

TOWARDS RESILIENT AND SUSTAINABLE AGRICULTURE AND FOOD SYSTEMS

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1. INTRODUCTION

Indonesia's economy in Q3-2022 grew by 5.72% (y-on-y) not too bad compared to the Region. The agricultural sector grew 1.65%, had been a cushion for recession during the Covid-19 Pandemic, but too low to serve as contributor for poverty alleviation and human development; Poverty rate in March 2022 fell to single digits of 9.54% (26.16 million people). The majority live in rural areas (12.29%), they are farmers, farm laborers, and temporary workers etc. Poverty in Java (13.85 million 52.96%), Sumatra (5.74 million 21.93%), Bali (2 million 7.91%), Sulawesi (2.01 million 7.69%), Kalimantan (0.98 million 3.73%), Papua (1.5 million 5.78%).



Figure 1 Indonesia's Economic Growth 2019-2022 (% , y-on-y)

Source: BPS, November 2022.

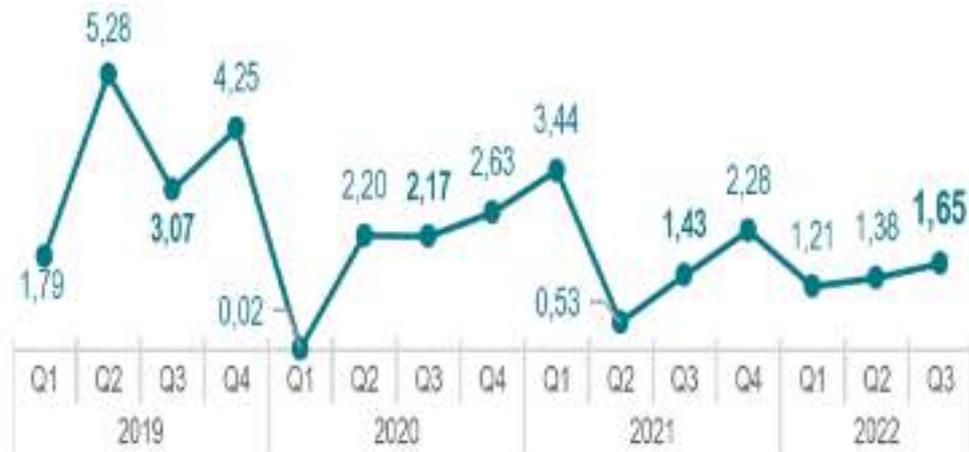


Figure 2 Agricultural Growth 2019-2022 (% y-on-y)
 Source: BPS, November 2022.

2. GRAND STRATEGIES IN ACHIEVING SUSTAINABLE DEVELOPMENT GOALS

a. Grand Strategies In Achieving Sustainable Development Goals

Sustainable Development Goals can be achieved with Six Strategies such as: Strategy #1: Human Development: Health System, Education System, Research dan Innovation. Strategy #2: Economic Productivity: Industrialization, SME Empowerment, Agricultural Development. Strategy #3 Green Economy: Low Carbon Economy, Blue Economy, Energy Transition. Strategy #4 Digital Transformation: Digital Infrastructure, Digital Utilization, Enabler Strengthening. Strategy #5 Economic Integration: Connectivity-Infrastructure: Superhub, Sea Hub, Air Hub, Domestic Value Chain. Strategy #6 Sustainable Rural-Urban: New Growth Sources, Regional balance.

Grand Strategies in Achieving Sustainable Development Goals



Enabling Environments: Bureacratic Reform, Fiscal Reform, Finance Sector Reform

Figure 3 Grand Strategies In Achieving Sustainable Development Goals
 Source: Bappenas (2022)

b. Food System Conceptual Framework (improved)

Five action tracks: 1. Ensuring access to safe and nutritious food for all 2. Shift to healthy and sustainable consumption patterns 3. Boost nature-positive production 4. Advance equitable livelihoods 5. Building resilience to vulnerabilities, shocks and stresses

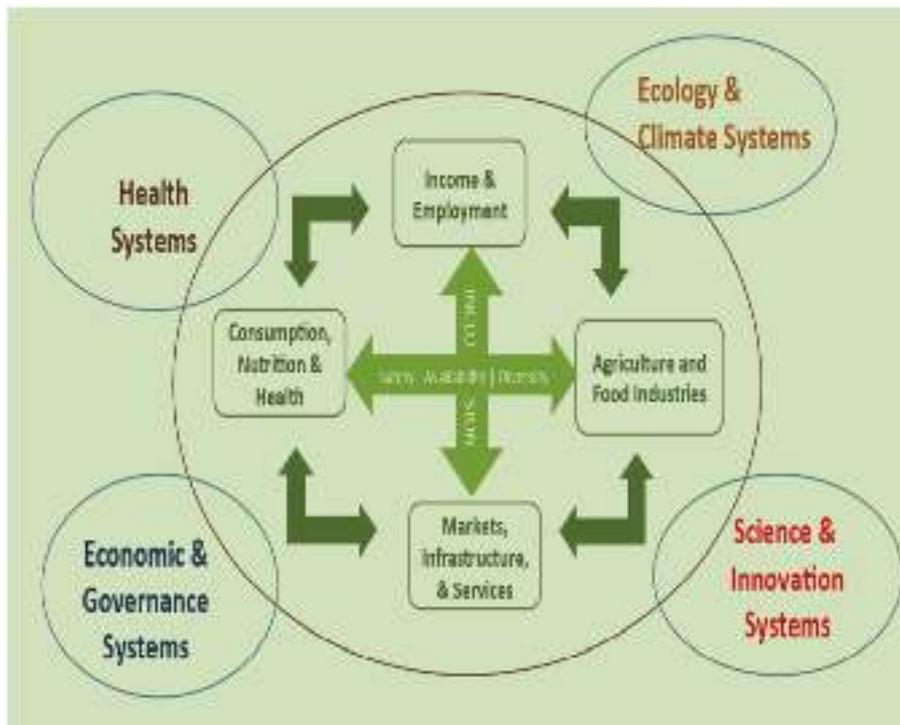


Figure 4 Food System Conceptual Framework
Source: Von Braun et al (2021).

c. Land-Use and Global Food Production Trend in 60 Years

Output growth at historical low. Yield growth at historical low. Area expansion higher than in last 60 years. Production capacity decreases significantly. Food systems contribute 33% of CO₂ emissions. New threats to the future of sustainability. Trend reversal only possible through technologies for sustainable intensification

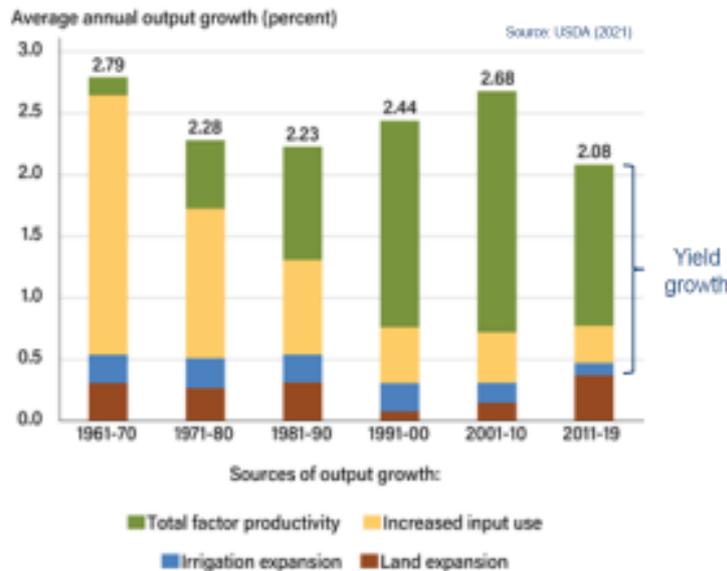


Figure 5 Land-Use and Global Food Production Trend
 Source: USDA (2021).

d. Demographic Changes and Indonesia's Population Pyramid

Demographic changes are quite dramatic: In 1970 the structure was dominated by the young age group (0-14) to 43.2% and decreased steadily to below 20% by 2050. The elderly population continues to increase, from 3% in 1970 to 18% in 2050. In 2055-2060, the proportion of elderly exceeds the proportion of young people. Social services are changing. Demographic Dividend: The population of productive age (15-64) is relatively large, so that more workers are available for work. The bonus depends on the workers quality themselves. By 2045, the population cohort will move to middle age, not youth. In 2070, the cohort moves to old age. Food types is definitely changing, the demand for functional foods will increase.

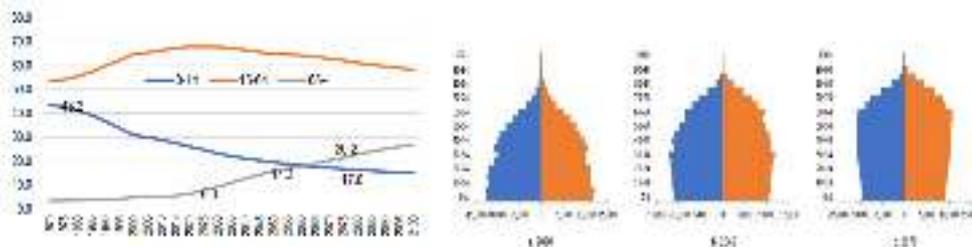


Figure 5 Demographic Changes and Indonesia's Population Pyramid
 Source: United Nations (2019).

e. G20: Resilient and Sustainable Agriculture and Food Systems

- 1) Promote investments in improving sustainable and climate-resilient technologies and practices;
- 2) Develop economically viable agriculture, which is capable of generating stable incomes, creating decent and quality jobs and opportunities for farmers and agricultural workers and members of their families and rural communities.
- 3) Improve food and nutrition security for a healthy and balanced diet, poverty alleviation, sustainable resource management and ecosystem conservation
- 4) Adhere to principles of open, fair, predictable, transparent & non-

discriminatory agricultural trade to ensure availability and affordability of food for everyone; and 5) Promote innovative agriculture entrepreneurship through digital innovations in agriculture and food systems, to improve farmers' livelihoods, empower women and provide opportunities for youth.

f. Suitability of Existing Farming Systems in Indonesia

Suitability rates are 42% suitable and 29% not suitable, limiting factors can be addressed. 29% not suitable, limiting factors cannot be addressed. Suitability parameters: 1) Temperature 2) Water availability 3) Soil characteristics 4) Nutrition retention 5) Salinity 6) Toxicity 7) Nutrient availability 8) Risk of Erosion.

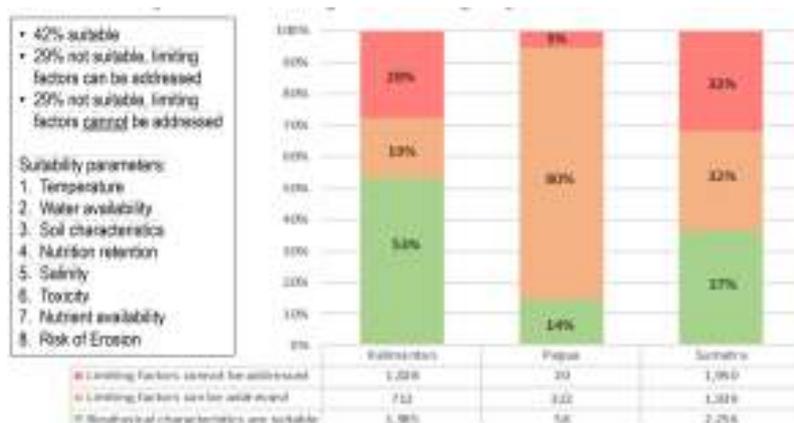


Figure 6 Suitability of Existing Farming Systems in Indonesia
 Source: Sustainable Lowland Agriculture Development in Indonesia (World Bank, 2021).

g. Rice System Productivity: Impacts of Climate Change?

Rice productivity in 2021 begins to recover. The 2022 wet dry season is not conducive to rice production. Prices of rice are low during harvest season (March-April), high planting season (November-January). New innovations and technological changes are very crucial to answer the new challenges ahead.

Description	2018	2019	2020	2021	2022*	Δ 2018-2019 (%)	Δ 2019-2020 (%)	Δ 2020-2021 (%)	Δ 2021-2022 (%)
Consumption (mill. ton)	29.66	28.93	29.40	30.04	30.07	-2.03	1.62	2.16	0.53
Production GKG (mill ton)	59.19	54.60	54.65	54.42	55.16	-7.76	0.09	-0.43	2.78
Production rice (mill ton)	33.94	31.31	31.50	31.36	31.78	-7.81	0.64	-0.45	1.34
Harvested Area (mill ha)	11.38	10.68	10.66	10.41	10.61	-6.14	-0.19	-2.34	3.92
Productivity (ton/ha)	5.20	5.11	5.13	5.23	5.20	-1.72	0.27	1.96	-0.55

Figure 7 Rice System Productivity
 Source: KSA BPS (17th October 2022)

h. Declining production capacity: Sustainability Issues

If production capacity falls, then production and productivity fall. Agricultural production systems are very vulnerable to disturbances in water availability, so that the conservation of water resources becomes almost absolute, etc. Increased production capacity must be carried out, including accelerating changes in agricultural technology. The sustainability of agricultural system is threatened. Land fatigue has occurred. Investment in soil health is needed, as well as improved irrigation management, environmentally friendly cropping patterns, crop rotation systems, etc. Empowerment of farmers' organizations and economic institutions are also equally important.

i. Sustainability Certifications: Opportunities for Smallholders

Indonesia is the 4th largest coffee producer, after Brazil, Vietnam, and Columbia, but the 2nd largest Robusta producer after Vietnam. Coffee production in 2021 was 765.000 tons, a bit increase from 753.000 tons in 2020. The majority (95%) of coffee farmers is smallholder (1 ha or less). 85% of coffee is Robusta (mostly Southern Sumatra) and 15% of coffee is Arabica (Aceh, Sulawesi etc.). Average yield is 560 kg/ha, far below that in Vietnam and Brazil. Sustainability certifications in has grown rapidly in the last decades, as a response of growing trend of global environmental governance in agricultural commodity trade, following global price fluctuation and intense competition among global markets.

j. Sustainability Advantage: Biofuels, Competitiveness

In 2021 palm area was 16.5 million hectares, producing CPO 51.3 million tons. Palm oil produces the most efficient volume of vegetable oil compared to other vegetable oils in the world: soybean oil, sunflower oil, rapeseed oil etc. COP26: Indonesia has signed FOLUR-Food System Land Use & Restoration. Indonesia develops B30 biofuels policy. CPO & cooking oil prices rose sharply In March 2022 CPO export was banned, causing chaotic domestic FFB market. ISPO, RSPO, ISCC: Sustainable palm oil is not easy, but believed to be more inclusive and comprehensive, and hence new strategies for competitiveness.

j. Roles of Private Sectors in Improving Agri-food Productivities

Long-term collaboration between private sectors and BRIN, MoA, universities to improve agri-food productivities, efficiency, etc. for agricultural development. Some private sectors have established PISAgro (Partnership for Indonesia Sustainable Agriculture), consisting of agri-food corporations and smallholders. Ensuring tax deduction principles for private sectors having made investment in R&D and innovation on agri-food, technological change, sustainability etc. Adaptation of technological advanced inputs to smallholder in rural areas to enable transformation from traditional into modern industrial scale farming.

3. CONCLUSION

- a. Strengthening food systems and sustainable agriculture by improving crop productivity and efficiency, climate change adaptation and mitigation, capacity building in R&D, rural development and employment creation;

- b. Calls for new knowledge, tools, policy, wisdom in approaching food systems and sustainable agriculture by incorporating ecological risks, soil erosions, heavy floods, water shortages, pests and diseases, public health issues etc.;
- c. Transdisciplinary approach is needed to incorporate several dimensions of biophysical and social-economic of sustainable agriculture and food systems
- d. Strategies towards resilient and sustainable agriculture and food systems, for its parts, must rely on more scientific and evidence-based policy formulation and implementation at the national, provincial, local and landscape levels.
- e. Human investment and institutional arrangements shall contribute to coping mechanisms and evidence-based solutions for sustainable development