OECD Conference
Agricultural Knowledge Systems

Session 3.B.
Public/Private Roles

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Outline of Presentation

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1. Context

- Our focus is the nexus of food security & climate change

- Nations are challenged with sustainably producing an increasing amount of food while mitigating adverse environmental impacts

- Innovation can address these challenges with technologies developed from relevant R&D

- Agricultural R&D is produced by agricultural knowledge systems (AKS)

- The private sector has a role in supporting AKS to provide this R&D

- Agriculture and AKS are crucial to New Zealand's economy

- This presentation will illustrate New Zealand private sector experience in investing in and supporting AKS

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2. Business Government roles are complementary

- Business and govt = shared analysis of challenges and opportunities
- Business and govt = different, but complementary objectives & roles

- Business role - BIAC (2009)
  - Maximising productivity
  - Capturing sustainable value
  - Listening to customers
  - Co-investing with Government where relevant – particularly where one solution solves the same problem for many businesses
  - Investing in growth/skills
- Government role
  - Foster an overall innovation-friendly policy framework
  - Unleash the power of entrepreneurship
  - Foster education and skills for innovation
  - Foster innovation for green growth and global challenges
  - Realise the potential of intellectual assets
  - Take a whole-of-government approach

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3. NZ policy instruments in AKS

Type of Innovation	Type of Collaboration	Govt. Policy Instrument	Case Study
Science-led High research intensity Performed by public sector	Public research, industry, and producers	Biological industries	Gold Kiwifruit
Cross sector Both research and development intensity Performed by public & private sector	Public research with firm	University & Crown research funding	Precision Irrigation
Industry-led High development intensity 50/50 public/private collaboration	Public funding with industry consortia	Primary Growth Partnership	Precision Seafood Harvesting
Near market – industry led Low development intensity Performed by private sector	NZ firm in international market	International trade linkages	Fonterra in China

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4a Gold Kiwifruit

An example of research-intensive innovation in AKS

- Industry seeks higher yield in variety that matches consumer preferences

- Long-term research platform - since 1991

- Govt, research org, grower-owned industry group collaboration

- Application of genetic improvement technologies; production management systems; post-harvest technologies; brand marketing

- Business objective to maximise productivity of existing natural resources – drives demand for new technology

- Power of entrepreneurship is unleashed

- IP and brand management secures viability of AKS and drives demand for new technology

- Asian links underpin marketing initiatives and subsequent demand maximises return on public and private investment in AKS

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4b Precision Irrigation

An example of cross-sector collaborative innovation

- Collaboration of university, Crown & industry research entities with private sector

- Improve efficiency of water irrigation for food production

- Develop a soil and crop-based decision support tool for spatial irrigation scheduling

- Based on real-time soil water status mapping

- Save water, save energy, reduce nitrate leaching, apply just the right amount of water needed

- Entrepreneurship that identifies global opportunity

- Multi-disciplinary teams - GPS, ICT, soils, engineering

- Uses existing publicly–funded national soils database

- Awareness of global water scarcity and carbon footprint issues

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4c   Precision Seafood Harvesting

An example of development-intensive innovation in AKS

- PSH = seafood companies with 30 - 60% of NZ high value quota

- 50/50 research partnership with government - $53 million, 7 years

- Harvesting system to target specific species and fish size

- Improve catch efficiency, preserve fish stocks, reduce by-catch

- Increase sustainability of inshore and deepwater commercial fishing

- Business objective to maximise productivity from existing natural resources – drives demand for new technology

- Research to improve a production process

- Research informed by data on fish species and stocks

- Business viability depends on sustainability and awareness of green growth and global challenges

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4d   Fonterra in China – dairy farms

An example of near-market innovation in AKS

- Fonterra is world leading exporter of dairy products

- China dairy industry forecast to grow from $22 billion to $71 billion by 2020

- Fonterra aim is safe, secure and sustainable supply to meet demand

- Business objective to maximise productivity on existing farm land $\Rightarrow$ drives demand for new technology for farms

- Entrepreneurship that identifies opportunity $\Rightarrow$ drives technology development

- Global links with China enables technology uptake

- Fonterra's production scale creates efficiencies for technology use

- Fonterra's base in New Zealand connects it to leading AKS for milk production

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5. Private sector role

- Business has a role in supporting supply to and demand for AKS to address food security and climate change challenges

    - Maximise productivity with existing resources

    - Focus on agricultural issues that have maximum impact for customers

    - Identify valuable technology solutions

    - Recognise the value of new and existing knowledge in AKS

    - Partner in multi-disciplinary and multi-national teams to overcome scientific, technical and market challenges

    - Fund R&D within the boundaries of business practice (see later)

    - Market the new product or process to create demand and hence raise the value of the AKS

    - Realise a commercial objective which will in turn create private and public benefits

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6. Boundaries for private sector role

- Businesses must weigh up many factors before investing.
- These assume special importance when investing in AKS, e.g:

  - **Risks** (e.g. Gold kiwifruit case)
    - Science and technical risks – mitigated by quality of long-term research
    - Market risk – mitigated by intellectual property management

  - **Timeframes** (e.g. Fonterra case)
    - Identifying new technologies and implementing them simultaneously with development of global markets

  - **Competencies** (e.g. Precision irrigation case)
    - Entrepreneurship, multi-disciplinary science and engineering, marketing

  - **Value to business** (e.g. Precision seafood harvesting case)
    - Sustainable resource management is critical to business viability

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7. Challenges for private sector role

- There are many challenges before businesses get tangible benefits, e.g:

    – Predictable economic policy with government confidence and support for business investment in AKS

    – Maintaining competitive advantage through new technology

    – Management capability, production scale, marketing etc

    – Overcoming inertia within a business that resists investment in new technology

    – Scientific, technical and knowledge management expertise

    – Actions of Competitors

    – Capturing and retaining IP

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8. Conclusions

- The private sector has a role to support AKS in ways consistent with business objectives

- Government policy is complementary with private sector support for AKS

- A fundamental principle consistent with business objectives and with sustainable food production, is to maximise productivity with existing resource use

- Business investment is constrained by boundaries common to all firms, but which take on special meaning in the case of investment in AKS

- Business needs to overcome challenges regarding the benefits and risks of AKS, that are influenced by their uptake and acceptance by government, the public and business itself

- R&D and innovation is thriving in the New Zealand business sector, as the case studies show.

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