1. What are the session key findings? What are the new Lesson(s) learned / Scientific progress (since AR5 release, if relevant)?

Nine papers were presented in this session. The papers examined adaptation and mitigation of climate change and sustainable ecosystem management using a broader approach that takes into account ecosystems embodied in landscapes. To understand the varying biophysical and socio-economic characteristics across the world, research of the papers was done at different geographical levels starting from global level and in the following regions: Sub-Saharan Africa, Latin America, Europe, and Asia to case study countries. The key findings are summarized below.

- There is need for improving climate change monitoring tools and methods in order to improve usefulness of monitoring essential climate variables for climate change mitigation purposes (Herold et al).

- Simulation tools that analyze the carbon budget and best practices could provide useful management options to achieve effective adaptation to and mitigation of climate change (Camus et al). Similarly water simulation models such as the Water Change Modelling System (WCMS) (Pouget et al) could provide support to decision makers in assessing potential future impact of global change on water resources and give guidance on the effectiveness of possible strategies of adaptation. For example, the Pouget et al study showed that by 2030 water deficit may reach 10% of the demand while in 2100 the deficit could reach 30% of the demand in 2014.

- Indigenous knowledge and involvement of local institutions are key to designing effective climate change adaptation and mitigation at landscape level. A study in Burkina Faso showed that farmers’ perception of change in precipitation was comparable with actual meteorological data. This suggests that indigenous knowledge could be used to advise farmers on strategies to adapt to climate change. Cabalzar also shows that indigenous peoples in the Amazon have developed detailed and sophisticated knowledge of the ecological processes, which could be used to design policies and strategies for sustainable ecosystem management and climate change. The results suggest that, rather than disseminating external knowledge for adaptation to climate change in a top-down approach, bottom-up indigenous knowledge could be used to design effective strategies for adaptation to climate change and conservation of ecosystems and biodiversity. Nkonya et al also found that degree of decentralization in sub-Saharan Africa increased the number of locally enacted byelaws related to adaptation to climate change.
Nkonya et al further showed that national level policies have a very strong influence on farmers’ adaptation to climate change.

- Using a case study from Indonesia, Meijer showed that there is large potential for private financing of ecosystem-based adaptation to climate change if appropriate incentives and regulations are created.
- Climate change is leading to greater coffee price volatility in Mesoamerica (Solano et al). One of the key farmers’ adaptation to such volatility is diversification in crop and other economic activities.
- Sea level rise is inevitable but a mixture of adaptation and mitigation strategies are always more effective than a single solution (Nichols).

2. **What are the major knowledge Gaps and Research Needs identified in the session?**

   - Actions taken to adapt to climate change at landscape requires a stronger understanding of beneficiaries and losers of such actions. Methods and approaches for analyzing the benefits and losses resulting from action or inaction of adaptation to climate change remain a major gap.
   - Even though biophysical scientists have made significant progress in analyzing adaptation to climate change, research in social-cultural aspect of landscape level adaptation remain weak and poorly funded.

3. **Did the session discuss/identify promising approaches in the fields of Adaptation and Mitigation, or both?**

   The major findings discussed above show the major approaches for adaptation and mitigation

4. **Are there take-home messages from the session?**

   *(When relevant, please specify targeted group of stakeholders. For example, policy-makers / COP21 negotiators, practitioners (experts, etc.), NGOs, private sector, citizens, media, etc.)*

<table>
<thead>
<tr>
<th>Take home message</th>
<th>Target</th>
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</thead>
<tbody>
<tr>
<td>Adaptation to climate change at landscape level requires the local people and institutions to take center-stage in designing solutions and actions</td>
<td>Policy makers, COP21 negotiators</td>
</tr>
<tr>
<td>The corporate businesses have a large untapped potential in financing adaptation and mitigation programs, but more cost-effective incentives are required to boost the current participation of the private sector</td>
<td>COP21 negotiators</td>
</tr>
<tr>
<td>More research required to develop better methods for monitoring climate change and required adaptation and mitigation actions.</td>
<td>Scientists</td>
</tr>
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</table>
5. **Are there Important Quotes from the session?**

“Let us approach the local people with open mindedness and readiness to learn from them, as they have a wealth of knowledge of climate change and ecosystems that have long been ignored and undiscovered.” (Ephraim Nkonya)

6. **Please include any other remark that you might have.**