Appendix C
– The Three Horizons Framework for the SDGs (3H4SDG)

THE ICEBERG
A Tool for Guiding Systemic Thinking

EVENTS — React
What just happened?

PATTERNS/TRENDS — Anticipate
What trends have there been over time?

UNDERLYING STRUCTURES — Design
What has influenced the patterns?
What are the relationships between the parts?

MENTAL MODELS — Transform
What assumptions, beliefs and values do people hold
about the system? What beliefs keep the system in place?
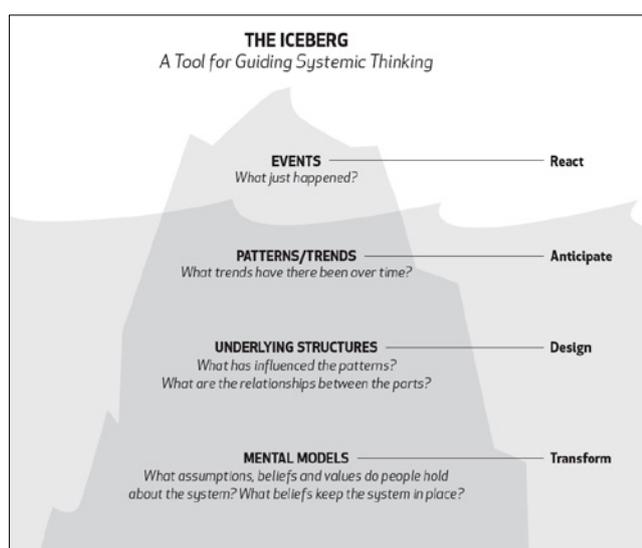
Figure 14: The iceberg metaphor of transformations.
Source: https://nwei.org/iceberg/

In relation to our work with the 2nd African Dialogue on TWI2050, we developed the workshop method The 3 Horizons Framework for the SDGs (3H4SDG). It was developed within the framework of The *World in 2050* (http://twi2050.org). The aim of the method is to cultivate the discovery of integrated pathways for reaching the 2030 Agenda's Sustainable Development Goals (SDGs) within planetary boundaries. The focus is on pathways that bring about transformational change. The method originated from the 3 Horizons framework (Sharpe et al. 2016), Aguiar (2015) and Folhes et al. (2015) and was inspired by SwedBio's Multi-Actor Dialogue Seminars as presented in Schultz et al. (2016), as well as systems thinking (Booth Sweeney and Meadows 2010; Meadows 2008; Reynolds and Holwell 2010). For further details, see Collste et al. (2019) and Aguiar et al. (in prep) where the framework was first published.[8]

Below, we present practical details related to the method as it was used during the Second African Dialogue on The World in 2050.

Preparations

This section presents the workshop preparations, including group divisions, roles, materials and evaluation.

Groups

The ideal size for break-out groups may vary between the conditions for the dialogue. One risk of a too big group is that participants may become silent and some participants may be left out of the discussions. Too small group sizes may on the other hand harm the diversity of the discussions as not enough of different perspectives are present. Also, there are practical difficulties in the sense that all participants should be able to actively engage with the 3 Horizons diagrams used in the dialogue. If the whole group is not more than 5–10 people, it may be favourable to not divide into break-out groups.

At the Second African Dialogue on TWI2050, we chose to divide the groups according to a (spatial) scale criteria. We had four geographically determined groups based on Sub-Saharan African regionalization from the African Union and the participant group (see Figure 15):
– West and Central (combining the two African Union zones),
– East,
– Southern, and
– African continent (Sub-Saharan).

The division of participants among the groups took into consideration various aspects such as location of the participant, professional background and the practical requirement of having manageable groups. Each group consisted of around 5-10 participants which facilitated inclusive discussions and participation. Each group was assisted by two co-facilitators.

Roles

The **participants** are the most important delegates at the dialogue as they are the knowledge and value bearers carrying the roles as experts that provide the content to the facilitated processes. Participants are expected to come prepared by considering the questions for the different steps of the workshop and reading background materials. In the Second African Dialogue, background materials included the report from the First African Dialogue on The World in 2050 (SDGC|A and SwedBio 2018).
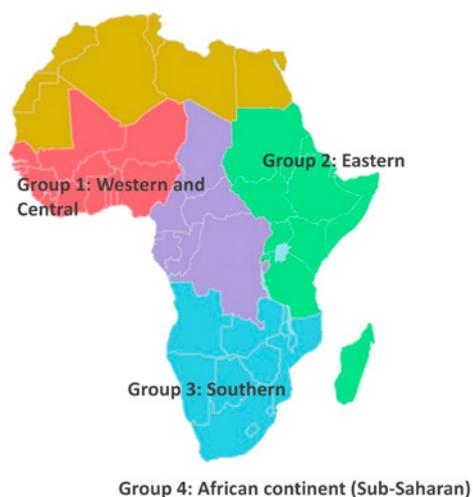
Figure 15: The geographic group division during the 2nd African Dialogue

Throughout the dialogue, participants are expected to participate actively during all steps. After the dialogue, participants are asked to review the draft report or other resulting materials.

The **facilitators'** role is to guide the respective groups through the dialogue steps and support a discussion atmosphere in which all participants are participating actively. An assigned facilitator is to act as an overall feedback provider for the facilitator team. The facilitators are there only to facilitate the process, not to give their opinions (this holds even if they would happen to be experts).

Plenaries moderator: if the group is divided to break-out groups, it may be good to appoint a plenaries moderator or overall facilitator. During the Second African Dialogue, the plenaries moderator rotated between the break-out groups during the break-out sessions to assist the facilitators and clarify any confusions between the groups.

Materials

The following is a general list to be adopted to the local circumstances and needs. During the Second African Dialogue, the following was provided for each break-out group:

– Big roll-out papers to construct the 3 horizons framework diagrams that could be around 2 x 3 meters to have enough space for the participants' inputs to the diagrams.
– Flip charts or white boards for taking notes of divergences and convergences across scales and other upcoming topics that facilitators can take note off.
– One computer and projector per room (for projecting the questions to be discussed, eventual searches on the internet and writing of the stories).

– Big (but not too big) post-it notes in different colours – having the colours representing different themes to be addressed in each step, e.g. based on divisions of the SDGs. The goal with the colouring is to provide some structuring to the discussion across all steps and ensure that for example social, ecological and governance dimensions are covered across the groups. During the Second African Dialogue, four colours were used: orange representing Governance (SDGs 16–17), green representing Environment (SDGs 13–15), yellow representing Economy (SDGs 7–12) and pink representing Society (SDGs 1–6) – see Figure 16. This division was inspired by the domains spelled out in the 2030 Agenda resolution (UN 2015): People, Planet, Prosperity, Peace and Partnership (peace and partnership being represented by an overarching governance domain). These divisions are generally applicable, but there may however be many other useful divisions depending on local circumstances for the dialogue.

Figure 16: Division of SDGs used during the 2nd African Dialogue on TWI2050.

Evaluation

At the end of the workshop, a facilitated evaluation session has two purposes. It can provide the participants with time to reflect upon the dialogue process. Also, it provides the organisers with feedback to improve the dialogue process for future dialogues or replications.

The steps

The dialogue can be divided into three STEPS – see Figure 17 (STEP 1 focusing on Horizon 3, STEP 2 on Horizon 1 and STEP 3 on Horizon 2. The Horizons were however not mentioned to the participants to not confuse the process). Each break-out group follows all the dialogue steps. During the Second African Dialogue, the first two steps took place during the first day and the final third step during the second day of the Dialogue.

After the presentations, groups were asked to discuss similarities and differences between the pathways they had developed in their first steps on the one hand and the global stories on the other.
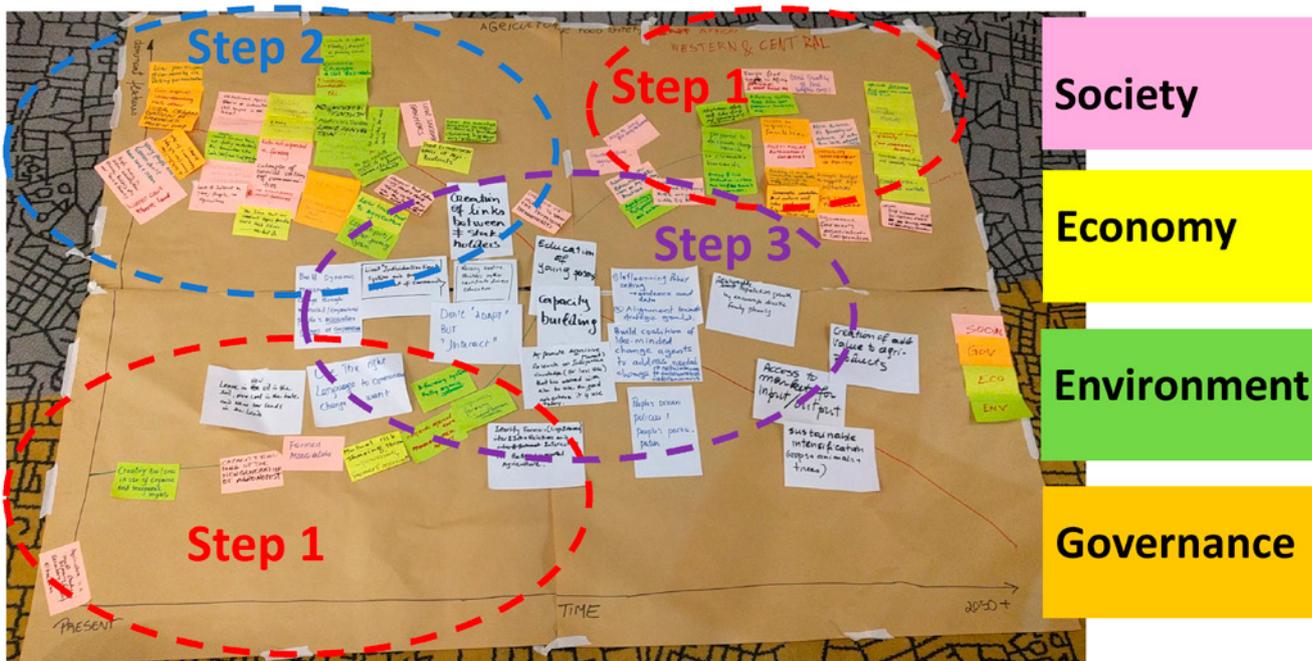
Figure 17: The final 3 Horizons diagram, with the parts emerging from the three steps noted with the dashed circles.

Step 1: Visions for future

The first STEP of the workshop focuses on the upper right and lower left corners of the 3 Horizons diagrams (for reference see Figure 17). The step concerns the visions for the future. In the case of the Second African Dialogue visions for future agriculture and food systems.

The overarching questions that guided the first step at the Second African Dialogue were:

– *What are your visions for the future agriculture and food systems? and*
– *What seeds do you see in the present agriculture and food system that support your future vision?*

The section begins with very brief introductions by the participants, followed by brief explanations of the step by the facilitators. If possible, the step's overarching questions can be displayed so that the participants see them all the time. At the Second African Dialogue, the questions were displayed to each group via projectors.

Thereafter, participants are asked to use post-it notes to write down key words and sentences regarding the first of the two overarching questions. At the Second African Dialogue, the post-it notes were color-coded (as displayed in Figure 16) to address different themes related to the food systems and for the group to get an overview if categories within different themes had been discussed. Participants' may be given a few minutes of silence to address the questions raised and write down key thoughts. Then, participants present their post-it notes for the rest of the group and put them down on the 3 Horizon diagrams. To initiate the

process and to facilitate inclusion and participation among group members, participants may be asked to present their results in two rounds before the discussion is more opened. While presenting the post-it notes, participants put them in the upper right corner of the 3 Horizons diagrams.

To facilitate a discussion that integrates different themes, the facilitators can keep track of the colours of the post-it notes that are being added.

If participants have different views on anything, the facilitators may take note of these on a separate flip-chart and highlight these so-called divergences for the group. The divergences may relate to differences in world views or inconsistencies between the desired future and actions being proposed. Besides the flip-charts, the diverging post-it notes can be marked with a triangle symbol: $\triangle$ or a star * in the diagram. Such divergences could represent pathway branching points[37].

After having had a few rounds and letting the participants of the respective groups discuss the questions and add post-it notes to the Horizon 3 diagram, the group may be asked to use the 3 Horizons diagram to create a **story.** The story can take various forms and creativity is sought. It may be in the form of a written text about the desired future, a letter from the future, a picture or painting. During this story phase of the discussions, the co-facilitators may leave the group to encourage participants' ownership of the outcomes.

The "physical **outcome**" of the first Step of the process is both the **3 Horizons diagram** with all the participants' inputs, the **story** that they collaborate on and the divergence list (if divergences arise).
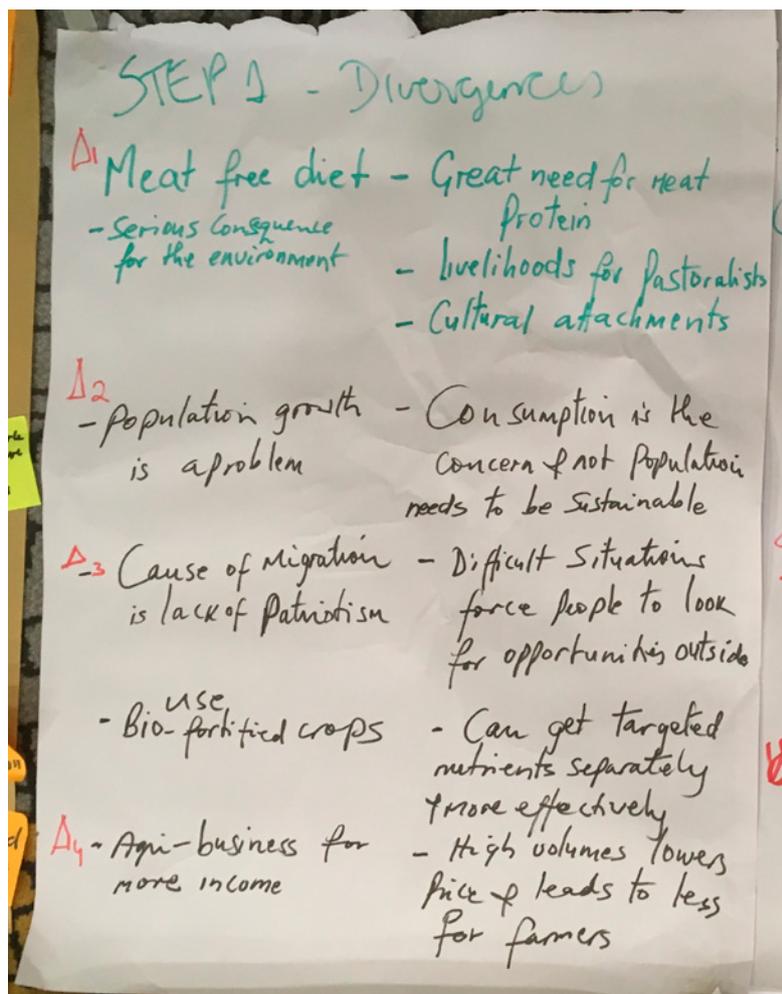
Figure 18: List of divergences from one of the groups at the Second African Dialogue.

After this, the same procedure can be followed for the second overarching question for Step 1 (in the African Dialogue case: *What seeds do you see in the present agriculture and food system that support your future vision?*). This time, post-it notes are in general placed in the lower left corner of the 3 Horizons diagram, but participants are free to put them where they think fit. The key is the quality of the discussion, not the precise following of procedures.

Step 2: The present concerns

Step 2 focuses on **present concerns**. The overarching question that guided the second step at the Second African Dialogue was:

– *What are the challenges facing agriculture and food systems in your region today?*

The procedure of Step 2 is similar to Step 1 and the participants use the same 3 Horizons diagrams to map out concerns in the form of post-it notes. This time, when the post-it notes have been added, they are to be clustered into related issues.

The next focus is root causes. The facilitators ask the participants about the root causes of the present concerns, using the iceberg in Figure 14 as a metaphor to facilitate the discussions.

In the end of the session, participants are asked to write or illustrate a story of the outcomes of the discussions. Again, the stories may be in the form of a letter, a newspaper article, several newspaper headlines or hashtags or other ideas that the participants come up with. To facilitate cross-scale interactions, by the end of the first day of the Second African Dialogue, the groups were rotating between each other. This made all groups visit each of the other groups.

The second day of the Second African Dialogue began with two presentations of global perspectives for Africa based on The World in 2050 report (IIASA, 2018), presented in plenary. The presentations were based on the question: *What do global scenarios say about how Africa can reach the SDGs?* The presentation was developed and delivered by Dr. Ana Paula Aguiar from Stockholm Resilience Centre.

Step 3: How to break the undesired futures and the undesired present to reach the desired futures

The third step focuses on transformational change needed[38].

The overarching questions may be formulated as:
– *How do we change the present system to transform to the desired futures? and*
– *Which measures and actions are required (considering the root causes)?*

In this step, the focus is on the area in the middle of the 3 Horizons diagram – on the change from the current system to the future and what is required for the transformation to take place. For this step, only one-coloured papers may be used. This because Step 3 differs as the focus is on change and not parts of the current dominating or future desired systems.

The first round may focus on the following question:
– What actions and measures are needed to reduce the present core challenges and their root causes in order to reach the vision?

And the second round may focus on:
– What actions and measures can be taken to upscale the seeds?

After having noted down answers on post-it notes as in the previous steps and added them to the diagram, the final part of the dialogue is left: for the participants to write a story or summary that connects all the steps and organise material on convergences and divergences to be used for the presentations for the other groups.

Final plenary and conclusion

In the final plenary discussion, each group presents the results of STEPs 1, 2 and 3. They also present convergences and divergences across scales and with the other groups.

The presentations may be structured as follows:
– Read the textual descriptions (Step 1, Step 2 and Step 3)
– Present the core elements of the steps
– Present the identified divergences in pathways inside the group and in relation to the global pathways.
– Discuss among them and with the audience.

After the dialogue: the synthesis of convergences and divergences

After the dialogue, the organisers may gather the materials and transcribe the 3 Horizon diagrams. Also, stories and convergences and divergences may be analysed and compared between the different groups. This is basically an iterative analysis, using auxiliary tables and some core factors and themes to guide.

References for Appendix C

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References and notes

1. Existing scenarios include those of the Integrated Assessment Models (IAMs). These are simplified, stylized numerical approaches to represent enormously complex physical and social systems. See the IPCC's Working Group III (WG3).

2. TWI2050 – The World in 2050 (2018). Transformations to Achieve the Sustainable Development Goals. Report prepared by The World in 2050 initiative. IIASA Report. International Institute for Applied Systems Analysis (IIASA). Laxenburg, Austria. Available at: http://pure.iiasa.ac.at/15347

3. IPCC special Report on Global Warming of 1.5°C. Available at https://www.ipcc.ch/sr15/Fazey, I. et al., 2016: Past and future adaptation pathways. Climate and Development, 8(1), 26-44, 37 doi: 10.1080/17565529.2014.989192

4. Seeds are initiatives of a good future that are exiting in the present, but to a smaller scale.

5. SDGC|A and SwedBio. 2018. The African Dialogue on The World in 2050: How Can Agriculture Contribute to Meeting the SDGs? Report on a Multi-Actor Dialogue for TWI2050, 28–29 August 2017, Kigali, Rwanda. Sustainable Development Goals Center for Africa and SwedBio/Stockholm Resilience Centre at Stockholm University.

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7. https://www.weforum.org/agenda/2016/05/70-of-africans-make-a-living-through-agriculture-and-technology-could-transform-their-world/

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10. Sharpe, Bill, Anthony Hodgson, Graham Leicester, Andrew Lyon, and Ioan Fazey. 2016. Three Horizons: A Pathways Practice for Transformation. Ecology and Society 21(2). http://www.ecologyandsociety.org/vol21/iss2/art47/, accessed November 27, 2018.

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15. For more information and other applications of the framework, please see: Sharpe, B., A. Hodgson, G. Leicester, A. Lyon, and I. Fazey. 2016. Three Horizons: a pathways practice for transformation. Ecology and Society 21(2):47. http://dx.doi.org/10.5751/ES-08388-210247 H3 Uni: A university for the third horizon.2018. http://www.h3uni.org Kate Raworth is presenting the use of 3Horizons in the following video: https://www.youtube.com/watch?v=_5KfRQJqpPU

16. United Nations. 2015. Transforming Our World: The 2030 Agenda for Sustainable Development. Resolution Adopted by the General Assembly on 25 September 2015. A/RES/70/1. Available at http://undocs.org/A/RES/70/1

17. One of the participants added some comments after the workshop. Because these comments changed the content of the report, we do not include them in the tables. These comments related to Table 3:
   • Affordable locally produced food crops are accessible to all.
   • Easily accessible markets (for agricultural products and for farmers to purchase farm inputs)
   • Economy at service of society (not other way around)
   • Subsistence agriculture will completely transform (increase productivity and crop quality)
   • Reinforcing intra-African markets.
   The same participant also noted that subsistence farmers are not a feature of this future. The participant also commented on the zero CO2 emissions: "we need to be realistic: Energy for food production is clean with reasonable CO2 emissions (not zero)". To the point "A farming system fully organic", the participant added: An integrated farming system that includes organic and reasonable use of chemical inputs.

18. One of the participants added some comments after the workshop. Because these comments changed the content of the report, we do not include them in the tables. This comment related to Table 4:
   • The participant suggested the following point: Old-fashioned education to be replaced by to Old-fashioned agricultural extension method

19. The original one was "Towards a Food Secure, Peaceful and Prosperous East Africa"

20. This step of the exercise is important as a preparation for discussing the actual pathways (and eventually to inform future quantitative/modeling analysis). In future dialogues, we will explicitly include the development of causal diagrams in the process (see Conclusion section – Recommendations for future dialogues).

21. Following the STEPS centre paradigm of first "opening up" to multiple perspectives, appreciating the existing pathways: https://stepscentre.org/wp-content/uploads/STEPS_Pathways_online1.pdf

22. For further information about this topic, see the DIE report: "Beyond the Agroecological and Sustainable Agricultural Intensification Debate: Is Blended Sustainability the Way Forward?", Jonathan Mockshell and Josey Kamanda, Discussion Paper / Deutsches Institut für Entwicklungspolitik ISSN 1860-0441, Bonn, 2018.

23. For further information, please contact: Youngfarmersinitiative@gmail.com, +250787694467

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25. FAO 2017. The future of food and agriculture. Trends and challenges. Rome: Food and Agriculture Organization of the United Nations.

26. WHO 2015. World report on ageing and health 2015. Geneva: World Health Organization.

27. According to the IPCC's Working Group III (WG3), Integrated models are simplified, stylized numerical approaches to represent enormously complex physical and social systems. Important input assumptions include population growth, baseline economic growth, resources, technological change, and the mitigation policy environment. However, they do not structurally represent many social and political forces that can influence the way the world evolves. The models use economics as the basis for decision making. This may be implemented in a variety of ways, but it fundamentally implies that the models tend toward the goal of minimizing aggregate economic costs of achieving mitigation outcomes. The models also] typically assume fully functioning markets and competitive market behavior.

28. Parkinson, S., Krey, V., Huppmann, D., Kahil, T., McCollum, D., Fricko, O., … Riahi, K. (2019). Balancing clean water-climate change mitigation trade-offs. Environmental Research Letters, 14(1), 014009. https://doi.org/10.1088/1748-9326/aaf2a3

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30. Rogelj, J., Popp, A., Calvin, K. V., Luderer, G., Emmerling, J., Gernaat, D., … Tavoni, M. (2018). Scenarios towards limiting global mean temperature increase below 1.5 °C. Nature Climate Change, 8(4), 325–332. https://doi.org/10.1038/s41558-018-0091-3

31. The Shared Socioeconomic Pathways (SSPs) were developed by the global change research community, to be used by the Intergovernmental Panel on Climate Change (IPCC). The SSPs are based on five different development routes for societal trends: i.e., sustainable development (SSP1), global fragmentation (SSP3), strong inequality (SSP4), rapid economic growth based on a fossil-fuel intensive energy system (SSP5) and middle of the road developments (SSP2). Each of the SSPs has been elaborated in a storyline and quantified using models. These storylines can be combined with different assumptions about climate policy to form a larger context of socioeconomic development and level of climate change (see for instance, Riahi et al., 2017 and Rogelj et al., 2018). The sustainable development scenario (SSP1) combined with stringent climate policy is a scenario exploring the route towards a more sustainable world—although the SDGs were not targeted in its development (Zimm et al, 2018). Sources:
Riahi, K., van Vuuren, D. P., Kriegler, E., Edmonds, J., O'Neill, B. C., Fujimori, S., … Tavoni, M. (2017). The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview. Global Environmental Change, 42, 153–168. https://doi.org/10.1016/j.gloenvcha.2016.05.009
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Zimm, C., Sperling, F., & Busch, S. (2018). Identifying Sustainability and Knowledge Gaps in Socio-Economic Pathways Vis-à-Vis the Sustainable Development Goals. Economies, 6(2), 20. https://doi.org/10.3390/economies6020020

32. In fact, in one of the plenaries there was a comment that African concerns are more focused on adaptation than on mitigating (other countries') emissions (and leading to questions about which compensation mechanisms would be in place and how this would affect small farmers)

33. Collste, D., Pedercini, M., & Cornell, S. E. (2017). Policy coherence to achieve the SDGs: using integrated simulation models to assess effective policies. Sustainability Science, 12(6), 921–931. https://doi.org/10.1007/s11625-017-0457-x

34. A significant point in the design of the Second Dialogue was that funding was not provided for the invited stakeholders to travel to Kigali, so most of the accepted invitations came from Eastern Africa (although many were born or experts in the other regions). Maybe as a result of this, the division of groups according to a geographic criteria proved useful for fostering the emergence of diversity between the pathways, but it did not lead to regional specificities in general. The gender ratio of the event was not balanced – 7 women: 24 men (23%).

35. In fact, during the last phase of preparation of this report, we learned one of the participants actually applied the method to discuss pathways to the SDGs in an Italian city. See: https://twitter.com/JacopoBencini/status/1096833769301032960 and https://twitter.com/GiovaGraziani/status/1096728194739290112

36. Schultz, M., T. Hahn, N. Hällström, and C. Ituarte-Lima. 2016. The Biggest Single Opportunity We Have Is Dialogue-Dialogue Seminars as a Methodology for Transformative Social Learning and Conflict Resolution in International Environment Negotiations, SwedBio at Stockholm Resilience Centre. This Is a Modification of a Paper with a Similar Name under Review in International Journal of Biodiversity Science, Ecosystem Services & Management.

37. Such divergences and branching points could for instance be a rural versus a total urban future; industrial versus agroecology; large scale versus small farms, land sharing versus land sparing; farmers subsidies like in the US and EU or not.

38. At the beginning of the third step of the Second African Dialogue, the break-out groups compared the content of their diagrams with the global scenarios that had been presented. They were asked to consider what was common and what was different between the global model scenarios and the pathways discussed by the participants. The facilitators noted the divergences on a flip chart. Also, the groups went back to consider the root causes that had been noted down during Step 2.