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| **REPORT OF**  **THE 17TH STEERING COMMITTEE MEETING OF THE ASEAN-AVRDC REGIONAL NETWORK FOR VEGETABLE RESEARCH & DEVELOPMENT (AARNET)**  **29 - 30 May 2023**  **Universiti Teknologi Brunei, Brunei Darussalam** |

**REPORT OF THE 17TH STEERING COMMITTEE MEETING OF THE ASEAN-AVRDC REGIONAL NETWORK FOR VEGETABLE RESEARCH AND DEVELOPMENT (AARNET)**

**29 – 30 MAY 2023**

**BRUNEI DARUSSALAM**

**INTRODUCTION**

1. The 17th Steering Committee Meeting of AARNET was held on 29 and 30 May 2023, hosted by Universiti Teknologi Brunei, Brunei Darussalam.
2. The Meeting discussed the progress of AARNET proposals, proposed projects by WorldVeg and shared on the status of vegetable R&D in respective ASEAN Member States (AMS).
3. The Meeting was attended by delegates from nine ASEAN member states (AMS) namely, Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam, and representatives from WorldVeg. The list of delegates appears as ANNEX 1.

**AGENDA ITEM 1: OPENING OF MEETING**

***Agenda 1.1: Welcome Remarks by Ms Poh Bee Ling, Covering AARNET Chair***

1. Ms Poh Bee Ling, Covering AARNET Chair and Singapore Focal Point, welcomed delegates to this Meeting and expressed her pleasure that the Meeting could be held physically for the first time since the COVID-19 pandemic. Attendance by so many AMS also reflected ASEAN’s continuing support for AARNET. She thanked Brunei Darussalam and WorldVeg for hosting and supporting the Meeting, respectively.
2. She highlighted that the world had become more volatile in the wake of many world events, which resulted in knock-on impacts on farmers and food security, and reiterated the importance of the work of AARNET in contributing to regional food security through partnerships in R&D. She hoped that all delegates would participate actively in the discussions and make this a successful and fruitful meeting.

***Agenda 1.2: Opening Remarks by Dr Syazana Abdullah Lim, Director of Center for Research on AgriFood Science and Technology (CrAFT)***

1. Dr Syazana Abdullah Lim, Director of Center for Research on AgriFood Science and Technology (CrAFT, gave her opening remarks. She expressed her thanks to WorldVeg and AARNET Secretariat for their help in organizing the meeting.
2. Dr Syazana highlighted that the world was experiencing a shift in weather patterns causing climate change issues, which had been affecting vegetable production and influencing pest and disease occurrences. She further emphasized the need to enhance cooperation and partnership within AMS and leverage on each other’s expertise and strength for exchange of information and technology transfer on vegetable research and development to overcome these challenges and ensure a sustainable food system for future generations.

***Agenda 1.3: Remarks by Mrs Delphine Larrousse, WorldVeg Regional Director for East and South East Asia***

1. Mrs Delphine Larrousse, WorldVeg Regional Director for East and Southeast Asia welcomed delegates to this meeting.
2. Mrs Larrousse highlighted that there was a growing focus on climate change and food systems, particularly after the impact of the COVID-19 pandemic on food accessibility. Such global events highlighted the need to transform food systems for both healthier diet and environment. She shared that 2023 was the 50th anniversary of WorldVeg, and there will be a series of celebratory activities.
3. Mrs Larrousse emphasized the importance of AARNET as a coordination platform among AMS for vegetables research and development, and thanked Brunei Darussalam and AARNET Secretariat for hosting and coordinating the meeting, as well as all AMS for their participations, and looked forward to the fruitful discussions that would take place. She also thanked the Taiwan’s Ministry of Foreign affairs (MOFA) for their financial support towards the AARNET steering committee meetings. Furthermore, she shared that WorldVeg would be presenting three project proposals during the meeting, and she wished all participants an engaging and productive event.

**AGENDA ITEM 2: ADOPTION OF AGENDA**

1. The Meeting adopted the Agenda, which appears as ANNEX 2.

**AGENDA ITEM 3: UPDATE ON AARNET PROJECT PROPOSALS**

***Agenda 3.1: Update on Improved coordination and strengthened capacity to deal with the invasive insect pest Phthorimaea absoluta (Tuta absoluta) in mainland Southeast Asia by WorldVeg [virtual presentation]***

1. Dr Paola Sotelo-Cardona, Scientist (Entomology), World Vegetable Center, presented online on the project “Improved coordination and strengthened capacity to deal with the invasive insect pest *Phthorimaea absoluta* (*Tuta absoluta*) in mainland Southeast Asia” which was funded by the Japan ASEAN Integration Fund (JAIF). Project commenced on 1 May 2021 and was completed on 31 Mar 2023. Her presentation appears as ANNEX 3.
2. The Meeting noted the results of the project:
   * Two-week training was conducted in WorldVeg’s East and Southeast Asia's Research and Training Station at Kasetsart University, Kamphaeng Saen, Thailand, 4 –17 December, 2022. A total of 27 participants from the ten ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam) attended the training.
   * The training provided participants with strategies to recognize *Phthorimaea absoluta*, the importance of a proper phytosanitary process, sampling, inspection, monitoring, identification of main pathways for invasion, and management strategies after the pest arrival. A risk assessment was conducted for each AMS through conducting survey with participants of the training program, and it provided baseline information for the development of the phytosanitary surveillance protocol for each country.
3. The Meeting noted that WorldVeg had submitted the final report to ASEC in April 2023 for consideration.

***Agenda 3.2: Update on other AARNET project proposals by AARNET Secretariat***

1. Ms Chia Siok Hiang, AARNET Secretariat, updated that ASEAN Secretariat (ASEC) was informed on AARNET’s decision to continue with three proposals and continued to seek ASEC’s assistance to source for possible funding opportunities for these proposals. Her presentation appears as ANNEX 4.
2. The Meeting noted the following updates:
   * For project proposal titled “Going wild in finding insect-pest resistance for tomato breeding in Southeast Asia”, ASEC previously shared that the project was too similar to the *Tuta absoluta* project, and suggested re-submitting the proposal when the *Tuta absoluta* project is completed. The proposed future steps would be to either re-submit the project proposal, or to change project focus to be explicit on breeding other traits.
   * For project proposals titled “Sustainable and eco-friendly protected cultivation of vegetables in South East Asia” and “Promoting biocontrol-based integrated pest management strategies for safer vegetables in the ASEAN countries”, ASEC had in Feb 2023 informed that these proposals were submitted to ROK for funding consideration.
3. The Meeting discussed and considered the options to move the projects forward as AMS still see value in pursuing the three projects. The Meeting agreed for WorldVeg to review the project proposals and revise them, if necessary. The project proposals would then be circulated to AMS for their comments before re-submission to ASEC.

**AGENDA ITEM 4: UPDATE ON WORLDVEG’S WORK IN THE ASEAN REGION**

***Agenda 4.1: Update on seed conservation project, Taiwan Asia Vegetable Initiative (TASVI), previously known as “Open Network for Asian Vegetables (ONAV) [virtual presentation]***

1. Dr Maarten van Zonneveld, Genebank Manager, World Vegetable Center, presented on the seed conservation project, Taiwan Asia Vegetable Initiative (TASVI), previously known as “Open Network for Asian Vegetables (ONAV). His presentation appears as ANNEX 5. He shared that there was a growing call for nutritious vegetables to diversify diets and develop resilient food systems, however traditional vegetables and wild relatives of vegetables were threatened and poorly conserved. There was the need to safeguard fruit and vegetable biodiversity as loss of such biodiversity would lead to less crop options and variation for breeding.
2. The Meeting noted that there were three hotspot of vegetable biodiversity: South America, Africa and South-east Asia. WorldVeg was carrying out a project “Taiwan Africa Vegetable Initiative (TAVI)”, funded by MOFA Taiwan, which commenced on Jan 2021 and would be completed in Dec 2023. The project aimed to rescue African vegetable biodiversity through germplasm collection of over 10,000 landraces and crop wild relatives in four hotspots.
3. The Meeting noted that TASVI, also funded by MOFA Taiwan, which aimed to strengthen international collaboration to salvage, store, and share vegetable biodiversity in Asia, was launched on 6 Dec 2022 in Taiwan, with key partners: Malaysia, Philippines, Thailand and Vietnam. The TASVI project would focus on two important crops for the region, i.e. chili pepper and tomato, and involve activities such as:
   * Selection of accessions for repatriation (repatriation of seeds meant that seeds would be sent back to the countries where the germplasm was collected)
   * Review of phytosanitary regulations
   * Connection custodians to users
   * Regenerate germplasm
   * Characterize germplasm
   * Share passport and characterization data with users
4. The Meeting discussed and AMS provided their views on the TASVI project:
   * Cambodia: Cambodia was interested in participating in the genebank survey, however they had limited knowledge and experience, hence they requested training from WorldVeg.
   * Indonesia: Indonesia was interested and willing to participate in survey and training activities, especially because the TASVI project focuses on chili and tomatoes which are important crops in Indonesia.
   * Malaysia: TASVI project would help to improve vegetable germplasm for breeding program, and improve the vegetable industry in Malaysia.
   * Thailand: The TASVI project was a good platform to collaborate with other countries e.g. through germplasm exchange.
   * Vietnam: The TASVI project was important for Vietnam, as many local vegetable varieties had been lost. TASVI would serve as a platform for their breeding program and help to improve vegetable varieties.
5. Dr van Zonneveld shared that for the next steps of the project, WorldVeg hopes to expand the TASVI project to more AMS and invited interested AMS to participate in a genebank survey and a training event in November.

***Agenda 4.2*** ***Project idea presented by WorldVeg on "Building a platform for vegetable diseases monitoring in the region" [virtual presentation]***

1. Dr Ricardo Oliva, Plant Pathologist, WorldVeg, presented on the project idea “Building a platform for vegetable diseases monitoring in the region”, also known as VeggieMon. His presentation appears as ANNEX 6 He shared that there was the need to understand pathogens to tackle them and reduce disease in systemic and coordinated way in the region. This was particularly important because pathogens evolve with crops and were sophisticated, so we could not rely on simple tools to control, and there was the need for collective and systematic approaches. He added that pathogens change quickly and move across borders, hence there was the need for early diagnostics and coordinated actions. Pathogen-informed decision tools would help to reduce disease epidemics.
2. The Meeting noted the envisioned structure of VeggieMon, which would comprise of people on the ground doing data collection, a central hub where information is uploaded, analysed, screened and curated, which would then trigger mid-term and long-term collective responses.
3. The Meeting noted the three main objectives of VeggieMon:
   * A regional platform that allows countries to coordinate effective interventions to contain vegetable diseases
   * Seasonal knowledge of the distribution of pathogen variants and crop resistance profiles readily available from breeders and extension officers in the ASEAN community
   * Increased capacity of quarantine and plant protection officers, as well as breeders and decision-makers to track diseases and take informed-decision to contain major diseases
4. The Meeting shared their views on the project:
   * Brunei: There was a similar project starting up in Brunei, hence Brunei was interested in this project and learning from WorldVeg and other AMS. Brunei would be able to share their expertise in AI.
   * Singapore: Since the output of the VeggieMon platform would inform breeding, the possibility of integrating this proposal with the project proposal on “Going wild in finding insect-pest resistance for tomato breeding in Southeast Asia” could be explored.
   * Thailand: The VeggieMon platform is important, would help to identify diseases of concern in the region, and inform breeding efforts.
5. WorldVeg would bring the project proposal back and review if it was possible to integrate it with other proposals, as well as prioritize the proposals for submission to ASEC.

***Agenda 4.3: Presentation on the use of germplasm by Dr Yann-rong Lin, WorldVeg Deputy Director General – Partnerships***

1. Dr Yann-rong Lin, Worldveg Deputy Director General – Partnerships, presented on the use of germplasm. Her presentation appears as ANNEX 7. She shared that vegetable diversity had decreased greatly, which limited the ability of crops to adapt to new environments. There was the need to conserve the vegetable diversity present in landraces, particularly as there was higher micronutrient content in indigenous varieties. Although WorldVeg had large collections of germplasm from the region, they would need to be regenerated and put to good use so that benefits could reach farmers and consumers.
2. The Meeting noted that WorldVeg had a nutrition database which could be accessed at the following link: <http://nutrition.worldveg.org/>, and that the Tea Research & Extension Station (TRES) in Taiwan had been exploring making vegetable powders to make unpalatable vegetables easier and more convenient for consumers to intake. WorldVeg had also done work to screen for biotic resistances (heat and drought tolerance) in tomato, amaranth and okra. They would be holding the International Plant Phenotyping Symposium (PhenoVeg 2023) from 26 to 27 September on marker-assisted breeding by a professor in the National Taiwan University, in collaboration with Known-You Seeds.
3. The Meeting shared their views on the presentation:
   * Singapore: As there was a growing trend to grow amaranthus for their seeds as a protein source, Singapore enquired if WorldVeg had such amaranthus accessions. Dr Lin replied that WorldVeg had grain amaranth in their collections that was drought and heat-tolerant. While it was more common in Asian countries to consume the leaves, in Africa it was more common to consume the grain. Singapore was welcome to request accessions of amaranthus from WorldVeg.
   * Thailand: As Thailand was facing problems with bacterial wilt in tomatoes, they requested bacterial wilt-resistant rootstock from WorldVeg. Dr Lin replied that there were commercial companies selling rootstock germplasm in Taiwan. An alternative was to join the APSA consortium, which would allow the chance to obtain breeding lines as well as attend open field days.

**AGENDA ITEM 5: STATUS AND PRIORITIES OF VEGETABLE R&D IN ASEAN**

***Agenda 5.1: Country presentation – Brunei***

1. Dr Syazana presented on status and priorities of vegetable R&D in Brunei Darussalam. Her presentation appears as ANNEX 8. She shared that around 41% of the tropical vegetables consumed in Brunei were locally produced, and that Brunei was able to achieve 66% self-sufficiency for tropical vegetables. The overall trend for vegetables was increasing imports and decreasing local production, due to lack of manpower as a result of COVID-19 pandemic.
2. The Meeting noted Brunei’s initiatives to boost vegetable production:
   * Awarding new sites under Department of Agriculture’s gazette to new companies
   * Awarding new sites for expansion to progressive companies
   * Youth awareness programmes to entice youths to become agripreneurs. There have been eight series of the programme since 2018, and the objective of the programme is to raise awareness of youths on opportunities in the agriculture industry.
   * Fund assistance for companies that wish to expand their farms, under Darussalam Enterprise (DARe) co-matching scheme.
   * Contract farming, where the Department of Agriculture & Agrifood facilitates existing companies to enter into contract farming with established local supermarkets and catering.
   * Use of technology in agriculture, for example fertigation in greenhouses, solar power, benching system and hanging fertigation system, which is used to combat flooding problems.

***Agenda 5.2: Country presentation – Cambodia***

1. Dr Sophea Kean updated on status and priorities of vegetable R&D in Cambodia. His presentation appears as ANNEX 9. He shared that Cambodia had 60,000 hectares of land dedicated towards vegetable production, with average yield of 15 ton/ha. The vegetable production in Cambodia’s lowlands was able to support 70% of the domestic market’s needs, while 30% would need to be imported from neighbouring countries.
2. The Meeting noted that Cambodia had an on-going breeding collaboration with WorldVeg regarding tomatoes (53 tomato lines) as well as other collaborations regarding hot chili (34 chili lines). Cambodia produced 50 tons of vegetable seeds to support Cambodia Food Reserve System each year. There was also a project being carried out in 15 provinces of Cambodia to support vegetable production, and Cambodia was promoting standards such as GAP and organic standards.

***Agenda 5.3: Country presentation – Indonesia***

1. Mr Agnofi M. Efendi, presented on status and priorities of vegetable R&D in Indonesia. His presentation appears as ANNEX 10. He shared that Indonesia had four national strategic vegetable commodities: garlic, shallot, chili and potato. IVEGRI had developed new varieties of potato, shallot, garlic, chili, tomato, bean, spinach, cucumber, water spinach and string bean. They had also conducted research into shallot propagation technology, technology to double chili productivity (>20ton/ha), technology to double shallot productivity (>40ton/ha) and potato seed production through tissue culture.
2. The Meeting noted Indonesia’s vegetable research priorities:
   * Development in marginal land
   * Increase product competitiveness
   * Precision farming
   * Society 5.0 (AI)

***Agenda 5.4: Country presentation – Malaysia***

1. Mrs Nor Hazlinda Mat Saat presented on status and priorities of vegetable R&D in Malaysia. Her presentation appears as ANNEX 11.
2. The Meeting noted that under Malaysia’s National Agro-food Policy 2.0 (2021-2030), the agrifood industry aims to reduce greenhouse gas emission, and to increase the self-sufficiency level of major food commodities. For vegetables, the goal was to increase the self-sufficiency level from 44.6% in 2019, to 70% in 2025 and 29% in 2030.
3. The Meeting noted that MARDI had been conducting breeding research and developed new varieties for the following crops: chili, tomato, sweet corn, cauliflower and round cabbage. In addition, production technology of cabbage sprout and conventional lowland cabbage pest control techniques (SOP) had also been developed.

***Agenda 5.5: Country presentation – Myanmar***

1. Mrs Lu Bu presented on status and priorities of vegetable R&D in Myanmar. Her presentation appears as ANNEX 12.
2. The Meeting noted the project “Selection of tropically-adapted lines of vegetables to improve productivity of the vegetable value chain in Southeast Asia” which was conducted by WorldVeg, with project collaborators being Fruit and Vegetable Research Institute (FAVRI), Hanoi, and Ministry of Agriculture, Livestock and Irrigation, Department of Agricultural Research (MOALI-DAR), Myanmar. The project focused on chili pepper, pumpkin, bitter gourd and tomato. The output of the project were tropically adapted varieties of tomato, hot pepper, bitter gourd and pumpkin.
3. The Meeting noted that there was protected cultivation being carried out in satellite research farms of the Department of Agricultural Research (MOALI-DAR), Myanmar, for year-round production of high value vegetables. However, such technology is still weak, hence there was a need to promote innovative technologies in Myanmar, as well as encourage use of bio-pesticides by reducing the use of chemical pesticides. There was also the need for more collaboration of research and development activities with WorldVeg for climate-smart vegetables agricultural systems in Myanmar, and Myanmar requested for seeds of pest and disease resistant tomatoes and other vegetables from WorldVeg.

***Agenda 5.6: Country presentation – Philippines***

1. Ms Flora Jarilla presented on status and priorities of vegetable R&D in Philippines. Her presentation appears as ANNEX 13. There were two major categories in the Philippine vegetable industry: lowland (widely dispersed, with the majority concentrated in Luzon) and highland/upland (mid- and high- elevation areas which require lower temperature to achieve optimum growth). The top 10 vegetables in the Philippines were Sweet potato, Eggplant, Matured Onion, Tomato, Squash, Bermuda Onion, Cabbage, Potato, String beans, and Taro/Gabi.
2. The Meeting noted the following national programs in the Philippines:
   * Gulayan sa Paaralan (Vegetable School Garden) Program, which aimed to promote interventions to address food insecurity and malnutrition through establishment of school-based gardens
   * National Urban and Peri-Urban Agriculture Program (NUPAP), which involved the establishment of urban garden or farms, promotion of urban and peri-urban agriculture technology (beekeeping, native chicken and egg production, quail and egg production, rabbit raising)
   * High Value Commercial Crops Development Programs (HVCDP), which provides technical and support services such as seed and planting materials distribution, extension support, education and training services, and R&D.
   * Green Revolution 2.0 Plants for Bountiful Barangays, which seeks to improve the nutrition of Filipinos by increasing production and supply of fresh fruits and vegetables in the urban, peri-urban, and rural areas, was launched in 2022
   * Private Sector Initiatives e.g. partnership Between Department of Agriculture – Urban and Peri-Urban Agriculture Program and Nestle Philippines Inc.
3. The Meeting noted that there were 5 National Crop Research And Production Support Centers in the Philippines:
   * Baguio –Highland Vegetables
   * Davao - Tropical Fruits
   * La Granja - Field Legumes
   * Los Baños - Lowland Vegetables
   * Guimaras - Mango

***Agenda 5.7: Country presentation – Singapore***

1. Ms Chia Siok Hiang presented on status and priorities of vegetable R&D in Singapore. Her presentation appears as ANNEX 14. The Singapore Food Agency was formed in April 2019, bringing together all food-related resources and capabilities for holistic management of the food industry “from farm to fork” in Singapore.
2. The Meeting noted that due to lack of land space, there had been a trend of increasing numbers of indoor vertical farms, while traditional outdoor farms have reduced in number in Singapore. Singapore had a ‘30 by 30 Goal’, aiming to build capabilities and capacity that would allow Singapore to produce 30% of its nutritional needs by 2030. There were R&D funds and technology adoption incentives to support achieving this goal.
3. The Meeting noted that Singapore’s Institutes of Higher Learning (IHLs) and Research Institutes (RIs) played a key role in driving vegetable R&D, and noted the research capabilities of the following IHLs and RIs:
   * Republic Polytechnic
   * Temasek Polytechnic
   * Agency for Science, Technology and Research (A\*STAR)

***Agenda 5.8: Country presentation – Thailand***

1. Mr Wisarute Sanmaerre presented on status and priorities of vegetable R&D in Thailand. His presentation appears as ANNEX 15. He shared that around 40% of land in Thailand was used for cultivation, with the major crop being rice. The major vegetables produced in Thailand were sweet corn, baby corn, shallot, tomato, potato, garlic and onion. Thailand has developed varieties of chili, sweet potato, potato, tomato, Chinese cabbage, yardlong bean, okra, asparagus and Chinese water convolvulus.
2. The Meeting noted that the vision of Thailand’s vegetable strategy was leadership in varieties of vegetables produce and products in line with environmentally friendly GAP/Quality standards/Safe vegetables/Seed hub, and that the R&D strategy direction was for protected cultivation, precision agriculture and organic agriculture:
   * Improving the crop productivity: Breeding for superior varieties, Improvement of cultivation technologies
   * Minimizing the production inputs: Minimizing labor rate
   * Minimizing losses due to pests and diseases, and inappropriate pre and post harvest handling
   * Improve quality
3. The Meeting noted Thailand’s strategy for AARNET:
   * Enhance the use of genetic material through mutual collaboration
   * Enhance the capacity of AARNET members
   * Share information: problem, potency, technology, strategy
   * Create strategic plan for comprehensive R&D in for Asia
   * Create and improve market in Asia

***Agenda 5.9: Country presentation – Vietnam***

1. Dr Nguyen Quoc Hung presented on status and priorities of vegetable R&D in Vietnam. His presentation appears as ANNEX 16. The main vegetable crops grown in Vietnam were cabbage, watermelon, vegetable bean, cucumber, tomato, pumpkin, Welsh onion and chili pepper. The majority (78 – 83%) of vegetable produced was consumed fresh in Vietnam, while 7% was exported and the remaining sent for processing.
2. The Meeting noted Thailand’s research directions for vegetable breeding, selection and development in Vietnam:
   * Selection and breeding
     1. Selecting and breeding high yielding varieties
     2. Selecting and breeding quality varieties for fresh feeding and partly for processing technology
     3. Selecting and breeding varieties that are resistant to diseases
     4. Selecting and breeding varieties to harvest and store products for a longer time
   * Cultural technique and high technology
     1. Technical process of cultivation: density, fertilizer, water, biology pesticides
     2. Seed production process
     3. High-tech process: plastic house, irrigation system, IoT sensor system, substrate, hydroponics ...
     4. Harvesting and storage suitable for processing system and exporting
3. The Meeting noted that Thailand made use of the following techniques for vegetable breeding:
   * Breeding by traditional sexual hybridization method
   * Application of biotechnology in the selection and breeding of hybrids, new materials:
     1. Mutation treatment through chemical and physical agents
     2. Molecular markers and marker assisted selection (MAS): RAPD, ISSR, SSR, SCAR, SNP
     3. Transgenic/gene editing approach

***Agenda 5.10: Discussion among AARNET Steering Committee’s members on vegetable R&D priorities for ASEAN***

1. The Meeting discussed vegetable R&D priorities for ASEAN. AARNET Chair highlighted that ASEC had shared that partners are looking at cooperation with ASEAN on the issues of sustainable agriculture, circular agriculture, smart farming, decarbonization, nature-based solutions etc.
2. The AMS and WorldVeg shared their respective R&D interests:
   * Brunei: Pest & disease management and smart farming technology e.g. digitalisation, automation and smart sensors. The aim would be to reduce manpower reliance.
   * Malaysia: Seed production to reduce reliance on seed companies. Focus crops would be shallot and potato that could be cultivated in lowlands. Reduction of cost of production. Improvement of nutrition e.g. biofortification to increase nutrition in vegetables. AI monitoring system for farms.
   * Myanmar: Focus on tomato and chili pepper crop. Requested more collaboration with WorldVeg on climate smart veg and smart farm technologies, as well as for seeds of pest and disease resistant tomatoes and other vegetables. Interest in learning more about quinoa production in Thailand and/or grain amaranth from WorldVeg.
   * Philippines: Focus on tomato crop, particularly pest and disease resistant varieties and varieties that are able to reduce harvesting time e.g. tomato fruits all mature at the same time. Also interested in mung beans.
   * Singapore: Indoor vertical farming due to impacts of climate change including seed production, and alternative methods of seed production e.g. tissue culture, grafting. As the common crops in ASEAN were tomato and chili pepper, there could also be a project focused on chili pepper.
   * Thailand: Focus on tomato and chili pepper crop. Vegetable production in urban city.
   * Vietnam: Focus on tomato crop, particularly pest and disease resistant varieties e.g. tomato yellow leaf curl virus. Promotion of indigenous crops.
   * WorldVeg: Transboundary pest and disease management, agrobiodiversity conservation and use, climate smart agriculture, urban and peri-urban agriculture, among others.
3. Mrs Larrouse summarized the results of the discussion:
   * Tomato and chili pepper were crops that all AMS were interested to work in.
   * Smart farming and automation were also of interest to all AMS, and was also aligned with ASEC’s priorities, hence future projects could focus on this topic.
4. The meeting agreed for AARNET Sec to capture the summary of this discussion on vegetable R&D priorities for ASEAN and circulate to all AMS for further comments.

**AGENDA ITEM 6: OTHER MATTERS**

***Agenda 6.1: Other Matters***

1. AARNET Secretariat updated the list of AARNET Steering Committee Members which appears in ANNEX 17.
2. Mrs Larrouse informed that the existing AARNET website would be closed and moved to be part of WorldVeg’s website. The Meeting discussed and agreed that it would not be suitable to put the entire AARNET reports on the website, however the names of the Steering Committee members could be put on the website.

***Agenda 6.2: Venue of Next Meeting***

1. In accordance with the ASEAN practice of rotating the host country by alphabetical order, Cambodia would be the host for the next AARNET Steering Committee Meeting, with the date to be confirmed later.

**AGENDA ITEM 7: RECOMMENDATIONS TO ASWGC and SOM-AMAF**

1. The key points of the Meeting are summarized below, which would be submitted to ASWGC for information:
   * The 17th AARNET Steering Committee (ASC) Meeting was held on 29 – 30 May 2023, hosted by Brunei Darussalam in Universiti Teknologi Brunei. The Meeting was attended by delegates from 9 AMS and World Vegetable Center (WorldVeg).
   * The meeting noted updates on the completed project “Update on Improved coordination and strengthened capacity to deal with the invasive insect pest Tuta absoluta in mainland Southeast Asia”, and noted presentations by AMS on the status and priorities of vegetable R&D in respective AMS.
   * The Meeting discussed WorldVeg’s seed conservation project called Taiwan Asia Vegetable Initiative (TASVI), and noted that the project’s objective was to strengthen international collaboration to salvage, store, and share vegetable biodiversity in Asia. Currently, 4 AMS, i.e. Malaysia, Philippines, Thailand and Vietnam were participating in the project. Other AMS could participate through WorldVeg’s survey and training on genebank.
   * The Meeting discussed WorldVeg’s project proposal “Building a platform for vegetable diseases monitoring in the region (VeggieMon)”, and agreed that the project will be useful for regional coordination in disease management. The Meeting agreed for WorldVeg to review this project together with the following existing project proposals, with the intention to integrate them if possible, and to prioritize two proposals for submission to ASEC for their assistance in seeking funding.
     1. Going wild in finding insect-pest resistance for tomato breeding in Southeast Asia
     2. Sustainable and eco-friendly protected cultivation of vegetables in South East Asia
     3. Promoting biocontrol-based integrated pest management strategies for safer vegetables in the ASEAN countries
   * The Meeting discussed the vegetable R&D priorities for ASEAN, including digital farming, pest and disease management for tomato and chili, and others, which would be collated into a document to be circulated to all AMS for their further inputs.
   * The 18th AARNET SC Meeting would be hosted by Cambodia (date and arrangement to be confirmed).

**AGENDA ITEM 8: ADOPTION OF REPORT**

1. The Meeting reviewed and adopted the Report ad referendum, for submission to ASWGC and SOM-AMAF.

**AGENDA ITEM 9: CLOSING OF THE MEETING**

1. AARNET Covering Chair closed the meeting and thanked all presenters, speakers and delegates for contributing to the meeting.
2. The delegates from Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand expressed their sincere thanks and appreciation to Brunei Darussalam and WorldVeg for the excellent arrangements made for the Meeting.
3. The Meeting was held in the traditional spirit of ASEAN cooperation and cordiality.

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