MODELLING FISH WELFARE LAW WITH ARTIFICIAL INTELLIGENCE

Lene Northwood (née Hansen)

Outline

1. Why look at fish welfare?
2. Why is fish welfare important?
3. What is the regulatory status?
4. What is One Welfare?
5. Law – The Bigger Picture
6. Common vs Civil Law
7. Cross-Border Crime
8. AI modelled law – Benefits and Concerns
9. Less Crime, Better Trade, Better Health
10. Challenges and solutions

Why Look at Fish Welfare?

- ~100-120 billion fish
- ‘Biomass’ labelling
- Overstocking
- Neglected sentience
- Cruel slaughter
- World Health Organisation
  - Antibiotic overuse
- UN Sustainable Development Goals
  - Life Below Water (SDG14),
  - Food Security (SDG2),
  - Sustainable Consumption & Production (SDG12)
  - Global Partnership for Sustainable Dvlpmt (SDG17).

Why Is Fish Welfare Important?

Sentient

- 110-120 Billion lives worth living
- Environmental Enrichment on the rise

Food Source

- Protein increases by ~6-8% annually

Antibiotics

- Excessive usage
- Huge variance in practice
- Antimicrobial resistance (AMR)

- One Welfare [9]

Excessive usage [2]

What Is The Regulatory Status?

- ~1%-5% directly protected
- Norway and the UK only direct
- Sentience debate
- Modern holism
- Poor enforcement
- One Welfare

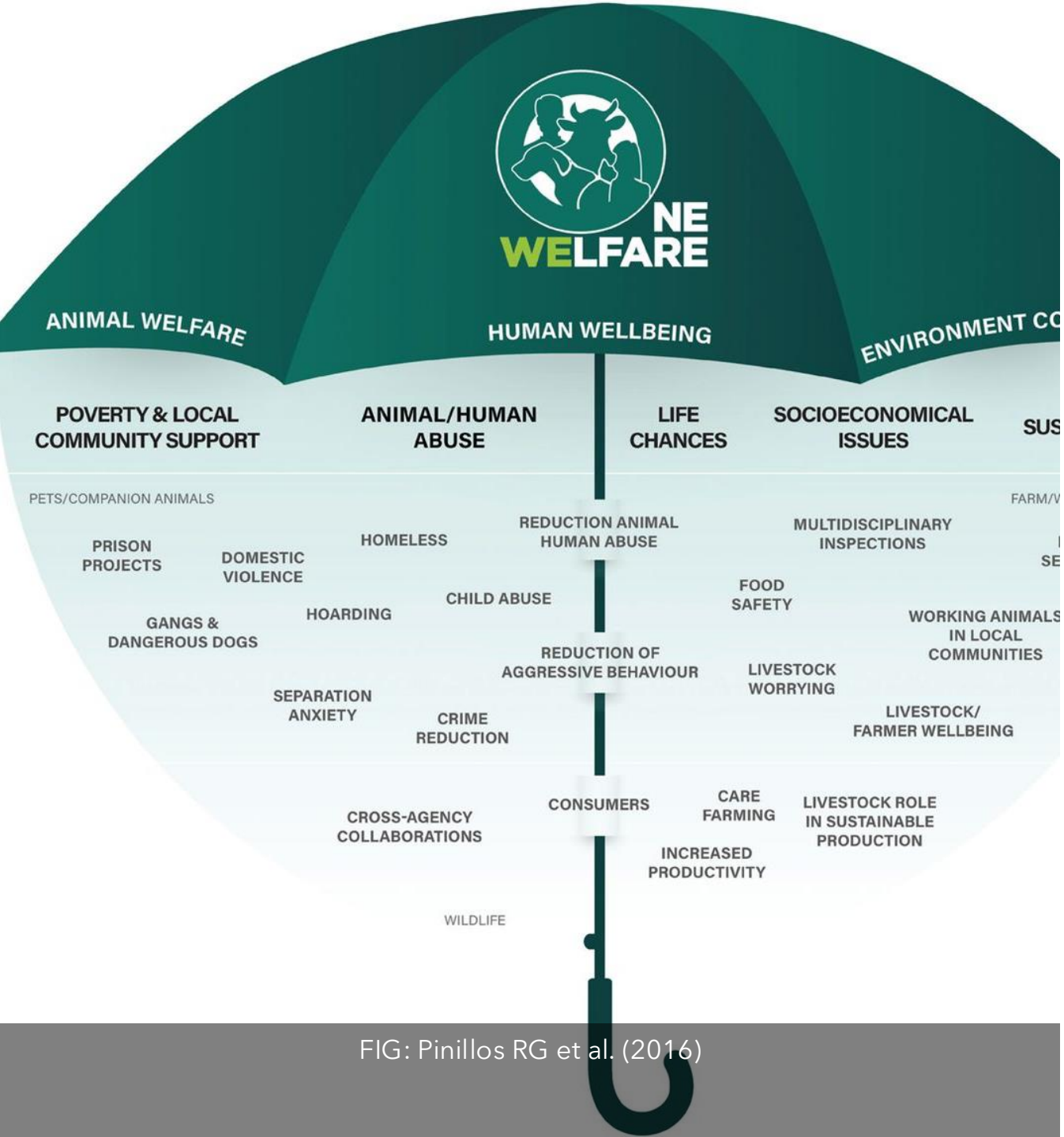


FIG: Pinillos RG et al. (2016)

What Is One Welfare?

- Simon Doherty- World Vet of the Year 2024
- Pinillos *et al. 2016*

Interconnected thinking

1. Animal (Fish) Welfare
2. Human Wellbeing
3. Environment Conservation

Why Is One Welfare Important For Fish?

Fish are often regulated in different ways, often driven by country priorities

Fish

- UK
- Norway

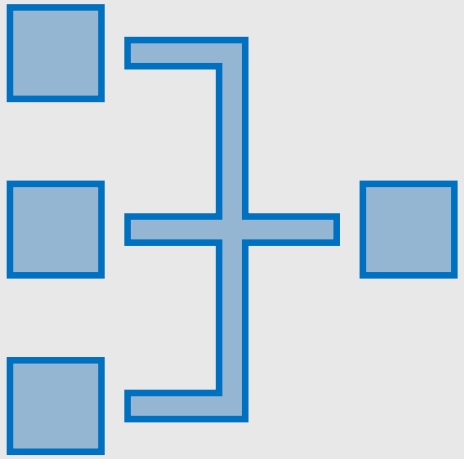
Human

- China - Biosecurity

Environment

- Australian - EPA

Law: The Bigger Picture



Regulation

- *Process* of regulating (changing / controlling behaviour).

Regulatory frameworks

- *Whole operating system* (Law + regulations + processes + enforcement + reporting + review mechanisms). Concrete, operational, and rule-based.

Governance (Lene's definition, strategic and systemic)

- Organisation chart *boxes* holding the instruments (institutions, authorities) and *arrows/wires* between them (who has authority, how decisions are made, and accountability maintained).

Common vs Civil Law

Category	COMMON LAW (UK, Canada, Australia)	CIVIL LAW (Most of the EU)
Primary Source of Law	**Legislation** (Acts of Parliament = *laws*). Framework-level; not fully comprehensive.	**Codes** (civil, criminal, commercial, administrative). Comprehensive, systematic statements of legal rules.
Role of Courts	**Case law creates new binding law.** Higher courts interpret statutes; lower courts must follow (stare decisis).	**Courts interpret but do not create law.** Judicial decisions are persuasive, not binding; interpretation must stay within the code.
Regulations	Detailed, legally enforceable rules issued by government departments. Provide operational standards, conditions, and enforcement tools.	Detailed, legally enforceable administrative rules issued by ministries/agencies. Must fit within the framework of the **code** and **statutes**.
Supranational / Higher-Order Law	Not applicable (no supranational legislative authority).	**EU legislation: • Regulations** (directly applicable law) • **Directives** (implemented into national law) • **Treaties** (constitutional layer) Drafted in a civil-law style and function like supranational codes.
Guidance	Non-binding government or intergovernmental documents. Influential but not law.	Non-binding interpretive documents from ministries, EU bodies, or agencies. Influential but not law.
Codes	Industry groups or regulators issue voluntary codes; binding if incorporated into legislation / regulation.	Industry/professional bodies issue voluntary codes; only binding if referenced in legislation or regulation.
Legal Logic	Law develops **incrementally** through judicial reasoning and precedent.	Law is **systematic** and codified; interpretation aims to preserve coherence and completeness of the code.

Cross-Border Crime

Fish

- Lower welfare practices
- Antibiotic violations

Human

- Antimicrobial Resistance
- Labour exploitation
- Human trafficking
- Money laundering

Environment

- Environmental dumping

AI Modelled Law – Benefits & Concerns

- Economics A
- Socioeconomics A
- Enforcement Capacity A

- Economics B
- Socioeconomics B
- Enforcement Capacity B

- Economics C
- Socioeconomics C
- Enforcement Capacity C

Agreement to Share Information, i.e. Memorandum of Understanding (MoU),
Align fish welfare, human wellbeing and environmental guidelines.

Less Crime, Better Trade, Better Health

- Cross-border terrorists target anomalies
- Crimes too small, too shameful or both
- Not worth the regulatory effort
- A similar idea to Europe's Schengen Zone
- Lowers administration
- Supports trade and supply chains
- World Health Organisation-AMR-key threat
- Aligning welfare and antibiotic practices
- Confidence in food biosecurity

Challenges & Solutions

Foreseeable Challenges

- Industry is powerful
- Prefers not to be regulated
- Not all people care about fish
- Therefore, politicians do not care
- Financial gains are not understood

Proposed Solutions are to highlight

- Fewer cross-border criminals
- Trade benefits (like EU Schengen)
- Health benefits (lower AMR chances)

Thank You!

Lene@fishlex.net

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Appendix I:

EU's Fish-Welfare Governance Pathway

Stage	What actually happens	Why it feels mandatory
Voluntary code	Industry/experts draft guidance	Creates shared expectations
Commission endorsement	Used in audits, guidance, and soft law	Becomes the "safe" option
Regulatory referencing	Inspectors use codes as benchmarks	Non-use increases risk
Market adoption	Retailers and schemes require compliance	Becomes commercially necessary
Legislative reform	New law draws on code content	Code influences law, but is not forced