

## Appendices for the manuscript:

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## Appendix A – Three Horizons results for STEPs 1, 2 and 3<sup>1</sup>

**Table A.1** - Three Horizons STEP 1 results: Desired futures. Red/italics \* means divergence inside the group.

	Ubuntu (local-regional)	P&PEA (local-regional)	Urugendo (local-regional)	Rainbown (pan-african)
SOCIETY	<p>People feel safe in Africa.</p> <p>Good quality of food (<i>yes/no GMO*</i>).</p> <p>Multipolar autonomous societies.</p> <p>Africa embraces its diversity and enhance it rather than look outward always.</p> <p>Dynamic farmers' association &amp; cooperatives.</p> <p>Creation of hubs to show the promising technologies.</p> <p>Access to land for everyone (women).</p> <p>Gender equal agriculture.</p> <p>Rebranding our education institutions on agriculture practice.</p> <p>Agriculture is embraced by young people as a good viable business pathway.</p> <p>Agriculture is a must - study in primary &amp; secondary education.</p> <p><b>Seeds of this future in the present:</b></p>	<p>Eastern African people (80%) are food secure (access, nutrition, vanity).</p> <p>Smallholder farmers mainstream into market economy.</p> <p>A great proportion of the population (90%+) is sustainably food secure and enjoys higher quality of life.</p> <p>Gender mainstreamed across agricultural value chains (100%).</p> <p>Empowered farmers &amp; technicians.</p> <p><i>Smaller family size (maximum 2 children/family) *</i></p> <p>Strong collaboration.</p> <p><b>Seeds of this future in the present:</b></p> <p>Youth empowerment programmes.</p> <p>JP – RWEE (Rural women economic empowerment joint program) promotes:</p> <ul style="list-style-type: none"> <li>- Food &amp; nutrition security</li> <li>- Access to finance</li> </ul>	<p>Highly food secure society.</p> <p>Society without any hunger 2050.</p> <p>A strong and sustainable agricultural sector with perfect food systems feeding the entire African society and the world.</p> <p>Agriculture as a way to foster inclusion/empower youth, women, marginalized communities</p> <p>Increased adoption of technology for data collection and analysis (e.g. for soil analysis).</p> <p>Agriculture attractive for youth.</p> <p><b>Seeds of this future in the present:</b></p> <p>Educated youth going into agriculture more now than hitherto – practicing agriculture as a business.</p>	<p>Empower Africa - Human capital development in order for people to make decisions and the right choices they need to be informed. African led decisions based on the context. Giving knowledge and empower skills rather than depending on foreign support. A competitive society that can execute sustainable policies, &amp; programs.</p> <p>People mindset change leading to a more aware and educated society to lead to different approaches and beliefs.</p> <p>People become well aware of benefits of family planning.</p> <p>Food secure society with diversified diets, access to water and good stewardship of water resources.</p> <p>More inclusive development (gender balance, equality, etc.).</p> <p><b>Seeds of this future in the present:</b></p> <p>Mastercard Foundation: youth empowerment initiative: funding for higher studies abroad.</p>

<sup>1</sup> Tables B.1, B.2 and B.3 are the exact transcriptions of the Three Horizons Diagrams as elaborated by participants. Please refer to the Dialogue report to understand the process (Aguiar et al., 2019). We provide the transcripts of participants' materials without further editing.

	Capacity building of the new generation of agronomist.  Farmers associations.	- Gender based policies, etc.  Empowering rural women & some men in 7 countries including Rwanda, Ethiopia, through agriculture (funded by Sida &...). Capacity building (farmers + technicians).		
ECONOMY	Affordable indigenous food crops are accessible to all.  Easily accessible markets.  Economy at service of society (not other way around).  Subsistence agriculture will completely transform.  Creating intra-African markets.  Seeds of this future in the present:  Mutual risk sharing through empowering farmers' association.	Value addition through food processing -> easy food distribution.  Eastern Africa not relying on rain-fed agriculture 50% of arable land irrigated (2030).  Improved agribusiness between Eastern African countries. Leading to:  - Employment  - Economic growth  - Labour mobility  Inclusive growth and shared prosperity.  Land conservation.  infrastructures put in place.  Less inputs (mineral) in agricultural production.  Eastern African Community integrated.  Large scale commercial farming projects.  Reduced reliance on external funding to agricultural development.	A strong agriculture sector with economically empowered farmers and farming communities.  Investing in food storage facilities by the private sector like cooperatives and other investors.  A well-integrated agricultural sector with better farming practices. that are environmentally friendly.  Agriculture sustaining a sizeable number in towns living as well of the driving sector of the economy.  Safe and sustainable food processing and conservation technologies in place.  Promote seeds quality - seed quality means quantity.  Highly productive agriculture whose contribution to GDP had decreased due to increased share of other sectors.  Private sector led agriculture and food systems with government only playing regulatory function.  Favourable terms of trade (internal and external) for African farmers so that they can fully benefit from production.	Priority given to promoting home grown agriculture and local knowledge.  More skilled people encouraged to go into agriculture.  Market oriented value chains and agribusiness that provide sustainable income from agriculture.  Agricultural production that meets demand of a growing population and urbanization.  Well-developed infrastructures (transport, ICT, energy) that support agricultural system.  Equitable access to finance.  <b>Seeds of this future in the present:</b>  Rwanda: Land consolidation program and crop intensification program.

		<p><b>Seeds of this future in the present:</b></p> <p>RYAF (Rwanda Youth in Agribusiness Forum) Investment in irrigation infrastructure.</p> <p>Kenya climate smart agriculture project.</p> <p>National agriculture rural inclusive growth project.</p>	<p><b>Seeds of this future in the present:</b></p> <p>Mobile tech-based payment/ transfer systems (similar to Kenya's MPESA*) applied to agricultural production may help farmers keep higher values shares.</p> <p>Government of Uganda has initiated E-voucher system invested in agro-processing facilities and distribution of inputs to farmers for increased production.</p> <p>Kenyan government invests in large- and small-scale irrigation to reduce dependence on rain fed agriculture (1.2 million acres to date).</p>	
ENVIRONME NT	<p>Agroecology fully understood and embraced.</p> <p>Adaptation efforts will take shape and vulnerability reduced.</p> <p>Prepared to climate change hazards.</p> <p>Energy for food production is clean and less (zero) CO2 emissions.</p> <p>A farming system free from poisonous pesticide use.</p> <p>Creating balance in use of organic and inorganic inputs.</p> <p>Seeds of this future in the present:</p> <p>A farming system fully organic.</p> <p>Organic agriculture.</p> <p>Minimal chemical inputs.</p>	<p>Value addition of agricultural products.</p> <p>Finance availability in agricultural sector.</p> <p>Environmentally friendly green revolution (sustainable agriculture).</p> <p>Increased agricultural production: quality + quantity (sustainability).</p> <p>Climate smart agricultural practices.</p> <p><b>Seeds of this future in the present:</b></p> <ul style="list-style-type: none"> <li>- Fruit trees</li> <li>- Irrigation</li> <li>- Green houses</li> <li>- Improved farm inputs</li> </ul>	<p>Improved land husbandry and water management systems plus use of organic fertilizers and pesticides not harmful to the environment.</p> <p>Increased agricultural land through good land management.</p> <p>Cultivate enough of all types of food.</p> <p>Soil which is fertile and free of diseases.</p> <p>Urban food forests.</p> <p><b>Seeds of this future in the present:</b></p> <p>Land consolidation in Rwanda.</p> <p>Existence of environmental laws and policies in most countries.</p>	<p><i>Biofortified crops are promoted (non-GMO). *</i></p> <p>Good quality and resilient crop varieties with high level of productivity are cultivated.</p> <p>Environmentally friendly agricultural practices.</p> <p>Environmental protection, and restoration.</p> <p><i>Diversified diets (e.g. fish, aquaculture, etc.) *</i></p> <p>Reduction/ban of plastic use to protect the environment.</p> <p>Seeds of this future in the present:</p>

	Sustainable farming: natural fertilizers and pesticides.			
GOVERNANCE	<p>Access to logistic facilities.</p> <p>Community involvement in policy.</p> <p>Funding is made available with little or no interest subsistence farmers.</p> <p>Enough budget to support agriculture initiatives.</p> <p>Democratic constitutions and culture will take root. Self-help collaborations will have role.</p> <p>Good legal framework.</p>	<p>Post-harvest handling &amp; storage.</p> <p>Good roads to farms / accessibility.</p> <p>Sustainable agriculture mechanization &amp; improved agricultural infrastructures.</p> <p>Private sector led agriculture.</p> <p>Agricultural policies (put in place) &amp; implemented.</p> <p>Streamlined systems &amp; structures for agriculture and food systems.</p> <p>By 2050 regional (Eastern African Community) cooperation in all aspects of agriculture.</p> <p>Evidence based policies and decisions.</p> <p>Data &amp; info</p> <ul style="list-style-type: none"> <li>- generated by communities</li> <li>- used by communities</li> </ul> <p>Sustainable intensification.</p>	<p>To have countries without any war so that farmers can cultivate more.</p> <p>Policy that promotes competitive, profitable and progressive farm business (adequate supply).</p> <p>Eliminate inter-African market access barriers to promote stable agricultural trade.</p> <p>Climate resilient sustainable food production to be developed through regional cooperation.</p> <p><b>Seeds of this future in the present:</b></p> <p>Existing cooperation through regional economic cooperation is promising. Non-conflict production and exchange.</p>	<p>Capable states, and strong institutions that can deliver, with a functioning structure and accountable to their citizens.</p> <p>Political will leading to a political environment that accommodates different views and it is receptive to changes – context specific.</p> <p>Effective land use planning and management, together with prioritization and zoning: based on AEZs African governments come up with tailored plans to guide agricultural planning and transformation.</p> <p>Policies and regulations that enable participation of different stakeholders for meaningful contribution toward sustainable development.</p> <p>People-led development programmes: having a space for bottom up initiatives/people centered approach for increasing sense of ownership.</p> <p>Political decisions are made based on scientific and grounded evidence.</p> <p>Policies and legislation are made with environment at the centre of the development.</p> <p>Agricultural institutions are decentralized and close to farmers.</p> <p>Effective agricultural policies are developed and implemented.</p>

				Seeds of this future in the present: In Rwanda: young people (engaging) in the political system
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**Table A.2** - Three Horizons STEP 2 results: **Present Concerns** (pink – society concerns, blue – economy/infra-structure concerns, green – environmental concerns, orange – governance or overarching concerns). **Red \*** means divergence inside the group.

Ubuntu	P&PEA	Urugendo	Rainbow
Collapse of social values of communities	Gender imbalances	Low uptake of ICT	Poor quality of education
Growing inequalities	Conflicts between agriculture and urbanization	Low inappropriate techniques +skills	Lack of universal health and education
Disconnect between technology and indigenous knowledge	Low adoption of technology	Inadequate infrastructure	High population growth*
Land degradation	Inadequate infrastructure for market access	Inefficient market system which does not support farmers	Low human capital
Climate change	Inadequate funding/financing	Lack of appropriate financing	Migration/brain drain*
Failing crops/less yield	Weak research and extension linkages	Environmental degradation	Ignoring indigenous knowledge
	Environmental degradation*	Lack of multi-sector approach (planning)	Lack of access to infrastructure (roads, IT, energy)
	Food insecurity	Lack of enabling policies & legal frameworks	Limited access to finance
	Inadequate sectorial coordination	Institutional weaknesses	Land/forest degradation
	<b>Root causes:</b>		Idle/unused local resources
	Low dissemination of research.		Climate change
	Limited research infrastructure.		Power inequality
	Prioritization and low demand driven agenda.		Corruption/ abuse of power
	Inadequate value addition.		<b>Root causes:</b>
	Law & policies. Poor governance.		(see Table 11 in the Report; Weak governance and lack of strong institutions repeated 6 times)
	Lack of capacity.		
	Population pressure.		
	Culture.		
	Limited arable land.		
	Low productivity.		
	Soil nutrition depletion (environmental degradation).		

**Table A.3** – Three Horizons STEP 3 results: Actions to reach the desired future. *Red/italics* \* means divergence inside the group.

	<b>Ubuntu (local-regional)</b>	<b>P&amp;PEA (local-regional)</b>	<b>Urugendo (local-regional)</b>	<b>Rainbown (pan-african)</b>
<i>Short-term actions</i>	<p>Intensify farmers' Inter- &amp; intra- relations and interaction for better communal agriculture.</p> <p>Education of young persons</p> <p>Capacity building</p> <p>Raising creative thinkers rather than certificate driven education</p> <p>Intensify farmers' Inter- &amp; intra- relations and interaction for better communal agriculture.</p> <p>Build dynamic movements for change through improved/empowered people's association groups or cooperatives</p> <p>Build coalition of like-minded change agents to address needed change: Networking, Collaboration and Alignment</p> <p>Creation of links between stakeholders</p> <p>Leaving new oil in the soil, new coal in the hole and new tar sand in the land</p> <p>Limit "Individualization" system and promote engagement of community</p> <p>Use the right language to communicate change we want</p> <p>Don't "ADAPT" BUT "Interact"</p> <p>Promote attentive research on indigenous knowledge (for local use) that has waned with aim to use and enhance it for use today.</p>	<p>Change in education system</p> <ul style="list-style-type: none"> <li>- Focus on early education</li> <li>- More value to service to communities</li> </ul> <p>Capacity building.</p> <p>Youth education to add SDGs in curricula sustainability courses.</p> <p>Women &amp; youth involvement.</p> <p>Farmers' empowerment.</p> <p>Add value in communities</p> <p>Increase national budget for agriculture beyond Malabo/Maputo threshold.</p> <p>Reinforcement of minimum forest cover (move from talk to action).</p> <p>Stop current conversion of agricultural land to commercial/residential property.</p> <p>Strengthen PPP model in agriculture.</p> <p>Improve market for agriculture.</p> <p>Alive – agroforestry for livelihood, empowerment.</p> <p>Research in integrated approaches.</p> <p>Advocacy + lobby.</p> <p>Funds mobilization (own funding).</p> <p>Nutrition sensitive agriculture.</p>	<p>Provide training to smallholder farmers.</p> <p>Provide better education.</p> <p>Farmers organize learning and exposure visits for benchmarking.</p> <p>Training on how to use technology.</p> <p>Set up agro-processing facilities and hand them to farmers for use.</p> <p>Increased provision of extension services.</p> <p>Form and implement insurance policy and subsidy to agriculture.</p> <p>Improve management of farmer organisations.</p> <p>Formulate legal and policy frameworks to streamline governance systems in farmer organizations.</p> <p>Small- and large-scale irrigation.</p> <p>Government and private sector investing in irrigation systems.</p> <p>Government increase budgetary allocation to agriculture support to boost the sector.</p> <p>Develop spatial plans.</p> <p>Support farmers to access domestic and external markets.</p>	<p>Actions that can be managed with a certain degree of decentralization, such as development of infrastructure, water access and energy systems</p> <p>Actions that require coordination at national level in order to be implemented, such as implementing educational program, promoting local knowledge and solutions and stimulating innovation. Management of natural resources falls under this category, and includes promotion of agro-forestry, and upscaling land-consolidation programs.</p> <p>Emphasis is given to data and the creation of a repository of data to better inform decision making.</p> <p><b>Key actions/premises:</b></p> <p>Creation of collaboration platforms for sharing best-practices</p> <p>global accountability towards fighting corruption</p>



<p><i>Long-term actions</i></p>	<p>Reasonable population growth by encourage drastic family planning</p> <p>Access to market for input/output</p> <p>Creation of added value to agri-products</p> <p>Sustainable intensification (crops + animals + trees)</p> <p>Influencing Policy setting :</p> <ul style="list-style-type: none"> <li>- Evidence and data</li> <li>- Alignment towards strategic goals</li> </ul> <p>People's driven policies – People's participation</p>	<p>Expand Agricultural subsidies and inputs to lift small-scale farmers from subsistence.</p> <p>Awareness of oneness of life interconnectedness.</p> <p>Accelerated expansion of irrigation infrastructure.</p> <p>Research in integrated approaches.</p> <p><i>* Tap demographic dividends in agriculture, through investment in youth.</i></p> <p>Using technologies.</p> <p>Invest in robust data management systems.</p> <p>Wise management of natural resources</p> <p>Funds Mobilisation (Own funds)</p> <p><i>*Centrality of agriculture recognized.</i></p> <p><i>*Decrease fertility rate.</i></p> <p>Using technologies.</p> <p>Cushion farmers from agricultural risks through insurance to increase level of technology</p> <p>Adoption and quality input use.</p> <p>Empathy, Integrity, Responsibility, Accountability, Political will</p> <p>A new organizing principle (values).</p>	<p>Investment in storage facilities.</p> <p>Youth and women programmes.</p> <p>Provide good quality seeds.</p> <p>Invest in dams, terracing, fertilizer.</p> <p>Fiscal incentives to foster urban food forests.</p> <p>Provide subsidised loans for youth.</p> <p>Create employment in rural areas.</p> <p>Develop trade policy to eliminate exploitation by middlemen.</p> <p>Fiscal incentives to promote exports of agricultural products.</p> <p>Form cooperatives and farmer organisations.</p> <p>Government and private sector provide physical infrastructure.</p> <p>Private sector provides agriculture equipment through leases to farmer organisations.</p> <p>Regulation and supervision of cooperatives and farmer organisations.</p> <p>Financial institutions and government provide affordable credit to farmers.</p>	<p>Related to the need to “advocate for change”, and require more time to be achieved since they depend on cultural and behavioural changes and on high level of coordination between different stakeholders and policies levels. hey require synergy, cooperation, coordination and formal agreements in place:</p> <ul style="list-style-type: none"> <li>- For these changes to happen there is the need of political will and to enable an environment that strongly support local knowledge and solutions vis á vis ‘imported’ knowledge and solutions.</li> <li>- The system is seen as inclusive, with women and youth involvement in decision making at the core of it.</li> <li>- Commitment from donors would be requested to identify long lasting changes vis á vis projects’ timed interventions.</li> <li>- Access to finance and insurance for citizens are key to promote equal growth together with social programs focused on citizens’ empowerment.</li> </ul>
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**Table A.4** – Extract of the texts written by the participants to synthesize the visions of the desired future and ways to achieve them.

<p><b>Ubuntu pathway:</b> Dear Granny, How are you? How are the neighbours? I bring you greetings from Ubuntu land where I have a farm alongside <b>community</b> friends. We grow several kinds of indigenous food crops and some support crops from outside of Africa. These crops serve food to us, our community, our animals and we also export some of the products to other parts of Africa and the world. We have formed several strong and active <b>cooperative</b> societies who advocate for our good as farmers in Ubuntu land. ... The <b>agroecology</b> of Ubuntu land and its people has been fully understood, and our yields have been tremendous and really profitable to us.</p>	<p><b>Prosperous and Peaceful EA pathway:</b> Our vision: 90% of East Africans are food secure (nutrition, quantity, quality, supply) and enjoy a high quality of life in a secure environment, facilitated by <b>climate-smart agriculture practices, climate resilient infrastructure</b>, agriculture value addition, innovative food systems and (regional) market integration allowing inclusivity (leaving no one behind). ... Over the years, there have been many debates about whether <b>small-scale agriculture</b> is viable or we should encourage <b>large-scale (industrial) farming</b>. Whether agriculture should be commercial, market-oriented, or community-oriented.</p>	<p><b>Urugendo pathway:</b> Dear friend, What a wonderful Sunday morning. Young people here are cultivating <b>large areas of land</b> that were once barren but have now been restored because of reforestation, water towers and through improved irrigation systems. ... Currently, the farmers are organized into <b>cooperatives</b> and have invested and own agro-based business and are major exporters of agro-processed products (e.g. beer, fruit juices, etc.). The youth are outstanding in agriculture and doing what they love. ... <b>Urban and peri-urban areas</b> have also become sources of food production through intensive investments in green houses within the urban setting.</p>
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## Appendix B – Divergence tables

**Table B.1** - Internal divergences inside each group, identified during the Three Horizons Dialogue (as registered by the participants during the Dialogue)

	Ubuntu (local-regional)	P&PEA (local-regional)	Urugendo (local-regional)	Rainbown (pan-african)
<b>STEP 1: Future</b>	if Genetic Modified Crops ( <b>GMOs</b> ) have a role in the future or if the future is organic and free from GMOs.	Whether or not to limit the <b>family size</b> (maximum 2 children/family).	<i>internal divergences not registered in the diagrams.</i>	(a) The adoption of <b>meat-free diet</b> (with serious consequences for the environment) versus the need for meat protein, the importance of herds in the livelihoods for pastoralists and cultural attachments. The group solved this conflict by adopting as part of the desired futures diversified diets (e.g. fish, aquaculture, meat, etc.), adapted to different contexts, as written in Table 10. (b) The adoption of <b>biofortified crops</b> (non-GMO) versus the opinion that we get target nutrients separately/more effectively (through other ways). (c) <b>Agribusiness</b> as a source of more income, since higher volumes (of production) lower prices and leads to less for farmers (also questions about role of large corporations)..
<b>STEP 2: Present concerns</b>	<i>internal divergences not registered in the diagrams</i>	How the participants perceived current <b>abundance of agricultural land</b> . One opinion was that the area of agricultural land is not sufficient; the opposite opinion was that there is enough agricultural land, but its use is	<i>internal divergences not registered in the diagrams</i>	(a) Perception of <b>population growth</b> as a problem, as opposed to consumption as a problem (consumption needs to be sustainable, population can be an opportunity). (b) Root causes of youth

		hampered by various factors, e.g. aridity.		migration/brain drain: discussion about lack of patriotism versus lack of trust and opportunities
<b>STEP 3: Pathway actions</b>	<i>internal divergences not registered in the diagrams</i>	<p>(a) demographic issues (whether to decrease the fertility rate or to take advantage (“tap”) the <b>potential of a large population</b>, e.g. as a capacity for agriculture);</p> <p>(b) the <b>type of agriculture</b> that should prevail in the future – whether subsistence agriculture should be sustained or replaced by market-oriented agricultural types, and whether these should be centralized small-holder driven.</p> <p>(c) whether to continue or discontinue <b>subsidies</b> and the role of government in supporting agriculture.</p> <p>Extract from Synthesis letter:  <i>Over the years, there have been many debates about whether small-scale agriculture is viable or we should encourage large-scale commercial farming. Whether agriculture should be commercial, market-oriented, or community-oriented. Also, whether we should limit population or to find ways to see it as an asset.</i></p>	<i>internal divergences not registered in the diagrams</i>	Having social democracy as the political ideology governing Africa. They solved this with a more general formulation “priority for social programs”

**Table B.2** - Divergences from each group to the global perspectives, registered by the participants during the Dialogue sessions.

Ubuntu (local-regional)	P&PEA (local-regional)	Urugendo (local-regional)	Rainbown (pan-african)
<p>STEP 3 - Synthesis letter: <i>"As you know from your time, some of the assumptions were that change was not going to happen without considering high levels of <b>urbanization</b> and to this we have applied drastic family planning measures which <b>reasonably limited population growth</b>".</i></p>	<p>STEP2: <b>land scarcity</b> as a problem or land degradation as a problem.</p> <p>STEP 2 Synthesis using hashtags:  <i>#4Billionmouths4Billionopportunities                      #IsFarmingtheFuture?                      #Isfarmingthenewcool?</i></p> <p>STEP 3 Synthesis to be presented at the plenary:  <b>a) Urbanized world:</b> <i>There might be alternative ways of living in rural! "Are global models thinking we will be Shanghai or New York?"</i>  <b>b) Tech-based production:</b> <i>What about putting people at the centre rather than technology at the centre?</i>  <b>c) Population growth:</b> <i>link to context and values: Multiple different visions and opinions on limiting population growth:                      "Think of population not only as consumers, but as people that add value to the world. There are important nuances and qualitative aspects."                      "Population is an asset" vs. "It is easier to provide quality education for people if they are fewer"                      "There are different ways of empowering and education" *</i></p>	<p>Not explicitly addressed but in general addresses strong <b>rural communities</b> bound by cooperatives.</p>	<p>STEP 2:                      Perception of <b>population growth</b> as a problem, as opposed to consumption as a problem (consumption needs to be sustainable, population can be an opportunity).</p> <p>Discussion about <b>meat-free</b> diets.</p>

**Table B.3** - Branching points and implications for society decisions and scenario design derived from the convergence analysis of the four pathways and global scenarios.

	<b>Divergences (possible branching points)</b>	<b>Implications for societal decisions at different levels</b>	<b>Implications for alternative scenario design</b>
<b>Urbanization</b>	Current global scenarios reflect a vision of a highly urbanized Africa, contrasting with the participants perspective on a more balanced urban-rural future for Africa, with quality of life in both.	The need to discuss and design policies aiming at the desired rate and quality of urbanization in each context.	Alternative scenarios representing multiple urban/rural relations, including strong rural communities and high quality of life, providing food first to local markets then to distant markets. Scenarios should address the quality of urbanization too (prosperity and services for all versus a chaotic urbanization in the Global South) and its implications for the SDGs.
<b>Population growth</b>	The issue of population growth was one of the core aspects of divergence inside the groups and in relation to the global perspectives: population growth can be seen as a problem (because of resource use and consumption trends), or as an opportunity for innovation and new youth markets, acknowledging that consumption patterns are the actual problem.	The need to discuss the role of family planning, technology and education in creating opportunities in rural and urban contexts.	Alternative sustainability scenarios beyond current assumptions of very low population growth and massive urbanization. Participants argued for seeing people as an opportunity (innovation, local markets) and excessive consumption the problem.

<p><b>Agricultural intensification and practices</b></p>	<p>A core divergence that emerged from the comparison across groups relates to the debate around agroecology or sustainable agricultural intensification (SAI) as pathways to a sustainable agriculture. Another key point debated as the use (or not) of Genetically modified crops (GMO).</p>	<p>The need to discuss alternatives, limitations and benefits of agricultural systems, directing policies according to different contexts.</p>	<p>Current global models adopt a land sparing narrative, basically relying on the "Sustainable intensification" proposal. New scenarios could allow for a broader range of options, including agroecology, or mixture of both these approaches in different contexts. Also allow for a combination of land sharing and land sparing at different scales and contexts.</p>
<p><b>Actors in agriculture</b></p>	<p>The role of different actors (small farmers, large-scale farmers, agribusiness companies, national States) in the agriculture system of the future was also a point of divergence, mainly related to the role of large-scale industrial agriculture. All groups emphasized the importance of cooperatives though. Some middle ground emerged in some groups related to develop a more holistic approach towards agriculture as a part of the general economy, including actions to protect small farmers and regulate what might be perceived as necessary large scale (sustainable) cultivation (not one actor in opposition to the other).</p>	<p>The need to discuss the role of different actors in the agricultural system of the future in different regions, and plan actions accordingly to protect (cooperatives of small farmers, for instance)/regulate them. This also has links to other sectors of the economy (through education and jobs) and to the urbanization processes. This issue is also related to the role of the agriculture sector in the economy as a whole (when compared to industry and services).</p>	<p>Future models/scenarios should be able to represent land tenure issues that are strongly linked to rural/urban well-being and urbanization. Alternative scenarios could represent a range from an extremely land concentrated landscape (in a highly urbanized world, with very few actors producing food) to a more balanced mix of types of actors and agricultural systems. Models should also represent cooperatives as economic actors.</p>

<p><b>Alternative diets</b></p>	<p>Participants in one of the groups disagreed about the adoption of meat free diets, then converging to "diversified diets" adapted to different contexts. Some argued that meat-consumption has negative consequences on the environment (such as deforestation, greenhouse gas emissions, etc.). Others argued that meat is important for nutrition, for the livelihoods for pastoralists and cultural attachments. Changes in diets was not a central issue in the other groups, but represents a major divergence in relation to global patterns, in which drastic reduction in meat consumption is usually necessary.</p>	<p>The need to discuss the impacts of alternative diets in the environment and health using scientific evidence, local and global environmental impacts, and socio-economic and cultural contexts.</p>	<p>Scenarios should explore multiple combinations of diets depending on context and cultural background, beyond the meat-free narrative. Better practices for herding could also be included to explore potential detrimental environmental impacts and the impacts of environmental change on this livelihood.</p>
<p><b>Markets for agricultural products</b></p>	<p>The issue of producing food to the global market and/or to local markets was present in several discussions, including the concern about local food security. In contrast, most current global sustainability pathways rely on a global free market narrative.</p>	<p>The need for planning according to best market solutions at different contexts (several backbone actions refer to market infrastructure.)</p>	<p>Current sustainability scenarios rely mainly on a global market for food production. Future scenarios could explore a broader range of narratives, including regional cooperation and local markets. Besides, more sophisticated models could explore the role of a few global corporations controlling the food system versus a more decentralized system.</p>
<p><b>Land-based climate change mitigation</b></p>	<p>Most discussions in the groups refer to the need to adapt to climate change. Global scenarios rely in general on a (global) land reduction pathway, in which food is produced on more suitable lands through highly technological and intensive production – which would also free land for restoration and biofuel production (both necessary to mitigate global emissions).</p>	<p>Discuss benefits and disadvantages of global mitigation at multiple levels, including internationally.</p>	<p>Global scenarios could explore a broader range of land-based mitigation options, from the current globalized ones (based on land adequacy and economic compensation through REDD) to a more distributed alternative (each continent mitigates its own historic emissions, for instance) or a mix between the two.</p>



## Appendix C – Evaluations

1. What was the most important moment(s) for you during this workshop? (text)
2. What ideas and insights do you take home from this workshop? (text)
3. What ideas or insights do you look forward to share at work? (text)
4. What was missing from this workshop? (text)
5. What is your view of the 3 Horizons approach (the tools and methods used for the dialogue)? (text)
6. How do you evaluate the following aspects of the workshop? Quantitative answers from 1(Bad)-2(Regular)-3(Good)-4(Very Good)-5(Excellent)
  - Facilitation
  - Organization
  - Were the questions discussed useful for your work?
  - a. Would you recommend this process to others?
7. Please add if you have any other comments? (text)

Submitted replies available on: <https://osf.io/prj8v/>

Nr	1	2	3	4	5	6	7	8	9	10
Question	What was the most important moment(s) for you during this workshop?	What ideas and insights do you take home from this workshop?	What ideas or insights do you look forward to share at work?	What was missing from this workshop?	What is your view of the 3 Horizons approach (the tools and methods used for the dialogue)?	How do you evaluate the following aspects of the workshop?: Facilitation	How do you evaluate the following aspects of the workshop?: Organization	How do you evaluate the following aspects of the workshop?: Were the questions discussed useful for your work?	How do you evaluate the following aspects of the workshop?: Would you recommend this process to others?	Please add if you have any other comments?
1	Presentation of prof. Sander Van Der Leeuw; Discussion/sharing on different topics in sub-groups	To change our thinking towards a continent development; <b>free of ourself of all barriers</b>	To conducting further studies in sustainable <b>programmes</b> . Capacity building; To invest more in environment research for mitigating and adaptation projects	Participation of local NGO; Not enough time for sharing with groups	The tool and methods have clarigy all present xxx and the pathway we xxx in order to achieve our 2030-2050. I <b>really appreciate the method used.</b>		4	4	4	5 I wish to see in the next dialogue a high xxx of guests from different countries of Africa
2	Moments of exchange and conversation	The collective <b>letter</b> to our Wanjiku	<b>Conversation</b> is key	Time	NA		4	4	4	4 Loved it
3	During professor Sander presentation and during the discussions on desired futures and the pathways to that xxx	That xxx of SDGs is possible with emphasis of <b>local xxx</b>	That <b>communities need to be empowered towards participative</b> in xxx local xxx that will xxx the africutlural and food systems xxx	Nothing that I can recall. Perhaps teaching materials or the presentations xxx. Sander's materials.	Very practical.		5	5	5	5 Very enriching to participate in this dialogue. xxx
4	Discussion in groups	The <b>vision</b> of reaching SDGs; <b>Pathways</b> to reach the vision.	<b>SDG and pathways to reach them;</b> Developing <b>texts/letters</b> to express ideas (visions, current situation pathways)	Using different/additiona l language, e.g. French	Tools useful but need more skills for users; <b>Methods for dialogue very good, and facilitate interaction and participation.</b>		5	4	5	5 To have opportunity to attend a similar workshop.
5	Plenary session on three horizons framework and xxx sessions according to African region	<b>Root causes</b> of food insecure in continent; present or current situation of every region; future xxx to chieve the vision	Identify xxx in reducing poverty and global perspective on the world in 2050	Farmers representatives; A short time of the workshop	NA		5	5	4	4 NA

6	Discussion on how we solve the current problem and how we move to the desired levels	That we can by 2050 be where we desire provided we deliberately pursue the xxx in the right direction = <b>agency</b>	That transforming agriculture requires a <b>multi-sectoral approach</b>	Concrete examples (building blocks) to start with and also realistic pathways with xxx	The approach is fine provided there are xxx scenario put in place or built in the process	5	4	4	5	Extension of the workshop in terms of time. I recommend that next time it should be more than 2 days.
7	Analyses of causes which inhibit agriculture xxx growth in Africa and xxx systems.	xxx	<b>The world in 2050 Report.</b> Share this with colleagues. How the SDG xxx	Case studies from individual countries. xxx	xxx	4	4	4	4	There is also need to share the models. xxx
8	The open discussion after the first keynote speech on Wednesday morning, when participatns discussed xxx and how to prepare to the transformation	The used methodology is extremely useful in <b>explaining the transformation to a wider public</b> , and to elaborate further research. <b>Many African experts still link transformation and GDP because it is a classic way.</b>	<b>That is extremely difficult to elaborate new ideas for the transformation we tend to adapt concepts and techniques we know. The transformation requires us to walk an extra mile.</b>	Perhaps a xxx theoretical/scenario discussion before starting break-up [sic!:] activities. Many participants did not read the materials before arriving.	It is great tool to elaborate on where we are and what is needed. <b>Perhaps, according to the approach, action can increase and peak half-way, but I personally believe action should xxx well before.</b>	5	4	5	5	The facilitators did a great job! Not easy to grasp simple messages from such articulate conversation among very different actors. Well done!
9	Presentations by the facilitators; Group work and presentations.	The different models for xxx SDGs; <b>the world in 2050 report</b> ; The current challenges in agriculture, where we wish to be <b>(vision), how xxx to reach the future</b>	Pathways xxx to sustainable social-economic transformation through modernizing agriculture	Everything went on well except that the time allocated was too short.	Challenges in agriculture should be viewed as actually opportunities; It is actually xxx to suggest practical solutions to agriculture; we need to set our visions/targets and then work backwards to xxx on desired visions.	5	4	5	5	xxxx

10	Diagram illustrating present system and its xxx. Group works.	I understand agriculture as business from this (TWI2050) workshops and I understand that Africa needs to xxx diversification but also needs to focus on xxx	Agriculture is business and that agriculture is the most important sector of the African economy and will have to be its driving energy out of poverty.	Everything was OK!!	Was very helpful to understand value added agriculture as percentage of GDP for Africa.	5	5	5	4 NA
11	The overall sharing was useful. No particular moment stands out.	The idea that there are groups such as those engaged in TWI2050 xxx a foresight xxx on the SDGs into the future.	I like the <b>storytelling on foresight</b> , and the letter writing to depict change	For me, there wasn't adequate clarity on what the expectation of the workshop are and what was the desired end-result.	Not very clear to me, but probably I did not pay adequate attention.	3	4	3	3 The overall sense of urgency and purpose appeared low. The conference was too relaxed with sessions not starting on time, etc.
12	Group discussions and brainstorming	Sustainability is an endless journey. New solutions to new problems.	Societies have a role to play in finding new solutions to new problems. People-led initiative. Promoting indigenous.	You should be providing per diem for workshop participants.	NA	4	4	4	4 NA
13	Group discussion and world-cafe	It is <b>possible to achieve something tangible if we bring people together</b>	That we need to make our models and scenarios reflect the ambition and progress	NA	It was stimulating conversation	5	5	4	4 NA
14	Break-away [sic!] group discussion	<b>Holistic approach to SDGs</b>	Break-away group approach; Holistic approach in addressing SDGs; Interdependence of SDGs	No facilitation. The organizers should xxx of participants.	A very good approach. However, all presentation should be sent to participants in good time, since time allocated for these presentations is limited.	4	4	5	5 None.

15	<b>The group work were nicely formed with different range of expertise which helped the discussion among the group members.</b>	How to realities /current challenges are linked with diferent proposed pathways for the future; Different <b>tensions and convergences</b> around different topic such as demography, urbanisation, industrialisation	The proposed assumptions and global models to achieve SDGs (Agri. and food)	<b>Private sector views were kind of missing in the picture</b>	Very helpful and relevant in a way that they are interlinked and build on each other	5	4	5	5 Keep the good work!
16	All the interesting discussions and sharing knowledge	The discussions about concerns and <b>root causes</b> , and the <b>assumptions in the global model</b>	The motivation to continue working with this	A break from the photographers....	Itäs a very illustrative way to discuss this problem, you get a good overview	5	5	4	4 NA
17	<b>The moment where we xxx our minds on the practiced issue and pathways to achieving the SDG goal in relation to food systems and agriculture</b>	Embracing ur diversification; we the aim to making it more for us and xxx support from other xxx; The idea that change is the contact while stability is the xxx	How best use models/projections as start points to a desired future; Sustainability is xxx environmental issue but one xxx society, making it a societal issue.	NA	A good method indeed. It gives room for proper dialogue.	4	4	5	5 A good space to engage and discuss way forward for Africa as Africans to Africa.
18	Discussing pathways towards achieving SDGs, learning about already existing initiatives	<b>Transfromational change</b> theory; Issues around implementing SDGs	Shared challenges across xxx and beyond; 3 Horizons approach; xxx around population growth and small scale/large scale farming in Africa.	Increase size of participants to enhance quality of discussions and generate ideas through practical experience	It is a great theory to help brainstorm different ideas. I think it can be improved to point directly to point fo action.	4	4	4	4 NA
						4,5	4,3	4,4	4,4 4,4

Stockholm University decision tree regarding approval from the Swedish Ethical Review Authority.

Collste, D., Aguiar, A. P., Harmáčková, Z., Galafassi, D., Pereira, L., Selomane, O., & van der Leeuw, S. (2023). Participatory pathways to the Sustainable Development Goals: Inviting divergent perspectives through a cross-scale systems approach. *Environmental Research Communications*.  
<https://doi.org/10.1088/2515-7620/acce25>

**Does your project require approval from the Swedish Ethical Review Authority?**

This questionnaire is intended as a tool to help researchers affiliated with Stockholm University determine whether or not they need to obtain approval from the Swedish Ethical Review Authority in accordance with the Ethical Review Act (2003:460). Your answers will not be saved and you can move back and forward in the form and make changes as needed.

Please note that many of the questions can be difficult to answer with certainty, partly because they refer to some quite tricky notions, but also because it may be difficult to know in advance exactly how a research project will develop. The result of filling out the questionnaire should merely be regarded as an indication based on the answers you have provided. If you are the least bit unsure about the questions or the result, you should get in touch with the Office for Research, Engagement and Innovation Services (REIS), which offers qualified support regarding research ethics (in collaboration with the university's legal counsels when required). If your project needs approval from the Swedish Ethical Review Authority, REIS can also offer advice in connection with your application. Contact: [etik@fs.su.se](mailto:etik@fs.su.se)

I have read and understood the above information.

Does the project involve physical interventions on living or deceased persons?

No

Does the project involve biological material that has been taken from a living or deceased person?

No

Does the project involve human subjects? (This may include study participants, informants, people being audio/video-recorded, people whose personal data occur in the collected or analysed material, etc.)

Yes

Does the project involve methods purporting to affect human subjects physically or mentally? \*

No

Does the project involve methods leading to an apparent risk of injuring human subjects either physically or mentally?

No

Does the project involve processing of any kind of information about human subjects? (Processing includes e.g. collecting, storing, analyzing, disseminating and compiling. The information may occur in various forms, e.g. text, sound, or pictures.)

No

**The project does not require approval from the Swedish Ethical Review Authority.**

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