lifecycle of infrastructure and the environmental impacts associated at each key stage. It will offer SAIs the opportunity to comment on the usefulness of the model

and to input their thoughts and comments. A further discussion will take place on the good governance structures for managing environmental impacts.

How will the work be undertaken?

- Organisation comparable with other WGEA workshops.

Expected contributions from other SAIs

- SAIs that have contributed case studies will be invited to prepare papers of their audit work or broad experience on infrastructure and give presentations during the seminar.

5. Expert panel of external stakeholders and other contacts

We propose to consult with a select number of organisations like the World Bank, the International Monetary Fund and the European Bank for Reconstruction and Development, amongst others, which have extensive experience in the financing of infrastructure projects. Such organisations often have robust environmental and sustainability performance requirements in place to ensure that environmental and sustainability standards are applied to all the projects financed by them.

Expected contributions from other SAIs

- SAIs will be invited to submit the names of other organisations that have wide international experience in infrastructure, and from which they feel the project would benefit.

Timeline and Key Milestones:

January 2011: Circulation of draft project plan and proposed scope of research paper to the subcommittee members and submission to the steering committee.

March 2011: 10th Steering Committee meeting in Morocco, review and approval of Project Plan

April 2011: Final version of the Project Plan

May 2011: First draft of generic infrastructure model with associated environmental and sustainability impacts will be circulated to SAI subcommittee members for comment

June 2011: Submission of final comments on generic infrastructure model with associated environmental and sustainability impacts from subcommittee members

July 2011: Request for submission of good governance structures that the SAI subcommittee members want included in the research paper and for submission of case studies of relevant audits or experience in the infrastructure sphere

September 2011: Submission of good governance structures and case studies by SAI subcommittee members

November 2011: Presentation of initial findings at a workshop session at the 14th WGEA meeting

January 2012: First draft of the research paper and circulation for comments

March 2012: Submission of comments on first draft of the research paper by subcommittee members

Mid 2012: 11th Steering Committee meeting and consideration and approval of the draft research paper

March 2012- September 2012: Incorporation of comments of subcommittee members and re-circulation

October 2012: Final draft of the research paper submitted to the Secretariat

April 2013: Final version of the research paper

June 2013: 15th meeting of the INTOSAI WGEA

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