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Meeting farmers' aspirations in the context of green development

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I. Introduction

1. Natural resources and environmental services in the Asia Pacific region are under extreme pressure because of increasing economic development, agricultural growth, industrial development, waste and demands for food, housing, water and energy. Climate change is augmenting these pressures through its impacts on the intensity and frequency of extreme events, changing rainfall and temperature patterns and sea level rise (IPCC fourth assessment report 2007). At the same time, agriculture is a major contributor to the problem. There is a need to switch to more sustainable and

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equitable growth patterns based on efficient use of resources, conservation and restoration of ecosystem services (i.e. green development) and to increase the resilience of production systems.

2. In addition, agricultural and rural areas are characterized by high incidences of absolute and relative poverty. At present, many farmers do not believe that they can meet their aspirations for decent and dignified livelihoods for themselves and their children in the agricultural sector or in rural areas. Indeed, the income gap in the region between agriculture and other sectors is projected by FAO to increase (Schmidhuber *et al.*, 2009). While there is awareness of the need to structurally transform the region's agricultural sector, many farming and rural communities perceive that structural transformation has been imposed upon them and represents a threat to their dignity, autonomy and control of their destinies. They see this transition as resulting in a loss of access to or control over natural resources; degradation of their environment and health linked to "modern" agricultural practices; and increased insecurity.

3. The region and its agricultural sector, therefore, face two momentous and complex transitions: a structural transformation¹ linked to fast, if uneven, economic growth, which leaves agricultural incomes stagnant, and a transition to sustainable agriculture aimed at reversing the unsustainable use and degradation of the region's limited base of natural resources and increasing its resilience. These transitions are rarely considered together. A key challenge for decision-makers, however, is how to adopt policies and strategies to successfully support and orient this double transition in a sustainable and equitable manner. In this regard, green development offers several important opportunities:

- an overall greening of agricultural production which may improve livelihoods;
- a shift away from a number of agricultural support policies that provide incentives to increase output towards policies that promote resource use-efficiency in the sector and assist in adapting to changing climatic conditions;
- new possibilities to meet the policy as well as market driven demand for greener agricultural products and to support policies related to payment for environmental services, as well as climate related financial mechanisms; and
- the chance for agriculture to support the greening of other sectors (e.g. energy or water) or to create jobs in the environmental and natural resources sectors.

4. The challenge for the green development agenda is the extent to which it can help bridge a widening gap between urban affluence and rural poverty, while also encompassing "green" measures necessary to enhance ecological well-being. To assist in the discussion about how to achieve this transition, this paper will ask the following questions:

- Can sustainable intensification of agricultural production and green economy opportunities raise farming households' livelihoods to levels similar to other sectors of the economy and shore up the role of agriculture in poverty reduction? And, under which conditions would farmers be willing or able to adopt sustainable intensification practices? How does climate change affect strategies for sustainable intensification in the region?
- Considering the region's narrow natural resources base and increasing water and land scarcity, what is the proportion of the rural population for which farming will represent, over the long term, a feasible and attractive proposition?
- To what extent is the success of agriculture's transition to sustainability dependent on broader rural development and socio-economic policies, and what are the degrees of freedom of agricultural policy?

Agriculture and green development

¹ Four interrelated processes define the structural transformation process:

- (1) a declining share of agriculture in gross domestic product (GDP) and employment;
- (2) rural-to-urban migration that stimulates the process of urbanization;
- (3) the rise of a modern industrial and service economy; and
- (4) a demographic transition from high to low rates of births and deaths.

5. The Green Revolution in agriculture swept much of the developing world during the 1960s, saving an estimated one billion people from famine, mostly in the Asia-Pacific region, and underpinning the region's efforts towards food security. Using high-yield crop varieties, irrigation, agrochemicals and modern management techniques, farmers in developing countries increased food production from 800 million tonnes to more than 2.2 billion tonnes between 1961 and 2000. However, these achievements came at a price. In many countries, decades of intensive cropping degraded fertile land, depleted ground water, provoked pest outbreaks, eroded biodiversity and vital ecosystem services and polluted soil and water.

6. As the world's population is projected to increase to 9.2 billion by 2050, developing countries will have to increase their food production by nearly 80 percent to ensure food security. They will have to overcome a series of challenges including declining growth in the yields of major cereals, increasing competition for land and water, declining soil fertility, rising fuel and fertilizer prices and the impacts of climate change.

7. The present paradigm of intensive agricultural production can no longer meet the challenges confronting us today. For sustained growth, agriculture must conserve and enhance natural resources and use an ecosystem approach that draws on nature and applies appropriate external inputs at the right time and in the right amount. This requires a major shift away from the homogeneous and technology transfer-driven model of agricultural production towards knowledge-specific farming systems which are more resilient to natural and economic uncertainties and which use biodiversity and associated biological technologies that enhance soil fertility, reduce erosion, reduce chemical use and conserve water use.

8. Sustainable production intensification (SPI) embodied in the Save and Grow paradigm, and Climate Smart Agriculture (CSA) are two powerful and complementary FAO approaches developed to address these challenges.

9. The SPI approach provides the technical basis for developing sustainable intensification strategies for specific agricultural activities and locations. The approach builds upon the scientific principles laid out in the FAO publication "Save and Grow", calling for better use of ecosystem services in agricultural production, including through crop genetic diversity and healthy soils, as well as the adoption of precision and knowledge intensive technologies. The CSA approach recognizes SPI as a key vehicle for achieving its three main objectives: increasing productivity and agricultural incomes, improving sustainability of resource use, increasing resilience and adaptation to climate change and mitigating greenhouse gas (GHG) emissions from agriculture. Increased resource use efficiency contributes to both adaptation and mitigation via effects on farm incomes and reduced emissions per unit product. Sustainable intensification on existing agricultural land is a major potential source of mitigation, by reducing conversion of forest and wetlands. The CSA approach provides a basis for prioritizing SPI options and focusses on identifying and building the needed institutional, policy and financing frameworks to support their effective implementation.

II. Key components of SPI

10. Green development strategies address habitat conservation and integrated landscape restoration with the aim of maintaining or restoring ecosystem services that support agricultural production. SPI includes a number of technologies related to:

- increasing the efficiency of use of fuel, fertilizer and water in the face of increasing demands on agriculture;
- reducing health risks and farming costs associated with pesticides through integrated pest management;
- promoting a holistic approach to farm planning and management that can be extended to larger-scale farmland management through community and group farm business arrangements such as cooperative farming, contract farming and machinery pooling;
- integrating crop and livestock systems;

- adopting knowledge-based precision irrigation that provides reliable and flexible water application, along with deficit irrigation and wastewater reuse;
- securing rainfed crops and improving their productivity in rainfed areas through improved drought-tolerant crop varieties, soil and water conservation and water-saving management practices;
- genetically improving cereal varieties and maintaining crop and livestock biodiversity;
- using agroforestry systems that include shrubs and trees in animal production or crop production systems, mimicking the natural ecosystem; and, using sustainable pasture and rangeland management for grazing livestock. SPI also includes a number of options that can help address sustainability challenges in other sectors. One example is the production of energy from biogas, which can contribute to addressing key challenges of the energy sector in the Asia-Pacific region; and
- increasing the resilience of production systems through improved water and soil management (e.g., reducing flood and drought risk).

III. Impact if SPI on small-scale farmers' incomes

11. The ecosystem services provided by agriculture largely depend on landscapes associated with small-scale and family farms. Therefore, the key question to address is whether SPI and green economy opportunities can raise farming households' livelihoods to levels similar to other sectors of the economy and shore up the role of agriculture in poverty reduction. Whether a transition to SPI will result in enhanced farmer incomes and livelihoods will depend on many factors.

12. SPI strategies and practices are meant to result in improved and more sustainable livelihoods through improved agricultural productivity and increased efficiency and reduction in the use of external inputs, such as fertilizers and chemicals. The transition to SPI explicitly recommends a shift in policies and incentives to reduce the negative externalities of agricultural production (e.g. reduction or elimination of subsidies for use of inputs including energy, water pricing or price supports that sustain unsustainable farming systems). FAO recognizes that, while transition to SPI may be beneficial in the longer term for farmers, the potentially deflating impact of these measures on incomes in the immediate and short-term will need to be offset by a range of measures to reduce transaction costs in access to inputs and markets. On the other hand, green development may provide opportunities to sustain farmers' incomes through the adoption of instruments that support positive externalities generated by agriculture, such as payments for environmental services. One of the main components of the climate smart agriculture approach is to identify mitigation co-benefits from agricultural practice changes that are important for food security and adaptation to climate change and develop links to climate finance to support their uptake. There is already considerable work linking mitigation finance (including, but not limited to carbon finance) to agricultural systems in China. Viet Nam is partnering with FAO on CSA and will be developing financing strategies that reward mitigation as well as other environmental services. In addition, the income effects on farmers may be enhanced if consumer demand for greener products translates into higher prices and if these are passed on to farmers. Thus, the calculus of the aggregated result of both positive and negative effects and supportive and depressive policies is quite complex.

13. The agricultural share of GDP in the Asia-Pacific region has been declining rapidly, but countries use agricultural price supports and other policies to keep people in agriculture; as a result, agricultural employment remains dominant in developing countries. However, low earnings from agricultural labour, relative to those gained in other sectors, cause farming households to rely increasingly on non-agricultural work to sustain their livelihoods. Rural areas have experienced sustained and massive migration of young and middle-aged farmers in search of better wages, leaving agriculture to older, often female and less educated workers. Increasingly, small-scale and family farming, which dominates agricultural production in low-income economies, is an occupation of last resort (Crowley, 2013). A consequence of this shift is increasing labour scarcity in rural areas. This has been a major driver for the accelerated mechanization of farm operations which has, in many cases, accelerated land degradation.

14. Therefore, it is unlikely that farmers will adopt SPI practices if they slow down the rates of increase in agricultural labour productivity and if they do not provide returns to labour that are competitive with opportunities in other sectors. In other words, SPI practices should also aim to save labour in order to increase the likelihood of being adopted.

IV. Impact on value chains

15. The other avenue for green growth lies in substantially increasing the returns to labour and, in this respect, building inclusive, greener and more efficient food chains. Value chains that link rural producers with urban consumers are an important element of greener agricultural development because they help to meet the demands of domestic and international markets for high-quality, safe food and for avoiding biological hazards (e.g. transboundary diseases and spread of noxious species). Ecocertification and ecolabeling have emerged as a response to the growing market demand for environmentally sound goods and services, with some consumers willing to pay a premium for certified products. For a number of farmers, switching to higher value crops, targeting niche markets, focusing on product quality and moving up the value chain may represent a viable option. However, improved governance along the food supply chain is a prerequisite for ensuring that both efficient, sustainable practices are enacted and more equitable value distribution is enabled, benefitting small-scale producers as well as the remainder of value chain participants.

16. Building the capacity of developing Asian countries to meet sanitary and phytosanitary requirements has connected farmers to higher value markets and increased their protection from pest and disease outbreaks. Likewise, farmers, farm cooperatives and agribusinesses using recognized or certified farm food safety (or organic) practices can become approved suppliers in both domestic and export markets, and the wider society can gain health benefits or better environmental management systems.

V. The need for land consolidation

17. While crop diversification to supply developing local, national and export markets have provided and will continue to provide farmers with significant opportunities that will be enhanced by a more discerning and greener demand from consumers, it must be remembered that the bulk of agricultural production (and allocation of land and water resources) will continue to focus on the mass production of staples, such as rice and cereals, even though the share will continue to decrease in quantity and value. For the farmers growing these staple crops, the “farm income problem” is the most acute, and for them, land consolidation/rental and mechanization will have to play a role in boosting farmer productivity and farm income (Christiaensen, 2013). Farm sizes are already consolidating in some cases where economies of scale can be achieved (e.g. the core rice districts of the Mekong Delta), but they are fragmenting where traditional land tenure or land management techniques cannot be scaled, such as in Thailand or India (Dawe 2008). In China, it has been calculated that a household growing only rice (with no other income sources) would need to increase its farm size by a factor of six now (and a factor of sixteen over the next five years) to match the typical income growth that rural households achieved from 2003–2008. Clearly this is not possible in such a short time span (Christiaensen, 2013).

18. Already, a number of countries in the region have adopted policies that deliberately aim at land consolidation in order to ensure that farming generates decent incomes and opportunities for employment:

- In the Socialist Republic of Viet Nam, the policy objective of multiplying farmers’ incomes by 2.5 by 2020 translates into land consolidation and intensification for rice producers in areas with comparative advantage, and diversification out of rice and with a focus on quality and value addition in other areas.
- China has recently adopted a range of policies to facilitate the emergence of large, mechanized and specialized “family farms.”
- A key strategy in Malaysia to reconcile the objectives of its National Economic Transformation Plan to become a developed economy by 2020 and to continue to have a high

level of self-sufficiency in rice is to create “estatization” and deliberate exit strategies for rice farmers in modernized federal rice granaries.

- On the other hand, Thailand’s “smart farmer” policy aims to develop a corps of farmers who are proud to be farmers and have the knowledge and skills to make complex decisions linked to market opportunities and to adopting sustainable practices. Nevertheless, the policy’s ambition (and criteria for “smart farmers”) is limited to farmers earning the official minimum wage. Although this would represent progress for many, it would be surprising if farmers were satisfied with the minimum wage as a reward for their skills, efforts and smartness (which obviously are not required in other sectors).

19. For these and other countries then, a key feature of the transition to SPI is that it will need to be compatible with a process of land consolidation, especially for the production of staples.

VI. Additional challenges in the Pacific Island countries

20. Among the Pacific Island countries, the transition to input- and capital-intensive agriculture has been complicated by traditional land-tenure arrangements and the general reluctance of the financial sector to provide loans without the security of private land tenure. The preponderance of traditional land-tenure systems also has prevented the consolidation of landholdings into large estates, despite the existence of a significant amount of underutilized agricultural land.

21. In addition, the food and income security of rural households largely depends on consuming their own production of staple root crops and tree crops, centred on no-input, itinerant food cropping systems incorporating land clearing and planting, followed by long periods of fallowing. This system of family food cropping requires households to maintain large agricultural landholdings, so that more than 80 per cent of their lands may remain fallow at any time to sufficiently restore soil fertility. However, population growth, particularly among Melanesian countries, is beginning to place a strain on this system of maintaining soil fertility, and there is accompanying pressure to transition to input-intensive agricultural production centred on more permanent cultivation of smaller agricultural landholdings.

22. Agricultural value chains in the Pacific suffer as a result of a number of factors, including the archipelagic nature of many of the subregion’s countries; low population densities; small domestic markets; high transaction costs associated with exporting to the Pacific Rim; very high internal transport costs because of poor quality transport and marketing infrastructure; lack of competition and high cost of energy inputs; and a range of quarantine issues. However, opportunities lie in improving the competitiveness of the agriculture sector to supply the growing domestic urban market and tourist markets, by introducing a range of policy measures to facilitate private-sector development and thereby decrease the environmental footprint of supplying these markets linked to shipping.

23. Some success has been achieved in exporting to higher-value niche export markets, such as certified organic and origin-branded product markets. However, the higher entry costs that result from the additional standards introduced by these markets has created some difficulties among smallholder-dominated Pacific agricultural sectors, and undermined efforts to scale-up the supply of these niches. Innovative arrangements between cooperatives and private enterprises have been successful in helping smallholders overcome these constraints (Herbel, 2011). However, the small size and limited capacity of farmer organizations and cooperatives in the Pacific still undermines efforts to overcome these entry costs through group marketing. In order to scale up successful initiatives, stakeholders must come together with clear roles and responsibilities to strengthen producer organizations capacity to connect small-scale producers with international market.

24. Some success has been achieved in meeting the minimum standards required by certified markets through the use of more flexible, peer-inspected Participatory Guarantee Systems (PGS). The cost of PGS certification is close to zero as capacity-building is conducted for free by peers. By reducing intermediaries and organizing collective marketing, PGSs provide a stable market and boost producers' profits. Unlike third-party certification, PGS certifies the entire production of their members (and not only a few commodities) and therefore encourages diversification, which in turn

promotes food security. It is uncertain whether the certification claims made by PGS standards will be acceptable in export markets; however, this system may assist smallholders in selling to higher-value domestic markets.

VII. The need to facilitate structural transformation

25. Given the decreasing availability of land and water in the region and the questionable prospects for green development to secure substantial increases in the welfare of most farming households, it would seem that SPI alone will not be able to underpin meaningful poverty reduction in rural areas. For most farmers, who will continue to be engaged in the production of staples, the adoption of SPI would be socially and economically acceptable only if it is compatible with a substantial increase in the size of farm operations. Rural households would maintain small farms to produce staples in order to provide a social safety net, but it is unlikely that they would adopt the knowledge-intensive skills and invest the necessary time and capital to boost agricultural productivity of only small land holdings. However, government regulations often hinder the sale/rental of land which would be required to increase farm size. Reform of land tenure laws is therefore an important, but politically delicate, issue.

26. The ability of small farmers to organize for collective action is crucial to fit their needs as well as to adopt more sustainable and productive agricultural practices. Indeed, collective action through producer organizations (POs) simplifies access to input and output markets as well as participation in value chains. POs are essential for providing voice to smallholders; to raise their aspirations and needs in the green growth agenda. However, prevailing structures all too often stand in the way of realizing POs' potential contribution in achieving equitable rural development. Stakeholders must therefore, come together with clear roles and responsibilities to define the enabling environment for POs to develop, thrive, and strengthen their capacity to facilitate farmers' application of Sustainable Production Identification (SPI). FAO is developing activities related to the strengthening of producers organizations in the context of Strategic Objective 3 focused on poverty reduction.

27. The emergence of farmers applying SPI, in a way that provides enhanced socio-economic status and achieves production objectives for staples of national food security policies within the available natural resources base, would likely be facilitated by rural populations having opportunities for employment outside agricultural production. FAO is developing activities related to the creation of rural employment in the context of Strategic Objective 3 focused on poverty reduction. This in turn requires that other sectors would need to have the capacity to absorb labour from the agricultural sector and that members of farming households would need the skills to enter productive employment in other sectors. East and Southeast Asia have followed, to a large extent, a Japanese model of investing in the education and skills of rural labourers so that they can find employment in other sectors. In these subregions, this will be further facilitated by demographics as population growth is expected to peak during the 2040s, and even earlier in China. The situation is rather different in South Asia, where population growth is expected to peak much later, during the 2080s, and where there have been jobless growth patterns and a lack of public investment in education. As a result, the only feasible path, at present, for most farming households to employ their excess labour resources throughout the year lies in increasing agricultural intensity through the depletion of available water resources.

28. History tells us that the only sustainable pathway out of poverty is higher agricultural productivity coupled with a dynamic non-agricultural economy—a structural transformation. It is a general equilibrium process, with agriculture intimately linked to what is going on in the rest of the economy (Timmer and Dawe, 2012). Degrees of freedom for agricultural policies are limited by policies of other sectors, crucially energy and water. Exit from agriculture has indeed been part of standard patterns of development in the region and elsewhere.

29. The key challenge to SPI will therefore lie in mediating the transition in a manner that ensures a balance between the exit rate from agriculture and the absorptive capacity of the rest of economy, in

order to avoid large-scale disruptions in livelihoods. This will require very significant public investment in policies and incentives that: (1) facilitate the transition towards SPI, (2) assist farmers and farmers' organizations in developing the necessary skills, knowledge and other resources to adopt more sustainable and productive agriculture practices; and (3) support deliberate exit strategies that will involve skill development and labour absorption in manufacturing and services. Strengthened social protection systems could also contribute to aiding farmers to overcome uncertainties and provide predictable basic income which may facilitate adoption of SPI-related technologies and/or support exit strategies.

30. More broadly, it has been suggested that the development discourse would benefit from shifting beyond the rural-urban dichotomy to focus more on how best to urbanize and develop the rural non-farm economy and secondary towns. Evidence suggests that rural diversification and secondary town development lead to more inclusive growth patterns than metropolization (Christiaensen, 2013) because more poor people find their way to the rural nonfarm economy and secondary towns where job opportunities are mostly non-skilled or low-skilled. These opportunities are also often more accessible (e.g. through commuting or by switching occupations locally) than those in distant cities. The World Bank's 2009 World Development Report "Reshaping Economic Geography" (World Bank, 2009) has also called for spatially blind provision of social services and infrastructure so that migration is only motivated by economic opportunities and not by the search for better amenities.

31. National and local contexts are very diverse however. The development and promotion by FAO of territorial approaches to sustainable natural resources management under Strategic Objective 2 and Strategic Objective 3 provide promising avenues for governments and local stakeholders to elaborate adapted, more comprehensive and multisectoral strategies that address the combined challenges of rural prosperity and sustainability of ecosystems, including through the adoption of SPI, and through strengthening rural-urban linkages.

VIII. Conclusions and recommendations

32. The progressive adoption of a green growth agenda leads to strengthening environmental policies that protect the ecosystems on which farming depends (e.g. conserving watersheds and water resources, addressing water pollution and controlling the use of harmful pesticides and chemicals) and enables society to better recognize the ecosystem services that agricultural landscapes provide. As a result, regional and national green growth agendas are favourable to the aspirations of farming and rural communities to regain control of their future. A green growth development agenda therefore provides a platform for governments to negotiate future policies and strategies with producers' organizations and rural communities.

33. A green growth agenda also helps to highlight problematic aspects of structural transformation that have adversely affected rural communities and smallholders and resulted in hardships and unacceptable inequities. However, it is not clear that such an agenda would be sufficient to address the structural issues that make a future in agriculture a questionable proposition for farmers and future generations. Meanwhile, food sovereignty agendas could encourage governments and farming communities to support the continuation or expansion of public support policies and subsidies that support farmers' incomes in the short term, but lock farming communities, particularly small-scale and family farms, into farming systems that perpetuate rural poverty, gender inequity and child labour in agriculture (Crowley, 2013). These policies could exacerbate the negative environmental impacts of present production patterns while mobilizing public budgets that might be better spent on supporting structural reforms and investments within or outside of the agricultural sector.

34. In transition economies, farmer organizations typically support the adoption of an ecosystem conservation-focused agricultural agenda when national food security concerns decrease because of increased prosperity. However, as discussed earlier, while the adoption of SPI is, in the long term, necessary, SPI recommendations do not necessarily result in agricultural and rural livelihoods that provide incomes similar to those in other sectors in the short term. Incentives, such as payments for

environmental services or carbon sequestration, though important, may not provide the necessary financial rewards to create sustainable incomes.

35. Key issues related to structural transitions are complex and include questions on the desired end-game and strategies for equitable and sustainable transitions. These questions should be debated in the policy arena among stakeholders at the national level and, as relevant, at local levels of economic decision-making and natural resources management. In this context, it is important to review the main agenda items of representative farmer organizations as commonly expressed in regional and national policy dialogues. Public policy dialogues must address whether rural populations agree with conservation-based policies that may restrict their future prosperity prospects. The public conversation should focus on three key strategic questions:

- What are the prospects for rural development outside of agriculture?
- If agriculture is expected to remain the key contributor of rural incomes, what type of environmentally sustainable farming system can procure significantly higher incomes?
- Who will pay for ecosystem services and how? Farmers, customers and/or the public?

36. In policy terms, the question can be rephrased into the quest for measures that address the prospect of a widening income gap between farm and non-farm incomes – which would ultimately raise the pressure for workers to leave rural areas and attract cheap labour to more remunerative urban areas and non-farm environments – without distorting international competition, resource allocation or trade.

37. Paradoxically, a successful transition to SPI may very well depend on including technologies that are environmentally sustainable, but at the same time labour-saving, as well as on creating successful exit strategies for a large proportion of the agricultural labour force and recognizing the limitations of agricultural policy. Ultimately, it will be necessary to broaden the scope of the discussion to a multisectoral framework that goes beyond agriculture and natural resources management to encompass urbanization policies, patterns of public investment in infrastructure, services and education and development of non-agricultural economic sectors in rural areas. Such an approach will assist the environment as well as help effect a successful transition towards sustainable agricultural production and intensification, and therefore reinvigorate and prioritize support to agriculture. It is therefore suggested that the International Year of Family Farming – which aims to raise the profile of family and smallholder farms – should focus on how to manage transitions in the region to include green development based on wider environmental values while increasing farm incomes to levels similar to other sectors, so as to not disadvantage the poorest and most vulnerable in rural areas.