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Review of the APEC Food Security Roadmap Towards 2020 Final Report (Draft 13102020)

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Review of the
APEC Food Security Roadmap Towards 2020
Final Report
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Review of the APEC Food Security Roadmap Towards 2020

Final Report

KEY MESSAGES

1. APEC Food Security Roadmap Towards 2020 (AFSR) is an important guiding document for APEC member economies. The Review was conducted to ascertain the status of implementation of AFSR goals by APEC Member Economies. The Review finds APEC member economies have worked towards implementing the goals of each PA in the respective WG.
2. Working Group 1, Sustainable Development of Agricultural and Fishery Sectors (SDAFS) has four priority areas and 41 goals. The Survey finds that 17.94 percent of the respondents have either started to implement policies to meet the Goals of the WG; or has enforced the policies but have yet to meet the objectives of the Goals (16.85 percent) or has fully enforced the policies and have meet the objectives of the Goals.
3. Working Group 2, Facilitation of Investment and Infrastructure Development (FIID), has two priority areas with 15 identified goals. The Survey finds that the economies have either started to implement policies to meet the Goals of the WG (18.48 percent); or has enforced the policies but have yet to meet the objectives of the Goals (13.11 percent) or has fully enforced the policies and have meet the objectives of the Goals (35.10 percent).
4. Working Group 3, Enhancing Trade and Market (ETM) has five priority areas and 22 goals. The Survey found that the economies have either started to implement policies to meet the Goals of the WG (22.62 percent); or has enforced the policies but have yet to meet the objectives of the Goals (18.94 percent) or has fully enforced the policies and have meet the objectives of the Goals (37.57 percent).
5. The review finds that the Covid-19 pandemic destructs supply chain and affects operational capacity. There are shift in the domestic market which contribute to the challenges in food security. To address the food security challenges during the Covid-19 pandemic, the respondent economies adopt the cooperation on critical issues impacting food security.
6. Moving forward, APEC Member Economies may consider working on a new APEC Food Security Roadmap taking into account the effects of the Covid-19 Pandemic; and efforts and progress made by other regional and multilateral organisations such as ASEAN, the United Nations and its agencies and the World Trade Organisation. In addition member economies may consider carrying forward few areas requiring further implementation such as issues on gender, management of natural resources such as land and water, and food losses and waste.

1. Introduction

As the host for the APEC 2020, Malaysia is keen to address the issue of food security. Based on the theme **“Optimizing Human Potential Towards a Future of Shared Prosperity,”** food security within the APEC economies remain a major concern, especially with the impact of the Covid-19 pandemic. Hence, Malaysia’s Chairmanship focuses on food security through Priority Area No. 3, i.e. Driving Innovative Sustainability.

The concept of food security for all people and the physical and economic access to safe and nutritious sustenance, has always been an important policy goal in the APEC region. Food security is a multi-dimensional and complex issue consisting of many social, economic, environmental, and political factors. Food security depends on the availability, accessibility, utilization, and stability of food. To address the sustainable development of the agricultural and aquaculture sectors, APEC member economies adopted the APEC Food Security Roadmap Towards 2020 (ASFR) in Beijing in 2014. APEC member economies also adopted the Food Security and Climate Change Multi-Year Action Plan 2018-2020, which is to encourage sustainable and productive food systems.

As it was adopted in 2014, the ASFR does not directly address the challenges of a major health and safety issue such as the Covid-19 pandemic. The current COVID-19 pandemic, which has caused disruption to global food supply chains is also expected to influence the design of the food security roadmap in the APEC member economies post-2020.

As the host of the APEC 2020, Malaysia has agreed to undertake a review of the ASFR. The main objective of the Review is to ascertain the level of implementation of the goals of ASFR by the APEC member economies and to make recommendations for improvements. In addition, Malaysia will also take the initiative to conduct an informal discussion with APEC Member Economies on the impact of Covid-19 pandemic on food security through the Focus Group Discussion.

The Report provides an analysis of the findings of the Review and the challenges of Covid-19 pandemic on the future of food security in the APEC region. The analysis is based on the stocktaking exercises, the focus group discussion and the survey forms submitted by 12 member economies.

2. The APEC Food Security Roadmap Towards 2020

2.1 History Leading to the APEC Food Security Roadmap Towards 2020

Considering that establishing a comprehensive food system-based food security environment in APEC is a complex and long term effort, APEC has taken various actions leading to the APEC Food Security Roadmap Towards 2020 (ASFR) in the 2014. ASFR is also supported by the implementation of the Food Security and Climate Change Multi-Year Action Plan 2018-2020 which encourages sustainable and productive food systems, including sustainable aquaculture, that efficiently utilize resources such as water resources and fisheries waste. Improving resilience, adaptation and productivity of food systems contributes to protecting and conserving the environment and mitigates the effects of natural disasters and climate change.

Leading to the ASFR, APEC member economies undertook several initiatives, among them the Niigata Declaration on APEC Food Security, 2010; the creation of the Policy Partnership on Food Security (PPFS) in 2011; and the Kazan Declaration on APEC Food Security in 2012.

2.2 Salient Features of the APEC Food Security Roadmap Towards 2020

The Visions and Goals of the AFSR are:

1. APEC economies that are free from hunger and malnutrition, and contribute to the efforts of improving the living standard of all, especially the poorest and small holder, in an economically, socially and environmentally sustainable manners; and
2. To enhance food supply efficiency, provide more affordable food for lower income consumers. APEC economies will strive to reduce food loss and waste by 10% compared with the 2011-2012 levels by 2020 in the Asia-Pacific economies aim to advance beyond the Millennium Development Goals 2015 hunger goals.

The missions of the AFSR are:

1. The development of a food sector that is economically efficient and profitable, socially acceptable, and environmentally sound;
2. Strengthening exchanges and coordination with other APEC fora, such as the Agricultural Technology Cooperation Working Group, the Committee on Trade and Investment, the Food Safety Cooperation Forum and its Partnership Training Institute Network, the Ocean and Fisheries Working Group and High-Level Policy Dialogue on Agricultural Biotechnology;
3. To develop mechanism that encourages food production and trade, as well as to improve food stocks and safety nets for the poor and the role of trade in stabilizing food prices; and
4. To improve farm efficiency for all farmers, including small holders.

The AFSR adopts several strategies. They include Sustainable Development of the Agricultural and Fishery Sectors, Facilitation of Investment and Infrastructure Development, Enhancing Trade and Markets. Members are encouraged to develop a multiyear business plan; to integrate private sector, including who exactly will do what, when, where and how, and how those actions will be funded; address core issues including research and development, technology dissemination, management of marine ecosystem and aquaculture, farmer organization empowerment, and sustainable management of natural resources and knowledge sharing and technical cooperation.

APEC Food Security Roadmap towards 2020 (Table 1) consists of three PPFS's working groups, namely, (1) Sustainable Development of the Agricultural and Fishery Sectors (SDAFS); (2) Facilitation of Investment and Infrastructure Development (FIID); and (3) Enhancing Trade and Markets (ETM).

The SDAFS has four priority areas (PA), with 41 goals. The second working group (FIID) has two PA with 15 goals, and the third working group (ETM) has 22 goals.

There have been several other activities since the adoption of the AFSR in 2014 as listed in Table 2.

3. Methodology of the Review

The Review process involves three steps, namely the Stocktaking exercise; the Survey and the Focus Group Discussions with the public sector and private sector of the member economies.

3.1 Stocktaking Exercise

The Stocktaking exercise involves desktop analysis to ascertain the level of implementation of the AFSR by the APEC member economies up to December 2019. The focus of the Stocktaking is the level of implementation of the action plans by the three PPFs' working groups, namely, (1) Sustainable Development of the Agricultural and Fishery Sectors (SDAFS); (2) Facilitation of Investment and Infrastructure Development (FIID); and (3) Enhancing Trade and Markets (ETM).

Data are collected and compiled mainly from published APEC reports and relevant websites, covering the work of various APEC working groups including: Ocean Fisheries Working Group (OFWG); Agricultural Technical Cooperation Working Group (ATCWG); APEC High level policy Dialogue on Agricultural Biotechnology (HLPDAB); Policy Partnership for Science, Technology and Innovation (PPSTI); APEC Committee on Trade and Investment (CTI); Asia-Pacific Information Platform for Food Security (APIP); Food Safety Cooperation Forum (FSCF); Committee on World Food Security; and ASEAN Food Security Information System (AFSIS).

The Stocktaking report is attached as Annex.

3.2 The Survey

The main objective of the survey is to ascertain the status of implementation by the APEC Member Economies and private sectors of the goal set under each of the AFSR WG. The feedback provided by economies and private sectors will be used to complement the Stocktaking report to obtain more information on the implementation of the goals set under AFSR.

The Survey consists of two sections. The first section is to ascertain the status of implementation of the AFSR WG. The second section highlighted the issues APEC food security resulting from the Covid-19 pandemic.

The survey forms were sent to all APEC member economies on the 14 August 2020, and as of 1 October 2020, 12 member economies (the Respondents) returned the completed survey forms. The Respondents are Australia, Chile, China, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Chinese Taipei, Thailand and United States.

3.3 The Focus Group Discussions

The Review process held two focus group discussions (FGD), the first one was held on the 25th August 2020 and the second one was on the 6th October 2020 for the private sector. The FGD aimed to supplement the Stocktaking and the Survey in ascertaining the level of implementation of the AFSR; verifying and providing specified documents or sources for AFSR; and gathering input from the public and private sectors on APEC Food Security.

4 Findings of the Survey

The finding of the Survey confirms the finding of the Stocktaking that member economies have been working towards meeting the Goals set by the respective Priority Areas in each of the Working Group. The Survey also identifies a few areas where member economies may work in enhancing the implementation of the respective goals.

4.1 Working Group 1

In Working Group 1, the Survey finds that 75 percent of the Respondents have responded well to implement the Goals set by each PA of the WG1 (see Chart 1). The Survey finds that the economies have either started to implement policies to meet the Goals of the WG (17.94 percent); or has enforced the policies but have yet to meet the objectives of the Goals (16.85 percent) or has fully enforced the policies and have meet the objectives of the Goals (40.16 percent).

Looking deeper into implementation of each of the PA, the survey finds that:

- a. In PA 1 (see Chart 2), 81.56 percent of the Respondents have either started to implement policies to meet the Goals of the PA 1 (15.48 percent); or has enforced the policies but have yet to meet the objectives of the Goals (16.67 percent) or has fully enforced the policies and have meet the objectives of the Goals (49.41 percent).
- b. In PA 2, (see Chart 3), 75.93 percent of the Respondents have either started to implement policies to meet the Goals of the PA 2 (13.89 percent); or has enforced the policies but have yet to meet the objectives of the Goals (17.59 percent) or has fully enforced the policies and have meet the objectives of the Goals (44.45 percent).
- c. In PA 3, (see Chart 4), 73.81 percent of the Respondents have either started to implement policies to meet the Goals of the PA 3 (17.86 percent); or has enforced the policies but have yet to meet the objectives of the Goals (17.86 percent) or has fully enforced the policies and have meet the objectives of the Goals (38.09 percent).
- d. In PA 4, (see Chart 5), 68.54 percent of the Respondents have either started to implement policies to meet the Goals of the PA 4 (24.54 percent); or has enforced the policies but have yet to meet the objectives of the Goals (15.29 percent) or has fully enforced the policies and have meet the objectives of the Goals (28.71 percent).

The above shows that of the four PAs in WG 1, PA 4 requires the economies to put more efforts to implement the goals. The Survey also finds rooms for improvement for:

- effective implementation of the technology dissemination systems to enhance capacity building including addressing gender sensitive information dissemination (PA1, Goal 4);
- improving gender equality in fishery development and ensuring that modernisation and efficiency measures do not discriminate against women (PA2, Goal 5);
- increasing PPI in the construction of land reclamation programs; technical cooperation for improving water resources management in developing economies (PA 4, Goal 6; and
- promoting participatory irrigation management (PA4, Goal 15)

4.2 Working Group 2

In Working Group 2, the Survey finds that 67 of the Respondents have been working towards meeting the Goals of the two PAs in WG 2 (see Chart 6). The Survey finds that the economies have either started to implement policies to meet the Goals of the WG (18.48 percent); or has enforced the policies but have yet to meet the objectives of the Goals (13.11 percent) or has fully enforced the policies and have meet the objectives of the Goals (35.10 percent).

Looking deeper into implementation of each of the PA, the survey finds that:

- a. In PA 1 (see Chart 7), 66.7 percent of the Respondents have either started to implement policies to meet the Goals of the PA 1 (16.70 percent); or has enforced the policies but have yet to meet the objectives of the Goals (16.70 percent) or has fully enforced the policies and have meet the objectives of the Goals (33.30 percent).
- b. In PA 2, (see Chart 8), 66.7 percent of the Respondents have either started to implement policies to meet the Goals of the PA 2 (20.25 percent); or has enforced the policies but have yet to meet the objectives of the Goals (9.51 percent) or has fully enforced the policies and have meet the objectives of the Goals (36.91 percent).

The above shows that of the two PAs in WG 2, PA 2 requires the economies to put more efforts to implement the goals. The Survey also finds rooms for improvement for:

- Developing a framework of activities/ business plans with reference to the Principles for Responsible Agriculture Investment (PRAI) under the FAO (PA2, Goal 9)
- Creating List of prospective infrastructure projects for development using the mechanisms of state-private partnership (PA2, Goal 6); and
- Consolidating information on the Asia Pacific Information Platform on Food Security (PA2, Goal 4).

4.3 Working Group 3

In Working Group 3, the Survey finds that 79 percent of the Respondents have responded well to implement the Goals set by each PA of the WG3 (see Chart 9). The Survey finds that the economies have either started to implement policies to meet the Goals of the WG (22.62 percent); or has enforced the policies but have yet to meet the objectives of the Goals (18.94 percent) or has fully enforced the policies and have meet the objectives of the Goals (37.57 percent).

Looking deeper into implementation of each of the PA, the survey finds that:

- a. In PA 1 (see Chart 10), 82.14 percent of the Respondents have either started to implement policies to meet the Goals of the PA 1 (17.26 percent); or has enforced the policies but have yet to meet the objectives of the Goals (17.26 percent) or has fully enforced the policies and have meet the objectives of the Goals (47.62 percent).
- b. In PA 2, (see Chart 11), 71.87 percent of the Respondents have either started to implement policies to meet the Goals of the PA 2 (29.16 percent); or has enforced the policies but have yet to meet the objectives of the Goals (13.56 percent) or has fully enforced the policies and have meet the objectives of the Goals (29.15 percent).

- c. In PA 3, (see Chart 12), 83.4 percent of the Respondents have either started to implement policies to meet the Goals of the PA 3 (25 percent); or has enforced the policies but have yet to meet the objectives of the Goals (16.7 percent) or has fully enforced the policies and have meet the objectives of the Goals (41.7 percent).
- d. In PA 4, (see Chart 13), 75 percent of the Respondents have either started to implement policies to meet the Goals of the PA 4 (16.7 percent); or has enforced the policies but have yet to meet the objectives of the Goals (22.2 percent) or has fully enforced the policies and have meet the objectives of the Goals (36.1 percent).
- e. In PA 5, (see Chart 14), 83.3 percent of the Respondents have either started to implement policies to meet the Goals of the PA 5 (25 percent); or has enforced the policies but have yet to meet the objectives of the Goals (25 percent) or has fully enforced the policies and have meet the objectives of the Goals (33.3 percent).

The above shows that of the five PAs in WG 3, PA 1 and PA 2 require the economies to put more efforts to implement the goals. The Survey also finds rooms for improvement for:

- Reviewing the deployment of data standards in the framework of APEC and accounting the interest of the food industry (PA1, Goal 8a);
- Continuing the maintenance APIP (PA1, Goal 10b);
- Eliminate custom duties in goods that can help economies dependencies and encourage them to use agriculture natural resources (PA1, Goal 11a);
- Developing unified methodologies to estimate food losses and waste (PA2, Goal 1);
- Identifying major sources of food loss and waste in the distribution channel (PA2, Goal 2); and
- Facilitating the sharing of best practices in the APEC region (PA2, Goal 4).

5 Impact of Covid-19 on Food Security in APEC Region

5.1 Overview

APEC member economies face declining economic growth potential as a result of Covid-19. The decline in the economy will result in losses of income to employees made redundant in retail, manufacturing, tourism, and other hard-hit sectors as well as those in the informal sectors.¹ The increase in unemployment will lead also to higher poverty rate, which will contribute to the inequal access to food.²

The disruption in food supply chains caused by the movement restrictions, health risks due to infection of Covid-19 to workers, and logistics chokepoints have raised the risks in access to food. Covid-19 is already affecting the entire food system and the food supply chains. Disruptions due to restrictions of movement, logistics, trade facilitation and supply chains, and trade prohibitions and restrictions have imposed potential risks on the availability and hike in the prices of food and agriculture produce within APEC economies.

Despite challenges to the food security and food supply chains, global food supply and prices remain stable according to the Food Price Index of the FAO in March 2020. This was mainly due to the demand contractions amid lockdowns and quarantines. At the same time, demand contractions coupled with reduction in supply will have an impact on food security. The reduction in demand of food can be attributed to the decrease in purchasing power, the capacity to produce and distribute food, which may affect the poor and the vulnerable.³

Although the global food price seems to be stable, local food prices may increase due to domestic price shocks.⁴ Such domestic shocks are already taking place in several APEC economies due to the closure of slaughterhouses, inadequate or unavailability of packing facilities and labour shortages due to quarantines and movement restrictions impacting the harvest. In addition, workers, who are mainly low-income, are vulnerable to the pandemic, due to occupational hazards. Hence, it is important to ensure the good health of workers by providing and adhering to safety measures, such as testing, physical distancing and other hygienic practices.⁵

In the face of Covid-19, increased efforts are needed among APEC economies to ensure that food value chains function well and promote the production and availability of diversified, safe and nutritious food

¹ International Labour Organisation (ILO), (2020) ILO Monitor: COVID-19 and the world of work. Third edition, 29 April 2020 (ILO, Geneva) and World Bank. (2020a). East Asia Pacific Economic Update April 2020: COVID-19 and the EAP Region (World Bank, Washington DC).

² PovcalNet, a tool provided by the World Bank for estimating global poverty, see also <https://blogs.worldbank.org/opendata/impact-covid-19-coronavirus-global-poverty-why-sub-saharan-africa-might-be-region-hardest> (last accessed 30 April 2020).

³ Committee on World Food Security, 2020. Interim Issues Paper on the Impact of COVID-19 on Food Security and Nutrition (FSN) by the High-Level Panel of Experts on Food Security and nutrition (HLPE), 24 March, 2020 (FOA, Rome).

⁴ World Food Program, (2020), COVID-19 Will Double Number of People Facing Food Crises Unless Swift Action Is Taken, <https://www.wfpusa.org/news-release/covid-19-will-double-number-of-people-facing-food-crises-unless-swift-action-is-taken/>.

⁵ Centre for Disease Control and Prevention (CDC) (2020), Meat and Poultry Processing Workers and Employers, Interim Guidance from CDC and the Occupational Safety and Health Administration (OSHA), <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/meat-poultry-processing-workers-employers.html>.

for all. It is important to ensure that policies, such as short-term measures to restrict trade, do not distort global markets.

Collective action is needed to ensure that markets are well-functioning, and that timely and reliable information on market fundamentals is available to all. This will reduce uncertainty and allow producers, consumers, traders and processors to make informed production and trade decisions and contain panic behaviors in global markets.⁶

In this situation, APEC economies might want to encourage food producers to adopt new advanced technologies, such as agriculture biotechnology to accelerate production networks in catching up with lost time. In addition, agriculture and fishery sectors may adopt modern digital technologies to address food shortage. In the agricultural sector, for example, farmers who employ information and communication technology could obtain information about markets, soil quality, and weather through their smartphones, use sensors to monitor crops, run self-driving tractors to harvest quickly and efficiently, and sell directly to consumers over the Internet. Better inventory management will also lower the cost of producing and delivering perishable agricultural products by decreasing waste.

The stocks-to-use ratio in the APEC region shows that food security in APEC is currently in a strong position as compared to the global food crisis in 2007 to 2008. However, the ratio is not equal among all APEC economies. It is found that less than a third of APEC economies were able to improve particularly on food products like rice and wheat.⁷ Detailed analysis also demonstrates that there is a need to maintain open markets for food products to strengthen food security across the APEC member economies.

It is important during Covid-19 to ensure that essential activities such as food production, supermarkets and distribution keep running and open with open trade lines. Otherwise, APEC economies might face risk of endangering their food security when food products cannot be supplied across borders within the region.⁸

On the hand, according to the WTO Information Note on Standards and Regulations and Covid-19 on 22 May 2020, many members adopt the utilisation of electronic processes for certification requirements. This is in line with the e-Phyto Solution being implemented by the International Plant Protection Convention (IPPC). This may increase efficiency in the food supply chains and avoiding handling delays. However, whilst the utilisation of electronic and digital technology in the SPS measures is welcome, there is a need to support the lesser developed economies to develop the system. There is also a need to ensure that the system is tamper proof to ensure an appropriate compliance with the science-based risk management and biosecurity arrangements.

⁶ Food and Agriculture Organisation of the United Nations (FAO), (2020), Joint Statement on COVID-19 Impacts on Food Security and Nutrition, 21 April 2020, <http://www.fao.org/news/story/en/item/1272058/icode/>.

⁷ Carlos Kuriyama, APEC Policy Support Unit, POLICY BRIEF No. 33, May 2020, Export Restrictions and Food Security in the Context of the COVID-19 Pandemic.

⁸ Joseph Glauber, David Laborde, Will Martin and Rob Vos, "COVID-19: Trade Restrictions Are Worst Possible Response to Safeguard Food Security," International Food Policy Research Institute: IFPRI Blog, 27 March 2020, <https://www.ifpri.org/blog/covid-19-trade-restrictions-are-worst-possible-response-safeguard-food-security>.

Further, APEC economies may consider the recommendation of FOA Regional Conference for Asia and the Pacific:⁹

- i. Ensuring Access to Safe and Nutritious Food for All (enabling all people to be well nourished and healthy)
- ii. Shifting to Sustainable Consumption Patterns (promoting and creating demand for healthy and sustainable diets, reducing waste)
- iii. Boosting Nature Positive Production at Sufficient Scales (acting on climate change, reducing emissions and increasing carbon capture, regenerating and protecting critical ecosystems and reducing food loss and energy usage, without undermining health or nutritious diets)
- iv. Advancing Equitable Livelihoods and Value Distribution (raising incomes, distributing risk, expanding inclusion, creating jobs)
- v. Building Resilience to Vulnerabilities, Shocks and Stresses (ensuring the continued functionality of healthy and sustainable food systems)

5.2 Survey on the Covid-19 Pandemic

5.2.1 Challenges in Food Security Faced by Member Economies as a Result of Covid-19 Pandemic

Chart 15 shows challenges faced by the APEC member economies identified by the Respondents. The challenges are:

- i. Threatened supply chain (83.3 percent);
- ii. Affected operational capacity (83.3 percent);
- iii. Shift in domestic market (83.3 percent);
- iv. Reduced trade resulting from closures of border (75 percent);
- v. Issues on import and export (75 percent);
- vi. Delay in transporting the goods (75 percent);
- vii. Effect on the workers (58.3 percent); and
- viii. Limited access to agriculture input (41.7 percent).

In addition, China also said that covid-19 pandemic has affected the price of food.

5.2.2 Measures Taken by Member Economies to Address Food Security Challenges due to Covid-19 Pandemic

Chart 16 shows measures taken by the Respondents to address the food security challenges due to the Covid-19 pandemic. The Respondents have taken the following measures:

- i. Increasing Technology and innovation in supply chain (91.7 percent);
- ii. Reducing bottlenecks in logistic supply chain (83.3 percent);
- iii. Guarantee consumers access to food (83.3 percent);
- iv. Mitigate the risk of a shortage of agricultural labour (83.3 percent);
- v. Providing assistance to support smallholders to enhance agricultural productivity (75 percent).

⁹ FAO Regional Conference for Asia and the Pacific, Thirty Fifth Session, 1-4 September 2020, UN Food Systems Summit, APRC/20/INF/25 Rev.1.

In addition, Chile said they have taken market transparency measures to address the food security challenges due to the Covid-19 pandemic. Singapore have looked into reducing reliance on agri-input imports, shared best practices to maintain connectivity and keep food value chains moving during the pandemic, and worked towards a collective commitment to avoid unnecessary export bans and restrictions on food products. Whereas, United States coordinating responses with trade partners/mitigating impacts to trade.

6 Policy Recommendation

Part 1: Recommendation to Improve Food Security Goals

There are recommendations from the Respondents to improve the following in order to achieve the food security goals (See Chart 17):

- i. R&D and innovation (91.7 percent);
- ii. Technology adoption and IR 4.0 (66.7 percent);
- iii. Institutional framework (50 percent);
- iv. Data availability and usage (50 percent);
- v. Export oriented (41.7 percent);
- vi. Land tenure (25 percent).

However another 33.3 percent of the Respondents have suggested:

- i. To promote sustainable food systems;
- ii. Inclusive development;
- iii. Sustainable food system;
- iv. Regulatory reform; and
- v. Collective food security collaborations between various economies.

Part 2: Recommendation for Further Implementation

The Review suggests further implementation for:

- i. effective implementation of the technology dissemination systems to enhance capacity building including addressing gender sensitive information dissemination (WG 1, PA1, Goal 4);
- ii. improving gender equality in fishery development and ensuring that modernisation and efficiency measures do not discriminate against women (WG1, PA2, Goal 5);
- iii. increasing PPI in the construction of land reclamation programs; technical cooperation for improving water resources management in developing economies (WG1, PA4, Goal 6);
- iv. promoting participatory irrigation management (WG1, PA4, Goal 15);
- v. Developing a framework of activities/ business plans with reference to the Principles for Responsible Agriculture Investment (PRAI) under the FAO (WG2, PA2, Goal 9)
- vi. Creating List of prospective infrastructure projects for development using the mechanisms of state-private partnership (WG2, PA2, Goal 6);

- vii. Consolidating information on the Asia Pacific Information Platform on Food Security (WG2, PA2, Goal 4);
- viii. Reviewing the deployment of data standards in the framework of APEC and accounting the interest of the food industry (WG3, PA1, Goal 8a);
- ix. Continuing the maintenance APIP (WG3, PA1, Goal 10b);
- x. Eliminate custom duties in goods that can help economies dependencies and encourage them to use agriculture natural resources (WG3, PA1, Goal 11a);
- xi. Developing unified methodologies to estimate food losses and waste (WG3, PA2, Goal 1);
- xii. Identifying major sources of food loss and waste in the distribution channel (WG3, PA2, Goal 2); and
- xiii. Facilitating the sharing of best practices in the APEC region (WG3, PA2, Goal 4).

Part 3: Recommendation to Address Food Security Challenges due to Covid-19 Pandemic

The Respondents have proposed the following to address food security challenges due to Covid-19 pandemic (See Chart 18):

- i. To increase the cooperation on critical issues impacting food security (100 percent);
- ii. To maintain connectivity to avoid any disruption of food supply chains (91.7 percent);
- iii. To increase sharing of information to prevent food security deterioration within the region (91.7 percent);
- iv. To work within relevant APEC committees and working groups toward a collective commitment (58.3 percent); and
- v. To consider lowering import tariffs and other quantitative import restrictions on food products (41.7 percent)

7 Conclusion and Recommendation

In conclusion, APEC Food Security Roadmap Towards 2020 is an important guiding document for APEC member economies. Findings of the review indicate that the APEC member economies have worked towards implementing the goals of each PA in the respective WG. There are some goals requiring enhanced implementation efforts by some Member Economies. Moving forward, APEC Member Economies may consider working on a new APEC Food Security Roadmap taking into account the effects of the Covid-19 Pandemic; and efforts and progress made by other regional and multilateral organisations such as ASEAN, the United Nations and its agencies and the World Trade Organisation.

APPENDICES

Table 1: AFSR Working Groups and Priority Areas

Working Group	Priority Areas	Goals
WG1: Sustainable Development of the Agricultural and Fishery Sectors (SDAFS)	1. Promoting research and development and technology dissemination;	<ol style="list-style-type: none"> 1) Promoting private and public R&D spending in agriculture and fishery. 2) Creating an attractive investment climate to encourage more private sector R&D investment in agriculture and fishery. 3) Promoting interaction between research institutes and innovation centres in APEC economies by means of establishing a regional network of such institutions and centres. 4) Developing effective public technology dissemination systems to enhance capacity- building and promoting agricultural knowledge sharing and transfer, while ensuring that gender-sensitive dissemination systems are created. 5) Promoting effective mechanisms to facilitate voluntary public-private technology transfer, while respecting intellectual property rights. 6) Developing policy environments for the use, regulation and trade of innovative and emerging technologies. 7) Developing technologies for efficient use and sustainable management of agricultural and fishery resources. 8) Developing agricultural technologies to adapt to or mitigate the impact of climate change. 9) Providing open access to publicly funded agricultural relevant data. 10) Supporting initiatives to drive sustainable productivity gains, such as the G20 Meeting of Agricultural Chief Scientists whose goals are to identify global research priorities and targets, facilitate collaboration between public and private sector organizations in key areas, and track progress on established goals over time. 11) Conducting an analysis on agricultural and fishery areas and resources under stress and determine means and ways to return its potentials into full recovery or regenerate.
	2. Promoting effective management of marine ecosystems, fisheries, and aquaculture;	<ol style="list-style-type: none"> 1) Improving fisheries management and sustainable aquaculture practices. 2) Promoting sustainable aquaculture practices.

		<ol style="list-style-type: none"> 3) Promoting contributions of sustainable managed small-scale fisheries and aquaculture to food security. 4) Increasing investment in fishery human resources through trainings on technical capacity to foster more rapid implementation of best practice fishery management and legislative measures. 5) Improving gender equality in fishery development and ensuring that modernization and efficiency measures in this sector do not discriminate against women.
	<p>3. Strengthening farmer's organizations and cooperation, strengthening resilience of smallholders, promoting the welfare of women in farming, empowering smallholder farmers into the food supply and value chain, and enhancing services and training for small holders; and</p>	<ol style="list-style-type: none"> 1) Providing easy and simple access for small holders to agricultural financial sources. 2) Supporting small holder farmers' participation in agricultural insurance in order to reduce farming risks. 3) Empowering farmers and farmer groups or organizations through agricultural education and training, access to information, and technology transfer. 4) Providing small holder farmers and farmer organizations, including women farmers and traders, equitable access to markets and information on production, supply, demand, and prices of agricultural and fishery products in order for them to effectively participate in the markets. 5) Facilitating agricultural and fishery best practices sharing through training, extension services, and technology transfers. 6) Expanding access of women to local and regional agricultural associations, noting that women's groups and cooperatives are often the most difficult to form and sustain. 7) Conducting the targeting programs for women in agriculture by using gender-based analysis of programs' impacts to ensure these women receive maximum benefits from the efforts to achieve sustainable food security.
	<p>4. Ensuring sustainable management of natural resources such as land and water, enhancing positive externalities and minimizing negative social and environmental externalities of agriculture and fisheries, increasing resilience to natural disasters and global climate change, and</p>	<ol style="list-style-type: none"> 1) Promoting agricultural production practices that assist in adapting to, and mitigating of the impact of climate change. 2) Promoting sustainable crop diversification and agricultural production practices which contribute to enhancing land conservation while reducing chemical fertilizer dependencies.

	<p>providing food safety net, including proper nutrition for vulnerable communities.</p>	<ol style="list-style-type: none"> 3) Developing and introducing effective conservation systems to maintain soil fertility. 4) Developing sustainable agriculture by encouraging the use of environmentally low impact resources. 5) Facilitating technology transfers and best practices sharing in the area of sustainable management of land and water resources. 6) Increasing public-private investments in the construction of land-reclamation programs in APEC economies. 7) Promoting the sustainable use of natural resources by all people and societies. 8) Developing universal and voluntary guidelines on natural disaster preparedness for farmers and industries. 9) Facilitating data and information sharing as well as best practices to expand natural disaster preparation and recovery. 10) Building a coherent public-private cooperation system framework in the food and market supply chain for natural disaster management. 11) Facilitating investment for agriculture and fishery infrastructure construction and renovation to prevent and prepare for natural disasters. 12) Improving sustainable irrigation by greater investments in water infrastructure. 13) Promoting technical cooperation in order to improve water resources management in developing economies. 14) Promoting water management and renovation of old facilities for more efficient use of limited water resources. 15) Promoting Participatory Irrigation Management (PIM) and the understanding of multi-functionality of paddy fields and agricultural water in cooperation with the International Network for Water and Ecosystem in Paddy Fields (INWEPF). 16) Identifying policy options and market approaches that give sufficient incentives to farmers, agri-food sector, and consumers to better react to market changes and contribute to taking positive measures such as soil erosion prevention and flood prevention. 17) Identifying food insecure communities and taking targeted steps to overcome the problems, including provision of
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		<p>proper nutrition mainly for pregnant women and children.</p> <p>18) Facilitating data and information on the comparative nutritional value of foods and on the necessity of adequate nutrition during childhood development.</p>
WG2: Facilitation of Investment and Infrastructure Development (FIID)	1. Promoting investment in agriculture including by supporting negotiations of the Principles for Responsible Agricultural Investment (PRAI) under the guidance of the FAO;	
	2. Infrastructure development and analysing the impacts of Foreign Direct Investment (FDI).	<ol style="list-style-type: none"> 1) Increasing public investments in agriculture. 2) Creating an attractive business environment to encourage more private sector investments in agriculture. 3) Ensuring a high level of investor protection, including safeguarding and enforcing the rights and claims of investors and protecting robust intellectual property rights including Plant Variety Protection (PVP). 4) Consolidating information on the Asia-Pacific Information Platform on Food Security (APIP). 5) Sharing good practices of agricultural investments through APIP. 6) Creating lists of prospective infrastructure projects for development using the mechanisms of state-private partnership in the framework of the PPFS. 7) Developing a functioning, well-coordinated transport and logistics network in APEC. 8) Reducing post-harvest losses through infrastructure development of food markets and supply chains, including the use of public/private partnerships. 9) Developing a framework of activities/business plans with reference to the Principles for Responsible Agricultural Investment (PRAI), for APEC economies under the guidance of the FAO. 10) Forming a policy/roadmap in the development of the food industry utilizing a cold chain infrastructure and starting several pilot projects for building the cold chain infrastructure in the selected economies through public-private partnerships. 11) Promoting responsible agriculture investments that contribute to food security and nutrition.

		<ul style="list-style-type: none"> 12) Supporting investment programs aimed at strengthening the food security of APEC economies within a framework of cooperation with international financial institutions (banks, funds, etc.) 13) Disseminating knowledge on the use of information technology to enable the use of "precision farming" techniques. 14) Addressing supply chain barriers to trade, such as market access, boarder administration and telecom and transport infrastructure.
WG3: Enhancing Trade and Market	1. Facilitating trade in food and agricultural products	<ul style="list-style-type: none"> 1) Ensuring an affirmation of the pledge to end protectionist measures in trade of agricultural products. 2) Studying the impact of trade-related measures, especially export measures that impact food security. 3) Promoting development of regionally integrated markets. 4) Strengthening confidence in agricultural markets and establishing effective systems of collecting and disseminating market information. 5) Promoting harmonization of standards and adherence to international, science-based universally accepted standards, i.e. Codex, World Organization for Animal Health (OIE), International Plant Protection Convention (IPPC) and initiatives of the FAO, WHO and specialized WTO-Technical Barriers to Trade (TBT) and WTO-SPS Agreements. 6) Ensuring compliance with the WTO regulations in order to enhance transparency. 7) Reaffirming our pledge to refrain through the end of 2015 from imposing new export restrictions (Declaration of APEC leaders, 2012). 8) Improving effective global data standards for the connectivity of the food supply chain in support of APEC's existing supply chain objectives and in coordination with the CTI 9) Analyzing food market information such as price levels and the impact of price volatility throughout APEC economies. 10) Increasing transparency of the market. 11) Supporting negotiations within APEC and WTO on Environmental Goods and Services i.e: " Green Goods"
	2. Reducing food losses and waste (FLW)	<ul style="list-style-type: none"> 1) Developing unified methodologies to estimate food losses and waste. 2) Identifying major sources of food loss and waste in the distribution channel

		<p>(farm storage, food harvesting, food processing industries, transportation, retailers, and households), and compiling regional strategies for specific products in both developing and industrialized economies.</p> <ol style="list-style-type: none"> 3) Introducing a plan for striving toward a targeted rate of food loss and waste reduction 4) Facilitating the sharing of best practices in the APEC region. 5) Strengthening food supply chains and reducing food losses in developing economies through public-private partnerships.
	3. Improving governance frameworks;	<ol style="list-style-type: none"> 1) Sharing strategies and experiences among APEC economies regarding their food security policy governance frameworks and their food security communication strategies with the private sector. 2) Encouraging each APEC economy to establish the best or, at least, better governance framework for food security policy and communication strategies in each APEC economy, for example by establishing policy deliberating council with private sector and civil society membership for the purpose of incorporating external stakeholders' viewpoints at the policy planning stage; soliciting opinions from private sector and civil society before important policy decisions are made.
	4. Promoting, studying and sharing of best practices of risk management methods among stakeholders in order to strengthen food security; and	<ol style="list-style-type: none"> 1) Evaluating the likelihood and impact of food security threats, with soliciting stakeholder input during the evaluation process. 2) Creating diversified strategies to respond to various potential economic and environmental risks for each of the APEC member economies. 3) Sharing best practices in risk management methods to strengthen food security in APEC economies.
	5. Incentivizing trade and production to encourage increased output and yields in a sustainable manner.	

Table 2: Development on AFSR since 2014

Year	Activities
September 2014	<ul style="list-style-type: none"> • Beijing Declaration on APEC Food Security at the 3rd APEC Ministerial Meeting on Food Security. The Declaration supports APEC Food Security Roadmap Towards 2020 and APEC Food Security Business Plan (2014-2020)
September 2015	<ul style="list-style-type: none"> • Plan of Action of the High-Level Policy Dialogue on Food Security and Blue Economy • The action plan addresses various issues and concerns for sustainable food supply chains from resilient resources for inclusive growth within the Asia-Pacific Region.
April 2016	<ul style="list-style-type: none"> • APEC Public – Private Dialogue on Facilitating Infrastructure Investment to Enhance Food Security. • Piura Declaration on APEC Security at the 4th APEC Ministerial Meeting on Food Security. The Declaration looks at the strengthening of the PPFS through a review of its results, process improvement and governance in order to ensure that it remains effective and relevant.
August 2017	<ul style="list-style-type: none"> • Discussion on Challenges for Water Governance in the Context of Climate Changes
December 2017	<ul style="list-style-type: none"> • Recommendations on the potential Impacts of Climate Change on Smallholder Farmers
August 2018	<ul style="list-style-type: none"> • Survey on Strengthening Public-Private Partnership to Reduce Food Losses in the Supply Chain
June 2019	<ul style="list-style-type: none"> • Dialogue on strengthening Rural Areas as a Contribution to APEC Food Security. • The APEC economies shared experiences and view of current rurality and important ingredients in public and private sector initiatives by encouraging the local knowledge base, strengthening abilities and identified rural entrepreneurs as a key factor.
July 2019	<ul style="list-style-type: none"> • A project on Reducing Food Waste by Using Information and Communications Technology (ICT) and Innovative Technologies

	<ul style="list-style-type: none"> Reported activities on Reducing Food Loss and Waste among APEC member economies
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Chart 1: Achievement within Goals in Working Group 1

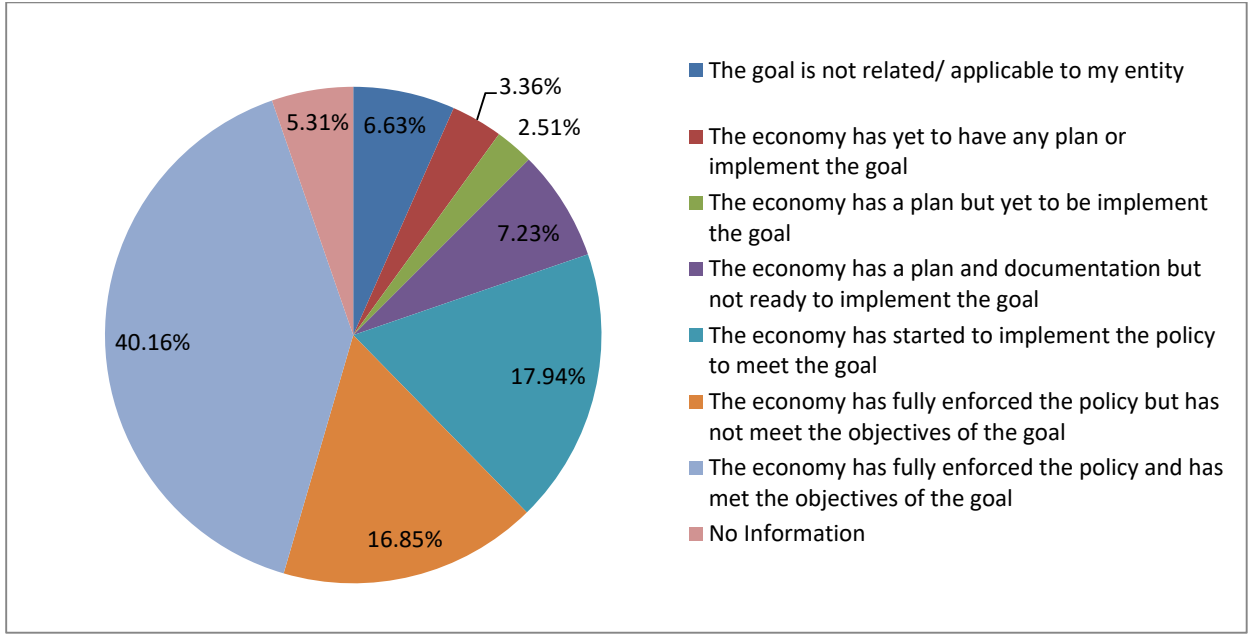


Chart 2: Achievement within Goals in Working Group 1, Priority Area 1

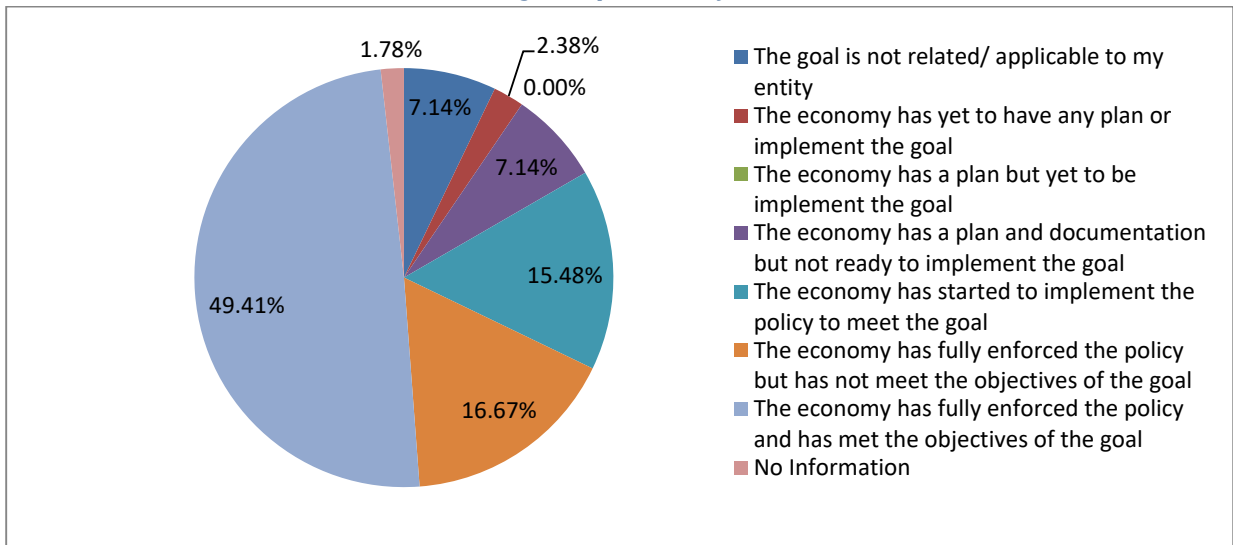


Chart 3: Achievement within Goals in Working Group 1, Priority Area 2

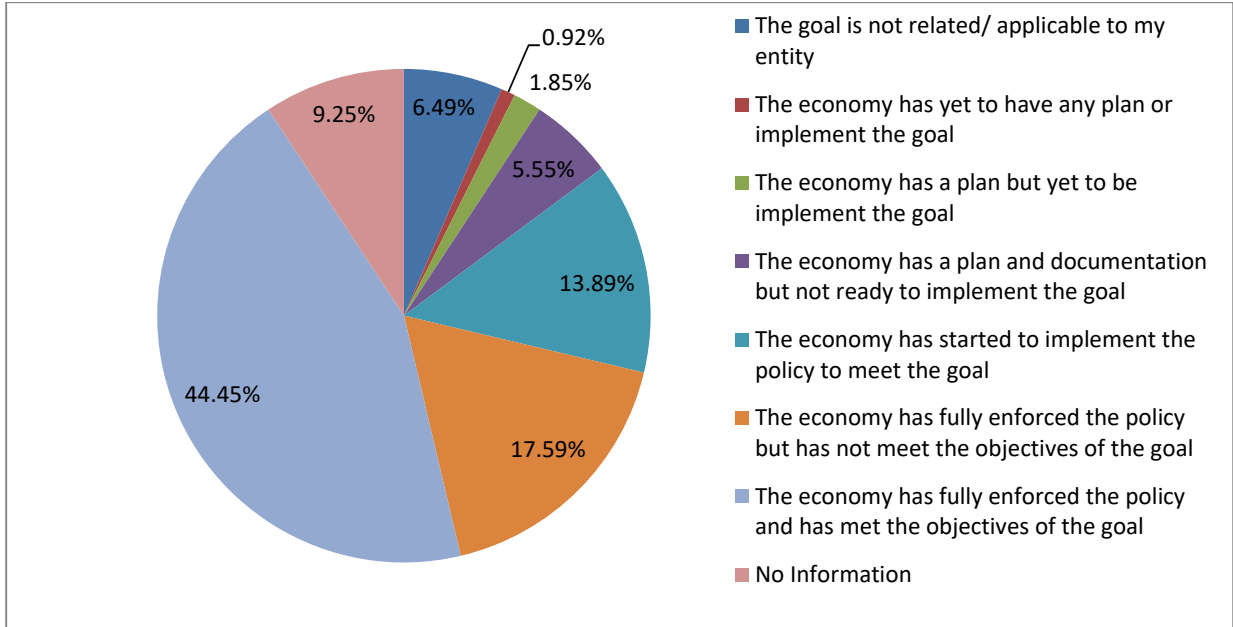


Chart 4: Achievement within Goals in Working Group 1, Priority Area 3

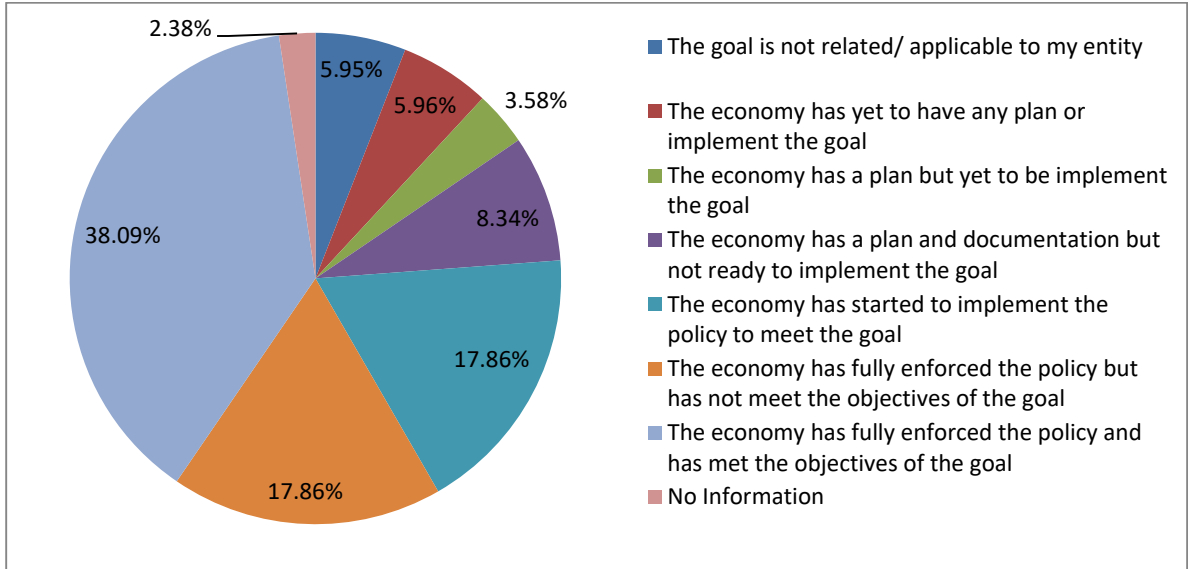


Chart 5: Achievement within Goals in Working Group 1, Priority Area 4

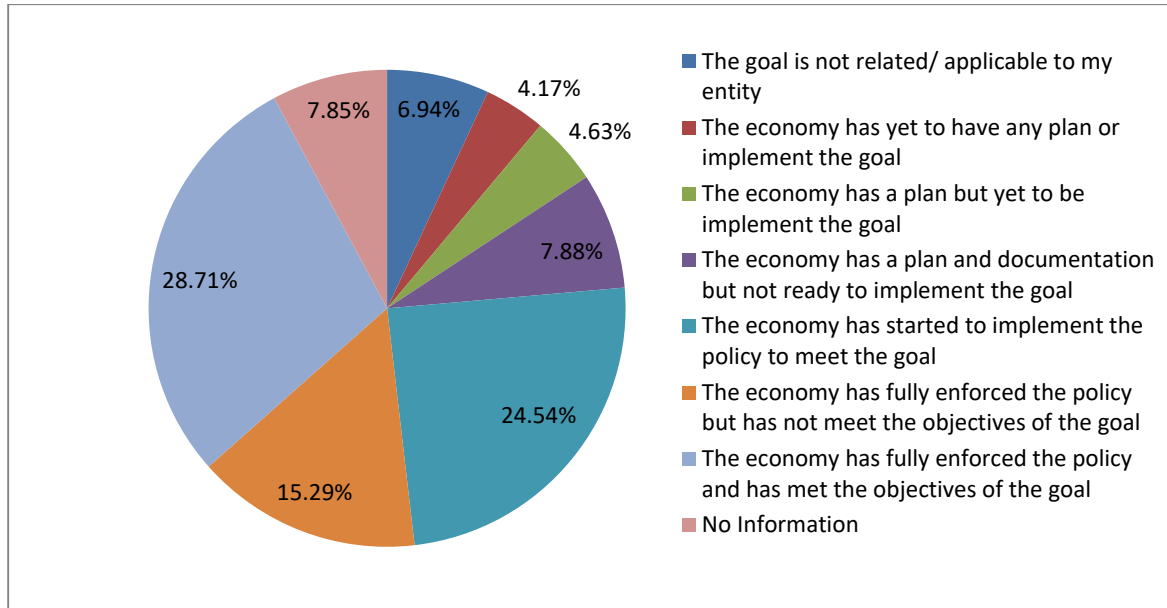


Chart 6: Achievement within Goals in Working Group 2

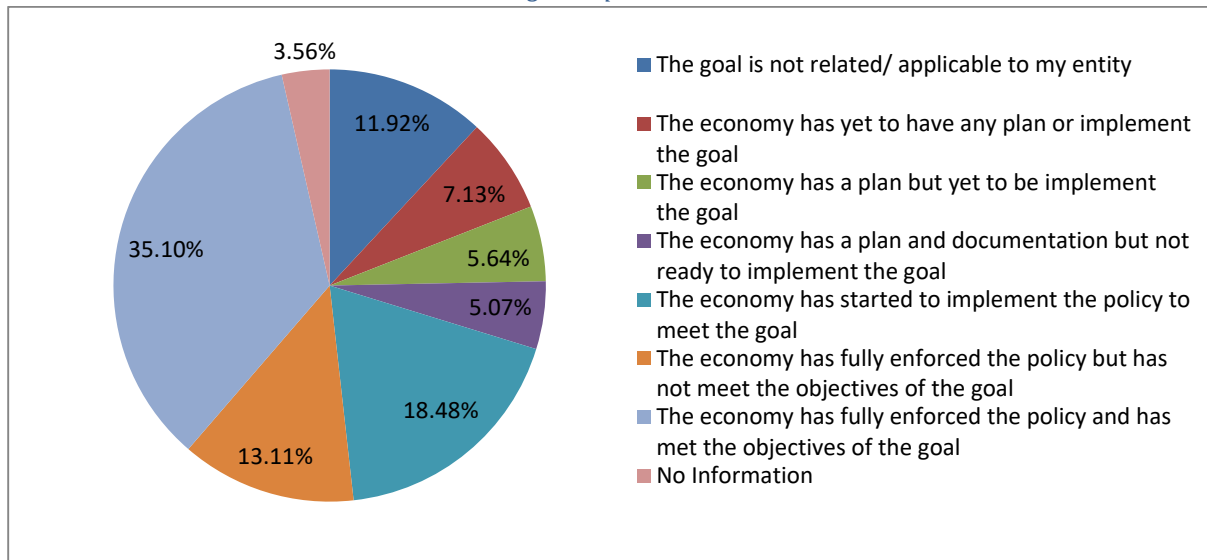


Chart 7: Achievement within Goals in Working Group 2, Priority Area 1

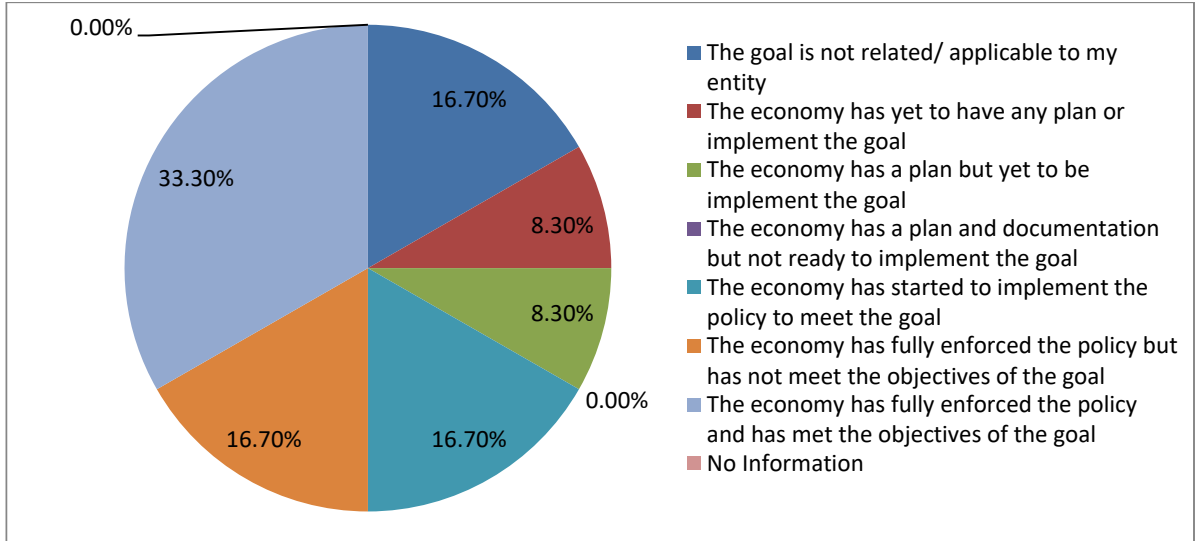


Chart 8: Achievement within Goals in Working Group 2, Priority Area 2

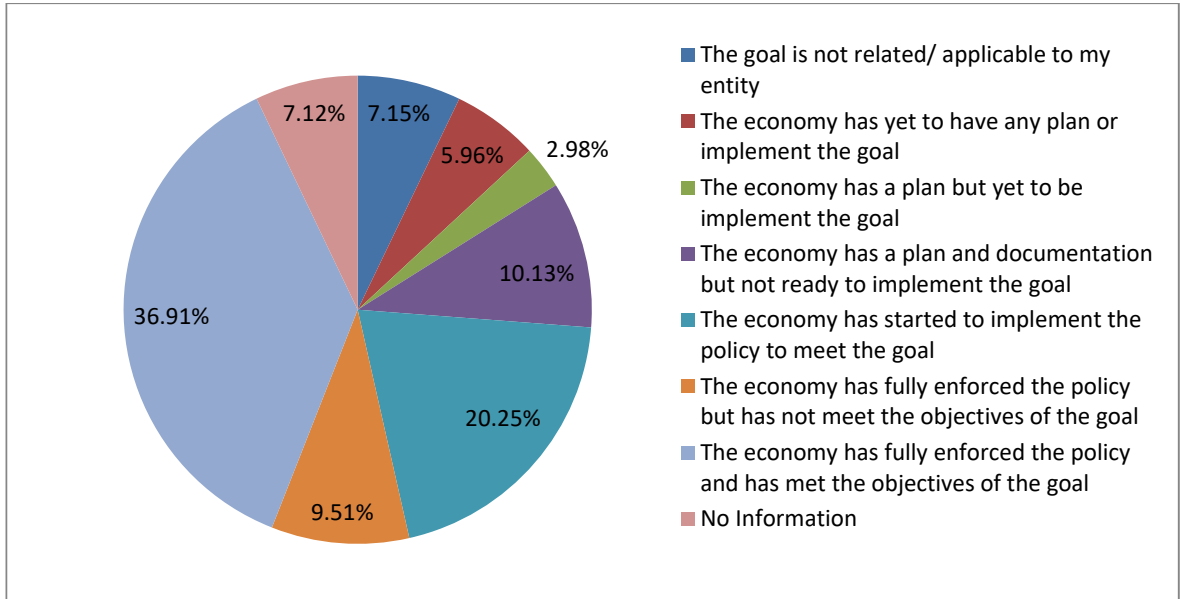


Chart 9: Achievement within Goals in Working Group 3

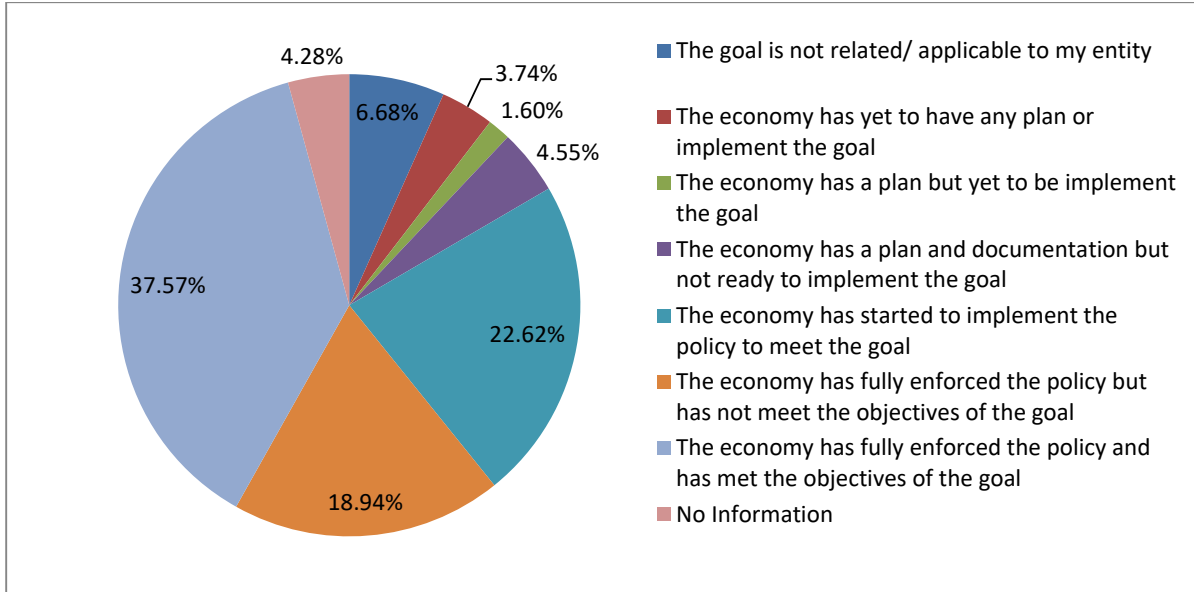


Chart 10: Achievement within Goals in Working Group 3, Priority Area 1

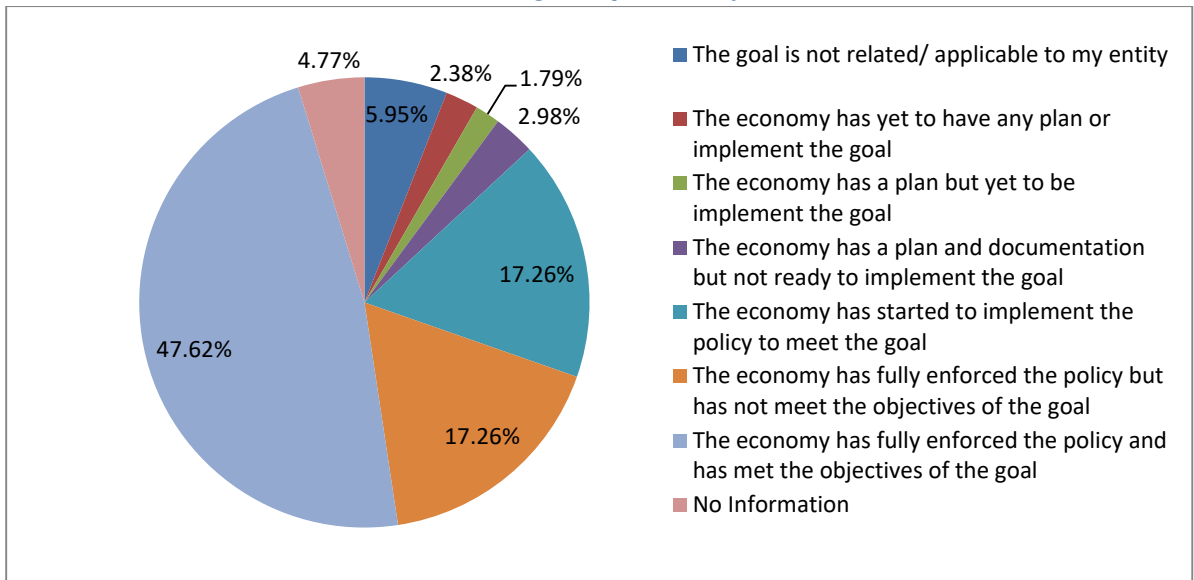


Chart 11: Achievement within Goals in Working Group 3, Priority Area 2

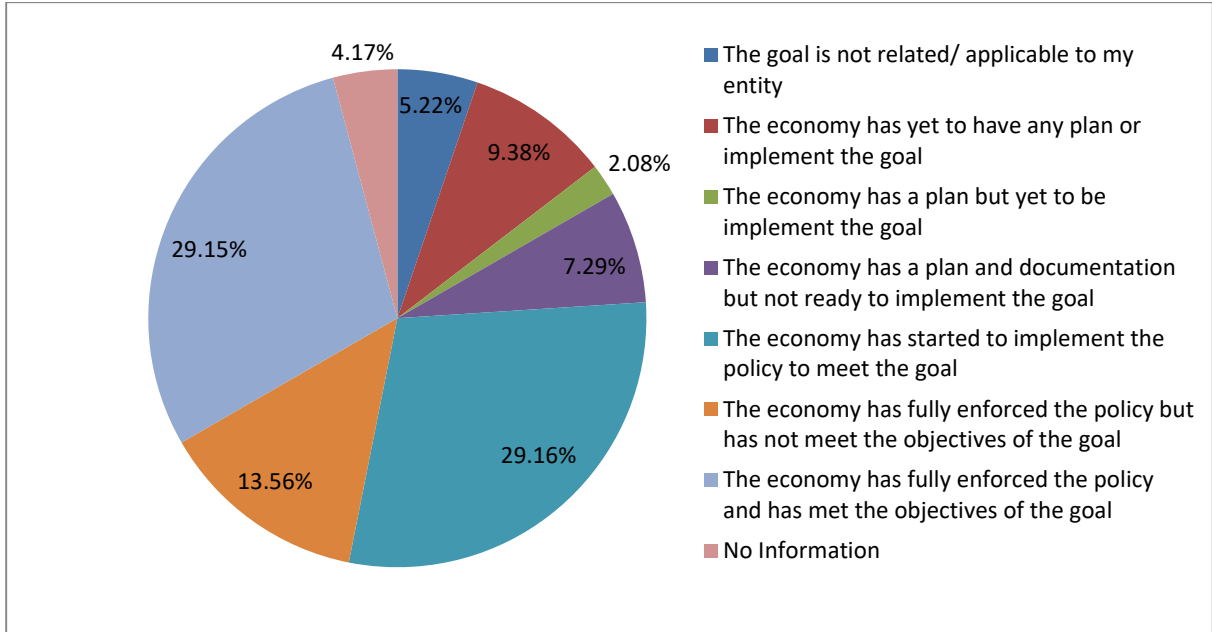


Chart 12: Achievement within Goals in Working Group 3, Priority Area 3

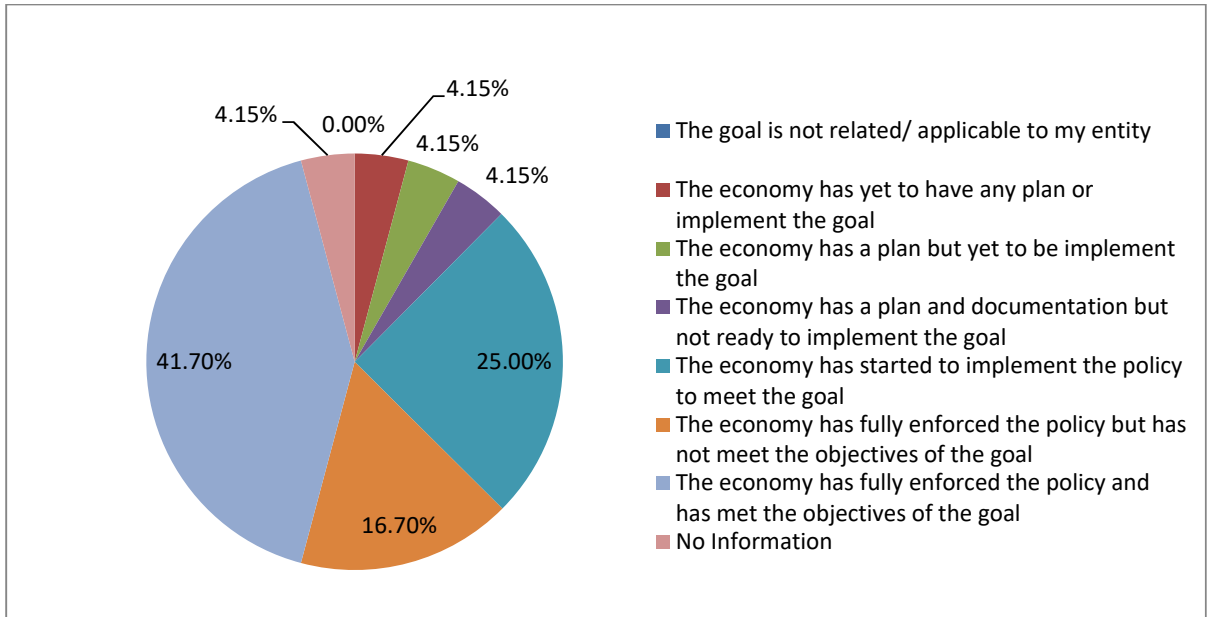


Chart 13: Achievement within Goals in Working Group 3, Priority Area 4

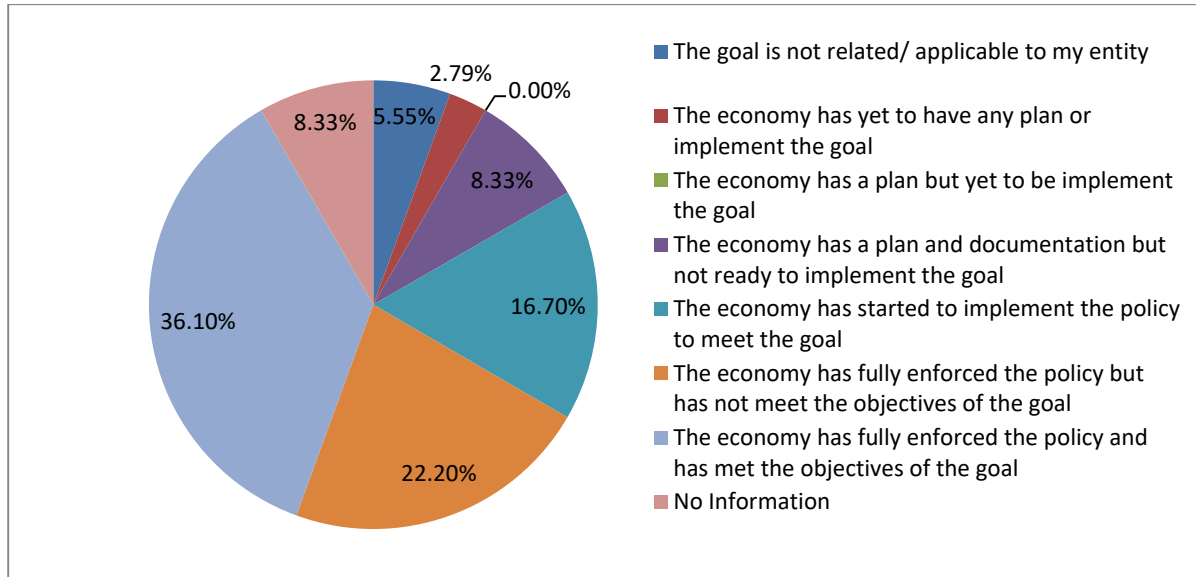


Chart 14: Achievement within Goals in Working Group 3, Priority Area 5

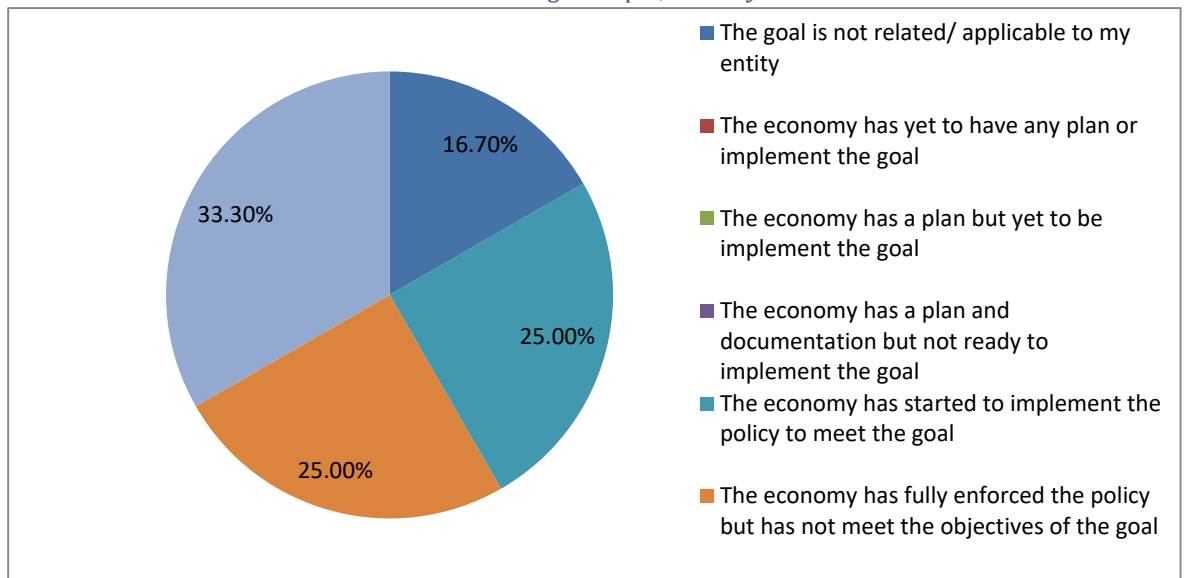


Chart 15: Challenges in Food Security Faced by Member Economies as a Result of Covid-19

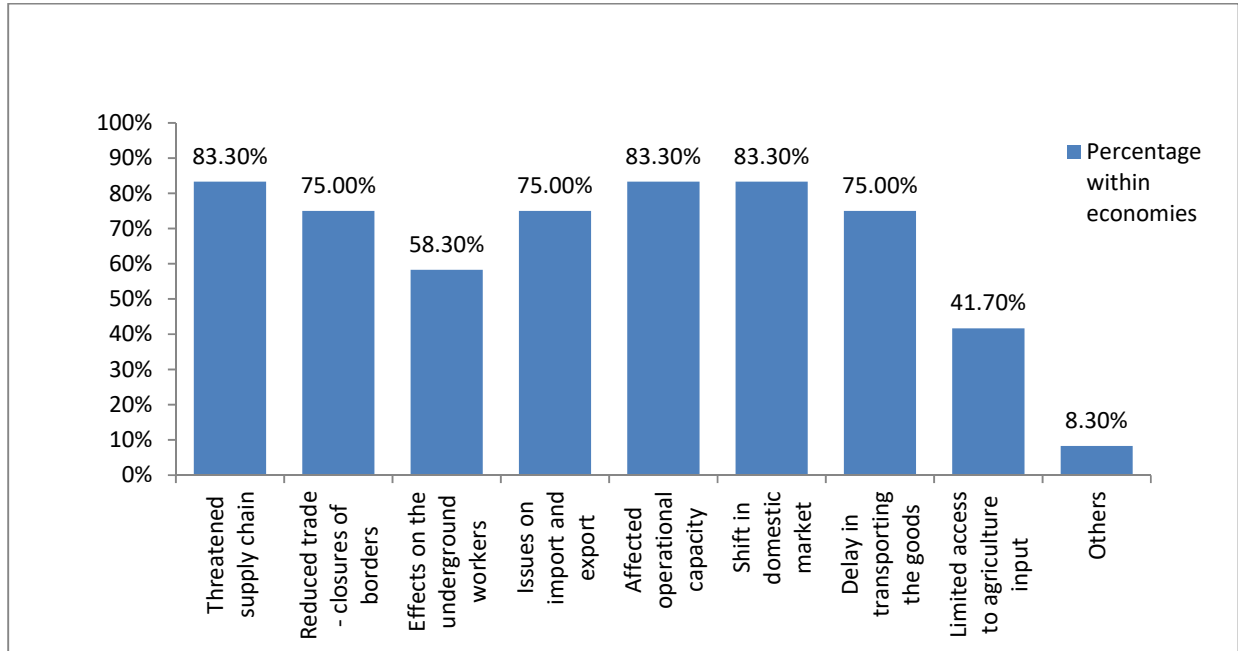


Chart 16: Measures Taken by Member Economies to Address Food Security Challenges due to Covid-19 Pandemic

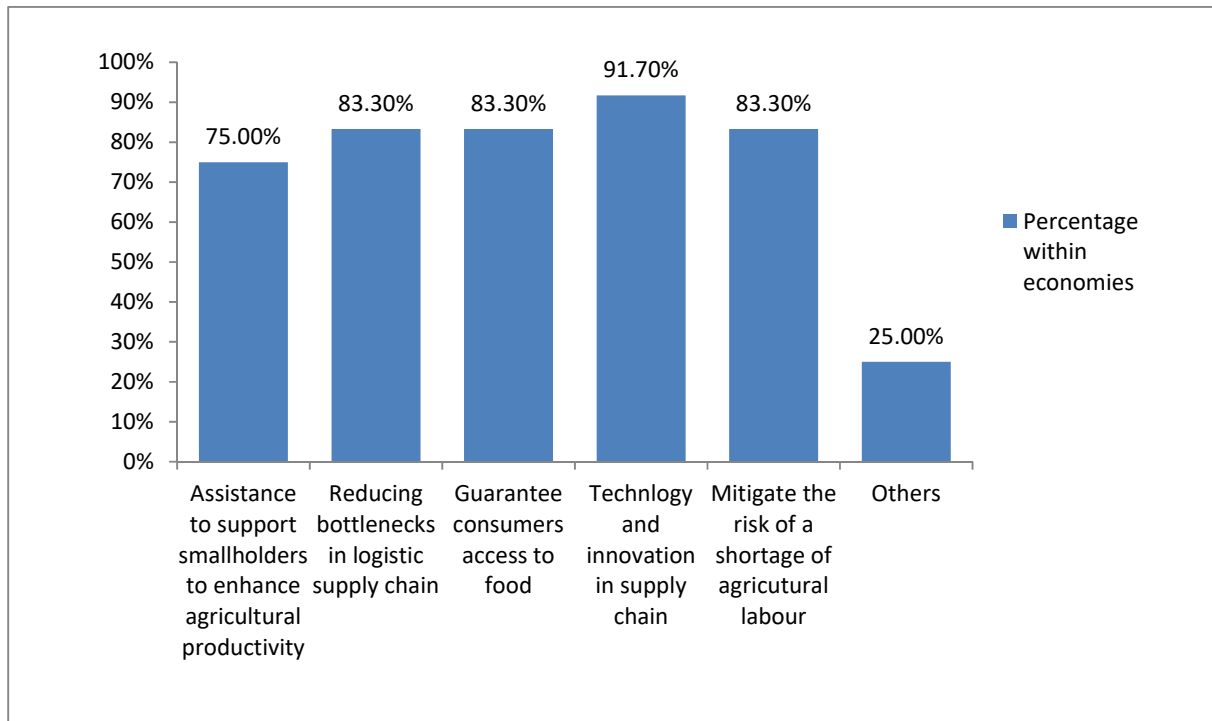


Chart 17: Recommendation to Improve Food Security Goals

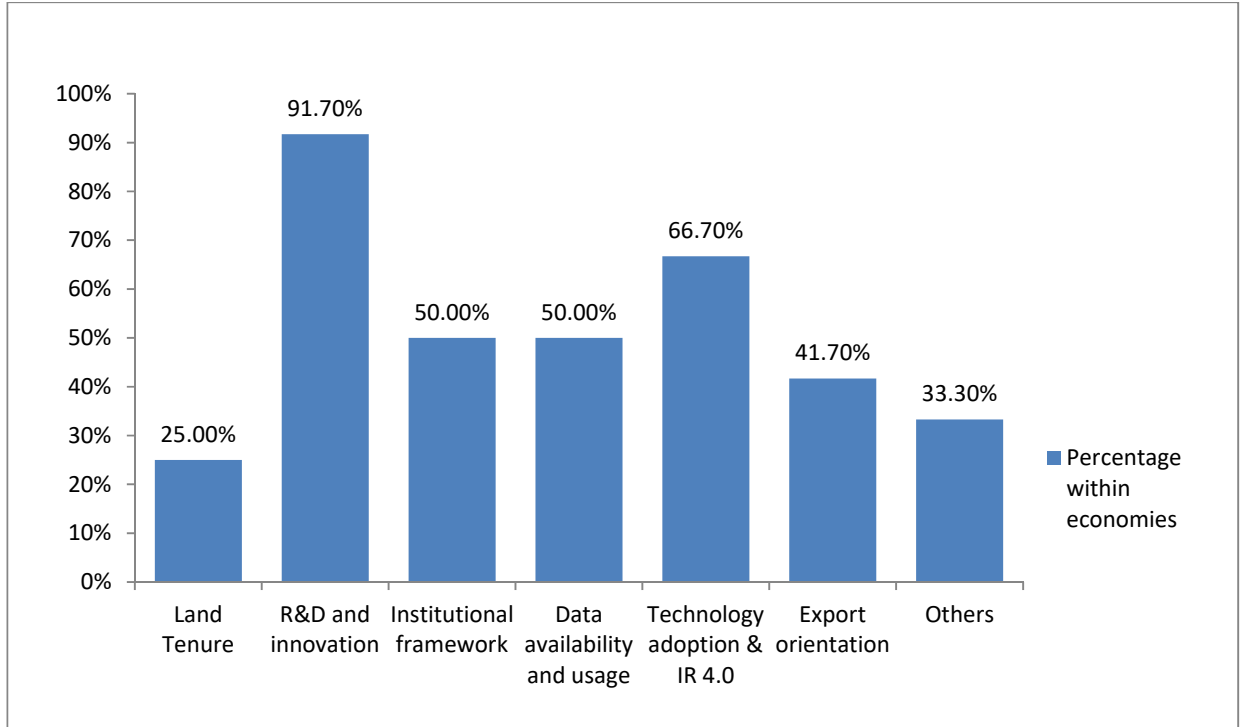
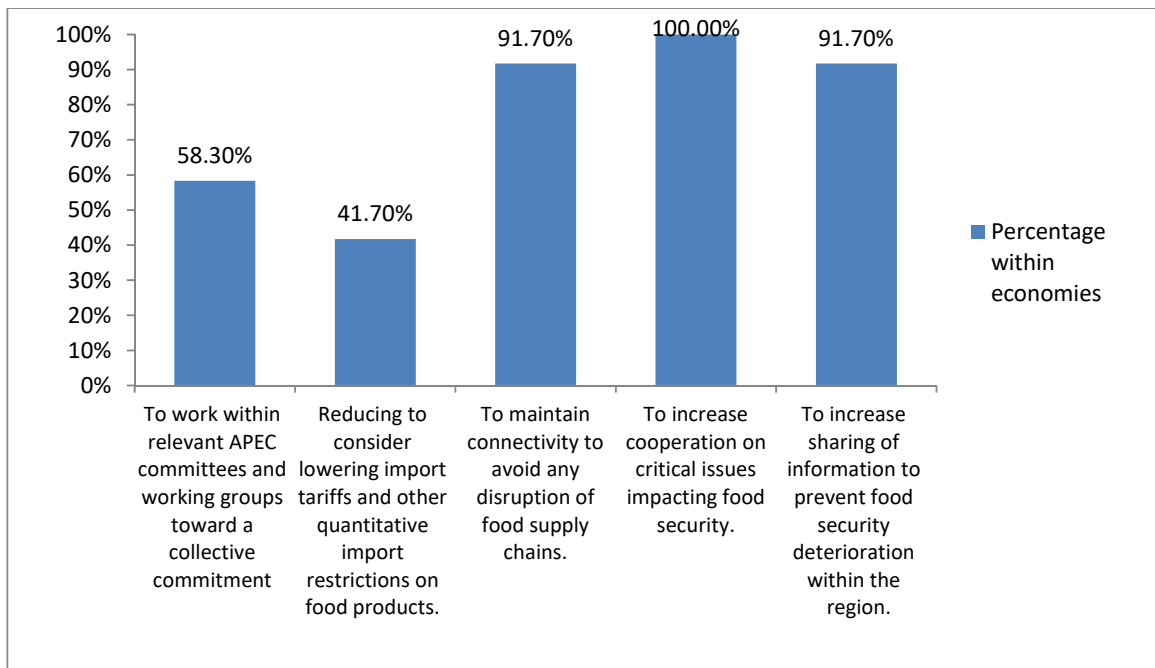


Chart 18: Recommendation to Address Food Security Challenges due to Covid-19 Pandemic



ANNEX



Review of the
APEC Food Security Roadmap Towards 2020
Stocktaking Report
(Revised Draft 13102020)

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Review of the APEC Food Security Roadmap Towards 2020

Stocktaking Report

KEY MESSAGES

7. As the host economy for APEC 2020, Malaysia undertakes to review the achievement of the goals of the APEC Food Security Roadmap Towards 2020 (AFSR).
8. The desktop-based Stocktaking exercise is the first step towards ascertaining the level of implementation of the AFSR. It is generally found that (i) the AFSR's goals are broad in nature; (ii) reports filed by member economies through various means and publications do not make any specific cross referencing to the specific goals of the ASFR; and (iii) most of the information in available reports, databases and websites are not current. Hence, the information will have to be verified with the APEC member economies through a survey or a focus group discussion (FGD).
9. Working Group 1, Sustainable Development of the Agricultural and Fishery Sectors (SDAFS) has four priority areas and 41 goals. It is found that many member economies (i) strive to promote private and public R&D and to attract more R&D investment in agriculture and fishery; (ii) encourage interactions between research institutes and innovation centers; (iv) conduct or participate in activities, to assess risk in implementing investment in agriculture and fishery; (v) are parties to various agreements to improve fisheries management and sustainable aquaculture practices; (vi) have introduced measures to mitigate impact of unpredictable volcanic eruptions; and (vii) are also involved in promoting sustainable crops. APEC member economies have also adopted the APEC Roadmap on Combatting Illegal, Unreported and Unregulated (IUU) Fishing, in 2019.
10. Working Group 2, Facilitation of Investment and Infrastructure Development (FIID), has two priority areas with 15 identified goals. APEC has set-up a web-database, the Asia-Pacific Information Platform on Food Security (APIP). It is found that, many member economies (i) shared their activities and good practices of their agricultural plan and investment with APIP; (ii) introduced measures to encourage more investment in agriculture; (iii) introduced measures to facilitate investment and infrastructure development; and (iv) established agricultural long-term policy and the roadmap for food industry.
11. Working Group 3, Enhancing Trade and Market (ETM) has five priority areas and 22 goals. It is found that (i) APEC through the APEC Food Safety Modernisation Framework to Facilitate Trade work to ensure Member economies compliance with the WTO regulations; (ii) efforts to reduce trade barriers in trade of agriculture products have made slow progress; (iii) many member economies have been working towards adopting a comprehensive plan on Food Lost and Waste (FLW); and (iv) member economies are involved in sharing of best practices in risk management methods to strengthen food security.
12. Due to the Covid-19 pandemic, APEC member economies face declining economic growth potential. The disruption in food supply chains caused by the restrictions of movement, logistics, trade facilitation and supply chain and trade prohibitions and restrictions have imposed potential risks on the availability and hike in the prices of food and agriculture produce within APEC economies, especially at the local levels due to domestic price shocks. Increased unemployment may lead to higher poverty level and inequal access for food. The COVID-19 pandemic, is expected to influence the design of the APEC Food Security Roadmap Post 2020.

4. Introduction

As the host for the APEC 2020, Malaysia is keen to address the issue of food security. Based on the theme “**Optimizing Human Potential Towards a Future of Shared Prosperity,**” food security within the APEC economies remain a major concern, especially with the impact of the Covid-19 pandemic. Hence, Malaysia’s Chairmanship will also focus on food security through Priority Area No. 3, i.e. Driving Innovative Sustainability.

The concept of food security for all people and the physical and economic access to safe and nutritious sustenance, has always been an important policy goal in APEC. Food security is a multi-dimensional and complex issue consisting of many social, economic, environmental, and political factors. Food security depends on the availability, accessibility, utilization, and stability of food. To address the sustainable development of the agricultural and aquaculture sectors, the APEC member economies adopted the APEC Food Security Roadmap Towards 2020 (ASFR) in Beijing in 2014. APEC member economies also adopted the Food Security and Climate Change Multi-Year Action Plan 2018-2020, which is to encourage sustainable and productive food systems.

The ASFR does not directly address the challenges of a major health and safety issue such as the Covid-19 pandemic. The current COVID-19 pandemic, which has caused disruption to global food supply chains is also expected to influence the design of the food security roadmap in the APEC member economies post 2020.

As the host of the APEC 2020, Malaysia has agreed to undertake a review of the ASFR. The main objective of the Review is to ascertain the level of implementation of the goals of ASFR by the APEC member economies. In addition, Malaysia will also take the initiative to conduct an informal discussion with APEC Member Economies on the impact of Covid-19 pandemic on food security.

The Report discusses the findings of the stocktaking exercise undertaken by Malaysia since the end of the SOM1 meeting in February 2020. The Stocktaking exercise, which is mainly based on desktop research, reviewed actions taken by APEC member economies to implement commitments and action plans of the ASFR up to the end of 2019. The Report also outlines the challenges of Covid-19 pandemic in the work for any future APEC Food Security Roadmap Post-2020.

5. Methodology of the Stocktaking

The Stocktaking’s main objective is to ascertain the level of implementation of the ASFR by the APEC member economies up to December 2019. The focus of the Stocktaking is the level of implementation of the action plans by the three PPFS’s working groups, namely, (1) Sustainable Development of the Agricultural and Fishery Sectors (SDAFS); (2) Facilitation of Investment and Infrastructure Development (FIID); and (3) Enhancing Trade and Markets (ETM) (see Table 1 for the Priority Areas and Goals of each Working Group).

Data are collected and compiled mainly from published APEC reports and relevant websites, covering the work of various APEC working groups including: Ocean Fisheries Working Group (OFWG); Agricultural Technical Cooperation Working Group (ATCWG); APEC High level policy Dialogue on Agricultural Biotechnology (HLPDAB); Policy Partnership for Science, Technology and Innovation

(PPSTI); APEC Committee on Trade and Investment (CTI); Asia-Pacific Information Platform for Food Security (APIP); Food Safety Cooperation Forum (FSCF); Committee on World Food Security; and ASEAN Food Security Information System (AFSIS).

The Stocktaking encounters some limitations. Firstly, the goals in AFSR are broad in nature and many of the goals are discussed in various sources. Second, reports filed by APEC member economies do not necessarily make any specific cross reference to the specific goals of the ASFR. Third, most of the information in available reports, databases and websites are not up to date. Hence, the information will have to be verified with APEC member economies through a survey or a focus group discussion, which may take place after the stocktaking exercise.

6. Findings of the Stocktaking

3.1 Working Group 1: Sustainable Development of the Agricultural and Fishery Sectors (SDAFS)

3.1.1 Priority Area 1: to promote research and development (R&D) and technology dissemination

The SDAFS has four priority areas (PA) (Table 1), with 41 goals (Tables 2, 3, 5, 6). The Stocking findings for PA 1 (to promote research and development (R&D) and technology dissemination) are shown in Table 2 below.

Among others, the Stocktaking finds many member economies have been actively promoting private and public research and development in agriculture and fisheries in Goal 1. Such member economies include Australia, Indonesia, Japan, Malaysia, New Zealand, Papua New Guinea, Chinese Taipei and the USA.

To achieve Goal 2, i.e. Creating an attractive investment climate to encourage more private sector R&D investment in agriculture and fishery, APEC member economies conducted seminar and workshops. The seminars and workshops include FAO Technical Workshop on Best-Practices For The Implementation And Reporting Of SDG Indicators; Training Workshop on Safety and Risk Assessment of Agriculture-related Genetically Modified Organisms (GMOs); APEC Training Workshop on Marine Sustainable Fisheries Development, OFWG 04 2018; APEC-ATCWG Workshop on Capacity Building for Implementation of Risk Management Systems on Genetic Resources for Food and Agriculture in APEC Member Economies; Workshop on Financing Value-Added Production And Marketing Of Fishery Products In Asia And The Pacific; Fifth Global Fisheries Enforcement Training Workshop (GFETW); Maritime Workshop in Vladivostok, 4- 7 October 2017; Workshop on Agricultural supply chain and role of wholesale and role of wholesale markets in Viet Nam Investment Assessment and Application of High-Level Technology for Food Security in Asia the Pacific; Workshop on Agricultural supply chain and role of wholesale and role of wholesale markets; and Investment Assessment and Application of High-Level Technology for Food Security in Asia and the Pacific.

Research institutes and innovation centers in many APEC member economies have also been interacting with each other (Goal 3).

3.1.2 Priority Area 2: To promote effective management of marine ecosystems, fisheries, and aquaculture

The findings for PA 2 are shown in Table 3 below. In PA 2,¹⁰ the Stocktaking finds that many APEC economies ratify, or adhere to various international agreements and codes to improve fisheries management and sustainable aquaculture practices. The agreements and codes include the United Nations Conventions on the Law of the Sea (UNCLOS), the United Nations Fish Stocks Agreement (UNFSA) and the Food and Agriculture Organization of the United Nations Compliance Agreement (Table 4). The APEC member economies have also taken steps to combat illegal, unreported and unregulated (IUU) fishing and associated trade and improving management of fisheries. APEC member economies also agreed to the APEC Roadmap on Combating Illegal, Unreported and Unregulated (IUU) Fishing, adopted at the Third Senior Officials' Meeting in Chile in 2019.¹¹

3.1.3 Priority Area 3: Strengthening farmer's organizations etc.

The findings for PA 3 are shown in Table 5 below. In PA 3, which relates to, among others, the strengthening farmer's organizations, smallholders, promoting the welfare of women in farming,¹² the Stocktaking finds that many member economies work towards achieving the second goal and fifth goal i.e. supporting small holder farmers' participation in agricultural insurance in order to reduce farming risk; and facilitating agricultural and fishery best practices sharing through training, extension services, and technology transfers. For example, Indonesia and the Philippines have taken measures to mitigate the devastating impact of unpredictable volcanic eruptions especially on poor communities, most of whom rely on agriculture.¹³

In line with the fifth goal, the Stocktaking finds that Australia, New Zealand and Papua New Guinea initiated a workshop on sharing best practices and policies especially on women in agriculture and fisheries.¹⁴

The stocktaking is not able to identify any compliance with Goals, 1,3, 6 and 7.

3.1.4 Priority Area 4: Ensuring sustainable management of natural resources etc.

The findings for PA 4 are shown in Table 6 below. PA 4¹⁵ has 18 goals and many member economies have been working towards achieving the objectives of the goals. The achievement are as follows: On Goal 1 on promoting agricultural production practices that assist in adapting to, and mitigating of the impact of climate change, member economies adopted the APEC Compendium of Best Practices for Women in Agriculture and Fisheries.

¹⁰ Priority Area 2: To promote effective management of marine ecosystems, fisheries, and aquaculture.

¹¹ https://www.apec.org/Meeting-Papers/Annual-Ministerial-Meetings/2019/2019_AMM/Annex-C.

¹² Strengthening farmer's organizations and cooperation, strengthening resilience of smallholders, promoting the welfare of women in farming, empowering smallholder farmers into the food supply and value chain, and enhancing services and training for small holders. PA 3 has seven goals.

¹³ Letter of Agreement with The Food and Agriculture Organization of the United Nations (FAO) and World Animal Protection - <http://www.fao.org/asiapacific/news/detail-events/en/c/1294336/>

¹⁴ <https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2243>

¹⁵ Ensuring sustainable management of natural resources such as land and water, enhancing positive externalities and minimizing negative social and environmental externalities of agriculture and fisheries, increasing resilience to natural disasters and global climate change, and providing food safety net, including proper nutrition for vulnerable communities.

1. For Goal 2, Promoting sustainable crop diversification and agricultural production practices which contribute to enhancing land conservation while reducing chemical fertilizer dependencies, there are efforts to promote sustainable crops such as the benefits of GE technology by the, Canada, Peru, Philippines and the United States.
2. For Goal 3, the Stocktaking finds that Chinese Taipei has been using soil electrical conductivity (EC) sensors (salinity of soil) and data analytics to determine the best time to harvest high value crops.
3. In meeting Goal 4, developing sustainable agriculture by encouraging the use of environmentally low impact resources, several member economies, Australia, Canada, China, Singapore, and the United States have implemented the development of sustainable agriculture.
4. For Goal 5, i.e. facilitating technology transfers and best practices sharing in the area of sustainable management of land and water resources, eleven member economies Australia, Brunei Darussalam, Indonesia, Malaysia, Papua New Guinea, Philippines, Singapore, Thailand, and Viet Nam have adopted the Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating Illegal, Unreported and Unregulated Fishing.
5. In Goal 6, increasing public-private investments in the construction of land-reclamation programs in APEC economies, the Stocktaking finds many member economies including Brunei Darussalam, Canada, New Zealand, Russia and the United States have implemented the public-private partnership (PPP).
6. For Goal 8, the stocktaking is only able to identify Indonesia in developing universal and voluntary guidelines on natural disaster preparedness for farmers and industries.
7. In meeting Goal 9, facilitating data and information sharing as well as best practices to expand natural disaster preparation and recovery, member economies such as Korea and Viet Nam have conducted workshops and data sharing programs.
8. For Goal 10, many economies such Australia, Japan, Malaysia, Korea, and the United States, have introduced framework for public-private cooperation framework in the food and market supply chain for natural disaster management.
9. For Goal 11, several economies including the Brunei Darussalam, Canada, China, Hong Kong, Korea, Malaysia, New Zealand, The Philippines, Russia, Singapore, Chinese Taipei, the USA and Viet Nam have seen improvement of public investment for agriculture and fishery infrastructure in case of natural disaster.
10. For Goal 12, Canada, China, Malaysia, the USA and Viet Nam have shown their concern for improving sustainable irrigation by greater investment in water infrastructure.
11. In meeting Goal 13, several economies conduct collaborations and technical cooperation in order to improve water resources management in developing economies. Such economies include Australia, Canada, Chile, China, Japan, Mexico, Peru, Philippines; Russia, Thailand and the USA.

12. For Goal 14, some economies such as Australia, Canada, New Zealand, Papua New Guinea and Peru have taken initiatives for water resource management to foster dynamic relation in the agriculture sector stakeholder.
13. In Goal 15, economies have conducted capacity building on management technologies for climate smart rice cultivation in the South-East Asian and Latin American rice sector. Participating economies include Chile, Japan, Malaysia, Mexico, New Zealand, Philippine, Thailand and Viet Nam.
14. For Goal 16, Chinese Academy of Agricultural Sciences (China), Agriculture and Agri-Food Canada (Canada), Health Science Authority (Singapore), and the United States Department of Agriculture (USA), have been involved in meeting the goal. The goal is to develop policy options and market approaches that give sufficient incentives to farmers, agri-food sector, and consumers to better react to market changes and contribute to taking positive measures such as soil erosion prevention and flood prevention.
15. In meeting Goal 17, Canada and the United States have been involved in working on the best practices for women. Goal 17 is about identifying food insecure communities and taking targeted steps to overcome the problems, including provision of proper nutrition mainly for pregnant women and children.
16. The Stocktaking is not able to find any information on Goal 7 i.e. promoting the sustainable use of natural resources by all people and societies; and Goal 18, i.e. facilitating data and information on the comparative nutritional value of foods and on the necessity of adequate nutrition during childhood development.

3.2 Working Group 2: Facilitation of Investment and Infrastructure Development (FIID)

The FIID has two priority areas. PA1 focuses on promoting investment in agriculture through supporting the Principles for Responsible Investment in Agriculture and Food Systems (PRIAFS). PA 2 focuses on the development of infrastructure and analyzing the impacts of FDI. The achievements of the goals of PA 1 and PA 2 are shown in Table 7.

Priority Area 1 (PA1) deals with the promoting investment in agriculture including by supporting negotiations of the Principles for Responsible Agriculture Investment and Food Security (PFIAFS) under the guidance of the FAO. The PRIAFS was endorsed at the Committee on World Food Security in October 2014.¹⁶ Responsible investment in agriculture and food systems are essential to improve food security. The aim of this principle is to promote responsible investments which improve food security and contribute towards the right to adequate food supply in the context of national food security.

The PRIAFS is a voluntary instrument that aims at all parties involved in agricultural food systems and offers practical directions. The PRIAFS results from a collaborative process in which all relevant parties i.e. the governments, civil society, the private sector, international organizations, private foundations and research institutions. However, due to insufficient data, the stocktaking exercise has not been able

¹⁶ www.fao.org/3/a-au866e.pdf

to determine whether the PRIAFS has been adopted and implemented by the relevant parties in the APEC member economies.

To ascertain the level of implementation of the two priority areas, the Report refers to the Asia-Pacific Information Platform on Food Security (APIP).¹⁷ APIP itself is one of the goals to be achieved in the AFSR. APIP is a system for sharing information on food security measures by the APEC member economies. Its development was based on the APEC Action Plan on Food Security agreed to at the APEC Ministerial Meeting on Food Security, in Niigata, Japan in 2010.

Apart from consolidating information, APEC economies are also required to share their good practices of agricultural investments through APIP. However, not all APEC member economies consolidate and share their activities and good practices of their agricultural plan and investment. The Stocktaking finds that Australia, Chile, Japan, Malaysia, Peru, Russia, and Chinese Taipei are among the member economies actively consolidating information on the site.

In achieving food security, most of the member economies look to create an attractive business environment to encourage more investment in agriculture especially from private sectors. However, not all information on the progress of the private sector investment in the agriculture sector are available on APIP. The Report has to refer to the respective official government websites on agriculture to gather more information.¹⁸

The Report finds that the progress of the implementation of PA2's 15 goals on the facilitation of investment and infrastructure development differs from one economy to another. Some of the member economies have already established their own long-term agricultural policy and roadmap in the development of their food industry. These include Chile, Japan, Malaysia Papua New Guinea and the United States. The Report also finds that developing APEC member economies like Papua New Guinea and the Philippines require support programs from development partners aimed at strengthening their food security. It is also observed that linkages between increasing public investments and creating attractive business environments to encourage more private investments vary from one economy to another (Table 7).

3.3 Working Group 3: Enhancing Trade and Markets (ETM).

3.3.1 PA 1: Ensuring an affirmation of the pledge to end protectionist measures in trade of agricultural products.

Working Group 3, Enhancing Trade and Market (ETM) has five PAs and 22 goals. The Findings on PA 1 is shown in Table 8.

PA 1 is on facilitating trade in food and agricultural products. To facilitate trade in food and agriculture products, APEC has undertaken efforts through the APEC Food Safety Modernisation Framework to Facilitate Trade to ensure compliance with the WTO regulations by member economies. The objectives

¹⁷ www.apip-apec.maff.go.jp

¹⁸ A reference was made towards the economies official government website on agriculture for example www.usda.gov, www.moa.gov.my, www.maff.go.jp, www.agriculture.gov.au, www.mafra.go.kr, www.agriculture.gov.pg and www.agriculture.gov.bn (for a full reference, refer to Annex)

of the effort are to enhance transparency and promoting harmonization of standards and adherence to international, science-based universally accepted standards.

On the other hand, the Report observes that efforts to reduce trade barriers in trade of agriculture products have made slow progress.¹⁹ Whilst APEC has undertaken a study on the impact of export measures on foods security, the study is still in progress.

3.3.2 PA 2: Reducing food losses and waste.

PA 2, Reducing food losses and waste (FLW) has five goals. The findings on PA 2 is shown in Table 9.

Most of the APEC economies have incorporated the first and second goals in their FLW plan. Fourteen APEC member economies have been working towards achieving the third goal through comprehensive plan on FLW. In achieving the major goals prescribed in the AFSR, the APEC Report on Feasible Solutions for Food Loss and Waste Reduction 2018 recommends APEC member economies to undertake certain measures. Such measures include recognising the importance of improving assessment methodology, data collection, FLW quantification, education campaigns, harvesting technical aid, post-harvest facility support, improved handling and transportation, capacity building, and food recycling, as well as capacity-building and networking with other relevant APEC sub-fora and international organizations.

The Report finds that APEC member economies are still in progress in achieving the fourth goal which is to facilitate the sharing of best practices in the APEC region.

3.3.3 PA 3, 4, 5: To improve the governance framework, to promote, study and share best practices of risk management and to incentivize trade and production

PA 3 with 5 goals sets the goals to improve the governance framework of food security in APEC. PA 4 with 3 goals, on the other hand, sets the goals to promote, study and share best practices of risk management methods among stakeholders to strengthen food security. Further PA 5, sets the goal to incentivize trade and production to encourage increased output and yields in a sustainable manner. The findings on PA 3, 4 and 5 are shown in Table 10.

In PA 3, due to insufficient data, the Report has not been able to ascertain the level of achievements of each of the goals. In PA 4, the Stocktaking finds that one goal that has been progressively moving, the sharing of best practices in risk management methods to strengthen food security in APEC economies. This goal is monitored under the platform of Best Practices Workstream Food Security and Climate Change Multi-Year Action Plan (MYAP) 2018-2020. In addition, the Report is unable to find any specific programs or actions under PA 4 to evaluate the likelihood and impact of food security threats.

Further, PA 5 does not set any specific goal. The Stocktaking finds no specific data shared among APEC economies of its progress between 2015 and 2020.

¹⁹ It is recorded in APEC economies that Thailand imposed the most protectionist across sectors in trade of agricultural products due to the nature of the economy with high dependency on agricultural products. See, Non-Tariff Barriers in Agriculture and Food Trade in APEC: Business Perspectives on Impacts and Solutions, APEC Business Advisory Council & University of Southern California, Marshall School of Business, November 2016.

4 Impact of Covid-19 on Food Security in APEC Region

APEC member economies face declining economic growth potential as a result of Covid-19. The decline in the economy will result in losses of income to employees made redundant in retail, manufacturing, tourism, and other hard-hit sectors as well as those in the informal sectors.²⁰ The increase in unemployment will lead also to higher poverty rate, which will contribute to the inequal access to food.²¹

The disruption in food supply chains caused by the movement restrictions, health risks due to infection of Covid-19 to workers, and logistics chokepoints have raised the risks in access to food. Covid-19 is already affecting the entire food system and the food supply chains. Disruptions due to restrictions of movement, logistics, trade facilitation and supply chains, and trade prohibitions and restrictions have imposed potential risks on the availability and hike in the prices of food and agriculture produce within APEC economies.

Despite challenges to the food security and food supply chains, global food supply and prices remain stable according to the Food Price Index of the FAO in March 2020. This was mainly due to the demand contractions amid lockdowns and quarantines. At the same time, demand contractions coupled with reduction in supply will have an impact on food security. The reduction in demand of food can be attributed to the decrease in purchasing power, the capacity to produce and distribute food, which may affect the poor and the vulnerable.²²

Although the global food price seems to be stable, local food prices may increase due to domestic price shocks.²³ Such domestic shocks are already taking place in several APEC economies due to the closure of slaughterhouses, inadequate or unavailability of packing facilities and labour shortages due to quarantines and movement restrictions impacting the harvest. In addition, workers, who are mainly low-income, are vulnerable to the pandemic, due to occupational hazards. Hence, it is important to ensure the good health of workers by providing and adhering to safety measures, such as testing, physical distancing and other hygienic practices.²⁴

In the face of Covid-19, increased efforts are needed among APEC economies to ensure that food value chains function well and promote the production and availability of diversified, safe and nutritious

²⁰ International Labour Organisation (ILO), (2020) ILO Monitor: COVID-19 and the world of work. Third edition, 29 April 2020 (ILO, Geneva) and World Bank. (2020a). East Asia Pacific Economic Update April 2020: COVID-19 and the EAP Region (World Bank, Washington DC).

²¹ PovcalNet, a tool provided by the World Bank for estimating global poverty, see also <https://blogs.worldbank.org/opendata/impact-covid-19-coronavirus-global-poverty-why-sub-saharan-africa-might-be-region-hardest> (last accessed 30 April 2020).

²² Committee on World Food Security, 2020. Interim Issues Paper on the Impact of COVID-19 on Food Security and Nutrition (FSN) by the High-Level Panel of Experts on Food Security and nutrition (HLPE), 24 March, 2020 (FOA, Rome).

²³ World Food Program, (2020), COVID-19 Will Double Number of People Facing Food Crises Unless Swift Action Is Taken, <https://www.wfpusa.org/news-release/covid-19-will-double-number-of-people-facing-food-crises-unless-swift-action-is-taken/>.

²⁴ Centre for Disease Control and Prevention (CDC) (2020), Meat and Poultry Processing Workers and Employers, Interim Guidance from CDC and the Occupational Safety and Health Administration (OSHA), <https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/meat-poultry-processing-workers-employers.html>.

food for all. It is important to ensure that policies, such as short-term measures to restrict trade, do not distort global markets.

Collective action is needed to ensure that markets are well-functioning, and that timely and reliable information on market fundamentals is available to all. This will reduce uncertainty and allow producers, consumers, traders and processors to make informed production and trade decisions and contain panic behaviors in global markets.²⁵

In this situation, APEC economies might want to encourage food producers to adopt new advanced technologies, such as agriculture biotechnology to accelerate production networks in catching up with lost time. In addition, agriculture and fishery sectors may adopt modern digital technologies to address food shortage. In the agricultural sector, for example, farmers who employ information and communication technology could obtain information about markets, soil quality, and weather through their smartphones, use sensors to monitor crops, run self-driving tractors to harvest quickly and efficiently, and sell directly to consumers over the Internet. Better inventory management will also lower the cost of producing and delivering perishable agricultural products by decreasing waste.

The stocks-to-use ratio in the APEC region shows that food security in APEC is currently in a strong position as compared to the global food crisis in 2007 to 2008. However, the ratio is not equal among all APEC economies. It is found that less than a third of APEC economies were able to improve particularly on food products like rice and wheat.²⁶ Detailed analysis also demonstrates that there is a need to maintain open markets for food products to strengthen food security across the APEC member economies.

It is important during Covid-19 to ensure that essential activities such as food production, supermarkets and distribution keep running and open with open trade lines. Otherwise, APEC economies might face risk of endangering their food security when food products cannot be supplied across borders within the region.²⁷

On the hand, according to the WTO Information Note on Standards and Regulations and Covid-19 on 22 May 2020, many members adopt the utilisation of electronic processes for certification requirements. This is in line with the e-Phyto Solution being implemented by the International Plant Protection Convention (IPPC). This may increase efficiency in the food supply chains and avoiding handling delays. However, whilst the utilisation of electronic and digital technology in the SPS measures is welcome, there is a need to support the lesser developed economies to develop the system. There is also a need to ensure that the system is tamper proof to ensure an appropriate compliance with the science-based risk management and biosecurity arrangements.

In facing the threats of the Covid-19 pandemic on food security, APEC member economies could adopt the following measures:

²⁵ Food and Agriculture Organisation of the United Nations (FAO), (2020), Joint Statement on COVID-19 Impacts on Food Security and Nutrition, 21 April 2020, <http://www.fao.org/news/story/en/item/1272058/icode/>.

²⁶ Carlos Kuriyama, APEC Policy Support Unit, POLICY BRIEF No. 33, May 2020, Export Restrictions and Food Security in the Context of the COVID-19 Pandemic.

²⁷ Joseph Glauber, David Laborde, Will Martin and Rob Vos, "COVID-19: Trade Restrictions Are Worst Possible Response to Safeguard Food Security," International Food Policy Research Institute: IFPRI Blog, 27 March 2020, <https://www.ifpri.org/blog/covid-19-trade-restrictions-are-worst-possible-response-safeguard-food-security>.

1. To work within relevant APEC committees and working groups toward a collective commitment. This is to ensure that unnecessary export bans and restrictions do not escalate over the time as those measures could disadvantage consumers and firms.
2. To consider lowering import tariffs and other quantitative import restrictions on food products.
3. To maintain connectivity as to avoid any disruption of food supply chains.
4. To increase cooperation on critical issues impacting food security. For example, New Zealand and Singapore issued commitment to eliminate customs duties and not to impose export restrictions for 124 essential goods, including food and healthcare products through a Declaration on Trade in Essential Goods for Combating the Covid-19 Pandemic.
5. To increase sharing of information to prevent food security deterioration within the region.

Further, APEC economies may consider the following measures:²⁸

- vi. Ensuring Access to Safe and Nutritious Food for All (enabling all people to be well nourished and healthy)
- vii. Shifting to Sustainable Consumption Patterns (promoting and creating demand for healthy and sustainable diets, reducing waste)
- viii. Boosting Nature Positive Production at Sufficient Scales (acting on climate change, reducing emissions and increasing carbon capture, regenerating and protecting critical ecosystems and reducing food loss and energy usage, without undermining health or nutritious diets)
- ix. Advancing Equitable Livelihoods and Value Distribution (raising incomes, distributing risk, expanding inclusion, creating jobs)
- x. Building Resilience to Vulnerabilities, Shocks and Stresses (ensuring the continued functionality of healthy and sustainable food systems)

5 Conclusion and Recommendation

In the stocktaking exercise, there is insufficient data to conclude the achievements and shortcomings of the APEC Food Security Roadmap Towards 2020. Hence, the Report proposes a focus group discussion (FGD) and a survey to be conducted to ascertain the level of implementation of the AFSR among the APEC member economies. The FGD and the survey may also explore policy approaches taken by the APEC member economies to address the issue of food security as a result of the Covid-19 pandemic.

²⁸ FAO Regional Conference for Asia and the Pacific, Thirty Fifth Session, 1-4 September 2020, UN Food Systems Summit, APRC/20/INF/25 Rev.1.

Table 2: AFSR Working Groups and Priority Areas

<i>Working Group</i>	<i>Priority Areas</i>
<i>1. Sustainable Development of the Agricultural and Fishery Sectors (SDAFS)</i>	<ol style="list-style-type: none"> 5. Promoting research and development and technology dissemination; 6. Promoting effective management of marine ecosystems, fisheries, and aquaculture; 7. Strengthening farmer’s organizations and cooperation, strengthening resilience of smallholders, promoting the welfare of women in farming, empowering smallholder farmers into the food supply and value chain, and enhancing services and training for small holders; and 8. Ensuring sustainable management of natural resources such as land and water, enhancing positive externalities and minimizing negative social and environmental externalities of agriculture and fisheries, increasing resilience to natural disasters and global climate change, and providing food safety net, including proper nutrition for vulnerable communities.
<i>2. Facilitation of Investment and Infrastructure Development (FIID)</i>	<ol style="list-style-type: none"> 3. Promoting investment in agriculture including by supporting negotiations of the Principles for Responsible Agricultural Investment (PRAI) under the guidance of the FAO; 4. Infrastructure development and analysing the impacts of Foreign Direct Investment (FDI).
<i>3. Enhancing Trade and Markets (ETM).</i>	<ol style="list-style-type: none"> 1. Facilitating trade in food and agricultural products; 2. Reducing food loss and waste; 3. Improving governance frameworks; 4. Promoting, studying and sharing of best practices of risk management methods among stakeholders in order to strengthen food security; and 5. Incentivizing trade and production to encourage increased output and yields in a sustainable manner.

Table 3: APEC Member Economies Compliance with the Goals of WG1, PA1

WG1: Sustainable Development of the Agriculture and Fishing Sector	
PA 1) Promoting research and development and technology dissemination.	
Goals towards 2020	Findings/ Sources
1) Promoting private and public R&D spending in agriculture and fishery.	<p>Some economies such as Japan, Papua New Guinea, and Chinese Taipei, have taken initiatives to promote private and public research and development spending in agriculture and fishery. OECD recorded like R&D spending in agriculture and fishery by some economies like Australia, Indonesia, Malaysia, New Zealand, and the United States.</p> <p>No updated data since 2019.</p> <p>Ocean Fisheries Working Group (OFWG) https://www.apec.org/Achievements/Group/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Ocean-and-Fisheries</p> <p>Agricultural http://www.fao.org/3/a-au866e.pdf; https://stats.oecd.org/Index.aspx?DataSetCode=FISH_PAT_RD</p>
2) Creating an attractive investment climate to encourage more private sector R&D investment in agriculture and fishery.	<p>Most economies have conducted workshops and seminars to assess the risk in implementing investment in agriculture and fishery;</p> <p>Many economies shown progress in increasing private sector investments in agriculture namely Brunei, Canada, China, Hong Kong, Korea, Malaysia, New Zealand, Philippines, Russia, Singapore, Chinese Taipei, the United States and Viet Nam.</p> <p>There is no clear indication from other economies.</p> <p>Agricultural Technical Cooperation Working Group (ATCWG) https://www.apec.org/Achievements/Group/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Agricultural-Technical-Cooperation</p>
3) Promoting interaction between research institutes and innovation centres in APEC economies by means of establishing a regional network of such institutions and centres.	<p>APEC Research Centre has developed smart power management for self-sustained green community to promote the interaction between institutes and innovation centres</p>
4) Developing effective public technology dissemination systems to enhance capacity-building and promoting agricultural knowledge sharing and transfer, while ensuring that gender-sensitive dissemination systems are created.	<p>New Zealand has developed effective technologies to enhance the capacity of rice production. There is no further information regarding other economies.</p> <p>APEC Policy Partnership for Science, Technology and Innovation (PPSTI) https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Policy-Partnership-on-Science-Technology-and-Innovation#:~:text=The%20PPSTI's%20mission%20is%20to,sector%20and%20other%20APEC%20fora.</p> <p>Specialized APEC Research Centers</p>

	<p>https://www.apec.org/Groups/Other-Groups/Specialised-APEC-Centers</p> <p>Policy Partnership on Science, Technology and Innovation Work Plan for 2020. - https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Policy-Partnership-on-Science-Technology-and-Innovation#:~:text=The%20PPSTI's%20mission%20is%20to,sector%20and%20other%20APEC%20fora</p>
<p>5) Promoting effective mechanisms to facilitate voluntary public-private technology transfer, while respecting intellectual property rights.</p>	<p>No information on the Goal.</p> <p>APEC Policy Partnership for Science, Technology and Innovation (PPSTI) https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Policy-Partnership-on-Science-Technology-and-Innovation#:~:text=The%20PPSTI's%20mission%20is%20to,sector%20and%20other%20APEC%20fora.%E2%80%9D</p> <p>APEC Policy Partnership for Science, Technology and Innovation (PPSTI) https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Policy-Partnership-on-Science-Technology-and-Innovation#:~:text=The%20PPSTI's%20mission%20is%20to,sector%20and%20other%20APEC%20fora.%E2%80%9D</p>
<p>6) Developing policy environments for the use, regulation and trade of innovative and emerging technologies.</p>	<p>There are efforts in developing policy environments for the Goal.</p> <p>APEC Policy Partnership for Science, Technology and Innovation (PPSTI) https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Policy-Partnership-on-Science-Technology-and-Innovation#:~:text=The%20PPSTI's%20mission%20is%20to,sector%20and%20other%20APEC%20fora.%E2%80%9D</p> <p>2019 APEC Economic Policy Report - https://www.apec.org/Publications/2019/11/2019-APEC-Economic-Policy-Report</p>
<p>7) Developing technologies for efficient use and sustainable management of agricultural and fishery resources.</p>	<p>Japan and New Zealand have developed technologies in this field.</p> <p>No further information regarding other economies Ocean Fisheries Working Group (OFWG) https://www.apec.org/Achievements/Group/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Ocean-and-Fisheries</p> <p>Agricultural Technical Cooperation Working Group (ATCWG) https://www.apec.org/Achievements/Group/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Agricultural-Technical-Cooperation</p>

	<p>APEC Workshop on Marine Science, Technology and Innovation towards Science Based Management and Sustainable Use of Oceans and Marine Resources, OFWG 03 2016, Japan.</p> <p>Capacity Building on Management Technologies for Climate Smart Rice Cultivation in the South-East Asian and Latin American Rice Sector, ATC 01 2017A, New Zealand.</p>
8) Developing agricultural technologies to adapt to or mitigate the impact of climate change.	<p>There is no information of economies working on this goal. However, APEC has recognised the change in climate change and conduct 2 days symposium held in Philippines in 2015. Agricultural Technical Cooperation Working Group (ATCWG) https://www.apec.org/Achievements/Group/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Agricultural-Technical-Cooperation</p> <p>Symposium/Workshop on Planning a Collaborative Research, Development and Extension Program on Climate Change among APEC Member Economies (2015) - https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=1675</p>
9) Providing open access to publicly funded agricultural relevant data	<p>No information available online on the public funded agricultural relevant data.</p> <p>Agricultural Technical Cooperation Working Group (ATCWG) https://www.apec.org/Achievements/Group/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Agricultural-Technical-Cooperation</p> <p>The APEC Symposium on Agricultural Science Data Sharing and Service, ATC 05 2017S, China.</p>
10) Supporting initiatives to drive sustainable productivity gains, such as the G20 Meeting of Agricultural Chief Scientists whose goals are to identify global research priorities and targets, facilitate collaboration between public and private sector organizations in key areas, and track progress on established goals over time.	<p>No clear information for public and private sectors involvement in supporting initiatives to drive sustainable productivity gains.</p> <p>Asia Pacific Information Platform for Food Security (APIP) https://apip-apec.maff.go.jp</p>
11) Conducting an analysis on agricultural and fishery areas and resources under stress and determine means and ways to return its potentials into full recovery or regenerate.	<p>No clear information regarding the analysis on agricultural and fishery areas and resources and ways to return it into full recovery or regenerate.</p> <p>Ocean Fisheries Working Group (OFWG) https://www.apec.org/Achievements/Group/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Ocean-and-Fisheries</p> <p>Agricultural Technical Cooperation Working Group (ATCWG) https://www.apec.org/Achievements/Group/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Agricultural-Technical-Cooperation</p> <p>Marine Ecosystem Assessment and Management in the Asia-Pacific Region Phase III (2012) - http://publications.apec.org/Publications/2012/04/Marine-</p>

	<p>Ecosystem-Assessment-and-Management-in-the-AsiaPacific-Region-Phase-III--Pilot-APEC-Large-Mar</p> <p>Final Project Completion Report: High Level Private-Public Forum on Cold Chain to Strengthen Agriculture & Food's Global Value Chain (2016) - http://publications.apec.org/Publications/2016/02/Final-Project-Completion-Report-High-Level-PrivatePublic-Forum-on-Cold-Chain-to-Strengthen-Agricultu</p>
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Table 4: Findings of the Goals of WG1, PA 2

WG1: Sustainable Development of the Agriculture and Fishing Sector	
2) Promoting effective management of marine ecosystems, fisheries, and aquaculture	
Goals towards 2020	Findings/ Sources/ References
1) Improving fisheries management and sustainable aquaculture practices.	<ul style="list-style-type: none"> • Many APEC economies had implemented FAO code on best practices on financial and trade of fish production by FAO code. • APEC adopted the EBFM in Chile <p>https://www.apec.org/Meeting-Papers/Annual-Ministerial-Meetings/2019/2019_AMM/Annex-C</p> <p>https://www.apec.org/Meeting-Papers/Annual-Ministerial-Meetings/2019/2019_AMM/Annex-C</p> <p>http://www.fao.org/asiapacific/news/detail-events/en/c/1294336/</p>
2) Promoting sustainable aquaculture practices.	<ul style="list-style-type: none"> • Member economies conducted knowledge sharing through knowledge exchange and the OFWG 2016 manual. • APEC Initiative on Combatting Illegal, Unreported and Unregulated (IUU) Fishing in 2019 in Chile <p>2019 PSU insight on regulatory environment file:///Users/user/Downloads/APEC%20Food%20Security%20Roadmap%20Towards%20202014som3027anx11%20(1).pdf,</p>
3) Promoting contributions of sustainable managed small-scale fisheries and aquaculture to food security.	No information
4) Increasing investment in fishery human resources through trainings on technical capacity to foster more rapid implementation of best practice fishery management and legislative measures.	No information
5) Improving gender equality in fishery development and ensuring that modernization and efficiency measures in this sector do not discriminate against women.	No information

Table 5: Ratification Status of the UNFSA and FAO Compliance Agreement by APEC Member Economies

Agreements/ Economies		The United Nations Fish Stocks Agreement (UNFSA) ²⁹	The FAO Compliance Agreement. ³⁰
		Date of ratification	Date of ratification
1	Australia	(23/12/1999)	(19/08/2004)
2	Brunei	-	-
3	Canada	(03/08/1999)	(20/05/1994)
4	Chile	-	(23/01/2004)
5	People's Republic of China	-	-
6	Hong Kong, China	-	-
7	Indonesia	(28/09/2009)	-
8	Japan	(7/08/2006)	(20/06/2000)
9	Republic of Korea	(1/02/2008)	(24/04/2003)
10	Malaysia	-	-
11	Mexico	-	(11/03/1999)
12	New Zealand	(18/04/2001)	(14/07/2005)
13	Papua New Guinea	(04/06/1999)	-
14	Peru	-	(23/02/2001)
15	Philippines	(24/09/2014)	-
16	Russia	(04/08/1997)	-
17	Singapore	-	-
18	Chinese Taipei	-	-
19	Thailand	-	-
20	United States	(21/08/1996)	(19/12/1995)
21	Viet Nam	-	-

²⁹ https://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm

³⁰ https://www.researchgate.net/figure/List-of-the-parties-to-the-Compliance-Agreement_tbl3_264503052

Table 6: Findings of the Goals of WG1, PA 3

WG1: Sustainable Development of the Agriculture and Fishing Sector	
3) Strengthening farmer’s organizations and cooperation, strengthening resilience of smallholders, promoting the welfare of women in farming, empowering smallholder farmers into the food supply and value chain, and enhancing services and training for small holders	
Goals towards 2020	Findings/ Sources/ References
1) Providing easy and simple access for small holders to agricultural financial sources.	No information on this Goal
2) Supporting small holder farmers’ participation in agricultural insurance in order to reduce farming risks.	Indonesia and the Philippines have taken measures to mitigate the devastating impact of unpredictable volcanic eruptions especially on poor communities, most of whom rely on agriculture http://www.fao.org/asiapacific/news/detail-events/en/c/1294336/
3) Empowering farmers and farmer groups or organizations through agricultural education and training, access to information, and technology transfer.	No information on this Goal
4) Providing small holder farmers and farmer organizations, including women farmers and traders, equitable access to markets and information on production, supply, demand, and prices of agricultural and fishery products in order for them to effectively participate in the markets.	Some APEC economies had implemented FAO code. FAO-AMIS and the IGC, while USDA data are based on local marketing years. Implementing EBFM in Chile https://www.apec.org/Meeting-Papers/Annual-Ministerial-Meetings/2019/2019_AMM/Annex-C
5) Facilitating agricultural and fishery best practices sharing through training, extension services, and technology transfers.	Sharing had been done through knowledge exchange. OFWG 2016 manual. 2019 PSU insight on regulatory environment file:///Users/user/Downloads/APEC%20Food%20Security%20Roadmap%20Towards%20202014som3027anx11%20(1).pdf,
6) Expanding access of women to local and regional agricultural associations, noting that women’s groups and cooperatives are often the most difficult to form and sustain.	No information

7) Conducting the targeting programs for women in agriculture by using gender- based analysis of programs' impacts to ensure these women receive maximum benefits from the efforts to achieve sustainable food security.	No information
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Table 7: Findings of the Goals of WG1, PA 4

WG1: Sustainable Development of the Agriculture and Fishing Sector	
4) Ensuring sustainable management of natural resources such as land and water, enhancing positive externalities and minimizing negative social and environmental externalities of agriculture and fisheries, increasing resilience to natural disasters and global climate change, and providing food safety net, including proper nutrition for vulnerable communities	
Goals towards 2020	Findings/ Sources/ References
1) Promoting agricultural production practices that assist in adapting to, and mitigating of the impact of climate change.	According to FAO agricultural production practices has been promoted and implemented mostly based on technology (compendium report). However, specific adapting to and mitigation of impact of climate change has not been clearly clarified. APEC-Compendium-of-Best-Practices--Women-in-Agriculture-and-Fisheries https://www.apec.org/Publications/2020/06/ https://apip-apec.maff.go.jp/cl/good-practices/1_4/1_4_1/sustainable_food_production_system_under_climate_change.html
2) Promoting sustainable crop diversification and agricultural production practices which contribute to enhancing land conservation while reducing chemical fertilizer dependencies.	There are some efforts to promote sustainable crops such as GE technology benefits from biotech crops in some economies such as, Canada, Peru, Philippines, and the United States but enhancing land conservation has yet to be proven in written report. ISAAA 2015 Report, 4/27/2016, https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2121
3) Developing and introducing effective conservation systems to maintain soil fertility.	Chinese Taipei is using soil electrical conductivity (EC) sensors (salinity of soil) and data analytics to determine the best time to harvest high value crops. https://www.unwomen.org/en/what-we-do/economic-empowerment/facts-and-figures
4) Developing sustainable agriculture by encouraging the use of environmentally low impact resources.	Development of sustainable agriculture has been implemented in some APEC economies including Australia, Canada, China, USA, Singapore. https://www.worldbank.org/en/topic/agriculture/brief/promote-environmentally-sustainable-agriculture https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2077
5) Facilitating technology transfers and best practices sharing in the area of sustainable management of land and water resources.	The Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating Illegal, Unreported and Unregulated Fishing has been adopted by the eleven participating economies i.e. Australia, Brunei Darussalam, Indonesia, Malaysia, Papua New Guinea, the Philippines, Singapore, Thailand, and Viet Nam https://apip-apec.maff.go.jp/au/plan/files/37d230b932323ba22c2d2d5afc17378f.pdf

6) Increasing public-private investments in the construction of land-reclamation programs in APEC economies.	Economies such Brunei, Canada, New Zealand, Russia and the United States have implemented the public-private partnership (PPP) has over hundreds of infrastructure projects representing huge sum of capital investment. https://apec.org/-/media/APEC/Publications/2018/11/2018-APEC-Economic-Policy-Report/TOC/Individual-Economy-Reports.pdf
7) Promoting the sustainable use of natural resources by all people and societies.	No information
8) Developing universal and voluntary guidelines on natural disaster preparedness for farmers and industries.	The requirement is reflected in Indonesian law https://www.pertanian.go.id/home/ https://apip-apec.maff.go.jp/bn/policies
9) Facilitating data and information sharing as well as best practices to expand natural disaster preparation and recovery.	Workshops and data sharing programs were conducted in Korea and Viet Nam. https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=1998
10) Building a coherent public-private cooperation system framework in the food and market supply chain for natural disaster management.	Many economies such Australia, Japan, Korea, Malaysia and the United States have introduced framework for public-private cooperation. https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2077
11) Facilitating investment for agriculture and fishery infrastructure construction and renovation to prevent and prepare for natural disasters.	Some economies including the Brunei, Canada, China, Hong Kong, Korea, Malaysia, New Zealand, The Philipinnes, Russia, Singapore, Chinese Taipei, the United States, and Viet Nam have seen improvement of public investment for agriculture and fishery infrastructure in case of natural disaster IRENA MARKET 2018. https://www.ers.usda.gov/webdocs/publications/ https://www.moa.gov.my/documents
12) Improving sustainable irrigation by greater investments in water infrastructure.	Canada, China, Malaysia, the United States, and Viet Nam have shown their concern for improving sustainable irrigation by greater investment https://www.moa.gov.my/web/guest/mygap
13) Promoting technical cooperation in order to improve water resources management in developing economies.	Technical cooperation allows improved integrated management of water recourses between and within different economies. Such collaborations occur between Australia, Canada, Chile, China, Japan, Mexico, Peru, Philippines, Russia, Thailand, and the United States. https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2499

<p>14) Promoting water management and renovation of old facilities for more efficient use of limited water resources.</p>	<p>Some economies such as Australia; Canada; New Zealand; Papua New Guinea; Peru have taken initiatives for water resource management to foster dynamic relation in the agriculture sector stakeholder.</p> <p>https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2237</p>
<p>15) Promoting Participatory Irrigation Management (PIM) and the understanding of multi-functionality of paddy fields and agricultural water in cooperation with the International Network for Water and Ecosystem in Paddy Fields (INWEPF).</p>	<p>Economies conducted capacity building on management technologies for climate smart rice cultivation in the South-East Asian and Latin American rice sector has been done through a water management in irrigation systems, such as alternate wetting and drying (AWD) management. Participating economies include Chile, Japan, Malaysia, Mexico, New Zealand, Philippine, Thailand and Viet Nam.</p> <p>https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2149</p>
<p>16) Identifying policy options and market approaches that give sufficient incentives to farmers, agri-food sector, and consumers to better react to market changes and contribute to taking positive measures such as soil erosion prevention and flood prevention.</p>	<p>Agriculture and Agri-Food Canada (Canada), Chinese Academy of Agricultural Sciences (China), Health Science Authority (Singapore), United States Department of Agriculture (United States of America) have been involved in meeting the goal.</p> <p>http://www.caas.cn/en/</p>
<p>17) Identifying food insecure communities and taking targeted steps to overcome the problems, including provision of proper nutrition mainly for pregnant women and children.</p>	<p>There are best practices for women in few economies such as Canada and the United States.</p> <p>https://www.unicef.org/media/60806/file/SOWC-2019.pdf</p> <p>http://www.fao.org/3/a-x8200e.pdf</p>
<p>18) Facilitating data and information on the comparative nutritional value of foods and on the necessity of adequate nutrition during childhood development.</p>	<p>No information.</p>

Table 8: Findings of the Goals of WG2, PA 1 and PA 2

WG2: Facilitation of Investment and Infrastructure Development	
1) Promoting investment in agriculture including by supporting negotiations of the Principles for Responsible Agriculture Investment under the guidance of the FAO.	
Goals towards 2020	Findings/ Sources/ References
	The principles for responsible investment in agriculture and food systems which is already been endorsed at the Committee on World Food Security in October, 2014. However, accurate data not available (data to be retrieved from APEC Economies) www.fao.org/3/a-au866e.pdf
2) Infrastructure development and analyzing the impacts of Foreign Direct Investment (FDI).	
1) Increasing public investments in agriculture.	Brunei, Canada, China, Hong Kong, Korea, Malaysia, New Zealand, The Philippines, Russia, Singapore, Chinese Taipei, the United States, and Viet Nam have reported increasing public investments in agriculture.
2) Creating an attractive business environment to encourage more private sector investments in agriculture.	<p>Many economies including Australia, Brunei, Korea, Malaysia, New Zealand, Papua New Guinea and the United States (just to name a few) have been in progress to create an attractive business environment to encourage more investment in agriculture especially from private sectors.</p> <p>Canada - https://agpal.ca/ Chile - https://www.gfar.net China - http://english.agri.gov.cn Hong Kong - https://www.afcd.gov.hk/english/agriculture/sadf Japan - Summary of the Basic Plan for Food, Agriculture and Rural Areas Korea - http://www.mafra.go.kr/english/1416 Malaysia - https://www.moa.gov.my/documents Mexico - https://documents.pub/document/ New Zealand - https://www.mpi.govt.nz/funding-and-programmes/farming/ Papua New Guinea - http://www.agriculture.gov Philippines - http://www.da.gov.ph Russia - https://apip-apec.maff.go.jp Singapore - https://www.sfa.gov.sg Viet Nam - https://apip-apec.maff.go.jp/vn/policies</p> <p>Chinese Taipei - Promoting New Agriculture Innovation Act for 2017 to 2020 in Taiwan, Min-Hsien Yang; I Han, (2017) - http://ap.ffa.agnet.org Thailand - Thailand Agricultural Policies and Development Strategies, Apichart Pongsrihadulchai, Ph.D. (2019) - http://ap.ffa.agnet.org</p> <p>The United States - Economic Returns to Public Agricultural Research, Keith O. Fuglie and Paul W. Heisey, Economic Brief No.</p>

	<p>10, September 2007. https://www.ers.usda.gov/webdocs/publications/</p> <p>Australia - https://www.agriculture.gov.au Brunei - https://apip-apec.maff.go.jp/bn/policies Canada - http://www.agr.gc.ca/eng/international-trade/ Chile - https://www.gfar.net/sites China - http://english.agri.gov.cn/news/ Hong Kong - https://www.afcd.gov.hk/english/agriculture/sadf Indonesia - https://www.pertanian.go.id/home/ Japan - https://www.maff.go.jp/e/policies/law_plan Korea - http://www.mafra.go.kr/english/1416 Malaysia - Ministry of Agriculture (MOA) - https://www.moa.gov.my/documents/20182/29029/ Mexico - https://documents.pub/document/new-vision-for-agrifood-development-in-mexico New Zealand - https://www.mbie.govt.nz/ Papua New Guinea - http://www.agriculture.gov.pg Peru - https://apip-apec.maff.go.jp/pe/policies/2014/03/25/ Philippines - http://www.da.gov.ph/ Russia - https://apip-apec.maff.go.jp/ru/policies Singapore - https://www.sfa.gov.sg/ The United States - https://www.ers.usda.gov/webdocs/publications/95912/</p> <p>Chinese Taipei - Promoting New Agriculture Innovation Act for 2017 to 2020 in Taiwan, Min-Hsien Yang; I Han, (2017) - http://ap.fftc.agnet.org/files/ap_policy/998/998_1.pdf Thailand - Thailand Agricultural Policies and Development Strategies, Apichart Pongsrihadulchai, Ph.D. (2019) - http://ap.fftc.agnet.org/files/ap_policy/980/980_1.pdf</p>
<p>3) Ensuring a high level of investor protection, including safeguarding and enforcing the rights and claims of investors and protecting robust intellectual property rights including Plant Variety Protection (PVP).</p>	<p>Little information available on the economies progress in ensuring a high-level investor protection. Brunei, Peru, Philippines, Singapore and Chinese Taipei provide information available on the APIP website.</p> <p>Brunei - https://apip-apec.maff.go.jp/bn/policies/2014/03/25/ Peru - https://apip-apec.maff.go.jp/pe/policies/2014/03/25/ Philippines - https://apip-apec.maff.go.jp/ph/policies/2014/03/25/ Singapore - https://www.ipos.gov.sg/ Chinese Taipei - https://apip-apec.maff.go.jp/tw/policies/2014/03/25/</p>
<p>4) Consolidating information on the Asia-Pacific Information Platform on Food Security (APIP).</p>	<p>Not all economies consolidate information on APIP. Australia, Chile, Japan, Peru, Russia, Chinese Taipei and Malaysia, to name a few actively consolidating information on the site.</p> <p>APEC APIP - https://apip-apec.maff.go.jp</p>

<p>5) Sharing good practices of agricultural investments through APIP.</p>	<p>Not all economies share information on good practices of agriculture investment on APIP. Chile, Japan, Peru, Russia, Chinese Taipei and Malaysia, to name a few actively sharing information on the site.</p> <p>APEC APIP - https://apip-apec.maff.go.jp</p>
<p>6) Creating lists of prospective infrastructure projects for development using the mechanisms of state-private partnership in the framework of the PPFs.</p>	<p>Little information is available on the lists of prospective infrastructure projects from the economies. Brunei, Hong Kong, Mexico, Papua New Guinea, Peru, Chinese Taipei and the United States provided information about infrastructure projects. It is uncertain whether the projects are within the mechanisms of state-private partnership in the framework of the PPFs.</p> <p>Australia - https://apip-apec.maff.go.jp/au/good-practices/files Brunei - https://oxfordbusinessgroup.com/news Chile - https://www.gfar.net/sites/default/files/ China - http://english.agri.gov.cn/news/dqnf/201702/ Hong Kong - https://www.afcd.gov.hk/english/agriculture/agr_hk/ Indonesia - https://www.pertanian.go.id/home/ Korea - http://www.mafra.go.kr/english/1431/ Malaysia - https://apip-apec.maff.go.jp/my/ Mexico - https://documents.pub/document/new-vision-for-agrifood-development-in-mexico New Zealand - https://www.mpi.govt.nz/funding-and-programmes/ Peru - https://apip-apec.maff.go.jp/pe/policies Philippines - https://apip-apec.maff.go.jp/ph/policies/2014/03/25/ Chinese Taipei - A Public Private Partnership: How to increase Whole Grain Consumption for the benefit of public health; RICE International Conference 2014 - https://apip-apec.maff.go.jp/tw/good-practices Thailand - http://ap.ftc.agnet.org/ap_db.php?id=688 The United States - https://www.ers.usda.gov/ Viet Nam - https://apip-apec.maff.go.jp/vn/policies/2014/03/25/</p>
<p>7) Developing a functioning, well-coordinated transport and logistics network in APEC.</p>	<p>Most of economies including Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Mexico, Peru, Philippines, Russia, Chinese Taipei and the United States show progress in developing a functioning and well-coordinated transportation and logistics network.</p> <p>Australia - https://apip-apec.maff.go.jp/au/good-practices/ Brunei - https://apip-apec.maff.go.jp/bn/policies/2014/03/25/ Canada - https://apip-apec.maff.go.jp/ca/good-practices/ Chile - https://apip-apec.maff.go.jp/cl/policies/2014/03/25/ Hong Kong - https://www.afcd.gov.hk/english/agriculture/ Indonesia - https://www.pertanian.go.id/home/ Japan - https://www.maff.go.jp/e/policies/law_plan/ Korea - http://www.mafra.go.kr/english/1482/subview.do Malaysia - Ministry of Agriculture (MOA) - https://www.moa.gov.my/documents/20182/29029/ Mexico - https://apip-apec.maff.go.jp/mx/policies/2_1/2_1_5/ Peru - https://apip-apec.maff.go.jp/pe/policies/2014/03/25/</p>

	<p>Philippines - https://apip-apec.maff.go.jp/ph/policies/2014/03/25/ Russia - https://apip-apec.maff.go.jp/ru/good-practices/ Singapore - https://www.sfa.gov.sg/food-import-export Chinese Taipei - Logistic Infrastructure; https://apip-apec.maff.go.jp/tw/policies/2014/03/25/ Thailand - Logistic Infrastructure; https://apip-apec.maff.go.jp/th/policies/2014/03/25/ Viet Nam - Logistic Infrastructure; https://apip-apec.maff.go.jp/vn/policies/2014/03/25/</p> <p>New Zealand - Global Value Chains: New Zealand Case Studies, McGraw Hill, Ministry of Primary Industries - https://apip-apec.maff.go.jp/members/2014/06/20/files/13_Mr.Hill.pdf</p> <p>China - Liu (2014) Current Situation and Development Suggestions of Chinese Agricultural Product Value Chain – https://apip-apec.maff.go.jp/cn/good-practices/1_10/liu_2014_current_situation_and_development_suggestions_of_chinese_agricultural_product_value_chain.html</p> <p>United States - Traceability in the US Food Supply: Economic Theory and Industry Studies, Elise Golan, Barry Krissoff, Fred Kuchler, Linda Calvin, Kenneth Nelson, and Gregory Price, AER-830 - https://www.ers.usda.gov/webdocs/publications/41623/28667_aer830b_1_.pdf</p>
<p>8) Reducing post-harvest losses through infrastructure development of food markets and supply chains, including the use of public/private partnerships.</p>	<p>Most of economies are aware of the importance to reduce post-harvest losses through infrastructure development. However, it's a little bit difficult to establish the use of public/private partnerships as due to little information on the implementation of this goal.</p> <p>Australia - https://apip-apec.maff.go.jp/au/good-practices/1_10/foodmap Brunei - https://apip-apec.maff.go.jp/bn/policies/2014/03/25/ Canada - https://apip-apec.maff.go.jp/ca/good-practices/1_10/the_value_chain_roundtables_vcrt.html China - http://english.agri.gov.cn/ Hong Kong - https://www.afcd.gov.hk/english/agriculture/ Indonesia - https://www.pertanian.go.id/home/ Japan - https://www.maff.go.jp/e/policies/law_plan/ Korea - http://www.mafra.go.kr/english/1482/ Malaysia - https://www.moa.gov.my/documents/20182/29029/ Mexico - https://apip-apec.maff.go.jp/mx/policies/2014/03/25/ Philippines - https://apip-apec.maff.go.jp/ph/policies/2014/03/25/ Singapore - https://www.sfa.gov.sg/food-farming/post-harvest-technology Thailand - http://www.mekonginstitute.org/program-185/ Viet Nam - https://apip-apec.maff.go.jp/vn/good-practices/1_10/</p> <p>Chile - Carmen Bain (2010) Governing the Global Value Chain: GLOBALGAP and the Chilean Fresh Fruit Industry - https://apip-apec.maff.go.jp/cl/good-practices/1_10/carmen_bain_2010_governing_the_global_value_chain_globalgap_and_the_chilean_fresh_fruit_industry.html</p>

	<p>New Zealand - Global Value Chains: New Zealand Case Studies, McGraw Hill, Ministry of Primary Industries - https://apip-apec.maff.go.jp/members/2014/06/20/files/13_Mr.Hill.pdf</p> <p>Papua New Guinea - Improving marketing efficiency, postharvest management and value addition of sweetpotato in Papua New Guinea, Chang, Christie; Irving, Donald; Lutulele, Robert; Kornolong, Birte; Be'Soer, Lilly. - https://hdl.handle.net/1959.11/16064</p> <p>Peru - The Participatory Market Chain Approach: from the Andes to Africa and Asia, André Devaux, Miguel Ordinola, Sarah Mayanja, Dindo Campilan and Douglas Horton (2014) - https://www.researchgate.net/profile/Andre_Devaux/publication/264975667_The_Participatory_Market_Chain_Approach_PMCA_from_the_Andes_to_Africa_and_Asia/links/53f927dc0cf27c365ceaa61/The-Participatory-Market-Chain-Approach-PMCA-from-the-Andes-to-Africa-and-Asia.pdf?origin=publication_detail</p> <p>United States - Traceability in the United States Food Supply: Economic Theory and Industry Studies, Elise Golan, Barry Krissoff, Fred Kuchler, Linda Calvin, Kenneth Nelson, and Gregory Price, AER-830 - https://www.ers.usda.gov/webdocs/publications/41623/28667</p>
<p>9) Developing a framework of activities/business plans with reference to the Principles for Responsible Agricultural Investment (PRAI), for APEC economies under the guidance of the FAO.</p>	<p>Almost no information available for this goal. It's safe to get data from the economies themselves.</p> <p>www.fao.org/3/a-au866e.pdf</p>
<p>10) Forming a policy/roadmap in the development of the food industry utilizing a cold chain infrastructure and starting several pilot projects for building the cold chain infrastructure in the selected economies through public-private partnerships.</p>	<p>Some of the economies like Chile (Chile Vision 2030, Towards a Vision for Agricultural Innovation in Chile in 2030), Japan (The Policy Package for Enhancing Competitiveness of Japan's Agriculture), Malaysia (Malaysia National Agro-Food Policy 2011-2020), Papua New Guinea (Papua New Guinea National Food Security Policy 2018-2027) and the United States (USDA Agricultural Projections to 2029) have formed the relevant policies.</p> <p>Australia - No available data Brunei - No available data Chile - https://www.gfar.net/sites/default/files/files/298_Chile_Vision_2030 China - https://apip-apec.maff.go.jp/cn/good-practices/ Indonesia - https://www.pertanian.go.id Japan - The Policy Package for Enhancing Competitiveness of Japan's Agriculture - https://www.maff.go.jp/e/policies/law_plan/ Korea - http://www.mafra.go.kr/english/1431/</p>

	<p>Malaysia - Malaysia National Agro-Food Policy (2011-2020); https://www.moa.gov.my/</p> <p>Mexico - https://documents.pub/document/new-vision-for-agrifood-development-in-mexico</p> <p>New Zealand - https://apip-apec.maff.go.jp/members/2014/06/20/</p> <p>Papua New Guinea - Papua New Guinea National Food Security Policy 2018-2027 - http://www.agriculture.gov.pg/</p> <p>Peru - https://apip-apec.maff.go.jp/pe/policies/2_1/2_1_5/</p> <p>Russia - http://documents.worldbank.org/curated/en/</p> <p>Singapore - https://apip-apec.maff.go.jp/sg/good-practices/1_10/</p> <p>US - USDA Agricultural Projections to 2029 - Interagency Agricultural Projections Committee. - https://www.ers.usda.gov/webdocs/publications/</p> <p>Chinese Taipei - A New Chapter in Taiwan's Agriculture in 2019, Wan-Yu Liu (2019) - http://ap.ffc.agnet.org/files/ap_policy/998/998_1.pdf</p> <p>Thailand - THE AGRICULTURAL DEVELOPMENT PLAN UNDER THE 12th NATIONAL ECONOMIC AND SOCIAL DEVELOPMENT PLAN (2017-2021), Thailand Agricultural Policies and Development Strategies, Apichart Pongsrihadulchai, (2019) - http://ap.ffc.agnet.org/files/ap_policy/980/980_1.pdf</p>
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<p>11) Promoting responsible agriculture investments that contribute to food security and nutrition.</p>	<p>Most of the economies are keen to promoting responsible agriculture investments. Economies like Australia, Canada, Chile, New Zealand, Mexico, Peru and Philippines (just to name a few) established their national research agency on food nutrition in implementing this goal.</p> <p>Australia - https://www.csiro.au/en/About Brunei - http://www.agriculture.gov.bn/ Canada - http://www.agr.gc.ca/eng/food-products/?id=1360881916382 Chile - https://apip-apec.maff.go.jp/cl/good-practices/1_9/1_9_1/food_safety_plans_and_promotion_for_haccp.html China - http://english.agri.gov.cn/news/dqnf/201702/t20170206_247179.html Hong Kong - https://www.afcd.gov.hk/english/agriculture/ Indonesia - http://www.irti.org/iri/go/km/docs/ Korea - http://www.mafra.go.kr/english/1485/subview.do Mexico - https://apip-apec.maff.go.jp/mx/policies/2014/03/25 New Zealand - https://www.mpi.govt.nz/haumaru-kai-aotearoa-nz-food-safety/ Papua New Guinea - http://www.agriculture.gov.pg/wp-content/uploads/2018/12/ Peru - https://apip-apec.maff.go.jp/pe/policies/2_2/2_2_1/ Philippines - http://www.gov.ph/section/legis/republic-acts/ Singapore - https://www.sfa.gov.sg/food-farming/farming-initiatives United States – Food nutrition - Food and Nutrition Service USDA https://www.fns.usda.gov/programs</p> <p>Malaysia - Malaysian Standards On Good Agricultural Practices Of Crop, Fisheries, Poultry And Cattle Production System (MyGAP) - https://www.moa.gov.my/web/guest/mygap</p> <p>Japan - Nabeshima (2014) Import Rejections of Agricultural and Food Products from East Asia: Issues and Future Challenges - https://apip-apec.maff.go.jp/ja/good-practices/1_10/nabeshima_2014_import_rejections_of_agricultural_and_food_products_from_east_asia_issues_and_future.html</p> <p>Chinese Taipei - Overview of Food Security and Policy Directions in Chinese Taipei, Hwang-Jaw Lee (2014) - http://ap.ftc.agnet.org/files/ap_policy/202/202_1.pdf</p>
<p>12) Supporting investment programs aimed at strengthening the food security of APEC economies within a framework of cooperation with international financial institutions (banks, funds, etc.)</p>	<p>Developing APEC economies such as Papua New Guinea, Indonesia and Philippines, and require programs aimed at strengthening the food security.</p> <p>Papua New Guinea - Productive Partnerships in Agriculture Project, http://www.agriculture.gov.pg/wp-content/uploads/2019/05/PPAP_Project-Information-Leaflets.pdf.</p>

	<p>Philippines - Various Foreign-Assisted Projects - http://www.da.gov.ph/services/special-programs-project-coordination-assistance/foreign-assisted-projects/</p> <p>Russia - Agricultural Policy of Russia;- http://documents.worldbank.org/curated/en/148121468092976669/pdf/290130fixed0wb1agroruss1eng</p> <p>Chinese Taipei - Participation of International Organizations - https://eng.coa.gov.tw/ws.php?id=2505457</p> <p>Viet Nam - https://www.mard.gov.vn/en/Pages/international-cooperation.aspx</p>
<p>13) Disseminating knowledge on the use of information technology to enable the use of "precision farming" techniques.</p>	<p>Many economies have started to share information on the IT in farming.</p> <p>Papua New Guinea - Papua New Guinea E-agriculture Strategy - https://www.agriculture.gov.pg/publications/e-agriculture-strategy/</p> <p>Russia - Foundation for Agrarian Development Research (FADR);- http://www.fadr.msu.ru/fadr_e/index_e. Html</p> <p>Singapore - Food Farming, Singapore Food Agency; https://www.sfa.gov.sg/food-farming</p> <p>Malaysia - Precision Agriculture in Malaysia, Ahmad S. Bujang and Badril H. Abu Bakar, Smart and Precision Farming Program, Engineering Research Center, Malaysian Agricultural Research and Development Institute (MARDI), Serdang, Malaysia - http://ap.ffc.agnet.org/files/ap_policy/1005/1005_1.pdf</p> <p>Chinese Taipei - Crops and food security- experiences and perspectives from Taiwan, Chen-Te Huang PhD, Tzu-Yu Richard Fu PhD, Su-San Chang PhD, Asia Pac J Clin Nutr 2009;18(4):520-526 - http://apjcn.nhri.org.tw/server/APJCN/18/4/520.pdf</p> <p>Thailand - Acceptance and Readiness of Thai Farmers toward Digital Technology, Suwanna Sayruamyat and Winai Nadee (2019) http://ap.ffc.agnet.org/files/ap_policy/970/970_1.pdf</p>
<p>14) Addressing supply chain barriers to trade, such as market access, boarder administration and telecom and transport infrastructure.</p>	<p>In addressing supply chain barrier to trade, some economies conducted studies on the subject. For example, Australia's study is based on the impact of Queensland flood in Dec 2010. For other economies like Brunei, Canada, Chile, China, Indonesia, Japan, Korea, Malaysia and Chinese Taipei (just to name a few) several projects are currently underway or in progress to improve logistics efficiency and capacity.</p> <p>Australia - https://apip-apec.maff.go.jp/au/good-practices/</p> <p>Brunei - https://apip-apec.maff.go.jp/bn/policies/2014/03/25/</p> <p>Canada - https://apip-apec.maff.go.jp/ca/good-practices/1_10/</p> <p>Chile - https://apip-apec.maff.go.jp/cl/good-practices/1_10/</p> <p>China - Liu (2014) Current Situation and Development Suggestions of Chinese Agricultural Product Value Chain - https://apip-apec.maff.go.jp/cn/good-practices/1_10/liu_2014</p> <p>Indonesia - https://www.pertanian.go.id/home/</p> <p>Japan - https://www.maff.go.jp/e/policies/law_plan/attach/pdf</p>

	<p>Korea - http://www.mafra.go.kr/english/1482/subview.do</p> <p>Malaysia - https://www.moa.gov.my/documents/</p> <p>Papua New Guinea - http://www.agriculture.gov.pg/</p> <p>Philippines - https://apip-apec.maff.go.jp/ph/policies/2014/03/25/</p> <p>Russia - https://apip-apec.maff.go.jp/ru/good-practices/</p> <p>Singapore - https://www.sfa.gov.sg/food-import-export/</p> <p>Chinese Taipei - https://apip-apec.maff.go.jp/tw/good-practices/1_10/</p> <p>US - https://www.ers.usda.gov/</p> <p>Viet Nam - https://apip-apec.maff.go.jp/vn/good-practices/</p> <p>Mexico - Prentice and McLachlin (2008) Industry Issue Paper: Refrigerated Food Transport from Canada to Mexico: Cold Chain Challenges - https://apip-apec.maff.go.jp/mx/good-practices/1_10/prentice_and_mclachlin_2008_industry_issue_paper_refrigerated_food_transport_from_canada_to_mexico_c.html</p> <p>New Zealand - Global Value Chains: New Zealand Case Studies, McGraw Hill, Ministry of Primary Industries - https://apip-apec.maff.go.jp/members/2014/06/20/files/13_Mr.Hill.pdf</p> <p>Peru - The Participatory Market Chain Approach: from the Andes to Africa and Asia, André Devaux, Miguel Ordinola, Sarah Mayanja, Dindo Campilan and Douglas Horton (2014) - https://www.researchgate.net/profile/Andre_Devaux/publication/264975667_The_Participatory_Market_Chain_Approach_PMCA_from_the_Andes_to_Africa_and_Asia/links/53f927dc0cf27c365ceaa61/The-Participatory-Market-Chain-Approach-PMCA-from-the-Andes-to-Africa-and-Asia.pdf?origin=publication_detail</p> <p>Thailand - FAO (2013) Organic supply chains for small farmer income generation in developing countries Case studies in India, Thailand, Brazil, Hungary and Africa - http://www.fao.org/3/i3122e/i3122e.pdf</p>
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Table 9: Findings on WG3, PA 1

WG3: Enhancing Trade and Market	
1) Facilitating trade in food and agricultural products	
Goals towards 2020	Findings/ Sources/ References
1) Ensuring an affirmation of the pledge to end protectionist measures in trade of agricultural products.	<p>Thailand has been imposing high number of NTMS compared to other economies.</p> <p>APEC Committee on Trade and Investment https://www.apec.org/Groups/Committee-on-Trade-and-Investment</p> <p>Non-Tariff Barriers in Agriculture and Food Trade in APEC: Business Perspectives on Impacts and Solutions, APEC Business Advisory Council, University of Southern California, Marshall School of Business, November 2016</p>
2) Studying the impact of trade-related measures, especially export measures that impact food security.	<p>Existing study focused mainly on Collective Strategic Study on Issues Related to the Realization of the FTAAP in 2016 APEC Committee on Trade and Investment https://www.apec.org/Groups/Committee-on-Trade-and-Investment</p> <p>Workshop on Trade and Investment Inter-dependencies in Global Value Chains (GVCs): Are Policy Frameworks for Trade and Investment, such as Trade and Investment Agreements keeping apace? - https://www.apec.org/Publications/2019/11/Workshop-on-Trade-and-Investment-Inter-dependencies-in-Global-Value-Chains</p>
3) Promoting development of regionally integrated markets.	No information available
4) Strengthening confidence in agricultural markets and establishing effective systems of collecting and disseminating market information.	<p>Many member economies have established effective systems of collecting, disseminating, and analyzing food market information.</p> <p>APEC and Food Security Official Website https://www.apec.org/About-Us/About-APEC/Fact-Sheets/APEC-and-Food-Security</p> <p>APEC and Food Security, 14th September 2018. https://www.apec.org/About-Us/About-APEC/Fact-Sheets/APEC-and-Food-Security</p>
5) Promoting harmonization of standards and adherence to international, science-based universally accepted standards, i.e. Codex, World Organization for Animal Health (OIE), International Plant Protection Convention (IPPC) and initiatives of the FAO, WHO and specialized WTO-Technical Barriers to Trade (TBT) and WTO-SPS Agreements.	<p>Many APEC economies have signed and ratified the WTO Trade Facilitation Agreement.</p> <p>APEC Committee on Trade and Investment https://www.apec.org/Groups/Committee-on-Trade-and-Investment</p> <p>Capacity Building and Technical Assistance to Implement Programs Related to WTO Trade Facilitation Agreement</p>

<p>6) Ensuring compliance with the WTO regulations in order to enhance transparency.</p>	<p>Many APEC economies have signed and ratified the WTO Trade Facilitation Agreement.</p> <p>Hong Jin and Desmarchelier Patricia on behalf of Food Standards Australia New Zealand. 2019. APEC Food Safety Modernisation Framework to Facilitate Trade, APEC Secretariat, Singapore.</p> <p>APEC Committee on Trade and Investment https://www.apec.org/Groups/Committee-on-Trade-and-Investment</p>
<p>7) Reaffirming our pledge to refrain through the end of 2015 from imposing new export restrictions (Declaration of APEC leaders, 2012).</p>	<p>Many economies still have export restrictions.</p> <p>Data derived from Global Trade Alert database from January 2014 until April 2020.</p> <p>Global Trade Alert https://www.globaltradealert.org/country/12,30,36,41,42,43,92,96,103,123,132,147,160,162,163,54,173,190,206,222,228/affected-jurisdictions_12,30,36,41,42,43,92,96,103,123,132,147,160,162,163,54,173,190,206,222,228/period-from_20140101/period-to_20200405/flow_export/sector_011,012,013,014,015,016,017,018,019,021,022,023,024,029,031,032,041,042,043,044,045,049,162,180,211,212,213,214,215,216,217,219,221,222,223,231,232,233,234,235,236,237,239,241,242,243,244,250,346,352,441,445/area_goods%20%20(GTA)</p>
<p>8) Improving effective global data standards for the connectivity of the food supply chain in support of APEC's existing supply chain objectives and in coordination with the CTI</p>	<p>APEC issued some guides such as the APEC Guidelines and Best Practices for the Adoption of Global Data Standards - https://www.apec.org/Publications/2020/03/APEC-Guidelines-and-Best-Practices-for-the-Adoption-of-Global-Data-Standards</p> <p>APEC Committee on Trade and Investment https://www.apec.org/Groups/Committee-on-Trade-and-Investment</p>
<p>9) Analyzing food market information such as price levels and the impact of price volatility throughout APEC economies.</p> <p>10) Increasing transparency of the market</p> <p>11) Supporting negotiations within APEC and WTO on Environmental Goods and Services i.e: " Green Goods"</p>	<p>No clear information</p>

Table 10: Findings on WG3, PA 2

WG3: Enhancing Trade and Market	
PA 2, Reducing food losses and waste (FLW)	
Goals towards 2020	Findings
1) Developing unified methodologies to estimate food losses and waste.	<p>Member economies have started to implement these goals</p> <p>Asia-Pacific Economic Cooperation https://www.apec.org/Publications/2018/09/APEC-Survey-Report-on-Feasible-Solutions-for-Food-Loss-and-Waste-Reduction</p> <p>https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Agricultural-Technical-Cooperation</p> <p>APEC Survey Report on Feasible Solutions for Food Loss and Waste Reduction, APEC Agricultural Technical Cooperation Working Group, APEC Policy Partnership on Food Security, August 2018</p>
2) Identifying major sources of food loss and waste in the distribution channel (farm storage, food harvesting, food processing industries, transportation, retailers, and households), and compiling regional strategies for specific products in both developing and industrialized economies	<p>Member economies have started to implement these goals</p> <p>Global Report on Food Crises 2020 - https://docs.wfp.org/api/documents/WFP-0000114546/download/?_ga=2.181027876.2085965703.1592808169-1745501211.1592808169</p>
3) Introducing a plan for striving toward a targeted rate of food loss and waste reduction	<p>Member economies have started to implement these goals</p> <p>APEC Survey Report on Feasible Solutions for Food Loss and Waste Reduction, APEC Agricultural Technical Cooperation Working Group, APEC Policy Partnership on Food Security, August 2018.</p> <p>Asia-Pacific Economic Cooperation https://www.apec.org/Publications/2018/09/APEC-Survey-Report-on-Feasible-Solutions-for-Food-Loss-and-Waste-Reduction</p> <p>https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Agricultural-Technical-Cooperation</p>
4) Facilitating the sharing of best practices in the APEC region.	<p>Member economies have started to implement the goal.</p> <p>Asia-Pacific Economic Cooperation https://www.apec.org/search?Query=APEC+Policy+Partnership+on+Food+Security</p> <p>https://www.apec.org/Publications/2019/10/Reducing-Food-Waste-by-Using-Information-and-Communications-Technology-and-Innovative-Technologies</p> <p>Reducing Food Waste by Using Information and Communications Technology (ICT) and Innovative Technologies,</p>

	Tokyo, Japan, 10-11 July 2019, APEC Policy Partnership on Food Security, October 2019
5) Strengthening food supply chains and reducing food losses in developing economies through public-private partnerships	Providing farmers with necessary technologies and managerial knowledge in handling and storage through improved extension services: Available data only for Malaysia & Chinese Taipei
	Enhancing investments in modern agricultural machinery and equipment, storage facilities and transportation infrastructure: Data available on few economies like (Chile, Chinese Taipei, Viet Nam).
	Facilitating programs that encourage smallholder farmers to organize, diversify and scale up their production and marketing. Data available for Canada, Chile, Philippines, Malaysia, Chinese Taipei, the United States, Viet Nam,
	<p>Enhancing investments in the food supply chain with cold chain infrastructure in order to develop the food manufacturing industry and help increase revenues for farm producers. Information available for Chile, Chinese Taipei and Viet Nam. APEC Survey Report on Feasible Solutions for Food Loss and Waste Reduction, APEC Agricultural Technical Cooperation Working Group, APEC Policy Partnership on Food Security, August 2018.</p> <p>Asia-Pacific Economic Cooperation https://www.apec.org/Publications/2018/09/APEC-Survey-Report-on-Feasible-Solutions-for-Food-Loss-and-Waste-Reduction</p> <p>https://www.apec.org/search?Query=APEC+Policy+Partnership+on+Food+Security</p> <p>https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Agricultural-Technical-Cooperation</p>

Table 11: Findings on WG 3, PAs 3, 4 and 5

WG3: Enhancing Trade and Market	
3) Improving governance frameworks.	
Goals towards 2020	Findings/ Sources/ References
1) Sharing strategies and experiences among APEC economies regarding their food security policy governance frameworks and their food security communication strategies with the private sector.	No clear information available APEC tackling new food security challenges 2014 - https://www.apec.org/Press/News-Releases/2014/0514_PPFS Asia-Pacific Economic Cooperation https://www.apec.org/search?Query=APEC+Policy+Partnership+on+Food+Security
2) Encouraging each APEC economy to establish the best or, at least, better governance framework for food security policy and communication strategies in each APEC economy, for example by establishing policy deliberating council with private sector and civil society membership for the purpose of incorporating external stakeholders' viewpoints at the policy planning stage; soliciting opinions from private sector and civil society before important policy decisions are made.	No clear information available Food Securities Policies in APEC 2012 - https://www.apec.org/Publications/2012/09/Food-Security-Policies-in-APEC Asia-Pacific Economic Cooperation https://www.apec.org/search?Query=APEC+Policy+Partnership+on+Food+Security
4) Promoting, studying and sharing of best practices of risk management methods among stakeholders in order to strengthen food security.	
1) Evaluating the likelihood and impact of food security threats, with soliciting stakeholder input during the evaluation process.	No clear information World Food Program https://www.wfp.org/news APEC Set Sights Beyond 2020 (2016) - https://www.apec.org/Press/Features/2016/1113_2020
2) Creating diversified strategies to respond to various potential economic and environmental risks for each of the APEC member economies.	No clear information Preparing SMEs for Disasters (2014) - https://www.apec.org/Press/Features/2014/0324_smes
3) Sharing best practices in risk management methods to strengthen food security in APEC economies.	under Best Practices Workstream Food Security and Climate Change Multi-Year Action Plan (MYAP) 2018-2020 Climate Change Multi-Year Action Plan (MYAP) 2018-2020 - https://www.apec.org/Meeting-Papers/Sectoral-Ministerial-Meetings/Food-Security/2017_food_security/MYAP
7) Incentivizing trade and production to encourage increased output and yields in a sustainable manner.	

	<p>There are efforts taken on incentivizing trade and production to encourage increase in output and yields. However, no clear indication on the countries involve.</p> <p>The Role of Digital Payments in Sustainable Agriculture and Food Security 2017 - https://www.apec.org/Publications/2017/10/The-Role-of-Digital-Payments-in-Sustainable-Agriculture-and-Food-Security</p>
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