Sustainable Livelihoods in Today's World: Insights from Systems Thinking and Complexity Theory

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History of Environmental Management Approaches

Era	Natural Resources depletion	Pollution concerns	EM Approaches
Hunter gatherer	Environment constraints on people	None	Taming Nature Environment as enemy
Agricul-tural	Environment as friend and servant	Little	Environment as factor of production, classical economics

Industrial era	Impacts begin preservation movements	Public Health concerns	• Environment as externality

- Public Health programs
- Preservation movement
- Neo-classical economics

1945-1972	Major impacts recognised water, forests, land, fish.	• Air pollution	• Above intensified
		• Waste management	• Command and Control begins (regulations)
			• Neoclassical economics

1972-1980	Resource depletion scarcity recognised major treats to social security	• National impacts intensified • Global impacts recognised	• USEPA set up (command control) • Institutions begin • Global conference (Stockholm) • International NGO's • World conservation strategy • North – South splits • Sustainable yields • Env. econs • Nat. Res.econs

1981 – 1992			
	• Emergence of sustainable development paradigm	• Dynamics of pollutants movement	• Command and control intensified
	• Ozone depletion	• Low level detection	• Market instruments introduced
	• Deforestation	• Assimilative capacities	• Industrial ecology
	• Biodiversity depletion		• Systems thinking applied
			• Adaptive management
			• Civil society action
			• Env + Nat. Res.econs

1992-present	• Above continues • Fish/other stocks depletion • Partial recovery of ozone layer	• Atmosphere pollution intensified • Global warning concerns • Third world cities (air, water, sewage, garbage)	• Businesses are major players • International treaties • Market instruments • Applications of chaos and complexity theories began • Ecological economics • Environmental enhancement as asset building

THE PLACE OF PEOPLE IN DEVELOPMENT (1)

1st Era

- Modernisation/ Industrialisation
- Transfer of Technology and Resources
- Development *for* People

2nd Era

- Capacity Building
- Training
- Human Resources Development (soft side development)
- Development *of* People

THE PLACE OF PEOPLE IN DEVELOPMENT (2)

3rd Era

- **Participation**
- **Rise of CSO**
- **Development *with* People**

4th (Current) Era

- **People-centred development**
- **SHD**
- **Sustainable Livelihoods Development *by* People**

Sustainable Livelihoods Concept

- **Livelihoods**
  - Activities
  - Entitlements
  - Assets
- **Sustainability**
  - Capacity to cope with shocks and stresses
  - Economic efficiency
  - Social equity
  - Ecological integrity

Assets

- **Human assets**
  - Knowledge
  - Skills
  - Creativity
  - Adaptive strategies
- **Social assets**
  - Governance
  - Decision making power
  - Community
  - Culture
- **Natural assets**
  - Land/soil
  - Water
  - Air
  - Flora and Fauna
- **Physical assets**
  - Buildings
  - Roads
  - Machinery
  - Crops/livestock

Figure 1: Sustainable Livelihoods Framework

Development Principles

Sustainable Livelihoods

- Holistic
- Self-empowering
- Participatory
- Sustainability consideration inherent
- Broad based pro-poor growth
- Cross-sectoral
- Gender Sensitive

Other Approaches

- Reductionistic
- Welfarist / delivery
- Top-down
- Sustainability consideration externality / add on
- Growth and trickle down
- Sectoral
- Gender blind

TODAY'S WORLD

- GLOBALISATION
- RISK
- GOVERNANCE

GLOBALISATION

- The global electronic economy
- Regularity in contacts with goods, services and lives of people who are line differently from us
- Rather than more we have less control
- Increasing uncertainty and risk

- Risk is closely innovation
- New constraints and opportunities
- Expansion of democracy, while exposing its limits

- **Feedback**
  - **as fundamentalism**
  - **as civil society protests**
- **Expanding inequality**
- **Crisis of nation state identity in face of obsolete geopolitics**

RISK

- Origin – sailing into unchartered waters (space)
- Transferred to time as in banking and finance
- Inseparable from ideas of probability and uncertainty

- **Positive embrace of risk is the source of energy and innovation that creates wealth in a modern economy**
- **External and Manufactured Risk**
- **Shift from what nature can do to us to what we are doing to nature (but not everywhere)**

- Climate change as example

- In manufactured risk we can't be completely certain until it is too late

- Irreducible uncertainty

- Optimal ignorance

- The world's tendency to surprise us is increasing
- Hazards created by ourselves are more threatening than those external
- What tools then are suited to this scenario?

GOVERNANCE

(DEMOCRATISING DEMOCRACY)

- Mature democracies run by old boys networks, political patronage, backstage deals
- Effective devolution of power
- Greater transparency in political affairs
- Political party collaboration with single issue groups
- Fostering a strong civic culture bottom up
- Building a democracy of human relationships
- Seek a balance between government, economy and civil society
- Fostering democracy above and below the nation state
- The role of the European Union
- But nothing comes without struggle
  - What techniques best inform today's Struggles

THE CONTEXT IN SUMMARY

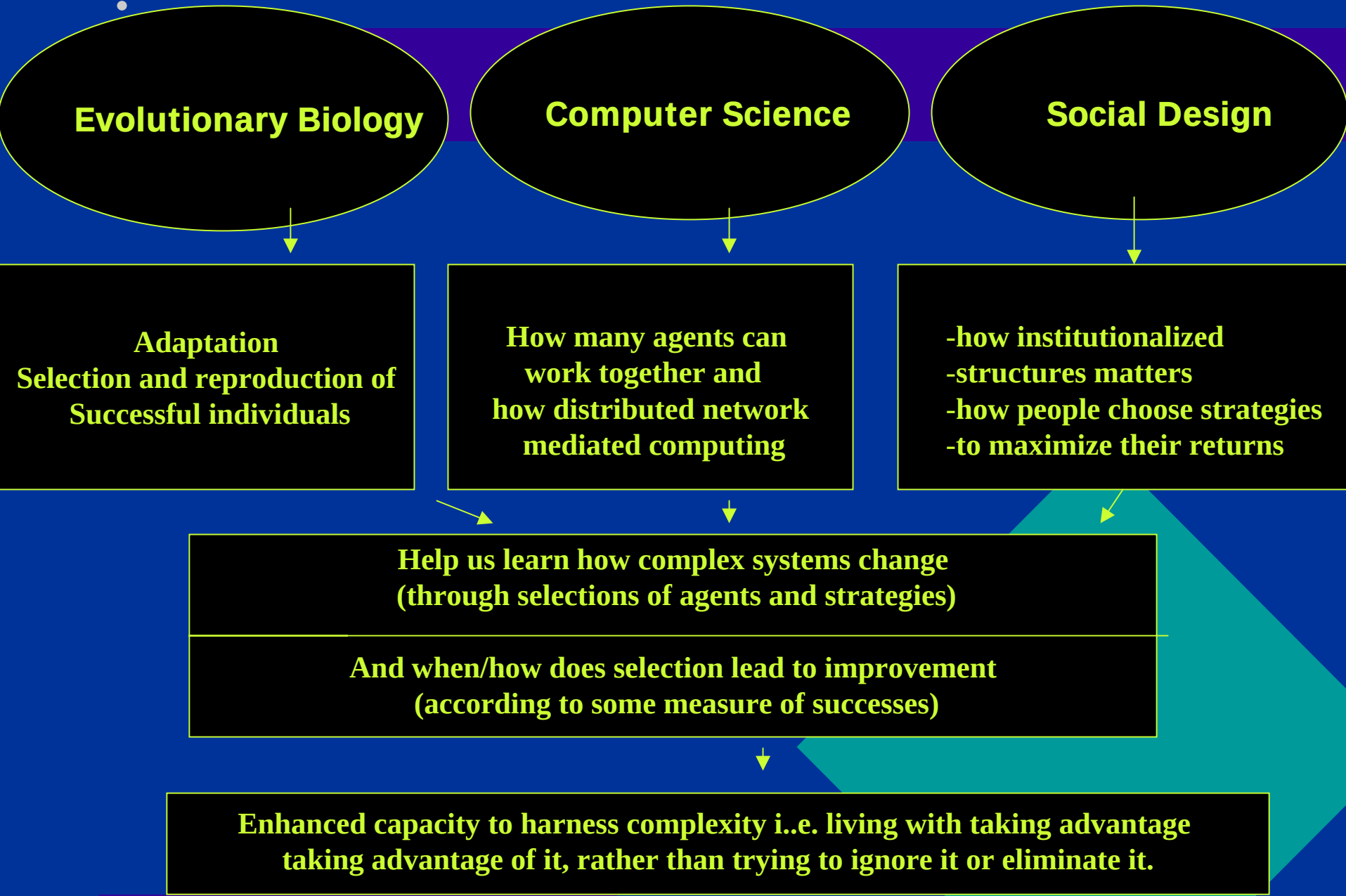
- Many participants, many kinds of participants, interacting in many ways that continually reshape their collective and individual future

- New ways of doing things, new kinds of participants may arise and old ways or old participants may persist or vanish.

- A situation in which small changes can unleash major consequences and one in which large changes in policies or tools produce no long run change in peoples behavior

- Such a world is a complex adaptive system
- Many participants, numerous interactions, much trial and error learning, abundant attempts to imitate each other's success --- rich opportunities to harness the resulting complexity

HOW - THE TOOLS



What kinds of “new” insights do we get?

- How natural innovation occurs and how its power can be exploited
- Improving the way people work together
- What is the best way to manage the development of software (as in the Linus success story - hierarchy or flat? Or decentralization of variation with centralized maintenance of standards i.e. MANAGING levels OF UNIFORMITY and VARIATION

- Understanding why northern Italy prospered while southern Italy remained poor? - internal interactions – rich networks of horizontal linkages for corporation for success – voluntary associations in Northern Italy created networks of trust in the Middle ages- social capital theory

- How can government foundations and cooperation design competitions that have a positive effect on the evolution of excellence – selection of standards

What is the Systems Thinking

- The discipline which makes visible that our actions are inter-related to other people's actions in patterns of behavior and are not merely isolated events.
    - Open and general systems theory (Von Berthalanffy)
    - Organizational Cybernetics –(Stafford Beer)

- Soft Systems Approach – Checkland
- Critical Systems Thinking – Churchland
- Systems Dynamics (fifth discipline) – Senge
- Complexity Theory/Complex Adaptive Systems – Holland, Kaufman, Kay and Schneider, Axelrod and Cohen, Marion, others

SYSTEMS PRACTICE

- BOUNDARY JUDGEMENTS
- DEEPENING SYSTEMIC APPRECIATION
- PRISMATIC THOUGHT
- ORGANISATIONAL LEARNING & TRANSFORMATION
- SYSTEMIC EVALUATION

BOUNDARY JUDGEMENTS

- Shift from problems, solutions and normal organisational life
- People, purposes and interacting issues emerging in conflict and /or cooperation
- Draw tentative boundaries around stakeholders, focussing on xxx, raising issues and dilemmas
- The boundaries define the action area
- Who is inside and benefits from it
- Who is outside and does not
- What are the consequences?
- How do we feel about that
- Boundaries are temporary and partial

DEEPENING SYSTEMIC APPRECIATION

- Opening four windows on the action area
- ♦Systems of Processes (efficiency and reliability)
- ♦Systems of Structures (effectiveness)
- ♦Systems of meaning (agreements etc)
- ♦Systems of knowledge-power
- (emancipating the privileged and unshackling the underprivileged)
- ✞Prismatic thought ✞ options for action

Organisational Learning and Transformation

- (Using learning scenarios and systemic evaluation
- ✞ First scenario learns in the context of the future we might be heading for
- ✞ Second scenario learns about ideal futures
- ✞ Third scenario learns of ways to close the gap i.e. ways to move to ideal system properties or to shift the boundaries

All three scenarios are continually revisited

✞Systemic evaluation of issues and dilemmas of systems of processes, structures, meaning and knowledge power, indicates performance of projects in these terms

✞ Provides information for reflection on and change where necessary

✞Seek balance between instrumental action and experimental action.

WHERE DO WE GO FROM HERE

We understand fairly well the usefulness and Limitation of linear, reductionist and deterministic approaches

We have just begun to develop new insights using complex adapative systems thinking. New tools are becoming available.

At the same time the world has changed in dramatic ways creating new opportunities and new challenges

- UFW should help foster decision making which promote SL for the people of KW, Canada and the World

- What are the implication of SL
  -Livelihood means
  -Sustainability implies….
  -Mainstreaming environmental management in people's livelihood decision

U of W cannot do this if it works:

- **Only through F.E.S and not for example with planning, geography, engineering, management sciences (innovation), international studies with affiliates colleges, engineers sans frontiers etc..**

- **Only by itself and not with other centres of excellence e.g. in rural/urban development pt, public policy, business administration, etc...**

- **Only with KW and not linked other townships/regions in Ontar**

- **Only within Ontario and not with Canada**

- **Only within Canada and with the international community**

- **Only with academia, and not with local people, businesses and government**

Of course this sounds unmanageable, over ambitious and even impossible.

- But this is exactly what the history of the environment and development lessons tells us to do.
- It is exactly what a globalized world arena requires
- It is precisely how Canada can use its pockets of excellence to maintain and enhance its competitiveness in today's world while enhancing the quality of life, cultural diversity and social conditions which Canada is justly proud of
- And it is exactly what the recent thinking and tools from complex adaptive systems, computer science and knowledge networks allow us to do.

- To make this a reality we must of course be focussed, pragmatic, start at an appropriate scale, not too large, but not too small where the inherent complexities are not present.

- But the most important step is to begin.

- I propose therefore that University of Waterloo establish a transdiciplinary centre for the promotion of Sustainable Livelihood in Canada and the world, and that the Walter Bean Professor help with this process. As we said before, sustainable livelihoods will only come from prosperous business, enlightened public policy and an engaged civil society.

Therefore, the centre will focus its initial efforts in developing:

Practical tools for Business leadership, decision making and management in the new economy

Complementary tools and processes for public policy

Principles, practices and partnership for engaging civil society