

Annex 3

IAASTD East and South Asia and the Pacific (ESAP) Subglobal Assessment Annotated Chapter Outline

Section I **Setting the scene in ESAP**

Chapter 1 **Contextual realities¹**

The chapter will include (a) the contextual realities, including diversities of biophysical, geographical and agricultural systems,* (b) geographical and physiographical diversity which ranges from sub continents, large and small islands, as well as inland and highland areas; within the regions, (c) the impact of natural disasters like tsunamis, earthquakes, forest fires, El Nino/La Nina, typhoon, flood, and drought, which complicate the attainment of the development and sustainability goals. It will assess the effect of increasing pressure from urbanization, excessive extraction (logging, irrigation, grazing, etc.) and unsustainable agricultural practices on the region's natural resources, i.e. land and water.

Other contextual realities covered by the regional assessment report include (a) the region's being subject to inter- and intra-country sociopolitical and economic conflict; (b) varying trade and market access within and without the region and varying levels of competitiveness in agriculture production and marketing; (c) some countries are highly dependent on food imports and that, in some, trade barriers inhibit exportation of agricultural products; (d) the contextual description will also include a presentation of regional, bilateral, and multilateral agreements operative in the region.

Some of the indicators considered in the discussion of human well-being (nutrition, health, livelihoods) and social and environmental sustainability may include:

- Per capita income; poverty line; Gini coefficient
- Literacy
- Sanitation (potable water, etc.)
- Malnutrition (infant and toddler mortality, etc.)
- Healthcare (including prevalence of disease)
- Gender equity
- Animal welfare
- Biosafety and food safety

1.1 Biophysical context (Geography, climate, natural resource base, etc.)

- Has AKST addressed the biophysical diversity of the region?
- How has it addressed?
- What is the result?

1.2 Geopolitical context (Conflict, trade barriers, market access, etc.)

- Has AKST addressed the geopolitical diversity of the region?
- How has it addressed?
- What is the result?

1.3 Human well-being (Hunger, nutrition, health, poverty, livelihoods, environmental and social sustainability)

- Has AKST addressed human well being within the region?
- How has it addressed?
- What is the result?

* Agriculture includes production of crop, fisheries, forest, live stock etc.

Section II Historical and Current Perspectives

This section will present AKST (including typology and scope) systems within ESAP. It will discuss the flow and transfer of AKST at all levels and its impact on the development and sustainability goals.

The historical and current impact of AKST (local and external) on development and sustainability goals will be assessed. This analysis will include a discussion of institutional arrangements and the social and economical return from public and private sector investments in research, training and extension. It will also include other key factors of growth (infrastructure, private sector investment, etc.) that affect the impact of AKST (positive or negative).

Chapter 2 AKST within ESAP from past to present

2.1 Trends in AKST: Production practices

This subchapter will analyse trends in production practices (e.g., irrigated/rain-fed systems, food/cash crops; manual/mechanized farming, mixed cropping including animal husbandry, fisheries/mono-culture; small/large farms; contract farming; high-value crop farming; low external farm input/ high chemical input dependent farming; post-harvest technologies and facilities; and agrobiodiversity within the region. The assessment should take into consideration the cross-section of farmers, particularly the small farmers, who are in majority, and for whom farming is a way of life.

It will also describe geographical similarities/differences in the outputs and use of AKST within the region. It will also assess the characteristics of successful (and unsuccessful) technology transfer within the region including the use of case studies such as *Leucaena* in the Philippines and brown plant hopper in Indonesia.

- What has shaped AKST systems in the region (e.g., effect of migration from Indochina on rice cultivation, colonialization on regional agricultural systems, etc.)?
- What characterizes AKST in the region?
- Who were the AKST prime-movers?
- What has been their influence on AKST?
- What motivated AKST development and transfer?
- What effects have rural-urban migration and urbanization had on AKST and vice versa.
- How much has urban demand affected rural agricultural production?
- How has labor availability affected AKST within region?
- What, if any, were the effects/influence of AKST developments, movements, adoption/adaptations within the region, on other regions, globally and vice versa.
- What has been the effect of AKST on hunger, nutrition, human health, poverty, livelihood environmental and social conditions within the region.
- How has AKST contributed to addressing the issues of natural resource management, particularly water?

Authors should consider the diversity and size of countries/systems within the region, which can be broadly divided into the following groups,

- Large countries – China, India
- Medium countries- Thailand, Malaysia, Indonesia, Philippines, Vietnam, Japan
- Small countries- Pacific countries, Bhutan, Mongolia

2.2 Trends in AKST: Generation, Access, Dissemination, Adaptation

This subchapter will assess the trends in interaction among agricultural research and development, training and extension within the region. It will analyze the roles of various stakeholders (including small-scale farmers) from both, the public and private sector on the generation, access, dissemination and adaptation of AKST. In addition it will assess the trends on how research priorities have been set within the region and the impacts on farmer and stakeholder involvement

in priority setting. Further, this chapter will assess AKST from the standpoint of farmer- identified needs, e.g., the capacity of farmers to create, adopt, adapt and utilize AKST.

It will assess the role of local knowledge systems and institutional S&T systems in facilitating public-private sector and rural-urban partnerships and the effects of international trade regimes on AKST.

- How are AKST research and extension priorities set in the region? What effects have these priorities had on agricultural development?
- Are there gender differences regarding generation, access and dissemination of technology? If so, how are these addressed or not addressed in AKST?
- What is the degree of input into R&D and training and extension from small-scale farmers?
- How is individual (e.g., extension workers, scientists, etc.) and institutional performance evaluated?
- What factors affect the cooperation of individuals and institutions with small-scale farmers?
- What are the trends in local, national, regional and international institutional arrangements and philosophies (including participatory research)?
- What are the trends and effects of public and private funding for agricultural RDTE (including part government-part private/farmer funded RDTE)?
- What type of RDTE activities are funded; what are the cost-benefit ratios; what is the hierarchical linkage of activities (top-down or bottom-up priority setting, benefits and beneficiaries, sustainability of effects, etc.)?
- What is the relevance of RDTE to farmers' self-identified needs and opportunities; e.g., ability to demand, evaluate, adopt and adapt new technology (including access to new/appropriate information and technologies)?
- How is local and institutional knowledge valued?
- What are effective linkages between local and institutional good practices and AKST?

2.3 Impact of AKST on development and sustainability goals

This subchapter should analyze the consequences (positive and negative) of AKST on development and sustainability goals over the past 50 years. It should assess impacts as a function of national systems and ecosystems. In doing so, the authors should look at case studies (successes and failures) from different parts of ESAP and lessons from other countries that are relevant to ESAP. The Report should also assess ownership and control of AKST and the products of AKST (i.e., patenting versus 'free and common ownership' of AKST etc.).

One of the challenges for the region is distribution, preservation and access to food – many countries have adequate production of food, but yet many remain hungry due to their inability to access and pay for food. Authors should also assess AKST for their capacity to improve equitable income distribution and provide opportunities for desirable (e.g., non-exploitative) employment generation.

Some cross-cutting questions of interest:

- Which production practices are economically and ecologically friendly?
- How do production practices respond to sustainability, particularly in times of crisis?
- Has food been economically accessible throughout the region historically and what is the current accessibility of food?
- Has AKST contributed to equitable income distribution?
- Has AKST responded to post harvest losses? If so, how has been the farmer's response to it?
- Has AKST provided employment opportunities that do not exploit labor?
- How has farmers' capacity matched AKST developments?
- What has been done to bridge the gap between farmers and AKST? What has been the impact?

2.3.1 Nutritional security and health

This subchapter will analyze, among other things, the effects of changes in yields (quality and quantity) on nutritional security and health. For example, topics could include an examination of tradeoffs between productivity and genetic biodiversity; the effects of infrastructure on distribution/transportation and economic access to food; the impacts of diversification of production technology; the utilization of non-grain food sources (such as fish, etc.); and the public health impacts of various technologies (such as residues/pollution from agro-livestock based industry, pesticides in run-off, etc.). The subchapter should also mention the effect of food idiocies and preferences on acceptance and adoption of AKST.

2.3.2 Poverty and rural livelihoods

This subchapter will look at the impact of AKST on the well-being and profit margin of small- to large-scale farmers. The discussion will include an analysis of the impact of farmers' access and knowledge to use production inputs (e.g., seed, fertilizers, pesticides, credit, etc.) and access to post-harvest and agro-based technology (e.g., value-adding technology) on poverty and rural livelihoods. Other analyses could include the effects of agricultural market access and control; entrepreneurship (cooperatives, niche markets, farmer organizations, etc.), empowerment/equity/vulnerability (who bears the risk; who reaps the benefits) and rural-urban relationships/migration on poverty and rural livelihoods.

Highly productive small farm areas should be included in the assessment of small-scale production.

2.3.3 Social Equitability and Sustainability

This subchapter will look at impacts of AKST on equity (including gender wage equity and land access, tenure and management). The relative well being of small- to large-scale farmers will be discussed in relation to political stability and rural-urban migration.

- Within the past 50 years, have there been any substantial changes regarding technology research and transfer taking gender concerns into consideration? What effects have changes resulted in? Are these effects cost effective? If effects are positive, have these been sustained?
- Has women's triple role (reproductive, productive and community responsibilities) seriously been taken into consideration in AKST anywhere in the sub-region in a large-scale (not pilot project)? What have been the characteristics and effects of this? Have impacts been sustain over a long period (i.e., ten years or more)? What factors contribute to their sustainability?
- What has been AKST's contribution to labor related issues?(eg. labor income, labor friendly technologies etc)
- How has AKST contributed to equitable distribution of income among farmers of different stature, i.e., gender, different economic stature, casts etc?
- How have land access and tenure affected farmers' practices and decision making regarding AKST?
- How have land ownership and management patterns affected AKST impacts on the development and sustainability goals?
- Has AKST contributed to the stability of social stability? How?

2.3.4 Environmental sustainability

This subchapter will present the state of conservation and management of natural resources (water, land, germplasm and species biodiversity (*in situ and ex situ*) within ESAP. Some of the topics to be assessed will include resource use, waste management, (air, soil, and water pollution) and responses to natural disasters (e.g., early warning systems in coastal areas as well as small island states).

The Assessment will review not only pilot projects but large-scale projects/programs as well. It will be important to know to what extent environmental conservation efforts have succeeded beyond the pilot project phase and what conditions enable scaling-up.

- What are the positive and negative environmental impacts of various agricultural technologies (e.g., on soil, air and water quality and quantity; biodiversity, etc.)?
- How has urbanization's demand on natural resources (i.e., land, water, forests) affected agriculture's sustainability and development in different areas of the region? How has this been addressed by AKST?
- What influence has AKST had in conditioning key trends and their consequences (impact on poverty and environment) in water and agriculture (eg irrigation, groundwater, rain-fed agriculture, watershed programs)?

Chapter 3 Influence of trade regimes and agreements on AKST

This chapter will analyze the influence of national, regional and international trade regimes and agreements on AKST. It will also analyze the region's response to the various trade regimes and agreements as well as AKST's role in addressing these.

- How much influence/power do different countries in the sub-region have in determining their agricultural profitability/situation in relation to other countries? Who are the regional and global powers and how/how much do they influence agricultural trends, AKST, trade regimes and agreements? How has this influence affected sub-regional and country agricultural development?
- In addition to assessing the effects of WTO and other national, regional and international trade regimes and agreements, what measures have countries in the sub-region as well as the sub-region as a group taken to address/buffer/prevent negative effects? Have any of the effects had a 'domino' impact? If so, what factors/activities been included in this domino impact?
- What has been AKST's response to the effects of WTO and other national, regional and international trade regimes and agreements? What effects have these responses had on agricultural development and the sustainability?

Section III Plausible futures

This section shall draw up different story lines and scenarios reflecting development and application exercises. It will take into consideration the different drivers that affect AKST in the region. Each storylines should be enriched through a more comprehensive representation and analysis of the development of AKST, brought to life through scripted storylines which weave together regional development goals, the key challenges and issues, AKST and the enabling institutional context.

Chapter 4 Plausible futures

4.1 Introduction and rationale

Identification of assumptions, discussion of parameters, variables and sources of data; use of qualitative and quantitative data.

- 4.1.1 The purpose and objectives of the scenarios exercise
- 4.1.2 Methodology

4.2 Drivers affecting AKST in ESAP

- 4.2.1 Description of drivers of change (inputs/access to inputs; markets; AKST/access to AKST; policies; natural resources; investment; research and development; training and

extension; credit/rural capital; empowerment of women; climate change; labor shifts; consolidation farms, farmer organizations; etc.)

4.2.2 Interactions across the ESAP region and countries specific to region, including Australia and New Zealand. The authors should look at emerging scenarios such as (a) shifts from rural to urban areas, including regional and international migration; (b) increased income and changing life styles; (c) change in farm sizes and farming strategies, (specialization vs. diversification, consolidation vs. fragmentation etc); (d) industrialization (urban and rural).

4.3 Development of storylines

Key issues for farmers, including small-scale farmers in the ESAP region include: land title/tenure; water quality and quantity; soil health; crop diversification; biodiversity; access to and ability to assess and utilize AKST; access to credit and markets; labor options and labor availability; post-harvest processing and value addition; sustainability and diversity of livelihood options; networking among farmers; culture/community; food security/sovereignty; rural entrepreneurship/capacity building; risk management capacity; linkages and integration with other enterprises, etc.

Examples: Of special interest for scenarios are the status, livelihood and survival of small-scale farmers. Thus, for example, in one scenario small-scale farmers continue to be responsible for a large share of agriculture—and their lives (and environments) and hence their lives change due to shifts in policy and institutional commitments. In a second scenario, food and fiber is produced primarily through large-scale agricultural enterprises, and formerly small-scale farmers move into other activities. In a third scenario, small-scale farming exists but predominantly under contract to larger enterprises. All 3 scenarios then examine what policy/institutional decisions would have led to the described future, and analyze expected impacts on the sustainability and development goals.

Another group of scenarios should look at the future of R&D and training, extension and education (exploring implications of different funding sources, implications for the direction, priority, type of AKST that would follow, and impacts on development & sustainability goals.)

4.4 Presentation of outputs for different scenarios

- 4.4.1 Outputs for development and sustainability goals
- 4.4.2 Outputs for key challenges and issues
- 4.4.3 Interpretation and synthesis of outputs

Section IV Looking forward: Options for action

This chapter will assess response options that will affect the ability of AKST to help achieve the challenges implied by the development and sustainability goals.

Chapter 5 Development and Sustainability Goals: AKST options

This chapter will assess AKST options for addressing future challenges in attaining the development and sustainability goals. The chapter will also examine the trade-offs among the goals that arise when a given set or type of AKST is adopted.

5.1 Role of technologies and practices

- Conventional technologies and knowledge;
- Local knowledge and practices;
- New frontiers of science: biotechnology, nanotechnology, pharmaceuticals, cosmetics; and
- Interrelationship of various technologies and knowledge systems.

5.2 Enabling Environments: Institutions

This subchapter will discuss potential institutional arrangements (for research and development, training and extension [RDTE]), policies and regulations that will better position AKST systems to address the development and sustainability goals. Options will highlight the balance between productivity and environmental sustainability goals as depicted in future scenarios, which may differ across countries.

- How can institutions facilitate research, development, testing and dissemination of technologies by farmers?
- What kinds of partnerships help achieve the development and sustainability goals?
- How does the incorporation of local knowledge/technology into AKST institutional systems affect the development and sustainability goals?
- How can interagency linkage be strengthened to address the broad societal objectives? e.g. linkages/coordination between various public, private and CSO institutions of national, regional and broad international nature.

The discussion should include the likely contribution of a range of possible RDTE systems to the goals, including that of commodity and discipline-oriented systems, formal and non-formal education systems, and integrated AKST systems that include local technology and knowledge.

The subchapter will explore and compare the relative potential and contribution of institutional arrangements that incorporate local knowledge/technology into AKST systems; promote partnerships between public and private sectors, CSOs, etc; facilitate farmers conducting research, testing and disseminating the technologies; strengthen linkages between and among regional and sub-regional NARS and International Agricultural Research Centers (IARCs); and shift from technology transfer to participatory approaches between institutions and other stakeholders, including farmers, investors etc.

5.3 Enabling Environments: Policies and regulations

This subchapter will assess how different policy and regulatory options could minimize negative impacts and maximize positive impacts of AKST on health, nutrition, livelihoods, environment, and social sustainability. Policies to be assessed may include S&T policy, national laws and regulations, regional and international agreements (CODEX, CBD, etc.), common laws and customary norms, and cultural traditions and practices.

Authors should identify

- What policy options facilitate responses and adjustments to changing (global, regional, sub-regional and national) situations?
- How will various policy and regulatory options affect the balance between agricultural production and environmental objectives as depicted in future scenarios?
- How can government incentives (tax breaks, etc.) affect AKST?
- How can intellectual property rights and patent law and other legal instruments affect the impacts of AKST?

5.4 Looking forward: Role of commitment, learning and change

This subchapter will assess and project the degree to which individual, professional, institutional and social commitment, learning and change may enable AKST systems to realize their potential for achieving the sustainability and development goals considering the unique characteristics of the ESAP region.