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Expert Meeting on Policies and Programmes for Technology
Development and Mastery, including the Role of FDI
Geneva, 16–18 July 2003

**REPORT OF THE EXPERT MEETING ON POLICIES AND PROGRAMMES FOR
TECHNOLOGY DEVELOPMENT AND MASTERY, INCLUDING THE ROLE OF
FDI**

held at the Palais des Nations, Geneva
from 16 to 18 July 2003

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Chapter I

CHAIRPERSON'S SUMMARY

1. The Expert Meeting on Policies and Programmes for Technology Development and Mastery, including the Role of FDI examined the policies and programmes that Governments can consider for the purpose of improving competitiveness and upgrading their technological development: policy changes conducive to moving up the technology ladder, including transfer of technology; technology development to meet international norms and certification; and financial and fiscal measures to promote collective action among institutions and actors for “linking, leveraging and learning”.

2. The Secretary-General of UNCTAD said that technology was the key to the development link between trade and investment, as it offered the means to increase the value added of exports. He noted that trade had long been considered a tool for development, but that mere increases in exports did not guarantee development unless the value added of exports also increased. He cited the example of Mexico, where export volumes had tripled in seven years, but had not laid the foundation for widespread development or an increase in real wages. A recent study of exporting and importing firms in Brazil had revealed that foreign firms exported 70 per cent more and imported 290 per cent more than domestic firms. While foreign firms' tendency to import might not be invariable, their export gains might not be as favourable as they first appeared if they led to a consequent increase in imports. Both export “quality” and export “quantity” should therefore command attention. He asked the experts to concentrate on the heart of the development problem: what are the best policies to increase value-added production? What policies would generate a virtuous circle in high-value-added exports and well-paid jobs? He hoped that the conclusions of the Expert Meeting would advance the preparations for UNCTAD XI on this theme.

3. A resource person introduced the reports by the secretariat (issues paper, background report and case studies). The presentation defined key terms such as competitive versus comparative advantage, and firm versus national competitiveness. She summarized the key drivers of technological development discussed in the issues paper, which the secretariat had used to analyse technological development for competitiveness in the case studies. Policy outcomes from those case studies (Ghana, Malaysia, Singapore, Taiwan Province of China and Uganda) were summarized. In commenting on the three Asian economies that had upgraded their technological capacities, the resource person identified the following factors as critical: (a) vision and commitment of government; (b) skills training; (c) attracting export-oriented foreign direct investment (FDI); (d) support for local industry (notably in the Republic of Korea and Taiwan Province of China); and (e) local technological efforts in terms of research and development (R&D). The presentation also highlighted key conclusions emerging from the case studies: the existence of interrelationships between drivers, giving rise to the need for early and concerted policies across a variety of policy fronts; and the importance of balanced incentives for different actors. In general, it is better for countries to do moderately well across all drivers, rather than outstandingly well on some drivers, but badly on others.

1. Main challenges and responses for technology development and mastery

4. The participants identified the main challenges and responses for technology development and mastery as described below.

Necessity of good governance

5. Successful technology development and mastery for competitiveness require good governance in order to identify and target appropriate policies, to take early and concerted action, and to establish virtuous, self-reinforcing circles across an integrated range of policy fronts, including human resource development, R&D, investment promotion and production capabilities.

6. To facilitate good governance, particularly the coordination of competitiveness policies among ministries, a specific body or institution should be charged with collecting information, benchmarking and formulating a national vision and strategy for competitiveness. Such a vision and strategy should be founded on smart partnerships between the public and private sectors, with the Government as the facilitator and the private sector as the driver.

Interrelated technology drivers

7. Key drivers of technology development are interrelated. For example, advanced human capital and skills training are integral to R&D efforts, to internalizing technologies embodied within FDI and to utilizing patents and licences. Similarly, the new technologies embodied within R&D, FDI and licensing themselves introduce and develop new and varied skills. Feedback effects between drivers mean that, when addressed together, drivers can be mutually reinforcing. When formulating policies for competitiveness, Governments need to consider a set of several interrelated policies rather than isolated or disjointed ad hoc policies. Coordinated efforts are needed across the different policy fronts to maximize their joint impacts.

Equal treatment for foreign and local enterprises

8. Balanced efforts are needed to support both foreign investors and local enterprises because without a strong business sector to act as a partner, supplier and customer, the positive potential of trade, investment and technology transfer cannot be realized. Local enterprises can be divided into those created by opportunity entrepreneurs and those created by necessity entrepreneurs, with different needs and hence different policy implications. Governments need to formulate policies to target suitable foreign investors and to strengthen their local entrepreneurs to partner with them.

Technology infrastructure

9. Countries at all levels of development need to support technological activity by enterprises, although the balance of measures differs. Each country needs an efficient

technology infrastructure, composed of MSTQ (metrology, standards, testing and quality) institutions, R&D support institutions, and business services for small and medium-sized enterprises (SMEs). The role of R&D increases with the level of industrial development. While R&D is carried out by some enterprises, public R&D institutions and universities can play a critical role by conducting basic research and providing specialized knowledge inputs. Developing countries should strengthen the technological activities of all enterprises: in SMEs through proactive extension services and productivity centres, and in large enterprises by encouraging and financing R&D (particularly applied development rather than pure research).

10. Intellectual property rights (IPRs) have different implications for countries at different levels of development. On balance, countries that are starting to innovate benefit from stronger IPRs. Countries that do not innovate – most low-income countries – pay a price for strengthening IPRs while gaining little. There may be a case for differentiating the application of strong IPRs by levels of economic and technological development.

Skills development

11. Moving up the technology ladder requires an adequately skilled labour force that can learn to use and adapt new technologies. To develop the necessary skills, Governments must invest in both a sound base of primary/secondary education and the specialized skills essential to the business sector. They can enlist the help of the private sector to develop the skills that are needed for competitiveness. This will ease the resource burden of providing for skills training and ensure that it is demand-driven. Governments can form partnerships with the private sector and industry associations to provide specialized skills training. They can provide infrastructure and related incentives (for buildings and equipment) while the private sector provides skills centres management, training manuals and instructors. Outsourcing to the private sector will help ensure training in those valuable skills required by the commercial sector. Such training should be given on a fee basis. Building capabilities needs support.

Role of FDI

12. There are different types of FDI with different characteristics and impacts, according to source, sector and destination. According to the *World Investment Report 2001*, 60 per cent of FDI going to Asian countries was in the manufacturing sector, whereas FDI going to Africa and Latin America was resource- and service-based. It is important to target better-quality, technology-intensive FDI. Whilst recognizing the critical role of resource endowments in determining the nature of FDI and its impact on and within an economy, Governments need to design and implement policies and an investment framework to upgrade the nature of FDI entering their economies. They should pay particular attention to foreign investors' ability and willingness to transfer learning, skills and technology. Investment promotion agencies can play critical roles in targeting and attracting suitable types of FDI that will increase local processing capabilities and hence value added.

Infrastructure

13. Despite pressures to develop rural infrastructure within poverty reduction strategies and Millennium Development Goals, there is still a need to provide business infrastructure, particularly in transport, power, communications, and information and communication technologies (ICTs), for the SME sector. Governments need to recognize the importance of infrastructure for the productive activities of the business and SME sectors, and to make a commitment to balanced infrastructure investment.

Collective action

14. There is a convincing case for support for collective action in building linkages between different economic actors and a strong institutional framework for technological development. Export processing zones (EPZs) have proved successful in promoting exports, innovation and linkages between suppliers, producers, vendors and distributors. Incubators have been successful in helping start-ups with venture capital and ongoing financing through their difficult initial phase. Clusters have been successful in helping established enterprises meet external requirements in terms of scale and quality.

Incentives

15. The evidence suggests that financial grants and fiscal incentives can have greater impact on SMEs than transnational corporations (TNCs). Similarly, financial incentives are likely to be more useful to SMEs than fiscal incentives, particularly for technology upgrading. Therefore, Governments need to take into account their countries' endowments and the structure of the economy and productive activities in designing incentive policies. They need to ensure that they select the appropriate financial and fiscal incentives, according to their objectives, revenues and industrial and entrepreneurial base. Short-term fiscal fixes for budgetary deficits should not be achieved at the expense of the long-term health of the commercial and productive sectors.

WTO reforms

16. Governments should consider bringing back non-actionable subsidies for R&D and disadvantaged regions within the WTO Agreement on Subsidies and Countervailing Measures. These subsidies could be broadened to cover product diversification, the SME sector and all new technologies, not just environmentally friendly ones.

Role of the international community

17. Successful technology development requires considerable public and private investment. Some countries, particularly LDCs, have limited resources and need support from the international community. At the same time the national scope for strategies for competitiveness is being reduced by various international commitments. The international community needs to give developing countries more time to use national policies and measures to climb the technology ladder.

Future actions

18. The following future actions by international organizations could further technology development and mastery:

- UNCTAD and UNIDO should cooperate to establish a common position on competitiveness, what drives it and how to measure it; and collect “international best practices” and make them available to developing countries. This could be done within the context of investment policy reviews.
- UNCTAD should continue to promote best practices in business skills development for SMEs both through public–private partnerships and through its EMPRETEC programme.
- UNCTAD, through its Commission on Science and Technology for Development, should contact the national focal points for technology development and bring to their attention the results of the Expert Meeting through the electronic network STDev.
- UNCTAD, within its FDI policy analysis, should identify those ways in which TNCs can have a more positive impact on development, particularly helping local enterprises to climb the technology ladder.
- UNCTAD should undertake more research on the most cost-effective incentives for SMEs to upgrade and master technology.
- UNCTAD should continue to analyse the coherence between WTO requirements and competitiveness policies.

2. Measures of competitiveness

19. A representative of the United Nations Industrial Development Organization introduced the analytical framework of the Industrial Development Scoreboard (IDS). He distinguished between the performance criteria of competitive industrial performance (CIP) (exports, share of medium- and high-tech exports, manufacturing value-added (MVA), share of medium- and high-tech MVA) and the drivers or capabilities of CIP (skills, R&D, FDI, royalties and licensing, infrastructure). He highlighted the uses of the IDS as a diagnostic tool for benchmarking industrial performance and capabilities. As such, it could give valuable guidance to policy makers in developing countries. He presented an analysis of country changes in CIP between 1985 and 1998, categorizing countries as “winners” and “losers” on the basis of changes in their relative rankings (1985–1998) and comparing this to their absolute scores on the CIP Index. Some over-performers managed to insert themselves into global supply chains via FDI. Under-performers had not managed to mobilize the resources for skills development or supporting local enterprises, and had not attracted significant FDI. As a result, a number of countries were regressing down the technological ladder and were de-industrializing.

20. Discussions focused on the use of benchmarking as a useful departure point for policy analysis and for tracking progress and the impact and influence of policies. The selection of relevant indicators posed problems. For example, the use of electricity and telephone

mainlines may not be representative indicators for other types of infrastructure (freight, roads, transport).

21. There is an important difference between absolute and relative indices. Countries' absolute scores can improve, but their relative rankings may still slip (the case of "running to stand still") in relation to other countries. Ultimately, however, it is countries' relative rankings that matter most, since (a) competitiveness is a relative concept: what matters is how countries perform in manufacturing and export markets, compared with other countries; and (b) absolute scores mean different things at different ends of the distribution of index scores. For example, at the tails of the distribution, countries may need huge improvements in scores to change rankings. In the middle of the distribution, where countries tend to bunch together, only small changes in absolute scores may result in a large change in rankings.

22. The experts recognized, finally, that benchmarking was a useful tool, but not an end in itself, and that it should be used to better inform policy-making.

3. Drivers of technology development: How Asia got ahead

23. Discussions were organized around four panel presentations. Two case studies were presented, one each for Malaysia and Indonesia. The Malaysian strategy was based on attracting export-oriented FDI. In the last 30 years, Malaysia has created EPZs and incentive schemes for TNCs and local enterprises. FDI has generated local business opportunities that have grown over time. The local manufacturing base has been strengthened by spillover effects of former TNC employees starting their own companies and by TNCs themselves starting local companies. Finally, a local manufacturing base has been created that has been able to service the TNCs globally, as well as expand into the Asian region itself. The reach and the sophistication of SMEs operating in Malaysia have made them total solution suppliers.

24. The Malaysian strategy for export competitiveness has comprised the following key components:

- Government vision and commitment: the Government convinced the private sector that it was a credible partner and able to deliver on long-term commitments, and has acted as a facilitator, while allowing the private sector to drive productive activities;
- Attracting of FDI to solve unemployment problems;
- Smart partnerships: between the public and private sectors for skills development and for strengthening local enterprises through various "hand-holding" schemes and business linkage programmes;
- Incentive schemes: these created a compelling reason why the private sector should support the development objectives of Malaysia; matching grants were used so that the incentives were not simply "hand-outs".

25. Malaysia intends to continue its "smart partnerships" with the private sector, to encourage Malaysian enterprises to engage in "cooperation" (cooperation plus competition)

and to invest heavily in ICTs. The presenter identified the main challenges facing Malaysia as meeting the skills gaps caused by continuous advances in technology, formulating exit policies to deal with outflows of FDI, and combining the different objectives of the public and private sectors for a win-win situation.

26. An expert from Indonesia described the organizational structure and outlined the legal framework and administrative system of science and technology policy in Indonesia. Indonesia is coordinating its science and technology policy through the Ministry of Research and Technology. It has developed a number of incentive schemes to encourage the commercialization of technology from inception of the idea to the maturity of the enterprise. These incentives cover basic and applied research, and partnership programmes, as well as management and intellectual property rights. KATALIS (technology catalyst) is one of the new schemes aimed at facilitating research and development of ideas into bankable products. Furthermore, commercial products with business plans are supported through incentive programmes to become start-up companies. The expert also highlighted the important function of incubators in facilitating commercialization.

27. Two other panellists gave overviews of how Asia got ahead. One described East Asia as the most dynamic region in the developing world in production and in exports, especially in non-resource-based manufactures. In particular, East Asia has nine out of the twelve developing world exporters, providing 90 per cent of developing world exports. East Asian tigers have followed different strategies to achieve export competitiveness: some have relied on external drivers such as FDI (Hong Kong (China), Malaysia and Singapore), while others have relied on internal drivers such as their own technological effort and support to local enterprise (Republic of Korea and Taiwan Province of China). However, these strategies were being modified because competitiveness policies now promoted both internal and external drivers (i.e. FDI and support to local enterprises).

28. The factors that contributed to the East Asian success story included good governance, with long-term vision and commitment, selective industrial policies and good luck. It was observed that East Asian tigers had succeeded in getting ahead because they had built local capabilities and were able to use existing technologies effectively. Again, different strategies had been used: some had used FDI to build local capabilities, while others had protected domestic industry to do so. Building local capacity entailed not just educating workers, but also investing in R&D. In summary, it seemed that the East Asian economies were able to deliver on macroeconomic fundamentals as well as focus on microeconomic improvements to build up their competitive advantages.

29. The challenge facing the experts was to identify which policies were replicable and whether they would have the same effect under changing economic conditions (such as the end of the semi-conductor boom, the emergence of China, WTO requirements, etc). In particular, the rest of the developing world lacks some of the critical resources, for example skilled manpower and FDI flows. In addition, few developing countries are mounting the local technological effort needed to upgrade their technological capabilities. This makes it difficult for them to plug into global supply chains, as did the East Asian tigers. The panellist

also noted the difference in the composition of FDI that went to the East Asian tigers and that which went to the rest of the developing world. FDI flowing to East Asia went to the manufacturing sector, whereas for many other developing countries it went largely to the primary and tertiary sectors. This type of investment has fewer spillover effects in terms of technology development or diversifying the economy. Thus, FDI-targeting policies are critical and one of the few tools of industrial policy left under the WTO requirements.

30. The resource persons and experts spoke at length of the challenge posed by China and its ability to attract vast amounts of FDI. One argued that China is in a class of its own, combining elements of each of three strategies as well as its own unique characteristics, such as low wages and a “reserve army” of labour, highly productive labour, a massive local market, and so forth. The Chinese Government has used its advantages very efficiently to increase export competitiveness and upgrade technology, thus posing a serious competitive challenge to other developing countries in the region. There was a chance that China would also take over the most dynamic sectors of the global market. Given the challenge that China posed, developing countries needed to upgrade faster, to identify their market niches and to create incentive schemes that would enable foreign and local enterprises to fill those niches. Good governance and the ability of the Government to respond and to implement the right type of policies to catalyse the private sector were the critical factor in this regard. Another resource person noted that this was not a one-time push but a continuing process of designing catching-up policies to enhance firm-level competitiveness. The Asian countries had followed an aggregate productivity approach prioritizing three types of inputs: skilled labour, infrastructure and technology absorption.

31. East Asia could continue to meet the global challenges through improvements in good governance and the development of domestic and regional long-term finance for investment. It was noted that the growth of the private sector reduces the role of the public sector without counterproductive privatization shocks. A resource person suggested that countries can still engage in selective industrial policies, such as targeting certain kinds of FDI, supporting local SMEs and subsidizing R&D. These were still allowable under WTO rules. He also indicated areas for future public–private partnerships particularly in ICT infrastructure, business linkages and mobilization of savings for investment.

4. Drivers of technology development: Africa and Latin America

32. A second panel compared the experiences of Africa and Latin America in climbing the technology ladder. Two case studies were presented – for Mauritius and the United Republic of Tanzania – and an update was given on Brazil’s new policy towards science and technology. The expert from Mauritius drew attention to the limitations of the Asian model for Africa and suggested that Mauritius’ experience was more relevant for African countries. The key drivers for advancing technological capabilities in Mauritius included solid institutional support, long-term investments in training and human resources, national commitment to technology development based on FDI, wise imitation and original design and manufacture (ODM). Strategic private–public partnerships were essential in promoting technology. He suggested that policies for technological upgrading in Africa should involve a

resource-sharing approach, and he illustrated this approach with Mauritius' successful experience of technology diffusion schemes, technology incubators and clustering (in particular in agro-industry, ICT, textiles and footwear) for technological upgrading for SMEs. He recommended national partnerships, "liberalization plus" and clusters as means of promoting technology development. Finally, he highlighted the challenge posed by China to African countries' trade, especially in the textile and apparel trade.

33. A resource person presented the case of the United Republic of Tanzania, another African country whose industrial performance has been disappointing. Although the country had achieved macro-stability (as dictated by the World Bank), private sector development had not followed. Manufacturing value-added was only 7.5 per cent in 2000. The expert noted that although the United Republic of Tanzania had had significant industrial growth rates during the second half of the 1990s, its industrial base remains very low. The manufacturing sector has not been able to increase employment, and wages in manufacturing remain very low. The resource person gave four economic reasons for the United Republic of Tanzania's poor industrial performance:

- The country's private sector does not have the capabilities (i.e. skills and technology) to take advantage of sectors of comparative advantage (e.g. agro-processing industries). The evidence is that the sector's inability to transform agricultural inputs into basic agro-processed products has led to post-harvest losses of around 25 to 40 per cent in the fruit and fish industries. Moreover, the United Republic of Tanzania has a positive trade balance in unprocessed food exports and a negative trade balance in processed food exports.
- Trade liberalization and regional integration have not triggered industrial growth. Trade agreements have reinforced the United Republic of Tanzania's role as an exporter of primary and very low value-added manufactures. This is more significant in the Southern African Development Corporation, given the differences in the sophistication and maturity of members' manufacturing sectors.
- The United Republic of Tanzania's manufacturing has not plugged into global production systems, and is therefore not benefiting from the transfer of technology. FDI inflows remain very low (\$193 million in 2000) and most of them have not gone into manufacturing.
- The country lacks the dynamic technology-based SMEs that undertake innovation and demand highly qualified staff. It has few growth-oriented SMEs (which are often run by non-Africans) and many survivalist microenterprises.

34. The resource person also emphasized the importance of defining the country's industrial vision (short-, medium- and long-term goals) on the basis of a thorough industrial assessment using benchmarking exercises to find major bottlenecks in industrial activity; find competitive strengths to be exploited (e.g. low wages, high skill level); and identify sectors with growth potential ("picking winners"). This can help developing countries define the kind of technology and skills to be developed, and FDI to be attracted. Thus, capability building is faster and more cost-effective.

35. A resource person outlined the new approach that Brazil is applying to science and technology policies to ensure that they contribute to social development, poverty reduction, social inclusion, wealth creation and distribution. Although Brazil has strong traditions in academic and scientific research, it is generally the largest Brazilian companies, the TNCs and the developed countries that benefit from this research. Local enterprises had generally not been able to invest in R&D and had usually purchased technology from abroad. The main thrust of the new science and technology policies involves decentralization of federal funding, so that investments may be directed to areas that were previously outside the R&D system; the popularization of science, so that it acquires political significance and social relevance to all segments of society; strengthening science teaching in schools; and creation of local productive chains with a technology focus through “regional productive arrangements”. The resource person emphasized the importance of a stable macroeconomic environment and reasonable interest rates in promoting investments in technology. International regulatory frameworks also need to allow flexibility in designing national strategies. Lastly, the resource person noted that Brazil remains firmly committed to the Doha trade round, particularly as a means of promoting liberalization in sectors in which developing countries have greater competitive advantages.

36. Another resource person described how clusters and value chains can be used to upgrade SMEs in Latin America. He defined clusters as spatial concentrations of specialized firms benefiting from collective efficiency, external economies and joint actions. Some clusters had also managed to enter global value chains and thus engage in both horizontal and vertical networking. He defined upgrading as innovation to increase value added in the value chain (applicable to processes, products and functions or between sectors). He described case studies for different types of clusters in several Latin American countries. From the case studies he concluded that collective efficiency and partnerships may enhance the upgrading of SMEs. He identified policy implications of promoting linkages between firms and strengthening the local position within value chains. Some TNCs, he observed, were less interested in fostering learning and transferring technology or knowledge to SME partners. In all sectors, but especially in traditional manufacturing, it was essential to ensure consistency between micro-support policies and the overall macroeconomic framework since macroeconomic instability could reverse micro successes.

5. Entrepreneurship and competitiveness

37. A third panel examined the interrelationships between entrepreneurial activity, economic growth and competitiveness. The starting point was the Global Entrepreneurship Monitor (GEM), a survey of entrepreneurial activity in 37 countries. One objective of the survey was to explore the relationship between entrepreneurial activity and growth and, if there was a positive relationship, to identify policies that could be used to stimulate entrepreneurial activity. There was an overwhelmingly positive correlation between the two. All countries with high entrepreneurial activity enjoyed growth. The highest rates were found in the Asian developing countries and Latin America, whereas the lowest rates were in the mature Asian countries and countries in transition. The results were explained by the fact that entrepreneurs can be divided into necessity entrepreneurs (those that have no other option)

and opportunity entrepreneurs (those that perceive a business opportunity and elect to start a business). What this means for policy makers is that they must design policies for both types of entrepreneurs.

38. The panel examined a subset of entrepreneurs – those with high potential who have the best chances of providing more jobs, exports and new market niches. It was noted that high-potential new ventures were both important and relatively rare. For example, in Finland 1 per cent of the high-growth firms contributed 35 per cent of employment growth and 44 per cent of sales growth among Finnish “gazelles” (high-growth ventures). The GEM survey found that only 10 per cent of start-up attempts aim to grow to a size of 19 employees or more in five years’ time. Also, they intend to export and to use a new technology. High-potential entrepreneurs are found mostly in Europe, in the so-called former British affiliates (Australia, Canada, New Zealand, South Africa and United States of America) and in Asian developing countries. High-potential start-up activity is positively correlated with indices of international competitiveness. The good news is that this high-potential activity appears to respond to policy, and thus national entrepreneurship policies need to be differentiated according to policy objectives such as export competitiveness. Policies must be selective and the incentives must be right.

39. The interregional adviser for enterprise development presented UNCTAD’s programme for high-potential entrepreneurs. It offers them a one-stop shop for business services and access to financial services. It is highly selective and out of 250,000 applicants only 60,000 have been accepted for training. The basic training develops the most important entrepreneurial characteristics, since entrepreneurs can be trained. It supports another finding from the GEM research, namely that entrepreneurs need assistance to identify and deal with business opportunities.

6. Policy options for competitiveness and their consistency with international commitments

40. The experts’ discussions concluded with consideration of the coherence between national strategies for technology development and international commitments. One expert noted that the focus of competitiveness policies is on technology capacity building. FDI can play a role in this context, and it is important for countries to start attracting knowledge-intensive FDI rather than just capital-intensive FDI. The evidence is clear that much of the learning from FDI that has benefited host economies comes from operational activities, training, and modifications and adaptations of plant and equipment. Targeting the right FDI is thus essential for developing economies.

41. The expert added that the role of government in strengthening local and national innovation systems should go beyond the provision of basic infrastructure. Government support should also take the form of financial incentives and subsidies, including measures for building partnerships among those engaged in R&D, including universities, institutes and enterprises.

42. Another expert described the importance of public–private partnerships in national systems of innovation. He emphasized that after the cold war private sector R&D expenditure took off and now exceeds that financed by Governments. Previously, most technology breakthroughs had originated in the defence sector. Now there was a reversal and most breakthroughs originated in the private sector. The current R&D portfolio has also shifted from sectors such as electrical and mechanical engineering, geological sciences, physics and chemistry to computer, medical and biological sciences. The expert stated that, properly constructed, operated and evaluated, partnerships can provide an effective means of accelerating commercialization and bringing products from the laboratory to the market.

43. A representative of the WTO considered the implications of WTO rules for the technology policies identified by the experts. What emerged was that very few of the policies were completely immune to the risk of countervailing measures, especially if they were specific and resulted in increased exports that affected someone else's market. However, the possibility of another country bringing a case to the WTO was uncertain, since it might be difficult to demonstrate that a subsidy had caused damage to an industry in another country. The case was more clear-cut for export subsidies and local content rules that were clearly prohibited by the Agreement on Subsidies and Countervailing Measures. However, export promotion subsidies were allowable for the lowest-income countries. Also, horizontal subsidies targeted to SMEs were generally allowable for all countries under the agreement. He also noted that other WTO agreements, especially the Agreement on Trade-Related Investment Measures, were relevant to technology and FDI policies.

44. Proposals for modifying certain WTO rules are being tabled in preparation for the Cancún Ministerial Conference. There are a number of things that developing countries can do to build competitiveness. In Doha it was agreed that it was necessary to improve and clarify the Agreement on Subsidies and Countervailing Measures. There is thus a golden opportunity to introduce new proposals that would enable developing countries to pursue national strategies for competitiveness. So far, the overwhelming majority of proposals have been submitted by countries belonging to the Organisation for Economic Co-operation and Development. Developing countries, on the other hand, have made very few proposals and now risk losing the opportunity to submit proposals that would secure their national policy space. A notable exception is a proposal by Cuba and Venezuela to reintroduce the category of non-actionable subsidies into the ASCM (applying only to developing countries) and to expand it to include subsidies for product diversification.

Chapter II

ORGANIZATIONAL MATTERS

A. Convening of the Expert Meeting

45. The Expert Meeting on Policies and Programmes for Technology Development and Mastery, including the Role of FDI was held at the Palais des Nations, Geneva, from 16 to 18 July 2003.

B. Election of officers

(Agenda item 1)

46. At its opening meeting, the Expert Meeting elected the following officers to serve on its bureau:

Chairperson:	Mr. Vasan Appanah (Mauritius)
Vice-Chairperson-cum-Rapporteur:	Mr. Paul Reynolds (United States of America)

C. Adoption of the agenda and organization of work

(Agenda item 2)

47. At the same meeting, the Expert Meeting adopted the provisional agenda circulated in document TD/B/COM.3/EM.18/1. The agenda for the Meeting was thus as follows:

1. Election of officers
2. Adoption of the agenda and organization of work
3. Policies and programmes for technology development and mastery, including the role of FDI
4. Adoption of the report of the Meeting

D. Documentation

48. For its consideration of the substantive agenda item, the Expert Meeting had before it a note by the UNCTAD secretariat entitled "Policies and programmes for technology development and mastery, including the role of FDI" (TD/B/COM.3/EM.18/2).

E. Adoption of the report of the Meeting

(Agenda item 4)

49. At its closing meeting, the Expert Meeting authorized the Rapporteur to prepare the final report of the Meeting under the authority of the Chairperson.

Annex

ATTENDANCE *

1. Experts from the following States members of UNCTAD attended the Meeting:

Angola	Mauritius
Bangladesh	Mexico
Barbados	Mozambique
Cameroon	Netherlands
China	Panama
Cuba	Russian Federation
Ecuador	Serbia and Montenegro
France	South Africa
Ghana	Switzerland
Indonesia	Syrian Arab Republic
Jordan	Trinidad and Tobago
Lebanon	Turkey
Madagascar	Venezuela
Malaysia	Zambia

2. The following intergovernmental organizations were represented at the Meeting:

African, Caribbean and Pacific Group of States
Asian-African Legal Consultative Committee
European Commission

3. The following United Nations agency was represented at the Meeting:

United Nations Economic Commission for Europe

4. The following specialized agency and related organization were represented at the Meeting:

United Nations Industrial Development Organization
World Trade Organization

5. The following non-governmental organizations were represented at the Meeting:

General Category

* For the list of participants, see TD/B/COM.3/EM.18/INF.1.

International Confederation of Free Trade Unions
International Council of Environmental Law
World Federation of Trade Unions

6. The following special invitees attended the Meeting:

Mrs. Simona Morachioli, Istituto per la Promozione Industriale, Rome, Italy
Mr. Xavier Petit, University of Lyon, Lyon, France
M. Yves Regez, Ingénieurs du monde, Lausanne, Suisse
M. Léon-Augustin Tassi, Chef de service, Direction de la promotion commerciale du développement industriel et commercial, Yaoundé, Cameroun
Mme Claire Thuadet, Direction des Nations Unies, Sous-direction des Affaires économiques, Ministère des affaires étrangères, Paris, France
Mr. Laszlo Zila, SME Promotion Department, Ministry of Economy and Transport, Budapest, Hungary

7. The following resource persons attended the Meeting:

Mr. Guilherme de Aguiar Patriota, Head, Science and Technology Division, Ministry of External Relations, Brasilia, Brazil
Mr. Manuel Albaladejo, Queen Elizabeth House, University of Oxford, United Kingdom
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