OFFICIAL FEEDBACK FORM

DIALOGUE DATE	Friday, 4 June 2021 10:30 GMT +10:00
DIALOGUE TITLE	A Celebration of Fusion, 1st International XRX-AG Conference
CONVENED BY	Dr John Troughton Australian Agricultural Centre
DIALOGUE EVENT PAGE	https://summitdialogues.org/dialogue/17357/
DIALOGUE TYPE	Independent
GEOGRAPHICAL FOCUS	No borders

The outcomes from a Food Systems Summit Dialogue will be of use in developing the pathway to sustainable food systems within the locality in which they take place. They will be a valuable contribution to the national pathways and also of interest to the different workstreams preparing for the Summit: the Action Tracks, Scientific Groups and Champions as well as for other Dialogues.

1. PARTICIPATION

TOTAL NUMBER OF PARTICIPANTS

PARTICIPATION BY AGE RANGE

	0-18		19-30	2	31-50	7	51-65		66-80		80+

PARTICIPATION BY GENDER

5	Male	4	Female		Prefer not to say or Other

NUMBER OF PARTICIPANTS IN EACH SECTOR

	Agriculture/crops	5	Education		Health care
	Fish and aquaculture		Communication		Nutrition
	Livestock		Food processing		National or local government
	Agro-forestry		Food retail, markets		Utilities
1	Environment and ecology		Food industry		Industrial
1	Trade and commerce		Financial Services	2	Other

NUMBER OF PARTICIPANTS FROM EACH STAKEHOLDER GROUP

1	Small/medium enterprise/artisan		Workers and trade union
	Large national business		Member of Parliament
	Multi-national corporation		Local authority
1	Small-scale farmer	3	Government and national institution
	Medium-scale farmer		Regional economic community
	Large-scale farmer		United Nations
1	Local Non-Governmental Organization		International financial institution
	International Non-Governmental Organization		Private Foundation / Partnership / Alliance
	Indigenous People		Consumer group
3	Science and academia		Other

2. PRINCIPLES OF ENGAGEMENT

HOW DID YOU ORGANIZE THE DIALOGUE SO THAT THE PRINCIPLES WERE INCORPORATED, REINFORCED AND ENHANCED?

The Dialogue established at the outset that it was to not only achieve but exceed the Principles and uniquely integrated them as a design feature in the dialogue but especially the outcomes as actions of the dialogue. The principles were; Act with urgency - Organise and Deliver, Commit to the Summit - Join and deliver Be respectful - Our total focus was around the health and well-being of individuals, enhance resilient livelihoods and communities, and promote good stewardship of natural resources, while respecting local cultures and contexts. Mindful of Recognise complexity - Our framework is around reducing the complexity of delivering nutritious food Embrace multi-stakeholder inclusivity - Our stakeholders were completely aligned with the possibilities discussed within the dialogue Complement the work of others - All stakeholders brought something unique to the table Build trust - All stakeholders were transparent and completely motivated to participate in a project together.

HOW DID YOUR DIALOGUE REFLECT SPECIFIC ASPECTS OF THE PRINCIPLES?

The Food Systems Summit is guided by a set of seven principles of engagement. The AAC Dialogue incorporated these into its discussions and can report significant acceleration of all of them, summarised in the Three Steps. Step 1. Nutrition. Basic Solution. The adequate human nutrition mathematical equation is half/50% fruit and vegetables, quarter/25% carbohydrates and a quarter/25% protein along with water and nutrients. Step 2. Nutrition plus Income. It is difficult to maintain the nutritious integrity of food along the food chain. The basic solution can be disrupted by both time, if drought stops production, and distance if production and consumption are separated. It is greatly disrupted by a city rural decoupling which requires a farm, horizontal or vertical, not a garden to produce in volume to feed the chain from farm to fork. Step 3. Global Fusion. The AAC is especially engaged in the interface with the community. Planetary boundaries fence the global farm, within which fusion from brain wave to global consequences is orchestrated by numerous human constructs to ensure human behaviours meet those required from family to global governance, including the commons. The UN provides the direction through the community derived 17 Sustainable Social Goals. As a contributor we will contribute in identifying and designing the actions. XRX-AG and XCHANGE is our contribution today to the Food Systems Summit as part of the Decade of Action to achieve the Sustainable Development Goals (SDGs) by 2030. The Summit “will awaken the world to the fact that we all must work together to transform the way the world produces, consumes and thinks about food.”

DO YOU HAVE ADVICE FOR OTHER DIALOGUE CONVENORS ABOUT APPRECIATING THE PRINCIPLES OF ENGAGEMENT?

Diversity is the key to a robust discussion. Our dialogue involved presentations followed on with questions, and then ended with a facilitated dialogue. Respect of what each stakeholder brings to the table is key. Having a relaxed environment with committed and engaged participants. Better results are obtained with a small number of participants.

3. METHOD

The outcomes of a Dialogue are influenced by the method that is used.

DID YOU USE THE SAME METHOD AS RECOMMENDED BY THE CONVENORS REFERENCE MANUAL?

✓ **Yes**

No

4. DIALOGUE FOCUS & OUTCOMES

MAJOR FOCUS

The XRX-AG Distributed Knowledge Network.
Agricultural Education Trends
The rapid adoption in Riverina horticulture and agriculture of the new technologies of big data, IOT, digitalisation, precision agriculture, 3D printing, autonomous tractors and cars, robots, renewable energy, genetic engineering, drones and protected cropping requires education to catch up. This especially relates to the primary and secondary education as a feeder to the Universities at Canberra and Wagga Wagga and extended reality can marry immersive learning with experiential learning in this new era. The Big Data era requires big screens for both research and education purposes, inclusive of dynamic 3D projection.
Towns in the region have or can have resources for local, on the ground, instruction linked by the internet and nodes to subject experts anywhere on the globe through a XRX-AG Distributed Knowledge Network. Locally derived data will come from drone surveys, fixed cameras, IoT, information and products from businesses and special projects. Local businesses and farms can support and help guide the curriculum most appropriate to their regional area, although the training will be for careers nationally or internationally. The development of 5G and the Starlink network shows that the future will ensure that regional NSW is fully linked to cope with the new capabilities of XRX-AG.
It is proposed that especially primary and secondary school children, but any citizen, will have access to an Experience Centre in a school, local hall or business, to give exposure to the science and technology needed for tomorrow's farmers. Critical to each Centre will be the capability of an XRX-AG Immersive Experience for Learning, coupled to access to reality experiences on local farms, businesses and industries. In addition, the presence of a terminal, node/desktop with links into universities will allow immediate exchange of new knowledge into the regions.

This would include Dynamic 3D visualisation of Agriculture with big screen, small screen, AR, VR, VR video and VR 180 experiences. XRX-AG is the era of both big data and extended reality.Content
Developments in grassland, cropping and horticulture plant management will be included. Generic engineering, new plant varieties, optimisation of plant growth conditions, water, nitrogen and phosphorus cycles and management. The protected cropping for high quality export crops there will be a VR experience of managing a crop from seeds to dispatch.
Understanding climate and weather, modelling and understanding climatic trends and impact on plants and agriculture is central. Drought resilience a feature, as would rainfall and water flows in catchments. Carbon cycling will be central, from energy input, to allocation in plants, to tracking residence times in plants, soils, products and atmosphere. Design and implementation of renewable energy and batteries for on farm and local networks, its production, transmission and storage is included. Immersive learning content will extend from the paddock to the plate.

Central to the program will be the markets, customer and consumer requirements. This would be for both export and local markets. It would include all aspects of food, production, processing, preservation, preparation and impact and linkage to human health. This would link to training in agritourism, with hands on experience in meeting, greeting, entertaining, feeding tourists. The use of new media savy, internet tools to promote agritourism and apps for tourists to explore NSW will be included. Uniting all programs will be the financial education about risks and rewards of all actions, modelling the carbon and finance economies.
Career Creation
The courses and facilities will be online and off line and available to all people of all ages, sex, nationalities, experience and background with immersive and adaptive learning. The approach is let the students set their own journey and pace of exploration and learning with immersive experiences invading all aspects of the value chain from landscapes to human health. The program will emphasise leadership.

ACTION TRACKS

✓	Action Track 1: Ensure access to safe and nutritious food for all
	Action Track 2: Shift to sustainable consumption patterns
	Action Track 3: Boost nature-positive production
	Action Track 4: Advance equitable livelihoods
	Action Track 5: Build resilience to vulnerabilities, shocks and stress

KEYWORDS

	Finance		Policy
	Innovation	✓	Data & Evidence
	Human rights		Governance
	Women & Youth Empowerment		Trade-offs
		✓	Environment and Climate

MAIN FINDINGS

Ryan Young
• Bring together people who study the problem with people who live with the problem to develop solutions
John Clarke
• Incorporate digital data and models into education to encourage better decision-making
John Troughton
• Action solution cluster: Wagga Wagga Framework for Nutrition
Tim Brown
• Create digital twins of farming land to monitor change over time (e.g. nutrient yields)
Tim Gentle
• Use dash boards to help improve on-farm productivity as well as improve connectivity with and understanding of consumers (i.e. using individual digital twins to inform food choices)
Lisa Castleman
• Use digital data to make decisions easier for farmers
Andrew and Eleanor
• Move towards real-time 3D visualisation Explore existing platforms and embrace the rapid technological change of game engines where appropriate.

Robyn Alders
Q: how to ground truth digital data?
Q: to bring SDG12 into the discussion?
Q: how to increase productivity of food with optimal natural nutrient density rather than just increasing the weight or volume of produce? Aiming to improve quality and quantity.

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OUTCOMES FOR EACH DISCUSSION TOPIC - 1/6

XRX-AG Framework for Nutrition is obtainable with the collaboration and input of all stakeholders.
Discussion topic " What the World Needs Now. Wagga Wagga Framework for Nutrition" John Troughton
It's all about Nutrition, which by definition is "the process of producing and procuring the food necessary for health and growth" Process – Digitising and Integrating all Systems and Actions.
Link Self to Seed to Self.
Producing, Procuring... What is nutritious food?
The World Health Organization (WHO) recommends 400 g/day for their health and nutrition benefits. Insufficient intake of fruit and vegetables is estimated to globally cause around
3.9m/yr million deaths worldwide
14 % of deaths from gastro-intestinal cancer
11 % of those due to ischemic heart disease,
9 % of those caused by stroke (Afshin et al., 2019
Fruits and Vegetables
Grow almost anywhere.
Grow almost anytime.
Anyone can grow them.
Land free, commons
Economics, for disadvantaged
Energy free
CO2 free
Labor free
Genes free, seeds or propagated
Educational gardens are strongly supported in Australia by Governments and Industry
Globally There are Millions of Gardens & Food Hubs that need the UN to Recognise & Support
URBAN FOOD HUB & LIVING LABORATORY
With 100+ species of edible plants,
Ōtākaro Orchard a free edible landscape for everyone,
1,000 kg of fresh produce produced each year, with 780 parks, 26 community gardens, 70 edible school gardens, 5 food forests, and 26,000 fruit trees on public land.
From Field to Fork
1. Nutritious Production
2. Maintain Nutritious Value
3. No Product Waste
What would be a desirable outcome of this?

We need new institutions and frameworks like a global agricultural trading system that has sustainable supply chains as part of its mandate. We need much more investment in the food system, and we need access to jobs and at least minimal social protection for those affected by hunger. Moreover, in the field of food and agriculture, there is, to date, no institution like there is in climate policy, where there is a UN committee, the Intergovernmental Panel on Climate Change, the IPCC, which provides a clear structure for the interaction of science and policy.

Australian Agricultural Centre
AAC takes concepts, "Frame" & converts into actions, "Work", FRAME-WORKS
"Ensure"
Action: To Produce the Wagga Wagga Framework for Nutrition (Prof von Braun) To Globally Educate, Enable and Execute Actions to Produce Nutritious Food for All
Digital technologies for communication and education
Digital technologies to allow farmers to sell their products with minimum transaction costs, addressing market failures.
Digital technologies will be critical for the Wagga Wagga Framework for Nutrition and plant breeding.
1. Digitise and fuse processes from Seed to Field to Fork
2. Digitise and fuse into processes from Faculty to Farm
3. XCHANGE products, goods or services digitally
4 Digitise, visualise in 3D, video and XCHANGE knowledge by bringing the farm into the house or laboratory or the laboratory onto the farm
5. Incorporate Brain to Biosphere issues into the Digital Circular Economy, communities, farms and gardens from Bega to Botswana to Brazil
1.To take the nutrition message globally, "the processes of production and procurement of the food necessary for health and growth", into all farms, schools, homes, villages and the food chain. Through XRX-AG. Supporting field staff. From SELF TO SEED TO SELF
2. Win the hearts and minds of the front line farmers and food chain managers and workers.
3. Provide solutions for the hungry, the farmers, food safety, those optimising the food chain.
4. Bring the farms, digitally, into the homes, companies and labs to engage with global experts and revitalise through XCHANGE. Embellish and Visualise the Digital Sister.
5. Return a revitalised, reprogrammed package ready for education, enablement and execution.

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OUTCOMES FOR EACH DISCUSSION TOPIC - 2/6

Farming Smarter – a soils project for the next generation
Lisa Castleman & Rebecca Waalkens Ag Services Team Riverina Local Land Services
Why set goals for land-holders?
How do you achieve a goal if you don't set it?
Offer landholders on-farm data with science and advisory support
We target lime rates which will raise the pH to either 5.2 or 5.8,
Our ultimate goal is to raise the soil pH above 5.5, in the 5.5-6.0 range

Remember:
Acidity needs to be saturated before excess alkali can be produced
Lime particles do not move beyond where they were surface applied or incorporated
Only excess alkali can move into soil solution and then to depths below the topsoil
We also need there to be a soil solution for amelioration to occur
Soil moisture and significant rainfall events are important for deeper movement

Ensuring a healthy pasture
Management factors include:
ameliorating soil pH
underlying soil fertility and the addition of inputs
disease and pest management
species & cultivar selection
grazing management
Seasonal factors such as climate-rainfall, temperature, length of growing season.

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OUTCOMES FOR EACH DISCUSSION TOPIC - 3/6

Tim Brown - Director Austraian Plant Phenomics Facility, ANU Node.
From Lab to field to farm: Envisioning a continental scale Digital Twin of Australia as infrastructure for enabling a carbon neutral future.
We face a triple threat this century
Food Security
Biodiversity
Climate Change
Agriculture plays a significant role in all these issues.
Carbon neutral is vastly insufficient - Carbon drawdown is a necessity (Changing farming practices)
Tackling the challenges of the 21st century with National Infrastructure
What can we build - open infrastructure platform for managing data
How we can build it - IoT sensors can push precision environmental data to the cloud for every farm/ modern farm equipment/automated drone flights/ privacy can be built in so users use their own data
What this enables - Researchers & Breeders: supports continental scale analysis & provides caor infrastructure field trials/ provides farmers with low barrier to entry access to benefits of digital agriculture/ Industry can value-add by building commercial offerings off this infrastructure/ remove4s needs for startups to build full platforms from scratch; enables low-risk/low-cost startu ecosystem .
Envisioning the future by looking back.
Some tech solutions for building the future - High resolution, high frequency satellite data/Tools for making sense of big data/ Standardising drone and other 3D data.
Linking open projects enables scalable solutions
Continental scale datasets enable amazing things with ML/AI
How we architect infrastructure has a huge impact on outcomes - we need to build an "Internet" layer for data sharing, then innovate on top of that
Looking to the Future - Our current tools for data visualisation and managment aren't sufficient for these datasets.
Use of gaming systems and digital twins
Real time global simulations already exist
How will we create the new tools and interfaces that enable the next generation of ecosystem research?

ACTION TRACKS

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OUTCOMES FOR EACH DISCUSSION TOPIC - 4/6

Tim Gentle - Think Digital
XR Trends & Adoption - Is Agriculture Ready?
Adoption of XR Agriculture
Improve, Safety, Training, education, Marketing, Communication
Safe Animal Handling
Bio Security Training
Australian Agricultural Centre Virtual Campus - Hands on learning by doing.
Big opportunity is to increase productivity using XR technologies in agriculture
Capturing lots of Data creating data insights
2021 - X - XR Wearings and AI Robotics, use of AR wearables
Location specific data - IOT Sensors, Cattle tags, NDVI, Soil Data, Tasks and Instructions, Remote Assistance
End Users - Producers and their teams, consultants, corporates, government, education
Digital Twins, virtual field days
Agriculture + Immersive technology + Communication + Business

ACTION TRACKS

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OUTCOMES FOR EACH DISCUSSION TOPIC - 5/6

Eleanor gates-Stuart & Andrew Hagan Charles Sturt University Creative Industries - extended Reality Collaborative
Artistry in Action - Animation and visual effects - Real-Time Visualisation
Collaborate with CSU Agripark & Farm
Goes beyond story-telling to story living. The XRC empowers bold new research by dissolving distance. We can reduce the perceptual distance between us, be empathetic to alternate points of view, accelerate understanding, and reduce the time from concept to reality. The XRC enables research that can lower physical, environmental or financial risk while achieving high-impact outputs with meaningful societal engagement.

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OUTCOMES FOR EACH DISCUSSION TOPIC - 6/6

John Clarke Research Team Leader, Regional Projections CSIRO
Climate Change Take 2
Climate models do a good job of projecting plausible future climates
Climate projections are not forecasts
A range of future climates are possible and this will always be so

Our actions and impact on Climate Change is in place and will play out for the next 20 years, we just have to stop further damage.

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AREAS OF DIVERGENCE

Agriculture generates high volumes of Ag data that is required to be communicated to achieve these goals. Fortunately, in parallel, satellite and communications systems and devices provide the high volume pipe for universal connectivity in real time. This multidirectional communication between all parts of the food system, including food production and nutrition scientists, farmers, transporters, economists, bankers, processors, marketers and consumers, will ensure knowledge is always in any hands, in the right form at all times. Digital Farm Twin, Digital Agriculture Twin plus edge computing
Our dialogue saw a snapshot of a rapidly growing and expanding Fusion that matches an expanding nutritional food demand to the supply of food products designed to ensure “Good Health and Well- Being”. The algorithm for good health is transferred back down the food chain to production and in the process meets multiple SGD goals, from 1-17, especially to ensure resilient and sustainable societies, food systems and healthy citizens.There is an amazing food story to tell. From education to application our goal is to capture food data at source, analyse, edge compute, fuse, distribute, create digital twin farms and apply it in all parts of the the food industry, from farm to fork. XR is about implementation, it will personalise the information to each individual from student, to farmer to researcher to policy maker, resulting in actions. Let’s see it. A Celebration of Fusion.

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ATTACHMENTS AND RELEVANT LINKS

ATTACHMENTS

- **Wagga Wagga Framework for Food Systems**
  https://summitdialogues.org/wp-content/uploads/2021/06/IMG-5304-scaled.jpg
- **UN Action Dr Haddad Solution Clusters**
  https://summitdialogues.org/wp-content/uploads/2021/06/IMG-5303-scaled.jpg
- **What the World Needs Now**
  https://summitdialogues.org/wp-content/uploads/2021/06/IMG-5302-scaled.jpg
- **Solutions**
  https://summitdialogues.org/wp-content/uploads/2021/06/Screen-Shot-2021-05-13-at-2.23.30-pm.png
- **Future Agriculture**
  https://summitdialogues.org/wp-content/uploads/2021/06/Regional-Education-for-Future-Agriculture-Flyer2-1-scaled.jpg
- **Location Specific Data**
  https://summitdialogues.org/wp-content/uploads/2021/06/Screen-Shot-2021-06-09-at-3.44.28-pm.png

RELEVANT LINKS

- http://www.australianagriculturalcentre.com

CORRECTIONS, ADJUSTMENTS, OR CHANGES

Title	!st XRX-AG Conference A Celebration of Fusion
Date	10/06/2021

The Australian Agricultural Centre supports The UN Food Systems Summit and especially the goal “it will awaken the world to the fact that we all must work together to transform the way the world produces, consumes and thinks about food.” It especially addressed, “Action 1 Ensure Access to Safe and Nutritious food for All” The AAC Game Changing Framework for Food, with XRX-AG and XCHANGE The AAC sees urgency in the establishment of such an entity to immediately 1. conduct educational classes to ensure the Framework and its construction is properly developed to include XRX-AG and XCHANGE 2. establish the framework with input from multiple sources and extend to a universal, international operational system. 3. implement at least 3 pilot schemes building on existing entities to demonstrate the approach in a school setting, community garden and commercial operation. The Australian Agricultural Centre through the Dialogue established a Game Changing Framework to unite all peoples and transform the way the world produces, consumes and thinks about food. It uniquely integrated the three dimensions of food, each with specialised but disparate players 1. the micro nutrients in the food to the macro, gardens and farms. 2. the seed to the savoury foods that are eaten. From farm to fork 3. the research laboratories to the steps in the food chain to ensure innovation and nutritious food

ATTACHMENTS

- **AAC UN Food Systems Summit Dialogue Outcome**
  https://summitdialogues.org/wp-content/uploads/2021/06/DAWE-.pdf