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## 1. Review of technical co-operation among developing countries

*Mr. Elmer K. Timby, Honorary Member and Past Vice President of IABSE presented a report to the UN "High-Level Committee on the Review of Technical Co-operation among Developing Countries" in New York at the beginning of June 1981. We are very glad to reprint his report hereafter.*

*The Editor*

### 1. Objectives of technical co-operation

This discussion of technical co-operation among countries is directed primarily to a concept concerned with acquisition by a developing country of comprehensive technological capabilities and experience. The usual objectives are to provide for the developing country's citizens an improved quantity and quality of living through better food, shelter, education, jobs and cultural opportunities; and for the acquiring country itself, favorable economic balance between exports and imports.

Achieving those objectives in a sustained manner requires that the implementation of technical co-operation be consistent with the needs, desires, environment, resources and demographic parameters of the acquiring nation.

In passing, brief mention is made of that limited implementation of technical co-operation which is concerned with the creation of a single large public works project (e.g., a major bridge, a railroad connection between mine and seaport, a large dam for power or water use, or an international airport) to meet a specific need. Such a project can be handled technologically almost entirely by foreign personnel; and can provide a major emphasis for further comprehensive implementation of technical co-operation.

One caveat is that such a project must be properly operated and maintained continuously thereafter as regards its technological aspects. Failing to do so will cause the benefits from such an implementation to fade away, resulting in an unnecessary and substantial waste of human and material wealth. Such a single large project seldom has resulted in great cultural and economic improvements unless it has been followed by developing locally the comprehensive capabilities first mentioned; and to which this discussion now returns.

### 2. Societal, political and technological considerations

Creating technological capability is only an exercise. The capability as well as its products must be used to become valuable. Initial planning, financing, design and construction of a service or industrial facility are necessary but by no means are sufficient for purposes of realizing full potential toward improving qualities of living. Adequate and competent technological attention must be given also to the continuing operation and maintenance, and finally the replacement of a facility. A proper balance and blend of theory and of judgment based on experience must prevail throughout.

In wider perspective, technology is only one of three members of the triumvirate needed to create, operate and maintain successfully a technological facility. Both government and the public at large are essentially equal partners with technology in such an endeavor.

For example, visualize a bridge, a highway, a power generating and distribution facility, a water utilization program, an airport, a harbor, or a government office building. Societal, political and technological considerations permeate every phase of action from concept to final utilization. Representatives of government, its public, and technology must communicate effectively with each other; respect the expertise, responsibilities, needs and limitations of each other; and mutually agree promptly on decisions all along the line. Initial and long-term favorable results are seldom achieved otherwise.

It is additionally emphasized that successful creation and utilization of a major technological facility is not limited to technological capabilities. As a matter of fact, the real policy decision-makers in such a project are NOT the technologists. Such critical decisions as whether or not the project will be built, what functions it will serve, where and when it will go forward, how it will be financed, what zoning regulations and building codes will govern, and who will administer, design, construct, operate and maintain the project are very often made, and rightly so, by elected or appointed public officials having little technical knowledge or experience; but who have the responsibility for the government as well as the people which the facility will serve.

### 3. Dissemination of knowledge

Recent history shows that the advancement of technological theory and procedures, as well as the publication of such developments, have all been progressing nicely. It is primarily in the utilization thereof that difficulties have arisen. A contributing factor has been that English is rapidly becoming the language of technology, although IABSE still maintains three official languages, namely English, French and German. The availability of publications to technologists in developing countries has been further limited by their inability to export currency to pay dues to international and foreign national and international technological organizations and thereby receive their publications; or to pay travel, subsistence and registration costs for foreign conferences; or to purchase books and periodicals from foreign publishers.

A case in point is the current production of a monograph by the Council on Tall Buildings and Urban Habitat, headquartered at Lehigh University, Bethlehem, PA 18015, USA. The fifth and final volume will be published in late 1981. The monograph is a compilation of practically all known technical and societal data and experience concerning planning, design, construction and utilization of high-rise buildings in urban areas as shelter for people, cultural purposes, business and commerce, and governmental activities. Experience with past use has taught some valuable lessons. That experience should be heeded in meeting the increasing need for high-rise buildings in urban areas almost everywhere. That experience has been assembled and discussed, prior to incorporation in the monograph, by approximately 1,500 trained persons native to about 50 countries, meeting in 40 regional and two international conferences (one sponsored by UNESCO) hosting nearly 10,000 attendees. The cost of the monograph is miniscule compared to its potential benefits to a government of a nation facing a need for high-rise buildings. But under current limitations, its availability to technologists in developing countries will be essentially nil.

It is germane to note that the high-rise building study and monograph project:

- was conceived by a national group of IABSE;
- was developed and guided initially as a joint venture effort of IABSE and the American Society of Civil Engineers;
- was a co-operative effort of three international and three national technical organizations representing the full range of related expertise from planning through construction;
- was supported financially by both public and private sectors.

### 4. Comprehensive approach

Employment of foreign experts may be utilized effectively to assist a developing nation in the technological, societal and political phases of industrial development, starting with the prerequisite basic public works support facilities and then the beginning of industrialization to provide jobs, housing, food and betterments in the other qualities of living. However, the people and the government of the developing nation must gradually become involved and eventually be the principals in the development process if it is to be truly successful. Systematic and reasonably rapid development of essential self-sufficiency in all except huge and unusual projects is deemed mandatory.

Any effective program for the implementation of the benefits of the utilization of technology from a country having capability and experience to a country lacking those characteristics should recognize and accept the foregoing basic criteria. Experience shows that to do otherwise will result in:

- 1) unproductive delays;
- 2) waste of material and human wealth; and
- 3) disappointing operational results.

It follows that the effectiveness of a technical implementation program can be substantially enhanced by a coordinated comprehensive approach which includes, in addition to technological education, financial seed money and experience, the following:

- a) training in the societal and political aspects of public works and industrialization, in addition to training in technology;
- b) on-the-job training in developed countries of all members of the triumvirate native to developing countries with respect to planning, financing, design, construction, operation and maintenance of technological projects and industries as a means of developing administrative, technological and operational experience and judgement;
- c) additional training of the members of the triumvirate of the developing country through working with foreign experts on local projects;
- d) definitive long-range programs within the developing country with respect to:
  - 1) a master plan for technical development on a national scale; and
  - 2) educational and training programs for all members of the triumvirate in harmony with local requirements and limitations of a technological nature plus the local cultural, economic and demographic needs and resources.



## 5. The contribution of IABSE

The International Association for Bridge and Structural Engineering consists of thousands of members of recognized capability and world-wide experience in certain technological fields closely related to implementation of technical co-operation for purposes of economic and cultural development through utilization of technology.

IABSE has a sincere desire to co-operate with nationals and with governments of developing countries. It is believed that mutually beneficial results will accrue to all parties if the government of a developing country and IABSE explore jointly ways and means through which IABSE can:

- counsel with governmental agencies and also groups of technologists in a developing country to assist in forming a national group of IABSE within the developing country;
- assist in determining how individual and institutional members of such a national group can obtain the benefits of publications, congresses, symposia and seminars sponsored by IABSE, both within the developing country and abroad;
- encourage those individual members to participate in the work of the working commissions, task groups and administration of IABSE;

- provide opportunities for exchanges of experience between those individual national group members and their counterparts in other nations; and
- generally help to increase national knowledge, experience and capabilities for purposes of effectively implementing technical co-operation to the end that the forces and materials of Nature can be utilized for the benefit of the people at price the people can afford to pay.

Parties having an interest in such a co-operative effort should address questions, comments and suggestions to:

The Secretariat  
IABSE/AIPC/IVBH  
ETH-Honggerberg  
CH - 8093 Zurich, Switzerland

It is hoped that this brief discussion of a major international problem, from the perspective of a particular discipline, will encourage meaningful consideration of related important aspects. Each technical association as well as each government has an obligation to think and to work hard for co-operative progress in improving qualities of living for all. The creation of strong programs to recruit and support technologists and administrators of distinction is an essential element in that progress. What has been done heretofore is, in certain cases, substantial. What can be done is unbelievable.

## 2. Planning and environmental criteria for tall buildings

Volume PC Published

This final volume of the five-volume series on planning and design of tall buildings will be published in October 1981. IABSE members will be interested in having in their library this volume that ranges over the full spectrum of engineering, architecture, planning, and social sciences.

Some of the factors of particular interest in the fifteen chapters are the following:

**Philosophy of tall buildings:** Consideration of esthetics, sociological and religious factors, and alternatives to high-rise buildings. Decision making parameters that are suitable for computerization.

**History of tall buildings:** Problems that faced the ancients are still with us in the provision of urban space for life and work. Development of tall masonry buildings. Early tall buildings framed in iron, steel, and reinforced concrete.

**Social effects of the environment:** Human satisfaction with the high-rise. Role of environmental stimuli and the social and cultural differences.

**Socio-political influences:** Policy-making as between the public and private sector.

**Economics:** The entwining of political and economic considerations.

**Architecture:** The broad scope of architectural factors and their role in producing successful tall building designs.

**Interference and environmental effects:** The interconnection of internal and external environmental factors in coordination with architectural aspects.

**Urban planning and design:** Consideration of the tall building as part of the urban system. Land use and zoning.

**External transportation:** Integration of the high-rise with transportation systems.

**Parking:** Entrance and exit requirements, zoning, flow patterns, and consideration of site conditions.

**Operation maintenance and ownership:** Tenancy and ownership factors that are unique to residential and commercial buildings.

**Energy conservation:** Economies to be achieved through recycling of energy that otherwise is wasted. Reduction of excessive levels of cooling or heating.

**Motion perception and power:** Psychological and physiological reactions to motion. Design criteria for structural systems and damping devices.

**Project management:** Consideration of complete life cycle of building. Reduction of overall time and cost of construction leading to early occupancy.

**Systems methodology:** Application to building analysis, design, and performance.

The monograph is a publication of the Council on Tall Buildings and Urban Habitat and is available from the American Society of Civil Engineers, 345 East 47th Street, New York. The following is a schedule of prices:

PC: \$75.00, SC: \$50.00, CL: \$50.00, SB: \$75.00, CB: \$62.50.

The price of the entire set is \$250.00.