

CIB and the Environment

What will be the consequence of sustainable development on the construction industry by the year 2010?

A CIB W82 Project on

Sustainable Development and the Future of Construction

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This CIB international Project was launched on the occasion of the W82 Amsterdam Meeting in Spring 1995. In accordance with the scope of this Commission which deals with "Future Studies in Construction" - to supply, analyse and interpret the external (exogenous) factors affecting the development and future of the construction field, and, to produce, formulate and evaluate its future alternative - the Project has as its objective to answer the following question: "What will be the consequences of sustainable development on the construction industry by the year 2010?".

Sustainable Development: a still imprecise concept, but one which surely concerns the construction sector

"Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs". According to this definition from the World Commission on Environment and Development (1987), it is clear that the various activities of the construction sector have to be regarded and analysed when considering sustainable development. As a matter of fact, on one side, the built environment constitutes one of the main supports (infrastructures, buildings, ...) of economic development, and, on the other side, its construction entails a significant impact on the resources (land, materials, energy, water, human/social capital). Hence the construction industry has many direct and indirect links with the various aspects of sustainable development.

The First International Conference on Sustainable Construction held in Tampa in 1994 introduced the following definition of sustainable construction: "The creation and responsible maintenance of a healthy built environment based on resource efficient and ecological principles" (Kibert and alii).

This very broad definition can be seen only a starting point to formulate a more concrete definition of the concept of sustainable construction and to establish precisely the stakes and issues of sustainable development with regard to the construction sector. More research is required to investigate the relationship between sustainable development and the future of construction (see Figure 1).

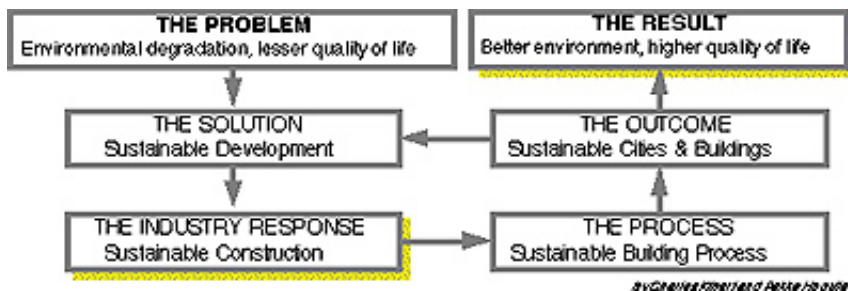


Figure 1: Sustainable Construction Road Map

A project focused on clarifying the "Sustainability Concept" applied to the construction sector

The study is focused on the clear definition of the links between the construction sector and the principles of sustainable development. It follows a methodology which has several main characteristics:

- i) it is an international study allowing the presentation and consideration of the specificity and orientations of various countries;
- ii) it is a future study aiming at defining a clear vision of what the construction sector can be in fifteen/twenty years in the framework of a sustainable development and how this goal can be attained;
- iii) it is executed by experts coming from organisations deeply involved in the topic at the national level.

The Project has been divided into four Phases (see Figure 2). Twelve countries were involved in Phases 1, 2, 3 which are completed and which aimed at, firstly, sharing the current understanding of what is meant by sustainable construction, and secondly, at defining national views on the main question which is asked.

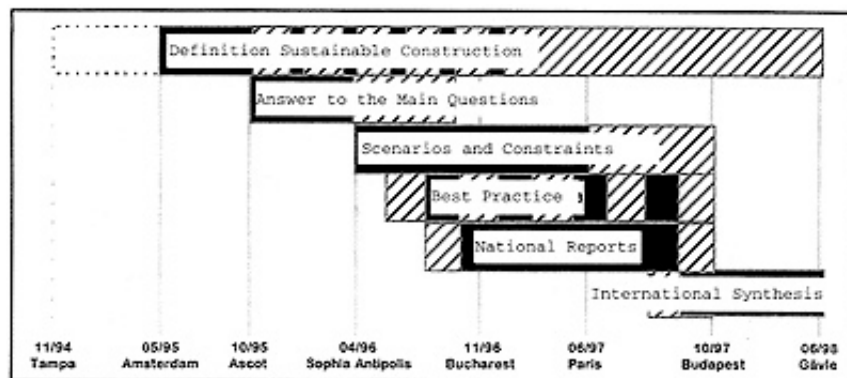


Figure 2: The Main Phases of the Project

Phase 1: Definition of the Concept of Sustainable Construction

Phase 1 of the Project sought to identify what each participating country or region understands by "Sustainable Development" and "Sustainable Construction".

This was the reason why the request was made to the 10/95 Meeting participants to present papers which put together national initiatives on Sustainable Construction and to endeavour to discuss a definition of sustainable construction. It was proposed to start from the definition provided by Kibert and alii.

The intention of the Meeting was to generate an interactive debate consistent with the holistic nature of the subject. In total, thirteen papers from ten countries (Canada, Finland, France, Hungary, Netherlands, New Zealand, Palestine, Rumania, UK and USA) were received and discussed, covering a wide range of topics.

The meeting consisted of a series of informal interactive sessions to identify common themes and concerns. The papers were extremely diverse but even so common threads could be identified.

Several definitions of Sustainable Construction were offered which reflected the regional diversity and differing priorities among the participating countries. They included a more precise but still concise definition of "Sustainable Construction" derived from Kibert's one, to more general and detailed views such as the French one which introduces 24 criteria.

Phase 2: Answers to 5 Main Questions

The questions to be answered in Phase 2 were the following:

- What kind of buildings will be built in 2010, and how will we adapt existing buildings?
- How will we design and construct them?
- What kind of materials, services and components will be used there?

- What kind of skills and standards will be required?
- What kind of cities and settlements will we have then?

No common methodology was given to participants on how to find answers to these questions. That was left open to be freely defined in each country: e.g. scenario for sustainable construction, analysis and documentation of expert interviews and brainstorming sessions. National studies consisting of answers to the five questions together with a more precise (i.e. more concrete) definition of sustainable construction from the participating countries were requested for presentation at the 4/96 Meeting.

It was also decided that the precise content of the coming Phase 3 would be delineated at this meeting. The ideas of i) integrating the activities of other relevant CIB Working Commissions and Task Groups and ii) including the presentation of some success stories had already arisen.

Phase 2 commenced with Belgium, Finland, France and the Netherlands. The number of participating countries soon increased to twelve after Australia, Canada, Hungary, Italy, Japan, Rumania, United Kingdom and United States decided to join the project.

It was not easy to agree on a single common definition for Sustainable Construction. Consequently each country was allowed the liberty of using the Kibert definition or its own definition for Sustainable Construction.

Answers to the main questions differed between nations, and within nations. A complete map of answers from a country (Finland) is presented in Figure 3.

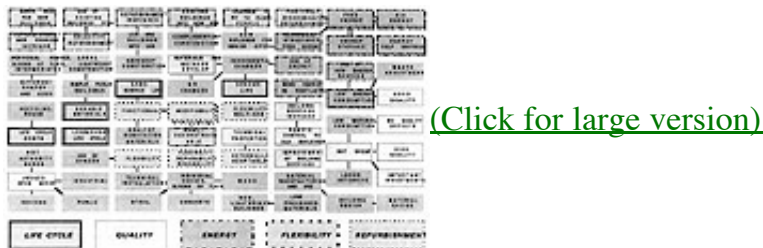


Figure 3: Main Themes of Sustainable Construction in Finland in 2010

Phase 3: National Reports

The first results of Phase 2 of the project generated a need for a common methodology to be applied in Phase 3 enabling later international synthesis based on national studies.

For this reason, W82 proposed in mid-96 a methodology to be followed.

This proposal is based on a multi-dimensional analysis of the problem (see Figure 4). Three dimensions are introduced:

- Ecological principles (six principles are defined in the construction field in order to meet the three basic goals of a Sustainable Development: to eliminate resource depletion, to eliminate environmental degradation, and to create a healthy interior and exterior environment).
- Resources (four resources are concerned: land, energy, water and materials).
- Life-cycle phases of the construction process (five phases are defined: develop and plan, design, construct, operate, deconstruct).

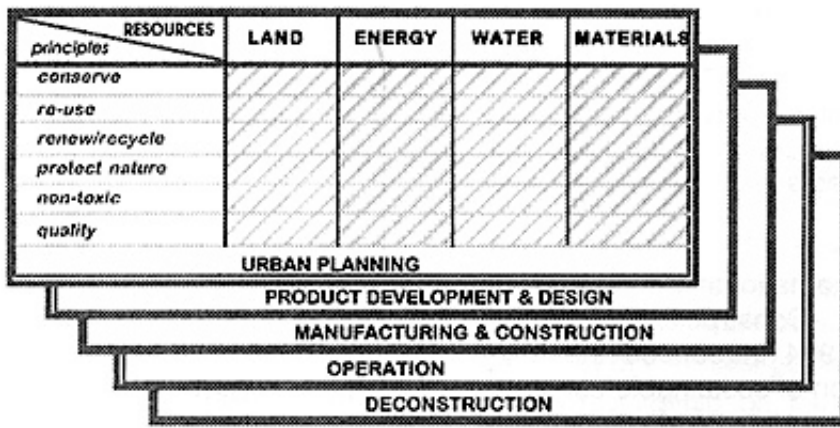


Figure 4: Proposed Format for National Reports

For each point in this three-dimensional space, it is possible to think about the consequences for the construction industry and therefore to give at least the elements of a response to the five questions defined earlier.

A general significant observation originating from several participating members was that the definition of Sustainable Development and therefore the definition of the ecological goals and principles which were proposed did not necessarily fit the concept in all the countries. As a matter of fact it appeared from the Ascot and Sophia Antipolis papers that the concept from some countries could be much broader than the "ecological" concept proposed here.

On the other hand, the methodological approach does offer an interesting support for thinking about consequences to the construction industry. It seemed to allow us to grasp the overall idea; to debate the appropriateness of activities intended to contribute to a Sustainable Development, and to constitute an effective instrument to make a synthesis of national reports.

It is why it was agreed to make use of this methodological approach for Phase 3 of the Project. To solve the problem linked to the important observation noted above, it was agreed to give each country the opportunity to add to each dimension as many topics as needed.

It was also agreed that the project participants would present the best practices of Sustainable Construction from their countries in their National Report.

Several National Reports are today already available.

Phase 4: International Synthesis

The final Phase of the Project is an international synthesis of the results (see Figure 5). That work, which started in Summer 97, is based on National Reports. The results will be presented at the CIB World Congress which is to take place in Gävle in June 1998.

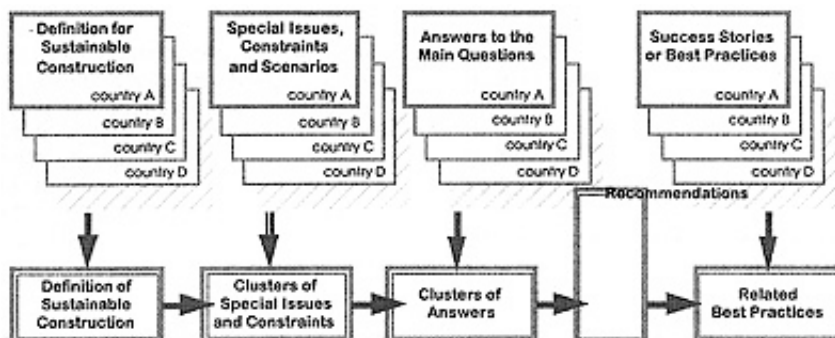


Figure 5: Methodology for the International Synthesis

The final results of the project will provide an international view of the long term contribution by Sustainable Construction in Sustainable Development. Clusters of national differences, due to special issues and national constraints will give more specific views on different levels and approaches by clusters of countries. Best practices of sustainable design will be gathered. Recommendations for government, management of construction and machine industry and for research and development will be provided.

CIB Members from countries not already involved in the project can still join the Project by getting in touch with Luc Bourdeau - CSTB - Fax: +33.4.93 95 67 06 - E-mail: l.bourdeau@cstb.fr