

Lecture 1 – Indigenous gongora

Indigenous knowledge = accepted term to include the beliefs and understandings of non-western people acquired long-term association with a place.

→ practical common sense based on teachings and experiences passed on from generation to generation
→ practices developed and sustained over thousands of years e.g. seasonal calendar from Ngan'gi language group

Western society could have discovered things had they spoken to indigenous community e.g. platypus (habitat, how they lay eggs, behaviours, anatomy), emu (astronomy, ecology, the dreaming feeding/eating habits)

- Developed practices that both helped maintain and keep land in good condition (managing the land), whilst harvesting and hunting for food that didn't disrupt environment → only took what they needed for consumption

- 'Working on Country' project → implemented by Government to help protect traditional indigenous knowledge, culture and land

- 'Mapoon Land and Sea Program' → nest protection to monitor number of turtles. Reduce threats to vulnerable and endangered turtles.

- Indigenous community can name and identify animals from how they swim (see from surface of the water). Based off this they know which one to hunt and which not to hunt.

Indigenous knowledge is important to incorporate as we approach the present and future challenges for conservation and management of animals and land.

Lecture 2 – Biodiversity Gongora

Biodiversity: biological diversity (range of species, biological communities, habitats, environments, ecosystem processes)

→ Ecosystem (biological communities and habitats)
→ Species (plants, fungi, protist & animals)
→ Genes (genetic diversity)

Species diversity and benefits

- food chain
- adaptation to environmental challenges
- buffers humans and biological communities from climate change impacts
- Provides resources and services to agriculture, food, shelter, biomedicine, economic income, spiritual fulfillment

Measuring species diversity

- estimates of their densities in different habitats
- base estimates off size, abundance, behaviour and habitats

Species richness: total number of given species in specific area

Species evenness: degree to which the number of individual organisms are evenly divided between

different species of the community/how equal the community is numerically

Species rarity: the rarity of organism within ecosystem

Disparity: measures the phenotypic differences between species within a population

Species richness

- simplest measure
- cannot count all species when there is limited time
- differentiating difficulties

Alpha diversity: diversity within particular ecosystem

Beta diversity: changes in sample composition along an environmental gradient

Gamma diversity: rate of change of species diversity along environmental/geographical gradient

How it is approached -

1. Identify organism groups of interest
2. Identify boundaries of community
3. Survey area for organisms of interest

Sampling techniques to measure species diversity

e.g. observation, traps, recordings, footprints, DNA barcoding, history, photographs and videos

Lecture 3 – Interaction between production animals and wildlife

Kangaroos

- 4 species (red, eastern & western grey, wallaroo or euro)
- populations fluctuate dramatically
- prefer short green feed, shelter in bushland
- can migrate in large numbers in drought (impacts feed)

Kangaroo movement – current state of play

Kangaroo impact is greater with fewer domestic livestock, more trees, less predation, less commercial harvest

Current management not working: commercial system suffers from low demand, damage mitigation system - impractical and lacks credibility

Dingoes and kangaroos

- wild dog leads to increased kangaroo numbers if livestock numbers are low
- kangaroo control is enhanced by allowing greater predation by dingoes
- dingo control reduces their effectiveness as predators
- Dingoes cause stock losses

Understanding predator-prey relationships

Predators create consumptive and non-consumptive impacts on prey behaviour

- Kangaroos display anti-predator vigilance in the presence of predators
- kangaroos smell predator faeces and avoid areas it exists

Where to with kangaroo management

- More dingoes or specifically trained dogs
- kangaroo repellents (dingo urine and faeces)
- human predation behaviour

The grey ghost

Habitat: alpine & sub-alpine

Worldwide pop: 3,500-6,590

Features: 4 feet, thick tail & fur, long tail, small rounded ear, wide paws

- faced extinction in 1970's. Currently endangered.

Threats: loss of habitat, prey-base depletion, conflict with local people, lack of conservation capacity

Programmes:

- Himalayan homestays (invited participation to develop training programs to help monitor snow leopard and prey species → help villages to predator-proof corrals.

Estimated each predator proof corral saves 2-5 snow leopards. Reduced total livestock losses.

Paradigms for conservation

- Protectionist/preservationist approaches (regulate and enforce)

- sustainable use approaches (create incentives for good practice)

Protectionism

- removes threat of legal exploitation & simple in concept

- doesn't build incentives or capacity for conservation

- negative and inequitable impacts on livelihoods

- makes cooperation with local people difficult

What is meant by sustainable use

- ensuring use of wild living resources is sustainable.

- employing use of wild living resources to create incentives for conservation

What sort of use?

1. Consumptive – removing specimens from the wild.

Subsistence: hunting. Commercial: commercial logging and harvesting in native forests

2. Non-consumptive – no removal

Rationale for sustainable use as a conservation tool (cycle)

Use of wild resources means wildlife yields benefits to people → people value wildlife → people make efforts to conserve and sustainable manage wildlife habitats

Large kangaroos

- abundant, superbly adapted animals

- high quality, wild harvest products

- potential for change in the industry and its regulation

Aims of kangaroo management program

1. Manage commercial operators
2. Ensure humane treatment of kangaroos
3. Promote community awareness and participation
4. Monitor industry complaints
5. Monitor kangaroo populations
6. Undertake program reporting and review
7. Facilitate adaptive management

Current kangaroo meat industry

- Farmers outside the commercial zone want in – boundaries can be arbitrary and apparently inconsistent

- Prior to about 2012, 80% of roo meat went to Russia as high protein filler in smallgoods, then that market was closed

- Now the industry is struggling, with the domestic market growing slowly

What is changing

- macro meats has implemented male-only harvest to deflect 'orphaned joey' issue

- farmers use fencing in attempt to control kangaroo impacts

- harvest regulation being reviewed

- Licences can be removed

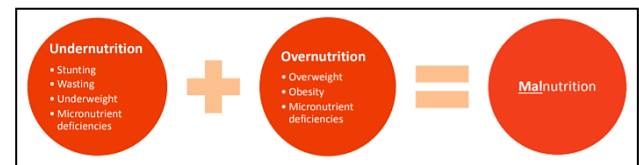
Emu Industry

- became legal to farm in 1990 for oil, meat and feathers

- Expansion and contraction → <10 growers nationally

- difficult to transport (limited market)

Lecture 4 – the global food challenge



Australia as a malnourished nation

- 60% of Australian adults overweight or obese (2011)

- 25% Australians obese in 2011

- Annual cost of obesity = \$56.5 billion

- Inadequate daily iron intake in 23% of women

- Overweight and obese patients developing paradoxical nutritional deficiency

- 5% Australians food insecure

One health

- the collaborative effort of multiple disciplines → working locally, nationally and globally to attain optimal health for people, animals and environment

- Aims to: improve health and wellbeing through prevention. Promote multi sectoral collaborations and a treatment of health hazards

Ecohealth

'Global health and well-being are the result of complex and dynamic interactions between determinants, and between people, social and economic conditions and ecosystems'

Planetary health

'The health of human civilisations and the natural systems on which they depend'

Types of undernutrition

Wasting – low weight for height

Stunting – low height for age

Underweight – low weight for age

→ macro and micronutrient deficiencies

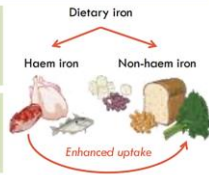
Food and nutrition security

When all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life.

Compared to plants, animal-source foods provide more:
energy, fat, vitamin B-12, riboflavin, vit A, vit E, iron,
zinc, calcium, vit D

Nutritional contributions of animal-source foods

Protein of high biological value	<ul style="list-style-type: none"> Essential amino acid profile is well-matched to body's requirements Contrast to cereals, typically largest contribution to protein intake (eg. maize – limiting in lysine and tryptophan)
Variety of micronutrients in bioavailable forms	<ul style="list-style-type: none"> Efficient for addressing multiple micronutrient deficiencies Haem iron, pre-formed vitamin A
Enhanced uptake of less bioavailable micronutrients	<ul style="list-style-type: none"> Non-haem iron (plant-source foods) Significant given inhibitory effect of oxalates and phytates in diet
High nutrient density	<ul style="list-style-type: none"> Benefits for young children and those with reduced dietary intake Small amounts can significantly increase nutritional adequacy of diets based on staple crops



Global trends

- human pop. = 9 billion by 2050
- food production needs to increase by 70% between 2005-2050
- Crop yields decrease by 10-20% over next 30 years because climate change

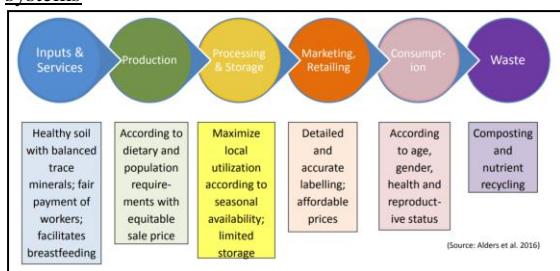
Strengthening food and nutrition security through family poultry and crop integration in Tanzania and Zambia

- to reduce childhood undernutrition by analysing and testing opportunities to enhance the key role that women play in improving poultry and crop integration and efficiency to strengthen household nutrition

To deliver sustainable food systems, three challenges need to be overcome

1. Move from commodity based → gender and nutrition sensitive value chains
2. Improve food processing, packaging and distribution
3. Ensure food safety

Promoting nutrition-sensitive value chains and food systems



One welfare

An interdisciplinary approach to human, animal, and social welfare is critical to further progress in welfare science. A one welfare approach directly bolsters connections and comparisons between animal and human welfare.

Lecture 5 –

Goals of farming

- put animals in a suitable environment and provide appropriate nutrients to facilitate good health, growth and reproduction

- eliminate extreme adverse conditions
- select suitable individuals for reproduction
- decrease mortality until 'productive' phase of life

Relevance of this for humans

- urbanized species

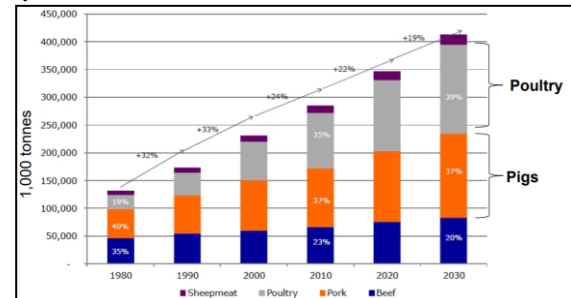
Impacts on: knowledge of food production, attitudes to food production, use of resources, loss of arable land for food production

World pop (2050) = 9.7 billion. 80-85% population increase will be in the developing world

Associated impacts → climate change, urban wealth, waste disposal, intensive farming, livestock

Relevance of animal production

- greatest increase will involve intensive production systems → 795M undernourished



Meat consumption per person will increase due to increase in capita income. As humans increase in wealth, dietary preferences change (meat consumption increase)

Obstacles to overcome in satisfying world demand for animal protein: lower feed conversion efficiency, lower green house gas output, lower water use, minimise land use

Research and investment opportunities

- ruminants change non-edible fibrous plant material to protein
- base feed for intensive livestock around waster bi-products
- new/alternative plant crops for live stocks

Pigs

Origin of domesticated pigs: 10,000-11,000 ya

Pannage: the right to pasture pigs in a forest or woodland

WWII: gov policy to reduce food waste (livestock industries targeted: pigs, poultry, dairy) – Dutch famine

Post WWII – impetus for intensification

- food security in post-war Europe → reliable source of safe and cheap food (especially protein)

Pig production 1950's = intensive on dairy farms

Post WWII = intensification of sow housing e.g. neck tethering of breeding sows in partial gestation stalls

→ Concerns over factory farming (ethical issues) in 1960's