

APPENDICES

**1. STATE CO-OPERATIVE TECHNOLOGY PROGRAMMES
IN THE UNITED STATES**

State	Population (millions)	Rank by population	Budget (fy95) (\$ millions)	Rank by budget	\$ spent per capita	Rank by per capita spending
Alabama	4.22	22	2.20	29	0.52	36
Alaska	0.61	48	5.28	20	8.65	1
Arizona	4.08	23	1.97	33	0.48	40
Arkansas	2.45	33	0.41	45	0.16	46
California	31.43	1	6.06	17	0.19	44
Colorado	3.66	26	3.57	25	0.97	28
Connecticut	3.28	27	22.50	7	6.85	2
Delaware	0.71	46	4.25	23	5.98	3
Florida	13.95	4	11.50	12	0.82	31
Georgia	7.06	11	32.40	4	4.59	6
Hawaii	1.18	40	3.88	24	3.28	9
Idaho	1.13	42	0.73	41	0.64	35
Illinois	11.75	6	2.10	30	0.17	45
Indiana	5.75	14	5.90	18	1.02	26
Iowa	2.83	30	2.00	31	0.70	34
Kansas	2.55	32	13.60	10	5.33	5
Kentucky	3.83	24	2.80	26	0.73	43
Louisiana	4.32	21	0.85	39	0.19	42
Maine	1.24	39	2.34	28	1.89	16
Maryland	5.01	19	12.09	11	2.41	12
Massachusetts	6.04	13	5.05	21	0.84	30
Michigan	9.50	8	15.20	8	1.60	18
Minnesota	4.57	20	6.35	16	1.39	22
Mississippi	2.67	31	0.13	47	0.05	48
Missouri	5.28	16	2.75	27	0.52	37
Montana	0.86	44	0.66	46	0.77	32
Nebraska	1.62	37	1.67	36	1.03	25
Nevada	1.46	38	0.05	48	0.03	49
New Hampshire	1.14	41	1.25	37	1.10	24
New Jersey	7.90	9	15.11	9	1.91	15
New Mexico	1.65	36	0.80	40	0.48	39
New York	18.17	3	26.30	6	1.45	20
North Carolina	7.07	10	41.59	1	5.88	4
North Dakota	0.64	47	1.25	38	1.95	14
Ohio	11.10	7	38.53	2	3.47	8
Oklahoma	3.26	28	6.45	15	1.98	13
Oregon	3.09	29	0.69	42	0.22	42
Pennsylvania	12.05	5	37.65	3	3.12	10
Rhode Island	1.00	43	0.00	50	0.00	50
South Carolina	3.66	25	1.80	34	0.49	38
South Dakota	0.72	45	2.00	32	2.78	11
Tennessee	5.18	17	1.45	44	0.28	41
Texas	18.38	2	30.26	5	1.65	17
Utah	1.91	34	8.39	14	4.39	7
Vermont	0.58	449	0.05	49	0.09	47
Virginia	6.55	12	10.30	13	1.57	19
Washington	5.34	15	5.00	22	0.94	29
West Virginia	1.82	35	1.80	35	0.99	27
Wisconsin	5.08	18	5.80	19	1.14	21
West Virginia	0.48	50	0.60	43	1.25	23
United States	259.81	-	405.36	-	1.56	-

Source: State Science and Technology Institute (1996).

2. LIST OF ISRAELI INCUBATORS AND PROJECTS¹

Name of Incubator	Incubator Projects
Advanced Technologies Centre Association	Image processing/pattern recognition systems Chipless cutting tools and machines Cosmetic inspection of ophthalmic lenses Advanced ceramics manufacturing technology Micro label identification system Environmentally friendly peristaltic refrigeration technology Conducting materials Medical instruments Seed germination Fabrication of titanium sapphire rods for tunable lasers IMS equipment for identifying food product quality Electrochemical supercapacitors Aerial digital data processing systems Mechanical energy absorbent materials Advanced micro-machining technology for capacitive accelerometers Electromagnetic devices for accelerated development of plants Advanced fruit and vegetable cleaning process
Technion Entrepreneurial Incubator Co. Ltd.	Ultrasonic spray dryer Thermochemiluminescence photometer for medical diagnosis Cardiovascular performance assessment system Industrial vacuum equipment analysers Ozone generator (Ozonator) Ultrasonic probes Bone injection gun Uterine tissue collector Emulsifying equipment Personal lifeguard Electrophoretic deposition of advanced ceramic shaped objects and multilayer laminates Computerized laser treatment system Tip-truck overturn prevention system Harvesting and pruning tools Telem - an automated traffic law enforcement system Nonisocyanate polyurethane compounds Optical dew-point hygrometer and sensor Technology and machine for fantasy gemstones production Super composite material UV dosimeters for sun and artificial UV sources Labour control systems Playground toys Automatic growing systems Ultra light ceramic foams Left ventricular assist device Hormone replacement therapy by medicaments derived from pomegranates Tissue adhesives Autonomous navigation system Image processing algorithm Precision positioning system Satellite network based modem A surgical tool for cataract treatment Ultra-light weight, collapsible structural elements

¹ Further detailed information on each of these projects may be found at <http://www.incubators.org.il/>.

Name of Incubator	Incubator Projects
	Cosmetic and medical systems New glass pH electrode Video and high-volume data stream real-time encryption Rapid biodegradable hydrophobic material
Ofakim Innovative Technologies	Complete clean-up of marine oil spills Internal combustion rotary engine Computerized cardiopulmonary monitor Efficient liquid-ring compressor/pump Flexible roadway speed humps Cryothermic device for hemorrhoid treatment Plastic surgery and skin graft equipment Portable electronic respirator for emergencies and intensive care Real time integration of animation and real images in video films Wound closing bands and suction hooks Cake decorating device Illuminated signs Dynamic stair trainer
The Initiative Centre of the Negev	Smart parking device Friction welding machines; bi-metal connectors for power and light utilities Industrial and automobile catalytic converter Ultrafine rare metal powders Surgical gastrointestinal stapler Steel cable monitor Hand-held reader for microbial cell counts Skin blood flowmeter Multifrequency vibratory drive Home networking and automation over power lines Thermo-electric generator Exotic liqueur, nectar, fruit juice and cosmetic oil Automatic batch weighing unit for multi component mixtures Medical diagnostic chip Polyurethane floor coating
Meytag - Golan Initiative Centre	Salts separation and cleaning in electrical field An exothermic process for producing electrically conductive ceramics Pigments for corrosion preventing paints and coatings Ion therapy devices Computerized graphic catalogue Ion implantation process Slow release fertilizer Shape memory alloys Desulfurization of heavy fuel Apparatus and method for tissue cleansing Synthetic marble Decorative and protective shield Water purification technologies Fluidic jet sensors Renewable filter for purifying domestic drinking water Cleaning acidic gases Detection of heavy metals in water Mineral paints and coatings Organic coating for fruit and vegetables Orthopedic chair Utilization of CO ₂ for manufacture of fertilizers Dental implants

Name of Incubator	Incubator Projects
	Airway medical technology Cut flowers preservation Appetite suppressant medication Nutrition powders and food colors Corrugated plastic sheets for roofs A tool for catching mosquitoes Lithoextractor-triptor medical instrument Long life polymer films with optical filter properties Environmentally friendly pesticides Active flow pipe connector Electrocopy-a new solution for electroforming Polymer enzymes transferred to the body Polymer for purifying industrial sewage and oil spills Equipment for plasma coating deposition at low temperatures Telemetric system for cattle guarding
Misgav Karmiel Technology Incubator	Plant micropropagation Thin films Multi chip modules Glucose tolerant factor Trichoderma Magnetic separation of gold Modular vending machine Self-propagating diffusion coatings Targeting and delivery of chemotherapeutic drugs Bio artificial liver Polymer piston rings Virtual modeling Dynamic range compression Micro-encapsulation of compounds Solid lubrication tools Recycling of ceramic powders Natural compounds rich in iron
Technology Incubator Arad	Automated staff scheduling Conformance to quality standards Multidrug electronic commutator Polymeric filter media Home automation smart switch Turbo-mixer for aeration Gardening machinery Mechanical knife for girdling
Incubator For Technological Entrepreneurship Kiryat Weizmann Ltd.	Microbial quality control of food and medical products Flat disk brushless electrical motors UV bandpass solar blind optical filters Electro-optic components based on conductive polymers Water absorbing polymers Processing and production of tomato seeds Transducer and system for high precision measurement of angular co-ordinates Air-fuel plasma torch spray system Bioconversion of agricultural residue into animal feed Utilization of cheese whey for personal care and dermatological products Vein entry indicator Ultrastable enzymes High resolution two dimensional code reader 360° visibility scan bit mapped display sign

Name of Incubator	Incubator Projects
	Cancer diagnostics Biomarkers for diagnosing predisposition to epilepsy and for monitoring antiepileptic treatment Determining propensity to form calcium oxalate kidney stones Environment friendly coatings for printed circuit boards Computerized training monitoring system Dental digital X-ray
Patir Research and Development, Ltd. (Patir) Jerusalem College Of Technology Industrial Incubator	Optimization of metal cutting Automatic recognition of vehicle registration plates X-ray mammography processing Infrared detector array Auto-ID optical card and system Software utility as a unified interface to all user's data Calibration and planning of robots and electromechanical equipment Simulator for programmable logic controller In-situ optical surfaces characterization system Miniature three dimensional measurement system Breast milk measurement device Thermoplastic leather development Fast access optical disk drive for computer data Programmable keyboards Self-heating of liquid food Lightweight UV protective fabrics Arterial blood pressure measurements Electronic dice
Nitzanim Initiative Centre Ltd.	Technology for manufacturing of hydraulic and pneumatic cylinders and rods Automation of PCB layout Advanced electric welder Antidandruff shampoo treatment Electro-optical currency counter CellINC - wireless internet access Plant disease control based on nutritional microelements Internet based catalogue service supporting e-commerce in industrial components Tire made of elastic elements
Gat High Tech Centre	Tennis exercise machine Road signaling and safety information Neonatal resuscitation simulator Safety and load monitoring for commercial vehicle Oral hygiene products Surface hardening of metal objects Anti-burglary system Diagnosis of power plant steam turbines Wiped surface crystallizer Welded bellows Acoustical estimation of myocardial blood flow Electromagnetic casting Programmable data acquisition Automatic equipment systems for building technology Advanced polymers for absorbing impact energy Behavioral health care - prevention education and training software Automatic equipment for bread and roll twisting Active road marking system
Naiot Technological Centre Ltd.	Flow control in industrial precision systems Modular pelvis implant components Laser alert system

Name of Incubator	Incubator Projects
	Rehabilitation of complex fractures in hand and wrist Internal heart massaging device Interactive training system Testing tools for real-time and embedded systems Defibrillator Instant diagnosis of vaginal diseases Innovative algorithms and tools Process control technologies Enhancing cognitive skills Client server system Health product from eastern plants Biosynthesis technology and modification of enzymes Medical diagnostic products Cervix dilatation monitor Vaccine technologies Non-invasive diagnostic tool
Ashkelon Technological Industries	Electromagnetic non-invasive pain treatment Nt-5 interacting convection vacuum gauge Ultra violet metal-halide lamp Acoustic and thermal insulation material A method to diagnose infection in cattle and poultry Electrocardiometer Phonoenterograph Tissue resonance analysis Distribution valve plate for axial piston pipes Water organic pollution monitor Cable-type fire/overheating detection system Image processing and 3D reconstruction in real time Integral turbo-compressor Hydrophobic roof and wall coatings Actuator for active aerodynamic control Radar system for rear end collision detection Fully digital modem circuit core Clapping machine Electrolytic metal plating module for wafers Hollow fibre ion exchange pervaporation module for separation of organic solvents
Mofet B'yehuda Ltd.	Industrial component e commerce on the Internet Computerized speech therapy Sophisticated flow meters Acoustic communication system Extraction of proteins from the waste products of seed oil pressing Assembly toys Egg checking technology Herb based medicine to treat diseases from food intolerance Expert and control systems for intensive aquaculture Waste treatment system for cow milking centres Electrochemical disinfecting technology for preparing sterile mushroom substrate Rose oil production in cultured plant cells Acaricide textile finish Bio-oxidation method for production of iron oxide pigments from iron filings Agricultural protection products from extracts of Israeli aromatic plants New processes for waste rubber recycling Preserving organic matter by separating dry and liquid phases Clinical assay kit determines efficiency of anticancer drug treatment

Name of Incubator	Incubator Projects
Orit Technological R and D Centre in Ariel	Protection of living cells via novel use of nano-particles Thermo-chemical surface modification for cutting tools base materials New composite of glass and polymers Removal of heavy metals from water Detection of genetic diseases by utilizing polymer chain reaction techniques New welding and hardfacing flux-cored wires Cancer therapy, prevention and detection Computerized motorless and electromagnetically controlled infusion pumps Catalytic antibodies for the treatment of sepsis Integrated avionics and control system for unmanned vehicles Self stabilized ceramic heating elements A multi-sensor close surrounding vision interpretation device Innovative electroplating technology Diagnostics of heart disease A bio-control agent containing an endotoxin gene Comparison-shopping and purchasing tool Regulated centrifugal compressor for air-conditioners Method and apparatus for assessing visual fields High-tech industrial sewing machines
The Jerusalem Software Incubator	Distributed search on the Internet Qualitative information ranking within the Internet Computers for seniors Natural-language interface for on-line transactions and information Simulation of mixing for chemical and process engineers Automatic comparator and measurement tool for planar parts New lighting system for animal farms Electrohydraulic fuel injection system for diesel engines Catalytic heating appliances Electronic ballast for high intensity discharge (HID) lamps Heat transfer calculations software Virtual reality engine Motion picture and television production Software working environment for engineers Signature software for e-mail and documents Separator for dry substances Virtual touch system Internet co-browsing Content based forgery detection in images – iSiT
Yozmot - Granot Initiative Centre	Leaf sensor for irrigation applications Personal vehicle for recreation purposes Radar system for collision avoidance Device for monitoring and improving alertness Fire retardant, fire resistant, thermally isolating materials Natural extracts Computerized universal fixture systems Safety and two-way communication device for divers Electrical reactor for recycling animal manure Voice recognition Computerized system for separating male from female chicks Cold hydroforming of complex shape high precision tubular products Doped glasses for optical/lasers applications Medical devices for cryosurgical treatments Recycling and extraction of metals Application generator for designing simulation systems Magnetoelastic sensors

Name of Incubator	Incubator Projects
	<p>Forward error correction for communication applications Dental mirror with embedded video camera Process control system for steel production Multi-sensory programme for developing English language reading skills Isothermal compressor/expander Enhanced glass ceramics technology Gas analyser for aggressive substances Magnetotherapeutic device for bone growth stimulation Xerostomia treatment device Rapid prototyping system Magnesium recycling</p>
Biomedical Incubator Rad-Ramot Ltd.	<p>Early and non-invasive diagnosis of skin, breast and cervical cancer A comprehensive disease management package for breast cancer patients Functional screening systems for lead compounds for drug development Air and power chucks Device for massaging diabetics' feet Backlights for liquid crystal displays Ear protectors for divers and water sports Body odors treatment Infusion pump A serological test for the diagnosis of Alzheimer's disease Antiallergic drugs and compounds</p>
Western Negev Initiative Centre	<p>Gas cylinder Micro-algae separator Flexible scale Liquid heater Chilled vegetables Disease detection in plants Automatic chucks Automatic safety device in elevators Industrial polishing pastes Dynamic massage Electrically induced anesthesia A bracelet for detection of stress situations in infants Mycoinsecticides based on fungi</p>
Meytav - Technological Enterprises Initiation Centre	<p>Natural express honey products for alternative medicine Cell culture for deriving plant secondary metabolites High efficiency aggregate screening technology Non-contact administration of biologically active substances Production of non-standard metal profiles Safe medical thermometer Ultra fine pulverizing vortex mill Skin permeability measuring device Computerized system for optimization of soil compaction Epoxy materials and polymer technologies Piezoelectric prospecting device</p>
Hitec Har Hotzvim Technology Entrepreneurship Centre	<p>Expression of genes in plants for biopharmaceutical and agricultural purposes High pressure extrusion Contrast agents for MRI and ultrasound imaging Expression of proteins in yeast for therapeutic and industrial uses Quick measurement of concrete and cement consistency Highly selective pain killing drugs Secure information transfer Electroluminescent fibres</p>

Name of Incubator	Incubator Projects
	Dental simulation systems Power filtration products Etherphone Delivery documentation and management system Device for enhancing the efficiency of peritoneal dialysis Pulmonary edema monitor Home language training Advanced embedded computing solutions Liver and kidney support system Latent image technology
Am-Shav Technological Applied Development Centre	Gateway to multimedia An automatic extractor of digital terrain models Image analysis Accelerator of biological data computation Solar water heating system Vehicle driving simulator Accurate controllers for electric motors Massager Combustion-improving device Production of composite material vessels Helmet braking light system Spatial frame structures Environment simulator for computer embedded systems A device for rehabilitation and maintenance of water wells Deep bed filtration Advanced voice analysis technology Piezo hydraulic actuator
Kinarot Initiation and Development Company Ltd. Technological Incubator	Electric barrier system to prevent insect and pest infiltration Building materials based on autoclave foamed concrete Automatic system for wafer global planarization Master muffler, an exhaust device for vehicles Centrifugal gas/air compressor Natural fertilizers and pesticides and their application Dairy cattle feed additive Ball worm transmission system Ultra-high frequency device for treatment of animal diseases Water-borne rust converting primer for metals Instruments for shoulder surgery Heating system for greenhouses Jellyfish repellent products
L.N. Innovative Technologies Centre For The Development Of High-Tech Enterprises (Former Kiryat-Yam Technological Incubator)	Processing of petroleum-based waste to obtain standard fuels People counting technology Device for enhancement of lymphatic and venous return Comprehensive management and service system for non-hazardous solid waste management Stapler for fixation of sternum and ribs Composite structures Waste free recycling of battery lead Multicolor glass products Gas cleaning by vortex bubbling chamber Metal machining monitoring Healing technology Microspheres based method for wound healing Power pack for tapping through holes Automatic cardiometer - ACM

Name of Incubator	Incubator Projects
	Advanced chromatographic materials Surgery device Tungsten carbide thick coating technology K-intermediator software package Software tools in biotechnology and bioinformatics High voltage insulating interfaces and overload protection systems Natural products from higher basidiomycetes mushrooms
Yozmot Haemek Technological Incubator	Dimmer system for lighting poultry runs Medical waste sterilizer Dental implant for replacement of missing teeth Electrode materials for high performance tantalum ultracapacitors High speed steel powder with wear resistant coatings Rumen sound monitor for health protection of bovine herds Rechargeable batteries of increased capacity and extended life Computerized precision management system for intensive agriculture Self-regulating constant temperature heating element Conductive, resistive and insulating patterns printed by ink jet Separation of isotopes of hydrogen, oxygen, nitrogen and carbon Permanent track plow for single pass complete row crop cultivation Ultrasound reactor for hydrometallurgical production of nano-ceramic powders Intermetallic alkali dispensers and alkali earth granules with a neutral metal coating Multimedia interactive information source Computer vision system for medical applications Production of extra fine cobalt and nickel powders from metal fluorides Continuous combustion synthesis of ceramic, composite and intermetallic powders Sorbent to remove petroleum products from water surface, sewage, soil Quaternary, ammonia silicate based, thermostable organo-mineral polymers Monitoring the ciliary beat of the mucociliary system in the respiratory tract and in female reproductive organs
Target Technology Centre	Enhanced electronic translator Cellular localization search system Virtual sales representative Liquid filling systems Manufacturing execution system Extended active surface battery Dairy control and management system Plasma generator Composite material products based on commingled plastic and paper Motors and motor components tester Outlets constituting in-home distributed communication network Bulk industrialized processing of seafood

Source: <http://www.incubators.org.il/>.

3. SOME KEY INDICATORS OF R AND D AND TECHNOLOGICAL DEVELOPMENT IN ASIA-PACIFIC COUNTRIES

Country/Economy	Per cent of GDP			Per cent of GERD			No.	Percent of 24 year old population	
	GERD	BERD	GOV + HERD	BERD	GOV + HERD	GNP per capita (1996 ^{c/})		Patents granted in US in 1996 ^{d/}	No. of 24 yr. olds with a first degree ^{e/}
Japan (1997) ^{a/}	2.89	2.10	0.65	72.7%	22.5%	34,630	23,089	28.0	7.2
S. Korea (1997) ^{a/}	2.89	2.10	0.76	72.7%	26.3%	10,610	1,496	23.3	8.9
Chinese Taipei (1998) ^{a/}	1.98	1.25	0.46	63.1%	23.2%	13,310	1,620	20.6	6.7
Singapore (1998) ^{a/}	1.80	1.11	0.44	61.7%	24.4%	30,550	84	11.5	7.8
Australia (1996) ^{a/}	1.64	0.79	0.85	48.2%	51.8%	18,000	468	35.9	8.0
New Zealand (1997) ^{a/}	1.13	0.32	0.81	28.3%	71.7%	13,350	53	33.7	6.1
India (1992) ^{a/}	0.74	0.19	0.54	25.7%	73.0%	380	37	4.8	1.1
China (1998) ^{a/}	0.69	0.31	0.37	44.9%	53.6%	750	62	1.4	0.9
Malaysia (1992) ^{b/}	0.37	0.17	0.20	44.7%	55.3%	4,370	11	3.2	0.8
Philippines (1992) ^{b/}	0.22	0.05	0.16	21.8%	73.5%	1,160	6	-	-
Indonesia (1992) ^{b/}	0.20	0.07	0.15	33.0%	77.0%	1,080	1	3.6	0.8
Thailand (1992) ^{b/}	0.20	0.02	0.17	9.4%	85.5%	2,960	11	9.8	1.7

Sources:

a/ Minchin (2000)

b/ Garrett-Jones/ASEAN (1997)

c/ ADB (1998). Data for Australia, Japan, New Zealand are for 1995.

d/ T. Turpin, H. Spence, S. Garrett-Jones and A. Marsh, "South-East Asia and the Pacific Rim," in H. Moore (ed.), *UNESCO World Science Report 1998* (Paris: UNESCO Publishing/Elsevier, 1998), pp. 212-236; National Science Board (1998). Data for China, Chinese Taipei and India are for 1995.

e/ National Science Board (2000). Data are for "1997 or latest year".

Note: BERD = Business enterprise research and development.

GERD = Gross domestic expenditure on research and development.

HERD = Higher education expenditure on research and development.

NSE = Natural sciences and engineering.

4. TECHNOLOGY BUSINESS INCUBATORS AND SCIENCE AND TECHNOLOGY PARKS IN THE PHILIPPINES

Site	Status*/year established	Tenants/technologies*
1. TBIs (Responsibility of the Technology Application and Promotion Institute - TAPI)		
<ul style="list-style-type: none"> • Bicutan DoST TBI (within various research institutes of DoST) 	1990	23 tenants: TAPI: 8 Industrial technology development institutions: 2 Metal industry R and D centres: 11 Food and nutrition research institutions: 2
<ul style="list-style-type: none"> • University of the Philippines (Diliman campus) TBI 	Operational (pilot facility)	5 tenants Forest Prod. R and D Inst.: 2
<ul style="list-style-type: none"> • University of the Philippines (Los Banos campus) TBI 	Operational	
<ul style="list-style-type: none"> • Bohol TBI 	Operational	
<ul style="list-style-type: none"> • Canlubang, Laguna TBI 	Operational	
<ul style="list-style-type: none"> • Iligan TBI 	Operational	
<ul style="list-style-type: none"> • Pangasinan State University TBI 	Under construction, 1994	
<ul style="list-style-type: none"> • Negros Occidental TBI 	Negotiations with international donors in progress, 1994	
<ul style="list-style-type: none"> • Central Luzon State University TBI 	Proposed	
<ul style="list-style-type: none"> • Agusan del Sur 	Proposed	
<ul style="list-style-type: none"> • Visayas State College of Agriculture 	Proposed	
<ul style="list-style-type: none"> • University of the Philippines (Visayas campus) 	Proposed	
2. Technopoles (Department of Science and Technology - DoST)		
<ul style="list-style-type: none"> • University of the Philippines (Los Banos campus) 	Operational	3 tenants, each in a separate new building

Source: Stuart Macdonald and Richard Joseph, *Technology Business Incubators and Science and Technology Parks: Assessment Report*, Report by the Centre for Research Policy, University of Wollongong, for the Department of Science and Technology, the Philippines (Wollongong: University of Wollongong, September 1995).

* Data are as at 1994-1995.

5. ESCWA INITIATIVE FOR TECHNOLOGY PARKS, INCUBATORS AND HIGH TECHNOLOGY CLUSTERS

It is essential for the economies of the ESCWA countries to become more diversified, productive, competitive and environmentally friendly. While institutional forms such as technology and research parks, technology incubators and high-technology clusters are not the only options, they do constitute effective means of achieving many worthwhile objectives in all three directions.

This is apparent from the experiences of both developed and developing economies, where new institutional forms of this kind have led to the creation of new employment opportunities in response to the challenges of growing populations and new global, local and regional changes. Similar results could be attained in the ESCWA member countries, although it is important to bear in mind that such initiatives should not be viewed as an end in themselves, but as a link between industry and R and D institutions.

ESCWA must co-operate and work in co-ordination with its sister United Nations organizations and with relevant international and regional organizations to formulate and assist in the implementation of appropriate initiatives, taking into account, from the very outset, the special needs and priorities of the ESCWA member countries.

These initiatives should target the creation of technology parks, incubators and high-technology clusters through:

- (a) Enhanced awareness of the possibilities offered by these new institutional forms;
- (b) Assistance with the assembling of experienced national teams of motivated individuals;
- (c) Substantive contributions to the formulation of governmental and business-sector technology policies and strategies;
- (d) Advice on the creation of infrastructure capabilities and legislative instruments likely to make the ESCWA member countries and their business communities attractive to high-tech entrepreneurs and international technology-based partnerships.

The notes on technology park initiatives in frame 52 constitute:

- (a) A basis for the formulation of detailed project proposals for fundraising;
- (b) A starting-point for future regional and international co-operation and co-ordination.

With respect to both the above, it would be highly desirable for ESCWA to:

- (a) Draw on the body of experience that has accumulated to date for the purpose of formulating optimal procedures, methods and criteria for the selection and implementation of suitable forms of technological capacity-building initiatives of particular relevance for the ESCWA and other Arab member countries;
- (b) Serve as a catalyst and a co-ordinator of efforts within and among its member countries with a view to formulating and implementing initiatives in the above-mentioned areas and to publicize them as soon as possible, using the means provided by new information and communication technologies. The member countries, for their part, could provide assistance in providing relevant information and possible support.

The Expert Group Meeting on Capacity-building Initiatives held in Beirut during 1-3 November 2000 recommended that ESCWA should undertake the study and formulation of models for use in the creation, monitoring and management of technology parks and incubators, taking into account the variety of economic systems found in the ESCWA member countries and the importance of ensuring that legislative, regulatory and managerial arrangements for such initiatives are effectively blended into currently prevailing conditions.

Frame 52. ESCWA Initiative for the Creation of Technology Parks in the Member Countries

A number of resolutions of the Economic and Social Council and the General Assembly in the 1980s and 1990s have called for focused efforts aimed at the dissemination of new technologies, the facilitation of technology transfer and the building of scientific and technological capacity, with emphasis on developing countries' need for sustainable development and enhanced economic competitiveness and productivity.

Past ESCWA work programmes have focused, in targeting the above objectives, on studies and expert meetings. This has been justified by the need to create awareness of, and build consensus on, essential strategic and policy issues that are deemed to be lacking, or at any rate underdeveloped, in many ESCWA institutions.

However, these issues have now been adequately addressed, and both reports from the field and the recommendations of a number of expert group meetings suggest that the time is ripe for ESCWA to undertake operational activities aimed at fostering technology, research, development and demonstration networks and activities with a view to linking production and services capacity to enhanced technology inputs. In at least three expert group meetings of the Technology Section, the participants have adopted recommendations urging ESCWA to play a more active networking role in technology capacity-building. ESCWA meetings of eminent persons convened to consider priority areas relating to ESCWA's work programmes have also emphasized these points in recent years.

Technology parks can play and have played an important part in technological capacity-building by bringing together at a single physical location facilities such as R and D, manufacturing, high-level training, technology and business incubation, financing institutions, standardization and calibration laboratories, testing and analytical facilities and industrial services and facilities.

ESCWA—through its Technology and Industry Sections as well as its Regional Advisers—has been approached to provide inputs in the design of technology parks and technology/business incubators from concerned institutions in the Syrian Arab Republic, Kuwait, Lebanon, Palestine, Jordan and other countries.

The fact that institutions in a number of ESCWA member countries, including Egypt, Oman, Bahrain and the United Arab Emirates, are in the process of setting up park facilities, contemplating their establishment or seeking advice on such measures, is further evidence of the need for ESCWA to play a clearly defined role on this front.

It is in this context that an ESCWA initiative aimed at fostering the creation of technology parks, essentially as instruments for networking at the disciplinary, sectoral and functional levels, would constitute a logical and necessary step at the present time. ESCWA's role might focus on the following tasks:

- (a) Preparation of documents on the role played by technology parks and other capacity-building schemes, including their constitution, organizational structures and resource requirements with case studies from developed and developing countries, including nascent examples from some ESCWA member countries;
- (b) Developing frameworks for the establishment of technology parks and other capacity-building schemes, comprising at least three models in order to allow for variations in the nature and diversity of current economic conditions and the disparate degrees of sophistication of national S and T and innovation systems;
- (c) Monitoring activities aimed at the creation of technology parks and their subsequent operation in the ESCWA member countries with the aim of facilitating exchanges of know-how and expertise;
- (d) Acting as a hub for a network of technology parks and other capacity-building schemes in the ESCWA member countries.

The meeting also recommended that the development of the above-mentioned frameworks should be undertaken as part of an integrated initiative that ESCWA was asked to launch at the earliest possible opportunity, in view of its regional status and its abundant stock of knowledge of and information about various aspects of socioeconomic development in its member countries.

In view of the importance of effective frameworks for the establishment of similar initiatives in other Arab countries, ESCWA was also asked to seek existing and potential avenues of co-operation and co-ordination with other relevant United Nations bodies and international and regional organizations in efforts aimed at the dissemination and customization of these models for optimal application in the Arab countries.

In addition, inasmuch as frameworks for technology initiatives should be adapted more closely to national socioeconomic conditions in each member country, ESCWA was asked to identify national institutions with a view to co-operation aimed at furthering and customizing frameworks for specific national needs and aspirations.

The participants further recommended that ESCWA should provide assistance for relevant national and regional bodies with a view to developing models for initiatives aimed expressly at the promotion of small and medium businesses and the role of women in technology development. Feedback on priorities should be actively sought through a market survey. The choice between dedicated or specialized technology parks/ incubators should be made with a view to the characteristics of the area under consideration and the particular attributes it might impart to the park/incubation scheme.

Finally, the experts taking part in the meeting expressed the hope that these efforts would result in the creation of a network of institutions dedicated to the establishment and management of technology park and technology incubation initiatives and the monitoring of their performance.