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Options for agriculture at Marrakech climate talks:

messages for SBSTA 45 agriculture negotiators

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Abbreviations and acronyms

AAI	Agricultural adaptation interventions
ACPC	African Climate Policy Centre
ADB	Asian Development Bank
AfDB	African Development Bank
ASEAN	Association of Southeast Asian Nations
AU	African Union
AWP	Agricultural Work Programme
CBD	Convention on Biological Diversity
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CDKN	Climate and Development Knowledge Network
COMESA	Common Market for Eastern and Southern Africa
COP	Conference of Parties
CTCN	Climate Technology Centre and Network
EBRB	European Bank for Reconstruction and Development
ECOWAS	Economic Community of West African States
EU	European Union
EWS	Early warning system
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
GCF	Green Climate Fund
GEF	Global Environment Facility
GFCS	Global Framework for Climate Services
GHG	Greenhouse gas
GIZ	German Corporation for International Cooperation
IAR	International Assessment and Review
IDB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developing Countries
LDCF	Least Developed Countries Fund
LEG	LDC Expert Group
M&E	Monitoring and evaluation
MRV	Monitoring, reporting and verification
NAMA	National Appropriate Mitigation Actions
NAP	National Adaptation Plans
NAPA	National Adaptation Programmes of Action
NARS	National Agricultural Research Systems
NDC	Nationally Determined Contributions
NWP	Nairobi Work Programme
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PPCR	Pilot Program for Climate Resilience
REDD+	Reducing Emissions from Deforestation and Forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
SAARC	Pacific Community and South Asian Association for Regional Cooperation
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SCCF	Special Climate Change Fund
SDGs	Sustainable Development Goals

SMART Simple, Measurable, Accurate, Reliable and Time-bound
UNCCD United Nations Convention to Combat Desertification
UNDP United Nations Development Programme
UNFCCC United Nations Framework Convention on Climate Change
UNISDR United Nations International Strategy for Disaster Reduction
UN-SPIDER United Nations Platform for Space-based Information for Disaster Management and Emergency Response
WFP World Food Programme
WMO World Meteorological Organization

Key messages

- SBSTA 45 in Marrakech represents a unique opportunity for Parties to decide on the future of agriculture within the UNFCCC. The process of discussions on issues related to agriculture initiated at COP17 in Durban 2011 culminates at COP22 in Marrakech 2016.
- The explicit reference to food security in the preamble of the Paris Agreement and the Intended Nationally Determined Contributions which prioritize agriculture as a sector for adaptation and mitigation actions, provide a foundation for Parties to develop appropriate frameworks to support actions within the agricultural sector.
- SBSTA workshops on agriculture in 2015 and 2016 allowed Parties to share experiences, identify priorities, and propose ways of taking action within the agricultural sector and so provide the core knowledge base to work from.
- As Parties reach a decision on issues related to agriculture at SBSTA 45, a number of options are available. This report presents ten such options that might contribute to a decision, taking into consideration political priorities, implementation arrangements, timelines and level of ambition.
- Options outlined in this report are not mutually exclusive and can be combined in many different ways.

Introduction

Climate change will affect all four dimensions of food security: availability, access, stability, and utilization of food (Schmidhuber and Tubiello 2007). Food availability from crops, livestock, and fisheries will be affected (Campbell et al. 2016), both through long-term trends in temperature, precipitation, yields, quality and diseases, and through nearer-term increases in climatic variability, meaning more frequent or intense droughts, heat waves, cold snaps, sea surges and other weather extremes. Major knowledge gaps on climate change impacts within non-crop sub-sectors, such as livestock and fisheries, and at the food system or landscape level, for example trade-offs between nutritional and environmental benefits, limit global capacity to ensure food security under progressive climate change (Campbell et al. 2016).

The Paris Agreement, signed in 2015, explicitly refers to safeguarding food security within its preamble and the Intended Nationally Determined Contributions (INDCs) of a vast majority of countries prioritizes agriculture as a sector for adaptation and mitigation actions. These developments provide a critical opportunity for Parties to develop appropriate frameworks to support actions within the agricultural sector. Mobilizing this political commitment and acting to transform the agricultural sector, would be a crucial discussion at this year's Conference of Parties (COP) meeting in Marrakech, when Parties conclude discussions related to agriculture within the United Nations Framework Convention on Climate Change (UNFCCC) Subsidiary Body for Scientific and Technological Advice (SBSTA), which provides the COP with scientific and technological advice. This report presents options that Parties can consider in their deliberations at the 45th session of the SBSTA, and arrive at a decision on agriculture. The options presented are drawn from Parties' submissions and deliberations at SBSTA 42 and SBSTA 44.

Background

Within the UNFCCC, the issue of climate measures within agriculture is nearing the end of an extended process that will determine future pathways for how the issue is addressed. The process to discuss issues relating to agriculture was initiated in 2011 when the 17th COP, held in Durban, referred agriculture to the SBSTA for more detailed discussion. Following exchange of views on the topic in 2012, the SBSTA at its 38th session requested submissions from Parties and observer organizations on the current state of scientific knowledge on how to enhance the adaptation of agriculture to climate change impacts while promoting rural development, sustainable development and productivity of agricultural systems and food security in all countries, particularly in developing countries. This should take into account the diversity of the agricultural systems and the differences in scale as well as possible adaptation co-benefits (UNFCCC 2013). Submissions were received from Parties and observer organizations and an in-session workshop on the topic was held at SBSTA 39 in November 2013. This was followed by a conclusion at SBSTA 40 in June 2014 (UNFCCC 2014a), to get Parties' views on undertaking scientific and technical work in the following areas:

- Development of early warning systems and contingency plans in relation to extreme weather events and its effects such as desertification, drought, floods, landslides, storm surge, soil erosion, and saline water intrusion;
- Assessment of risk and vulnerability of agricultural systems to different climate change scenarios at regional, national and local levels, including but not limited to pests and diseases;
- Identification of adaptation measures, taking into account the diversity of the agricultural systems, indigenous knowledge systems and the differences in scale as well as possible co-benefits and sharing experiences in research and development and on the ground activities, including socio-economic, environmental and gender aspects;
- Identification and assessment of agricultural practices and technologies to enhance productivity in a sustainable manner, food security and resilience, considering the differences in agro-ecological zones and farming systems, such as different grassland and cropland practices and systems.

SBSTA invited Parties and observer organizations to submit views related to these topics and requested the Secretariat to organize in-session workshops on these topics in conjunction with SBSTA 42 and 44. Key messages from these workshops are summarized in Box 1. Following these workshops and production of workshop reports, SBSTA 45 will convene in Marrakech in November 2016 to determine next steps to take agriculture forward within SBSTA and UNFCCC.

Box 1. SBSTA workshops on agriculture

Workshop on the development of early warning systems and contingency plans in relation to extreme weather events and their effects such as desertification, drought, floods, landslides, storm surge, soil erosion, and saline water intrusion – *2 June 2015*

Parties highlighted the important role of early warning systems (EWS) and contingency planning in response to climate change impacts on the agricultural sector (UNFCCC 2015b). Several challenges were identified including availability of high quality scientific data, human capacity and finance. Synergies among processes of the Convention, including the Nairobi Work Programme (NWP), research and development, technology transfer, capacity building, and emergency responses, were noted as important. Parties identified potential ways forward as: (1) a systematic assessment of the current situation related to EWS coupled with sharing of information and experiences, (2) development of a web platform for information sharing, and (3) finding practical ways to support Parties in the development of EWS at the regional, national and subnational levels.

Workshop on the assessment of risk and vulnerability of agricultural systems to different climate change scenarios at regional, national and local levels, including but not limited to pests and diseases – *3 June 2015*

There was consensus among Parties that climate change, increasing climate variability and extreme weather events have adverse effects on agriculture and food production (UNFCCC 2015a). Considering the importance of the agricultural sector in meeting food security goals, assessment of risk and vulnerability of agricultural systems was identified as a priority.

The challenges in conducting such assessments, such as technical and capacity gaps, were noted. Parties identified potential ways forward as: (1) exploring synergies among processes under the Convention (e.g. related to finance, technology transfer, capacity building, and technology needs assessments), (2) further cooperation through knowledge-sharing activities of the Convention (e.g. database development, sharing, exchange of experts), and (3) development of a web platform for exchanging information (e.g. on experiences gained, good practices, support tools and models, databases, and lessons learnt).

Workshop on the identification of adaptation measures, taking into account the diversity of the agricultural systems, indigenous knowledge systems and the differences in scale as well as possible co-benefits and sharing experiences in research and development and on-the-ground activities, including socio-economic, environmental and gender aspects – *20 May 2016*

Parties shared experiences related to adaptation measures and highlighted their respective priorities. Common priorities and needs included technology transfer, capacity building, downscaling climate data and scenarios to local levels, ensuring food security and enhancing food safety. Parties noted that adaptation measures should be context-specific at local, national and regional levels. Some Parties called for a focus on indigenous knowledge as well as scientific approaches. Some Parties highlighted the need to focus on gender sensitive solutions taking into account the important role of women in agricultural systems, in particular in developing countries. Parties noted that the different processes under the Convention, such as the NWP, the Climate Technology Centre and Network (CTCN) and the technology mechanism, technical expert meetings on adaptation and the finance mechanism, can be synergistic to SBSTA's work on agriculture. With regard to SBSTA's future role, some of the Parties indicated that SBSTA could focus on accessing scientific and technical information, data sharing, supporting research, and measuring potential impacts. While winding up the workshop, the co-chair highlighted that all options for cooperation should be explored, and investment in adaptation measures in agriculture is needed.

Workshop on the identification and assessment of agricultural practices and technologies to enhance productivity in a sustainable manner, food security and resilience, considering the differences in agro-ecological zones and farming systems, such as different grassland and cropland practices and systems – *23 May 2016*

Parties shared experiences on agricultural practices and technologies that enhance productivity in a sustainable manner. Building on the premise that proven, inexpensive practices and technologies provide the best options for scaling up, Parties highlighted the wide range of tried and tested approaches in different countries. Practices and technologies discussed at the workshop included those relating to crop management, soil management, water management, livestock and rangeland management, climate information and risk management. Parties also discussed the differences in scales of application of these practices and technologies. Parties highlighted the future role that SBSTA can play in relation to pests and diseases, stress-tolerant varieties, identification of technologies, evaluating alternatives and knowledge sharing.

Identifying options for agriculture

To support Parties as they reach a decision on agriculture at SBSTA 45, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and its partners identified options that Parties can consider at SBSTA 45 (see Table 1). These options are based on: the submissions made by Parties to SBSTA 42 and SBSTA 44, statements and discussions during the four in-session workshops, and the workshop reports from SBSTA 42 in-session workshops on agriculture.

For each option we present:

- An outline of the option;
- Possible pros and cons of the option;
- Ways forward to implement the option.

Adopting options for agriculture

The options described in this report are not exhaustive or mutually exclusive. Parties may consider different combinations of these and other options depending on political, technical and institutional priorities. Each option outlines different pathways for future efforts; the choice among options has implications in terms of levels of ambition, complexity in implementation, timelines and costs. The authors do not advocate for the adoption of any particular option, but endeavour to provide Parties with information relating to practicalities involved in implementing each of the options and their pros and cons.

Table 1. Options for agriculture at SBSTA 45

Option 1	Linking agricultural adaptation to the UNFCCC finance mechanism
Option 2	Strengthening agricultural adaptation actions within the technology transfer and capacity building processes
Option 3	Provision of technical support to enable Parties to implement their NDCs
Option 4	SBSTA work programme on agriculture
Option 5	Addressing agricultural adaptation through processes outside the Convention
Option 6	Process for discussing mitigation as a co-benefit of agricultural adaptation interventions
Option 7	Development of an agricultural knowledge and learning platform
Option 8	Measuring the efficacy of agricultural adaptation interventions
Option 9	Support to development of early warning systems
Option 10	Other processes under the UNFCCC to take agriculture forward

OPTION 1: Linking agricultural adaptation to the UNFCCC finance mechanism

It is the right moment, for several reasons, to create a coherent delivery system to drive forward implementation of agricultural adaptation interventions (AAI) in the nationally determined contributions (NDCs): the international climate community came together at the Paris COP, nationally driven INDCs show agriculture to be a priority, and progress on green finance has been supported by the G20 this year. With special recognition of food security issues in the Paris Agreement, there is clear justification for SBSTA/ Subsidiary Body for Implementation (SBI)/COP to provide guidance on substantive issues to the operating entities of the finance mechanism (the well-established Global Environment Facility (GEF) and the newly established Green Climate Fund (GCF)) so they give a higher priority in their funding programmes for agriculture. So far guidance from SBSTA/SBI/COP to the operating entities of the financial mechanism has focused on operational rather than substantive issues, thus a gear change is needed.

The outputs of the Technical Expert Meetings emanate from a strong foundation of knowledge as to what measures and practices can work from research. Conclusions could be drawn and a package of potential implementation measures which meet needs identified in INDCs, could be defined using experience from all sources of funding within and outside the finance mechanism, that is from the Least Developed Countries Fund (LDCF), the Special Climate Change Fund (SCCF), the Adaptation Fund, the Pilot Program for Climate Resilience (PPCR) and potentially bilateral and multilateral Official Development Assistance (ODA).

Each country has its own institutional arrangements, plans and strategies. The interface between the international and national level still needs to be streamlined with mediating mechanisms. Furthermore, the role of the private sector in respect of investment of publically provided climate funds has been contested, and the GCF is moving tentatively.

Ways forward

A multi-track approach is necessary to create an enabling environment for investment in agricultural adaptation. Key actions would include:

- Work with the Standing Committee on Finance to fast-track a process for streamlining guidance to the finance mechanism. This means that there will be a space for specific guidance to be given to ensure agriculture receives a higher priority.
- Ensure agriculture and climate funding is considered within the Facilitated Dialogue in 2018.
- Work towards real progress being made that can be documented at the Global Stocktake in 2023.
- Use agriculture research and professional community to help and support project preparation at country level to submit proposals to the operating entities of the finance mechanism.
- Integrate external and domestic funding, public and private funding at national level, because most investment in agriculture comes from domestic resources.
- Create national-level enabling environments and regulations for private sector leverage.
- Use discussion and decision forums outside the UNFCCC, for example a high-level political discussion under World Economic Forum, to support efforts within the Convention and its financial mechanism *(See Option 5 for more on addressing agricultural adaptation through processes outside the Convention).*
- Provide clear information briefs to GEF Council members and the GCF Board on the need to make faster progress on AAI.

Pros

- The INDCs make a clear case for agriculture as a priority within nationally determined priority actions, which can be supported by the finance mechanism.

Cons

- Funding through the finance mechanism is only a small part of climate finance and investment.
- The GEF and GCF do not work on specific sectoral issues such as agriculture but on more cross-cutting approaches, therefore a shift from the current approach is needed.
- Funds for the National Adaptation Programmes of Action (NAPAs) from the LDCF are heavily constrained and the Adaptation Fund lacks resources, however, GCF funds may get routed there.
- Little detail in INDCs on specific investment needs in agriculture and general lack of fundable projects.
- Allocation of climate finance has tended to favour those countries with the capacity to spend; there is a difficult balance to be struck between delivering to the poorest and most vulnerable and maintain global food supplies.

OPTION 2: Strengthening agricultural adaptation actions within the technology transfer and capacity building processes

The Technology Mechanism has been supporting activities related to agricultural resilience. The CTCN, mandated to support the removal of barriers to climate technologies, has received a large number of requests related to agriculture, reflecting the needs of developing countries in this sector (e.g. efficient land and water use, agro-meteorological information systems, early warning systems, livestock management, agroforestry, irrigation systems). This reflects some common trends and priorities that could be supported at the regional level, with a strong emphasis on South-South collaboration and engagement with the private sector. The Technology Executive Committee also emphasized key lessons learnt for agricultural resilience, including the importance of engaging local stakeholders through bottom-up and participatory approaches to ensure sustainability and suitability to local contexts and enable replication of local innovations (UNFCCC 2014b).

Capacity building efforts within the UNFCCC are being conducted by multiple bodies and processes, including the technology and finance mechanisms, following guiding principles within the frameworks agreed in Marrakech at COP7. To provide an overview of capacity-building support being provided to developing countries and to improve the monitoring of the effectiveness of capacity building, the Durban Forum on Capacity-building was established in 2012. The Paris Committee on Capacity-building is also in the process of initiating activities, and a decision with regard to its Terms of Reference is likely to be made at COP22. In the context of Parties' capacity needs highlighted in SBSTA in-session workshops on agriculture, SBSTA could advise these processes with regard to capacity building for adaptation in agriculture.

National planners need greater capacity to mainstream climate change and agricultural resilience into policies at multiple scales and to address the disconnect between climate change and poverty reduction frameworks (Prowse et al. 2009). Various processes of the Convention, with guidance from the Paris Committee on Capacity-building, can build national planners' capacity. There are opportunities to link national technology and capacity-building actions to national analysis of key gender issues, such as women's roles in agricultural value chains, gendered climate impacts in policy and programme design, and engaging women organizations in capacity development (Huyer et al. 2015).

Ways forward

The technology and capacity development efforts under the Convention already address agriculture. A SBSTA decision on agriculture at SBSTA 45 could make an explicit reference to these links, and requests that these be strengthened. Operationalizing new capacity building efforts to achieve impact on the ground would require connecting stakeholders (government, business, civil society, extension, research), and mobilizing political will and champions who move the agenda forward, as well as building a practical monitoring system to aggregate lessons (including collection of sex-disaggregated data for monitoring progress and benefits related to gender). Links to the finance mechanism would enable larger-scale actions and sustainability. An increase in resources to bodies that assist Parties on technology transfer and capacity building would enable them to overcome the current shortfall to respond to country needs and support them in reaching their NDC goals.

Pros

- Efforts to strengthen agricultural adaptation action within the technology and capacity development processes can be done quickly as they build on existing work, effective partnerships and on-the-ground support mechanisms.
- This is a good time to increase country-driven efforts, as Parties have identified their priorities in INDCs, and a large number of Parties are concluding their Technology Needs Assessments.
- Can build on lessons learnt on adopting country-driven approaches, gender and social inclusion, and private sector engagement.

Cons

- The Paris Committee on Capacity Building is in its early stages of development.
- The financial resources available under existing mechanisms are limited.

OPTION 3: Provision of technical support to enable Parties to implement their NDCs

The INDCs submitted by Parties indicate that agriculture is a priority sector for adaptation and mitigation action. CCAFS released a report in December 2015 and an updated analysis in May 2016 which revealed that 119 Parties include agricultural mitigation in their INDCs, and that of the 138 Parties that include adaptation, almost all (127) include agriculture as a priority (Richards et al. 2016). SBSTA has the opportunity to take cognizance of these priorities and support adaptation and mitigation actions in the agricultural sector.

Provision of technical support to enable Parties to take actions consistent with their INDCs is critical to support implementation of adaptation and mitigation in the agricultural sector. In their submissions to the agriculture in-session workshops at SBSTA 42 and 44, Parties noted a number of priority issues for research and support, including:

- Assessment of risk and vulnerability of agricultural systems;
- Climate impacts on pests and diseases;
- Contingency planning and early warning systems;
- Plant and livestock breeding;
- Processing technologies to reduce post-harvest loss;
- Climate information services for agriculture;
- Crop management;
- Soil management;
- Water management;
- Livestock and rangeland management.

Also a number of cross-cutting themes were highlighted as important for the above work including indigenous knowledge, gender equality, scale issues, economic valuation of costs and benefits, and preparation of robust financial proposals.

Ways forward

A number of actions could enhance technical support for NDC implementation in agriculture:

- Establishment of regional working groups for sharing context-relevant technologies, strategies, and institutional arrangements.
- Designing the agricultural knowledge and learning platform (*see Option 7*) in a way that it supports implementation of NDCs.
- Initiating a dialogue with SBI to identify ways in which SBSTA can support implementation of NDCs by providing the necessary scientific and knowledge inputs.
- Creating an online platform or repository of adaptation and mitigation technologies in the agricultural sector.
- Achieving synergies with processes outside the Convention which support adaptation and mitigation actions in the agricultural sector. There has been, and is, a high level of support to national adaptation and mitigation policies and planning from many agencies, including United Nations Development Programme (UNDP), German Corporation for International Cooperation (GIZ), Climate and Development Knowledge Network (CDKN), World Resources Institute (WRI) and African Climate Policy Centre (ACPC), with financial support from several major development partners and funds.

Pros

- Technical support for action on agriculture is sorely needed. Over 1/3 of Parties mentioned the need for agriculture-related technology transfer in their INDC submissions (Richards et al. 2016).
- Opportunity to address critical gaps in knowledge, for example on barriers to adoption of new practices, financial and economic returns to NDC investments, and metrics for adaptation, by supporting research and related capacity building.

Cons

- Parties have some similar needs for technical support, for example in accessing finance or in developing monitoring and evaluation (M&E) protocols, but many technologies to adapt to and mitigate climate change within the agricultural sector are locally specific.

OPTION 4: SBSTA work programme on agriculture

A future SBSTA work programme on agriculture (AWP) can generically be understood as a programme of work under the Convention operating within the mandate of SBSTA (article 9 of the Convention), which is to:

- Provide assessments of the state of scientific knowledge relating to climate change and its effects;
- Prepare scientific assessments on the effects of measures taken in the implementation of the Convention;
- Identify innovative, efficient and state-of-the-art technologies and know-how and advise on the ways and means of promoting development and/or transferring such technologies;
- Provide advice on scientific programmes, international cooperation in research and development related to climate change, as well as on ways and means of supporting endogenous capacity-building in developing countries; and
- Respond to scientific, technological and methodological questions that the Conference of the Parties and its subsidiary bodies may put to the body.

Also according to article 9, the AWP shall comprise government representatives competent in the relevant field of expertise and it shall report regularly to the Conference of the Parties on all aspects of its work.

An AWP would most likely include a decision plus an annex. The first part of the decision could include a preamble recognizing or noting the importance of agriculture in relation to climate change, food security and sustainable development and perhaps recall earlier decisions on the matter including the relevant Sustainable Development Goals (SDGs). The second part of the decision could include the adoption of the AWP with a request to SBSTA to implement the AWP, including a mandate for further elaborating a list of activities and outputs. A decision could also include an invitation to Parties and organizations to support the work, including financial support and a timeline to review the AWP. The annex could then contain the programme's objectives, expected outcome, scope and work modalities.

Pros

- A dedicated AWP would provide a comprehensive platform for scientific and technical treatment of challenges and opportunities facing agriculture in the context of climate change.
- The AWP would allow Parties to deal with synergies and trade-offs of different agricultural practices, and depending on the actual decision, an AWP could be relevant for farming at different scales, using different practices under different climate regimes and would be a strong base for reaching out to bodies and institutions working inside and outside the Convention.

Ways forward

Even if Parties decide to move forward with a work programme on agriculture, it will be challenging to agree on all the details during SBSTA 45. Parties could instead use a similar process to when the Nairobi Work Programme (NWP) was decided. At COP10, Parties requested SBSTA to develop a structured five-year programme of work on the scientific, technical and socio-economic aspects of impacts, vulnerability and adaptation to climate change. The decision at COP10 established the following scope: methodologies, data and modelling; vulnerability assessments; adaptation planning, measures and actions; and integration into sustainable development. Parties then further elaborated this at the subsequent SBSTA session building on a round of submissions, developed an indicative list of activities including actions to be carried out by SBSTA and tentative timing and finally decided on the NWP at COP11.

Following this approach, Parties would need to agree on a rather short decision in Marrakech covering the mandate to develop an AWP preferably with some guidance on the scope and possibly with a reference to the SBSTA mandate, though this is implicit when working under SBSTA. Since there are different views on the scope and context of an AWP, it would be particularly useful to reach agreement on this in Marrakech to allow Parties to focus on the next steps during 2017. Some of the language used for mandating the workshops held at SBSTA 42 and 44 could be used, taking into account the need for generic language to allow the work programme to deal with emerging aspects that Parties find relevant. At Marrakech, Parties could mandate SBSTA with an initial timeframe of the AWP and an invitation to Parties and observer organizations to submit views. During 2017 Parties would then have time to develop an indicative list of activities to be undertaken by an AWP and finally by SBSTA 47 to agree on objectives, scope of work and work modalities.

Cons

- Risk of becoming a time-consuming information compilation exercise that does not deliver the actual results needed in the sector, unless mechanisms to translate knowledge into action are developed.
- Depending on the actual content of the AWP, an increased need to coordinate with other programmes under the Convention such as the NWP to avoid duplication of work will be needed.

OPTION 5: Addressing agricultural adaptation through processes outside the Convention

Much momentum for the Paris Agreement is derived from external parallel discussions outside the UNFCCC. Multiple options outside the Convention can also be leveraged to support adaptation in the agricultural sector. Relevant processes and organizations include:

UN common system organizations and processes

- Sustainable Development Goals implementation processes, particularly actions towards achieving SDG2, "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture".
- Food and Agriculture Organization of the United Nations (FAO), which provides technical assistance on food and agriculture issues.
- International Fund for Agricultural Development (IFAD), UN agency funding agriculture development actions in member countries.
- World Meteorological Organization (WMO), a specialized UN agency for meteorology.
- United Nations International Strategy for Disaster Reduction (UNISDR), which supports disaster risk reduction efforts in countries, including through the Hyogo Framework for Action, which aims at reducing vulnerabilities to natural disasters.
- World Food Programme (WFP), UN agency which provides humanitarian aid to address food security issues.
- Other Rio conventions, i.e. Convention on Biological Diversity (CBD) and United Nations Convention to Combat Desertification (UNCCD).
- Intergovernmental Panel on Climate Change (IPCC), tasked with providing scientific assessments related to climate change.

Multi stakeholder platforms

- Global Alliance for Climate Smart Agriculture, a voluntary coalition of state and non-state actors for knowledge-sharing and collaboration.
- Global Framework for Climate Services, a mechanism for enhancing the quantity, quality and application of climate services.

Private sector processes

- World Business Council on Sustainable Development
- World Economic Forum

Non-UN inter-governmental organizations

- The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), a network of 15 international research centres and partners.
- Regional and sub-regional bodies and mechanisms, such as the African Union (AU), Association of Southeast Asian Nations (ASEAN), Common Market for Eastern and Southern Africa (COMESA), Economic Community of West African States (ECOWAS), European Union (EU), Pacific Community and South Asian Association for Regional Cooperation (SAARC).

Multilateral development banks

- African Development Bank (AfDB)
- Asian Development Bank (ADB)
- European Bank for Reconstruction and Development (EBRB)
- Inter-American Development Bank (IDB)
- World Bank Group

These organizations and processes are engaged with Parties to the Convention at multiple levels in implementing and supporting adaptation actions in the agricultural sector. Strengthening these links as a stand-alone option or in conjunction with other options will allow Parties to leverage the expertise and resources of these processes and organizations.

Ways forward

Parties to the Convention are already linked with many of these processes and institutions. Leveraging on these linkages, SBSTA can initiate a process to secure inputs from these processes and organizations to address the needs and priorities highlighted by Parties in the workshops at SBSTA 42 and 44. The Nairobi Work Programme offers lessons in achieving synergies with processes outside the Convention and a similar approach can be adopted to address issues relating to agriculture. The focus of engagement could include knowledge to support implementation, exchange of best practices, and mobilization of financial resources. Due consideration should be given to the key actions which can be performed by different institutions, based on their core competencies, which will be synergistic to efforts under the Convention. For example, multilateral development banks can complement actions undertaken under the finance mechanism. This option can be achieved in conjunction with many of the other options outlined in this report.

Pros

- Parties are already engaged in many relevant processes outside the Convention, and can therefore leverage on existing action engagement for early action and avoid duplication.
- Processes outside the Convention can help address capacity needs of Parties on specific areas (e.g. early warning systems, climate information services) as well as multiple levels (national, sub-regional, regional).

Cons

- The mechanisms outside the Convention are not necessarily well engaged with the Convention itself, and some new links would need to be developed.
- Processes outside the Convention may lack the democratic accountability and legitimacy of the UNFCCC, as they are constituted by smaller groups of (often industrialised) countries or non-state actors.
- There is also a risk of the different organizations and processes subscribing to conflicting norms, objectives or policy instruments; and of waste of resources due to several institutions competing for scarce resources.

OPTION 6: Process for discussing mitigation as a co-benefit of agricultural adaptation interventions

Meeting the Paris target of keeping global warming well below 2°C will require profound emissions reductions in all sectors, including agriculture. Scientists estimate that agriculture must achieve annual emissions reductions of 1 $GtCO_2e/yr$ to contribute to the 2C target without compromising food security (Wollenberg et al. 2016). This level of emissions reductions will need widespread adoption of new policies and technologies in agriculture, for which the UNFCCC could provide critical support.

In its current discussions, SBSTA focuses on adaptation in agriculture. Mitigation is acknowledged as a co-benefit of adaptation actions. Mitigation co-benefits are defined as the net reduction of CO_2 emissions resulting from climate change adaptation. Climate change adaptation measures such as increasing soil organic carbon, efficient use of nitrogen fertilizers, sustainable intensification of ruminant livestock, agroforestry, and water saving in irrigated rice can reduce net greenhouse gas (GHG) emissions relative to business-as-usual projections. All of these measures can potentially also improve rural livelihoods and food security.

Even without an explicit focus on mitigation, SBSTA could provide an ongoing forum for progress on agricultural mitigation among Parties by continuing to recognize mitigation as a valid co-benefit of adaptation actions in agriculture. Technical work on adaptation could also address technical needs for mitigation in agriculture, such as quantification of agricultural emissions and emissions reductions. SBSTA could thus support Parties' full range of NDC commitments across the adaptation and mitigation spectrum.

Ways forward

Rather than a formal process on agricultural mitigation within the official venues of the UNFCCC, more informal discussion forums may help to take forward mitigation as a co-benefit of adaptation, as understood by SBSTA. An immediate first step would be a global-level informal meeting ahead of the decision at SBSTA 45. This meeting and other informal discussions could address, for example, mitigation co-benefits of specific agricultural adaptation activities, mechanisms for finance and technical assistance, modalities for leveraging funds from mitigation for adaptation in agriculture, monitoring reporting and verification of mitigation actions in agriculture, and social impacts and safeguards, such as for gender. These informal processes could contribute to the future work of the IPCC and the Global Stocktake.

Pros

- More efficient efforts and investments in adaptation in agriculture that deliver co-benefits to mitigation without compromising rural livelihoods and food security.
- Integrated support to both adaptation and mitigation pledges in NDCs.
- More meaningful inclusion of agriculture in the Global Stocktake in 2023.

Cons

- Not all Parties may support detailed consideration of agricultural mitigation within formal UNFCCC processes.
- Research gaps and incomplete evidence on the mitigation co-benefits of adaptation, and management of trade-offs where these arise.
- Significant investment needed to reduce uncertainties in GHG emissions estimates.

OPTION 7: Development of an agricultural knowledge and learning platform

The proposed agricultural knowledge and learning platform could include: technical options for climate change adaptation in agriculture, synergies with mitigation, opportunities and dynamics with other sectors (such as forestry, markets and finance), and effective mechanisms to facilitate exchange of lessons and actual implementation support. This platform could provide a solutions hub of experiences, innovative technologies, and proven portfolios of practices and services. The platform could not only gather scattered information and resources, as most of the existing platforms, but also support developing countries with comparative cross-regional analyses of:

- Methods on how to assess local, subnational and national agroclimatic vulnerability;
- Creation of financial products and incentives to leverage adaptation to climate change and variability within a markets framework;
- Setting up and implementing contingency plans;
- M&E tools and methods to identify potential and effective synergies on food security, gender and social inclusion;
- Adaptation and mitigation measures that can contribute to national targets and international commitments;
- Supporting the articulation of National Agricultural Research Systems (NARS) and extension bodies with international research centres to strengthen capacities and engage in joint development of technology and transfer mechanisms.

The platform could build capacity and strengthen South-South cooperation through the recognition of shared challenges, needs and conditions that can potentially be resolved faster by learning from others' experiences. Cross-sectoral interaction (for example with the forestry sector) would ground the platform's priority options into actual results and impacts.

Ways forward

The agricultural knowledge and learning platform could be built under the UNFCCC Secretariat or at CTCN. SBSTA could request Parties to submit their views on the development of such a platform and may request the Secretariat to prepare a synthesis paper based on the submissions by Parties. To implement the platform, Parties could nominate a core group to coordinate the platform and formulate its goals and work plan. Each discussion group within the platform should be able to establish its own priorities within the guidelines from the core group. Effective and explicit mechanisms for the platform could include online seminars, online information exchange, virtual discussion groups, links to other platforms, specialized groups on specific topics such as monitoring, metrics, gender, synergies on adaptation and mitigation, financial instruments, tools, challenges and biophysical and agroclimatic conditions.

Pros

- A focus on technical, knowledge and financial options, rather than political options.
- A technical solutions hub to accelerate scaling-up of successful local initiatives.
- Promotion of regional actions.
- Building on what has already been developed could lead to more effective use of limited adaptation finance.
- Support to Parties' positions on agriculture in the negotiations.

Cons

- The platform could suffer from losing buy-in over time, becoming one more of those that enjoys a huge inauguration and rapid closure.
- Lack of interest in participation from Parties.
- Efforts for a non-political platform might not be successful.
- May be time-consuming and distract from higher priorities for action on adaptation.
- Such a platform would need to be very carefully designed to address reluctance in uptake which other similar platforms have experienced.

OPTION 8: Measuring the efficacy of agricultural adaptation interventions

SBSTA has the opportunity to develop guidelines and protocols for monitoring, and SMART (Simple, Measurable, Accurate, Reliable and Time-bound) metrics for adaptation and resilience, that can:

- Support sustainable, equitable agriculture to meet current and future food security under climate change in the context of multifunctional, multi-purpose, productive and sustainable landscapes.
- Provide a shared international framework for resilience-building in agriculture that enhances knowledge exchange, capacity building and technology transfer.
- Be country-driven, general, voluntary, pragmatic, transparent, non-prescriptive and non-intrusive, taking into account national circumstances and national priorities.
- Create, in a stepwise approach efficiencies for all Parties by harmonizing with monitoring protocols and metrics for GCF, SDGs, FAOSTAT and avoiding any conflict with established Monitoring, Reporting and Verification (MRV) systems (e.g. for REDD+) and International Assessment and Review (IAR).
- Include specific consideration of agriculture-dependent livelihoods, rural poverty reduction and household food security.
- Identify gender indicators and use sex-disaggregated data for agricultural adaptation.
- Establish safeguards for investments in adaptation and resilience-building in agriculture.

Ways forward

- Timetable and process to develop monitoring and metrics for adaptation in agriculture would benefit from close alignment with development of NDCs and NAPs at country level.
- Coordination with the following UNFCCC and other international bodies and processes would be helpful: SBI (including on gender mainstreaming), NWP, Adaptation Committee, LDC Expert Group, NAP Adaptation Programme, GEF Evaluation Office, Organisation for Economic Co-operation and Development (OECD), GCF.
- Work towards integration into a coherent framework for monitoring on all environmental and developmental purposes (e.g. agriculture, forests, climate, health, income, livelihoods), harmonizing or aligning with existing approaches, and including assessment of policy performance.
- Gender indicators and objectives should be defined at the beginning, in consultation with women's organizations at national / sub-national levels and with national UNFCCC gender focal points.
- Various technical agencies, including FAO and CGIAR, and development agencies, including IFAD and World Bank, are working in this area together with international development partners, and harnessing this experience by bringing in their expertise could accelerate progress.

Pros

- Strong comparative advantage in establishing international agreement on measurement of adaptation and resilience in agriculture.
- Well positioned to enhance harmonization of metrics for adaptation in agriculture vis-à-vis all work streams of SBSTA, SBI, NWP, Adaptation Committee, LDC Expert Group, NAP Adaptation Programme.
- Track record around consideration of socio-economic outcomes and social equity issues, including gender.

Cons

- May be time-consuming and distract from higher priorities for action on adaptation, considering the history of discussions on MRV for mitigation.
- Given the context-specificity of adaptation needs and adaptive capacities, the potential for meaningful global frameworks and shared metrics may be limited.
- More informal groups, supported by technical agencies, may be able to make faster process on technical aspects of guidelines, protocols and metrics than SBSTA.

OPTION 9: Support to development of early warning systems

At the SBSTA 42 in-session workshop on early warning systems (EWS), all Parties agreed on the central importance of EWS and contingency plans to reduce the vulnerability of the agriculture sector to climate change and extreme weather events. Many Parties consider EWS to be a key tool in reducing climate-related risks and damage to agricultural production and to the production capacity of agricultural systems.

Suggestions for future work under SBSTA included systematic assessment of current status of EWS, technical needs assessment, sharing of information and experiences, development of a web platform for information sharing, and practical mechanisms to support Parties in the development of EWS at the regional, national and subnational levels. SBSTA is well placed to improve the integration of EWS with finance mechanisms (e.g. triggers for payments from international insurance funds), improve the quality of data used in EWS and broaden access to EWS among a wider set of users, including smallholder farmers (Coffey et al. 2015). SBSTA would also be in the position to enable better integration between indigenous knowledge and scientific approaches to EWS and to promote public-private partnerships for EWS delivery. SBSTA also has the opportunity to redress previous lack of attention to gender-differentiated climate change vulnerabilities and capacities (de Leon et al 2016) through development of EWS specifically designed to overcome gender inequalities.

Links with processes and organizations beyond the Convention would be especially important for delivery of effective EWS. Relevant processes and organizations at the global level include the UNISDR (Hyogo Framework), WMO, the Group on Earth Observations, the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), the Global Framework for Climate Services (GFCS), WFP, FAO and CTCN.

Ways forward

- Commission a near-term concise review of the current situation on EWS and contingency plans, to meet Parties' immediate information needs;
- Identify specific areas of where SBSTA could add value to work on EWS beyond the Convention;
- Build synergies with existing processes under the Convention, including the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts, the Cancun Adaptation Framework and the Nairobi Work Program;
- Ensure that any knowledge platform on agriculture developed under SBSTA (*see Option 7*) includes EWS and contingency plans.

Pros

- There have been impressive achievements on both national-level EWS and multi-country regional mechanisms, for example drought and famine forecasting, providing a firm basis for future EWS at scale.
- SBSTA well placed to promote integration of EWS with finance mechanisms, indigenous knowledge and gender equality.
- The Convention's mechanisms for capacity-building could be very useful for improving EWS particularly in Least Developed Countries.

Cons

- Risk of duplication with the considerable body of work on EWS outside the Convention.
- Development of EWS and contingency plans is a complex combination of stakeholder engagement and technical inputs, often context-specific with limited transferable lessons.
- Functional EWS and contingency plans are insufficient without the finance and capacity to act on forecasts and plans.

OPTION 10: Other processes under the UNFCCC to take agriculture forward

Any action under SBSTA would benefit from synergies with other UNFCCC mechanisms, and in the absence of progress on agriculture at SBSTA, work in other UNFCCC venues could provide continuity. Agriculture is dealt with by a number of agenda items and programmes under the Convention:

- The Nairobi Work Programme, the Cancun Adaptation Framework including the Adaptation Committee will continue its work on vulnerability assessments, adaptation planning, supporting Least Developing Countries (LDC) implementing national adaptation plans (NAPs) etc. The LDC Expert Group (LEG) will continue to support LDCs on the National Adaptation Programmes of Action (NAPA) as well as support the work on adaptation agreed under the Paris Agreement. All of this work will continue to be relevant for agriculture.
- The agenda item on gender and climate change is another important possibility to address agriculture in a gender context and this could cover a broad range of aspects including adaptation, mitigation, climate technologies etc.
- Mitigation and agriculture is a part of commitments for Annex I Parties under the Convention and the Kyoto Protocol. It is part of non-Annex I Parties efforts to implement Nationally Appropriate Mitigation Actions (NAMA), REDD+ in the forest sector, and in the National Determined Contributions (NDC) under the Paris Agreement after 2020.
- Financing as related to agriculture will continue to come under the work of the Standing Committee on Finance and supported by the finance mechanism of the Convention (GCF and GEF) *(See Option 1: Linking agricultural adaptation to the UNFCC finance mechanism)*.
- The Technology Mechanism with its Technology Executive Committee and the Climate Technology Centre and Network (CTCN) will continue to facilitate the implementation of enhanced action on technology development and transfer to support Parties in mitigation and adaptation actions including for agriculture *(See Option 2: Strengthening agricultural adaptation actions within the technology transfer and capacity building processes)*.
- Parties agreed at COP21 to establish the Paris Committee on Capacity-building with the aim to address gaps and needs for capacity-building in developing countries. While this work still has to begin it also offers an opportunity to include agriculture in regard to capacity-building.

While achieving synergies among these programmes and mechanisms is possible, it will not be purely from an agriculture perspective as none of these programmes and mechanisms has agriculture as their main focus.

Ways forward

This option can be achieved in conjunction with many of the other options outlined in this report. Also, in the absence of a SBSTA decision at SBSTA 45, in the case that Parties do not decide on any new steps under the agenda item on issues related to agriculture, rule 16 of procedure applies and Parties thus continue consideration of agriculture at the next session, SBSTA 46 in Bonn in 2017. A SBSTA decision on agriculture, such as a work programme as described in *Option 4*, would be expected to facilitate coordination with the other UNFCCC initiatives and mechanisms dealing with agriculture.

Pros

- The different programmes and mechanisms of the Convention offer a substantial number of avenues for dealing with many different aspects of agriculture, even without a decision in Marrakech on further work on agriculture.
- Funding of NAMAs and NAPs as well as NDCs can attract considerable funding under the Convention (GCF, GEF) and harness private sector funding leading to substantive progress on critical impact indicators.
- The agenda item on gender provides an excellent opportunity to cover the spectrum of actions on agriculture, given the prominence of women in agriculture and food systems.

Cons

- Taken alone, this option runs the risk of a highly fragmented approach to agriculture that will struggle to address synergies and trade-offs among the different contributions to food security, adaptation and mitigation provided by agriculture.
- The lack of rigorous, coordinated monitoring and evaluation under multiple instruments will make it difficult to assess progress.
- A fragmented approach will not attract the experts needed to ensure comprehensive coverage of agriculture.
- This option will not attract significant additional resources to the sector.

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This report presents ten options that Parties to the United Nations Framework Convention on Climate Change (UNFCCC) can consider in their deliberations on climate measures within the agricultural sector at the 45th session of the SBSTA in Marrakech in December 2016 .

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