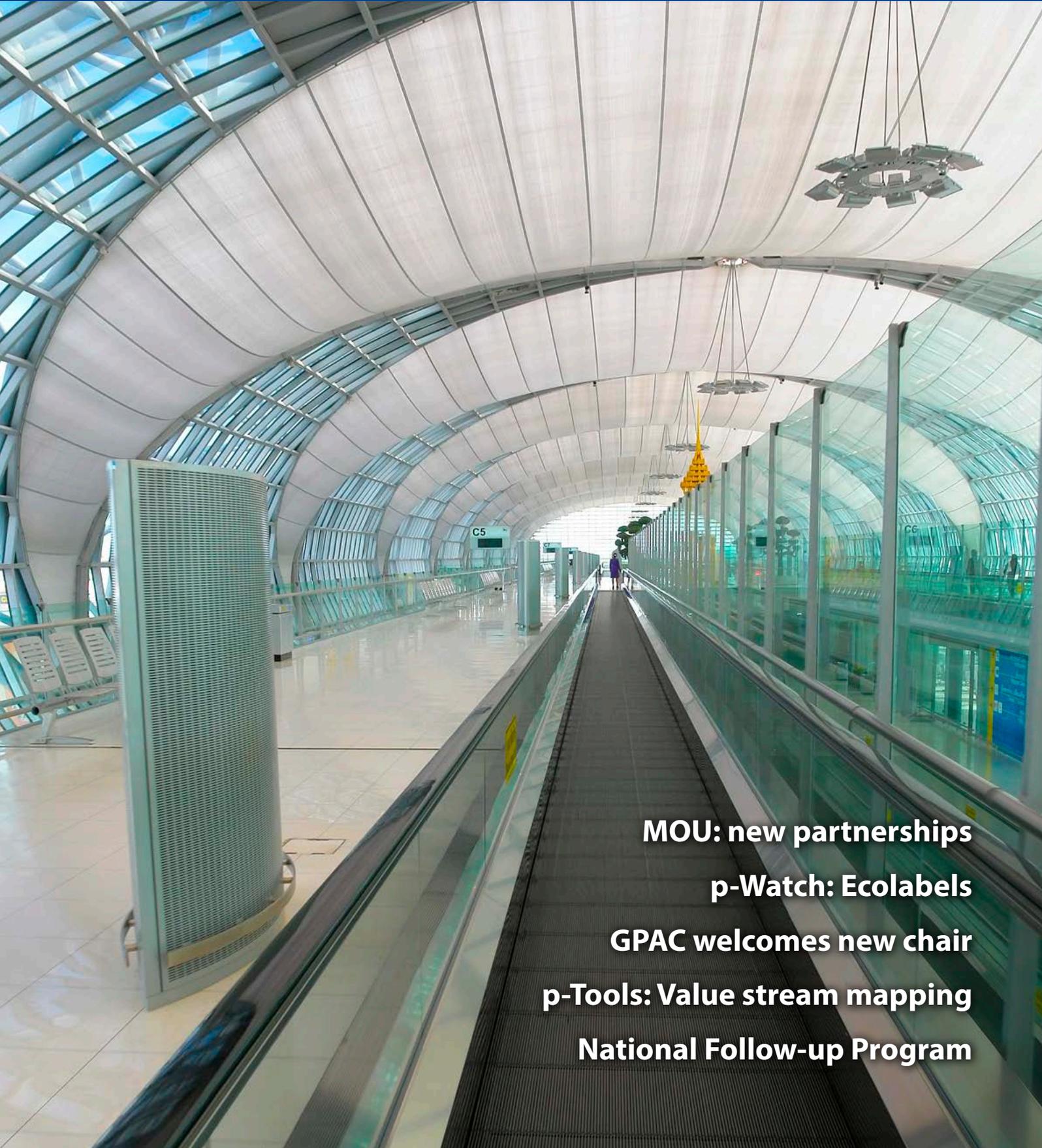


APO NEWS

Information to Make a Difference in Productivity

March–April 2016 • Volume 46 Number 2 • ISSN: 1728-0834



MOU: new partnerships
p-Watch: Ecolabels
GPAC welcomes new chair
p-Tools: Value stream mapping
National Follow-up Program

Expanding the productivity network



(L-R) APO Secretary-General Mari Amano and CIRDAP Director-General Dr. Cecep Effendi shake hands after the MOU signing.

Regional partners in integrated rural development

A memorandum of understanding (MOU) between the APO and Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) was drafted, and CIRDAP Director-General Dr. Cecep Effendi visited the APO Secretariat to meet Secretary-General Mari Amano to sign the document officially. CIRDAP, an intergovernmental organization based in Dhaka, Bangladesh, was established in 1979 to promote integrated rural development in the Asia-Pacific region. The three-year MOU will not only serve as a framework to implement a series of collaborative programs for both organizations but also pave the way to building a solid new relationship based on shared interests, missions, and goals to achieve regional sustainable development.

Preparations are underway for four projects to be cohosted this year by the APO and CIRDAP under the framework of this MOU and implemented in cooperation with NPOs, starting with a course on organic agroindustry development leadership to be held in Bangladesh in May. Others will be a workshop on agricultural insurance systems, a productivity training course targeting women in micro and small agrifood-processing businesses, and a regional conference to discuss the greening of food supply chains.

Director-General Effendi noted that the MOU was significant for his organization, offering benefits such as attracting more international participants through the APO network and creating more opportunities to share CIRDAP's own local expertise and hospitality with the region. 🌐

Assisting productivity efforts in Colombia

Discussions are underway between the APO and Science and Technology Centre of Antioquia (Centro de Ciencia y Tecnología de Antioquia; CTA) on plans for assisting the city of Medellín, Colombia, in its local and national efforts to promote productivity and innovation based on an MOU signed in December 2015.

"Since 2012, the CTA has been implementing Enplanta, a program supported by the local government of Medellín focusing on transferring best practices of productivity improvement to local businesses. The productivity movement will soon extend beyond the Antioquia region, as a tripartite agreement between the Ministry of Commerce, Industry and Tourism, Mayor of Medellín, and CTA will soon be signed with the objective of promoting productivity and building competitiveness on a national level. With such developments, the MOU is crucial for us, as this is a challenge

continued on page 3 ▶



CTA Assistant Director and Director of the Productivity Line Arboleda Palacio (R) with Embassy of Colombia in Japan Communications Attaché Paula Esguerra (L) and Economic Development of Antioquia Province Secretary Tomás Cipriano Mejía (C).

for which the APO's support, experience, and capabilities will be very important," noted CTA Assistant Director and Director of the Productivity Line Jaime Arboleda Palacio.

The CTA is a private law and not-for-profit corporation established in 1989 by the Government of Antioquia, business representatives, and universities to support the economic and social development of the region. In recent years, in cooperation with the Mayor's Office of Medellín through its International Cooperation Agency, as well as the Ministry of Commerce, Industry and Tourism, the CTA has been

mandated to develop a framework to contribute to national development through the enhancement of productivity.

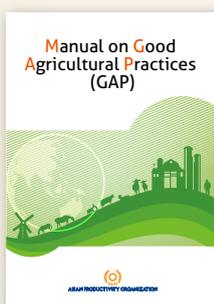
The parties met in August last year at the APO Secretariat to discuss how the CTA could benefit from the APO's experience and expertise in the area of productivity promotion. The MOU sets out the general scope for cooperative activities and exchanges between the two organizations on various subject areas, including training and capacity building of productivity practitioners, Green Productivity, and productivity measurement. 🌱

New publications



Policy Development for Green Productivity Promotion: Evidence from Asian Productivity Organization Member Economies

This is a compilation of findings from the Workshop on Policy Development for Green Productivity Promotion conducted by the APO in March 2015 to examine existing public policies and programs in the region to promote best practices in GP promotion.



Manual on Good Agricultural Practices (GAP)

To assist practitioners, producers, extension workers, and related professionals in disseminating sustainable agricultural development methods, this manual contains insights and experiences of resource persons on Good Agricultural Practices (GAP).

ISBN: 978-92-833-2463-8 (Paperback)
978-92-833-2464-5 (PDF edition)

GBM
Jakarta
19–21 April, 2016

58th GBM to convene in Jakarta

The 58th Session of the APO Governing Body will be held in Jakarta, Indonesia, 19–21 April, at the Hotel Mulia Senayan-Jakarta. The agenda for the meeting will include the Annual Report of the Secretary-General, approval of the APO Budget for the 2017–2018 Biennium, report on the proposed Roadmap to Achieve the APO Vision 2020, and appointment of the Secretary-General.



Ecolabels: greening productivity for universal good



Green Productivity is a combination of two fundamental concepts: sustainability, a synonym for continuity in production and consumption; and creating more while using less. “Green” and “productivity” are about the effective use of resources. Making more while taking less maximizes environmental benefits and economic returns, helping both commerce and the planet. How can GP-linked gains be measured and evaluated, since the latter is impossible without the former? The Global Ecolabelling Network (GEN) considered this question at its recent Annual General Meeting (AGM) of delegates from 50 countries and territories, especially relating to green or sustainable public procurement.

An ecolabel is an environmental stamp of approval, but not all are created equal. Vague terms not supported by scientific research cannot be used for measuring resource conservation or product comparisons. Included in these are “greenwash” terms such as “environmentally friendly,” “natural,” “harmless,” and “green” itself. The weakest version of an ecolabel is one created by a producer to market a product. It may be as straightforward as an isolated, sometimes irrelevant fact (“does not contain X”) or as fanciful as a dancing dolphin. The next rung up the ladder of credibility is occupied by well-supported, often third party-verified, claims in a defined sphere such as energy consumption or water use. Some examples, such as Energy Star or Fair Trade labels, are valid sources of information on specific facets of products or services.

The top rung is the preserve of ISO-defined Type 1 ecolabels. These are multifaceted, cover a range of environmental impacts, and have measurement definitions with independent verification. National and international ecolabel organizations supporting the Type 1 label code may

apply to become GEN members. GEN member programs require “licensed” applicants to track the entire life cycle of product components. A take-back scheme is incorporated in many specifications, leading to recycling, remanufacturing, and extension of component life, yielding economic and productivity benefits. As recycling and waste are core infrastructure issues for local authorities, and pollution generally concerns regional and national governments, the use of Type 1 ecolabels as procurement guides is especially beneficial. GEN member ecolabels also require license applicants to question their product supply chains to ensure sustainable productivity.

Type 1 ecolabels are outward signs for ethical consumption, a rapidly growing purchasing movement worldwide. If sales are the driving force behind production, then consumer purchasing patterns are important to manufacturers. GEN Ukraine member Living Planet recently polled nearly 1,000 consumers and found 82% willing to choose products with better environmental characteristics at higher prices. Regardless of price, 25% were willing to buy ecolabeled products. A global Nielsen survey found that 55% of the public were willing to pay more for items from companies “committed to positive social and environmental impact.”

In survey information provided for the GEN member (and government-owned) ecolabel Environmental Choice New Zealand, Colmar Brunton research (Better Futures 2015) found that nationwide purchasing behavior was increasingly influenced by sustainability, but 71% of respondents could not name a brand or an organization as a leader in sustainability, while 81% agreed that how businesses talk about social and environmental commitment was confusing and hard to





understand. While survey results vary, the trend is consistent. Companies are committing to green initiatives because they make good business sense, despite a lack of understanding in the marketplace.

There are two challenges in communicating the veracity, impact, and value of ecolabels. The first involves manufacturers and service providers, who may not realize that sales can increase when products and services carry a GEN-backed ecolabel. Secondly, consumers who are burdened with increasing amounts of “greenwash” need help identifying true ecolabeled products and services; research suggests they are desensitized by pseudoinformation. A clear, simple guide that shoppers can understand with ease, like the GEN member ecolabel, is necessary.

Consumers may respond to environmentally benign products and services with the so-called ecolabel effect, however. A study by the University of Missouri-Kansas City in 2013 found that coffee drinkers were willing to pay more for a cup of “ecolabeled” coffee than the identical product labeled “conventional” and claimed to enjoy it more. The conclusion was: “Ecolabels not only promote a willingness to pay more for the product but also lead to a more favorable perceptual experience of it.” A 2015 study by the University of Gävle, Sweden, set volunteers tasks to be conducted under two identical light sources, one labeled “environmentally friendly” and the other “conventional.” They felt more comfortable under the ecolabeled light and performed the tasks better. The ground for bogus ecolabeling is therefore fertile. However, GEN member Type 1 ecolabels inform consumers in a nonpartisan, ethical way, squeezing out pseudoscience and distinguishing promotional claims from genuine environmental performance.

The increasing recognition of GEN by other global organizations such as the UNEP, OECD, and APO is being reflected in its growing online presence and physical and informational outreach. At the recent AGM, the measurability of the impact of ecolabels received considerable attention.



Bjørn-Erik Lønn, the new chair of GEN, addresses the Asia Carbon Footprint Network Conference in Hong Kong during the GEN AGM week. Photo courtesy of GEN.

Several members have been developing metrics to evaluate the environmental impact of certified product categories and gave examples. A single water tap operating to the specifications of the Korean Eco-Label Program was shown to save 4,330 liters over a three-year period. Another GEN member found that using an ecolabeled air-conditioner reduced CO₂ by 4,010 kg per year, calculated from energy savings of 6,540 kWh.

The China Ecolabel (CEL) has the most certified products of any GEN member, and their combined estimated impact is massive, avoiding the emissions of 8.59 million tons of carbon dioxide, 205,000 tons of volatile organic compounds, 482,000 tons of carbon monoxide, and 64,000 tons of nitrogen oxide over a one-year period. Even more staggering is that CEL-certified products were estimated to have saved 227 million tons of water and 13.3 billion kWh of electricity in 2013

continued on page 6 ▶





Working groups at the GEN AGM last October worked on ecolabel impact measurement and GEN growth plans. Pictured (L–R) Semyon Gordyshevsky (Russia), Hiroyuki Kobayashi (Japan), and Guy Ladvocat (Brazil). Photo courtesy of GEN.

alone. The Singapore Environment Council is another GEN member leading from the front. Its Envision program is a positive force for changing behavior.

“Greener” workplaces result in lower staff turnover and less absenteeism, contributing considerably to productivity. Ecolabel programs increasingly provide environmental performance specifications and assessment processes for workplaces. Air quality, commuting distances and office transport, lighting, and other physical aspects are included in most “green office” standards. “This is one of many criteria categories operated by members of GEN that have an impact on commerce, manufacturing, and the purchasing patterns of governments, companies, and consumers,” stated Chair of the GEN Board of Directors Bjørn-Erik Lønn. “Ecolabeling is really a positive triple line, or win-win-win situation for the sake of reduced environmental impact, better business for the licensee, and the feeling of making the right sustainable choices among consumers and buyers for the benefit of the future. With the COP21 climate accord in Paris, the spotlight is turned, as never before, on the measurement of our efforts and our success in mitigating the human

attack on the environment. GEN members have a seminal role in that process.” 🌱



Michael Hooper is an award-winning communicator, journalist, editor, and photographer. Also an experienced radio and television director/presenter, Michael is marketing communications advisor for GEN, producing its on- and offline communications. He has guided web, video, and print output for government-owned Environmental Choice New Zealand for most of the last decade. Michael studied language, politics, and administration at Victoria University, Wellington. He currently lives with his partner at the historic eco-lodge Orongo Bay Homestead in New Zealand’s Bay of Islands and undertakes regular overseas assignments and engagements.

New era in the regional green economy



GPAC board members, with newly elected Chairperson Hajime Bada, Honorary Adviser, JFE Holdings, Inc.

“Utilizing the vast network of the APO to connect with Asian countries, the Green Productivity Advisory Committee (GPAC) hopes to continue to play an active role in achieving a sustainable society,” stated GPAC Chair Teisuke Kitayama, Chairman of the Board, Sumitomo Mitsui Banking Corporation, as he opened the 14th GPAC meeting, 3 February, at the Rihga Royal Hotel, Tokyo. In referring to COP21 and the adoption of the Paris Agreement, he stressed that, “These global events have a significant impact on the Japanese industry, not only in strengthening our own efforts for greater technological innovation and new business development in the area of the environment and energy, but also in sharing green technologies with other APO members in their development efforts.” The GPAC, established in 2003, is a unique network of high-level representatives from leading Japanese private-sector corporations with expertise in green business and green technologies. The APO works closely with the GPAC to benefit from members’ guidance on key GP programs such as the Eco-products International Fair (EPIF).

Attended by representatives from GPAC member companies as well as observers from the Japanese government, foreign missions, and other Japanese environmental and industrial agencies, the meeting had several agenda items, including the reappointment of the two vice chairs, a report on preparations for the 10th EPIF to be held in Thailand in June, and the endorsement of Vietnam as the host country for the 11th EPIF to be held in Ho Chi Minh City in 2017.

In his presentation, Director-General of the Federation of Thai Industries Jumrud Sawangsamud briefed the GPAC on efforts underway to promote the event. He emphasized that participation in the EPIF represented an opportunity for enterprises in the environmental field and sought the cooperation and support of the GPAC in making it successful. Representing the EPIF Preparatory Committee, Senior Advisor to ORIX Corporation and Committee Chair Yukio Yanase detailed the potential advantages of the EPIF and urged GPAC members to give their full support to it.

The meeting included the handover from former Chair Kitayama to Honorary Adviser, JFE Holdings, Inc., Hajime Bada. In his acceptance speech, the new chair expressed his commitment to the committee, noting that, “The recent global developments in the area of climate change mitigation have been a turning point for the activities of this committee. It will be a meaningful, honorable role to act as chair at such a critical time, and I look forward to making my greatest efforts to intensify the significance of this committee.”

In closing the meeting, the GPAC endorsed three proposals by Chair Bada: 1) In recognition of the significance of the upcoming 10th EPIF in the response of the region to the needs created by climate change, the GPAC will continue supporting the fair through the EPIF Preparatory Committee. 2) The GPAC will also assist in the planning of the 11th EPIF through the EPIF Preparatory Committee. 3) The APO Secretariat and EPIF Preparatory Committee Chair will organize the next GPAC meeting, its agenda, and initiatives for the expansion of its membership. 🌱

Eco-Products International Fair 2016



Date: 8–11 June

Venue: Bangkok International Trade and Exhibition Centre (BITEC), Bangkok, Thailand

Organized by the APO, Federation of Thai Industries (FTI), and Thailand Productivity Institute (FTPI)

Official website: www.epif2016-thailand.com/en

Taking regional best practices local: National Follow-up Program



(L–R) Secretary of State, Ministry of Agriculture, Food and Fishery Orm Lim Ser joins Secretary of State Sat Samy and Deputy Secretary of State, Ministry of Industry and Handicraft (APO Alternate Director for Cambodia) Tung Ciny in presiding over the opening ceremony of the National Conference on Enhancing the Roles of Mass Media in Innovation and Knowledge Transfer to Improve Productivity and Competitiveness of the Rice Sector of Cambodia, 7–9 December 2015. Photo courtesy of NPCC.

Background

For decades, APO projects generally fell into two categories: multicountry and individual country. The former type usually involves productivity topics of interest to all or selected members, while the latter targets the needs of an individual country with the style, design, and format catering to specific national needs or interest. Individual-country projects may range from offering direct technical assistance to NPOs by international experts to schemes allowing one APO member to visit another to observe model projects and best practices.

Although the individual-country projects have been enhanced over the years in response to requests of members for greater diversification in approaches, challenges remained. For example, the official language of English used for APO multicountry projects sometimes posed difficulties. Some members simply lacked the resources and know-how to plan initiatives utilizing the APO's existing individual-country programs. Taking such realities into consideration and in the hope of developing a method to provide more flexible opportunities from which all members could benefit, the APO Governing Body at its annual meeting in April 2015 adopted the National Follow-up Program (NFP) allowing multicountry projects to be translated into programs on a national level.

The NFP runs throughout the year, with interested APO members submitting proposals to the Secretariat. In principle, each member country is entitled to hold one NFP project

each year, but depending on the total number of annual applications and budget availability, some APO members may have additional opportunities. The linkage of proposed NFP projects to the original multicountry ones is crucial and is created by participants who attended the original versions then taking the initiative in planning an NFP version tailored to their countries. The linkage is also strengthened by utilizing the same international experts to support the national projects.

Benefits

As soon as the NFP was introduced in June 2015, the interest of APO members was evident. Since September 2015, five APO members have taken advantage of the new scheme, with six NFP projects successfully organized so far. Bangladesh conducted the first, its National Conference on Enhancing the Role of Mass Media Practitioners in Knowledge Transfer to Improve Agricultural Productivity. The project inherited the objectives of its multicountry “parents” held in 2013 and 2014 and localized them to explore the potential role of mass media in facilitating the transfer of productivity information, knowledge, and technology to local small farmers.

Because NPOs take the initiative in organizing NFP projects, and they are very “localized” events, they attract both huge numbers and a very diverse range of participants from various levels involved in a country's productivity efforts. Cambodia and Nepal conducted their versions of national conferences on Enhancing the Role of Mass Media

Practitioners in Knowledge Transfer to Improve Agricultural Productivity in December last year, attracting between 70 to 100 participants representing not only local productivity practitioners but also high-ranking officials such as state secretaries from related ministries, heads of industry associations, and leading private-sector enterprises. The conferences in both countries were widely covered by local television channels and newspapers.

Another benefit of localizing APO projects is the great flexibility in redesigning them to meet specific needs or interests. Cambodia conducted the National Workshop on Agritourism Development in January utilizing the NFP to promote agritourism as a strategy to strengthen the competitiveness and sustainability of the country's booming tourism sector. For Malaysia, the National Workshop on Measurement of Productivity in the Public Sector in January became an important opportunity to raise the awareness of various stakeholders of the concepts and approaches in measuring public-sector productivity while simultaneously beginning a multipartite national discussion on the subject in terms of initiatives to be carried out under the Eleventh Malaysia Plan, 2016–2010.

Finally, the NFP contributes to extending the APO's reach throughout the region by intensifying the dissemination of knowledge and information to a wide array of professionals at the national level. The Practice-oriented Workshop on Energy Efficiency conducted in India in January synthesized the experiences of the APO and its numerous multicountry projects on the topic to create its own training platform for local officials and professionals in the area of energy auditing and management, raising awareness of energy efficiency while exchanging practical knowledge and experience.



Participants in the National Conference on Enhancing the Role of Mass Media Practitioners in Knowledge Transfer to Improve Agricultural Productivity and Farmers' Welfare in Nepal during a group workshop.

Feedback

Deputy Director-General of Tourism Aing Sovannroath, of the Ministry of Tourism of Cambodia, first attended the multicountry workshop on Agritourism Business Development and subsequently initiated the organization of a national workshop on the topic. He expressed deep appreciation to the APO because, "The national workshop was able to share the knowledge and ideas of the experts with a large number of stakeholders. Participants gained a lot of valuable ideas and insights from the presentations and discussions during the three-day workshop. After this, we will organize more meetings with relevant stakeholders and the private sector to move forward with this new tourism product in Cambodia."

Faruque Ahmed from Bangladesh Television experienced both the multicountry project as well as the NFP one targeting mass media practitioners. He commented that the scheme had provided a rare opportunity for local professionals from different sectors to come together to share insights and experiences on a common platform.

The NFP will continue to create more opportunities for APO member countries to participate in multicountry APO projects with a regional focus and then take advantage of the available means and resources to develop and conduct productivity enhancement activities geared toward their own local communities. The NFP is widening the scope of APO influence throughout the Asia-Pacific, recognizing the uniqueness of its members while working toward the same common goal. 🌐

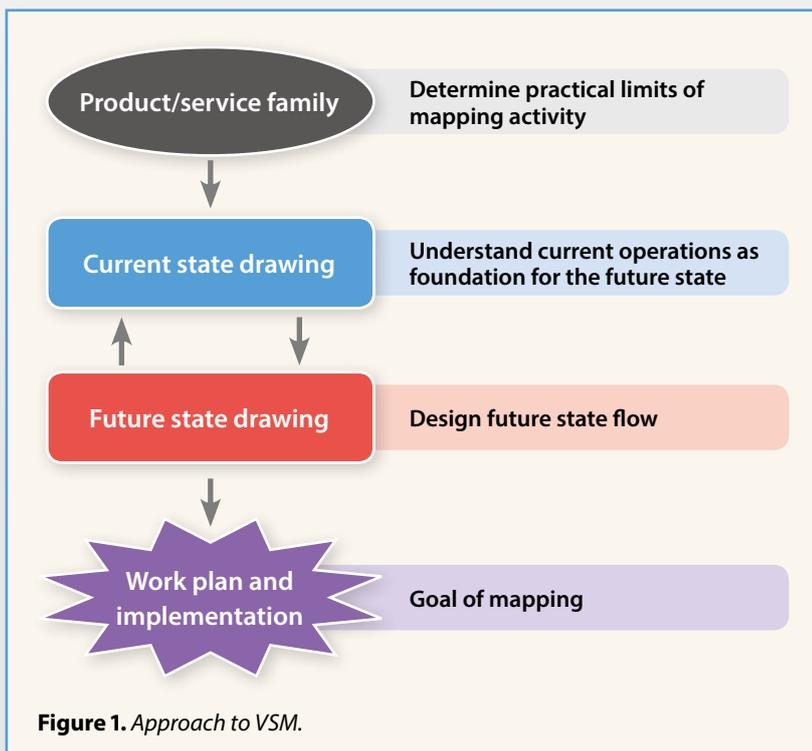


Resource person and NPC Deputy Director General Shri R. Virendra interacting with participants during a theoretical training session during the practice-oriented session of the Workshop on Energy Efficiency, India, 18–22 January. Photo courtesy of NPC.



Introduction to value stream mapping

Value stream mapping (VSM) is a visualization tool among lean techniques, which are based on the Toyota Production system, used to document, analyze, and improve the flow of information and materials required to produce a product or service for a customer. It is a process for measuring, understanding, and improving the flow and interactions of all the associated tasks to keep the cost, service, and quality of a company's products or services as competitive as possible. VSM is an end-to-end system taking into account all processes involved in producing a product or service as well as the management and information systems that support those processes. By analyzing the value stream map, we can identify continued opportunities to enhance value, eliminate waste, and improve flow.



Approach to VSM

To construct a value stream map, the boundary must first be determined by selecting a product or service family (Figure 1), i.e., a group of products/services sharing similar process steps that are not necessarily identical (Table 1). This isolates different families to distinguish the needs of the customer and the purposes of the transactions for each family and is vital to show current steps, delays, and information flows required to deliver the product or service. The current-state map forms the foundation to identify the nonvalue-added activities and then to improve the flow and shorten the end-to-end lead time.

Through analysis of the current-state map, we can identify opportunities for improvement by applying lean techniques like the kanban/pull system, single-minute exchange of die, continuous flow, heijunka (production leveling), pokayoke (mistake proofing), etc. to remove waste and improve

the process flow to derive the future-state map. Some future-state questions to be asked include:

- What does the customer really need?
- How often will performance be checked?
- Which steps create value and which generate waste?
- How can the work flow with fewer interruptions?
- How will work be controlled between interruptions?
- How will the workload and/or activities be balanced?
- What process improvements will be necessary to achieve the future state?

From the future-state map, the work plan is broken into loops prioritized for kaizen improvement, minimizing the use of resources. The following common-sense approach is recommended:

- Eliminate nonvalue-added tasks that do not require new IT efforts.
- Simplify the remaining steps requiring minimal IT support (e.g., minimize transactions entering the value stream).
- Change the flow of transactions or paperwork

Table 1. Identifying a product/service family.				
"A group of products and/or services that share similar processing steps: they do not have to be identical to each other."				
Product	Processing Steps			
	Estimate/quote	Design/configure	Enter order	Generate job packet
Model A			●	●
Model B			●	●
Model C	●	●	●	●
Model D	●	●	●	●

to "process one, move one" (e.g., improve layout, cross-training, cell implementation).

- Implement solutions requiring significant IT support.

Constructing a value stream map

A cross-functional team is required to construct a value stream map and ensure that every detail of the flow and management of activities in creating the product or service family is covered. Various software packages can help in

continued on page 12 ▶

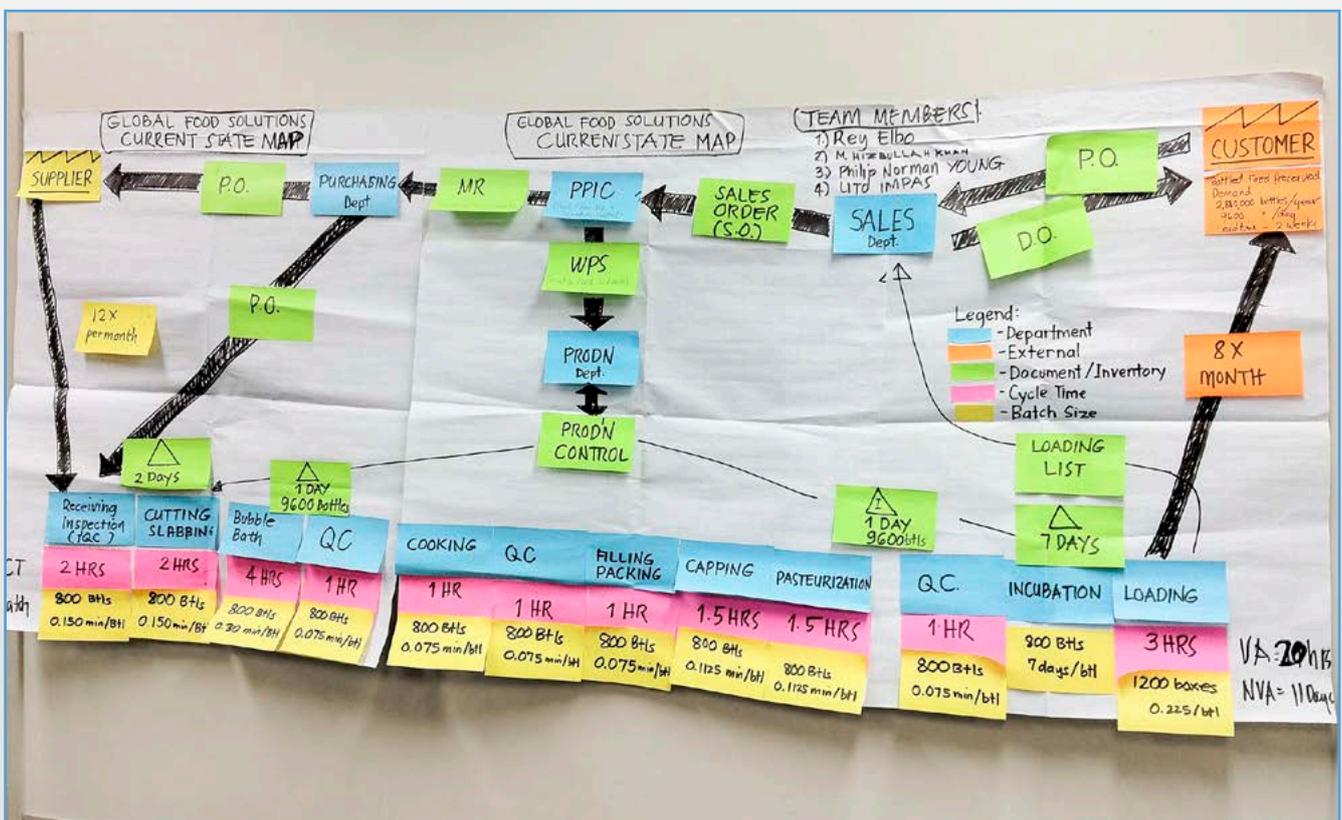


Figure 2. Value stream mapping in progress.



constructing a value stream map. However, when drawing up a value stream map by a cross-functional team, flipcharts and sticky notes work equally well (Figure 2). For documentation purposes, the map can then be reconstructed using VSM software.

Six steps are involved in creating a current-state value stream map:

- Document customer information and need, i.e., identify the key group of customer demands for the selected product or service family. The lead time to deliver the product or service must also be determined.
- Identify main processes in order, not by the department or functions in the company. This should be detailed in a forward-flow manner.
- Select process metrics. This reflects the cost, service, and quality within the value stream. Some examples of process metrics include process times, changeover times, batch size, inventory, number of people, etc.
- Perform a value stream walk-through and fill in data boxes, including inventory and resident technology to show how work is created, progresses, and is organized. This is done with the cross-functional team observing each of the main process steps identified in step 2 and collecting the agreed-upon data in each step.
- Establish how each process prioritizes work, including instructions, scheduling logic, or prioritization, for example, by due date, order size, customer, etc.
- Calculate system summary metrics, such as lead time versus process time, first-pass yield, cost, and/or other value stream summary measures. This requires assessing the value stream performance from a systems perspective.

Below are some tips for constructing a value stream map:

- Identify the basic process boxes before performing the actual walk-through.
- Identify the metrics that the team will collect for each process box.
- Add other information (via visual icons or metrics) as the process is observed in motion.
- Guard against making the map too unwieldy; start simply and add boxes as necessary.
- Estimate the performance of the current state first to get a quick picture of the existing value stream.
- Walk the value stream to gather performance data associated with creating value.
- Ask questions regarding activities and issues to understand potential barriers in designing future states.

- Map the whole value stream as a team.
- Assign team members specific tasks to perform in the mapping process.
- Always draw by hand and in pencil.

In addition, specific sets of process, material, information, and general symbols are used to construct a value stream map (an example of these symbols can be found at: <http://www.lean.org/Bookstore/ProductDetails.cfm?SelectedProductId=9>).

Application of VSM

VSM is typically used in conjunction with the plan-do-check-act (PDCA) cycle for continuous improvement. Constructing current- and future-state maps helps define the work plans and target metrics in the planning stage. Value stream maps also help communicate plans to all stakeholders when lean champions are selected to implement the changes identified. With the target performance metrics determined in the future-state map, we can then reflect upon the actions undertaken, and the cycle is repeated.

A key point in the application of VSM is that it is simply a visualization tool to help communicate plans of action and create consensus and prioritization of lean implementation in operations. It should not be done as a one-off exercise for planning without action on the lean improvement opportunities identified. Every improvement step taken is a move to improve productivity. By repeating the PDCA cycle, enterprises will be well on the way to staying competitive through lean applications. 



William Lee is the cofounder and chief trainer for *The Smart Methodology (TSM) Asia*. With over 15 years of experience in manufacturing, operations, and technology management, he has spearheaded lean manufacturing initiatives in both MNCs and local SMEs from a range of industries as well as served as visiting lecturer in universities and institutions and regular resource person for the APO. William received an EngD from Cranfield University, UK, and holds MEng and BEng degrees from the National University of Singapore, in addition to trainer certification from the Workforce Development Agency of Singapore.

