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**Toward a Viable Economic Development
- Issues and Strategies for Improving Benefit -**

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On behalf of hosting country for 30th Anniversary Forum, I would like to congratulate all Member States, IAEA and UNDP for the accomplishment in the past 30years as reviewed by the previous speakers.

When the RCA was first incepted and launched under the framework of IAEA in early 1970s, Member States had high aspiration for the Nuclear Science and Technology based economic developments for the participating countries. In order for the effective regional nuclear cooperation, the scope at the beginning was limited to the research, development, and training related to the Nuclear Science and Technology of Radioisotope and Radiation Application to the Agriculture, Industry, and Medicine. In such a way, RCA did try to avoid infringement on the commercialized proprietary information and at the same time to meet international nuclear nonproliferation requirements on the sensitive technologies such as enrichment, reprocessing, and heavy water production. Therefore, nuclear energy technology such as reactors and fuel cycles were excluded from the scope of activity.

So far, the RCA's activities have been somewhat success as a whole, to build up effective nuclear cooperation networking and partnership. The foremost lesson learned during last 30 years was how regional cooperation can be successfully implemented among Member States with different techno-economic and socio-political infrastructures. As a result, most Member States were able to train competent scientists and engineers at their national research institutions for Radioisotopes and Radiation Technology. They would be the disseminator as well as center for the Nuclear Science and Technology transfer and dissemination to the needed respective end users in their countries for the commercialization so as to contribute to further economic development based on these technologies.

Based on my experience from the evaluation of IAEA/RCA/UNDP projects in early 1990s, the issues related with the improving benefits by better Radioisotope-Radiation applications for viable economic development are

1. Project Design: There could have been a more effective coupling of RCA activities with other technical cooperation activities financed by UNDP, IAEA and

bilateral donors. This would be a continuing challenge for most regional projects, and one that can only be met by the diligent attention to the need to ensure such collaboration. The principal task is to increase awareness of the application advantages of nuclear technology. This issue is particularly important. The actual introduction of these technologies for the commercialization and further economic developments require generally additional assistance from either national and bilateral or international programmes. In any future phase, this is an issue that will require greater attention.

2. Project Management: The management structure and technical support provided by the regional technical advisers were observed to be effective and particularly valuable. In future work, the use of such regionally-based technical support should be increased, even if this requires that IAEA assume more directly at Headquarters, a greater proportion of administrative coordination function.

3. Project Operations **TRAINING:** In any training programme, one of the most important tasks is selecting the appropriate group of trainees for the appropriate type of training event. The project must make additional efforts to ensure that such placement is more effectively carried out. Three general problems were recognized.

Firstly, trainees selected for some of the technical courses and workshops did not have the necessary background to effectively participate and utilize the training. To some extent, such problems are inherent in a regional activity where there is a great diversity within the region.

Secondly, the regional Executive Management Seminars (EMS), which have grown considerably in importance, require additional attention in order to play the very important role for which they were designed. Their content generally has been far too technical and failed to address with sufficient rigor the issues of economic costs and benefits. It is these economical facts which are crucial to any decision by industry to proceed with the introduction of the technology. Changes should be made in their structure and content to reflect the important differences between an EMS and a technical seminar. The goal of an EMS should be to interest high level management in the potential of utilizing a specific technology. This principally requires convincingly presenting the economic, marketing, productivity, quality and profit impacts from adopting a specific technology and the essential elements to be considered in reaching such a decision. At this level, executives will have only a very secondary interest in the physics, chemistry, and engineering details of the technology. Course curricula, lecture content and the selection of lectures must be made with these factors in mind. Participant selection for the EMS also had not been effective as desirable. It is very difficult to attract executives away from industry for two-day meetings outside of their own country. The EMS need to be made shorter and should target participants from user industries rather than service organizations. Far more attention needs to be given to arranging tightly focused national EMS.

Thirdly, in several states, it was apparent that the national coordinators and principal counterpart institutions have an incomplete understanding of the need for having an industrial market for the technology. As a result, the technology tends to remain in the

government research institutions, rather than being transferred to industry. It would be useful to try on a pilot basis for marketing and extension strategies for moving technologies from a research base to industrial applications.

PUBLIC ACCEPTANCE: There has been a substantial increase in concern throughout the region with protection and safety issues surrounding the technologies relevant to the projects. Unless this concern is effectively addressed will not make the full contribution capable to regional industrial development. Certainly all the training activities should directly address these concerns in relation to the particular technology that they are covering. This attention should not be as an afterthought to an otherwise technical presentation, but must be given equal attention as an important factor whether these technologies will be transferred. Additionally, the Agency should consider providing direct assistance to its major counterpart institutions on how to effectively approach public and worker acceptance issues in the context of introducing nuclear applications. This Agency's assistance will have to extend to providing materials, developing public information strategies and providing training on effective means of addressing management and worker concerns.

FUTURE STRATEGIES FOR IMPROVING ACTIVITIES BENEFITS

The projects in the past phases have addressed a number of promising areas of real importance to industrial development throughout the region. The progress made in some applications in many ways remarkable. While the projects are not totally responsible for these developments, it has played an essential role in their wider application. A number of needs that seem to be appropriate, high priority targets for a regional activity remain.

1. **Assistance** to the small and medium size industries in improving productivity and quality. Many of the technologies advanced during the earlier phases have found regional applications in larger industries. This is natural as it is these industries that have the needed technical base for such innovations and that are involved in highly competitive export markets. Asian economic development and the opening of internal and external markets, however, has progressed so rapidly that small and medium industries throughout the region are feeling considerable pressure to upgrade the quality of their product line and increase their productivity. Many of the technologies already addressed by RCA projects have ready applications in such small and medium size industry.

2. **Environmental problems** associated with industrial production are becoming more serious in the region. Some of these pollution problems such as flue gas control of fossil fuel thermal power plant and sewage have promising methods of control through the application of nuclear technology. The specific action should be taken to the contribution for a regional activity to speeding the solution of these serious problems.

3. **Much of the transport infrastructure** of the region is in need of serious upgrading to meet the rapid economic and trade growth being experienced. General building construction activity is rapidly increasing. A number of relatively simple nuclear technologies, moisture and soil compaction instruments and tracer studies of

sedimentation, can greatly increase speed and safety in the civil engineering industry.

For the successful accomplishment of RCA projects, the general management and scope of activities should be reviewed and evaluated periodically with the terms of reference. The result of such evaluation can be a good feedback to improve effectiveness of the transferred Nuclear Technology for the socio-economic development of the countries.

Best Management Mix

The progress in new science and technology has been remarkable. However, the IAEA, UNDP, and RCA Member States funding resources for the activities have been dwindling due to a long standing zero-growth budget and the recent financial crisis of the region. In order to incorporate modern Information Technology, Biotechnology, Nano-science, etc, into Radioisotope and Radiation application so as to improve further sustainable economic development, the entirely new dimension of the modern nuclear technologies transfer from donor countries to the national nuclear research centers have to be made effectively. New dimension of the technology transfer would require new funding resources. This means that the management of RCA projects has to be **Mission Oriented** to ensure that the end users would be surely beneficial to commercialize the transferred nuclear technology and contribute to the socioeconomic development of a recipient country.

Up to now RCA activities have been somewhat top down approach. Thus, some Member States were not able to commercialize valuable transferred new technologies to their national research centers for the benefit of socio-economic development. To rectify such mishap, the potential end users have to participate from the project design and feasibility study stage at the very beginning. For the most effective management of RCA projects, there would be the optimum

Best Management Mix in Top Down and Bottom Up approaches "Toward a Viable Economic Development".

Best Energy Mix

Asian region have the fastest growing population and economic development. To sustain such rapid growth, the energy security of the region has to be secured without adverse environmental impact from the drastic increase in energy uses. With the current trends and future projections, regional energy supply will grow and possibly could significantly increase mainly developing countries such as China, India, Indonesia, Viet Nam, Thailand, and etc. In view of the projected large increase in energy requirements and dwindling supply of oil as well as natural gas in this region, nuclear energy has to be a sustainable alternative energy to oil within foreseeable future.

The World Energy Council report up to 2020 concluded that the global reliance on fossil fuels and large hydro would remain strong, albeit with special emphasis on natural gas and cleaner fossil fuel systems. However, total reliance on these energy sources to meet the growing electricity demand of the world is not sustainable, especially in the context of two billion more people by 2020. Thus, a role of nuclear

power must be stabilized with the aim of possible future extensions in parallel with the efforts to develop intrinsically safe and affordable nuclear technology need to be encouraged.

Also, the drastic increase in energy uses accelerates the grave adverse environment in the region such as greenhouse effect and acid rain. Such grave environmental impact can be minimized by timely expansion of nuclear energy utilizations with **Best Energy Mix taking into account of Special Need of the Region**. The RCA activity would usefully expand its scope to cover these important areas of energy and environment planning with the view to improve the quality of life in this region.

Taking this opportunity, I would like to pay attention to my former colleagues Dr. Ramanna, Ebe, Munir Kahn, Prof. Baquini and Ambassador Siazon, Jr. for the untiring efforts and great contribution toward the success of RCA activities during the first phase.

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