

III. DISCUSSION

181. The following issues were presented to the participants as a basis for discussions, which led to the formulation of the recommendations given in chapter IV.

A. SCIENCE AND TECHNOLOGY POLICY INITIATIVES FOR TECHNOLOGICAL CAPACITY-BUILDING

182. Technology policies are now universally recognized as the basis for sound capacity-building, competitive edge and productivity, with the promise of profound impact on socio-economic development. Recent studies¹ indicate, however, that many ESCWA member countries—and by the same token, many other Arab countries as well—have yet to formulate viable policies with regard to the acquisition and dissemination of capacity in new technologies.² The issues discussed were:

(a) What are the respective roles of governmental and non-governmental institutions, including S and T organisms as well as business enterprises, in financing and implementing national and sectoral technology initiatives?

(b) What modalities may be utilized in linking technology initiatives to sources of demand and socio-economic priorities?

(c) How can national technology policy form a basis/framework for specific national and sectoral initiatives and what are the essential linkages and implementation modalities to be established?

B. TECHNOLOGY CAPACITY-BUILDING INITIATIVES

183. The wealth of information available from both developed and developing country experiences offer important lessons for future action at the policy, institutional and resource levels. However, the range of new modalities being implemented by developed and developing countries alike for accelerating the adoption and dissemination of selected new technologies (technology parks, technology incubators, technology networks, innovation centres and industrial clusters) have so far received only limited attention in Arab countries. The issues discussed were:

(a) What are the main lessons gained from the experiences of the developed and developing countries reviewed by the papers presented during the first day of the Meeting?

(b) When is an initiative considered successful? Are economic criteria considered sufficient as performance indicators?

(c) What are the essential conditions for the success of a given type of initiative at the policy level? At the institutional level? At the resource level?

(d) How could international and regional organizations become involved in initiatives designed to improve technological capacity-building and promote innovation?

(e) How could the design of initiatives, particularly those targeting the promotion of knowledge-based development, be adapted to the cultural, moral and social values of the region?

(f) Is it possible to launch technology-based initiatives without the benefit or backing of a national S and T policy? Or is it possible to allow for some degree of parallelism in relation to policy design and implementation and the adoption of a specific initiative?

¹ See the ESCWA study on “Science and technology policies for the twenty-first century” (E/ESCWA/TECH/1999/4) and the ESCWA study on “Assessment of research and development in selected ESCWA member countries: local technological inputs” (E/ESCWA/TECH/1997/5).

² Including, for instance, new ICTs, new materials and a host of biotechnologies for applications in a wide variety of areas.

C. SPECIAL INITIATIVES

184. Capacity-building initiatives may often be aimed at specific new technologies or applications. Arriving at practical conclusions or recommendations with such a purpose in mind requires special focus on the requirements and prospects pertaining to the area of technology being considered.

1. *Information and communications technologies*

185. The importance of ICTs in the knowledge-based economy for the Arab region is well recognized by Governments, NGOs, business enterprises and others. Adopting viable means for accelerating endogenous technological capacity-building is of equal importance in ICT transfer and dissemination. At the same time, the modalities for accelerating the pace of capacity-building and ICT transfer and dissemination must be linked to national, even local, settings. The issues were:

(a) What are the most important initiatives for ICT capacity-building that are most effective in the transfer and dissemination of these technologies?

(b) What viable frameworks for national and regional ICT initiatives in the Arab region should be considered?

(c) Which means and modalities can be used for accelerating endogenous technological capacity-building in ICTs?

(d) What are the main features of initiatives aimed at introducing ICTs to Arab manufacturing SMEs?

2. *Biotechnologies*

186. Several applications of modern biotechnologies in agriculture have entered commercial use during the past few decades, some of which have even been introduced with varying degrees of success in Arab countries.³ The general consensus is that a greater measure of regional and global harmonization of regulations and procedures is needed before more effective applications become possible. The discussion focused on the question of which initiatives would be most suited for applications of modern biotechnologies to become more widespread in agriculture, manufacturing and health care in the Arab region.

3. *New materials technologies*

187. New materials now constitute the basis of thriving manufacturing capabilities in many countries. While inroads by selected polymeric materials are being made, a range of new materials has yet to be introduced and applied in specific areas. The issues discussed were:

(a) What new forms of cooperation between stakeholders are necessary for a more effective introduction of these technologies?

(b) On the basis of the experiences of industrializing and industrialized countries, what are the main features of the specific initiatives aimed at such ends?

4. *Environment-based initiatives*

188. Initiatives aimed at environmental amelioration in the Mediterranean countries have acquired considerable momentum. In many ways, such initiatives may catalyze technological innovation and could also lead to valuable opportunities for promoting entrepreneurial opportunities. The issues discussed were:

(a) How might the Arab countries make better use of such initiatives?

³ For example, the now traditional methods of plant tissue culture.

(b) What changes at the policy, institutional and regulatory levels are needed to allow the Arab countries to make better use of these initiatives?

(c) What new technological capabilities are needed to optimize their benefits?

(d) Is there room for especially designed national and regional initiatives to tackle these needs?

D. INITIATIVES BASED UPON UNIVERSITY, ENTERPRISE AND GOVERNMENT COOPERATION

189. Universities in Arab world have a strategic role to play, despite the fact that they have, in the past, been slow in restructuring and in linking up with their main beneficiaries and end-user communities. They have also been slow in introducing the necessary changes needed to prepare Arab youth for competing in the global knowledge-based economy.

190. Many steps urgently need to be taken in order to reform the universities. Such reforms should encompass introducing additional disciplines, updating academic programmes and attending to the specific needs of enterprise, in particular SMEs. The points discussed were:

(a) Would national enterprises be willing at all to provide significant financial support to universities in the Arab countries?

(b) What should universities offer in return?

(c) How best to arrive at cooperation within technological networks?

E. TECHNOLOGY PARKS

191. Examples exist of both multidisciplinary technology parks as well as parks dedicated to a single discipline area of application. Each has its merits and disadvantages. It is essential to identify the optimal model for a given country or sector on the basis of socio-economic and technological considerations. The issues discussed were:

(a) What role could Governments in the Arab countries play in the design and implementation of technology park initiatives in order to increase their chances of success?

(b) How might this role be best described? That of a promoter, an investor, a manager, a partner?

(c) Setting up a network of technology parks at the national or regional level may address the shortcomings of the “dedicated technology park” model. How feasible are such networking schemes?

F. TECHNOLOGY INCUBATORS

192. International experience in technology incubators has been positive in producing more product and process innovations through start-up enterprises. The questions discussed were:

(a) What adaptation, if any, is needed for technology incubator initiative schemes to be transferred to Arab countries with a reasonable rate of success?

(b) Should Governments become heavily involved in incubation schemes, or should they simply provide support and encouragement to private sector enterprises and NGOs to develop such schemes?

(c) What role should Government agencies, chambers of commerce and industry, international organizations, foreign companies and others play in order to achieve optimal incubation schemes?

G. HIGH-TECHNOLOGY INDUSTRY CLUSTERS

193. In the United States, high-technology industry clusters (HTICs) have resulted in phenomenal growth in the targeted industrial segment as well as in a chain of related businesses. Moreover, much of the growth and improvement of industry agglomeration was achieved at minimal cost and with limited public support. In addition, the clusters are useful tools for defining medium- and long-term industrial and technology development strategies. The issues raised were:

- (a) What types of HTICs are more adaptable to the economic context of Arab countries?
- (b) How can Governments provide the business-friendly regulatory climate that is needed for the development of HTICs?
- (c) How can the private sector take the lead in developing HTICs?

H. THE PUBLIC SECTOR AND TECHNOLOGY INITIATIVES

194. The public sector dominates the scene in the Arab countries. It is still the locus of enormous resources, both financial and human, in many of these countries and is sometimes largely responsible for technology transfer and funding for R and D, as well as for higher education. Yet, its mammoth hierarchical structures react with enormous inertia in the face of innovation. The questions discussed were:

- (a) What initiatives would stand the best chance of changing prevailing institutional forms in the public sector and activating greater dynamism and innovation in their function?
- (b) How might more flexible and efficient models be introduced to invigorate public sector enterprises?

I. TECHNOLOGY INITIATIVES FOR WOMEN

195. Looking at women's socio-economic status, there seems to be room for improvement in adapting technologies to the needs of women and in making women aware of the new technologies that affect their lives. The issues discussed were:

- (a) How is women's status affected by technology in the region? Is the effect positive or negative?
- (b) How can women be encouraged to use and keep pace with technology?
- (c) What kinds of technology initiatives are most suited for women in the cities? What about rural women?
- (d) What actions can the Government take to improve the lot of women in technology initiatives? What about educational institutions and the enterprises?

J. ENHANCING SME CAPABILITIES THROUGH THE UPGRADE OF CORE BUSINESS FUNCTIONS

196. The operations of SMEs in Arab countries are, for the most part, based on medium-low technological capabilities. The core business functions of these enterprises are firmly rooted in traditional practices that leave them with limited competitive abilities. A clearer definition of core business processes and functions is needed before new technologies may be usefully adapted to the needs of Arab SMEs. A guide to best practices for enhancing core business functions, taking into account changes introduced by new technologies, is sorely needed. Such a guide would include classification of SMEs and define their most important core business functions. The principal issue discussed was whether this could form the basis for initiatives aimed at improving the core performance of SMEs in the Arab countries in their adoption of new technologies.