AGRICULTURE, FOOD, AGRO-PROCESSING SECTOR WORKSHOP

Workshop Report

Cape Town | 19 March 2019

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Introduction

The future has already arrived. The technological and digital revolution of economies – particularly the world of work - has been a reality since the dawn of the 21st century. But the pace of change accelerates with every passing year. This development has been dubbed the Fourth Industrial Revolution (4IR), and its impacts are both deep and wide-ranging.

The countries of the Global North are at the forefront of the changes taking place because of 4IR. However, developing economies, such as South Africa, can still find a niche by investing in the technologies and new skills that are essential for this new world. A national 4IR readiness plan is a necessary starting point.

This is where the Fourth Industrial Revolution Partnership for SA (4IRSA) comes in. 4IRSA is an initiative driven by some of South Africa's leading academic and research institutions, with the aim to produce a coherent and comprehensive national 4IR plan for the country. 4IRSA was founded by the Universities of Witwatersrand (Wits), Johannesburg (UJ), and Fort Hare (UFH), with support from Telkom SA SOC Ltd.

The partnership draws on the best South African traditions of dialogue, collaboration and negotiation to find lasting solutions. Though it is still at its infancy, the partnership will open its doors to all South African universities and research institutions, business, labour, government departments and civil society. 4IRSA is essentially the Codesa of the 21st century.

Ultimately 4IRSA will host two summits where all the above stakeholders will have a chance to participate in producing a national plan for the digital economy of the future. The first of these, the Digital Economy Summit, is set

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to take place in June 2019. It will define the foundational rules and principles that should underpin a national response plan. The second gathering, the Summit of Declarations, will produce an implementable national action plan.

A series of sectoral workshops are currently underway with some of the identified stakeholders to prepare the way towards the summits. The first of these took place on 16 November 2018 and focused on government departments, public research institutions, and the World Economic Forum.

Executive Summary

Agriculture and its value chain have been earmarked by the government as one of the key sectors to boost economic growth and create jobs. But like other areas of the economy, the future of the sector is unpredictable due to the technological disruptions we are already seeing as South Africa starts embracing the Fourth Industrial Revolution (4IR).

In its National Development Plan, the government estimates it can potentially create 600,000 jobs in communal areas and another 300,000 jobs through commercial farming by 2030.

If these goals become a reality, they could provide a major boost to build an inclusive rural economy. The South African countryside and the rural economy it supports retains huge potential for value- and job-creating activity. However, the state and rural stakeholders – farming communities, commercial agriculture, land rights activists, environmentalists and other interested parties – need to collaborate to find solutions to stark challenges that remain for the sector.

The economic value chain that encompasses farming, food production and distribution, general agriculture and land usage faces myriad challenges, some unique to South Africa. There are generally fewer permanent jobs in the sector, and wages are lower. The global challenge of climate change is taking its toll, land redistribution has been patchy and painfully slow, there are gaps in the support for developing farmer, from both the state and relevant commercial entities; and while South Africa has underutilised arable land, many of its people live with hunger and food insecurity.

The World Economic Forum has warned South Africa that its rural population cannot be left behind as the country starts coming to terms with 4IR, as this will only widen the yawning inequality gap.

But 4IR disruption contains at least as many opportunities for development as it does challenges: new seed technologies can help increase yields without endangering public health and safety, emerging farming methods may help promote more sustainable land use, increased production could lead to increased job creation, and the growing importance of technologies such as drones, accurate geo-mapping, and the use of big data can help manage both South Africa's water scarcity and the effects of climate change. Moreover, some of the emerging technologies and methods of food distribution and storage make it possible to reduce waste and increase food security in vulnerable communities.

For these reasons, 4IRSA held a workshop in Cape Town on the sector on March 19, 2019, for stakeholders to come together and discuss the future of food. They included government, labour, business and university researchers.

The government launched Operation Phakisa in 2014 to address key priorities such as unemployment, poverty and crime. It is based on the 'Big Fast Results' model adopted by the Malaysian government, which enabled that country to achieve impressive developmental outcomes within a short period.

In February this year, President Cyril Ramaphosa told the House of Traditional Leaders that the government wanted to unleash an agricultural revolution.

This proposed revolution would include finalising 30-year leases with 900 farmers to enable them to mobilise funding for agricultural development, buy equipment and modernise their farming methods. Emerging farmers have struggled to gain access to finance, markets and technical support due to the lack of secure land leases. This makes it difficult to integrate into value chains.

However, both established commercial and emerging farmers will have to embrace 4IR to put food on tables and leapfrog other countries in the global markets.

According to the Cape Peninsula University of Technology's Agrifood Technology Station, the impact of 4IR on the food industry will be massive:

- All stages of value chain of production will be affected;
- Businesses will need to create a roadmap to plan for new technologies, data and training needs;
- Jobs will be created, but a new skills set will be needed;
- To survive, companies will have to re-skill and retain such staff;
- Costs of down-time will increase exponentially as efficiencies increase, impressing the need for staff who can manage electrical faults immediately;

- Electrical (and other) skills training costs would be negligible in terms of costs based on down-time.

The collection of data from everywhere, such as on fields, food production lines or on check-out lines in supermarkets, is one of the key components of making 4IR work.

"In the centre of the collection activities stand digital sensors that have become very cheap to manufacture. The processing and exchange of the data is made possible by both very cheap computational power and the availability of internet connections even in the most remote parts of the country," it says in a brief.

"Using agriculture as an example, autonomous drones survey large plantations and collect data based on heat emission or other information patterns. This information is translated into optimal patterns of irrigation and fertilisation, which is immediately modulated into commands for fully-automated systems installed on the ground. Together with meteorological data, the right time for harvesting can be easily established. Self-driving harvesters will stand ready to respond accordingly."

This continues with food processing, where different monitoring technologies are in use or still must be installed. The data generated may be shared among the different actors on a digital platform.

It does warn though of job losses linked to mechanisation.
"These developments surely will have a lasting impact on agricultural production and food processing. Yes, it may cost a large number of jobs –

but mainly in those geographic regions that don't respond actively to these changes. At a second glance, especially for South Africa, these technological developments provide a welcome opportunity to make progress in the up-skilling of the labour force."

Government has identified agriculture as a key job driver targeting the sector to create about a million jobs by 2030, a target that can essentially be achieved through increased youth participation in the sector.

As South Africa seeks to implement land reforms, the issues of efficient farming and food security become paramount. The only way agricultural productivity is going to increase is with the use of technology, and the 4IR is going to play a pivotal part in this. Drones capacitated with high-resolution cameras collect land information and AI is used to classify the agricultural usages of the land. In fact, technology is now so advanced that this system is able to indicate which crop is planted in which area, at what period in order maximise yield. The University of Johannesburg is creating such a technology, and the business opportunities that will result out of this project will have significant impact on our agricultural production.

List of Attendees

4IRSA Agriculture, Food & Beverage and Retail - Invites

56 attendees confirmed

COMPANY	NAME	SURNAME	DESIGNATION
Aerobotics	James	Paterson	CEO
Africa News Agency (Fast Company)	Kyle	Villet	Group Head
African Centre for Cities, UCT	Gareth	Haysom	Research
ApexMedia	Kendal	O'Bryan	Account manager
Bridglot	Nico	Naudé	Engineer
Broadband Infraco	Andrew	Matseke	CEO
CiTi	Ian	Merrington	CEO
CRI/US	Gunnar	Sigge	Food Scientist
Deloitte	Jacqueline	Conradie	Senior Manager
Deloitte	Fatgiyah	Bardien	Associate Director
Deloitte Woodmead	Newton	Cockcroft	Lead Director
Departent of Economic Development and Tourism	Goodwell	Dingaan	Director of Agri-processing Unit
Department of Economic Development and Tourism	Olivia	Dyers	
Department of Economic Development and Tourism	Denver	Moses	
Ecocert	Hennie	Louw	Certification Officer, Auditor
Ecocert	Marianne	Smith	Management
FAWU	Katishi	Masemola +3	GS
FNB	Siyotula	Benedict	Marketing Manager, Strategist, Solutionist
GotBot	Nick	Argyros	Entrepreneur & Founder

COMPANY	NAME	SURNAME	DESIGNATION
GreenCape	Sam	Smout	Waste Sector Desk Analyst
HYBR Group	Vuyisa	Qabaka	Partner, Co-Founder (Uprise Africa)
Ikineo	Joshin	Raghubar	Founder and Executive Chairperson at iKineoVentures
Independent Africa	Alexandra	Dodd	Editor
Isipho Distributors CC	Mark	Veldsman	
Khoyn	Victory	Matibiri	Co-Founder
Kuebler Alfermi GmbH	Donald	Griffiths	SA Partner (Head of SA)
M4J	Jaco	van der Linde	Manager
MetriPlex	Shane	Royden Turner	Founder, CEO
Mezzanine	Dr Pieter	Breytenbach	Head of IoT Propositions
Nedbank	Lindy	Esterhuyse	Senior Client Coverage Banker at Nedbank Corporate & Investment Bank
Nedbank	Nazli	Temmers	Nedbank
OrderIn	Gillian	Couperthwaite	Strategic Projects Manager
Pepkor	Michael	Yolland	Digital Transformation Officer
Pick n Pay	Vicky	Jacobs	Innovation Specialist
Qfinsoft	Larah	Van Niekerk	Business Development Manager
RCL FOODS	Trevor	Harding	
RCS	Rudi	Visser	Head of Innovation & Acceleration

COMPANY	NAME	SURNAME	DESIGNATION
RepForce and TRUEDATA at EYONA Innovation Software	Stefan	Du Toit	Director
Senix Digital	Shaun	Fourie	Owner
Startup Bootcamp	Zacharia	George	Co-Founder and Chief Investment Officer
Sustainability Institute	Rosie	Downey	Lead Facilitator
Tapit Technologies	Tom	Newton-King	Founder, CEO
TFG Infotec	Werner	Du Toit	Enterprise Architect
The Loudhailer	Caitlin	Nash	Managing Partner
The Loudhailer	Jo	Griffiths	Managing Partner
The Loudhailer	Rozahn	Van Schalkwyk	Visual Executive
The Loudhailer	Kirsten	Roos	Communication Manager
Twizza	Ken	Clark	Executive Chairman
US	Albert	Strever	Head: Agro Innovation Hub (grapes&wine) at Stellenbosch University
WC Government	Tim	Parle	Chief Director: Digital Economy (Department of Economic Development & Tourism)
WC Government	Olivia	Dyers	Digital Leadership at Department of Economic Development & Tourism
Wesgro	Nonelela	Mtwana	
Wine and Spirit Board	Olivia	Poonah	Secretary
Wits	Reshma	Lakha-Singh	PR Manager
Xineoh	Brennan	Wright	VP Growth
Yoco	Bradley	Wattrus	Co-Founder

The 4IRSA Partnership and its Purpose

Dr Brian Armstrong, the head of the Secretariat for the Partnership, introduced 4IRSA to the industry participants:

Our departure point:

- This is a critical conversation for the country
- Several unconnected and divergent conversations
- Need a common discourse to develop a coherent set of responses.
- Many discussions not fact-based and rational
- Often zoom in too much on the tech

Critical Constituencies:

The 4IR will impact every part of the economy and the society
Hence all constituencies need to be a part of the dialogue and of formulating South Africa's response.

- Government (a broad cross section of departments and institutions)
- Industry (key players and representative associations and professional bodies)
- Small Business and Entrepreneurs
- Labour
- Academia
- Civil Society, representative organisation and NGOs
- International Organisations like the WEF, ILO, etc.
- The Media

Our Framework: Five Themes

Competitiveness, Concentration & Inequality
· What do we need to do to be globally competitive
· The link between digitalisation, concentration and inequality
· Control and Regulation of Critical Assets & Infrastructures for the 4IR, and the democratisation thereof
· The effectiveness and adequacy of competition law for a digital age
· New challenges in (re-)distribution in the global digital economy, and conceptual alternatives

Employment & Jobs
· The impact of AI, robotics and other emerging technologies on work and jobs
· Changing models for work and work structure
· Fair remuneration in a digital economy – platform value sharing and the gig economy
· High demand future skills
· Retention and mobility of high demand skills

Society, State & Citizen
· Reshaping the way society, state and citizen interact.
· Digital Literacy, adoption and empowerment
· Fostering Trust
· Towards the deployment and adoption of Government e-Services
· Personal Identity in a Digital and Cyber-physical World
· New Challenges and Opportunities for Democracy
· Social Order and Disorder in a cyber-physical world.

- New frontiers in safety, security and crime (and the balancing act with privacy and personal liberties).

Opportunities
- Export growth opportunities
- Competitiveness & Productivity enhancement
- Critical Infrastructures
- Global Growth Segments in which to play
- Platforms to include SMEs in national and global value chains
- Digital Republic or Digital Colony?
- Transforming Healthcare

Critical Success Factors
- – Getting the basics right
- – Policy & regulatory frameworks
- – Great Macro's
- – Policy execution
- – Sector Productivity growth
- – Competitive intensity
- – SMB participation share
- Skills, Education and Training
- The 4IR Ecosystem
  - – Technology fabric
  - – Physical fabric
  - – Financial fabric
  - – Innovation fabric
- Lessons from emerging economies and peers

Our Process

Get Started
- Form the partnership
- Establish Secretariat
- Formulate framework
- Start research agenda
- Government involvement

Broaden Participation
- Sector Workshops:
  - Government
  - ICT
  - Financial & Business Services Ecosystem
  - Commodities and heavy infrastructure ecosystem
  - Food, Agri and related ecosystem
  - Manufacturing
- Industry key players and associations, Labour, Academia, Civil Society, Global Organisations
- Workshops and individual engagement
- Research and position papers
- Establish discussion platform

Digital Economy Summit
- Share sector workshop outputs
- Build Alignment
- Elevate profile

- Agree critical focus and further discussion areas
- Agree framework for further work and roadmap to SoP

Elaboration
- Develop strategy and policy responses
- Enhance research base
- Continue to broaden inputs
- Start converging positions
- Formulate draft declarations

- **Summit of Declarations**
- Consolidate Workstreams into a coherent national response
- Commit to declarations
- Agree monitoring and evaluation mechanisms
- Agree future pathways

Towards Execution
- Execution – facilitation, measurement, …
- Monitoring and evaluation
- Ongoing research
- Ongoing dialogues

Purpose and Structure of the 4IRSA Workshops

The 4IRSA sectoral workshops are an integral part of the stakeholder consultation and management leading up to the Digital Economy Summit in June 2019. They are aimed at galvanising support for the 4IRSA process, allowing key stakeholders to influence and direct that process, as well as to gather industry insights and collate existing research on the extent and nature of 4IR-related changes in these sectors.

So far, 4IRSA has hosted sectoral workshops for the public service and government sector (including public research institutions), information and communication technology (ICT), mining and manufacturing, financial and business services, as well as food and agriculture.

Each of the workshops is divided into a general plenary session, in which the challenges of 4IR in the South African economy and society are explored. Participants – who are drawn from a wide selection of government, business labour, academia, civil society, and researchers – then separate into three breakaway groups that discuss the impacts of 4IR on their sector. The deliberations are based on three of the broad thematic areas identified in the 4IRSA process as being key to finding South African solutions to the challenge. These themes are:

· Society, State and Citizen: focusing on the changing nature of citizenship and social relations in the digital age, and how these relations are being disrupted by new systems and technologies
· Jobs, Employment and the future of work: focusing on the changing nature of work, modes of production, and the technologies that are changing the workplace

- Competitiveness, Concentration, Fairness and Equality: focusing on the challenges of economic concentration, disruption, and the reproduction of inequality within and between countries

4IRSA has recognised two more research themes that are not represented in the workshops, but will form a part of the discussions at the summit, and will be separate research areas going forward:

- **Growth Opportunities** (looking at the country's readiness to 'leapfrog' technological development based on international best practice and lessons, and where the potential growth sectors are); and
- **Critical Success Factors** (an attempt to define the goals, milestones and indicators that tell us what a successful 4IR strategy should look like).

Next was the director for Deloitte's strategy unit, Sikhumbuzo Ngcobo, who spoke about the firm's recently established physical 'connected retail experience' at its Greenhouse innovation space, where the workshop was held. The interactive experience allows visitors to gain a practical look at every aspect of the connected retail ecosystem – allowing people to sample new technology which is set to be introduced to the retail shopping space in the future.

Deloitte believes that connected retail technologies will not only make for a vastly improved shopping experience for customers, but retailers and suppliers who embrace and implement them effectively, will see a significant boost to their bottom line.

The Greenhouse allows people to understand the value of digital transformation – from enabling technologies to store management, inventory management, connected supply chain, connected workforce and advanced analytics.

The Western Cape Agricultural Sector and 4IR

The 4IRSA process aims to foster collaboration between governments, industry and other critical stakeholders to find the most workable solutions to the 4IR challenge in South Africa.

For that purpose, national, provincial and even local authorities are invited to give their perspectives and share their insights on 4IR, how it affects them and their constituencies, as well as their responses so far.

The government of the Western Cape – where the workshop was held – attended and shared the outcomes of research conducted with the University of Stellenbosch Business School on the future of the agricultural and food sector in the province.

The report, titled: The future of the Western Cape agricultural sector in the context of the Fourth Industrial Revolution, makes five recommendations on shaping the future of farming.

Government policy: It says clarity is required on the policy related to land as it believes this will influence investment decisions. Related to this is labour legislation and reforms required to government levies to support the agricultural sector. It wants trade assistance and incentives to be revised to support agricultural exports and imports, including the relaxation of regulations on agricultural equipment such as robotics and drones,

New credit lines: It wants credit assessments to be customised for farmers so that the use of technologies such as drone footage or sensor readings are admissible in support of credit applications.

Entrepreneur development: The report says the commercialisation of agricultural inventions should be supported by funding interventions and focused entrepreneur-support interventions, which include agri-tech development support, the development of cooperatives and start-up support. Key to this is exchange programmes from other regions.

Education and training: It says it is clear that the global agriculture market represents a big growth opportunity for current and new participants, but for this to be realised, investment in agricultural technologies is a prerequisite. The leverage points are not necessarily individual technologies but how an integrated agri-system is linked to a farming system and a biosystem.

Talent: The provincial government says industry discussion group have highlighted the importance of attracting future talent to the sector, possibly best addressed by co-opting private industry to invest in skills development.

Agri-industry collaboration: It says assisting or enabling the adoption of the technologies and innovation based on scientific reference cases and early adoption scenarios is crucial, supported by forums for engagement between the science community and commercial agriculture to jointly define and resource the new research agenda.

Breakaway Group Discussions

The three breakaway sessions were divided into seven desired outputs. Competitiveness, Concentration, Fairness and Equality had Outputs 1-3 (reflected below); State, Society and Citizen covered Outputs 4-5; and Jobs, Employment and the Future of Work looked at Outputs 6-7 below:

- **Output 1:** Assessing current competitiveness
- **Output 2:** Creating opportunities through disruption
- **Output 3:** Levers to drive competitiveness
- **Output 4:** Embracing shared goals
- **Output 5:** Scenarios to inform R&D agenda
- **Output 6:** Structures in the ecosystem involved
- **Output 7:** Roles to be impacted by Labour Shifts (Emerging and Declining)

OUTPUT 1: Assessing current competitiveness

This sector is competitive because:

- Our labour from bottom to top is relatively cheap and readily available.
- Our produce is hand picked and therefore is of a superior quality.
- High quality banking systems and institutions.
- Relatively well developed infrastructure.
- We have home grown super star firms that drive innovation across Africa
- Strong R&D and we have top quality research institutions in south Africa
- We are people with tenacity and people who will find solutions for problems. We are solution driven.
- Our produce is black spot free, only 1/3 of competitors are free.
- We are suppliers of ethical wine, where by working conditions, safety and security has been certified as ethical.

- Proximity to market. We have the unique positioning to serve Europe, Africa, the Americas and the far East
- Cape Town have very strategic ship ports, international trade route via Cape Town
- We have a geographic advantage (our summers and their winters), crop season advantage.
- We also benefit from an ocean economy. We border two oceans and the majority of our country's borders consist of shorelines which have access to the ocean.
- Our foods industry is very advanced
- We have a highly competitive agriculture sector, our land is very arable.
- Agriculture is the biggest employer within the extended value chain.
- We need to use land properly, to grow industry more and become more competitive.
- Space and resources. We are good at using limited resources, they are able to maximise the "bang for your buck", through efficient use of resources and space.
- The lack of sophistication that our neighbours experience is our advantage that can be capitalized on.
- We have a lot of small businesses and entrepreneurs. Diversity in SMB.
- We are able to add value throughout value chain
- Our supply chain and logistics capability is very advanced and integrated.
- Support institutions – supporting sectors, schemes, Standards, and certifications (CAS program running for 20 years).
- We have multiple support systems and services out there to help farmers.
- The agriculture sector is driving an inclusive economy where businesses are

partnering, training and hiring from the local community.
- We are not very regulated. This gives us an advantage. (But it can be a problem to when exporting, e.g. protocols not being signed)
- Food safety standards, legislation and food labelling laws are very competitive, very strict and are derived from global standards.
- Technology infrastructure and e-readiness. We have coverage and connectivity, others like Australia have it much worse.
- Our digital literacy within our society is reasonably competitive.
- Huge capacity for international trade.
- Different ways of reskilling employees.
- We have very skilled people, Agronomy advisory, right skills for human capital.
- IP protection framework (relative, semi competitive).
- South Africa have a food driven culture.
- We promote responsible tourism. Tourists eat and drink too, if we can grow our tourism it will grow this industry.
- Venture Capital, better access to scale, small farm owners need to co-op to compete.
- We have advanced brick and mortar retailers. Pick & Pay physical store layout is superior to Walmart.
- We have better access to market
- Biggest trade from shebeens and spazas. Their closeness to consumer is our strength - we have stores right next to consumers (Last Mile opportunity competitiveness, some big retailers and online stores struggle with)
- Our retail has the capabilities to be best in the world

OUTPUT 2: Creating opportunities through disruption

1. Artificial Intelligence and Machine Learning

- Prediction of required crops to guide decision making
- Seasonal fruit/veg available all year round
- Machine learning to fast track training of farm workers
- Digital hubs for tech concentration

2. Artificial Intelligence and Machine Learning

- Cost of banking and alternate banking solutions
- Using Blockchain for traceability and trade
- Food safety and traceability
- Provenance - food tracing.
- Crypto currency and e-money

OUTPUT 3: Levers to Drive Competitiveness

DRIVERS	MEDIUM TERM ACTIONS (NEXT 5 YEARS)	LONG TERM ACTIONS
Technology and Innovation	· Smartphone adoption · Accurate Positioning · Sandbox enable experimentation with block chain · Funding for R&D · Reduce data costs across the board · Use digital hubs to develop appropriate AI and machine learning · Roll out of smart phones, entry level phones	

DRIVERS	MEDIUM TERM ACTIONS (NEXT 5 YEARS)	LONG TERM ACTIONS
Human Capital	· Education · Support and develop re-skill (Digital skills) programs to ease movement between companies and roles · "Classroom of tomorrow" concepts to agriculture training · AI will be the great leveller in education · Import skills (Relax visas) · Development | support existing skills (Training, R&D credits, subsidies) · Available data on the workers skill levels · Must include R&D · Skills development strategy to be adopted to 4IR orientation · Reskilling in new and emerging industries	Curriculum development

DRIVERS	MEDIUM TERM ACTIONS (NEXT 5 YEARS)	LONG TERM ACTIONS
Global Trade and Investment	· Simplify and open the critical skills visa program with local mentorship/ coaching requirements · Really understanding the human implications of global trade agreements (BRICS, BREXIT) · Government to stop dumping of imported agricultural products · Enable ecosystems · Faster negotiation of trade portals for exports · Government selling SA? · Irish beef Blockchain example · Institutional traceability	· Do SA farmers know what opportunities there is because of Brexit? · Shift DT1 fund to encourage investment · Communication about trade agreements

DRIVERS	MEDIUM TERM ACTIONS (NEXT 5 YEARS)	LONG TERM ACTIONS
Institutional framework	· Data access & policy · Enable farmers to standardise quality · Drone legislation · Enable farmers to standardizes quality · 30% of produce bought within 30km of stores · Farmer profile registration · Incentivise retailers · Aggregation technology · Government engaged in addressing international trade (capacity X potential) · Enhancing quality and standards for suppliers and value chains · Availability of funding (R&D)	· Incentivise academic institutions to do local research (R&D clusters)
Sustainable resources	· Database of small holder farmers · Agriculture parks · Sharing technology-operators · Reduce wastage	

DRIVERS	MEDIUM TERM ACTIONS (NEXT 5 YEARS)	LONG TERM ACTIONS
Demand environment	· Aggregate Demand for payment SCFs · Sharing culture · Help solution provider get closer to the need · Sustainable social dialog	

OUTPUT 4: Embracing Shared Goals

A total of 16 'problems' were identified, related to a diverse set of topics, from policy, to leadership, tech, skills and consumer trends:

1. Engagement platforms   Communities
2. Digital business platforms   Value chains
3. Consumer platforms   Retailers, retail jobs, changing consumer habits

4. Radical transparency
5. (agri audit trails: producer—consumer)   Empowering communities/ consumers

6. 4IR and food (in)security   Consumers
7. 4IR and ecodevelopment   Sustainable production
8. Inequality marginalised communities etc.   Youth, 1st 1000 days of life, women,
9. Food waste   (see above groups)
10. Globalisation/concentration   Entrepreneurs, SMMEs

11. Supply/demand pressures	(see above groups), retail/ warehousing infrastructure
12. Food heritage/social cohesion	Society and individual
13. Socio-political changes/disruption	Citizenship, belonging, outsiders/ insiders
14. Government policy	Competition, consumers, citizens, economy
15. Skills	New tech, jobs, education system
16. Leadership void	Whole ecosystem
17. Infrastructure	Entrepreneurs, informal sector, etc.

OUTPUT 5: Scenarios to Inform R&D Agenda

An inclusive 4IR research agenda to be informed by the following goals:

1. Leave no person behind
2. Empower users through good digital identities
3. Make business work for people Keep everyone safe and secure
4. Build new rules for a new game
5. Break through the data barrier

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OUTPUT 6: Structures in the Ecosystem Involved

Structures in the ecosystem involved	Describe the desired structural change	Level of effort to drive transformation	Expected impact on the ecosystem
Education	Free training apps		
	Analytical and EQ studies – for high school and tertiary institutions		
	Invest in the foundation (focus on the value of foundation)		
	Early childhood development (transport, safety etc.)		
	Information and skills networks		
	Less reliance on traditional education institutions		

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Structures in the ecosystem involved	Describe the desired structural change	Level of effort to drive transformation	Expected impact on the ecosystem
	Science Lit and Maths Lit at primary level		
	Programming and computer science – as subjects in schools		
	ABET learning		
	Tech Lit		
	Greater emphasis on short courses		
		Need to teach to innovate not just to operate	
	Greater focus on early childhood development – specifically, the first 1000 days of a child's life		
Non-profit		Provide data	

Telkom WITS UNIVERSITY UNIVERSITY OF JOHANNESBURG University of Fort Hare Together in Excellence telecommunications & postal services Department: Telecommunications and Postal Services REPUBLIC OF SOUTH AFRICA Deloitte.

Structures in the ecosystem involved	Describe the desired structural change	Level of effort to drive transformation	Expected impact on the ecosystem
Government and Public Sector	Policies driven by human needs, not politics		
	Long-term consistency in policy is eroded by changing cabinets		
	Re-regulation of the education sector		
		Access to financial support and funding innovative projects	
		Create a culture of growth (personal and national)	

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University of Fort Hare
Together in Excellence

telecommunications & postal services
Department: Telecommunications and Postal Services
REPUBLIC OF SOUTH AFRICA

Deloitte.

Structures in the ecosystem involved	Describe the desired structural change	Level of effort to drive transformation	Expected impact on the ecosystem
	Creation of greater transparency to show how taxpayer's funds are being utilised	Drive for more openness and transparency within government and possibly adoption of technologies such as the Blockchain to make use of a distributed ledger for more accountability in terms of the uses of public funds by various individuals and government departments	4IR will be easier to adopt and implement if there is a clear audit path in relation to the funds used in driving the 4IR initiative
	Sharing of information to all parties		

Structures in the ecosystem involved	Describe the desired structural change	Level of effort to drive transformation	Expected impact on the ecosystem
	Make employees aware of the benefits they can derive from adoption of 4IR	Encourage employees to adapt to 4IR and new technologies and learn/educate themselves/enrol in classes	
	CEO and labour organisations displaying a united front	These two parties need to drive collaboration to bring in change	Employees will be more encouraged to adopt and accept 4IR implementation when they witness the company's executives and labour organisations actively working as one unit with a shared goal

Structures in the ecosystem involved	Describe the desired structural change	Level of effort to drive transformation	Expected impact on the ecosystem
	Labour is taken into account as a core pillar when business and government make plans for the future		The conflicts we see today will be reduced because those in labour would have been thoroughly consulted in order for decisions to be implemented
Business	Skills development and tech fluency		
	RPA needs to factor in the people from stage 1 and not simply at the end		
	Focus on process more than policy – currently too many hops to jump through for any collaboration		

Structures in the ecosystem involved	Describe the desired structural change	Level of effort to drive transformation	Expected impact on the ecosystem
	Companies need to adapt to and accept the new workforce – they are not ready or geared for the demands of the millennial workforce		
	Global millennial may not be the same as a South African millennial – companies need to be very cognisant of this when planning for the future of their workforce and its needs		

Structures in the ecosystem involved	Describe the desired structural change	Level of effort to drive transformation	Expected impact on the ecosystem
	Collaboration of businesses		Ensuring that businesses do not operate as silos where a lot of efficiency will be lost due to the closed-off nature of this sort of operating model
	Greater emphasis being placed on transparency within a business		
	Removal of hidden costs that hinder the growth of businesses		
	Connection to the gig-economy and collaboration with smaller players		

OUTPUT 7: Laws to be Impacted by Labour Shifts (Emerging and Declining)

Eminent Roles to be impacted by Labour Shifts (Emerging and Declining)	Drivers of the shift	What should we do for the sector to best manage this transition?
Agricultural labourers – Moving from permanent roles to seasonal roles. This results in more job insecurity	Decreasing cost of data & access to market information	Working with innovators, start-ups, entrepreneurs – get them into conversations with big corporates and government.
Data – to be shared across the supply chain as automation becomes more prevalent	A truly competitive and stable global market	When disruption emerges, do not leave it – ensure that some critical discussion is had between the disruptors and other major players. E.g. – Uber disrupting SA taxi industry but no real dialogue was entered into with government

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Eminent Roles to be impacted by Labour Shifts (Emerging and Declining)	Drivers of the shift	What should we do for the sector to best manage this transition?
Skills development will result in more specialised workers who are able to move from one farm to the other. V.S Power of the producers	Consumer awareness (eg. Environmentally conscious suppliers and ethically produced goods)	Necessary shift in academia
Drivers and operators of various vehicles and machinery – autonomous driving will result in more job losses	What are the (hidden?) agendas behind the technology introduced into countries/markets	
Micro entrepreneurs – drive for more business and marketing etc. skills	A bigger market space with greater access to information	
	Urbanisation and climate change (things that generally cannot be controlled)	

Eminent Roles to be impacted by Labour Shifts (Emerging and Declining)	Drivers of the shift	What should we do for the sector to best manage this transition?
	Incorporating these smaller farmers into the formalised economy and access to banks etc.	
	In the SA context: encourage individuals to become active in the market	
	Collaboration between small players and the bigger, more established parties – including resource and knowledge sharing.	
	The impact of big data in farming?	
	Governance issues?	
	Establishing agricultural hubs to share information	

Conclusion and Way Forward

The primary importance of the 4IRSA workshops is the role they play in stakeholder management. They also play a critical part in fostering the beginnings of collaboration in South African 4IR planning. Many of the attendees at the workshops have not previously been in the same room with each other, even though they work in related fields/industries as part of the same value chain or ecosystem. In the main, they tend to experience 4IR disruption separately.

While important insights are gained from these workshops as reflected above, they are not at this point aimed at finding solutions to the challenges of 4IR but play a galvanising role and give participants a stake in the process of finding the solutions.

After agriculture and agro-processing, 4IRSA held a mining and manufacturing workshop in Johannesburg on 26 March 2019 and the turn of the financial and business services sector came on 2 April 2019.

4IRSA will take the process forward towards the Digital Economy Summit in June 2019, during which the insights gained from the workshop process will be used to tease out the principles and elements that should define a South African response to the challenge and opportunities of the 4IR.