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Regional Implementation Meeting for Asia and the Pacific for the  
sixteenth session of the Commission on Sustainable Development (CSD-16)

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**SYNTHESIS OF THE THEMATIC REPORTS ON AGRICULTURE AND LAND,  
RURAL DEVELOPMENT, DESERTIFICATION AND DROUGHT -  
AN ASSESSMENT OF ASIAN AND PACIFIC PROGRESS**

(Item 3 of the provisional agenda)

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## Key messages

- *The Asia and Pacific region is home to the majority of the world's poor and hungry.* It also possesses the most limited access to biological resources, per capita, of any global region, and a rural population which is increasingly vulnerable, to desertification and drought and social and economic change. Hunger and under-nutrition are still critical issues for this region, despite its economic successes.
- *The development of environmentally sustainable economic growth patterns, based on a vibrant and inclusive rural sector and the eco-efficient use of natural capital, is the overarching and unique challenge for Asia and the Pacific.* Not only is this important for this region, but also for the global community.
- *Pacific island developing countries face the most immediate resource limitations as regards land resources, and vulnerabilities, but South and South-West Asian countries face the greatest challenges,* perhaps globally, in relation to disruptions of the hydrological cycle, growing populations and rising hunger and the fast-emerging threat of climate change. Overall progress in these countries in improving food security and rural development is inadequate.
- *Future increases in food production will require a focus on developing more efficient, rather than more intensive agriculture production models.* Major breakthroughs in new varieties and sustainable commercial farming systems, in particular irrigation systems, to promote efficient use of all types of agricultural inputs are needed, supported by appropriate fiscal incentives to promote efficiency of resource use, rather than more intensive resource use, to the benefit of both producers and consumers.
- *Investment in research must be redoubled to bridge the growing gap between current knowledge, and the knowledge needed to face future challenges.* Efforts at preserving genetic diversity as a basis for developing a competitive and resilient agricultural sector, should be increased.
- *Some progress can be reported under each priority area of action; however, none of these priority areas can be said have been sufficiently supported* by political commitment, finances, awareness, data, information and participation, and importantly, long-term, participatory, planning processes, to evoke reasonable optimism in the face of the challenge of climate change. Issues relating to access to resources (including energy), social equity and land tenure, technology transfer and development, institutional capacity, and trade policy development continue to be cited as constraints to progress in almost every area.
- *A few countries have shown remarkable progress in reforming the rural sector to produce significant progress in reducing poverty and hunger, but in almost every case, there are significant environmental consequences.* The result is that some regional countries are becoming increasingly vulnerable to climate change and natural disaster, in particular drought and other signs of environmental stress. Land degradation and desertification require renewed commitment, and a critical look at its driving forces.

- *The ongoing urbanization process implies the need for a greater emphasis on water use efficiency and demand-side management in both urban and rural areas; water sharing policies must increase efficiency of use, and equitable sharing of benefits and costs of water services.* This is critical to avoid significant impacts on long-term food production capacity, and governments can play a key role in creating environmentally and socially supportive markets of considerable magnitude. Drought is a natural hazard, with both climate and socio-economic driving factors. Escalating economic losses are associated with drought, and more investment in assessment and mitigation is needed.
- *Implementing energy transition in both urban and rural sectors is more urgent than ever; however it must be approached more carefully than ever.* Increased access to affordable sources of energy underpins sustainable rural development. In each case, energy, agriculture and land use policies must be carefully examined to determine that incentives for particular land uses and production systems represent the optimal uses of land and do not impact negatively on small producers, food security and ecosystem integrity. The incentives and opportunities provided by biofuels require careful assessment and identification of responses.
- *Land is becoming a more valuable resource than ever, optimizing its use, while increasing access to land as a basis for sustainable livelihoods is increasingly critical for human security.*
- *Key policy options include those which promote demand-side management in order to develop efficient and environmentally sustainable consumption and production patterns, empowerment of vulnerable groups, and also promote enabling environments for rural institutions that empower and support small producers that are at risk of marginalization, such as cooperatives, and microcredit organizations. Such institutions must increasingly play a role in conflict resolution regarding the use of resources.*

## INTRODUCTION

1. The sixteenth session of the CSD scheduled to be held in May 2008 will undertake a review of progress on key international commitments to sustainable development in the thematic cluster of "agriculture, rural development, land, drought, desertification and Africa."<sup>1</sup> The Regional Implementation Meeting (RIM) for the Asia-Pacific region is organized in preparation for the CSD-16. It is intended to (a) assess and review progress in the implementation of the JPoI, CSD-6/9, Agenda 21 and the Programme for Further Implementation of Agenda 21 on issues related to the cluster topics of CSD-16/17 in the Asia-Pacific region; (b) identify lessons learned and best practices to expedite implementation; and (c) identify constraints to further implementation.

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<sup>1</sup> The Commission on Sustainable Development (CSD), at its eleventh session (CSD-11), decided that the organization of work of the Commission should contribute to advancing the implementation of Agenda 21 (A21), the Programme for the Further Implementation of Agenda 21 (PFIA21) and the Johannesburg Plan of Implementation (JPoI) at all levels. The CSD also decided that in order to fulfill its mandate, the work of the Commission will be organized in a series of two-year implementation cycles, which will include a review session and a policy session.

2. As a basis for regional preparations for the upcoming CSD session, four thematic reports covering (1) agriculture and land; (2) rural development; (3) desertification; and (4) drought<sup>2</sup>, respectively, were prepared. A special report on climate change was also prepared in light of the critical impact of climate change on agriculture and rural development, and implications for regional economies and food security.<sup>3</sup> This document synthesizes the key findings of these reports.<sup>4</sup>

3. Asia and the Pacific is home to the majority of the world's poor and hungry.<sup>5</sup> At the same time has the lowest per capita availability of water and biological resources of all global regions, and is likely to face growing threats of drought, desertification and natural disaster in the context of a changing climate. This synthesis report therefore stresses that the overarching and unique challenge for the Asia and Pacific region is the promotion of environmentally sustainable economic growth patterns, based on a vibrant and inclusive rural sector and the eco-efficient use of natural capital.

4. The report describes the Asian and Pacific regional context, identifies the priority commitments to sustainable development in the CSD-16/17 thematic areas, assesses progress and outlines constraints to further implementation, policy options and best practices emerging from the region.

## **I. Asian and Pacific regional context**

5. Asia and the Pacific is a region of rapidly changing economies and societies. In addition to its newly-acquired status as the production centre of the world, it is also becoming the breadbasket to the world. More than 50 per cent of the world's industrial crops are produced in the Asian and Pacific region. The unprecedented economic growth in the Asia-Pacific region over the past three decades has therefore had profound impacts on agriculture and rural development, land resources and the demand for water. With more than half of the world's people on less than a fifth of its surface, most of them in rural areas, and being mainly small/marginal farmers or landless, Asian and Pacific countries faces great challenges in balancing poverty reducing agricultural and rural economic growth with sustainable natural resource use needed for such growth.

6. Although the agricultural sector continues to grow, it is declining in relative importance in Asia, both in terms of its contribution to GDP and its share of the labour force. Farm households are diversifying their sources of income toward services and industry, or leaving the agricultural sector altogether. Despite these trends and rapid urbanization processes, Asia and the Pacific accounts for 75 per cent of the world's rural population. A strengthened agricultural sector is important to those directly dependent on it, but also for regional and global food security. Member countries in Asia and the Pacific have made great strides at reducing poverty and food insecurity and improving human development.

7. The Human Development Index is higher today than it was in 1975 for all countries in the region.

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<sup>2</sup> ESD/RIM/2007/INF. 1-4, respectively.

<sup>3</sup> ESD/RIM/2007/INF. 5

<sup>4</sup> The contributions of the authors of these reports (Dr. Chris Landon-Lane, Mr. Mahesh Uniyal and Dr. Durga Paudyal, Dr. Victor Squires, Dr. Lian-You Liu and Dr. SVRK Prabhakar) are gratefully acknowledged.

<sup>5</sup> Ahmed and others differentiate between the "ultra poor" and the "poor", noting that Sub-Saharan Africa is home to more than three-quarters of the world's ultra poor, but, that most of Asia's poor live just below the dollar-a-day line. Ahmed, A, Vargas-Hill, R, Smith, L, Wiesmann, D and T. Frankenberger, 2007. *The World's Most Deprived: Characteristics and Causes of Extreme Poverty and Hunger*. IFPRI, Washington, DC.

8. Increasing per capita income and the influences of growing urbanization and globalization, represent both opportunities and challenges for the agricultural sector. Changing food consumption, marketing and trade patterns, together with increased competition for resources from other sectors, have exerted tremendous pressure on the agricultural sector to become more productive, more competitive and more efficient. The opening of economies poses difficult challenges for developing country food security, agriculture and natural resource management.<sup>6</sup> Global and national food systems are increasingly driven by consumer interests, changing consumption patterns and food quality and safety concerns. Food processing and retailing industries are profoundly affecting production, markets, trade, diets and public policy. Where developing countries fail to harness these different forces for public benefit and thereby realize the benefits of globalization, poverty and food insecurity increases. Aging rural populations, demands on women's time at home and in the fields, the decreasing cost of capital relative to labour and depleting natural asset basis further complicate the issue.

9. Despite this progress, many remain mired in poverty. Absolute income gaps between the richest and poorest quintiles, as well as gaps between rural and urban areas in terms of the quality of life and livelihood opportunities, are widening. Between 1990 and 2004, substantial reductions in the number of poor in China in particular, masked increases in the number of poor in South Asia during that period. None of the developing countries in Asia and the Pacific are on track to meet all of the Millennium Development Goals by 2015. Hunger and under-nutrition are still critical issues in the region. As of 2000 - 2002, there were still 548 million undernourished people in the developing and transition economies of Asia and the Pacific. Many farmers, fishers and foresters are exceedingly vulnerable to floods, droughts and cyclones as well as less frequent events such as earthquakes and tsunamis.

10. Meeting these needs implies the need for continued economic growth on an already-constrained resource base. The Asian and Pacific region has the lowest per capita availability of natural resources, and highest population density of all global regions, based on measures of biocapacity developed through ecological footprinting methodologies. This is reflected in the fact that the region has used almost all of the available land that is suitable for agriculture, while the demand for agricultural products continues to grow. Land loss to urbanization is increasing the pressure to raise crop yields, while non-food crops are claiming expanding land areas. It also implies that there is a massive and growing demand for the ecosystem goods and services, exceeding that in other regions. Where the demand outstrips the supply of ecological resources, or ecological resources are abused, the result is degraded land, desertification, drought and vulnerability to natural disasters.

11. In terms of the number of people affected by desertification and drought, Asia is the most severely affected continent. Water availability per capita in Asia is the lowest of all global regions, two thirds that of Africa. Desertification manifests itself in many forms across the region. Degraded areas are found in most countries, with prominent examples including the expanding deserts in China, India, the Islamic Republic of Iran, Mongolia and Pakistan, the steeply eroded mountain slopes of Nepal and deforested and overgrazed highlands of Lao PDR. Water and wind erosion, salinization and water-logging have severely affected productivity in large parts of Central, South-Asia, South-East Asia and China.

12. Human security in rural areas is a growing concern due to the vulnerability to ecological changes, particularly in the context of climate change. However, human security is also impacted by economic changes; increasing commercialization and specialization of

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<sup>6</sup> FAO, 2004. *Towards a food-secure Asia and Pacific*. Regional Strategic Framework for Asia and the Pacific, second edition. RAP Publication, FAO, Rome.

agriculture have pointed to concerns that small farmers may be increasingly marginalized unless specifically empowered to effectively participate. Social and political change that can bring progress and empowerment, can also play a part in reducing certain aspects of human security, where effective traditional resource management and indigenous knowledge that support sustainable agricultural practices, are discarded.

13. The damage inflicted on the natural resource base on the economy and society is largely un-costed. Prevailing economic systems reward broad scale degradation and do not encourage investments in natural capital. As a result, the economic costs of environmental degradation in developing countries are high. The Chinese Ministry of Agriculture estimates that the loss of agricultural production due to land degradation is equivalent to about 30 per cent of agricultural GDP.<sup>7</sup> This, and the growing realization that prevailing economic growth models do not always lead to inclusive poverty reduction and increased well-being, has increased interest in improving the quality of economic growth.

14. Due to its mainly rural population and vast diversity of agro-climatic conditions and the threat of climate change, South Asia faces the most important challenges (in terms of both severity and numbers of persons affected) in ensuring sustainable rural livelihoods. By contrast, several countries have made significant progress, including Thailand and Viet Nam, although these countries still face long-term challenges related to natural resource constraints. In these and other countries, enabling policy and economic environments have led to many success stories.

15. Other emerging challenges and threats include the changes in environmental sustainability posed by restructuring farm sectors; biosecurity risks from transboundary diseases, weeds, unintended genetic drift, e.g. from GMOs; heightened awareness of food safety concerns and trade implications; the widening gap between drought risk and mitigation/planning capacities and increasing vulnerability to other natural disasters such as floods. The food security challenge is changing; not only is it important to consider how to increase the total production of food, but also to ensure access to food through affordable processing, storage and distribution.

16. There remain tremendous unmet needs in terms of economic growth in this region. In the above context, each country, and the region as a whole, must consider how policies, plans and institutions that impact both rural and urban sectors, can ensure that the increasing demand for land resources and water be sustainably met, while supporting the development of a vibrant and inclusive rural sector. Climate change adds a new dimension to this question; how can this challenge be met in a context of increasing risk of drought and desertification, and undetermined ecosystem change?<sup>8</sup>

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<sup>7</sup> Not including the downstream costs of damage to infrastructure, water quality and river navigation. As reported in *"China Daily"*, Beijing, 12 September 2007.

<sup>8</sup> The 28th FAO Regional Conference for Asia and the Pacific recognized the importance of building a resilient rural society through the adoption of good agricultural practices and sustainable rural development. The Conference considered the experiences, lessons and implications of rapid economic growth for agriculture and food security in the region based on a diagnostic study carried out by FAO generally positive experiences with respect to poverty reduction, food security and rural development, but had also exposed important challenges related to growing income disparities, declining rates of agricultural growth, and environmental degradation. The Fifth Ministerial Conference on Environment and Development in Asia and the Pacific, held in 2005, stressed the need for urgent action to promote environmentally sustainable economic growth or "green growth", taking into account the declining resource base and increasing demands placed on this resource base by the rapid economic growth and environmentally unsustainable growth patterns manifested in the region.

17. Despite the compelling and growing need for action to improve human security, there is evidence that agriculture and rural development concerns may be falling off government and radar screens in this region. Regional preparations for CSD-16/17 give the opportunity for all stakeholders to re-assess their commitment to these sectors and to priorities in promoting environmental and socially sustainable economic growth.

**II. Priority commitments to sustainable development in the CSD-16/17 thematic areas.**

18. Given the Asian and Pacific context highlighted above, the overarching and unique challenge for the Asia and Pacific region is the promotion of socially environmentally sustainable economic growth patterns, based on a vibrant and inclusive rural sector and the eco-efficient use of natural capital. The wide-ranging international commitments to sustainable development relevant to the CSD-16 and CSD-17 thematic areas are summarized in scoping papers prepared by the CSD Secretariat in preparation for the CSD sessions.

19. The thematic reports prepared for the RIM grouped the international commitments under prioritized areas of action shown in table 1. These priority areas of action were reviewed in the context of the overall challenges facing the region, identified above, to be able to highlight the inter-linkages between priority areas of action.

<b>Table 1. Priority areas of action identified by thematic reports</b>			
<b>Agriculture and Land</b>	<b>Rural Development</b>	<b>Desertification</b>	<b>Drought</b>
<ul style="list-style-type: none"> <li>• Improve food security, hunger and nutrition.</li> <li>• Promote sustainable agriculture technologies.</li> <li>• Preserve social and genetic diversity.</li> <li>• Implement energy transition.</li> <li>• Improve planning and administration, ensure equitable participation.</li> <li>• Develop market mechanisms.</li> <li>• Mobilize financing.</li> </ul>	<ul style="list-style-type: none"> <li>• Promote rural food and livelihood security.</li> <li>• Empower rural poor for sustainable rural development.</li> <li>• Enhance rural women’s role at all levels in all aspects of sustainable agriculture and rural development.</li> <li>• Promote a level playing field in international markets for small rural producers.</li> </ul>	<ul style="list-style-type: none"> <li>• Improve food security, hunger and nutrition.</li> <li>• Promote a balanced ecosystem approach.</li> <li>• Promote policy reform to optimize land use and promote sustainability.</li> <li>• Foster participation, planning and administration.</li> <li>• Support conventions.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop strategies for drought preparedness.</li> <li>• Specific actions in drought-prone areas to improve food security, and mitigate economic impacts of drought especially for vulnerable households.</li> <li>• Promote sustainable agriculture.</li> <li>• Improve land and water management.</li> <li>• Mobilize financing.</li> </ul>

20. The result is shown in annex 1, which identifies the following as overall priority areas of action for the region:

- Improved food security and nutrition, reduced hunger;
- Improved planning and administration, including to ensure equitable participation;
- Balanced ecosystem approaches, including optimizing land use and preservation of genetic diversity;

- Eco-efficient water and energy use/production;
- Equitable trade and economic opportunity;
- Mobilization of financing.

21. Not all of these priority areas are applicable to every country and/or subregion; each faces its own unique challenges, as highlighted in the assessment of progress.

### **III. Sustainable agriculture, rural development, land use, drought risk and desertification mitigation in Asia and the Pacific - Assessment of progress.**

22. The thematic reports prepared for the RIM highlight the major areas of progress vis-à-vis the *priority* commitments identified above and in annex 1.

#### *Improved food security and nutrition, reduced hunger*

23. The regionalization and globalization of agricultural markets is rapidly altering the pattern of food production and consumption, creating challenges for achieving a balance between reliance on cost-efficient import and distribution of cheap food, and resilience to changes and shocks which from time to time occur and have very wide impact in a globalized economy. The Pacific islands' high dependence on imported food is a critical area of risk in these small countries. Other challenges to regional food security and nutrition include persistent rural poverty, vulnerability to drought and land tenure, stakeholder participation and other factors. An emerging challenge is the growing demand for biofuels which can drive the transformation of land used for food crops, to land used for energy crops, with significant impact on food security and small producer livelihoods.

24. International commitments in the CSD-16/17 thematic areas most directly relevant to food security nutrition and hunger refer to the need for sustainable food production, improved agricultural and pastoral technologies and methods, as well as strategies for dealing with national food deficiencies in periods of production shortfall and other drought related strategies (see annex 1).

25. The prevalence of hunger has been reduced in all countries in South, South-East and East Asia with the solitary exception of Democratic People's Republic of Korea, however, hunger and under-nutrition are still critical issues in the region; the decline hunger rates has not been able to outstrip population growth.<sup>9</sup> The Global Hunger Index (GHI), points South Asia out as a "hot spot" of hunger, along with Sub-Saharan Africa. East Asia and the Pacific experienced only a small reduction in its GHI score during the 1990s and early 2000s.<sup>10</sup> China and India are home to more than two-thirds of food insecure people in the region. According to FAO assessments, reduction in income poverty has not necessarily translated into food security; an important reason for this is that hunger itself is a constraint to escaping poverty.

26. The latest regional MDG progress assessment notes that progress in reducing the number of underweight children is one of the region's greatest failures, with almost one in

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<sup>9</sup> FAO, 2006. *The State of Food Insecurity in the World 2006*. FAO, Rome.

<sup>10</sup> Ahmed and others note that South Asia and Sub-Saharan Africa have similar GHI scores despite tremendous strides by South Asia and fact that South Asia's poverty rate is about 10 percentage points lower than Sub-Saharan Africa's. See Ahmed, A, Vargas-Hill, R, Smith, L, Wiesmann, D and T. Frankenberger, 2007. *The World's Most Deprived: Characteristics and Causes of Extreme Poverty and Hunger*. IFPRI, Washington, DC.

three children under five underweight.<sup>11</sup> In the Pacific island countries there are significantly high levels of child undernourishment and the percentage of underweight children remains unchanged, or has increased in at least four Pacific island countries.<sup>12</sup> South Asia still has the highest prevalence of underweight in children in the world, with almost one out to two children under five, underweight, and similarly high levels in Pakistan and Bangladesh. South-East Asia's prevalence rates, at 28 per cent, are similar to the level of Sub-Saharan Africa, and increasing in Indonesia.<sup>13</sup> Cambodia and India's lack of progress, notwithstanding strong annual GDP growth in the early 1990s and 20002, has been attributed to a lack of sectoral balance and marginal improvement in agricultural productivity.<sup>14</sup>

27. While there is malnutrition due to insufficient calorie, vitamin and mineral intake, there is increasing consumption of highly processed foods with added sugar, salt, fats, flavour enhancers and preservatives. Under-nutrition is being replaced by obesity, diabetes, dietary deficiencies, allergies and other dietary problems. Hidden hunger, which refers to the inadequate diet in terms of essential vitamins and minerals, rather than calorific food intake, affects nearly 1.5 billion persons in Asia and the Pacific, far exceeding the numbers of poor in the region. It is particularly prevalent in Central Asia, the Pacific, Bangladesh and the Philippines.

28. Food security issues have been addressed indirectly, through rural economy reforms. Thailand is perhaps the best example; others include China, Viet Nam, Bangladesh, Cambodia, Lao People's Democratic Republic, Nepal and Sri Lanka. Viet Nam, lifted nearly 7 million people out of food insecurity and reduced its share of people living on less than US\$1 a day from 15 to 2 per cent during the 1990s using market-oriented economic and agricultural reforms accompanied by targeted investment in rural infrastructure development.<sup>15</sup>

29. Agricultural productivity increases have been achieved by intensification of inputs such as fertilizers and irrigation expansion, and research and development, with growth trends only broken by disasters such as floods, drought, and political instability. Food production increases have kept pace with population growth, but demand for food will continue to grow, especially in India, China, Bangladesh and Indonesia.

30. Despite the unmet need, several countries are experiencing land degradation, soil erosion and recurrent seasonal drought. Land degradation and desertification impacts agricultural productivity, livelihoods and the flow of ecosystem services; by consequence, food and human security are also impacted. In Asian dryland populations there is the lowest GNP per capita and the highest infant mortality rates, attributable to the relatively low access to water in drylands which leads to poor health.<sup>16</sup> Land degradation processes and vulnerability to drought is the result of the complex interaction of physical, biological, political, social, cultural and economic factors, with unsustainable land use practices that result from this interaction being a critical determinant of the outcomes for human security. It is a particular concern for the long term food security in China and South Asia.

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<sup>11</sup> UNESCAP, ADB, UNDP, 2007. *The Millennium Development Goals: Progress in Asia and the Pacific 2007*. Asia-Pacific MDG study series. ST/ESCAP/2465. United Nations, Bangkok.

<sup>12</sup> Secretariat of the Pacific Community, 2004. *The Pacific Islands Regional Millennium Development Goals Report 2004*. UNDP, New York.

<sup>13</sup> UNESCAP, ADB, UNDP, 2007. *The Millennium Development Goals: Progress in Asia and the Pacific 2007*. Asia-Pacific MDG study series. ST/ESCAP/2465. United Nations, Bangkok.

<sup>14</sup> FAO, 2006. *The State of Food Insecurity in the World 2006*. FAO, Rome.

<sup>15</sup> FAO, 2006. *The State of Food Insecurity in the World 2006*. FAO, Rome.

<sup>16</sup> Millennium Ecosystem Assessment, 2005. *Ecosystems and human well-being. Millennium Ecosystem Assessment: Desertification Synthesis*. World Resources Institute, Washington, DC.

31. Research and development requires further support across the region, with much scientific research in the area of food and agriculture being market-driven, and therefore, often less pre-disposed to meeting the needs of the poor, and developing countries. However, the public sector commitment to agricultural research is variable, strengthened in some countries, declining in others.

32. However, there are other areas outside of these commitments that impact on food security, hunger and nutrition, including social inequalities and land tenure issues.

33. Lack of progress in South-Asia and some South-East Asian countries has been attributed to inadequate attention to basic infrastructure such as roads, communication, power, and social services such as health care and education, housing and sanitation. Other infrastructure important to a rapidly globalizing agricultural economy, include specialized extension support for production, processing, financing and marketing. Food insecurity also persists in some South and South-East Asian countries despite surplus food production because of deficiencies in the infrastructure for distribution and price distortions. South Asian countries are cooperating in addressing rural food and livelihood security issues through adoption by the South Asian Association for Regional Cooperation (SAARC) countries of the SAARC Development Goals (SDG) 2007 – 2012, aiming for a poverty-free South Asia. The 22 SDGs are divided into four categories – livelihood, health, education and environment goals.

34. Vulnerability to drought is an important contributor to food insecurity. Long-term planning and policies for drought risk mitigation are addressed in the following section, along with action to provide relief from drought.

#### *Improved planning and administration, including to ensure equitable participation*

35. Economic growth has been largely driven by large-scale industrial investments, leaving rural areas behind, except in a few countries. While improved productivity and commercialization of agriculture have boosted rural incomes, policies tend to favour large producers and have not been fully sensitive to social and ecological concerns. Ineffective agrarian reform together with population growth, especially in South Asia, has led to land fragmentation and declining agricultural productivity, in turn contributing to widespread food insecurity and large-scale distress migrations from rural to urban areas. In South-East Asia, the Philippines and Thailand are implementing major agrarian reform. However, in Myanmar, Laos and Cambodia, equitable and sustainable natural resource management is constrained by lack of good governance in land issues. In most countries, inadequacies in public investment in agriculture and legislation responsive to the need for land reform and land use administration is a constraint to sustainable land and natural resource management. Failure to consider equity in development and governance is marginalizing vulnerable groups, specially women, small producers and landless farmers<sup>17</sup> Better planning and preparedness for drought and desertification risks are critical aspects which require more focus.

36. Commitments in this area are wide-ranging and relate to promoting participation in sustainable agriculture, sustainable management of resources, land tenure administration improvement, addressing land-use interdependence between rural and urban areas (see annex 1), along with those relating to drought and desertification addressed later in this section.

37. Better governance and development of social capital has underpinned the relative stability of the Asian and Pacific region in the last decade and contributed to participative,

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<sup>17</sup>FAO, 2004. *Towards a Food-Secure Asia and Pacific - Regional Strategic Framework for Asia and the Pacific*. FAO Regional Office for Asia and the Pacific, Bangkok.

equitable development. In some countries, effective governance has been undermined by conflict, corruption, autocracy, and inequality, with examples in all subregions. International efforts to improve governance and human capital, need to ensure their scope includes rural areas, improving legal frameworks and administration to enable security in land tenure and also agricultural commerce. Many successful community based initiatives, such as cooperatives, land care groups, water user associations, farmer associations, and commodity groups are examples of opportunities from developing social capital.

38. Agrarian reform ensuring wider, secure and sustainable access to land, water and other natural resources, which significantly influence rural livelihoods opportunities, is essential for eradicating hunger and poverty, equitable development and social justice in South and Southeast Asia given the typically small farm sizes. In South and South-East Asia, with the exception of the Philippines, agrarian reforms have, in general, been centralized, government-led operations, with minimal stakeholder participation. The implementation of these programmes has been slow and has achieved only modest results, except in selected states of India such as Kerala, West Bengal and Karnataka. Although agrarian reform attempts have eliminated feudal and large absentee land-owning interests in these countries, these have failed to eliminate social differentiation based on unequal land ownership and the existence of intermediaries between tenants and owners.

39. The physical infrastructure for economic empowerment of rural poor is lacking in South Asia with inadequate government investment in transport, storage, power and market facilities as well as limited outreach of the formal banking sector in the rural areas. The agricultural value-addition and marketing infrastructure in South Asia is still not developed enough for effective promotion of small-scale agricultural and rural enterprises. Agricultural cooperatives, as democratic member-controlled organizations based upon social cohesion, self-help and equity, lack support for business development and in many cases lack autonomy, especially in South Asia.

40. The neglect of the stewardship of rural land users is a serious factor that contributes to accelerated land degradation. The challenge for governments is to find ways to reward rural people for sustainable land use practices. Reform of land tenure or guarantee use rights to publicly owned land has been taken place in some countries.

41. Decentralization has a key role in promoting sustainable rural development objectives through improved planning, implementation and delivery of equitable local development programmes and essential rural services. More and more Asia-Pacific countries are implementing some form of decentralization to empower local communities and recognize the role of civil society. In India, a quarter of a million elected village councils with over three million directly elected councilors, more than a third of them women, have been constitutionally recognized as the tier of grassroots governance and entrusted with a wider range of sustainable agricultural and rural development responsibilities. In recent years, in more and more countries in the region, local communities, local governments and civil society organizations are being delegated powers for sustainable forest management as a central element of rural development and sustainable natural resource management strategies.<sup>18</sup>

42. While many countries are giving a greater say to rural communities in local decision-making through some form of decentralization, there is still a lack of effective participation by rural poor in decision-making. Financial resources to build institutional capacities to ensure improved access to production and social services and equitable sharing of benefits of natural resource management have still not been devolved to local levels.

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<sup>18</sup> FAO, 2004. *Towards a Food-Secure Asia and Pacific - Regional Strategic Framework for Asia and the Pacific*. FAO Regional Office for Asia and the Pacific, Bangkok.

43. However in several countries, local actors and government agencies at all levels lack material and human resources to effectively undertake new roles and responsibilities under decentralized governance. In some countries, the initial impact of decentralization on reducing hunger and alleviating poverty for resource-poor people has been far from satisfactory.<sup>19</sup>

44. The Asia Regional Implementation Annex to the UNCCD guides subregional and national action towards implementing the provisions of the UNCCD. South Asian, South-East Asian and Central Asian country parties to the UNCCD have adopted Subregional Action Plans (SRAPs) to combat desertification and drought. National Action Plans (NAPs) under the UNCCD have been developed by 19 regional countries,<sup>20</sup> and have been marked by creation of conditions for broader stakeholder participation and other supportive developments. Implementation remains a challenge for several reasons, including the lack of funds, the lack of integration of these plans in national development plans and lack of incorporation of sustainable land management into economic reform processes, lack of inter-ministerial coordination and the need for enabling policy, legislative and institutional conditions. Cooperation on thematic areas is facilitated under the UNCCD in the region via thematic programme networks.<sup>21</sup>

45. Strategic planning in the energy sector has important implications for the rural sector in particular. Energy plays a central role in economic activity and inadequate or inequitable access to efficient, low-cost and sustainable energy affects the livelihoods of hundreds of millions of small farmers, landless and indigenous people in the Asian region. Rapidly rising fossil energy costs for farm inputs, local transport and agricultural machinery pose a major challenge to small farmers' households.

46. Building drought resilience needs to be part of other long-term planning goals and an integral part of policies related to agriculture, water, food security and hazard planning. Understanding the nature of drought hazard, corresponding impacts and underlying vulnerabilities and communicating these dangers in an effective manner, forms the basis for developing informed drought mitigation and preparedness measures. Asian and Pacific countries, as a priority must improve the understanding of drought, the relationships between drought, food production, food reserves, food security and food provision and improve capacity for agro-meteorology and contingency crop planning.

47. Commitments relevant to improved planning and administration for drought preparedness and mitigation of desertification refer to the development of national strategies for drought preparedness, including drought relief schemes, developing climate forecasting, risk mapping and modeling, and food supply/demand analysis; improved networking among information and early warning systems, capacity for drought impact assessment and the implementation of the UNCCD to assist with integrated planning and implementation of policies and programmes as well as the strengthening between synergies between the UNCCD, UNFCCC and UNCBD (see annex 1). Comprehensive databases on desertification, land degradation and human conditions, nation-wide anti-desertification campaigns and multi-stakeholder cooperation are also identified as priority areas of action for this region.

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<sup>19</sup> FAO, 2004. *Towards a Food-Secure Asia and Pacific - Regional Strategic Framework for Asia and the Pacific*. FAO Regional Office for Asia and the Pacific, Bangkok.

<sup>20</sup> China, India, Indonesia, Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, Lao PDR, Mongolia, Myanmar, Nepal, Pakistan, Palau, Philippines, Sri Lanka, Tajikistan, Thailand, Turkmenistan, Uzbekistan and Viet Nam.

<sup>21</sup> Six TPNs have been adopted - desertification monitoring and assessment; agro-forestry and soil conservation, rangeland management and fixation of shifting sand dunes, water resources management for arid-land agriculture, strengthening capacities for drought impact mitigation and combating desertification and integrated local area development programmes.

48. Selected relevant initiatives in drought-vulnerable areas include risk assessment and mitigation planning support, drought monitoring and early warning and vulnerability analysis in China, Australia, and South and South-West Asia (Afghanistan, Pakistan and West India). National, provincial and community plans or policies for drought have been prepared in countries such as Australia, New Zealand, India and Pakistan.<sup>22</sup> More detailed plans are required for countries such as China, Pakistan, Bangladesh, Cambodia, the Islamic Republic of Iran, Lao People's Democratic Republic, Nepal, Mongolia and Sri Lanka. Sectoral policies, such as the water legislation, incorporate drought in Japan, China and other countries. Provincial and local drought policy places increasing importance on self reliance and drought resilience.

49. In the context of drought policy in Australia, the self-reliance principle maintains that farmers and regional professionals were in the best position to develop the agronomic system practices and business strategies that would manage frequent agronomic drought. This has moved Australia's drought policy away from a subsidy-based reactionary or "crisis-driven approach; drought is treated as a normal part of the Australian farming environment. The self-reliance principle should also be reflected in short-term drought relief measures, along the lines of that of the New Zealand Government's five prong approach (income support, decision-making and planning support for farmers, grants for relocation, loans and technology transfer) is needed.

50. In most Asian countries, drought impact assessment is yet incomplete, and sometimes inaccurate. The integration and use of various information systems in the development and implementation of comprehensive drought preparedness plans and strategies, could be better explored to target vulnerable populations. Enhanced regional/subregional cooperation is particularly needed in the area of drought monitoring, where progress is particularly slow; initiatives in South and South-West Asia in particular should be strengthened and extended. Similarly, information and data on land degradation is limited and scattered; environmental monitoring and land use change evaluation is in place in most countries but limited in scope and spatial coverage; data and capability to support decision making through GIES is also lacking.

51. Community-based action is increasingly emphasized in many Asian countries, and allow for a multi-dimensional approach to a drought risk. Several regional programmes and institutions address drought as part of the work in disaster preparedness and offer important synergies for aligning drought preparedness planning with disaster planning in general, while the mandates of others such as the International Water Management Institute and the newly created International Centre for Drought Risk Reduction address drought more directly.

52. Progress on equitable participation is difficult to assess. A key area in which further progress is, however, needed, include opportunities for the 200 million person with disabilities. The proportion of women in national parliaments has increased in countries such as Afghanistan, Timor Leste and Viet Nam, but in other countries, is surprisingly low. Participation in decision-making power is improving in India, with constitutional reservation of one-third of elected village council seats for women, which has placed over a million rural women in decision-making positions in *Panchayati Raj* institutions at the local level.

53. Stakeholder participation is notable in UNCCD implementation processes. For action on desertification, incentive frameworks for a supportive role by the private sector must be developed. Taking into account the fact that some desertification processes are irreversible and

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<sup>22</sup> UN/ISDR, 2007. Drought Risk Reduction Framework and Practices: Contributing to the implementation of the Hyogo Framework for Action.

not easily mitigated, private sector action can include investment in creative approaches not to mitigate desertification, but to derive benefit from it.<sup>23</sup>

54. In some countries, such as Afghanistan, due to political instability and adverse climatic conditions, drought-induced agriculture failure, diminished food security, heightened hunger and future deaths are still prominent challenges.

#### *Eco-efficient water use and production*

55. Asia and the Pacific has the lowest availability per capita of all global regions. Water extraction rates exceed sustainable limits, placing some 45 per cent of the global population at risk of water stress. Inefficient irrigation systems are used in more than 90 per cent of irrigated lands in Asia, with poor maintenance linked to land degradation, soil erosion and salinization.<sup>24</sup> Inefficient water use increases vulnerability to, and risk of, drought. At the same time there is a rapidly growing demand for water, attributable not only to sheer growth in economic activity, but also changing consumer preferences, and production patterns. Any future increase in food supply will rely on higher agricultural productivity, led by commercial farming on irrigated land with good access to markets. A substantial increase from rainfed and marginal areas, using less labor, less water and less arable land will require major breakthrough in new varieties and farming systems that are more efficient, rather than more intensive, as well as increased attention to the impact of consumption and production patterns on water use.

56. Commitments in this area relate to promoting soil and water desalination and water conservation technologies, research on, and diffusion of, various water conservation and harvesting, techniques and technologies, including those in irrigation and soil management (see annex 1).

57. Supply side approaches - watershed management, water storage/harvesting and diversions between basins - are currently considered the most important strategies to meet the growing demand for water, particularly in the face of seasonal fluctuations. Newer supply-side initiatives include groundwater dams and aquifer recharge in China and India; in India, augmentation of recharge is closely related to the survival of about 15 million farmers and an equal number of cattle in the semi-arid basaltic plateau in Western India. Such traditional systems for water harvesting, and water-conserving agricultural practices such as gravel mulching are increasingly recognized, but still require more recognition and support for expanded use.

58. Demand-side management strategies are well-established in the field of energy, but are a less well-utilized approach to meeting water demand. Water use in urban areas impacts the availability of water in rural areas. There have been successful urban water efficiency initiatives in Australia, and Thailand, in which economic instruments have played an important part. However, few countries have developed comprehensive approaches to water resource efficiency which builds water efficiency into economic/fiscal systems to influence patterns of water use, infrastructure development and natural resources management.

59. There have also been few initiatives to develop equitable and efficient water allocation and sharing policies between urban and rural areas. Current practices of water allocation in which water is expropriated from one use to another in times of scarcity, result in social

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<sup>23</sup> An example of this is the cooperation between the Elion company in China and the development of desert industries (including a tourist resort) in the Kubuqi desert of Inner Mongolia, China. Elion website, accessed in October 2007 at <[www.elion.com.cn](http://www.elion.com.cn)>.

<sup>24</sup> ESCAP, 2006. *State of the Environment in Asia and the Pacific 2005*. United Nations, New York.

conflict and fewer incentives to establish long-term planning for water scarcity and efficient water use.<sup>25</sup> Water rights are an increasingly common ground for conflict in India, with both market (such as water pricing) and non-market interventions (such as regulation of water markets by village councils, and water cooperatives in West Bengal) showing benefits in terms of improved the efficiency of water use and equity of water access.

60. The production of export crops with a high water content result in losses of “virtual water.” Some regional water-stressed countries are among the largest net exporters of virtual water, globally.<sup>26</sup> Other evidence of relatively inefficient patterns of water lies in the GDP produced per unit of water use; in the industrial sectors of some relatively water stressed countries, this ratio is extremely low.<sup>27</sup>

### *Balanced ecosystem approaches, including optimizing land use and preserving genetic diversity*

61. How can it be ensured that the restructured farm sector is more environmentally sustainable than that it replaces? What kinds of agricultural technologies are most sustainable? Risks and challenges include overuse of agrochemicals, including chemical fertilizers, over-intensive animal production, antibiotics, biotechnology and diminishing genetic diversity. A clear lesson is that the costs of preventing harm are significantly lower than the costs of cleaning up, mitigating or offsetting – dryland salinity in Australia, China, Central Asia provides good evidence for this. The demand for biofuels provides new incentives for the conversion of critical ecosystems to energy crops. On the other hand, biofuel production on marginalized land can produce important economic benefits in rural areas, as well as climate change mitigation opportunities.

62. Commitments in this area refer to the promotion of traditional and indigenous agricultural systems and strengthening indigenous models of production, diversification of production systems, minimizing environmental social risk, national action plans for the protection and sustainable management of ecosystems, especially those affected by desertification, indigenous know how and various environmentally sound practices in agriculture and resource management, including the use of renewable energy (see annex 1).

63. Land degradation and desertification is the result of the lack of balanced ecosystem approaches to land use reflected in economic and population pressure and socio-economic policy and cultural practices, but also reflects prevailing climates. It most severely affects Central Asia,<sup>28</sup> South and South-East Asia, Mongolia and China. Despite urbanization, the ratio of agricultural land to agricultural population in the region’s developing countries has remained the same between 1994 and 2004. On average, the region achieved a 0.4 per cent annual increase in agricultural land, mirrored by the same rate of agricultural population increase.

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<sup>25</sup> ESCAP, 2006. *State of the Environment in Asia and the Pacific 2005*. United Nations, New York.

<sup>26</sup> Hoekstra, A.Y. and P.Q. Hung (2003). *Virtual Water Trade: A quantification of water flows between nations in relation to international crop trade*, Value of Water Research Report Series No. 11 (Delft, IHE).

<sup>27</sup> ESCAP, 2006. *State of the Environment in Asia and the Pacific 2005*. United Nations, New York.

<sup>28</sup> All Central Asian countries are affected or severely affected land degradation, desertification and drought., with the worst affected being Turkmenistan and Uzbekistan at almost 80 per cent affected by desertification, erosion affecting over 88 per cent of arable land in Kyrgyzstan and 97 per cent in Tajikistan, taking a heavy toll on livelihoods there. A partnership approach for financing UNCCD Implementation: The Central Asian Experience. 2005. Joint publication of the strategic partnership agreement for the implementation of the UNCCD in the Central Asian countries and the GEF. See also executive reports of Asian countries to UNCCD Committee for the review of the implementation of the convention. Fifth session, Buenos Aires, 12-21 March 2007.

64. In Central Asia, industrial demand for its abundant natural resources has led to large-scale land degradation and environmental pollution, poor dryland and rangeland management and extensive but inefficient and inadequately maintained, irrigation systems, are driving factors for land degradation and desertification. South-East Asia land degradation is the direct result of overgrazing, excessive use of fertilizers, shifting cultivation, unsustainable water management (inefficient irrigation, over-abstraction of ground water, especially in coastal regions, leading to salinization), conversion of areas critical for ecosystem services, encroachment of urban areas, overuse of forests for fuel wood, fires, mining, and droughts and population pressures.

65. In Mongolia and China, inadequate rangeland management and overharvesting of rangeland product results in land degradation with transboundary impacts via yellow dust and sandstorms. In the Pacific, climate change and land use change, including are major challenges.<sup>29</sup> In addition to pressures found in other subregions, erosion of traditional lifestyles and weakening of community-based decision-making processes have impacted negatively on the sustainability of resource use. However, there is a scarcity of data for sustainable management decisions and PICs need capacities to monitor changes in their rich marine areas that sustain livelihoods and national economic growth but are vulnerable to overexploitation and pollution.<sup>30</sup>

66. While there are numerous programmes and activities of most governments that directly or indirectly contribute to combating land degradation, the major investments to halt and reverse land degradation in the western region of China by China/ADB/GEF and to combat land degradation and desertification in the five Central Asian countries by ADB/GEF stand out for their exclusive focus on land degradation.

67. Land use planning has been notoriously inadequate in most countries, in particular in relation to the protection of key environmental resources, although areas protected for biodiversity are expanding in most countries. However, many existing land use strategies and methods are no longer sustainable in the face of economic and political change, population and economic growth, continuing lack of land tenure security in many countries. Growth and improvement in land management is patchy. Substantial policy gaps between stated policy in this area (such as commitment to increase government spending on agriculture and rural development), and actual implementation, has been noted.

68. A comprehensive assessment of the indigenous knowledge is still a weak point, and requires greater investment.<sup>31</sup> Regional commitments have been made to promote research, development and extension of integrated production systems for pests and nutrition, and to promote organic agriculture. Farmers and agriculture research institutions expect further agricultural advances in alleviating poverty and malnutrition will be achieved through the technology development of economical soil improvement, integrated pest and plant nutrition management, and pest tolerant varieties.<sup>32</sup>

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<sup>29</sup> SPC, 2004. *Pacific Islands Regional Millennium Development Goals Report 2004*. UNDP, New York. The 1995 "Code of Conduct for Logging of Indigenous Forests in Selected South Pacific Countries" and the 2003-2007 Action Strategy for Nature Conservation in the Pacific Region are among the strategies identified for addressing the concern.

<sup>30</sup> SPC, 2004. *Pacific Islands Regional Millennium Development Goals Report 2004*. UNDP, New York.

<sup>31</sup> CCICCD, 1999. *Traditional Knowledge and Practical Technologies for Combating Desertification in China*. China Environmental Science Press, Beijing.

<sup>32</sup> Sugino Tomohide and others, 2006. "Identification of Pulling Factors for Enhancing Sustainable Development of Diverse Agriculture in Selected Asian Countries (AGRIDIV)." UNESCAP/CAPSA, Working Paper No. 99. UNESCAP/CAPSA, Bogor.

69. With support from FAO, CGIAR agencies, donors and governments, there has been continuing progress on commitments to integrated production systems. FAO continues to extend the integrated nutrition approach, IPM and organic agriculture; however there is often inadequate funding by donors and governments for supporting NGOs, enabling policy and regulatory changes to foster a market-based incentive through comparative advantage.

70. The use of organic certification in countries as diverse as China, East Timor, New Zealand, Papua New Guinea and India and other standards-based market access, environment and quality management schemes<sup>33</sup> have provided immediate and longer-term benefits to farmers and processors from improved sustainability. Those countries with high dependence on agriculture such as Bhutan and Laos, with 94 per cent and 76 per cent of the workforce reliant on agriculture respectively, and those with high population growth (South Asia and East Asia), need special focus on increasing adoption of SARD.

71. Earlier productivity gains were from development of high yield varieties such as hybrid rice and maize, increased use of fertilizer and pesticides. For example, cereal production in the region doubled between 1970 and 1995. Subsequent increases in agricultural production in the region have been much reduced to about 15 per cent growth between 1991 and 2005.<sup>34</sup> Some least developed countries may have scope for productivity gains through increasing mineral fertilizer use, but other developing countries already apply mineral fertilizers intensively and further intensification will increase negative environmental impacts.

72. The beef and dairy sectors provide an example of the challenges met in the trend towards more highly intensive farming, including the health impacts of supplementary feeds and in-feed antibiotics. Positive outcomes in terms of sustainability include increased demand for alfalfa and other soil-beneficial fodder crops in China and Central Asia. While the difference in beef and milk systems production is big, the capital and operating costs are high as are the stresses on the animals and the security of input supply. In high-intensity farming, the system's resilience can diminishes as farm operators strive for better financial margins.

73. Over the last decade the biotechnology industry has released genetically modified (GM) varieties including maize, rice, and canola which rely on high levels of inputs to obtain high-yield under large-scale cultivation systems. There are a number of contentious issues with GM which re-confirm the need to apply the precautionary principle in further development of this technology. The main issue remains the internal and external costs of preventing and mitigating contamination of non-GM crops, seeds, and products. There is negative consumer demand for GM products in most countries, so they are sold in lower value markets such as livestock feed, bio-fuel, food processing aids.<sup>35</sup> While GM varieties provide some productivity gains to large-scale, irrigated and mechanized farms, there has been no commercialization of varieties to suit small-scale farmers, salt-tolerant and marginal farm land, or longer shelf-life and nutritional improvement. Solving poverty and malnutrition have not effectively been targeted by the predominant multi-national corporations promoting GM technology. Developing countries need to be fully aware of costs and management implications before adopting GM technology. The ongoing FAO Asian Bio-Net project –

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<sup>33</sup> E.g. GlobalGAP (formerly EUREPGAP), HACCP food safety (ISO 22000). Environmental Management Systems (ISO 14001) and Fair Trade, Dolphin-friendly fish and bird-friendly coffee accreditation.

<sup>34</sup> FAO, 2006. *Selected Indicators of Food and Agriculture in the Asia Pacific Region 1995-2005*, RAP Publication 2006/16. FAO RAP, Bangkok.

<sup>35</sup> Over 80 per cent of global canola production is GM-free and attracts price premiums of up to US\$100/mt internationally, while GM canola production is limited to two countries and has not increased since 1999. (see Australian Bureau of Agriculture and Resource Economics, 2007). Escapes of GM herbicide tolerant canola in Canada and the USA, for example, have resulted in litigation by biotechnology corporations against non-GM farmers for unintended, but unlicensed use of the technology, and in return litigation by farmers seeking compensation for contamination of their crops and land with herbicide-tolerant canola weeds.

whose aim is to assist countries in the region to safely harness the benefits of biotechnology – produced in 2006 a benchmark document on biosafety of genetically modified crops in Asia and a manual focusing on communicating the risks associated with the use of genetically modified crops.

74. Rapid expansion of forest cover has been experienced in China, India, Australia and New Zealand, as well as in Viet Nam. In other South-East Asian countries, as in other parts of the region natural forests are still under considerable pressure. Rates of afforestation in this region have exceeded other global regions since 1980. However, greater understanding of the hydrological benefits provided by forests, which vary from forest type, soil types and other biophysical characteristics, is needed. The link between aggressive plantation and benefits for watersheds should be better understood, as negative impacts have been identified in watersheds in which tree species such as eucalyptus have been grown. Research by the World Agroforestry Centre and others, also shows that agroforestry and other vegetation cover can provide hydrological and soil erosion control benefits.

75. Balanced ecosystem approaches must also address the high dependence of the rural sector on biomass as an energy source, which adds pressure to the natural resource base without specific intervention, including the deployment of appropriate technology. Between 80 to 90 per cent of Asia's rural household energy needs are still met by wood fuels and crop residues. About one billion rural people in the region depend solely on traditional energy sources.<sup>36</sup> The collection of biomass is a particular burden for women and girls, in terms of time, energy and health, and therefore presents substantial opportunity costs in the rural sector.

76. Based on community action, the Indo-German Watershed Programme implemented by the Darewadi village and the surrounding area of the Ahmednagar district in the Maharashtra state in India turned around a situation of near complete desertification, limited agricultural production and seasonal migration via restoration activity, crops switching and soil and water conservation. However, how to scale up and institutionalize such successes is a critical question.

### *Equitable trade and economic opportunity*

77. The benefits of globalization, particularly for low-income countries, are not always easily realized, due to the short-term inability of many developing country industries, to compete, the potential destabilizing effects of short term capital flows, increase exposure to price risk, worsening inequalities within and between countries, and lack of capacity for and/or commitment to the protection of the resource base. Government policies and programmes are needed to facilitate the transformation of agriculture that supports the development of a vibrant, inclusive and environmentally sustainable rural sector, including through support to the private sector, and in particular through support to small and marginal farm producers. Small and marginal farm and non-farm producers are not equipped to take advantage of, and comply with changing global and national market trends and conditions.

78. Commitments in this area address market access and development, diversification of exports, commodity price stabilization, declining terms of trade, access to rural credit and other financing, enterprise development support, training in technical and business skills, access to affordable energy and research in renewable energy sources, private sector investment in agricultural research as well as research in renewable energy sources (see annex 1).

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<sup>36</sup> UNESCAP, 2005. *Energy services for sustainable development in rural areas in Asia and the Pacific: Policy and Practice*. United Nations, New York.

79. The Agricultural Ministers' focus at the May 2006 FAO Asia Pacific Regional Conference was on trade impacts on food security and poverty reduction for a number of reasons. With more liberal trade, food and agriculture policy in the region has generally shifted from national food self-sufficiency to trade-based food security using comparative advantage and minimal regulation to keep basic food prices affordable. For example China has experienced rapid growth in domestic and export demand for its agricultural products, both for food and for bio-fuel production.<sup>37</sup> Since joining the WTO in 2001, there has been 11 per cent annual increase in food exports, mainly prepared foods from the urban agro-processing sector and chicken meat. Reflecting a comparative advantage, imports are dominated by livestock feed and food manufacturing resources such as soybeans and corn. Countries that have not developed a strong comparative advantage have maintained or strengthened a food self-sufficiency policy.

80. Countries in South, South-East and East Asia are negotiating regional and bilateral trading arrangements that have a direct bearing on small agricultural and rural producers whose interests could be more adequately considered, thus potentially denying them opportunities in international markets.

81. Capacities and legislation are inadequate to ensure a fair playing field for small farmers. Agricultural cooperative enterprises based on democratic member participation, social cohesion, self-help and equity provide sustainable employment opportunities, quality production/social services and marketing networks for farm and non-farm produce. They link rural and urban areas through provision of savings and credit and social services to vulnerable rural poor. However, legislation on agricultural cooperative enterprise development is not adapted to new market requirements for food safety and quality.

82. While gender disparities in basic education are being fast removed in South Asia, rural women lack adequate work opportunities. Rural work data from India's 2001 census shows that 30 million rural households had at least one member seeking work, the majority of them women. Rural women need access to land, water and other natural resources, inputs and services as well as equal opportunity for skills development and use. Some countries like Philippines, Indonesia and Thailand have made much progress in this direction through legal steps and policy measures to mainstream women's participation in development.

83. Many informal income-generating activities are fuel-intensive, and this makes women particularly vulnerable to fuel scarcities and increasing fuel prices. Easy and affordable access to efficient and sustainable energy sources can also open up opportunities for small-scale rural industries which currently account for less than 10 per cent of total rural energy demand.<sup>38</sup> An estimated 1.7 billion people in developing Asian countries in 2002 relied on biomass for cooking and heating.<sup>39</sup> Rural energy poverty especially affects women. "Some progress has been made in the region towards sustainable energy development taking advantage of locally available and environmentally benign renewable energy resources. Progress is however not observed across the board, and the share of modern renewable energy is marginal."<sup>40</sup>

84. Substantial policy development has been based on the increasing global demand for biofuels, but also the benefits for energy security of oil-importing countries and the fact that their production may also boost domestic farm and rural incomes.<sup>41</sup> India, Indonesia,

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<sup>37</sup> Institute of Market Economy, Development and Research Center of the State Council of China

<sup>38</sup> *Ibid.*

<sup>39</sup> *Regional Strategic Framework for Asia and the Pacific*, FAO, 2004

<sup>40</sup> *Ibid.*

<sup>41</sup> *High-level conferences on world food security and global challenges*, FAO Conference, 34<sup>th</sup> session

Malaysia, Philippines, Sri Lanka, Thailand and Viet Nam have national biomass energy programmes and projects. In India, the rural administrative sub-division of taluka comprising a closed biomass and rainwater basin with an average population of about 200 000, is the basis of the 1997 National Policy on Energy Self-sufficient Talukas. The talukas can produce an estimated 400 million tonnes of agricultural residues annually, enough for the country's rural energy, animal feed and natural fertilizer needs. India's National Biodiesel Mission is using *jatropha* plantations on wastelands as a mass rural income/employment-generation programme linked to commercial bio-fuel production.<sup>42</sup>

85. Indigenous people are among the poorest rural poor in the region which is home to about 70 percent of the world's more than 250 million indigenous peoples.<sup>43</sup> The large majority of indigenous communities live in upland and forested areas relying on subsistence production systems that are being affected by deforestation and restrictive legislation (national parks, etc) limiting their access to livelihood resources, particularly in India, Nepal, Myanmar and Lao People's Democratic Republic.

### *Mobilization of financing*

86. Two main vehicles were designed at Rio for financing sustainable development. The first was increased official development assistance (ODA) to developing nations. The United Nations Conference on Environment and Development (UNCED) Secretariat estimated that US\$600 billion would be required each year between 1993 and 2000 to implement Agenda 21 in the low-income countries. Of this, US\$125 billion was supposed to come from international donations or concessions<sup>44</sup>. Towards this end, the high-income countries reaffirmed their commitment at Rio to reach the United Nation target of providing 0.7 per cent of their GNP as ODA.

87. The reality however has been that ODA flows have failed to reach the 1992 targets. The additional investment flows to developing nations, through the Multi-lateral Environmental Agreements (MEAs) that were signed and agreed to during Rio have resulted in some US\$5 billion worth of commitments, mostly for the Global Environment Facility, with only some 40 per cent disbursed. More than 200 FAO field projects in 34 Asia-Pacific countries covering diverse areas relevant to the thematic areas, with total project delivery reaching US\$39.1 million in 2004.<sup>45</sup> In line with other donors, ADB's financial support to agriculture and rural development has changed significantly since the 1990s.<sup>46</sup> Direct investments in agriculture and natural resources have increasingly been replaced by other related rural investments in response to the changing demands of the region. In support of its poverty reduction strategy, ADB has made large investments in rural transport, rural electrification, rural microfinance and rural governance, all contributing to agricultural productivity and environmental outcomes. ADB's recently adopted Medium-Term Strategy II for 2006–2008 also mentions rural infrastructure as a high priority. The World Bank has recently re-established lending

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<sup>42</sup> *Role of agricultural cooperatives in biofuel development for rural food and livelihood security in Asia*, FAO-NEDAC regional workshop, 2007

<sup>43</sup> International Fund for Agricultural Development (IFAD)

<sup>44</sup> WSSD Report p.172 (op.cit)

<sup>45</sup> Report on FAO Activities in Asia and the Pacific Region (2004–05) with a Focus on the Achievement of the World Food Summit (WFS) Target and the Millennium Development Goals (MDGs), and Actions Taken on the Recommendations of the 27th APRC. FAO 28<sup>th</sup> APRC, Jakarta 2006

<sup>46</sup> Tadao Chino, *ibid*.

priority to agriculture, in response to its own research re-confirming the primary, and essential role of agriculture in developing economies.

88. In many Asia-Pacific countries, agriculture may contribute a minor share to GDP. However, when forward linkages such as agro-business and marketing, and backward linkages such as seeds and fertilizers are considered, the agriculture sector comprises a major share of national growth. It is estimated, for example, that in the Philippines about 74 per cent of GDP is related to agriculture. Increasing the volume of public investment in agriculture is of absolute necessity and it is crucial to make such assistance more effective.

89. While increased development assistance, public investment and debt relief are key elements, equal importance should be given to private sector investment. Commercial farmers, traders, input suppliers, agro-processors and transnational agribusinesses all contribute to a global system of investment in agricultural production, marketing and trade. But, importantly, small farmers themselves are amongst the biggest investors in agriculture. Public-private partnerships present new ways of bringing together producers – small farmers and cooperatives – with agribusiness and governments to create profitable ventures. The power of micro-credit has been highlighted by the work of the Grameen Bank and the award conferred on its founder, Mr. Muhammed Yunus.

90. The last decade has seen emergence of new financing opportunities including through the regulated carbon markets such as the Clean Development Mechanism (CDM) under the Kyoto Protocol to the UN Framework Convention on Climate Change, voluntary carbon trading schemes and growth of sustainable and ethical investment schemes listed in capital markets.

91. International financial institutions such as the ADB have recently established carbon credit funds. The private sector is also a growing source of finance for avoided emissions and environmental improvement programmes. The Carbon Disclosure Fund represents some 215 institutional investors with approximately US\$31 trillion of funds under management. The CDF seeks investment opportunities that do not carry a carbon exposure risk and this is starting a trend where risk, liability and long-term opportunity are emerging as stronger investment signals than they have been in the past.

92. At consumer level, some regional airlines such as Virgin and Qantas have implemented schemes by which passengers pay a small premium to offset carbon emissions from their travel, and the proceeds are used to finance accredited projects including reforestation and improved land management in developing countries.

93. Although there is considerable scope for expediting commitments to achieve sustainable agriculture and land use, particularly the sustainable management of forests, by designing and implementing projects and programmes linked to carbon markets, high transaction costs are an important barrier to developing country participation, and methodological difficulties are also a barrier to developing vibrant markets.<sup>47</sup> Carbon markets also brings into play other ways of abating, mitigating or offsetting emissions, while meeting rural energy needs.

94. Payments for ecosystem services are beginning to be explored in the region. Various watershed-based schemes have been initiated, and show promise of securing critical

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ecosystem services such as watershed protection. However, scaling these schemes to the national level is yet to be seriously initiated. Viet Nam has taken steps to develop recognize such payments in its policy.

95. However, these innovations do not address the gap between the growing research needs in almost every field and the funds available.

#### **IV. Climate change - what does it mean for sustainable agriculture and rural development?**

96. The most recent Assessment Report of IPCC<sup>48</sup> states that “climate change is projected to impinge on the sustainable development of most developing countries of Asia, as it compounds the pressures on natural resources and the environment associated with rapid urbanization, industrialization, and economic development”<sup>49</sup>. Working Group I to the Fourth Assessment of IPCC<sup>50</sup>, projects a warming of about 0.20C per decade for a range of emission scenarios and a further warming of 0.1°C per decade even if the concentrations of all greenhouse gasses are kept constant at 2000 levels. Anthropogenic warming and sea level rise will continue for centuries even if greenhouse gas concentrations were to be stabilized.

97. The IPCC report highlights the following vulnerabilities and uncertainties:<sup>51</sup>

- Glacier melt in the Himalayas which will increase flooding and reduce river flows as glaciers recede
- Declining freshwater availability in Central, South, East and South-East Asia, particularly in large river basins, adversely affecting more than a billion people by the 2050s.
- Increased risk of flooding from the sea in heavily-populated mega delta regions in South, East and South-East Asia and other coastal areas.
- Changed crop yields, (increased by up to 20 per cent in East and South-East Asia, and decreased up to 30 per cent in Central and South Asia) by the mid-21st century.
- Endemic morbidity and mortality due to diarrhea disease primarily associated with floods and droughts in East, South and South-East Asia, along with increased cholera risk in South Asia.

98. There is increasing evidence of the economic impacts of climate change. Increasingly frequent droughts in North-Western Bangladesh are pushing agricultural production to

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<sup>48</sup> The UN Framework Convention on Climate Change (UNFCCC) aims at stabilizing the greenhouse gas emissions and prescribes precautionary measures to achieve the targeted reduction in greenhouse gases. The Intergovernmental Panel on Climate Change (IPCC) has been mandated to assess the available scientific and socioeconomic evidence on climate change and its impact and options of mitigating climate change and adapting it; and to provide, on request, scientific/technical/socioeconomic advice to the Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC). Since its inception, IPCC has issued four comprehensive assessment reports on the status of climate change and its impacts.

<sup>49</sup> IPCC (2007) *Summary for Policymakers*. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, ML Parry, OF Canziani, JP Palutikof, PJ van der Linden and CE Hanson (Eds), Cambridge University Press, Cambridge, UK, 7-22.

<sup>50</sup> IPCC (2007) *Summary for Policymakers*. In: *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Solomon S, D Qin, M Manning, Z Chen, M Marquis, KB Averyt, MTignor and HL Miller (eds.), Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

<sup>51</sup> IPCC (2007) *Summary for Policymakers*. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, ML Parry, OF Canziani, JP Palutikof, PJ van der Linden and CE Hanson (Eds), Cambridge University Press, Cambridge, UK, 7-22.

marginal areas. Similar reports have also been made in Australia, China, India and the Mekong region. Along the southern and western Himalayan region, yields from long-established areas of temperate fruits are increasingly erratic because of warm winter temperatures and declining precipitation. In Malaysia, droughts are expected to impact oil palm, rubber, cocoa, and rice production.

99. Drought and desertification are the major threats posed by climate change. The intensity, duration and timing of droughts will vary from country to country. Other important climate trends related to drought in the region include:

- Significant drying trends in the Far East of the Russian Federation, Central North China and Northeast China.<sup>52</sup>
- Steady increases in annual and winter temperatures in Central Asia.
- Increased frequency of droughts in the Koreas since the 1980s.
- Increasing frequency of dry events notably related to *el Niño*, which have increased the frequency and severity of an emerging climate pattern referred to as “seasonal aridity.” Dry spells can extend 6 to 7 months in areas where previously this did not occur, e.g. in parts of Lao People’s Democratic Republic and Cambodia.

100. In Western China, Central Asia, Australia and the Himalayan region, variable and diminishing rainfall and other forms of precipitation including highland snow, melting to supply spring sown crops and pastures, makes dryland farming and grazing increasingly risky. Perennial crops may suffer reduced yields and may no longer be suited to their location. Farmers and itinerant farm workers face greater risk of loss of important income sources, and there will be significant adaptation costs including development of adapted varieties, further impetus for rural-urban migration, training in new vocations and alternative livelihood development. Forests, forest industries and the communities that rely on them face similar risk less uncertain tree growth and ability of forest to regenerate after logging, performance of plantations, and also increased risk of fire.

101. Fisheries, aquaculture and mariculture face risks in terms of sub-optimal water temperature for growth or survival of cultured or wild species (such as has caused coral bleaching in the Pacific and Indian Ocean Islands). Rising sea-levels put mariculture at risk, and saline intrusions into groundwater degrade already-scarce agricultural land and increase the vulnerability of small island developing states.

102. Societal and institutional vulnerabilities to climate change lie in poverty, weak institutional and life support systems, lack of good governance and strategic planning, high dependence on agriculture and related climate dependent sectors, and lack of long-term risk reduction strategies. In introducing the twin concepts of ‘adaptive’ and ‘mitigative’ capacity (by working groups II and III, respectively) the third assessment of the IPCC (2001) has made a significant contribution to the policy discourse by outlining what types of capacities are required, by whom, and when.<sup>53</sup>

103. Approximately half of all greenhouse gas emissions produced by developing countries are derived from land use, land use change and forestry (LULUCF) sectors.<sup>54</sup> The contributions of agricultural production in this region are not insignificant, and require further attention, with the support of financing via regulated and voluntary carbon markets. The role

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<sup>52</sup> Ma Z. G., Fu C. B., 2007. *Global acidification in the second half of the 20<sup>th</sup> Century and its relationship to large-scale climatic variations*. Science in China Series D: Earth Sciences, 50(5): 776-788.

<sup>53</sup> IPCC (2001) *Climate Change 2001*. In: *Proceedings of the Third Assessment Report of the Intergovernmental Panel on Climate Change (Three Volumes)*. Cambridge University Press, London, 2001.

<sup>54</sup> FAO Interdepartmental Working Group on Climate Change.

of tropical forests in international climate policy is receiving increasing attention; the debate on international financing for compensating developing countries for reduced emissions from deforestation and degradation (REDD) can be expected to further develop at the December 2007 Conference of Parties to the Kyoto Protocol.

104. However, adaptation to climate change presents a far more serious challenge. In a context of climate change, challenges and risks outlined in previous sections, are multiplied. A large proportion of the regional population depends on climate-influenced sectors such as agriculture, animal husbandry and forestry for their livelihoods.

105. Adaptation encompasses a range of actions to strengthen the social, economic and technical resilience of the poorest and most vulnerable against extreme climatic events. An extensive list of climate change impacts and adaptive mechanisms in Asian and Pacific countries are provided in the special report on climate change (ESD/RIM/2007/INF.5). This shows that some countries have already initiated vulnerability assessments with respect to climate change. These vulnerability assessments consist of identifying and analyzing the impact of climate change and variability on natural eco-systems, socio-economic systems, and human health. Some assessments also consider the institutional and financial capacities of the local communities, assessing the spontaneous and planned adaptation measures already taken up, and developing technical, institutional and financial strategies to reduce vulnerabilities.<sup>55</sup>

106. Other major adaptation initiatives being taken up by the countries in the Asia and Pacific region can broadly be grouped as follows:

- a. Development of crop varieties that is tolerant to perceived threats that include droughts, pests and diseases (Australia, India, Indonesia, Malaysia and Viet Nam).
- b. Expanding area under irrigation and efforts for better water management including watershed management practices (Australia, Bangladesh, China, India, Indonesia, Malaysia, Russian Federation and Viet Nam).
- c. Improving weather forecasts and linking with farm decision-making (Australia and India).
- d. Drought monitoring systems are being put in place though do not completely cover the entire country or are in inception stage (China, India, Viet Nam and Australia).
- e. Investment in rural infrastructure that promotes access to markets that in turn enhances the resilience of rural communities which is more relevant for the developing countries in the region (India, China and Sri Lanka).
- f. Capacity-building of farmers, research and extension systems gained importance. Training programmes have been organized at various levels to impart knowledge on impacts of climate change, designing cropping practices to avoid climate change impacts, and soil and water conservation practices in countries such as Bangladesh and Viet Nam.

107. FAO is building capacities at national, local and community levels for improved awareness and preparedness for climate change impacts. An FAO climate change adaptation project in Bangladesh has shown the vital role of local farmers' organizations, cooperatives, local governments and NGOs in promoting understanding of the impacts of climate change as

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<sup>55</sup> For example, see the UNFCCC's "*Background paper on Analysis of existing and planned investment and financial flows relevant to the development of effective and appropriate international responses to climate change.*" The UNEP project "*Assessments of Impacts of and Adaptation to Climate Change in Multiple Regions and Sectors*, implemented during 2001 to 2007 improved scientific capacity to assess climate change impacts, vulnerability and adaptation, advanced scientific understanding and improved links between climate change science and policy. See: <[www.aiaccproject.org](http://www.aiaccproject.org)>, accessed on 11 November 2007.

well as in creating “ownership of the adaptation options with the local people and institutions.”<sup>56</sup>

108. The urgency of establishing effective water conservation and use policies in the region that not only considers the droughts but also the floods cannot be over-stated. Countries in the region are slowly progressing towards drought-risk mitigation. While success stories involving basin level and field level water management practices involving watershed management and integrated natural resource management practices are evolving, larger scale application of these success stories is still lacking. In addition, governments in the region are emphasizing on the drought response. While drought response is an important aspect, lack of well-planned drought mitigation and drought monitoring mechanisms would not only aggravate the drought intensities and impacts but would make governments to invest more and more on fire fighting.

109. Climate change has serious implications for human security. Human security, if understood as an emerging paradigm governing human vulnerabilities that affect their access to food, environmental benefits and subsequently to the quality of life, is threatened through multiple pathways. This calls for a human security centric approach to development and increased emphasis on balanced ecosystem approaches and optimized land use.

## **V. Constraints, opportunities and policy options**

110. Basic constraints that continue to hamper further progress are identified by the thematic reports as including:

- Lack of strong political will, weak implementation mechanisms and inadequate financial support.
- Lack of capacity of rural institutions, particularly farmer’s organizations and rural finance/marketing systems.
- Lack of rural poor participation in sustainable natural resource management.
- Lack of a level playing field in agricultural trade for small agricultural/rural producers.
- Lack of awareness and access to relevant information.
- Lack of basic data for planning, assessment, operational planning and simple, decentralized solution Satellite technologies offer new opportunities for drought monitoring.
- Lack of integration and coordination of effort.
- Overall poor understanding of the functioning and resilience of ecosystems.
- Lack of awareness by various levels of government officials of the medium and environmental impact of interventions.
- Failure to seek objective analysis of policies that have may have fostered decades of mismanagement.
- Weak legal systems, resistance from landowners and imperfections in land tenure systems, as key institutional barriers to effective agrarian reform.
- Economic systems which allow for environmental externalities which create market failure.
- Lack of sufficient policy emphasis on economic growth in both urban and rural areas – insufficient effort to address the interdependencies and policies that govern the relationship between the two rural and urban sectors.

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<sup>56</sup> FAO Inter Departmental Working Group on Climate Change

111. The thematic reports also identify the following opportunities:

- The developing demand for safe and sustainably produced food – countries can identify and use comparative advantages.
- The emerging biofuel industry which can provide opportunities for farmers for use of marginal agricultural land.
- Growth in demand for secondary crops increase the possibility for poverty reduction aimed at secondary food crop farmers.
- Growing willingness to explore public-private partnerships, and more working examples.
- Climate change financing via carbon markets presents new opportunities for promoting integrated solutions to mitigate climate change, provide sustainable sources of energy, reduce other environmental impacts of farming activity and reduce poverty through reduced energy costs.
- Developing knowledge of market mechanisms can be harnessed to ensure equitable distribution and pricing of agricultural resources (particularly water).

112. The empowerment of the rural poor for sustainable rural development is a key policy approach that is well-recognized, but requires much further investment and institutional support. This includes policy to empower vulnerable groups, including women. Community based action is another manifestation of the principle. Institutionalizing community-based action via cooperatives has provided an important basis for progress in various parts of the region.

113. Other policy options that directly support the overarching challenges raised in this report, but which have received less attention in government policy frameworks, include demand side management, particularly for water, but importantly for increasing consumer awareness and driving the development of more environmentally sustainable, but economically viable consumption and production patterns. Certification and eco-labelling initiatives require further support. Policy to support the optimal use of land and other resources also require greater attention, including policy coordination among countries to reallocate resources beyond national boundaries and prompt proper resource use. Food and energy policy must balance the use of agricultural land and water resources for biofuel and food production.

114. Climate change threatens to exacerbate already-high levels of hunger and under-nutrition; it has been noted that food security offers an ideal entry point for evaluating priorities for food system responses to the challenge of climate change. Policy that addresses food security as a multi-faceted problem is more urgently than ever before.

115. Best practices from the region are varied, from agro-industrial entrepreneurship, cooperatives, microcredit and rural financial systems to farmer field schools in integrated pest management. Some of the most innovative projects are those multi-faceted projects with co-benefits on the economic, social and environmental fronts, and which utilize the strengths of the various policy approaches presented above. To maximize the impacts of these projects, by institutionalizing their approaches, coherent policy support is required to institutionalize these experiences.

### Annex 1: The International commitments under prioritized areas of action

	Agriculture and land	Rural development	Desertification	Drought
Improve food security and nutrition, reduce hunger	<ul style="list-style-type: none"> <li>• Increase sustainable food production and food security and halve number of undernourished people in world by 2015; incorporated in Millennium Declaration.</li> </ul>	<ul style="list-style-type: none"> <li>• Improve poor people's access to land, productive resources and social services.</li> <li>• Increase food availability/affordability through equitable and efficient distribution systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and/or transfer basic and improved .. agricultural and pastoral technologies ...to increase agricultural production and food security.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and/or transfer basic and improved .. agricultural and pastoral technologies .. to increase agricultural production and food security.</li> <li>• Design strategies to deal with national food deficiencies in periods of production shortfalls.</li> <li>• Improve .. capacities for agro-meteorology and contingency crop planning.</li> <li>• Establish contingency arrangements in case of drought for : short-term rural employment; food and fodder distribution and water supply; resources for drought relief; safety nets for vulnerable households.</li> </ul>
Eco-efficient water and energy use/ Production.	<ul style="list-style-type: none"> <li>• Employ market-based incentives for agricultural enterprises and farmers to monitor and manage water use and quality.</li> </ul>		<ul style="list-style-type: none"> <li>• Promote ... soil desalination and water conservation technologies</li> <li>• Undertake research on ways of reducing water loss from soils, increasing water absorption and on water harvesting.</li> <li>• Promote efficient extension-service facilities in such special techniques as soil and water conservation, water harvesting, small scale irrigation and agro-forestry.</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake research on ways of reducing water loss from soils, increasing water absorption and on water harvesting.</li> <li>• Provide assistance in the use and diffusion of appropriate water conservation technologies ...</li> <li>• Promote efficient extension-service facilities in such special techniques as soil and water conservation, water harvesting, small scale irrigation and agro-forestry.</li> </ul>
Balanced ecosystem approaches, including optimizing land use and preservation of genetic diversity.	<ul style="list-style-type: none"> <li>• Promote conservation of traditional and indigenous agricultural systems and strengthen indigenous models of agricultural production.</li> <li>• Intensify agriculture by diversifying the production systems, minimizing environmental and economic risks, pursuing an ecosystem approach to SARD, considering impacts of agriculture on natural ecosystems and based on sustainable use of renewable resources.</li> <li>• Maintain the integrated plant nutrition approach integrated pest management (IPM), environmentally-</li> </ul>	<ul style="list-style-type: none"> <li>• Initiate and encourage (by 2000) environmentally-sound energy transition in rural areas to better utilize the potential of agriculture and agro-forestry as sources of renewable energy.</li> </ul>	<ul style="list-style-type: none"> <li>• Formulate national action plans for the protection and sustainable management of ecosystems in areas/regions affected by desertification ... applying an integrated approach, embedded in national strategies for sustainable development and/or poverty reduction.</li> </ul>	<ul style="list-style-type: none"> <li>• Formulate national action plans for the protection and sustainable management of ecosystems in areas/regions affected by drought .. applying an integrated approach, embedded in national strategies for sustainable development and/or poverty reduction.</li> <li>• Promote the use and dissemination of indigenous knowledge and know-how in agricultural and pastoral systems and in activities to enhance natural vegetation cover.</li> <li>• Integrate indigenous experience and knowledge related to forests, forest lands and rangeland into anti-desertification</li> </ul>

	Agriculture and land	Rural development	Desertification	Drought
	<p>sound agricultural pest control, and encourage organic agriculture as part of contribution to SARD.</p> <ul style="list-style-type: none"> <li>• Apply the precautionary approach to develop appropriate and safe biotechnology for enhancing food security and sustainable agriculture Sustainable consumption.</li> <li>• Expand research and transfer of technologies in renewable energy sources, including biomass and solar energy, for agricultural production.</li> <li>• Ensure people's participation for sustainable agriculture; enhance the role of women, indigenous and community-based approaches.</li> <li>• Ensure that policies support sustainable management of resources particularly agricultural land, for the greatest sustainable benefits, and promote transition to sustainable land management and land tenure administration, accounting for land-use interdependence between rural and urban areas, ethnic minorities and women.</li> <li>• Implement Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture, adopted in 1996 and ratify International Treaty on Plant Genetic Resources for Food and Agriculture.</li> <li>• Develop appropriate legal frameworks, administrative measures and appropriate strategies for the protection of biodiversity, and the risk analysis and management of genetically modified organisms.</li> </ul>			activities.
Improve planning and administration, including to ensure equitable participation	<ul style="list-style-type: none"> <li>• Enhance access to existing markets and develop new markets for value-added agricultural products. Complete agreements relating to agriculture under WTO's Doha trade negotiations.</li> </ul>	<ul style="list-style-type: none"> <li>• Improve participation by women in decision-making in sustainable natural resource management.</li> <li>• Improve access for rural women household heads to land and basic</li> </ul>	<ul style="list-style-type: none"> <li>• Nation-wide anti-desertification .. campaigns within affected countries</li> <li>• Risk mapping and early warning systems, based on multi-disciplinary analysis.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop national strategies for drought preparedness both short- and long-term.</li> <li>• Develop drought-relief schemes and means of coping with environmental refugees, and integrate them into national</li> </ul>

	Agriculture and land	Rural development	Desertification	Drought
	<ul style="list-style-type: none"> <li>• Build capacity of commodity-dependent countries to diversify exports and address the instability of commodity prices and declining terms of trade.</li> <li>• Expand rural credit facilities and rural infrastructure related to processing, transportation and marketing, attract private investment in SARD.</li> <li>• Ensure people's participation for sustainable agriculture; enhance the role of women, indigenous and community-based approaches.</li> </ul>	<p>resources.</p> <ul style="list-style-type: none"> <li>• Develop national programmes for participatory local development aimed at the empowerment of rural poor and their organizations, particularly through increased access to productive resources, public services and institutions</li> </ul>	<ul style="list-style-type: none"> <li>• Comprehensive desertification, land degradation and human condition database component that incorporates both physical and socio-economic parameters</li> <li>• Strengthen the UNCCD ..to assist .. integrated planning and implementation of policies and programmes aimed at combating desertification</li> <li>• [Support conventions .. ] UNCCD, UNFCCC and CBD to continue exploring and enhancing synergies .. in the elaboration and implementation of plans and strategies under the respective conventions</li> <li>• Multi stakeholder cooperation in desertification control, combating land degradation, promoting reforestation, agroforestry and land management systems in countries affected by desertification.</li> </ul>	<p>and regional development planning.</p> <ul style="list-style-type: none"> <li>• Develop and/or strengthen, with international assistance, climate and weather information and forecast and national early-warning systems, with particular emphasis on the areas of risk-mapping, remote-sensing, agro-methodological modeling, integrated multidisciplinary crop-forecasting techniques, and computerized food supply/demand analysis.</li> <li>• Improve networking among existing information and early warning systems</li> <li>• Build the capacity for assessing the social, economic and environmental impacts of droughts and develop methodologies to forecast drought.</li> <li>• Strengthen the implementation of the UNCCD, as a vital instrument to assist countries in the integrated planning and implementation of policies and programmes related to drought adaptation and preparedness.</li> </ul>
Trade and economic opportunity.	<ul style="list-style-type: none"> <li>• Reverse the declining trend in public sector finance for sustainable agriculture. Promote private sector investment to strengthen agriculture research and dissemination to farming communities.</li> <li>• Expand research and transfer of technologies in renewable energy sources, including biomass and solar energy, for agricultural production.</li> </ul>	<ul style="list-style-type: none"> <li>• Improve market access to agricultural exports of developing countries.</li> <li>• Promote development of micro, small and medium-scale rural enterprises, improve access to credit, market information and markets for rural poor.</li> <li>• Provide affordable energy to rural communities, including cleaner, efficient and renewable energy services for sustainable rural development.</li> </ul>	<ul style="list-style-type: none"> <li>• Training programmes.. to develop technical skills and .. equal access to economic opportunities.</li> <li>• Access to credit and mobilization of savings.</li> <li>• Build marketing capacities among local people and communities.</li> <li>• Establishment of a revolving fund for credit to rural entrepreneurs.</li> </ul>	<ul style="list-style-type: none"> <li>• Training programmes.. to develop technical skills and.. equal access to economic opportunities.</li> <li>• Access to credit and mobilization of savings.</li> <li>• Establishment of a revolving fund for credit to rural entrepreneurs.</li> </ul>
Mobilize financing	<ul style="list-style-type: none"> <li>• Reverse the declining trend in public sector finance for sustainable agriculture.</li> </ul>			<ul style="list-style-type: none"> <li>• Mobilize adequate and predictable financial resources at all levels from all sources, including for the implementation of drought-relevant projects under the UNCCD.</li> </ul>