

**Economic and Social Council**

Distr.: General  
2 September 2015

Original: English

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**Economic and Social Commission for Asia and the Pacific**  
Committee on Trade and Investment**Fourth session**

Bangkok, 4-6 November 2015

Item 6 (a) of the provisional agenda\*

**Reports on activities of the regional institutions:****Asian and Pacific Centre for Transfer of Technology****Report on activities of the Asian and Pacific Centre for  
Transfer of Technology****Note by the secretariat***Summary*

The work of the secretariat in trade and investment is closely linked to and supported by the work of two regional institutions, namely the Asian and Pacific Centre for Transfer of Technology and the Centre for Sustainable Agricultural Mechanization. The present document contains a review of the activities and outputs of the former during the period 2013-2015 and highlights of future areas of work developed in response to requests from the member countries of the region that actively contribute to the Centre's vision. Currently, the activities of the Centre are broadly organized under three thematic areas: science, technology and innovation; technology transfer; and technology intelligence. Under these thematic areas, the Centre's activities are directed towards the following: building capacity for technology transfer of small and medium-sized enterprises; strengthening national innovation systems; developing institutional cooperation mechanisms for promoting renewable energy technologies; facilitating knowledge transfer on sustainable agricultural technologies and improved market linkages; increasing capacity for managing research and development activities of research institutions in new and emerging areas of technology, such as nanotechnology; and enhancing technology intelligence of stakeholders through the provision of technology information services and research and analytical work.

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\* E/ESCAP/CTI(4)/L.1.

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## I. Introduction

1. Since its inception in 1977, the Asian and Pacific Centre for Transfer of Technology has been committed to and provided services towards building technological capacity of countries in the Asia-Pacific region. The Centre has continued to assist member States by focusing on promoting national innovation systems, technology transfer support services for small and medium-sized enterprises, promoting critical emerging technologies, such as renewable energy technologies and nanotechnology, and providing technology intelligence to help member States address the challenges of today's dynamic business and technological setting. Under these areas, the Centre implemented a range of programmes of immediate relevance to the region during the period 2013-2015, including 34 capacity-building activities involving 16 member countries, namely Afghanistan, Bangladesh, Bhutan, Cambodia, China, India, Indonesia, the Islamic Republic of Iran, the Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka and Thailand. The activities, which were delivered with the involvement of 25 partner institutions, focused on a number of themes, including: promotion of national innovation systems; development of national science, technology and innovation (STI) strategies and initiatives for strengthening the enabling environment, including an innovation ecosystem for sustainable energy options; technology transfer support services for small and medium-sized enterprises; promotion of innovation systems for critical emerging technologies, such as renewable energy technologies and nanotechnology; promotion of sustainable agricultural technologies and improved market linkages; and provision of technology intelligence through normative and analytical studies, dissemination of technological information, networking and sharing of experiences relating to the management of technology.

2. The Centre has also been focusing on building and strengthening capacities of least developed countries, landlocked developing countries and small island developing States in Asia and the Pacific through South-South cooperation in close partnership with technologically and economically more advanced countries in the region. Among the least developed countries that benefited from the Centre's capacity-building activities were Afghanistan, Bangladesh, Bhutan, Cambodia, the Lao People's Democratic Republic and Nepal.

## **II. Activities during the period 2013-2015**

### **A. Fostering a science, technology and innovation enabling environment and systems of innovation for sustainable development**

3. The post-2015 development agenda being debated by the Member States of the United Nations is focusing on the promotion and balanced integration of the economic, social and environmental dimensions of sustainable development for present and future generations. Goal 9 of the draft post-2015 sustainable development goals is to “build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”. This overlaps with the Centre’s strategic area of STI for sustainable development with a special emphasis on national technology innovation systems at various levels. Specifically, the proposed goal 17 is to “strengthen the means of implementation and revitalize the global partnership for sustainable development”. One of the targets for that goal is to enhance North-South cooperation, South-South cooperation and triangular regional and international cooperation on and access to STI, and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism when agreed upon, while another one is to fully operationalize the technology bank and STI capacity-building mechanism for least developed countries by 2017. The Centre is, therefore, poised to play a key role in promoting and strengthening STI for sustainable development in the Asia-Pacific countries with special emphasis on South-South cooperation. The STI capacity-building activities of the Centre targets key actors of technology innovation — Government, industries, research and development (R&D) institutions and academia — that would enable them to develop their own holistic approach towards achieving their STI-based national sustainable development goals.

4. The Centre organized 17 capacity-building activities centred on the following areas: national innovation systems; STI strategy development; nanotechnology R&D management; and strengthening of a sustainable enabling environment for energy. Through these activities, more than 950 senior policymakers, R&D institutions, academia and other relevant stakeholders shared knowledge and lessons learned, which enhanced their capacity in various domains of STI.

#### **1. Strengthening of national innovation systems in the Asia-Pacific region**

5. The national innovation systems programme of the Centre was launched in 2005 with support from the Department of Scientific and Industrial Research of the Ministry of Science and Technology, India. The Centre is implementing phase II of the project, which was launched in 2010, to promote national innovation systems in Asia and the Pacific. The project aims to assist the participating countries in strengthening specific key components of national innovation systems identified by individual participating countries. During this biennium, the Centre assisted countries through capacity-building activities for policymakers, industries, universities, R&D institutions and other relevant stakeholders in the following areas: formulating and implementing strategic policies and programmes; managing technology business incubators; strengthening the enabling environment and strategies for sustainable energy options; promoting technology-based entrepreneurship; and working on new and emerging technologies. A key feature of the second phase is the involvement of several countries with

special needs, namely Afghanistan, Bangladesh, Bhutan, Cambodia, the Lao People's Democratic Republic, Myanmar and Nepal.

6. A brief report of the activities with details of their outreach and outcomes are provided below:

(a) National workshop entitled "Bangladesh Agricultural Technology Innovation System: Opportunities and Challenges", Dhaka, 2-3 September 2014, in cooperation with the Bangladesh Agricultural Research Council under the South-Asia component of the Network for Knowledge Transfer on Sustainable Agricultural Technologies and Improved Market Linkages in South and Southeast Asia (SATNET Asia) project. The activity focused on enhancing the understanding of the current agricultural technology innovation system in Bangladesh among the key actors of the innovation system (Government policymakers, R&D institutions, academia and industries), with an objective to provide specific recommendations for strengthening the system. Participants in the workshop included staff from the Bangladesh Agricultural Research Council, the Bangladesh Agricultural Research Institute and the Ministry of Agriculture, as well as scientists and researchers from agricultural universities in Bangladesh and representatives of not-for-profit organizations involved in the promotion of sustainable agriculture in Bangladesh. During the event, the Centre promoted the concept of technology innovation and elaborated the conceptual framework of the national innovation system and various dimensions and relevance of technology innovation in the agricultural sector. Senior policymakers in Bangladesh enhanced their understanding of the need to strengthen a national agricultural technology innovation system;

(b) ESCAP Consultative Meeting with Chinese Inventors and Technology Stakeholders on Technology Facilitation for Sustainable Development, 20 November 2014 in Kunshan, China. The meeting facilitated discussions involving key representatives of the China Association of Inventions, the Ministry of Science and Technology of China and relevant technology stakeholders. ESCAP officials shared the Commission's vision and mission on technology facilitation in the post-2015 sustainable development agenda, as well as exchanged ideas on developing national/regional STI and technology transfer strategies for technology facilitation. The meeting also explored possibilities of cooperation, partnerships and sharing of resources for supporting technology facilitation programmes/activities of ESCAP;

(c) A meeting of senior policymakers on evidence-based STI approaches to achieve sustainable development, Colombo, 26 November 2014, in conjunction with the annual Governing Council meeting of the Centre and the Asia-Pacific Trade and Investment Week organized by the Trade and Investment Division of ESCAP. During the meeting, senior policymakers from ministries dealing with science and technology from Bangladesh, China, India, Indonesia, the Islamic Republic of Iran, Malaysia, Pakistan, the Philippines, the Republic of Korea, Sri Lanka, Thailand and Viet Nam presented their current approaches to evidence-based STI policy formulation and brainstormed on its importance in achieving the post-2015 sustainable development goals. The meeting, which included a panel discussion on evidence-based STI policymaking and its governance in countries of the Asia-Pacific region, made it possible for the participants to develop the way forward. Participants in this event obtained improved insights into the STI-based approaches of Asia-Pacific countries for achieving their respective national development agenda.

7. Two other activities of note are the following:

(a) Workshop on Technology-based Entrepreneurship Development and Commercialization, Tehran, 27-28 October 2015, to be organized by the Iranian Research Organization for Science and Technology in cooperation with the Centre and the Regional Centre for Science and Technology Transfer of the Indian Ocean Rim Association. Having recognized the contribution of knowledge-based entrepreneurship to employment, growth and sustainable development, the Islamic Republic of Iran is organizing this event with the principal aim to address relevant issues, such as formulation of new business models, practical policies and measures to promote the growth of entrepreneurship by sharing best practices and lessons learned with participating countries. The workshop will also entail looking into conceptions, models and infrastructure for the development of technology-based entrepreneurship;

(b) Asia-Pacific National Innovation Systems Online Resource Centre. This online knowledge platform, set up with the objective to give science, technology and innovation stakeholders the opportunity to share policy approaches and experiences of countries on issues pertaining to strengthening national innovation systems, was updated with outputs and outcomes of the activities under the science, technology and innovation/national innovation system programme area of work of the Centre as of October 2014. Users can view and download presentations made by the national and internal experts and reports of the regional and national workshops, meetings and national innovative systems forums. In addition, sustainable energy strategies and reports on Indonesia and the Lao People's Democratic Republic are now accessible from the Online Resource Centre.

## **2. Development of guidelines on national science, technology and innovation strategies and initiatives for least developed countries**

8. The Asian and Pacific Centre for Transfer of Technology and the Science and Technology Policy Institute of the Republic of Korea have been combining some of their ongoing programme activities to assist the Lao People's Democratic Republic and Nepal in analysing their current STI framework conditions and developing strategies to strengthen their national innovation system enabling environments for STI-based national development. A report on the STI strategies for poverty reduction in the Lao People's Democratic Republic was brought out this year for wider circulation among the STI stakeholders in the country with the aim to catalyse the initiation of steps to implement the strategies. This report will soon be made available at [www.nis.apcctt.org](http://www.nis.apcctt.org).

9. Another activity that contributed to the development of the report is the brainstorming by policymakers in the Lao People's Democratic Republic on STI strategic planning and the development of a road map. The workshop on innovation system diagnosis in the Lao People's Democratic Republic and an action plan for STI was held in Vientiane on 26 and 27 May 2014. The workshop deliberated on the study results of the Centre and the Science and Technology Policy Institute on STI diagnosis and strategy development and various key aspects, such as background and guidelines, STI strategic planning, strategic R&D and priority setting, human resources development programmes, strategic STI governance, and financing of STI strategies, policies and programmes for the Lao People's Democratic Republic. The Centre shared its experiences and the findings of the United Nations Development Account project-led study on the preliminary assessment of the current technology enabling environment and innovation ecosystem with

specific reference to sustainable energy in the Lao People's Democratic Republic. International experts and resource persons from the Republic of Korea and Taiwan Province of China and representatives of key ministries and national institutions of the Lao People's Democratic Republic shared their perspectives of the country's policies and programmes.

### **3. Strengthening enabling environment including innovation eco-system for sustainable energy options**

10. The Centre and the Environment and Development Division of ESCAP, in July 2014, concluded implementation of the United Nations-funded project on affordable and accessible sustainable energy through South-South cooperation. The Centre's activities were focused on assisting Indonesia and the Lao People's Democratic Republic in developing national strategies to strengthen their enabling environment and technology innovation ecosystem. To achieve this, a national assessment framework was developed and used by national consultants of those countries to collect and organize relevant information about the current national conditions pertaining to sustainable energy, a technology-enabling environment and innovation ecosystem, a business-enabling environment and ecosystem, business models for the delivery of technologies that promote sustainable energy, South-South cooperation and case studies. Based on the findings of the assessment and experiences of other countries, draft national strategy reports for Indonesia and the Lao People's Democratic Republic were developed. These reports were reviewed and finalized at national consultative workshops held in both countries.

11. The following is a brief report of the activities pertaining to the above-mentioned project with details on their outreach and outcomes:

(a) Lao People's Democratic Republic National Stakeholders Workshop on Accessible and Affordable Sustainable Energy, Vientiane, 11-12 February 2014, in cooperation with the Department of Technology and Innovation, Ministry of Science and Technology, Lao People's Democratic Republic. Policymakers and experts from ministries and departments of the Government of the Lao People's Democratic Republic and other developing countries shared their experiences in promoting sustainable energy products and services through strengthening the technology enabling environment and technology innovation ecosystem. Discussions were centred on the challenges and opportunities in deploying sustainable energy projects and programmes for the off-grid population in urban and rural areas. Sharing of experiences from other developing countries has helped in setting energy strategies in the Lao People's Democratic Republic;

(b) Sustainable Energy Study Tour of the Senior Policymakers of the Lao People's Democratic Republic was organized during the period 21-28 February 2014 by the Centre in cooperation with national focal points in India, Nepal and Thailand. During this three-country study tour, a series of meetings were organized with policymakers, regulators, sustainable energy businesses and non-governmental organizations along with field visits. Senior policymakers from the Lao People's Democratic Republic were appraised on (a) the role of and need for competitive market and the private sector in delivering sustainable energy products and services; (b) various ways through which Governments can create market demand for the renewable energy products and services by providing tailor-made financial support and incentives to end users and energy service providers; (c) the need to regulate the energy market for the benefit of end users and energy service providers; and (d) the role of non-governmental organizations in delivering the policy

objectives of providing affordable and accessible sustainable energy to off-grid communities with private and Government entities;

(c) Indonesia National Stakeholder Workshop on Accessible and Affordable Sustainable Energy Options, Jakarta, 19-20 March 2014, in cooperation with the Indonesian Institute of Sciences. At this workshop, the national assessment framework on an enabling environment and technology innovation ecosystem was presented followed by a discussion during which developing countries shared their experiences on this aspect and on promoting sustainable energy products and services. The workshop brought together sustainable energy experts, policymakers, business stakeholders and community representatives from China, India and Indonesia and drew upon the examples of an enabling environment for promoting various sustainable energy options being explored in different countries;

(d) A consultative workshop on the Indonesia national strategy to increase affordability of sustainable energy options, Jakarta, 12-13 May 2014, in collaboration with the Indonesian Institute of Sciences. The key findings of an assessment of the national sustainable energy-enabling environment and technology innovation ecosystem of Indonesia were discussed and the draft national strategy report of Indonesia was the topic of a brainstorming session involving the participants. Senior policymakers of Brazil, Malaysia and the Philippines shared their experiences about their policy approaches and business models for delivering affordable sustainable energy options. During the workshop, several recommendations were suggested. One of them was to create a committee on renewable energy chaired and coordinated by the National Energy Council to improve coordination among various government ministries and departments;

(e) Consultative workshop organized to help the Lao People's Democratic Republic develop a national strategy to make sustainable energy options more affordable, Vientiane, 15-16 May 2014, in cooperation with the Department of Technology and Innovation, Ministry of Science and Technology, Lao People's Democratic Republic. At this workshop, key findings of the assessment of the country's sustainable energy-enabling environment and technology innovation ecosystem were presented and a draft national strategy report for the development and promotion of sustainable energy options was discussed. Senior policymakers from Afghanistan, India and Nepal shared their national approaches to enhance affordability and accessibility to sustainable energy options, while the International Renewable Energy Agency shared information on their programmes and the assistance they had extended to countries in promoting sustainable energy options. Participants from the Lao People's Democratic Republic increased their knowledge on the policy approaches of developing countries and the support mechanisms and successful business models for delivering affordable sustainable energy options;

(f) ESCAP Knowledge Dissemination Workshop on sustainable energy options, Bangkok, 24-26 June 2014. The participants included project partners, policymakers from target countries and national experts on the three components of the project – technology and innovation ecosystem (the Centre's component), Pacific Regional Data Repository and affordable and resource efficient housing concepts (ESCAP components). The workshop facilitated discussions and peer exchanges, which enhanced understanding and linkages among the three components of the project, assessed the potential outcome of the project and possible impacts and identified potential areas of cooperation and actions for implementing the strategy papers. At the end of workshop, a consolidated list of learning points and recommendations was made for future programming and policy development to make sustainable energy more affordable. On the third day of the workshop,

participants visited Bangchak Solar and Bangchak Biofuel of the Bangchak Petroleum Public Company Limited as recommended by the Ministry of Energy, Thailand and the Sang San Klong Rangsit community in Rangsit, Pathumthani, Thailand.

#### 4. Promoting innovation systems for new and emerging technologies

12. The Centre implemented activities aimed at strengthening nanotechnology R&D management capacity of relevant stakeholders, such as policymakers, R&D institutions, researchers and small and medium-size enterprises, in member States of ESCAP. Under this programme, relevant knowledge, experiences and best practices were shared among stakeholders to enhance their R&D management capacity and market competitiveness in the area of nanotechnology-based value added products development and commercialization. During the reporting period, the Centre organized two regional and four national capacity-building activities, which benefited more than 500 professionals, including 254 women, representing a wide range of organizations, such as Government ministries and departments, R&D institutions and small and medium-sized enterprises. The activities and their outputs are presented below:

(a) Established online Asia-Pacific Nanotechnology R&D Management Network (<http://nanotech.apcct.org>) to disseminate programme outputs, relevant information and promote regional networking;

(b) Finalized and disseminated (through the above-mentioned website and capacity-building workshops) the *Manual on Critical Issues in Nanotechnology R&D Management: An Asia-Pacific Perspective* to help regional stakeholders in the area of nanotechnology. The manual addresses various issues, namely (a) nanosafety, standardization, and certification, (b) protection and valuation of intellectual property (IP) and (c) the commercialization of R&D results;

(c) Nano Malaysia 2013 – Convention and Expo and National Workshop on Strengthening R&D Management Capacity of Researchers and Research Managers in the Area of Nanotechnology, Malacca, Malaysia, 10-13 December 2013, in cooperation with the National Nanotechnology Directorate, Ministry of Science, Technology and Innovation, Malaysia. Eleven international resource persons from India, Indonesia, Pakistan, the Philippines, the Republic of Korea and Thailand and 19 Malaysian experts shared their knowledge, experiences and good practices at the workshop. About 160 participants, including researchers, research managers, technology licensing officials of universities and R&D institutes and representatives from the private sector were trained on: nanosafety, standardization and certification; protection and valuation of intellectual property; and commercialization of R&D results;

(d) Expert Group Meeting on Testing, Standardization and Certification of Nanomaterials and Nanoproducts, Manila, 23 July 2014, organized in partnership with the Technology Application and Promotion Institute, Department of Science and Technology, Philippines. Twelve experts from nine member States, namely India, Indonesia, the Islamic Republic of Iran, Malaysia, Pakistan, the Philippines, the Republic of Korea, Sri Lanka and Thailand, shared country experiences and good practices regarding testing and the certification of nanomaterials and nanoproducts, and deliberated on critical issues and gaps in regulatory and institutional support frameworks, challenges in development and adoption of standards, characterization, testing, evaluation, labelling and certification procedures of nanomaterials and products. Key recommendations included the following: extend assistance to member States in developing nanosafety road maps;



facilitate a regional initiative on a nanotoxicity evaluation/assessment; source, compile and disseminate information on policy, regulatory and institutional support frameworks; and develop a directory/database of analytical tools;

(e) Workshop on Strengthening R&D Management Capacity of Researchers and Research Managers in the Area of Nanotechnology, Tehran, 25-26 February 2014, organized in cooperation with the Iranian Research Organization for Science and Technology. The Centre helped to strengthen R&D management capacity of nanotechnology stakeholders of the Islamic Republic of Iran through this workshop, which was attended by 117 target participants from ministries, departments, R&D institutes, universities and industries of the Islamic Republic of Iran. Eight international resource persons, from India, Pakistan, the Republic of Korea, Singapore and Thailand, and five experts from the Islamic Republic of Iran shared knowledge, experiences, case studies and good practices during the workshop. The participants enhanced their knowledge and understanding on: nanosafety, standardization, and certification; protection and valuation of intellectual property; and commercialization of research results;

(f) Stakeholder Workshop on Critical Aspects of Nanotechnology R&D Management, Manila, 24-25 July 2014, organized in partnership with the Technology Application and Promotion Institute, Department of Science and Technology, Philippines. Various Government and private sector agencies strengthened their understanding and knowledge on nanotechnology R&D management through the workshop, which was attended by 11 international experts from nine countries, namely India, Indonesia, the Islamic Republic of Iran, Malaysia, Pakistan, the Republic of Korea, Sri Lanka and Thailand, two experts from the Philippines and 37 target participants. The participants gained knowledge on nanosafety, testing, standardization and certification of nanomaterials and nanoproducts. A key workshop recommendation for the Centre was to assist member States in developing and drafting policy guidelines and strategies for innovating and commercializing nanotech-based products;

(g) Regional Open Innovation Forum on Promoting Nanotechnology and Agriculture for Sustainable Development, Shah Alam, Malaysia, 27-28 October 2014, organized in cooperation with the National Nanotechnology Directorate, Ministry of Science, Technology and Innovation, Malaysia. The Forum increased the understanding of stakeholders on the open innovation approach and how it could be applied to accelerate innovation in nanotechnology and sustainable agriculture. The participants included more than 100 stakeholders in nanotechnology and sustainable agriculture from Malaysia and 12 sectorial experts from eight member States, namely Japan, Malaysia, India, Indonesia, the Philippines, Singapore, Sri Lanka and Thailand. Key recommendations included: assist member States in enhancing capacity in intellectual property evaluation and technology valuation and evaluate the market-readiness level of technologies; enhance knowledge/capacity to develop and access knowledge management tools; and sensitize Governments to adopt an open innovation approach in their STI policies;

(h) National Workshop on Nanosafety and Regulatory Aspects of Nanotechnology, Shah Alam, Malaysia, 29-30 October 2014, organized in cooperation with the National Nanotechnology Directorate and SIRIM BERHAD, Ministry of Science, Technology and Innovation, Malaysia. About 95 Malaysian participants, which included representatives of Government, R&D institutions and the private sector, and three international nanosafety experts, from Singapore and Thailand, deliberated on international best practices of nanosafety regulatory frameworks. The workshop discussed

possible approaches and strategies to develop a national nanosafety road map for Malaysia.

## **B. Technology transfer through regional and subregional networking**

### **1. Sustainable agriculture**

13. Under the sustainable agriculture programme of work, the Centre co-implemented a European Union-funded project entitled “Network for Knowledge Transfer on Sustainable Agricultural Technologies and Improved Market Linkages in South and Southeast Asia (SATNET Asia)” in partnership with the Centre for Alleviation of Poverty through Sustainable Agriculture and the Trade and Investment Division. The Centre trained more than 700 participants, including representatives of agricultural research institutions and farmer federations, agribusiness professionals and government officials, policymakers and agricultural extension workers from six South Asian countries, namely, Afghanistan, Bangladesh, Bhutan, India, Nepal and Pakistan. Through a capacity-building programme for officials of the National Plant Protection Centre of Bhutan, the Centre established the first local manufacturing facility for biocontrol agents in the country to assist the Government in achieving the goals set under its organic agriculture road map. In addition, the Centre helped 3,000 smallholder farmers in South India export bananas to China, the Islamic Republic of Iran and Malaysia through a capacity-building programme on electronic traceability for agricultural trade facilitation. During the reporting period, the Centre organized the following events under this project:

(a) National Training Programme on Cost-Benefit Analysis of Agricultural Technologies, Thimphu, 25-27 November 2013, organized with the Council for Renewable Natural Resources Research and the Ministry of Agriculture and Forests of Bhutan;

(b) SATNET Asia Workshop — Stress-tolerant Technologies: Using Livelihood and Productivity Enhancing Approaches for Smallholder Farmers, Patna, India, 5-7 December 2013, organized jointly with Catholic Relief Services;

(c) SATNET Asia National Training Programme on Biological Controls of Pests and Diseases of Economically Important Agriculture Crops, Thimphu, 24-25 February 2014, and SATNET Asia Training on Mass Scale Production of Bio-control Agents and Establishing a Bio-control Laboratory, Thimphu, 26-28 February 2014. Both events were organized jointly with the National Plant Protection Centre of the Ministry of Agriculture and Forests, Bhutan;

(d) SATNET Asia National Training Programme on Cost-Benefit Analysis of Agricultural Technologies, Kathmandu, 3-4 March 2014, and SATNET Asia National Training Programme on Biological Control of Agricultural Pests and Diseases, Kathmandu, 5-7 March 2014, Kathmandu. Both events were organized jointly with the Nepal Agricultural Research Council of the Ministry of Agriculture;

(e) SATNET Asia National Training Programme on Cost-Benefit Analysis of Agricultural Technologies, Islamabad, 17-18 March 2014, and SATNET Asia National Training Programme on Biological Control of Agricultural Pests and Diseases, Islamabad, 19-21 March 2014. Both events were organized in cooperation with the Pakistan Agricultural Research Council of the Ministry of National Food Security and Research;

(f) SATNET Asia National Training Programme on Best Practices in Integrated Nutrient Management and Organic Farming (Jeevatu Technology), Kathmandu, 23-25 April 2014, organized in cooperation with Nepalese Farming Institute;

(g) SATNET Asia National Training Programme on Food Safety and Quality Assurance for Agricultural Trade Facilitation, Dhaka, 1-2 June 2014, and SATNET Asia National Training Programme on Biological Control of Agricultural Pests and Diseases, Dhaka, 3-5 June 2014. Both events were organized in cooperation with the Bangladesh Agricultural Research Council;

(h) SATNET Asia National Training Programme on Post-harvest Technologies for Increasing Shelf Life of Agricultural Products, Pondicherry, India, 18-20 June 2014, organized in cooperation with the Department of Food Science and Technology, Pondicherry University, India;

(i) SATNET Asia National Training Programme on Strengthening Market Linkages and Enhancing Trade Facilitation for Value Chain Actors in Small-Scale Food and Agro-Processing Sectors, Anand, India, 29-31 July 2014, organized in cooperation with the Institute of Rural Management, Anand, India;

(j) SATNET Asia National Programme on Bangladesh Agricultural Technology Innovation System — Opportunities and Challenges, Dhaka, 2-3 September 2014, organized in cooperation with the Bangladesh Agricultural Research Council;

(k) SATNET Asia Regional Training Programme on Postharvest Management and Market Linking for Vegetables and Fruits in South Asia, Hyderabad, India, 26-28 November 2014, organized in cooperation with the World Vegetable Center South Asia in Hyderabad.

14. The Asian and Pacific Centre for Transfer of Technology is implementing a project entitled “An Integrated Rural Economic and Social Development Programme for Livelihoods Improvement in the Dry Zone of Myanmar” in partnership with the Centre for Alleviation of Poverty through Sustainable Agriculture and the Centre for Sustainable Agricultural Mechanization. The project, which is being funded through the Livelihoods and Food Security Trust Fund (LIFT), supports integrated socioeconomic development in the Myanmar dry zone in the context of inclusive and sustainable development with special emphasis on livelihoods improvement and food security. The Centre is working towards strengthening the capacities of key stakeholders in the transfer of improved and environmentally sound technologies for small and medium-sized enterprises to improve the livelihoods and food security aspects of the people in the dry zone. The project activities comprise a range of analytical and capacity-building interventions and development of case studies, policy papers and policy briefs. During the reporting period, the Centre organized and participated in the following activities pertaining to the project:

(a) Inception workshop, Yangon, Myanmar, 5 May 2015. During this event, current and potential partners and project participants expressed their views on the project implementation strategy and workplan, discussed mechanisms for knowledge-sharing and collaboration, identified training needs of the development partners and explored opportunities for networking;

(b) Orientation meeting for consultants to be involved in the development of case studies and policy papers for the project. This meeting focused on developing a strategy, workplan and process flow for two case studies related to the development of the seed industry in Myanmar.

15. In addition, the Centre plans to deliver a training programme for key stakeholders in seed industry development in Myanmar during November-December 2015.

## **2. Renewable energy**

16. To support the implementation of ESCAP Commission resolution 64/3 on promoting renewables for energy security and sustainable development in Asia and the Pacific, the Asian and Pacific Centre for Transfer of Technology established the Renewable Energy Cooperation-Network for the Asia Pacific (RECAP). The main focus of this mechanism is to strengthen the capacity of participating member countries in implementing projects related to renewable energy technologies through training, cooperation and the promotion of partnerships among R&D institutions, universities, industries and other stakeholders in the region. The current membership of RECAP includes 16 member States of ESCAP, namely Bangladesh, China, Fiji, India, Indonesia, the Islamic Republic of Iran, Malaysia, Mongolia, Nepal, Pakistan, the Philippines, the Republic of Korea, Sri Lanka, Thailand, Vanuatu and Viet Nam. The Centre has provided training to more than 550 renewable energy professionals from the region on various aspects of renewable energy technology transfer and adoption. A brief summary of the Centre's activities carried out under the RECAP framework during the reporting period is provided below:

(a) Expert Group Meeting on Renewable Energy Resource Assessment for Countries in the Asia-Pacific Region, Bangkok, 25-26 September 2014, in partnership with the International Renewable Energy Agency and the Ministry of Science and Technology, Thailand. Twenty-six experts from 13 member States, namely Afghanistan, Australia, Cambodia, China, Japan, Kazakhstan, India, Indonesia, the Islamic Republic of Iran, Pakistan, Singapore, Thailand and Viet Nam, shared their expertise and gave country perspectives for renewable energy resource assessments. The experts at the meeting identified solar and wind energy as the renewable energy resource of greatest interest for resource assessment. Those two energy sources are of great importance to the energy future of the Asia-Pacific region. Representatives of ASEAN countries indicated a strong willingness to collaborate on mapping biomass resources for energy and other uses. The participants of the meeting also requested that the Centre and the International Renewable Energy Agency work together to develop a work programme for strengthening the capacity of member countries in the Asia-Pacific region on renewable energy resource assessment;

(b) Asia-Pacific Regional Workshop on Biomass Energy Resource Assessment, Bangkok, 6-8 July 2015, in partnership with the International Renewable Energy Agency and the Biomass Open Research Forum: Biomass Resource Assessment for ASEAN+6 Countries, Bangkok, 9-10 July 2015, in partnership with the Ministry of Science and Technology, Thailand. Participants from 15 member States, namely Afghanistan, Australia, Cambodia, China, Japan, India, Indonesia, the Islamic Republic of Iran, Malaysia, Nepal, New Zealand, Pakistan, Sri Lanka, Thailand and Viet Nam, participated in the regional workshop and the open forum. They were provided with hands-on training on various tools and techniques for biomass resource assessments. The open forum facilitated brainstorming on the establishment of the ASEAN network on biomass open research for facilitation of South-South cooperation among member countries in the ASEAN region and beyond with regard to biomass energy development, transfer and adoption.

17. The Centre and the International Renewable Energy Agency, in partnership with the Technology Application and Promotion Institute and the Department of Science and Technology-Region XI of the Philippines is organizing a regional training programme on renewable energy resource assessment and mapping, to be held from 28 to 30 September 2015 in Davao City, Philippines. Solar and wind energy experts and government officials involved in energy planning from seven ASEAN countries, namely Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, the Philippines and Thailand, are expected to participate in this programme. The objective of the programme is to provide a platform for strengthening existing capacities of member countries for identifying and assessing potential solar and wind energy resources and to initiate efforts to fully realize the social, economic and environmental benefits of these resources in countries in South-East Asia.

### 3. Technology transfer services

18. The Asian and Pacific Centre for Transfer of Technology has been engaged in strengthening the technology transfer capacity of key stakeholders in member countries through a wide range of activities, such as organizing training of trainers programmes on planning and managing technology transfer projects, providing technology transfer support services for small and medium-sized enterprises and entrepreneurs, organizing business-to-business meetings in specific sectors in partnership with key central agencies in member countries and technology information services through information portals and technology publications, and the establishment of specialized technology transfer networks in specific sectors. Emphasis is currently being placed on supporting South-South cooperation in new and emerging areas, such as renewable energy, sustainable agriculture and nanotechnology. During the reporting period the following activities were organized:

(a) Training programme on planning and implementing technology transfer projects, Bangkok, 15-17 July 2013, in partnership with King Mongkut University of Technology, Thonburi, Thailand;

(b) Workshop on Transfer of Climate-friendly Technologies, Tokyo, 1-2 September 2013, in partnership with the International Center for Environmental Technology Transfer;

(c) Workshop on skills development for networking and technology transfer for manufacturing sector, New Delhi, 13 January 2014, organized by the Asia and Pacific Centre for Transfer of Technology in partnership with the Federation of Indian Export Organizations;

(d) Workshop on strengthening small and medium-sized enterprises in the manufacturing sector through skill development in networking and technology transfer, New Delhi, 30 January 2015, in partnership with the Federation of Indian Export Organizations.

19. The Centre also began to integrate various stand-alone information technology-based technology databases and tools into its website in order to provide all available technology transfer support services under one platform. As part of this initiative, the technology databases from the Centre's key technology transfer portal, technology4SME.net, are being migrated to its website. The RECAP website is also being integrated with the Centre's website to provide ease of access to users interested in renewable energy technologies and partnerships.

## C. Technology intelligence

20. Over the past three decades, one of the key objectives of the Centre has been to provide technology intelligence to help member States, their policymakers, institutions, academia, technology transfer intermediaries and small and medium-sized enterprises to address the challenges of today's dynamic business and technological setting. In this endeavour, the Centre has continued to publish online periodicals and carry out a combination of normative and analytical studies of regional relevance to identify trends, highlight good policies and practices, and foster regional cooperation. Activities pertaining to technology intelligence during the reporting period can be summarized as follows:

(a) The Centre continued to publish several e-periodicals, namely *Asia-Pacific Tech Monitor* (quarterly) and *Value Added Technology Information Service (VATIS) Update* series on biotechnology, food processing, non-conventional energy (renamed new and renewable energy in January 2015), waste management (all quarterly), and ozone layer protection (bimonthly). It continued to provide free access to the e-periodicals;

(b) The Editorial Advisory Board for the *Asia-Pacific Tech Monitor* comprises 10 international experts who provided useful advice and guidance as and when required;

(c) The Centre published eight issues of *Asia-Pacific Tech Monitor* and 44 issues of *VATIS Update*, which were made available for free on [www.techmonitor.net](http://www.techmonitor.net);

(d) The Centre partnered with prominent institutions to publish two of the *VATIS Update* periodicals. *Ozone Layer Protection* was published with support from the Ozone Cell of the Ministry of Environment, Forest and Climate Change, India. *Biotechnology* was co-published with the Biotech Consortium India Limited, a Government of India undertaking;

(e) The Centre supported the ozone depleting substances phase-out efforts of India under the Montreal Protocol on Substances that Deplete the Ozone Layer through publishing and disseminating about 1,500 printed copies of each issue of *VATIS Update (Ozone Layer Protection)* among stakeholders, including small and medium-sized enterprises, policymakers, intermediary agencies and related stakeholders in India;

(f) The Centre brought out other useful information/knowledge products on themes that are relevant to small and medium-sized enterprises.

21. During the reporting period, the Centre's technology intelligence services resulted in several outputs as noted below:

(a) E-periodicals published by the Centre evolved to focus on current issues while meeting the overarching goal of fostering balanced and environmentally sustainable growth of small and medium-sized enterprises in the Asia-Pacific region. The periodicals disseminated a range of technological information on the latest technological innovations, technology policies, innovation management, technology transfer and events;

(b) *Asia Pacific Tech Monitor* featured articles focusing on eight special themes: leveraging intellectual property to promote innovation by small and medium-sized enterprises (October-December 2013); regional connectivity for shared prosperity (January-March 2014); open innovation system (April-June 2014); strengthening affordable and accessible sustainable energy options (July-September 2014); technology-based rural entrepreneurship incubators (October-December 2014); new and emerging

science, technology and innovation strategies (January-March 2015); renewable/sustainable energy technologies for last mile connectivity (April-June 2015); and smart specialization to enhance national technology competitiveness (July-September 2015);

(c) The eight special issues of *Asia-Pacific Tech Monitor* featured 36 articles contributed by 63 authors/experts from 22 countries, namely Bangladesh, Belgium, China, Fiji, France, Germany, Greece, India, Indonesia, Japan, Malaysia, Nepal, the Philippines, the Republic of Korea, Singapore, Slovenia, Spain, Sri Lanka, Thailand, the Netherlands, the United States of America and Viet Nam;

(d) The special feature articles presented data and analysis with respect to critical issues under various special themes and included several case studies and best practices from within the region and elsewhere;

(e) The 2014 and 2015 January-March special issues of *Asia-Pacific Tech Monitor* focused on issues relevant to the themes of corresponding Commission sessions. The 2014 special issue focused on regional connectivity for shared prosperity – technological challenges and opportunities for Asia-Pacific and new and the 2015 special issue on emerging science, technology and innovation strategies for the post-2015 sustainable development agenda;

(f) *Asia-Pacific Tech Monitor* disseminated information on about 120 of the latest technological innovations from around the world in several new and emerging areas, such as renewable energy technologies, nanotechnology, biotechnology, technologies for rural application and technologies for sustainable development. An almost equal number of technology market-related news items from Asia-Pacific countries were also collected and disseminated through the periodical;

(g) About 80 short articles providing useful how-to guides, best practices and tips for small and medium-sized enterprises were compiled and disseminated through the Business Coach section of *Asia-Pacific Tech Monitor*. The articles were featured under various topics relevant to small and medium-sized enterprises, such as start-up venture creation, venture financing, managing innovation, technology transfer and green productivity;

(h) In *Asia-Pacific Tech Monitor*, about 70 technology offers and 40 technology requests from 12 countries, including, China, Egypt, Ethiopia, France, Hungary, India, Mexico, Pakistan, the Philippines and the United Kingdom of Great Britain and Northern Ireland, were listed;

(i) In the 44 issues of *VATIS Update*, information on more than 1,500 of the latest technological innovations with potential commercial applications and important technological events were featured. The information was sourced from more than 500 information sources (mainly web-based). The key features of the *VATIS Update* series are the packaging of information in a capsule form and the facilitation of direct access to information sources, wherever possible;

(j) The Centre currently has close to 470 subscribers to its web-based periodicals. During the period January to December 2014 alone, 7,217 people visited the techmonitor.net site with 19,502 page views of *Asia-Pacific Tech Monitor* and *VATIS* issues. The Centre has also started to disseminate its e-periodicals through social media platforms, such as Facebook and Twitter.

22. During the reporting period, the following results were achieved under the normative and analytical work of the Centre:

(a) National Assessment Framework on Enabling Environment, Technology Innovation Ecosystem for Making Sustainable Energy Options Affordable and Accessible (for Indonesia and Lao People's Democratic Republic);

(b) Report on the National Assessment of Enabling Environment and Technology Innovation Eco-system for Making Sustainable Energy Option Affordable in Indonesia;

(c) Indonesia National Sustainable Energy Strategy Report on Enabling Environment and Technology Innovation Ecosystem for Affordable Sustainable Energy Options;

(d) Report on the National Assessment Framework of Enabling Environment and Technology Innovation Ecosystem for Making Sustainable Energy Options Affordable and Accessible (Lao People's Democratic Republic);

(e) Lao People's Democratic Republic National Sustainable Energy Strategy Report on Enabling Environment and Technology Innovation Ecosystem for Affordable Sustainable Energy Options;

(f) Policy brief on regional technology transfer for enhancing food security in the Asia-Pacific region.

### III. Future focus areas and programmes

#### 23. Ongoing:

(a) Project on South-South cooperation for STI policies in the Asia-Pacific region, funded by the United Nations Development Account, is being developed by the Trade and Investment Division with assistance from the Centre. The main objective of the project is to strengthen the capacity of selected countries of the Asia-Pacific region to formulate STI policies and strategies to strengthen their national innovations system. This project is scheduled to be implemented by the Trade and Investment Division and the Centre during the period 2016-2019;

(b) The Centre, in 2015, initiated work on its project entitled "An Integrated Rural Economic and Social Development Programme for Livelihoods Improvement in the Dry Zone of Myanmar", which is being funded through the Livelihoods and Food Security Trust Fund. The Centre will be focusing on transfer of improved and environmentally sound technologies for small and medium-sized enterprises to improve the livelihoods and food security aspects of key stakeholders in the dry zone of Myanmar;

(c) The Centre will continue to publish and upgrade the e-periodicals, *Asia-Pacific Tech Monitor* and *VATIS Updates*, in five specific areas namely: biotechnology; waste management; new and renewable energy; food processing; and ozone layer protection. In addition to web-based approaches ([www.techmonitor.net](http://www.techmonitor.net)), these periodicals will also be disseminated widely through social media, such as Facebook and Twitter. The archived information will be used to develop specialist publications and knowledge products in various technological themes of current interest. The outputs will then be disseminated to planners, policymakers, researchers, and managers of technology.

#### 24. New projects/programmes for funding:

(a) A concept note on diagnosis of national innovation systems and development of STI strategies to meet the national and sustainable



development goals. The proposed project will add value to the ongoing national innovation system programme of the Centre, which so far has focused on the concept and key components of a national innovation system. Potential donor agencies and members of ESCAP are being approached to help implement this project, starting in 2016;

(b) Regional and national capacity-building activities in the area of new and emerging technologies. In this endeavour, a new project will focus on South-South cooperation and regional cooperation mechanisms to develop and deploy new and emerging technologies. Funding opportunities will be explored with potential donor agencies;

(c) A project on renewable energy capacity-building activities in the member States in partnership with specialized institutions, such as the International Renewable Energy Agency;

(d) An Asia-Pacific regional project to promote the development, transfer, dissemination and diffusion of environmentally sound technologies to strengthen the means of implementation for sustainable development;

(e) A new capacity-building project focusing on strengthening value chain and market linkages especially on the postharvest processing of fruits and vegetables in South Asia;

(f) A project to institutionalize and establish a network for fostering grassroots technology innovation based enterprise development in rural areas of South Asian countries.

#### IV. Matters calling for the attention of the Committee

25. The Centre invites the Committee to consider the following suggestions and recommendations:

**(a) Enhancement of institutional support.** In order to meet increasing operational costs, the Centre requests the host Government of India to consider enhancing its institutional funding support and member States to augment their contributions in line with the recommended guidelines of \$30,000 for developing countries and \$7,000 for least developed countries. This will allow an expansion of the Centre's human resources and enable the implementation of programmes that deliver on a larger mandate and address comprehensively the regional sustainable development agenda through STI.

**(b) Enhancement of programme funding support.** To strengthen programme delivery and enhance a programme's impact, it is critical that the Centre mobilize resources through project funding to meet regional sustainable development needs of member States. The Centre seeks active cooperation from resourceful member Governments to fund relevant new capacity-building projects proposed by the Centre listed in para. 24 above.

**(c) Assignment of national experts.** It is important that the Centre strengthen its human resources in designing and delivering programmes that are relevant to member States. The Centre seeks active cooperation from member countries to implement suggested options, such as the secondment of experts from member countries on a non-reimbursable loan basis and the placement of experts from the corporate sector on a pro bono basis.