

# Natural Capital ~ A challenge for industry adoption and recognition

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RURAL ANALYTICS

# Natural Capital (definitions)

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Natural capital can be defined as the world's stocks of natural assets which include geology, soil, air, water and all living things (Natural Capital Forum)



Natural capital is the foundation of all farming systems - soil and water support crops and pastures, plants provide food and shelter for livestock and regulate the micro-climate for crops, and native animals (e.g., insects, reptiles, birds) provide services such as pollination, pest control and waste decomposition. (Latrobe University)

# Value of Natural Capital

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## The Australian Environmental-Economic Accounts (Australian Bureau of Statistics 2018) calculated

- the value of the nation's natural capital to be over AU\$6.4 trillion annually.
- Land (soil, water, biodiversity) accounted for 90% of the total value and had increased by 12% in comparison with other environmental assets (minerals, timber and energy);
- over A\$87 billion of agricultural debt that is highly exposed to a variety of natural capital dependencies.

## SO, WHAT! What's in it for me:

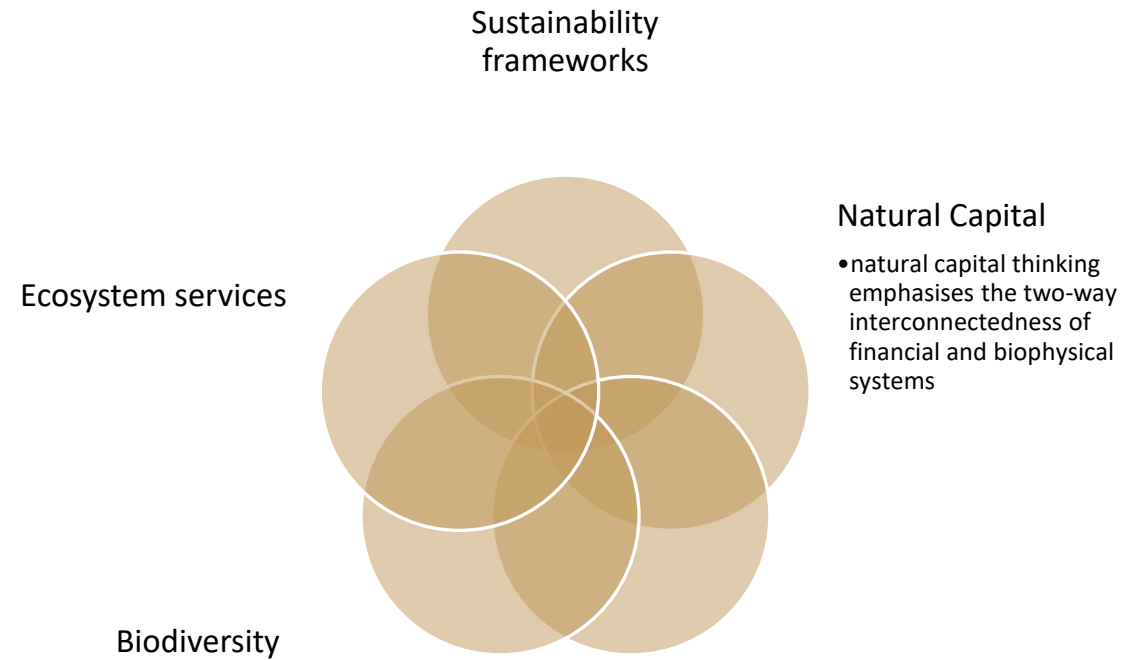
- Access to finance
- Access to markets
- Access to potential related ecosystem service payments

# Context

1. The National Farmers Federation has a vision to achieve a \$100 billion industry by 2030, with \$5 billion to come from **ecosystem services**
2. The previous federal government has announced a **\$30 million biodiversity stewardship** pilot program; a **\$4 million farm biodiversity certification** pilot program; \$4.7 million over three years to facilitate the development of approaches and tools to measure and integrate natural capital in financial products and solutions.
3. QLD state government \$35M to establish the Queensland Natural Capital Fund.
4. Various agricultural industries have developed/are developing their own **sustainability assessment frameworks**, including cotton, beef, eggs, dairy, sugar, grains, wool and sheepmeat, these all include aspects of natural capital
5. There is an overall framework now being developed (Australian Agricultural Sustainability Framework (AASF); which should link to Natural capital accounting
6. Consumer, finance and insurance companies are more environmentally-conscious and looking for sources of information to “value” environmental footprints (Natural Capital Accounting)

# The overlapping dilemma

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# Key Issues for natural capital

1. Lack of participation in sustainability recognition schemes including natural capital accounting
2. Sustainability metrics and NCA measurement methodologies developed by industries or other entities are often not scientifically-validated
3. Consumers don't trust industry bodies to do their own sustainability reporting and industry doesn't trust government with their data – there is a need for independent honest brokers
4. Top-down industry sectoral approaches fail to achieve:
  - Farmer participation
  - Cross-sectoral harmonisation and equivalency of metrics and indices
  - Regional development
5. Systems lack translation from biophysical parameters → financial accountancy → community confidence

Ascui, F., Ball, A., Kahn, L. and Rowe, J., 2021. Is operationalising natural capital risk assessment practicable?. Ecosystem Services, 52, p.101364.

Thematic area	Risk area	Potential indicators	Thresholds	Example data sources
Water	Water availability (rainfall)	Stocking rate index (e.g. stocking rate (DSE/ha) per 25mm long-term average annual rainfall over 250mm)	>1.3 high	Historical rainfall amount: BoM; Stocking rate: producer
		Long-term annual rainfall variability index	>1.25 high	BoM
		Modelled probability of pasture growth being insufficient to meet target needs	Tbd	ASKBILL; Producer
	Water use	Average total water consumption per DSE	> average consumption per DSE: high; total water consumption thresholds tbd	Producer
		Groundwater: 20-year groundwater level trend	Declining: high	BoM
		Surface water: Trend in lowest 10% streamflows	Declining: high	BoM
	Water quality	Frequency of poor stock drinking water quality episodes	Tbd	Producer
		Groundwater salinity (average and trend)	Average 1,000-3,000 mg/L TDS increasing: high; Average <1,000 mg/L TDS increasing: medium	BoM
		Surface water quality	Tbd	BoM
Weather and climate	Temperature extremes	Long-term average number of days over 1,000 kJ/m <sup>2</sup> /hour (cold stress) or Heat Load Index over 77 (heat stress)	Tbd	BoM
	Extreme weather	Historical frequency, severity and duration of extreme weather events	As defined by insurance industry	Insurance Council of Australia; Australian Flood Risk Information Portal
Soil	Soil quality	Proportion of farm's usable area with pH<4.7 (in CaCl <sub>2</sub> ) in top 15cm	Tbd	ASRIS/SLGA
		Proportion of farm's usable area with SOC <2% and 1% in top 15cm	Tbd	ASRIS/SLGA
		Proportion of farm's usable area in high to extremely saline condition	Tbd	ASRIS
		Proportion of farm's usable area with minimum ground cover <70% and <50%	Tbd	Monitor; TERN
	Fertiliser use	Average quantity and cost of fertiliser used, by type, per ha, DSE, kg LW or kg CFW	Tbd	Producer; Market analysts; Historical prices
		'Stress test' impact of high fertiliser price on total farm cash costs	Tbd	Producer; Market analysts; Historical prices
Biodiversity and ecosystems	Biodiversity	N/A	N/A	N/A
	Pasture composition	Proportion of farm grazing land in 'C' or 'D' condition	Tbd	Producer; Site assessment; DAS
	Weeds	Exposure to grazing-relevant weeds	Present: high; within projected distribution: medium; outside projected distribution: low	State and territory weed distribution maps
		Proportion of farm grazing land in 'C' or 'D' condition	Tbd	Producer; Site assessment; DAS
		Proportion of farm grazing land with bare and/or broken ground (zero ground cover)	Tbd	Monitor; TERN
	Pests and diseases	Historical frequency and severity of pests and diseases outbreaks	Tbd	Producer; Processors; Animal Health Australia
		Quality of biosecurity management	Lack of biosecurity management plan or certification: medium to high	Producer; Third-party assurance schemes
	Animal welfare	Historical level of non-compliance with animal welfare standards	Non-zero: medium to high	Producer
		Historical mortality rates (% lambs, weaners, ewes)	Single-born lambs: >10% high; Twin-born lambs: >30% high; Weaners: >4% medium, >10% high; Ewes: tbd	Producer
Energy	Energy use	N/A	N/A	N/A

A sheep example

# Initial beef sustainability logic map





# What must be industries response

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HARMONISATION AND RECOGNITION OF NATIONAL SYSTEMS AND FRAMEWORKS FOR AGRI-ECOSYSTEM SERVICES AND NATURAL CAPITAL



DEVELOPMENT OF A CREDIBLE FRAMEWORK OF INDICATORS OF RESILIENT LAND MANAGEMENT SYSTEMS (MEASUREMENT AND REPORTING)



BUILDING PLATFORMS AND TRAINING FOR NEXT GENERATION INDUSTRY REQUIREMENTS

# Natural Capital evaluation and accounting (a complex landscape)

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# Generating outcomes and pathways to participation and adoption

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Achieving natural capital outcomes from regional landscapes requires participation (see this project)



It also requires a framework for easy collection, prediction and storage of verified metrics (at farm level)

Transfer metrics to third parties

Organise metrics into quantifiable indices

Relate metrics to landscape management practices (consistency across agricultural enterprises)

Forecast impacts of weather and climate on metrics

