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

How can we orient science education towards sustainable development? Four experts with extensive experience in Education for Sustainable Development (ESD) discussed this issue during a parallel session entitled ‘Climate Change Education for Sustainable Development – Towards holistic science education’.

There is a disparity today between science education that focuses on scientific knowledge and the need to act to address climate change. According to Professor Arjen Wals from Wageningen University, Netherlands, “Climate Change Education must be more than ‘learning to know’. It has to include an action component.”

Professor Wals stressed the importance of learning to think holistically – a missing piece in current education systems. “Making the issues and not the disciplines the starting point of learning is the way forward”, he said.

The importance of helping students apply their school-based learning to everyday life situations was a central recommendation by the panellists. “Scientific knowledge alone will not stop climate change”, stressed Mona Zoghbi, an Environmental Consultant from Lebanon. Climate change education must be relevant to local contexts that can empower people to act. Overson Shumba, Professor at the Copperbelt University in Zambia, further stressed the importance of focussing on ‘learning as connection’. Copperbelt University engages students in carrying out investigations on campus emissions.

The Sandwatch Network provides another blueprint for a holistic approach to science education for sustainable development. The project has engaged students, teachers and communities from more than 30 countries in active science education to protect their local beaches. Gillian Cambers, Director of the Sandwatch Foundation, addressed the challenges in partnering with a variety of stakeholders
and highlighted the need to undertake real action to keep communities engaged. She stressed that further work is needed to bring the broad concept of climate change to the local level.

The interactive discussion also highlighted the central role of teachers in holistic science education that promotes sustainable development. “Teachers need to be empowered to act as bridges between climate scientists, students and communities”, concluded Professor Shumba.

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

There is a disparity today between science education that focuses on scientific knowledge only and the need to act to address climate change. Despite the urgency of transitioning to sustainability, there is relatively little emphasis, within the science curriculum, on discussion or analysis of sustainability issues that permeate our contemporary life, and a lack of teaching and learning experiences that can foster the sense of wonder, curiosity and responsibility of many young people about the natural world.

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

For resilient, low-carbon societies and economies to become reality, individuals need to be able to engage critically with issues and arguments, which involve scientific knowledge. Education and awareness-raising play an essential role in increasing the climate change adaptation and mitigation capacities of communities by enabling individuals to make informed decisions. Education helps learners understand the causes and consequences of climate change, prepares them to live with the impacts of climate change and empowers women and men to adopt more sustainable lifestyles.

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

“We are drowning in information while starving for wisdom’ E.O. Wilson, 1998, p. 300)

Environmental systems are complex and changes are usually due to multiple causes, not a single cause. Climate change education for sustainable development should make science education holistic, relevant, and meaningful to the individual and should therefore be:

• **Context specific**: methods and approaches should as much as possible be designed or adapted to the local situation, preferably by the actors involved (ownership). Learning as connection’ is learning that has meaning to people’s lives and enables learners to make connections between school knowledge and everyday knowledge
• **Leading to change**: the process of joint analysis and dialogue helps to define changes, which would bring about improvement and seeks to motivate people to take action to implement the defined changes.
• **Commitment to equity**: empowering those who are marginalised, deprived, excluded, often especially women.
Also:
Citizen science can provide very useful data and information about environmental and climate change provided there are sufficient quality control safeguards. Teachers have to be empowered to act as bridges between climate scientists, students and communities.

5. Are there Important Quotes from the session?
See the quotes in section 1.

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