

FINAL

MEETING REPORT

International Consultation Meeting on Transforming TVET for Meeting the Challenges of the Green Economy



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Executive Summary

The International Consultation Meeting on Transforming TVET for meeting the Challenges of the Green Economy was convened as a cooperation program among UNESCO-UNEVOC International Centre for TVET in Bonn, Colombo Plan Staff College for Technician Education (CPSC) and the GIZ -Deutsche Gesellschaft für Internationale Zusammenarbeit -Human Capacity Development in TVET / UNEVOC Centre Magdeburg.

Through the rich exchange of views, perspectives and lessons learnt among 20 countries represented from across five major regions including Europe, the Americas, Asia-Pacific, Africa and the Middle East, the meeting provided a platform to elaborate on key thematic issues including transition to green economy and the role of TVET, emerging green occupations and implications for TVET, international and regional cooperation frameworks and perspectives on transforming TVET for the green economy, and country perspectives on policies, achievements, best practices and challenges in transforming TVET for the green economy.

Discussions were led by the partner organizers the International Labor Organization (ILO), the European Training Foundation (ETF), with substantive input from German agencies including the German Federal Ministry of Education and Research (BMBF), the Federal Ministry for Economic Cooperation and Development (BMZ), and the German National Commission for UNESCO. The meeting was supported locally by the German Association for Water, Wastewater and Waste (DWA) which arranged the study visits to relevant water and waste water treatment facilities and reservoir. Delegates and attendees were from Belarus, Bhutan, Egypt, Fiji, Gambia, Germany, Italy, Rep. of Korea, Malaysia, Maldives, Mexico, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Russian Federation, Saudi Arabia, Sri Lanka and USA.

The meeting provided opportunities for countries to share the various initiatives and best practices undertaken by respective governments to transform institutional structures, formulate policies and implement strategies to address the requirements of the green economy. Where initiatives are lacking, some countries gained insights and valuable perspectives particularly from advanced economies with ongoing initiatives in preparing the workforce for the greening of society and economy. The meeting leveraged on the possible replication of best practices, paradigm shift, and green agenda setting in TVET sector in the context of country needs and resources. Based on other key substantive input drawn from the meeting and study visits, working groups were created to brainstorm and discuss thematic areas in detail guided by questions to identify future actions, strategies and priorities in the context of (1) policy and framework, (2) curriculum and programs, and (3) capacity development through networking.

At the end of the meeting, action points were agreed upon to elevate greening TVET into the mainstream education and training agenda. First, finalize a policy framework that will set in motion the development of a formal guide document to pursue transformations to a greener TVET. Second, continue creating opportunities for developing capacities through the development of toolkits or institutional level frameworks relevant to realize micro-level objectives relevant to greening TVET. Third, continue networking to further promote strategies for greening TVET. At the country level, delegates were encouraged to organize sensitization activities, disseminate ideas on wider scale and echo the substantive input gained from the meeting. Specific recommendations were further put forward in aid of future actions and deliberations suggested to be made at higher level along the lines of making TVET respond to meet the challenges of the green economy.

1. Introduction

1.1 Program Background

The growing significance of sustainability is having major impacts upon business, industry and society as a whole. Many new industries and employment opportunities are being developed, e.g. in ecotourism, environmental monitoring, sustainable community development, eco-design, recycling, alternative energy sources, land rehabilitation, pollution control, waste water treatment and reuse, etc. All require skilled workers who have knowledge of –and commitment to- sustainability, as well as the requisite technical knowledge. This is creating new roles and courses in Technical and Vocational Education and Training (TVET).¹

In recent years, the concept of a “green economy” has become central to the international agenda. It is useful to review and clarify the linkages between a green economy and sustainable development. The concept of a green economy does not replace sustainable development; but there is a growing recognition that achieving sustainability rests almost entirely on getting the economy right.²

There is no universal agreement on the definition of what a green economy entails³.

*The working definition of UNEP describes a “green economy as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. In a green economy, growth in income and employment should be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services”.*⁴

A similar, but broader definition is provided by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), which states that a “green economy can be defined as an economy where economic prosperity can go hand-in-hand with ecological sustainability”⁵.

Notwithstanding the complexity of an overall transition to a green economy, the impetus to moving to green economy varies considerably among nations, as it depends on the specifics of each country’s natural and human capital and in its relative level of development. As demonstrated in the United Nations Human Development Index⁶ there are many opportunities for all countries in such a transition- but at the cost of a large ecological footprint. Others have a very low footprint, but face urgent needs to improve access to basic services such as health, education, and potable water. Hence, the international community needs to understand green economies as sustainable societies, creating a

¹ UNESCO-UNEVOC, Orienting Technical and Vocational Education and Training for Sustainable development

² UNEP, Green Economy – Pathways to Sustainable Development and Poverty Eradication 2011

³ See, e.g., the first intersessional meeting for the United Nations Conference on Sustainable Development (10–11 January), Synthesis report on best practices and lessons learned on the objective and themes of the Conference (A/CONF.216/PC/3) (advance version available from <http://www.uncsd2012.org/files/intersessional/Synthesis-Report-Final.pdf>).

⁴ UNEP, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication — A Synthesis for Policy Makers* (France, 2011), p. 1. Available from http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_synthesis_en.pdf.

⁵ ESCAP, Conceptual Framework of Green Economy and Green Growth, (2011), p.1. Available from http://www.greengrowth.org/capacity_building/National-Seminar/2011/Thailand/Documents/GENERAL/GG-CONCEPT.pdf.

⁶ Global Footprint Network (2010). UNDP (2009)

balance between environmental, societal, cultural and economic considerations in the pursuit of enhanced quality of life.

As nations continue to expend resources and pollute and alter entire eco-systems, the transition to an environmentally sustainable economy is most urgent and will drive in coming years the changes in the mix of skills that countries require for development.

In particular, the joint ILO and UNESCO Recommendations on Technical and Vocational Education for the Twenty-First Century states that, as “a vital aspect of the educational process in all countries” TVET should:

- (a) Contribute to the achievement of the societal goals of greater democratization and social, cultural and economic development, while at the same time developing the potential of all individuals, both men and women, for active participation in the establishment and implementation of these goals, regardless of religion, race and age;
- (b) Lead to an understanding of the scientific and technological aspects of contemporary civilization in such a way that people comprehend their environment and are capable of acting upon it while taking a critical view of the social, political and environmental implications of scientific and technological change;
- (c) Empower people to contribute to environmentally sound sustainable development through their occupations and other areas of their lives.⁷

In this context, Greening TVET ought to open a window to the world and vice versa, e.g. TVET institutions should explore and exchange information about innovative teaching and learning methods, such as programs on renewable energy, clean water and clean technology, reorientation of TVET curricula, sustainable campus management programs and examples of innovative approaches to integrating learning in TVET with on-the-job training and community services aimed at positive societal responses to bring the relevance and emphasis for a sustainable future.

The desirability of moving to a green TVET and the means of doing so is still a work in progress. Some of the initiatives taken by the organizers in the recent past include:

- *The widespread dissemination of the recommendations of the Bonn Declaration (2004) on Learning for Work, Citizenship and Sustainability.*
- *Activities in 2005 to put the Action Plan into operation, including the preparation of a special issue of UNESCO's journal Prospects on TVET and sustainable development and convening the first two of a series of regional dissemination and capacity building conferences on the outcomes of the Seoul+5 conference in October 2004 on Learning for Work, Citizenship and Sustainability in the Asia-Pacific region (in partnership with the CPSC and the Office of the Vocational Education Commission (OVEC) of Thailand and in Oman for the Arab States.*

⁷ UNESCO and ILO (2002) *Technical and Vocational Education for the Twenty-First Century: ILO and UNESCO Recommendations*, UNESCO, Paris and ILO, Geneva, p. 9.

- *Two regional programs in July 2008 and November 2008, one in-country program, December 2010, respectively on TVET for Sustainable Development by CPSC, where key priority areas in TVET in support of Sustainable Development were identified to meet emerging challenges.*⁶
- *UNESCO-UNEVOC, CPSC and GIZ Advocacy for TVET for SD, capacity building in TVET for SD, development of the appropriate curriculum for integrating SD in TVET, learning resource materials development for TVET for SD, public-private-community partnership to enhance SD involvement and compilation of indigenous knowledge. Identifying new kind of approaches and creating new kind of teachers for implementing SD in TVET.*
- *Contribution to the Workshop on Education for Water Sustainability: Where Decades Meet at the UNESCO World Conference on "Education for Sustainable Development-moving into the Second Half of the UN Decade" organized in Bonn, Germany from March 31 to April 2, 2009.*
- *Involvement in the workshop on Green TVET and Education for Sustainable Development: Capacity Development Needs for Water Education organized in Munich, Germany from March September 13-17, 2010.*
- *International Conference on Education for Sustainable Development in TVET, jointly organized by IVETA, InWent, Germany and CPSC from December 3-5, 2010 in Manila, Philippines.*

For the year 2011, the organizers sought to build upon these past and ongoing key initiatives and once again convened an International Consultation Meeting that seeks to motivate policy makers, educators and specialists who are working in the field of TVET for their further commitment to transforming TVET towards a green development path and to increase innovation capacities to take advantage of opportunities arising from a green economy.

The International Consultation Meeting aimed to advance greening TVET through sharing expertise from various perspectives and good practices at country level, and featuring assumptions as to what the green TVET approaches could deliver as a pathway to a green economy. Through working sessions, the meeting identified key areas that may require greater emphasis in the development of greening TVET pathway and related issues and principles that will require further attention.

Through exchange of views, perspectives and lessons learnt, the meeting provided a platform to elaborate on the following themes:

- Transition to green economy and the role of TVET;
- Emerging green occupations and its implication for TVET; and
- Transforming TVET for meeting the challenges of the green society and green economy

1.2 Objectives of the meeting & Expected Outcomes

Objectives:

The meeting offered an opportunity for participants to develop a common understanding of the concept of greening TVET by:

- examining current trends and international discourse on TVET to advance the green economy;
- addressing new and emerging challenges in TVET for meeting the labor market demands;
- comprehending country perspective of good practices in Greening TVET; and
- reviewing capacities in strategic planning at country level and South-South and North-South technical cooperation;

Expected Outcomes

- Assimilated innovative approaches in TVET as to the changing nature of occupations;
- Set of leading practices distilled from the analysis of shared experiences;
- Set of key areas that may require greater emphasis in the development of greening TVET;
- Evidence-based information and guidelines for effective use at the country level;
- Increased awareness of green TVET as resources for supporting the enrichment of sustainability;
- Strengthened stakeholder involvements in TVET to advance the green economy

The outcomes of this meeting will be used to contribute to the development of UNESCO strategy for greening TVET and provide policy recommendations for the advancing of greening TVET.

1.3 Participants & Preparatory Work

Representatives and experts from CPSC member countries, the UNEVOC Network and GIZ networks, ILO, ETF, German agencies including BMZ, BMBF, BiBB, DWA representing national policy makers, curriculum planners and teacher educators, TVET institutions and their managers, teachers, and experts from TVET institutions, as well as international organizations, were convened to participate in the meeting and contribute to the expected outcomes of the meeting. The participants consist of representatives from the following countries and organizations:



Meeting session

Belarus	Malaysia	United States of America
Bhutan	Maldives	CPSC
Egypt	Mexico	UNESCO
Fiji	Myanmar	UNESCO-UNEVOC
Gambia	Nepal	ETF
Germany	Pakistan	ILO
Italy	Philippines	GIZ/Magdeburg University
Rep. of Korea	Saudi Arabia	
Russian Federation	Sri Lanka	

This wider scope of participants invited by UNESCO-UNEVOC, GIZ and CPSC, will ensure “TVET for Green Economy” becomes a key part of the national TVET agenda to be followed through the UNESCO Strategy for the Second Half of the UN Decade on Education for Sustainable Development (UNDESSED) and the UNESCO Strategy for Greening TVET.

Key players in TVET were invited to speak on varying issues and concerns surrounding the initiative of transforming TVET for meeting the challenges of the green economy. Thematic papers were presented on the following areas:

- Transition to green economy and the role of TVET;
- Emerging occupations and its implications for TVET;
- Transforming TVET for meeting the challenges of green economy: regional and international cooperation;
- Regional perspectives in transforming TVET for meeting the challenges of the green economy

Country perspective papers were also generated with focus on TVET in support of the green economy. The papers were intended to share case studies. Key areas covered by the country papers include:

1. Major TVET programs and activities, best practices and major accomplishments in support of Green Society and Green Economy with emphasis on Green TVET skills;
2. Illustration of policy support to transform TVET for Green Economy;
3. Information on the various challenges of TVET in the light of emerging green jobs; and
4. Lessons learnt & future challenges



Sessions during the two-day consultation meeting

2. Plenary Session Presentations and Discussions

Opening Addresses

The participants were welcomed by *Mr. Shyamal Majumdar* on behalf of the lead organizers, UNESCO-UNEVOC International Centre in Bonn. He informed that TVET is one of the top priorities of UNESCO and has gained increased attention from other similar international organizations as a common priority for many multilateral funding agencies, such as the World Bank, the Asian Development Bank, the African Development Bank, to name a few. UNESCO, the education arm of the UN, has formulated a TVET Strategy that lays out UNESCO's approach to promoting TVET and skills development within the broader lifelong learning framework.



By introducing the three core areas identified in the UNESCO TVET Strategy, which includes (1) provision of upstream policy advice and related capacity development, (2) clarification of skills development and improvement of monitoring; and (3) actions to act as clearing-house and info the global TVET debate, he explained the work of UNESCO-UNEVOC in the field of TVET. He further expressed the priorities and effort of UNESCO-UNEVOC to implement the strategy at global, regional and national level. Among others, capacity development in support of policy implementation at the national level; resource development and dissemination through the various online discussions such as e-Forum, TVETipedia, UNEVOC Network portal, and learning materials and publications were mentioned as a focus of UNESCO-UNEVOC's agenda. Besides, the promoting international corporation through the UNEVOC Network which has now spanned 167 countries worldwide was heightened as one of the priorities of the Centre in the field of TVET.

In the context of the meeting, he stressed that learning for sustainable development through TVET is one of the main themes in UNESCO programme. Being central to UNESCO's effort in the field of TVET, UNESCO-UNEVOC is pursuing the Greening of TVET as one of its institutional priority agenda, owing to the fact that it has been raised as a common concern across sectors. In the absence of a comprehensive and holistic framework that could fulfill the long-term goals of ESD in TVET and create solid foundations in formulating policies and strategies for green-oriented transformations in TVET sector in the context of the greening of the society and economy. Towards this end, the meeting was convened to assist in drawing the issues and challenges to be addressed. The initiative is envisaged to further assist in transforming TVET sector and creating TVET institutions that adhere to UNESCO's approaches to education for sustainable development and meeting the new demands of the greening of the economy and the society. Quoting Mother Theresa of Calcutta, he compared the initiative of gathering experts into the meeting as a small "drop in the ocean," a reflection of the fact that exerting a small effort against an enormous task of achieving sustainable development is a big challenge, by itself; however, without this effort, future targets would not be realized.



The greater landscape of Germany's transition to green economy and high interest to share relevant policies and strategies with players in TVET from all regions were relevantly shared by **Mr. Peter Thiele**, Head of Division for Policy Issues of Initial and Continuing Vocational Training, Ministry of Education and Research (BMBF). He opened the program on behalf of the host country by recording the Federal Government of Germany's high appreciation to UNEVOC and its new leadership for UNEVOC's worldwide visibility and dynamism in working for the development of vocational education and training (VET), particularly in Germany. In his deliberation, he spoke about the German dual system which according to him needs to perpetually adapt to, and anticipate, future skills needs and qualifications that match the fast-changing trends in the labor market, characterized by emergence of new technologies, shift from industry production to service and changes brought by the European integration process. In view of the formulation of the European 2020 Strategy that sets sustainable growth and the achievement of a competitive low carbon economy as top priorities across Europe, he identified the greening of economy as a priority issue in Germany's VET system both at the national and regional contexts. He stressed that these targets affect the demand and supply of skills and further impact upon the formulation of EU economic and social policies. From his deliberation, he identified important issues that need to be urgently addressed across Europe: balance in developing generic skills vis-à-vis generic green skills; production of more STEM-skilled (Scientific, Technological, Engineering and Mathematical) graduates to exploit opportunities in the low-carbon economy; and drumming up government interventions particularly in research subsidies and green technology market development to support green job creation. Addressing these issues, he said, will cater to some new opportunities, among which is the estimation of 400,000 gross jobs by 2015 on renewable energy and eco-construction sectors, based on the findings of a UK-commissioned study while 500,000 additional jobs in environmental protection by 2020 and 800,000 by 2030 in Germany are projected by the European Union. Specifically, the Federal Government of Germany is currently acting upon the issues by promoting sustainability and environmental protection as an overarching goal of the VET on one hand, and adapting training regulations according to new labor market demands, technological and ecological developments, on the other hand. He also emphasized the system's general direction for "topping-up" of competences to augment the skills already possessed by the workforce, to collectively meet the demands of jobs classified as existing jobs requiring green skills or jobs that need retraining. He described relevant developments in Germany's initial training in the last few years including creation of 82 occupations and modernization of 219 occupations; only a small number of dual apprenticeship training was established related to green occupation. On continuing training and retraining, a substantial number of courses related to environmental protection has been a key development with the integration of environmental

issues as part of the continuing vocational training regulation and the refinement and adjustment of training curricula in an integrative approach to take into account the increasing green skills needs in the labor market.

On behalf of the Federal Ministry of Economic Cooperation and Development (BMZ), **Mr. Klaus-Dieter Przyklenk**, Senior Advisor for TVET and Labor Markets, shared his perspectives on the importance of TVET in the German development and technical cooperation initiatives. Policies adapt to the needs of partner countries. Development of skills has also given impetus for competition in the globalized economy. In his deliberation, he emphasized that the German Government through the BMZ has been embedding TVET in its holistic Education Strategy called the Ten Objectives for Education. TVET's approach is anchored on principles associated with social and cultural factors, and the recognition of balance between human and social capital and ecological aspects, social coherence and human capital-driven growth. While the role of TVET is well-understood, he opined that the broad context of the green economy keeps it undefined in so far as TVET is concerned. For the purpose of having more concrete insights on green economy and associating with them the projected TVET outcomes, Mr. Przyklenk laid out some relevant questions he expected to be answered through the subsequent sessions, including the kind of growth model that can be used as a foundation for sustainable economic development. Keeping in mind the progresses that have been happening around other regions such as the Asia-Pacific, and noting activities in emerging economies like China, India and Brazil, developing and developed countries from the region should partake of the responsibility and discuss ways of uncoupling economic growth and prosperity from resource consumption and increasing green house gas emissions in the context of having the shared economic development vision, instead of limiting the responsibility of identifying the right model to be pursued to advanced economies. He acknowledged the rich interaction of ideas that centers on TVET, exemplifying the analysis being made, or has been made by ILO, OECD and other partners. On this basis, the adoption of an appropriate model must take into account the various contextual needs of countries, which he said would require more than just simple transfer of TVET models. Transformation of TVET towards a green economy must consider Public-Private cooperation, green occupational and competence standards, work-based training and professional and highly-qualified TVET teachers and trainers.

On behalf of Colombo Plan Staff College for Technician Education (CPSC), **Mr. Mohammad Naim Yaakub** welcomed participants and acknowledged the important role of the GIZ and UNEVOC in realizing the objectives of the cooperation for the meeting. He started off giving a comprehensive background of the successful joint programs and activities undertaken by CPSC, GIZ and UNEVOC under the trilateral cooperation established within the last three years, a reflection of a collective and consistent interest among three partners to harness the role of TVET in educating for sustainable development. He welcomed the idea of achieving the projected outcome of the meeting, which is the sharing of the progress in greening economy amongst countries represented from all regions



including Africa, America, Asia-Pacific Europe and the Middle East and understanding the total picture beyond localized and regional concerns that surround the issue. Representing CPSC as an inter-governmental organization with purview on Asia-Pacific region, he described the region's great biocapacity to offset ecological footprint. Considering that the region is not spared from the emergence of the green society and economy, he shared similar experiences in CPSC member countries where investments are substantially infused into the development of the green sector, and therefore green skills development of the workforce is also gaining ground particularly in advanced economies. He concluded by stating that CPSC desires to achieve more synergy in transforming, reforming and re-orienting TVET and that in the process, no country or region will be isolated or insulated from the effects of unabated environmental degradation. He further challenged to utilize the opportunity to contribute ideas, and suggest doable solutions that could unleash unity and substantive drive amongst TVET players as game changers in the field.

Mr. Oliver Laboulle, Head, Secretariat, UN Decade of Education for Sustainable Development, German National Commission for UNESCO stressed upon the value of changing human attitudes



and behavior to achieve the goals of sustainable development. Considering this, he explained the reason for declaring 2005 – 2014 as the Decade of Education for Sustainable Development (UN DESD) which aims to integrate the principles and values of sustainability into all forms of education and training including TVET. The German Commission for UNESCO supports the local implementation of activities related to the DESD. He shared his understanding of the call for TVET for the green economy as a new terminology for an old concept

(SD) that stems from outcomes of discussions from the Seoul Congress (1999) and key outcome documents like the Bonn Declaration (2009), the joint UNESCO-ILO recommendations on TVET for the 21st century. Noting that there is nothing new with the concept, he acknowledged that the meeting could significantly re-energize the discussion in TVET and its role in achieving sustainable development provided that fair social policies, environmental protection and sound economic development are well taken into account. He shared five key features of ESD that could guide discussions: (1) Interdisciplinary and holistic, (2) Values-driven, (3) Teaches critical thinking and problem solving, (4) Uses different methods, and (5) Locally-relevant and action-oriented.

On behalf of the GIZ, and the three partner organizers, **Mr. Harry Stolte**, Team Leader, Human Capacity Development, GIZ/University of Magdeburg, gave the vote of thanks. He highlighted that the trilateral cooperation implemented by GIZ, UNEVOC and CPSC is one way to initiate north-south-south cooperation and



dialogue in TVET. By having all relevant players and sectors represented, he hoped the meeting would bring forward concrete ideas and action points that will provide cornerstones for UNESCO to act upon. He stressed that GIZ's partnership with UNEVOC and CPSC, both as inter-governmental organizations for TVET, UNEVOC working on a global scale while CPSC is focused on Asia-Pacific region, will bring about remarkable outcomes, considering both partners' active and powerful activities across the regions of their responsibilities. The consultation meeting on green economy and the role of TVET, therefore, will reinforce the assimilation of understanding and formulate succinct actions on the issue. One direction GIZ expects the meeting to lead to is harmonizing opportunities for sustainable transition to green economy amongst countries, not by competition but coordinated shifts to green economy along with the right combination of development agenda for creating green jobs and preparing the workforce equipped with the green skills projected in the labor market.

2.1 Session 1- Transition to the Green Society and Green Economy and the Role of TVET

Keynote Presentations

- 2.1.1 **DEVELOPING A GREENING TVET FRAMEWORK** presented by **Mr. Shyamal Majumdar**, Head, UNESCO-UNEVOC International Centre in TVET in Bonn, Germany

Mr. Majumdar deliberated on the aim of UNESCO of mobilizing efforts towards formulating a comprehensive framework for Greening TVET. Towards this end, imperatives to support transition to green society and economy need to be fulfilled. He floated the proposal to have a three-tier approach for implementing a Greening TVET Framework, comprised of National Framework, Institutional Framework and International Cooperation, a reflection of a broad range of essentials and a representation of multiple players across sectors that may have existing relevant but fragmented approaches to achieve sustainable development. Under National Framework, countries need to consider formulating a Green Policy and Strategic Plan, upon which a Green TVET framework could be drawn. The said framework, he proposed, should have a holistic approach to transform the existing TVET institutions into Green TVET institutions with clear objectives and monitoring mechanism. He proposed that Institutional framework will have to focus on giving strategic directions to managing a Green Campus, adapting Green Curriculum, fostering Green Research, building capacity of Green Community and promoting Green Culture. The Green campus which is based on the philosophy of practicing what is being preached in managing campus resources such as energy,



water and waste resources. This dimension intends to reduce the carbon footprint of students, teachers and staff within the TVET institutions. The second dimension touches upon programs on **Green Curriculum** to meet upcoming skills for clean and green jobs. The third dimension has a major consideration on the need to build a **Green Community** through extending sustainable development practices at the community level so that the movement of TVET institutions is extended to the society at large. The fourth dimension is on **Green Research** to foster the development of a research culture in relevant areas of sustainable development. Fifth, promoting a **Green Culture** is intended to focus on strengthening values education, ethical standards, attitudes and behavior that respects ecological resources and values the future requirements of the future generation. A monitoring scheme of implementation at institutional level is proposed to be facilitated through a scorecard system that uses green criteria as may be relevant to desired success index of green TVET implementation. Under International Cooperation, the third tier, countries and organizations are proposed to have a structured platform for sharing good practices in Greening TVET, providing international assistance and enhancing cooperation in pursuit of an inclusive green growth on South-South and North-South-South cooperation. He also discussed transitions to green economy which have profound implications in occupational requirements. Citing a study conducted by the US National Center for O*Net Development, he elaborated possible implications of having a sound Green TVET framework in the types of occupations projected in a green economy: Green Increased Demand Occupations (GIDO), Green Enhanced Skills Occupations (GESO) and Green New and Emerging Occupations (GNEO).

Having made his pertinent point on the above, he identified some projected key challenges that will need to be overcome through the journey to social and economic transition. These include capacity development at all levels, development of networking and partnership for greening society, green skills identification and forecasting, development of ESD resource materials including tool kit, research and green innovations in ESD, monitoring, evaluation and impact analysis and inculcating innovation and critical thinking.

2.1.2 **TRANSITION TO THE GREEN SOCIETY AND ECONOMY & THE ROLE OF TVET** presented by **Mr. Harry Stolte**, Team Leader, Human Capacity Development in TVET/ UNEVOC Centre Magdeburg (GIZ)

Mr. Stolte covered in his deliberation the inter-relations of green economy with green jobs, green skills development and the role of TVET based on key definitions and



applications of global players including OECD, UNEP and ILO. Green growth, also inter-changeably termed as green economy, he said, is a cross-sectoral multidisciplinary and holistic approach that recognizes environmental sustainability and social equity as imperatives for economic development and growth. It has been characterized by notable changes in the ways business is run and societies are developed. Green economy, from across sectors, has relative underpinnings and parameters in that economic policies would tend to utilize it in terms of broadening the reach of regulations, fiscal reforms and industrial policies; Green business would significantly take it into account the green economy in promoting approaches for innovations and technology, education and training and business; finance sector, on the other hand, makes use of green economy in the context of green investments and harnessing green initiatives through incentives; trade and global governance sector expand international cooperation, standards and trade policies integrated with key principles of pursuing green growth. From the German perspective, Mr Stolte stressed that green growth is simply seen as a process of achieving economic growth with an ecological restructuring of economic processes to minimize environmental impacts. Reinforcing concepts put forward by ILO in its study on green skills and green jobs, he provided examples of the implementation of ESD in TVET at the macro level where TVET systems, training regulations and occupations integrate sustainability to create additional qualifications, emphasize certain environment-related occupations or derive specializations from existing technology occupations. At the meso level, ESD application is strengthened by equipping institutions with the appropriate capacities, facilities and curricula. Micro level approach involves contextualizing green TVET in specific instructional processes. Significant suggestions were offered to strengthen implementation. These include adjusting Green TVET according to labor market needs, expanding the global capacity building network through the proposed Germany-UNEVOC Global TVET Academy for Sustainable Development and implementation of an International Leadership Training on TVET and Climate change.

2.1.3 Summary of Session 1

The session significantly emphasized the importance of TVET as the main line of action of UNESCO and other countries, developed and developing alike, as well as global players such as GIZ. Consistent with the TVET Strategy of UNESCO, and in support of this, a holistic framework in greening TVET is considered essential to guide and consolidate the seemingly fragmented initiatives that surround transitions to a green economy and to appropriately cover other key components of green TVET like knowledge and attitudes, values, culture, instead of solely focusing on skill development alone. In the light of this direction, and in response to the inevitable transition to green economy and society, TVET sector can take proactive role in facilitating the many proposed approaches in integrating ESD in TVET, following macro, meso, or micro level approaches depending on the context of requirements.

Parallel to this, UNESCO, with the assistance of other key players, can also begin shaping the cornerstones for developing a Green TVET Framework.

2.2 Session 2 – Emerging Green Occupations and its implications for TVET

Keynote Presentations

2.2.1 EMERGING GREEN OCCUPATIONS AND THEIR IMPLICATIONS FOR TVET presented by Ms. Christine Hofmann, Skills Development Officer, ILO

On behalf of the ILO, *Ms Hofmann* elaborated on the crucial elements and assumptions of the ILO based on the outcomes of the ILO-CEDEFOP Project that dealt with skills for green jobs. She highlighted that transition to a low-carbon economy has been forecasted to have positive impact on employment in view of the assumption that the strengthened regulations to reverse climate change would lead to more environmental products and services produced and the expansion of green sectors will create green jobs. She however warned of the need to observe just transitions since vulnerable sectors, such as low-skilled workforce, will remain to be the least sector to be benefitted by the new green skill employment opportunities, often requiring high-level skills, or retraining for those already in possession of occupational skills.



She also highlighted that the extent of skills change determines whether new occupations emerge or whether existing occupations are changing. Recognizing the varying definitions of occupational changes across countries and regions, there are different levels of incorporating green skills components into occupations. Some occupations, such as renewable energy technicians (i.e., solar, biofuels) have notably high degree of skill change requirements or qualifications, therefore they are considered new emerging occupations that call for higher and specialized skills and knowledge training or continuing education. In those existing instances, Ms. Hoffman underscored that changes in existing occupations often take place at the low and medium-skill level. She also discussed the gender dimension of technical skills possession and job opportunities for women in the green sector. Women

are underrepresented in science and technology in many countries, which affects technology-intensive green sectors. Countries like India and Bangladesh, by contrast, target women in training for renewable energy jobs. Also, new sectors like eco-tourism attract women and can break traditional gender patterns, as is happening in Thailand. She pinpointed the weak coordination of skills development with environmental policies as a key reason why skills provision lags behind. She strongly proposed the use of qualitative research and analysis particularly in developing countries and economies in defining sectors, occupational compositions or employment impact in identifying skills and changes in occupations as data deficiencies are more imminent and greater.

2.2.2 **THE GREEN ECONOMY AND EMERGING GREEN OCCUPATIONS** presented by **Mr. Arne Baumann**, Labour Market Specialist, European Training Foundation (ETF)

The representative from ETF, **Mr. Arne Baumann**, succinctly covered the relevant foundation policy frameworks of the European Union (EU) as the bases for its work in education for sustainable development and the green economy, and ETF's own programs. Four important policies steer the EU to this direction, the EU Strategy for Sustainable Development, the EU Education Council: ESD, the EU 2020 Strategy and the Think Small First/ Small Business Act for Europe. In support of the work of the EU Commission, the ETF acts as a conduit in facilitating green transformations by promoting competences for sustainable development particularly in teacher education and curriculum reform, assisting VET schools agents through the Whole-School Approach to Learning for sustainable development, promoting methods of identification, forecasting and skills provisions for green jobs, integrating sustainable development issues into entrepreneurial learning and applying relevant indicators that



reflect sustainable development in education policy analysis of EU countries. To this end, the ETF work provides input to the development of a broad range of competences and skills in line with the needs of the labor market, most specifically in existing jobs that support transition and in sectors with direct role to play in the transition to green economy.

2.2.3. **THE GERMAN EXAMPLE IN THE WASTEWATER SECTOR** (From Past to Future) presented by **Ms. Helene Optiz**, German Water Association (DWA)

Ms Optiz deliberated on the range of functions of the DWA and its contributions to the training and development of technicians in Germany and



other countries. DWA, a non-governmental organization and technical-scientific association, primarily focuses on water and wastewater sector in Germany that supply and benefits 82 million population from the 6500 water utilities across the country. About 10,000 waste water treatment plants generally operate in the country, equivalent to an enormous number of trained personnel to run and manage water utility processes and resources in Germany. DWA gives direction in seven core areas: rules and standards, training, certification, information, network, membership, international cooperation and research. Across the water utility sector, DWA caters to supply the needed capacity of the workforce, in cooperation with vocational schools, for example in environmental engineering occupations needed in the water sector, which is growing in consistent demand in view of transitions to green economy. To support these requirements, DWA support external training across all levels of occupations, with an average of 37,000 participants per annum, facilitate skills certification and lifelong learning and promote VET in water sector to attract diminishing interests from students. DWA also engages in international cooperation projects and international capacity development through the German Water Partnership initiatives.

2.2.4. Summary of Session 2

The session provided important perspectives on the range of studies, programs and initiatives rolled out by international development organizations like the ILO and the ETF to support green transitions, mainly focusing on developing green skills and assisting countries to understand and cope with projected green job requirements. ILO underscored varying impacts of the greening of economy to employment whereby skills upgrading for low-skilled occupations would be required but not necessarily change social conditions, and varying extent of skills responses while new emerging occupations will not necessarily change all occupation skills content, but require retraining or skills augmentation to cope up with green skills requirements. The rest of other existing occupations with none or very minimal changes will continue to be demanded and therefore need to be analysed quantitatively and qualitatively. ETF, on the other hand, touched upon relevant EU policy provisions that reflect green development directions. The same serves as basis for ETF in undertaking competency and skill development initiatives to support green economic transitions. The German water utility sector responds to emerging occupational requirements in the green sector through a range of technical and vocational training and development across all occupations to reflect sustainable development, augment green skill requirements in water and water treatment technologies and operations.

2.3 Session 3 – Transforming TVET for Meeting the Challenges of the Green Society and the Green Economy: Regional and International Cooperation

2.3.1 TRANSFORMING TVET FOR THE GREEN ECONOMY: REGIONAL & INTERNATIONAL PERSPECTIVES presented by Mr. Mohammad Naim Yaakub, Director General, CPSC

In his presentation, **Mr. Naim** provided an overview of TVET's response to meeting the challenges of the green economy in the context of regional and international cooperation. A brief overview of the overall ecological footprint per country as cited by the UNDP stimulated his discussion on the extent of contributions of regions and countries in the overall global carbon footprint. He emphasized that countries with low human development achievements have also lower ecological footprint, compared to countries high in human development but with high carbon footprint. These two extremes need to move to the desirable and optimum state in the Sustainable Development Quadrant (SD Quadrant) of high human development and low ecological footprint. Relevant regional and international cooperation policy frameworks developed in the last 10 years are subscribed to arresting further environmental impact of social and economic development. They are useful in increasing the region's capacity to absorb changes brought by transitions to green economy. In view of these and the fact that as a whole, the region is represented in both high and low incidences of ecological footprint, countries are suitably aware of extreme conditions and have a good appreciation of how new developments in green economy could support and address multiple concerns in implementing regional strategies.



He enumerated relevant frameworks that provide enabling environment for green transitions. Among them are the Astana “Green Bridge” Initiative (Commonwealth of Independent States, Seoul Initiative Network on Green Growth, Sustainable Development Strategy for Central Asia for North and Central Asia, North-East Asian Sub-regional Program for Environmental Cooperation (NEASPEC), Thimphu Statement on Climate Change - Subregional Strategy for the Sustainable Development and the Pacific Green Growth Partnership Analysis of and Roadmap on Green Growth for Small Island Developing States for the Pacific region. There is no need to reinvent the wheel. He said these frameworks are founded on the key principles of sustainable development earlier stressed in the Brundtland Commission report of 1987, expounded in the Rio Summit of 1992 through Agenda 21 and revisited by the UN through the Decade of Education for Sustainable Development (2005-2014). This will further be reviewed in the Rio +20 meeting. He also

emphasized that the evolving global and regional frameworks work as enablers to support green transitions, development of green growth sectors and identification of green skills. The Asia-Pacific region, he said, is comprised by advanced economies such as Korea and Japan with high level of green growth enablers to drive green development. Then there are advancing economies such as China, India, Malaysia, Hong Kong, Philippines, Taiwan (China) and Thailand on the other hand, which support the advanced economies in supplying the skilled workforce required. He stressed the key elements in making TVET systems respond to green economy which are alignment of skills development policy with green growth, public-private and social sectors coordination, trained and skilled educators in green TVET, and strong quality assurance and monitoring mechanisms. To this end, CPSC, as a key player in TVET in Asia-Pacific region, has identified strategic actions based on a UN model for greening TVET, which are policy, capacity building, internationally-relevant debate and networks. On a larger scale, he offered a working continuum that can be considered by countries across region to make TVET respond to transformations to a green economy. The continuum starts with driving demand for green products and services, providing access, developing skills and making retraining provisions for those who already possess the skills, and creating jobs that will allow enterprise generation and employment. At the institutional level, he offered possible emulation of best practices, such as CPSC's effort to pursue the greening of TVET keeping in mind five key dimensions: Green campus, Green curriculum, Green community, Green research and Green culture. More on CPSC's green roadmap, he enumerated CPSC's plans to implement collaborative, participatory and holistic capacity building programs for TVET leaders for sustainability, incorporate green index in the quality assurance system of CPSC for TVET institution accreditation, strategic partnerships and continuous implementation of CPSC's greening TVET project.

2.3.2 **TRANSFORMING TVET FOR THE GREEN ECONOMY: REGIONAL & INTERNATIONAL COOPERATION** presented by **Mr. Klaus-Dieter Przyklenk**, Senior Advisor, TVET and Labor Markets, Ministry of Economic Cooperation and Development (BMZ), Germany



On behalf of the BMZ, **Mr. Przyklenk** highlighted the relevant cooperation work of the BMZ in South Africa in support of the development of renewable energy. The work of BMZ on TVET, he said is anchored on three core principles which include TVET's action orientation through school-based and industry-based linkages, work-orientation and promotion of key competences and skills. In the

context of the transformation to a green economy, BMZ sees as some of the challenges faced by TVET to include integration of green skills development in national strategies, the need to undergo systemic transformations only where relevant, demand and labor market orientation to foster need for diversified green human resources in priority areas and occupations, reliable labor market information that can pinpoint green qualification requirements and access to green TVET and green jobs. Recognizing these challenges, and in support to the South African Government's transition to green economy, BMZ entered into a bilateral cooperation program with the South African Government in 2008. The cooperation focuses on strengthening renewable energy sector in the African country for more energy efficiency, climate protection and adaptation to climate change. In 2010, the bilateral cooperation has led to the decision to pursue a Skills for Green Jobs Program which identifies three key program areas, namely Energy Program to be implemented by 2012, which aims to improve investment conditions in renewable energy and energy efficiency; the Skill Development for Green Jobs Program with components on Greening South Africa's skill development system and technology transfer, innovation and diffusion; and the Climate Program currently in implementation since October 2010.

2.3.3 **TRANSFORMING TVET FOR THE GREEN ECONOMY: REGIONAL & INTERNATIONAL COOPERATION** presented by **Mr. Reinhold Weiss**, Vice President and Head of Research, Federal Institute for Vocational Education and Training (BiBB), Germany

Mr. Weiss presented the major factors of Germany's successful transition to a green economy. Nearly 1.8 million people are engaged in the environmental and service sector. Worldwide, Germany enjoys 16% share in environmental technologies, which results in the increase in the number of jobs affiliated with green growth by 13% to 15% every year. It is projected that the eco-industry will generate 800,000 jobs which will generate a turnover of trillion Euro in 2030. The active work and favorable



conditions within the system chosen to be implemented gives the Government the advantage of employing strategies for innovative vocational education and training (VET) system. Germany has integrated sustainability in existing professions and trainings without implications to training regulations. Where required, specific training regulations for the few identified green professions need to be developed to assist in approximating required skills and workforce qualifications. In the absence of the requirements, training regulations for general professions necessitate some important

considerations: training should qualify for a wide range of jobs, minimum standards for company training must be defined and learning outcomes easily identified. Training should also be open to different and flexible training strategies, methods and technologies. In alignment to these considerations, professions within the dual system have been significantly reviewed, renewed and updated. A total of 64 new professions were identified from 1998 to 2010. On regional cooperation, companies are central to the coordinating and cooperative initiatives which take the bilateral form of interaction, for example between universities and companies, or companies with vocational training schools, trade unions or chambers of commerce, to mention a few.

2.3.4 Summary of Session 3

Across different regions, different frameworks and modalities have been developed to implement and organize cooperation among nations and facilitate support by multilateral organizations. The Asia-Pacific region has demonstrated active involvement and commitment to various regional and international frameworks in achieving sustainable development, an indicator that concepts and approaches have long advanced into national initiatives. Some countries are in better position to share their experiences and derive shared regional goal for achieving sustainable development. Regional cooperation in the form of bilateral partnerships also serves as good models. The active work and favorable conditions in Germany are observed to be working to its advantage; henceforth, it is able to demonstrate high capacity to employ within its existing systems strategies for innovative vocational education and training (VET) system, and translate them to regional countries in the European region. Another German agency, BMZ, provided example of efforts to share experiences and technologies of advanced country through relevant cooperation work with developing economies, for example in South Africa to promote renewable energy sector development. The session emphasized the need to strengthen the regional dialogue for promoting green economy, organize awareness creation at various regional and International levels/fora and share best practices.

2.4 Session 4 – Regional / National Perspectives on Transforming TVET for Meeting the Challenges of the Green Society and Green Economy

2.4.1 **KOREAN POLICY AND STATUS OF GREEN GROWTH WITH FOCUS ON TVET** presented by **Mr. Yo Heo**, Professor, Seoul Institute of Vocational and Advanced Technology Training (SIVAT), HRD Service of Korea

The presentation centered on the Republic of Korea's move to the green economy. The Government of Korea is one of the leading countries in the Asia-Pacific region that initiated the formulation of a national strategy to pursue green growth development. The formulation of the Green Growth Act considers three main factors for transition, Green growth to harmonize economy with environment, Green technology to foster energy-efficient, green and ecological methods to minimize green house gas emissions, and the Green industry to mobilize industry contribution to the green drive in all sectors. An important initiative called the Green New Deal Project identified three major fields, the Green Technology, High Convergence and High Value-Added Service, from which 17 new growth engines were identified. In support of this move, Vocational Competency Development Policy has been further formulated to factor in the need for developing training standards, qualifications system and the refurbishment of green growth training systems as requirements. Plans for these developments are in full swing, each having identified key result areas and areas for improvement to ensure that standards, qualifications and curricula adapt to the green development framework desired to be pursued.

2.4.2 **EDUCATION & TRAINING IN THE WATER SECTOR OF MEXICO** presented by **Mr. Jorge Arturo Casados Prior**, The Mexican Institute for Water Technology (IMTA), Mexico

The presentation deliberated the major education and training interventions in Mexico's water sector in the context of the greening economy. As an integral part of the six-year national development plan (2007-2012), the establishment of the Instituto Mexicano de Tecnologia del Agua (IMTA) is a key response to the formation of skilled workforce for the water sector. IMTA program is centered to formal education, external training and competency certification. Under formal education, post-graduate degrees are granted in particular water development and water management qualifications. External training is extended to professional and technical workforce on modularized courses. IMTA also assists in the fortification of the human resources through institutional capacity building. Under competency certification, reinforcement and training and competency evaluation against standards are undertaken.

2.4.3 **LABOR MARKET INFORMATION FOR GREEN SKILLS** presented by **Ms. Wendi Howell**, Program Director, Center on Education and Training for Employment, The Ohio State University, USA

Representing the UNEVOC Network in the United States, the presentation focused deliberation on the different methods of gathering information on skills demands in the labor market. Particularly when interest has spread widely across the US, Ms.

Howell emphasized that having clear and methodical approach to projecting skills assumptions will guide training systems both public and private to plan and invest in new opportunities based on the greening of the economy. Towards this end, she enumerated various types of labor market information sources that assist in analyzing conditions and requirements in the economy and determining future workforce needs. The general economic trends, national enterprise employment data, job bank data, census data, tracer studies, employer advisory committees and sectors surveys with focus on job forecasting are ideal data sources that could provide assumptions, projections or signs of occupation shifts, changes in employment sector, workforce information at varying extents or scope (national, localized etc.). Data generated through sector surveys are considered useful, Quarterly Census of Employment and Wages (QCEW) and Current Employer Statistics (CES) for medium term forecasting; Occupational Employer Statistics (OES) for long-term forecasting with 10-year projection. The US Bureau of Labor Statistics (BLS) uses the QCEW and OES methods in collecting green jobs information which employ approaches to determine jobs related to green production (output) or jobs actually employing environment-friendly practices (process). Based on these outcomes, jobs are listed in the Standard Occupational Classifications (SOC) that are further clustered into types of occupations in the green economy (green increase demand occupations or GIDO; green enhanced skills occupations or GISO; and green new and emerging occupations (GNEO) by the Occupation Information Network (O*NET). In view of the varying green jobs estimates, she highlighted the importance of having globally-understood assumptions and definitions of green jobs and information in the labor market for future planning.

2.4.4 **SUSTAINABLE DEVELOPMENT FOR WATER RESOURCES IN EGYPT**
presented by **Mr. Mahmoud Abdel Fattah Elkady**, Technical Education Sector,
Ministry of Education, Egypt

Ensuring sustainable development for the water resources of Egypt in view of the diminishing resources was the focus of the discussion made by Mr. Elkady. Of the 65 billion cubic meters required mainly for agricultural, domestic and industrial uses, only 55 billion cubic meters are available with present resources. Sustainable development initiatives in the water sector in Egypt prioritize the reduction of losses in water distribution for domestic use and irrigation distribution. Significant attention is also given to reverse the effect of water pollution caused by many factors, particularly industrial waste and fertilizer waste, to name a few. Egypt is seen to benefit from substantial water conservation, reduction in costs of water treatment and production costs.



2.4.5 Summary of Session 4

Regional experiences depict varying extent of achievements. Korea has formulated Green Growth Policy where it had identified green growth engines and significantly identified the relevant fields that are closely relevant to greening TVET. The various education and training provisions developed in Mexico through IMTA described specific sector-based priority in the education and training sector in fulfillment of the national strategic plan in the water sector. The generation of labor market information and forecasting of green jobs available in the market comprise the many considerations in the United States in the context of understanding the needs of the green economy. Ensuring long-term strategic planning and investments in the green sector by both the Government and industries would significantly depend on accurate data and information which can be derived in using various scientific and non-scientific methodologies. Egypt discussed the benefits of sustainable development in water sector development and preservation in the country.

2.5 Session 5 – Regional / National Perspectives on Transforming TVET for Meeting the Challenges of the Green Society and Green Economy

2.5.1 ESD AS A PRIORITY OF THE EDUCATIONAL POLICY OF THE REPUBLIC OF BELARUS presented by **Mr. Eduard Kalitski**, International Cooperation Department, Republican Institute for Vocational Education (RIPO), Belarus

Mr. Kalitski shared about the implementation of education for sustainable development in the Republic of Belarus anchored on the National Strategy for Sustainable Development for 2020. Backed up by an encouraging landscape of policy support, Belarus pursues as among its priorities the integration of sustainable development aspects in all levels of education system. The development of the ESD quality indicators, monitoring system, training programs and dissemination and adoption of best practices applicable in the local conditions in Belarus are also high on the educational agenda. Another target is the implementation of the joint partnership programs and projects and solicitation of support from international organizations and partners. Parallel to the directions taken to fully succeed in the country's efforts, Belarus has to face and overcome the challenges brought by the lack of innovative educational programs for training and retraining in ESD, absence of scientific researches in ESD and the low level of provision for information sources that hamper wider dissemination of knowledge on ESD.

2.5.2 SAUDI ARABIA AND THE GCC COUNTRIES: CHALLENGES FOR GREENING TVET presented by **Mr. Klaus Sodemann**, Senior Business Development Manager for TVET, GIZ GmbH, Technical and Vocational Training Corporation, Saudi Arabia

Mr. Sodemann gave an overview of the status, immediate concerns and observed priorities in the Gulf countries including Saudi Arabia from the lenses of GIZ's international cooperation. The GIZ's presence in the Saudi Arabia and other Gulf countries has given substantial input in the human resources development and water sector development in the region. As a part of the several projects in about 130 countries of the GIZ, the International Services of Germany's international cooperation agency builds upon the strong socio-economic framework of Saudi Arabia and neighboring Gulf states in further focusing government and international development initiatives. Key areas of concern that are hoped to be addressed with the help of bilateral cooperation is the fact that six GCC countries have been recorded to have very high carbon dioxide emissions per capital triggered by the highly resource-

intensive growth, depletion of natural resources especially oil and water. The pursuit of greening TVET in these countries is seen to open new opportunities and awareness on resource preservation and heightening of market potential. As part of the international service of GIZ, the Technical Teachers College (TTC) serves as the nucleus of any new training approaches to align future oriented initiatives in greening TVET that are yet to be initialized.

2.5.3. **TRANSFORMING TVET FOR MEETING THE CHALLENGES OF THE GREEN ECONOMY: THE GAMBIA EXPERIENCE** presented by **Ms. Jahou Samba Faal**, Director of Academics, Gambia Technical Training Institute, Gambia

Ms Faal spoke about the initiatives in the West African nation of Gambia in support of economic development parallel with exercising ecological sustainability. Green economy for sustainable development has become central to the development paradigm of the Gambia Technical Training Institute (GTTI), a UNEVOC network since 2004. A number of best practices of the GTTI present good opportunities to draw upon practical strategies replicable in other similar localities and address realities in pursuing green economy. GTTI, established in 1980 under a Parliament Act that aimed to revitalize and overhaul TVET in the country, implements capacity building and training of the youth in waste management collection and disposal as well as training on labor-intensive technologies supported by the UNDP; on-the-job training in partnership with industries such as Elton Oil, an indigenous oil marketing company and Total Oil; teachers and trainers' training on the manufacture and management of household metal supported by the FAO; small scale enterprise development supported by Europeaid and other sustainable livelihood initiatives and environmental-related capacity building programs.

2.5.4 **Summary of Session 5**

Belarus discussed the strong implementation of initiatives of its TVET sector related to ESD. Gambia focused on the country's current initiatives in contributing to sustainable development in training and solving unemployment of the youth. In the Arab region, the status of progress of the Gulf states including Saudi Arabia are needing further support and push to assist in addressing the fast rate of thinking natural resources. The GIZ, in partnership of the Government of Saudi Arabia work together to harness cooperation models for achieving sustainable development in the region.



2.6 Sessions 6 to 8 – Country Perspectives on Transforming TVET for the Green Society and Green Economy: Policies, Programs, Challenges and Achievements

2.6.1 KOREAN PERSPECTIVES ON TRANSFORMING TVET IN SUPPORT OF THE GREEN ECONOMY presented by Mr. Heon Bae Jeong, Professor, Chung Ang University, Ministry of Education, Science and Technology, Republic of Korea

Mr. Jeong presented the Korean model of implementing a framework for meeting the objectives of the green economy. In 2008, Korea declared Green Growth as a national goal to introduce strategies for green economic development to improve the quality of life and to establish a bridge between develop and developing countries. Korea promotes green growth and sustainable development through the Young Leaders Training Programs for Future Industry, integration of green research and development and industry promotion tools and best practices and initiatives in TVET in Korea's public organizations. To propel the agenda at implementation level, the Korea Environment Industry and Technology Institute (KEITI), established to integrate technology, industry and management support instruments in TVET in Korea, has been tasked to take up significant role. KEITI promotes environment technology development, eco-products, environmental industries and environmental management in industries. As a policy support means, three ministries work in line with TVET green transformation, including the Ministry of Knowledge and Economy, Ministry of Environment and the Ministry of land, Transport and Maritime. One observed challenge needed to be overcome is the influx of multiple players and organizers to pursue the same green agenda. Among the accomplishments in the present efforts is high result in TVET program achievements. Lessons learnt include the need for coordination of systems reengineering efforts, need for industry-driven policy for green manpower training and creation of green jobs. Towards stimulating further improvements in the promotion of green TVET, industry-driven training, ad hoc selection of industrial needs, efficient business structure and designation of overall coordinating agency or organization were suggested.



2.6.2 MALAYSIAN PERSPECTIVES ON TRANSFORMING TVET IN SUPPORT OF THE GREEN ECONOMY presented by Ms. Zainab Musri, Head of Electrical Engineering Department, Port Dickson Polytechnic, Department of Polytechnic Education, Ministry of Higher Education, Malaysia

Ms Musri focused her deliberation on the initiatives of the Government in promoting green technology and ushering Malaysia's transition to green economy. Ranked 27th out of 216 countries with high carbon emissions in 2008, ensuring sustainability and improving the quality of life has become a flagship agenda of the current Prime Minister of Malaysia. The creation logy and Water was among the first steps undertaken to principally foster low-carbon and low energy economic development. Effective incentive schemes were introduced including the granting of PS or Pioneer Status with full income tax exemption on income from renewable energy and energy efficient projects for 10 years. Tax exemptions from sales of related machines, consumables, properties and the like have been also put into place. Under specific strategies, formation of an Advisory Committee to advise on market trends in the green economy, identify labor market skills and job requirements and advice on green curriculum development have been initiated. Among the challenges faced by Malaysian polytechnic institutions as key provider of public TVET are manpower, facilities and funding and employability, which require corresponding intervention to full build the capacity for the green economy transition.



2.6.3 **PHILIPPINE PERSPECTIVES ON TRANSFORMING TVET IN SUPPORT OF THE GREEN ECONOMY** presented by **Mr. Ernesto Beltran**, Executive Director, International Program Development Unit/ Special Projects, Technical Education and Skills Development Authority, Philippines

TVET transformations towards the green economy in the Philippines are stimulated by the call for mitigating the effects of degradation of the rich ecosystem of the country and the high potential for green job generation. The Philippines has identified six sectors for this prospect, which include renewable energy, transportation, green construction, water, solid waste and land management. There are efforts to fast-track developments in clean public transport using CNG, electric-powered vehicles and other alternative bio-fuels. Sustainable building construction opens up opportunities for skills and competency upgrade in traditional jobs. More green-oriented initiatives have already been started in the above said sectors which encourage TVET sector in the Philippines to increase investments and focus priorities in workforce development. The Technical Education and Skills Development Authority (TESDA), demonstrates a systematic example of government efforts towards green transition. TESDA undertakes the ongoing development and revision of the Philippine's Training Regulations and Competency Standards as well as the corresponding Competency Assessment Tools where it expects to integrate green skills competencies as part of continuing efforts in the greening of TVET. Among other best practices implemented in the Philippines with inter-agency cooperation are the development of the Code of Practice (COP) for Refrigeration and Air-conditioning where TESDA provided input, training of automotive trainers on transition to cleaner energy, retrofitting of equipment for ODS(Ozone Depleting Substances), recycling of refrigerants, assessment and certification of vehicle emission control technicians and partnering with the private sector for green skill and technology development in green transport sector. He cited as a major challenge the promotion of green and decent jobs. In further ascertaining the role of TVET in a green economy, he

suggested the need to categorize and classify green collar occupation, integrate green skills competencies in all TVET qualifications, include green skills curricula in TVET training regulations, train the trainers on teaching green skills competencies and engage in private sector partnership on greening industries and occupations.

2.6.4 **SRI LANKAN PERSPECTIVES ON TRANSFORMING TVET FOR THE GREEN ECONOMY** (Case Study on the Use of Biofuels in Internal Combustion Engines in Sri Lanka) presented by **Mr. Chitral Ambawatte**, Director General, Department of Technical Education and Training (DTET), Ministry of Youth Affairs and Skills Development, Sri Lanka

Mr. Ambawatte provided a technical case study on the use of biofuels in internal combustion engines in Sri Lanka demonstrating actual application of technology, development and use of alternative and clean energy source using naturally abundant resources. Sri Lanka has been in the active exploration of using coconut oil, jathropa oil, vegetable oil and similar components to lower carbon emissions. From the technical explorations and experimentations, more serious research studies on biofuels and technical aspects of their use will need to be undertaken.

2.6.5 **PAKISTAN PERSPECTIVES ON TRANSFORMING TVET FOR THE GREEN ECONOMY** presented by **Ms. Nyla Qureshi**, Director General (A&F0, National Vocational and Technical Training Commission, Prime Minister's Secretariat, Pakistan

Ms. Qureshi presented the recent shifts in the responsibility of TVET in Pakistan and how this contributes in the present efforts of the Government to develop skills for the labor market. The Government seeks to focus on skilling the youth which accounts for more than 37 million or more than 30% of the total population as new labor market entrants. The National Vocational and Technical Training Commission, a national apex body under the Prime Minister Secretariat, was created to provide policy direction in TVET towards ensuring quality assured skills development system for greater inclusion and employability. Consistent with NAVTTC's mandate and prescribed reforms in Pakistan National Skills Strategy, efforts are directed to introducing competency based training, increasing the role of private sector, establishing a NQF, curricula development, accreditation & certification, training of trainers (TOT), expanding geographical provision, integrating informal economy workers and career guidance and placement services. In implementing reforms, the results of various disasters, calamities and environmental degradation in Pakistan have also stimulated efforts in focusing on new job creation in renewable energy sector, elimination of industries not of immediate use, substitution to adapt renewable energy and transformation to clean green jobs. Key challenges that need to be overcome through appropriate policy instruments are the weak or sometimes less priority of TVET Sector, lagging skills development, insufficient green R&D and non-existent R&D in TVET, insufficient green investments, limited technology transfer, relatively small source of future training demand, limited number of trained people and lack of understanding in linking TVET with green network.



Presenters from Pakistan, Philippines and Sri Lanka

2.7 **FIJI PERSPECTIVES ON TRANSFORMING TVET FOR THE GREEN ECONOMY** presented by **Mr. Silvio Vueti Tawake**, Senior Education Officer, Ministry of Education, National Heritage Culture and Arts, Youth and Sports, Fiji Islands

Current practices and initiatives in TVET in Fiji were highlighted in the deliberation as the country's response to the general status of TVET as a second option. Mr. Tawake shared as one notable condition of TVET is the involvement of many agencies and providers in TVET delivery. Policy support mechanisms include the formulation of a roadmap for democracy is entwined with the roadmap for sustainable development which highlights the aim of the government in education for peace and progress. The Ministry of Education is also implementing a strategy to vocationalize form education system. Like any other countries, challenges faced in the island are necessary to be overcome. Fiji recognizes that there is a lack of shared national vision and the lack of adequate resources and trained personnel to push forward needed reforms. The existing TVET culture, pedagogy and training are traditional which could mean they lag behind the real requirements in the labor market. In relation to green economy, the revision of the curriculum following the National Curriculum Framework reinforces the significant link of educational provisions with economic development directions and sustainable development. Apart from other initiatives for environmental protection, Environmental Education Workshops jointly supported by the education ministry and non-government are implemented to empowers teachers and students. He stressed the need to establish a TVET policy and reorient it to towards meeting the challenges of the Green Economy and clear articulation of TVET's approach to developing a society that can contribute to achieving a green future.

2.7.1 **MALDIVIAN PERSPECTIVES ON TRANSFORMING TVET FOR THE GREEN ECONOMY** (Human Capital Formation) presented by **Mr. Zubair Mohamed**, Chief Executive Officer, Maldives Polytechnic, Ministry of Education, Maldives

Mr. Zubair provided an overview of the challenges, priority sectors for development and efforts to skilling the youth. In spite of the great potential of the Maldives human capital, the Maldives lags in addressing massive unemployment problems faced by about 205,330 belonging to working age group of the 350,000 overall population in Maldives. While high-employment sectors like construction, tourism and fishery continues to yield many employment opportunities, a number of skilled foreign workers continue to dominate the economic landscape of Maldives. Through the special Training Project intended for the youth, training provisions are rolled out with the target of training the "yellow segment" or semi-skilled workforce, replacing semi-skilled expatriate workers for the specific sectors. The Government of Maldives implements reforms to

revitalize TVET and prepare the workforce for anticipated opportunities brought by the greening of the economy. As timely interventions, the creation of the TVET Authority in 2011 to assist the government in consolidating responses, will provide direction on regulation of TVET, capacity building and standards development. In view of a national target of making Maldives carbon neutral, the Maldives Polytechnic undertakes refocusing of curriculum through the integration of renewable energy courses in mainstream TVET in cooperation with the private sector.

2.7.2 **MONGOLIAN PERSPECTIVES ON TRANSFORMING TVET FOR THE GREEN ECONOMY** presented by **Ms. Tsolmon Shagdarsuren**, Legal Counsel, Agency of TVET, Mongolia

Ms. Shagdarsuren focused her deliberation on how the climate change has impacted the ecological potentials of the country including degradation of resources including land, forests, water and air. At the policy level, the passing of the new TVET law paved the way for the revitalized approach to reversing the impact of environmental conditions through TVET. The National Council of TVET was established in 2009, supported by sector and regional councils. The TVET Agency was established one year later to further pursue strengthening of TVET. Innovations have been introduced in the curriculum and training content to contribute this end. The development of basic competencies in vocational education and training systems incorporates ecological protection principles while core competencies are developed by inclusions of subjects relating to green technologies and occupational safety. Specialization of competencies incorporates standards for green occupations. Additional subjects related to environment and ecology are included in professional education as elective competencies. Based on these pedagogical reforms, “Green Garden” has been conceptualized as a best practice in Mongolia. Green garden is a cooperation program of employers and training organizations piloted in the Vocational Training and Commerce Center of Arkhangai province to produce competency based training program i.e. Forester and provide appropriate training environment. A number of lessons learnt which stress the need for policy, legal framework and pedagogy approaches in strengthening TVET for environmental protection.

2.7.3 **BHUTANESE PERSPECTIVES ON TRANSFORMING TVET FOR THE GREEN ECONOMY** presented by **Mr. Bumchu Wangdi**, Principal, Thimpu Institute of Automobile Engineering, Bhutan

Mr. Wangdi explained the core philosophy of Bhutan’s national development which is anchored on Gross National Happiness (GNH). Environmental and sustainable use of the environment, as well as balanced economic development has always been part of the strong pillars of development in Bhutan. One of the main principles of Bhutan’s Vision 2020 is pursuing sustainable development and demonstrating capacity to effectively respond to challenges and possibilities. By

these, shifts in the economy are significantly considered in Bhutan's pursuit of holistic development. He stressed that TVET plays a crucial role in meeting the core development philosophy of Bhutan by preparing skilled workforce for green jobs anticipated to eventually be demanded in Bhutan's predominantly service-oriented industry.

2.7.4 **NEPALI PERSPECTIVES ON TRANSFORMING TVET FOR THE GREEN ECONOMY** presented by **Mr. Jay Bahadur Tandan**, Member Secretary, Council for Technical Education and Vocational Training, Nepal

Mr. Tandan shared Nepal's perspectives on green economy, impact of local environmental issues such as deforestation, water contamination, wildlife conservation and carbon emissions to country's overall resources. While he stressed Nepal's negligible contribution to global climate change, effect is widely felt in the country. The Council for Technical and Vocational Training (CTEVT) is an apex body of TVET in charge of formulating TEVT policies, coordinating programs, developing and expanding TEVT through training provisions and ensuring quality of TEVT in the country. Nepal, which considers the greening of economy to be simply being a concern for ensuring low carbon emission, resource efficiency and social inclusiveness is strong in adhering to its commitment related to addressing environmental issues that consequently build the foundation to prepare for the green economy. Nepal, he said, is signatory to the UNFCCC, the Vienna Convention, CBD and Basel Convention. Nepal's climate change policies set new directions for mitigating and adapting to climate change. To further strengthening existing policy interventions, TVET sector is suggested to contribute significantly in the building of capacity of its people to expand participation and empowerment. Green TVET-related research and related initiatives are also recommended to expand adaptive capacity of the country and adopt programs using appropriate technologies. Technology development, transfer and utilization as well as developing and implementing scientific methods for natural resources management, also deemed necessary. Mr. Tandan emphasized that the existing educational paradigms are yet to prove they are adequate to address these burning issues on green economy and meeting green jobs. Paradigm shift towards re-orienting institutional capacity building, curriculum and technology development, technology transfer and use, policy strategies and better knowledge on Green TVET are highly recommended.

2.7.5 **MYANMAR PERSPECTIVES ON TRANSFORMING TVET FOR THE GREEN ECONOMY** presented by **Ms. Mya Mya Oo**, Rector, Yangon Technological University, Ministry of Science and Technology, Myanmar:

Ms. Oo provided detailed initiatives in Myanmar in harnessing the potential of the country's natural resources. Most of the green development initiatives in Myanmar are associated with rural development strategies. The core concepts of greening Myanmar's economy is significantly linked with alleviating poverty, promoting sustainability of environmental resources and developing rural technologies to assist local communities. Specifically, the greater use of renewable or alternative energy (solar, hydro, tidal, wind, biogas, biomass and biofuel) in

promoting rural development is a major undertaking by the MOST. Through MOST provisions, the implementation of relevant sustainable development-oriented training programs by public technical institutions like the Yangon Technological University, Mandalay Technological University, to mention a few, support this direction and additionally open up new opportunities for creating green jobs and livelihood sources in rural villages. However, key challenges in current efforts are the limited electricity access especially in rural areas, lack of technology in key public sectors, lack of sufficient financial, technical and human capitals to support nationwide approaches to developing economy, stimulating private sector participation and access to external funding resources. She stressed Myanmar's keen interest in transforming TVET in support of green economy to meet requirements for more green skill research projects that could promote greater reach of poverty reduction efforts in remote villages.

2.6.12 Summary of Session

Eleven country perspective papers were presented which depicted progress made by the different countries in the Colombo Plan region in relation to green economy and greening TVET. Countries are in different stages of development, which have an impact on the level of achievements made so far. The Republic of Korea and Malaysia are two of the countries with strong policy environment or emerging policy framework for pursuing green development. The green growth policy was formulated in Korea to further guide national and institutional level efforts in adapting strategies for the green growth engines identified. Excellent incentive schemes have been formalized in Malaysia, on the other hand, to stimulate interest to pursue green growth. Policy structures have been solidly planted which require consistent work to achieve significant progress in key result areas. Relevant programs were adopted in implementing the integration of green technologies and concepts in the curriculum, training regulations and standards in countries like the Philippines, Fiji and Mongolia. Countries like Sri Lanka, Myanmar, Pakistan, and Maldives depicted strong agenda for developing sustainable development practices linked with other national priority programs like youth skilling, addressing unemployment and alleviating poverty. In all presentations, it has become evident that a strong policy framework will need to be put in place to stimulate greater push for anticipating green economy and green jobs opportunities.

2.8 Study Visit

The meeting provided opportunities for participants to learn about the German experiences in water industry and wastewater sector development. Participants visited the Wastewater Treatment Plant in Bonn and a Drinking Water Reservoir/ Water Treatment Plant of Bonn where they gained an overview of the various water technologies, approaches in water resources management in the German water sector, water technician training systems and operations of sewage systems.

A lecture on “Advanced Technologies in the new Surface Water Treatment Plant” by Mr. Oluf Hoyer of The Wahnbach Reservoir Association discussed the theoretical aspect of operating the water reservoir in Bonn. This was supplemented by actual visit to facilities and observation of the water treatment process from its raw form down to the final stage of potable water being ready for distribution. The treatment process is so effective that tap water in the area served by the treatment plant is potable without further filtration.



Moreover, a visit to the headquarters of the German Association for Water, Wastewater and Waste (DWA) afforded participants new insights on the German training systems, German and the European standardization system in water sector, the structure of technician qualifications and the role of the DWA in TVET delivery, through a special lecture on “Technical Standardization, Continuous Learning and Professional Development in the Water Sector” made by Mr. Rudiger Heidebrecht, Head of Department, Training and International Cooperation, DWA. He also shared DWA’s approaches in capacity development through vocational training and support to other countries in advisory capacity and technical training, for example DWA had been involved in GTZ projects for water industry development in Palestine, Jordan and Egypt.

Selected delegates from relevant institutions actively involved in water technician education and training were convened to review and provide critical inputs to the draft framework for *The Greening TVET Toolkit* Project initiated by UNESCO-UNEVOC as a resource material for supporting the enhancement of water sustainability through TVET.

In view of the key learning gained from the study visits and workshop dedicated to review the Greening TVET Toolkit, delegates took home both theoretical and experiential insights that could guide developing countries in harnessing strategies for TVET for water sustainability. Using the German model, participants were also tasked to take stock their own country potentials as well as education and training approaches for possibilities of replicating best practices or further linking up with DWA and other relevant agencies for more information, advisory or technical support needed to fully realize TVET’s potential in water sector development particularly in developing countries.

Study visits

TVET plays a crucial role in developing water technicians and other emerging occupations associated with water sector development. The development of a toolkit in relation to green TVET for water sector development would be further explored and elaborated as UNEVOC takes the lead in finalizing concepts and approaches and integrating them with the key lessons learned and country contexts relevant to the use of a standard toolkit in cooperation with other German agencies.

2.9 Working Group Discussion

2.9.1 Conclusions of the working group discussion

Three working groups were convened on the last day of the meeting to discuss in detail three essential areas to be considered in identifying approaches for green transition and articulating requirements for TVET. Working group session for Policy and Frameworks discussed what role TVET must play in the green transitions and what policies and frameworks would be necessary to move to this direction. Working group session for Curriculum and Programs deliberated how the curriculum can reflect changes and needs and how TVET must respond to the demands for change of such transition. Working group session for Capacity Development through networking discussed drawing relevant priority areas and content for capacity development. The outcome of group discussions reflected the wide-ranging points and inputs given by the three groups.

2.8.1.1 Policy and Framework: The Role of TVET in the Transition to Green Society and Green Economy

On policy and framework, the group covered the challenges and policy implications that countries may face in transforming TVET towards transitioning to the Green Society and Green Economy. The TVET policies needed to support the direction of developing a comprehensive framework for greening TVET was also discussed. The main challenges highlighted were clustered into National challenges and Industry-based challenges. The first cluster includes (1) initial investment cost, (2) sovereign capital fund, (3) awareness of the green aspects to economy and society, (4) integration of green curriculum, and (5) country protocol towards TVET. Curricula and alignment to greening TVET, capacity building, facilities and infrastructures (equipment, devices and laboratory) and the integration of different training institutions and strengthening of coordination are among the challenges observed in the education sector. In the industry sector, (1) awareness on green technology, (2) lack of green technology and (3) tax incentives schemes are among the issues expected to be confronted in taking this direction. The



formulation of policies that could support greening of TVET institutions through the development of Green Campus, Green Technology, Green Community, Green Research and Green Culture had been strongly recommended. A model policy framework for greening TVET was then proposed highlighting six major policies with the strategies, actions and indicators to be used. These policies include (1) development of a TVET Protocol, (2) creation of a Green TVET fund, (3) formulation of an HRD Plan for TVET, (4) identification of Core Areas in Green Technology, (5) development of Green Curriculum in TVET, and the (6) strengthening of green Research and Development initiatives.

2.8.1.2 Curriculum and Programs: Emerging Occupations and its Implications for TVET

On Curriculum and Program, discussion focused on the green-based occupations projected and add-on priorities, and the implications and structural changes recommended for curriculum and their implementation. In the light of the greening of economy, four priority green occupations were projected for TVET to focus on, which are engineering technician assistant, construction technician, organic agriculture technician and power generation technician (solar, wind, biogas and hydro). Structural changes for student curriculum seen to be of urgent priority are adaption of advanced research-based technologies based on localized needs, lifting of relevant international standards, job analysis, adherence to national and international standards, work-based learning within curriculum, inclusion of generic skills, curriculum update which could either mean changing or topping-up on percentage basis, green entrepreneurship and recognition of prior skills from the workplace. For teacher training curriculum, industry immersion, capacity building with support from industry, programs for sensitizing TVET teachers for sustainability and establishing incubation centers for green technology researches.

2.8.1.3 Capacity Development through Networking: Transforming TVET for Meeting the Challenges of Green Economy

On Capacity Development through Networking, deliberation centered on the definitive requirements for capacity development, using the power of networking as a platform to support capacity development and proposed strategies. In view of the differentiated needs and approaches for capacity development by different levels of stakeholders which are students, educators, employers and others, specifically identifying capacity development needs for each cluster would be necessary. It was well-recognized that technology transfer or learning new technologies appears as common need for all the segments. Towards this end, international, regional, national and industry-based networking are needed, while institutional networking would benefit the process of building capacity in thematic areas. Suggestions for expanding activities to sensitize concerned sectors, scale up efforts, build commitment, establish cooperation and transfer technology would add value to this direction.

It was stressed during discussion that training on green skills must ensure matching green jobs to can absorb them. It was warned that there should not be any gap between education and jobs, in cases when countries' labor market is not fully prepared for green development. In response to this, it was highlighted that the growing expansion and changes in people's lifestyle are anticipated to cause the demand naturally, hence the market for green skills is sure to expand exponentially. Implementation of a fair and balanced framework that takes into account different contexts and requirements of countries in those key areas discussed was also emphasized.



Working group sessions

3. Meeting Conclusions & Way Forward



Closing session led by CPSC, UNESCO-UNEVOC and GIZ

3.1 Meeting Outcomes

The meeting concluded with a strong challenge to delegates to take advantage of the information and lessons drawn from the meeting and further sensitize TVET communities in respective countries of the expanding principles of TVET for sustainable development in view of economic growth and environmental stewardship.

Similarly, delegates should take advantage of the available platforms for greening TVET to make the TVET sector adapt to the requirements of transitions to green economy. International and global cooperation arrangements has a promising potential to allow the pursuit of inclusive journey noting that developed countries have made substantial advancements in mitigation and adaptation practices that other developing countries could learn from and identify with in the context of country requirements and potentials for meeting the challenges of the green economy.

The concept of green economy has mainstreamed into the work of the United Nations. Similarly, the mainstreaming of TVET into the priorities of UNESCO and other international organizations makes it logical for TVET to figure out necessary preparatory processes to develop and integrate skills, attitudes, knowledge and behavior into technical and vocational streams. Similarly, TVET process must take into account green skills requirements in the labor market to ensure that workforce are prepared for green jobs and occupations that are accurately forecasted and widely available in immediate future. Sustainable development principles as articulated in Agenda 21, and the differentiated responsibilities that can further be elaborated in the UN Conference on Sustainable Development once it convenes in 2012 will provide useful process for TVET.

Indicating that top-bottom (national) and bottom-up approach (institutional) approaches are needed to mobilize interventions of TVET, an integrated approach on policy, curriculum framework development and capacity development will be useful towards providing well-informed and synergic directions.

The meeting has successfully benefitted from the collaboration established among participating organizations and agencies, and from enriched sharing of information, initiatives and experiences with a promise of utilizing them in subsequent discussion at higher level to be led by UNESCO-UNEVOC with GIZ, CPSC, ILO, ETF etc. Towards this end, efforts should lead to having a holistic policy framework with particular focus on greening TVET to realize logical integration of the pillars of sustainable development into the green dimensions that TVET must now fit into its agenda.

UNESCO-UNEVOC was encouraged by all partners and delegates to take the lead. GIZ, as a close partner, could see supporting towards this direction particularly that capacity development for different levels of stakeholders had been reinforced in the discussion as an imperative to realize the objectives of green TVET transitions. Drawn from past lessons, establishing training provisions along the lines of labor market requirements will need to be ensured. The participation and activation of support of UN National Commission in each country would add value to these efforts.

CPSC, for its part, will be very much willing to work in synergy with its member countries in developing flagship regional programs on Green TVET and green transitions and take advantage of the cooperative framework that has long been established through CPSC and its TVET network in the Asia-Pacific region.

3.2 Fulfillment of the Objectives

The meeting provided the opportunity for participants who came from highly-diversified groups of economies to be aware and develop further a common understanding of the concept of green economy and greening TVET. A thorough examination and dynamic interaction on the role of TVET in the emerging green economy took place through the presentation of various organizations and country initiatives, as well as conceptual and implementation frameworks in regions where green economy has already evolved. The discussion brought about ideas on how to address new and emerging challenges in TVET for meeting the labor market demands. The good practices were significantly shared among countries and regions. The opportunity to discuss during working groups allowed planners and implementers to review current level of capacities, gaps and future opportunities that can be explored to initiate smooth transition to green economy taking into consideration the needs of the labor market and the kinds of jobs that will be required.

3.3 Conclusions

At the end of the meeting, it was agreed that greening TVET should be elevated into the mainstream education and training agenda keeping in mind the core concepts of sustainable development and emerging patterns of economic development that exercises ecological responsibilities. Through examining broader concepts, a framework for Greening TVET will need to be enhanced to pave the way for the development of a formal policy guide document in advancing transformations to a greener TVET, and further inform the UNESCO Strategy for Greening TVET. Concerned agencies and stakeholders from both the public and the private sectors should continue creating opportunities for developing capacities and collaborating towards the development of toolkits or institutional level frameworks in aid of systematic and sectoral green transitions. For example, water and energy resources are critical areas in which green TVET could exercise transformational model of reforms without losing sight of industry patterns of green growth and traditional supply-demand frameworks.

UNESCO-UNEVOC with the support of partners GIZ and CPSC, and in further consultation with ETF, ILO and other similar organizations, is entrusted to take the lead and finalize the approach for developing policy and holistic framework for Greening TVET, aligned with transformational model and principles for initiating adaptation and mitigation practices in TVET sector. Opportunities for initiating implementation approaches for ESD in TVET through a Global Leadership Development Program or operationalizing a Global TVET Academy for Sustainable Development, as jointly suggested by UNEVOC and GIZ, would be useful both as a process and as a pioneering model for global integration for meeting the green economic objectives.

Networking to further promote strategies for greening TVET shall be harnessed. By being aware of what global cooperation arrangements exist in greening TVET and what thematic priorities, labor market information or implementation modalities are available, could assist further in mapping up opportunities for gathering needed support in terms of policy advisory, financial subsidy, or conceptual development of green TVET structure.

The outcome of the meeting is intended to be reflected in the imminent development of an International Framework for Greening TVET and serve as input to agenda-setting and policy development mechanisms of the forthcoming UN Conference for Sustainable Development (Rio+20) which is anticipated to become a landmark forum to take up the transition towards Green Economy.

Countries represented were encouraged to disseminate information and organize country-level meetings to sensitize relevant levels of stakeholders at the ministry level, academe and private/ industry sectors of the high potential of green sector development and how TVET's role should be articulated to harness policy-level and other forms of supp

3.3 The Way Forward

In view of the above conclusions, the meeting has put forward the following recommendations for future actions:

- 1. Recognizing the importance of coming up with a holistic strategy for greening TVET, a Greening TVET Framework needs to be developed, critically reviewed and endorsed to articulate systematic and guided transformational strategies in TVET sector and strengthen capacities to meet the challenges of the green society and economy. Specific strategies and actions at the National, Institutional and International levels need to be elaborated to build sequential synergy of efforts. The said framework will complement or serve as an integral part of the landmark global initiatives such as the Rio +20 slated in the middle of 2012 and further inform UNESCO TVET strategy for green TVET at the local, national and regional levels.**
- 2. Understanding the many fragmented efforts in making TVET respond to the challenges of climate change, developing a Green TVET framework needs to consider a holistic approach that takes into account all important aspects of TVET for the green society and economy, which include but not limited to (1) National policy to address both legal framework and funding mechanisms, (2) Capacity development of both students and teachers, (3) Green curriculum framework to develop skills, attitudes, values and knowledge, (4) Green jobs available in the labor market, (5) Skills and qualifications standardization and (5) International partnerships and networking.**
- 3. A holistic framework for institutional transformation to greening TVET should include five major dimensions of greening TVET namely Green Campus, Green Curriculum, Green Community, Green Research and finally Green Culture.**
- 4. Affirming the double dividends of green economy, which are achieving sustainability with the right kind of economy and alleviating poverty, TVET sector must recognize that green transitions is no longer an option but a necessity. Developing and developed countries must identify common grounds and complementary working strategy to achieve smooth transition.**

- 5. Green skills development must follow the patterns of emerging green sectors, with careful effort to make use of data drawn from quantitative and qualitative methodologies towards forecasting accurate labor market information within a given green economy for over a given period of time.**
- 6. Partnership remains a viable tool for integrating fragmented actions, formulating shared visions and goals and diversifying implementation of differentiated responsibilities in green economy transitions. The role of the private sector/ industries in respect to articulating multi-dimensional aspects of Green TVET, will need to be emphasized.**
- 7. The UNESCO-UNEVOC in collaboration with relevant organizations (i.e. CPSC, GIZ, ILO, ETF etc.) must take the lead in initiating strategies and promoting Greening TVET. The development of resource materials, for example the Greening TVET Toolkit Project as a pilot material, is highly commended as a best practice in supporting TVET for water sustainability. Similar materials that could articulate TVET's role in promoting sustainability in other critical sectors (i.e., energy, etc.) could be developed and circulated for critical review among stakeholders.**
- 8. Opportunities for initiating implementation approaches for ESD in TVET through a Global Leadership Development Program or operationalizing a Global TVET Academy for Sustainable Development, as jointly suggested by UNEVOC and GIZ, should be continuously created.**
- 9. CPSC in demonstrating regional leadership in Asia-Pacific, will take a proactive role in promoting Green TVET by incorporating green TVET index and balance scorecard into regional quality assurance (i.e., Asia-Pacific Accreditation and Certification Commission) and develop relevant instruments towards this direction.**
- 10. In view of the projected importance of the Rio+20 forum in so far as the decisions to be made with respect to pursuit of ESD for the next decade, TVET's response to green transitions must be formally articulated and the output of the meeting must serve as significant inputs to discussions of the upcoming Rio+20 meeting.**

Annex 1: Programme

<u>Day one: Thursday, 27 October 2011</u>	
<u>Venue:</u> UN Campus - room 2705	
09:30 - 10:45	<p>Inauguration</p> <p>Master of Ceremony: <i>Ms. TJ Gayondato, Manager, Colombo Plan Staff College for Technician Education (CPSC)</i></p> <p>Welcome Remark by Mr. Shyamal Majumdar, Head of the UNESCO-UNEVOC International Centre</p> <p>Opening Addresses by</p> <ul style="list-style-type: none"> ➤ Mr. Peter Thiele, Head of Division Policy Issues of initial and Continuing Vocational Training, Federal Ministry of Education and Research (BMBF) ➤ Mr. Klaus-Dieter Przyklenk, Senior Advisor TVET and Labor Markets, on behalf of Federal Ministry for Economic Cooperation and Development (BMZ) ➤ Mr. Mohammad Naim Yaakub, Director General, Colombo Plan Staff College for Technician Education (CPSC) ➤ Mr. Olivier Laboulle, Head, Secretariat, UN Decade of Education for Sustainable Development (2005-2014), German National Commission for UNESCO <p>Video Presentations</p> <p>Brief Introduction by Participants</p> <p>Vote of Thanks on behalf of the Organizers: Mr. Harry Stolte, Human Capacity Development in TVET / UNEVOC Centre Magdeburg (GIZ)</p>
10:45- 11:05	Photo session and coffee & tea break
11:05-11:15	<p>Programme Orientation</p> <p>- Programme objectives and scope of the meeting by Ms. Naing Yee Mar, Programme Officer, UNESCO-UNEVOC International Centre</p>
11:15 - 12:00	<p>Session 1: Keynote presentations</p> <p>Theme: Transition to the Green Society and Green Economy and the Role of TVET</p> <p>Chaired by Mr. Mohammad Naim Yaakub, Director General, (CPSC)</p> <ul style="list-style-type: none"> ➤ Mr. Shyamal Majumdar, Head of UNESCO-UNEVOC International Centre ➤ Mr. Harry Stolte, Human Capacity Development in TVET / UNEVOC Centre Magdeburg (GIZ)

	- Q &A (15 minutes)
12:00 - 13:00	<p>Session 2: Keynote presentations Theme: Emerging Green Occupations and its Implication for TVET Chaired by Ms. Wendi Howell, Program Director, Center on Education and Training for Employment (CETE), The Ohio State University</p> <ul style="list-style-type: none"> ➤ Ms. Christine Hofmann, Skills Development Officer, International Labour Organization (ILO) ➤ Mr. Arne Baumann, Labour Market Specialist, ETF Operations, European Training Foundation (ETF) ➤ Ms. Helene Optiz, German Water Association (DWA) <p>- Q &A (15 minutes)</p>
13:00– 14:00	Lunch
14:00- 15:00	<p>Session 3: Keynote presentations Theme: Transforming TVET for Meeting the Challenges of the Green Society and Green Economy: Regional & International Cooperation Chaired by Mr. Shyamal Majumdar, Head of UNESCO-UNEVOC International Centre</p> <ul style="list-style-type: none"> ➤ Mr. Mohammad Naim Yaakub, Director General, Colombo Plan Staff College for Technician Education (CPSC) ➤ Mr. Klaus-Dieter Przyklenk, Senior Advisor TVET and Labor Markets, on behalf of Federal Ministry for Economic Cooperation and Development (BMZ) ➤ Mr. Reinhold Weiß, Vice President and Head of Research of the Federal Institute for Vocational Education and Training (BIBB), Germany <p>- Q & A (15 minutes)</p>
15:00 – 16:15	<p>Session 4: Regional/National Perspectives Theme: Transforming TVET for Meeting the Challenges of the Green Society and Green Economy Chaired by Mr. Harry Stolte, Human Capacity Development in TVET / UNEVOC Centre Magdeburg (GIZ)</p> <ul style="list-style-type: none"> ➤ Mr. Yo Heo, Professor, Seoul Institute of Vocational and Advanced Technology Training (SIVAT), HRD Service of Korea ➤ Mr. Jorge Arturo Casados Prior, The Mexican Institute for Water Technology (IMTA), Mexico ➤ Ms. Wendi Howell, Program Director, Center on Education and Training for Employment, The Ohio State University, USA ➤ Mr. Mahmoud Abdel Fattah Elkady, Technical Education Sector, Ministry of Education, Egypt <p>- Q & A (15 minutes)</p>
16:15 – 16:30	Coffee & tea break
16:30 – 17:30	<p>Session 5: Regional/National Perspectives Theme: Transforming TVET for Meeting the Challenges of the Green Society and Green Economy Chaired by Ms. Dagmar Winzier, Expert in VET for Sustainable Development, the Federal Institute for Vocational Education and Training (BIBB)</p>

	<ul style="list-style-type: none"> ➤ Mr. Eduard Kalitski, International Cooperation Department, Republican Institute for Vocational Education (RIPO), Belarus ➤ Mr. Klaus Sodemann, Senior Business Development Manager TVET at GIZ GmbH Location Saudi Arabia, Technical and Vocational Training Corporation, Saudi Arabia ➤ Ms. Jahou Samba Faal, Director of Academics, Gambia Technical Training Institute, Gambia <p>- Q & A (15 minutes)</p>
18:00	Welcome dinner reception
<u>Day two: Friday, 28 October 2011</u> <u>Venue: UN Campus - room 2705</u>	
09:00-09:30	Review of day one and introduction to day two By Ms. Naing Yee Mar , Programme Officer, UNESCO-UNEVOC and Mr. Rajesh Khambayat , Faculty Consultant, CPSC
09:30 - 10:25	Session 6: Country Perspectives Theme: "Transforming TVET for the Green Society and Green Economy: Policies, Programmes, Challenges and Achievements" Chaired by Mr. Teeluck Bhuwaneer, Head of UNEVOC Network, UNESCO-UNEVOC <ul style="list-style-type: none"> ➤ Mr. Heon Bae Jeong, Professor, Chung Ang University, Ministry of Education, Science and Technology, Republic of Korea ➤ Mrs. Zainab Musri, Head of Electrical Department, Port Dickson Polytechnic, Department of Polytechnic Education, Ministry of Higher Education, Malaysia ➤ Mr. Ernesto A. Beltran, Executive Director, International Program Development Unit/Special Projects, Technical Education and Skills Development Authority (TESDA), Philippines ➤ Mr. Chithral Ambawatte, Director General, Department of Technical Education and Training, Ministry of Youth Affairs and Skills Development, Sri Lanka <p>- Q & A (15 minutes)</p>
10:25-10:40	Coffee & tea break
10:40-11:35	Session 7: Country Perspectives Theme: "Transforming TVET for the Green Society and Green Economy: Policies, Programmes, Challenges and Achievements" Chaired by Ms. TJ Gayondato, Manager, Colombo Plan Staff College for Technician Education (CPSC) <ul style="list-style-type: none"> ➤ Mrs. Nyla Qureshi, Director General (A&F), National Vocational and Technical Training Commission, Prime Minister's Secretariat, Pakistan ➤ Mr. Silvio Vueti Tawake, Senior Education Officer, Ministry of Education, National Heritage

	<p>Culture & Arts, Youth and Sports, Fiji Islands</p> <ul style="list-style-type: none"> ➤ Mr. Zubair Mohamed, Chief Executive Officer, Maldives Polytechnic, Ministry of Education, Maldives ➤ Ms. Tsolmon Shagdarsuren, Legal Counsel, Agency of TVET, Mongolia <p>- Q & A (15 minutes)</p>
11:35-12:30	<p>Session 8: Country perspectives Theme: "Transforming TVET for the Green Society and Green Economy: Policies, Programmes, Challenges and Achievements" Chaired by Ms. Naing Yee Mar, Programme Officer, UNESCO-UNEVOC</p> <ul style="list-style-type: none"> ➤ Mr. Sayed Aminullah Alizai, Program Director, National Skills Development Program, Ministry of Labour, Social Affairs, Martyrs and Disabled, Afghanistan ➤ Mr. Bumchu Wangdi, Principal, Thimphu Institute of Automobile Engineering, Bhutan ➤ Mr. Jay Bahadur Tandan, Member Secretary, Council for Technical Education and Vocational Training, Nepal ➤ Ms. Mya Mya Oo, Rector, Yangon Technological University, Ministry of Science and Technology, Myanmar <p>- Q & A (15 minutes)</p>
12:30-13:30	Lunch
13:30-18:00	<p>Study Visits</p> <ul style="list-style-type: none"> ➤ Wastewater treatment plant in Bonn (by bus from UNESCO-UNEVOC), Gensemer Straße, Tel.: +49 228/42 99 14-0 ➤ Solar World in Bonn, Martin-Luther-King-Straße 24, Bonn, Tel: +49228 55920-0 (www.solarworld.de)
<p><u>Day three: Saturday, 29 October 2011</u> <u>Venue: UN Campus - room 2705</u></p>	
09:00-09:30	<p>Review of day two and introduction to day three</p> <p>By Ms. Naing Yee Mar, Programme Officer, UNESCO-UNEVOC and Mr. Rajesh Khambayat, Faculty Consultant, CPSC</p>
9:30- 11:30	<p>Session 9: Parallel Working Group Sessions</p> <p>Working Group 1: <u>Thematic Area I: The Role of TVET in the Transition to the green society and green economy (Policy & Framework)</u> Facilitator: Mr. Rajesh Khambayat & Ms. Ken Barrientos (CPSC)</p> <p>Working Group 2: <u>Thematic Area II: Emerging green occupations and its implication for TVET (Curriculum & Programme)</u> Facilitator: Ms. TJ Gayondato (CPSC)</p> <p>Working Group 3: <u>Thematic Area III: Transforming TVET for meeting the challenges of green society and green economy (Networking & Capacity building)</u></p>
Coffee & tea break in between	

	<i>Facilitator: Ms. Naing Yee Mar (UNESCO-UNEVOC)</i>
11:30-13:00	Session 10: Report of Working Groups (to be presented by elected Working Group Chair) Chaired by Mr. Rajesh Khambayat, Faculty Consultant, CPSC Working Group 1 Working Group 2 Working Group 3 Q & A (30 minutes)
13:00 – 14:00	Lunch
14:00-15:00	Session 11: Panel Discussion: Where To From Here? Chaired by UNESCO-UNEVOC, GIZ, CPSC Open Discussion and Q & A by participants
15:00 – 15:30	Coffee & tea break
15:30- 16:30	Official Closing and Certificate Awarding Ceremony Master of Ceremony Ms. TJ Gayondato, Manager, CPSC
<u>Day four: Sunday, 30 October 2011</u>	
09:00-11:00	Study visit to Drinking Water Reservoir of Bonn (Wahnachtalsperrenverband, Siegelsknippen, 53721 Siegburg)
11:30-13:00	Study visit to DWA- lecture “Technical Standardization and Continuous Learning” (DWA German Association for Water, Wastewater and Waste, Theodor-Heuss-Allee 17, D-53773 Hennef)
13:00-14:00	Lunch
14:00/14:30	Working session (Theodor-Heuss-Allee 17, D-53773 Hennef) chaired by Mr. Rüdiger Heidebrecht, Head of Department Education and International Cooperation, Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e.V. (DWA); Mr. Shyamal Majumdar; Ms. Naing Yee Mar. Participants to this session will validate a draft toolkit framework aiming to serve as an informational reference for TVET educators and practitioners which summarizes what is currently known about the potential and conditions in promoting TVET policy and practices for water sustainability. Invited institutions will be requested to provide critical input to the draft framework of the booklet which is the first in a series of The Greening TVET Toolkit Project, and to represent country/regional specific experience, practices and lesson learnt related to water education and programme development to be demonstrated in this booklet

Annex 2: List of Participants

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Acronyms

BLS	Bureau of Labor and Statistics
CES	Current Employer Statistics
CBD	Convention on Biological Diversity
COP	Code of Practice
CPSC	Colombo Plan Staff College for Technician Education
DESD	Decade of Education for Sustainable Development
DWA	German Association for Water, Wastewater and Waste
ESCAP	Economic and Social Commission for Asia-Pacific
ESD	Education for Sustainable Development
ETF	European Training Foundation
GNEO	Green New and Emerging Occupations
GESO	Green Enhanced Skills Occupations
GIDO	Green Increased Demand Occupations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ILO	International Labor Organization
OES	Occupational Employer Statistics
QCEW	Quarterly Census of Employment and Wages
R&D	Research and Development
SD	Sustainable Development
STEM	Scientific, Technological, Engineering and Mathematical skills
ToT	Training of Trainers
TVET	Technical and Vocational Education and Training
UN	United Nations
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEVOC	International Centre for Technical and Vocational Education and Training
VET	Vocational Education and Training

