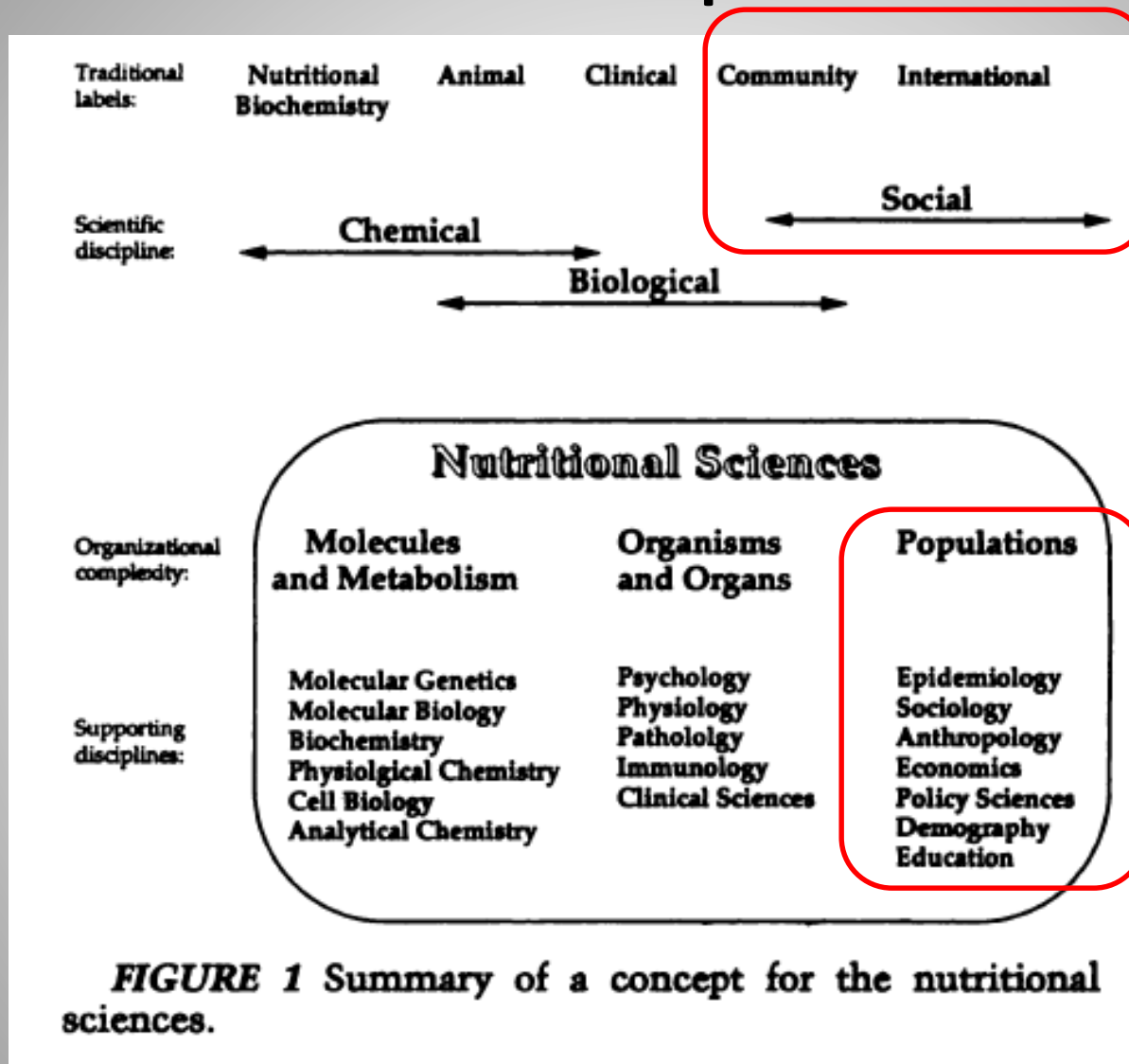


Advancing the Frontiers of Population Nutrition Research: New Questions, New Methods and New Approaches

David Pelletier
Associate Professor of Nutrition Policy
Division of Nutritional Sciences

Field of Nutrition Seminar, Feb 18, 2013

Scope



Future Directions for the American Institute of Nutrition¹

MICHAEL N. KAZARINOFF² AND JEAN-PIERRE HABICHT

J. Nutr. 1498-1499, 1991.

**Expanding the Frontiers of Population Nutrition
Research: New Questions, New Methods,
and New Approaches^{1,2}**

David L. Pelletier,^{3*} Christine M. Porter,⁴ Gregory A. Aarons,⁵ Sara E. Wuehler,⁶ and Lynnette M. Neufeld⁵

Adv Nutr 4:92-114, 2013

Outline

1. Frontiers in six dimensions
2. Rationale for these frontiers
 - Trends in society
 - *The nature of problems*
 - *Trends in science*
3. Illustrations
4. The Nature of Frontiers
5. Summary

Frontier Dimensions

- Why we study
- What we study
- Who we study
- How we study: Methods
- How we study: Approaches
- Disciplines

Dimension	Current <u>Tendencies</u>	Frontiers
Why	<i>Generalizable/ fundamental knowledge re. scientific questions</i>	Actionable knowledge of concern to stakeholders, organizations, communities, or publics at various scales; generalizable knowledge re. problem-solving

Dimension	Frontiers	Audience Survey
Why	Actionable knowledge of concern to stakeholders, organizations, communities, or publics at various scales; generalizable knowledge re. problem solving	
What	laws, regulations, norms, programs, organizations, systems, change processes in communities, programs, policies, etc.	
Who	policy makers, managers, implementers, leaders, networks, coalitions, private sector actors, citizens, universities	
How (methods)	social network analysis, discourse analysis, Q methodology, document analysis, media analysis, process tracing, stakeholder analysis, influence mapping, program impact pathways, etc	
How (approach)	engaged, participatory, action research, CBPR, participant-observer, reflection in action, embedded, emergent, systems- and complexity-oriented, reflexive, etc	
Disciplines	economics, sociology, anthropology, policy analysis, law, urban planning, political science, organizational behavior, management sciences.. and TRANSDISCIPLINARY	

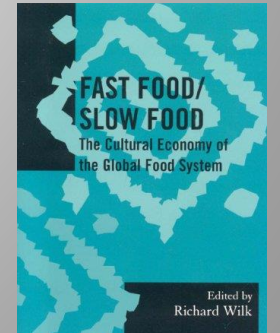
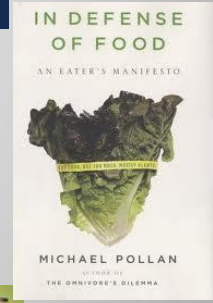
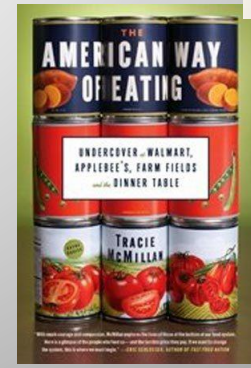
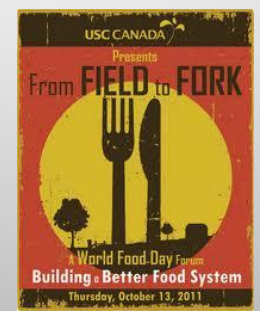
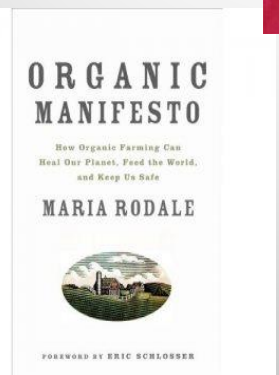
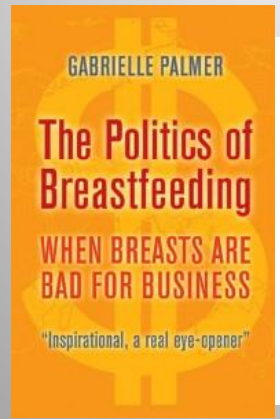
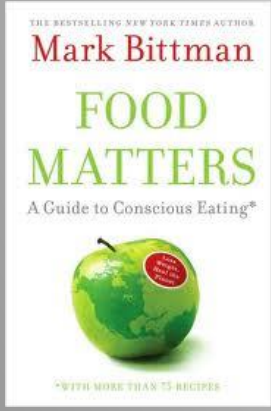
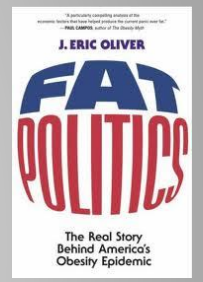
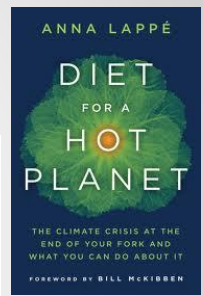
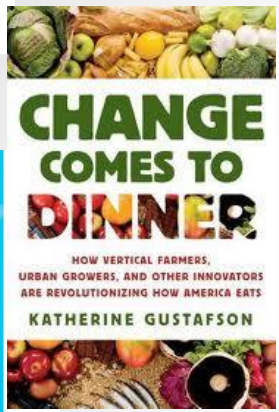
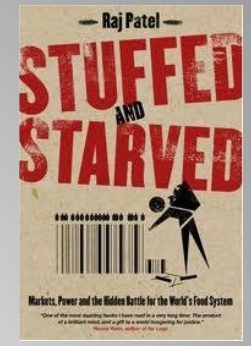
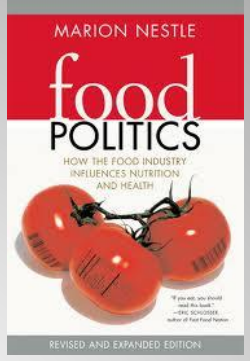
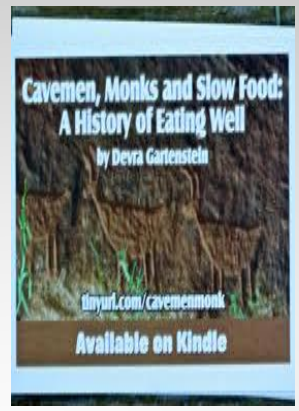
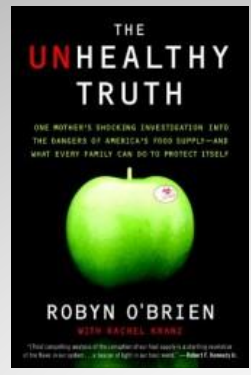
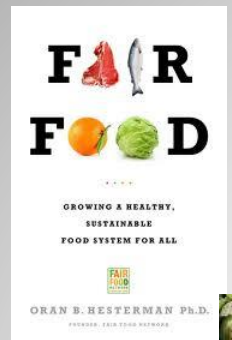
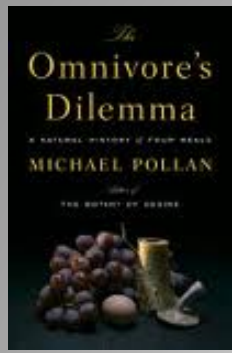
Rationale for these Frontiers

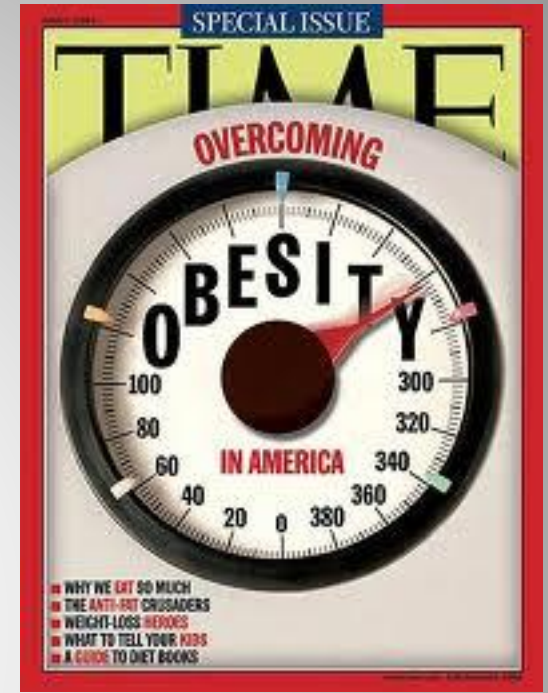
- 1. Trends in society**
2. *The nature of problems*
3. *Trends in science*

Trends in Society

- Nutrition has ascended on public and private agendas
- An extensive web of interconnected issues now is recognized
- Demand for results and accountability in public programs and publicly funded research
- Demand for research on effectiveness of interventions at scale (translational and implementation science)
- Nutrition must respond to these trends in order to remain relevant

Trends in Society







33 Countries working to scale up nutrition

The commitment and leadership of national stakeholders is at the heart of the SUN Movement. Efforts to scale up nutrition in SUN countries are driving global progress. Building from the SUN Framework, countries tailor efforts to meet local needs and capitalize on opportunities to maximize cross-sector resources, while establishing the foundation for a long-term commitment to nutrition.

HOW COUNTRIES GET INVOLVED



Committed countries are at the core of the SUN Movement. Any country working to deliver progress and action to scale up nutrition can participate in the SUN Movement.

[Read more](#)



Nepal

Committed to scaling up nutrition since 5 May 2011

[Read more about SUN in Nepal](#)



Indonesia

Committed to scaling up nutrition since 22 December 2011.

[Read more about SUN in Indonesia](#)



Namibia

Committed to scaling up nutrition since 16 September 2011.

[Read more about SUN in Namibia](#)



Mali

Committed to scaling up nutrition since 24 March 2011



Haiti

Committed to scaling up nutrition since 11 June 2012



Sierra Leone

Committed to scaling up nutrition since 16 January 2012

Participating Countries

B Bangladesh | Benin | Burkina Faso | Burundi

E El Salvador | Ethiopia

G Gambia | Ghana | Guatemala

H Haiti

I Indonesia

K Kenya | Kyrgyz Republic

L Lao PDR

M Madagascar | Malawi | Mali | Mauritania | Mozambique

N Namibia | Nepal | Niger | Nigeria

P Peru

R Rwanda

S Senegal | [Sierra Leone](#) | Sri Lanka

T Tanzania

U Uganda

Y Yemen

Z Zambia | Zimbabwe

1,000 DAYS

"Improving nutrition for mothers and children is one of the most cost-effective and impactful tools we have for poverty alleviation and sustainable development."
— May, 2014



[Learn More](#) →

» GET UPDATES ABOUT 1,000 DAYS

✉

WHY 1,000 DAYS?



It's the window of opportunity

The 1,000 days from the start of a woman's pregnancy until her child's 2nd birthday offer a unique window of opportunity to shape healthier and more prosperous futures. The right nutrition during this 1,000 day window can have an enormous impact on a child's ability to grow, learn, and rise out of poverty. It can also have a profound effect on the long-term health, stability, and development of entire communities and nations. [Read More >](#)

Nutrition on the Global Agenda

It is time to win the fight against malnutrition and accelerate gains in global health and development. <http://www.thousanddays.org/about/> [Read More >](#)

FROM OUR NEWSROOM

LATEST NEWS



WFP Joins World Leaders At Davos

1 day ago www.wfp.org



The vanishing middle: Why people with a healthy weight are disappearing

5 days ago www.theglobeandmail.com

BLOGS

Prime Minister's Olympic hunger summit

12 August 2012



Prime Minister David Cameron with Michel Temer, Vice-President of Brazil, Football legend Pele and Olympic double gold medallist Mo Farah at the Olympic hunger summit in Downing Street, 12 August 2012.

Trends in Society: Bottom Line Messages

- Nutrition has “arrived”
- “Nutrition” is no longer just “nutrition”
- How can we deliver results at-scale?

Rationale for these Frontiers

1. *Trends in society*

2. The nature of problems

– **Simple, complicated, complex, wicked**

3. *Trends in science*

Four Types of Problems



Simple



Complicated



Complex



Socially Complex

Technical vs Wicked Problems

- Indeterminacy in problem formulation
- Non-definitiveness in problem solution
- Non-solubility
- Irreversible consequentiality
- Individual uniqueness

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. Policy Sciences, 4, 155–169.

The role of business and cross-sector collaboration in addressing the ‘wicked problem’ of food insecurity

Ralph Hamann, Stephanie Giamporcaro,
David Johnston & Schirin Yachkaschi

Development Southern Africa Vol. 28, No. 4, October 2011

Principles for Framing a Healthy Food System

MICHAEL W. HAMM

*Depts of Community, Agriculture, Recreation, and Resource Studies;
Crop and Soil Sciences; Food Science and Human Nutrition,
Michigan State University, East Lansing, Michigan, USA*

Wicked problems are most simply defined as ones that are impossible to solve. In other words, the range of complex interacting influ-

Table 1. Summary of Differences Between Tame and Wicked Problems

Characteristic	Tame Problem	Wicked Problem
1. The problem	The clear definition of the problem also unveils the solution	No agreement exists about what the problem is. Each attempt to create a solution changes the problem

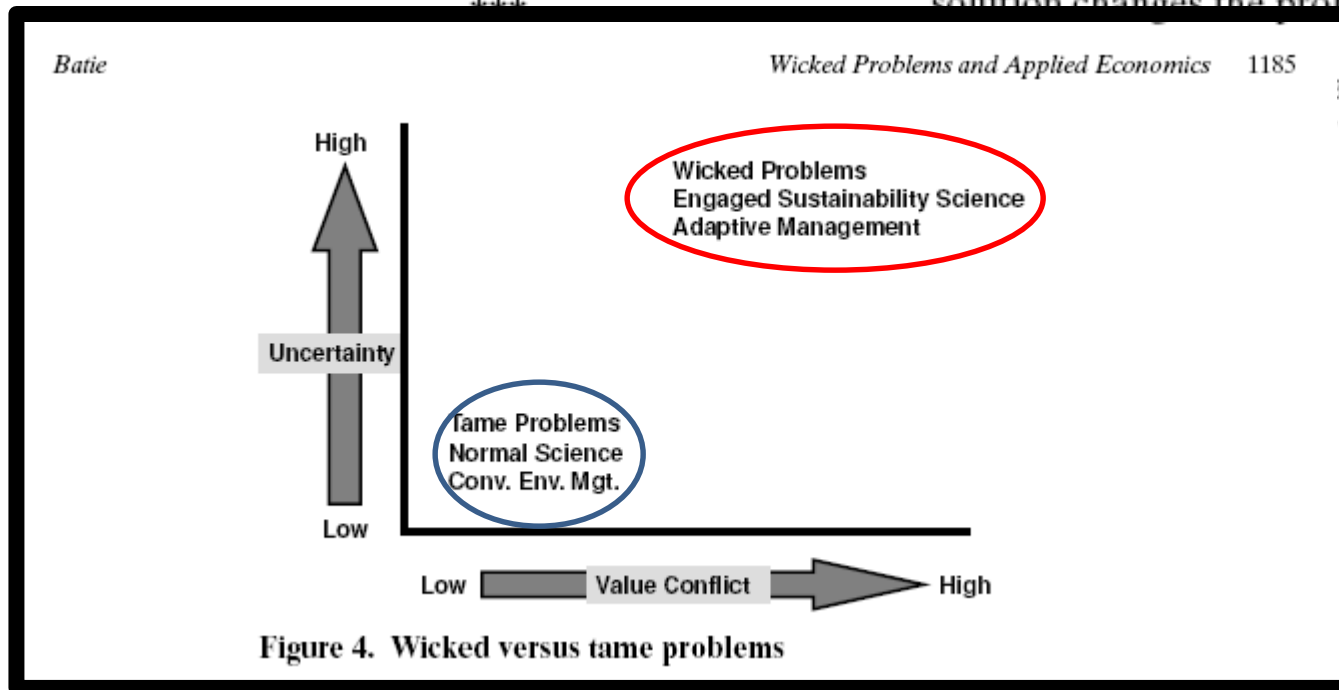


Figure 4. Wicked versus tame problems

Implications of Wicked Problems for the Research Approach

“Because wicked problems are in essence “expressions of diverse and conflicting values and interests” (Norton, 2012, p. 450), the process of working with them is fundamentally social, and should not be scientized in the conventional sense (Conklin & Weil, 2007).

“Instead of the partial and linear strategy of divide and conquer that aims at searching for definitive solutions, it requires a holistic and process oriented approach that is by nature adaptive, participatory, and transdisciplinary (APT for short).

FRONTIER HERE

“By examining a wicked problem as a whole through a panoramic social lens rather than a scientific microscope, and working with it through an open and heuristic process of collective learning, exploration, and experimentation, the APT approach promises to be efficacious in fostering collaborative behavior, reducing conflicts, building trust among all stakeholders and communities involved, and ultimately producing better and more satisfying results.

“With more empirical research and applications, a more developed APT approach, along with innovative methods and skill sets, will be a competent alternative to the traditional solution-seeking approaches.”

Dimension	Current <u>Tendencies</u>	Frontiers
Why	<i>Generalizable/ fundamental knowledge re. scientific questions</i>	Actionable knowledge of concern to stakeholders, organizations, communities, or publics at various scales
What	<i>nutrients, nutritional status, food and nutrient intake, food insecurity, behavior..</i>	laws, regulations, norms, programs, organizations, systems, change processes in communities, programs, policies, etc.
Who	<i>women, infants, children, elderly, consumers..</i>	policy makers, managers, implementers, leaders, networks, coalitions, private sector actors, citizens, universities
How (methods)	<i>limited range of quant and qual methods: Interviews, focus groups, regression, trials...</i>	social network analysis, discourse analysis, Q methodology, document analysis, media analysis, process tracing, stakeholder analysis, influence mapping, program impact pathways, etc
How (approach)	<i>detached, objectivist, positivist, reductionist, behaviorist, hypothesis testing</i>	engaged, participatory, action research, CBPR, participant-observer, reflection in action, embedded, emergent, systems- and complexity-oriented, reflexive, etc
Disciplines	<i>Nutrition, epi/biostatistics, biomedicine, psychology, social psychology...</i>	economics, sociology, anthropology, policy analysis, law, urban planning, political science, organizational behavior, management sciences.. and TRANSDISCIPLINARY

The Nature of Problems:
Bottom Line Message

“We can't solve problems by using the same kind
of thinking we used when we created them.”

Einstein

Rationale for these Frontiers

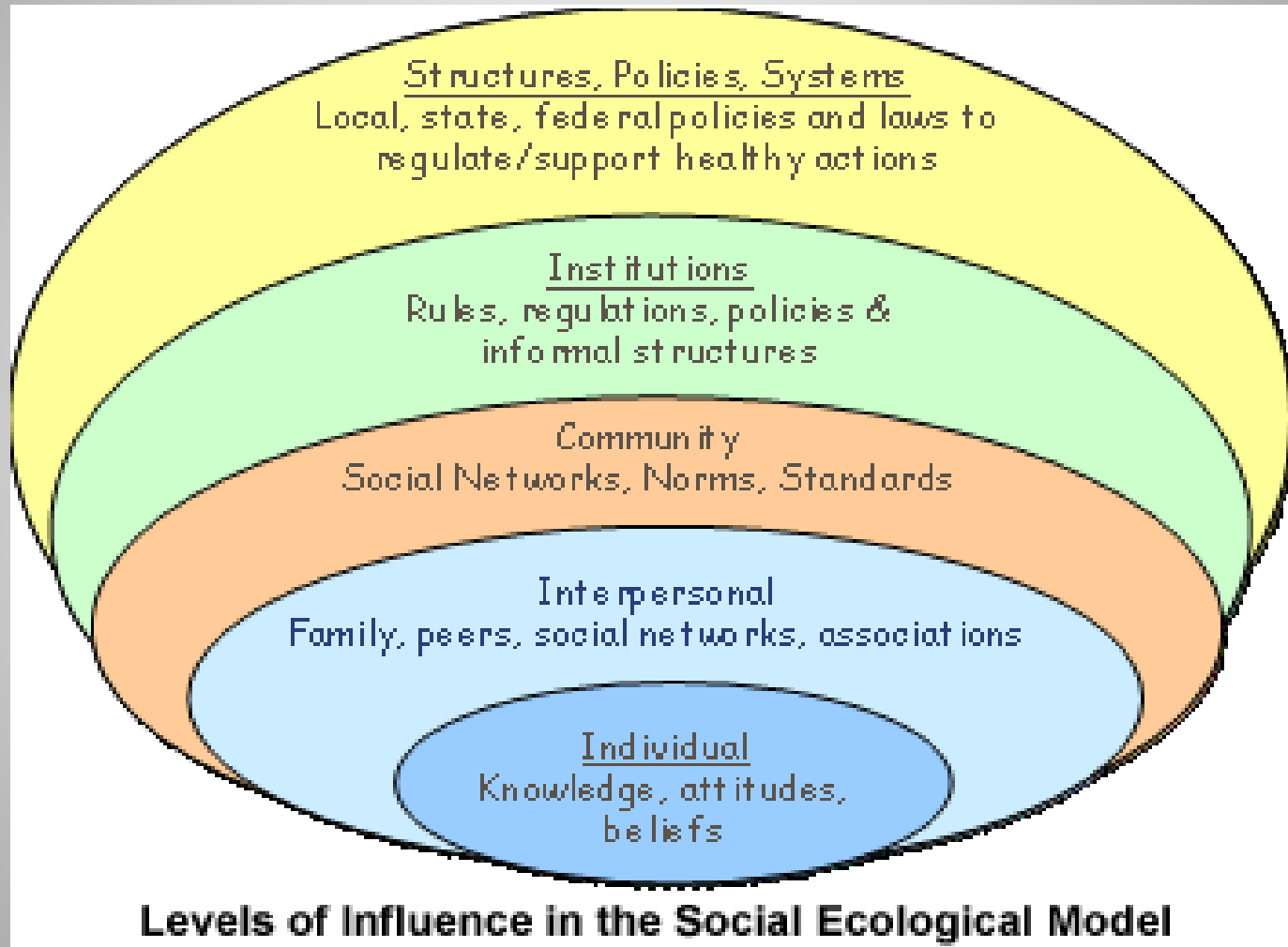
1. *Trends in society*

2. *The nature of problems*

3. **Trends in science**

- **Socio-ecological framework (revisited)**
- **Complex Adaptive Systems**
- **Mode 2 Knowledge Production**

The Socio-Ecological Framework



Social Ecological Approaches to Individuals and Their Contexts: Twenty Years of *Health Education & Behavior* Health Promotion Interventions

Shelley D. Golden, MPH¹ and Jo Anne L. Earp, ScD¹

Health Education & Behavior
39(3) 364–372

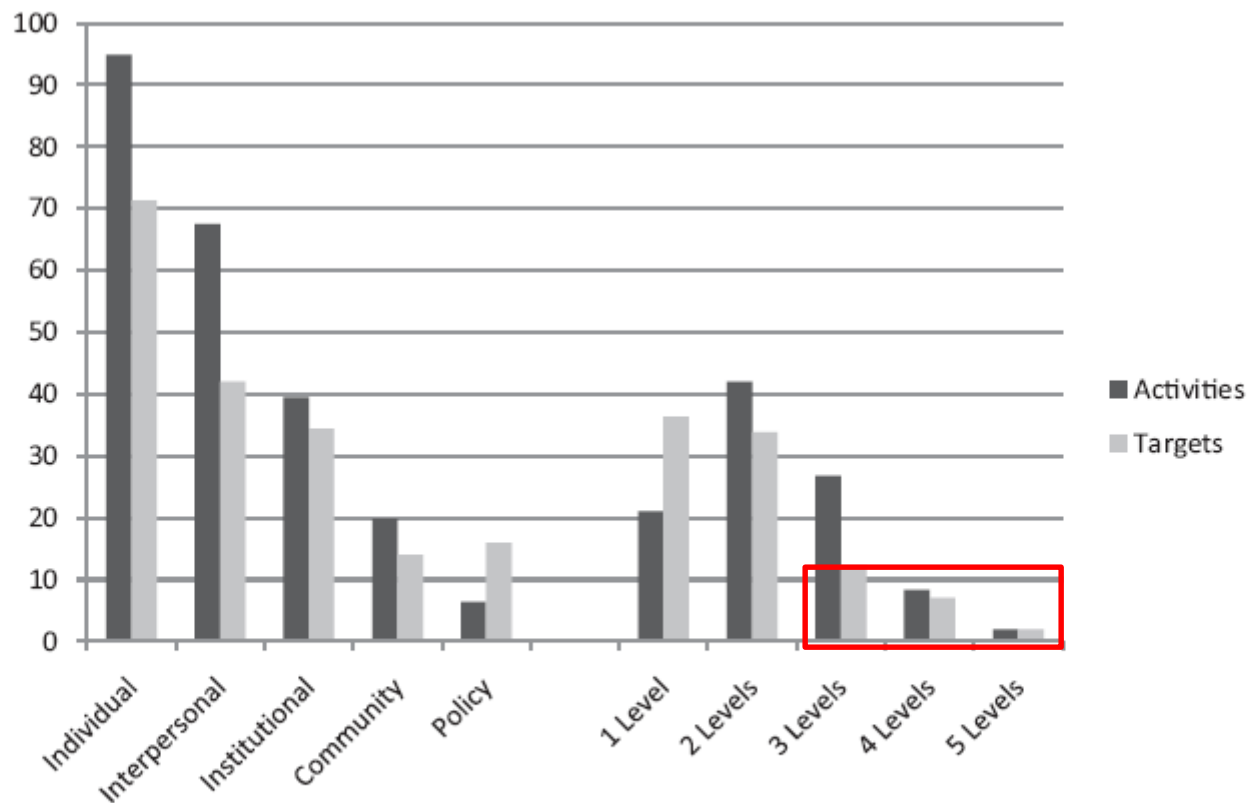
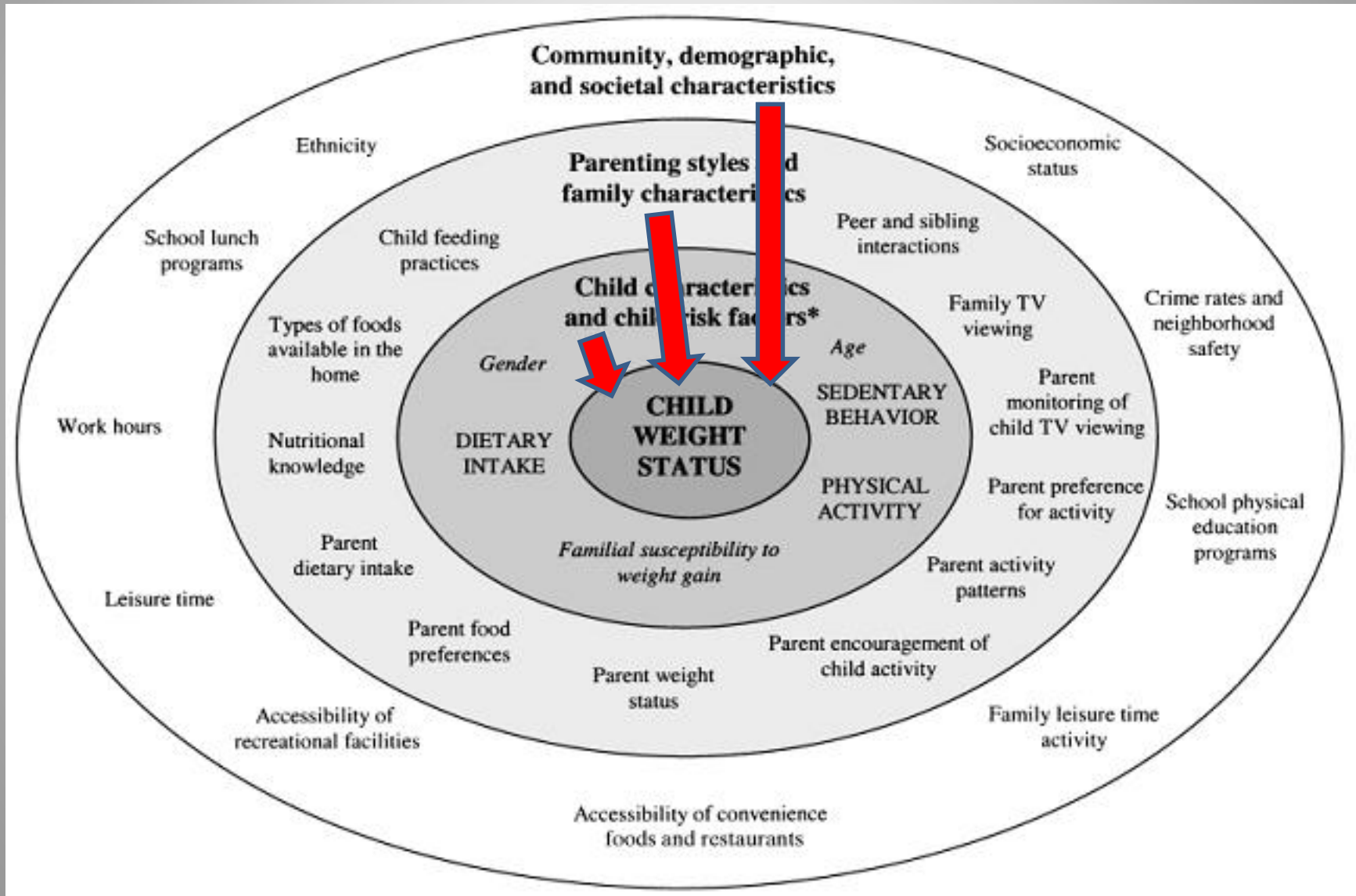


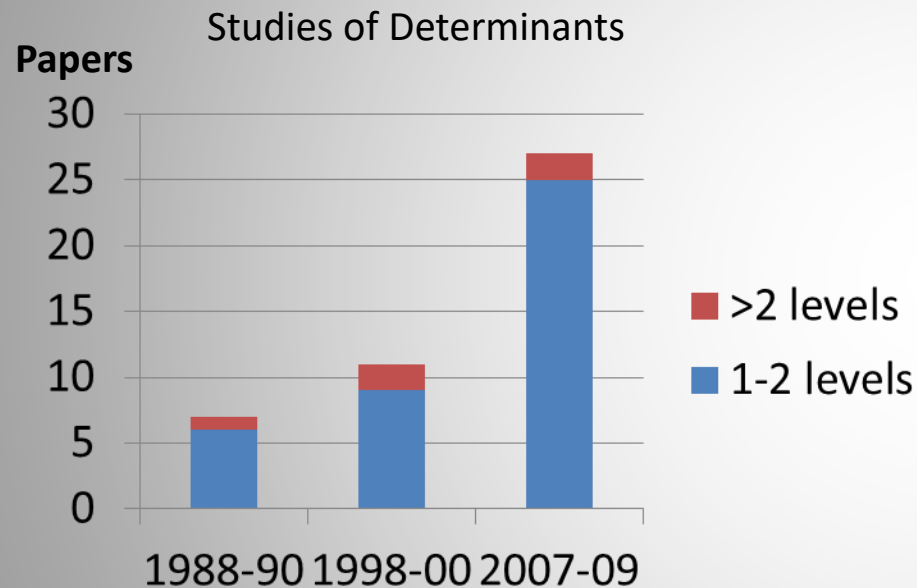
Figure 1. Percentage of articles describing intervention activities and targets of change at different levels of the social ecological model ($n = 157$) (Intervention articles published 1989-2008) (“Institutional” includes staff training)

The Individual-Centered Ecological Framework



Number of Levels of the Socio-Ecological Model Addressed in 105 Data-Based Nutrition Papers *

(data from Richard et al. Ann. Rev. Public Health 2011. 32:307–26)



* Published in American Journal of Health Promotion, the American Journal of Preventive Medicine, Preventive Medicine, and Health Education Quarterly/Health Education and Behavior; Journal of Nutrition Education/Journal of Nutrition Education and Behavior.

** Levels are: Individual, Interpersonal, Organizational, Community, Political, Other

Papers Published in Journal of Nutrition, Jan 2010-Aug 2012
(Community and International sections only)

Number of research papers: 80

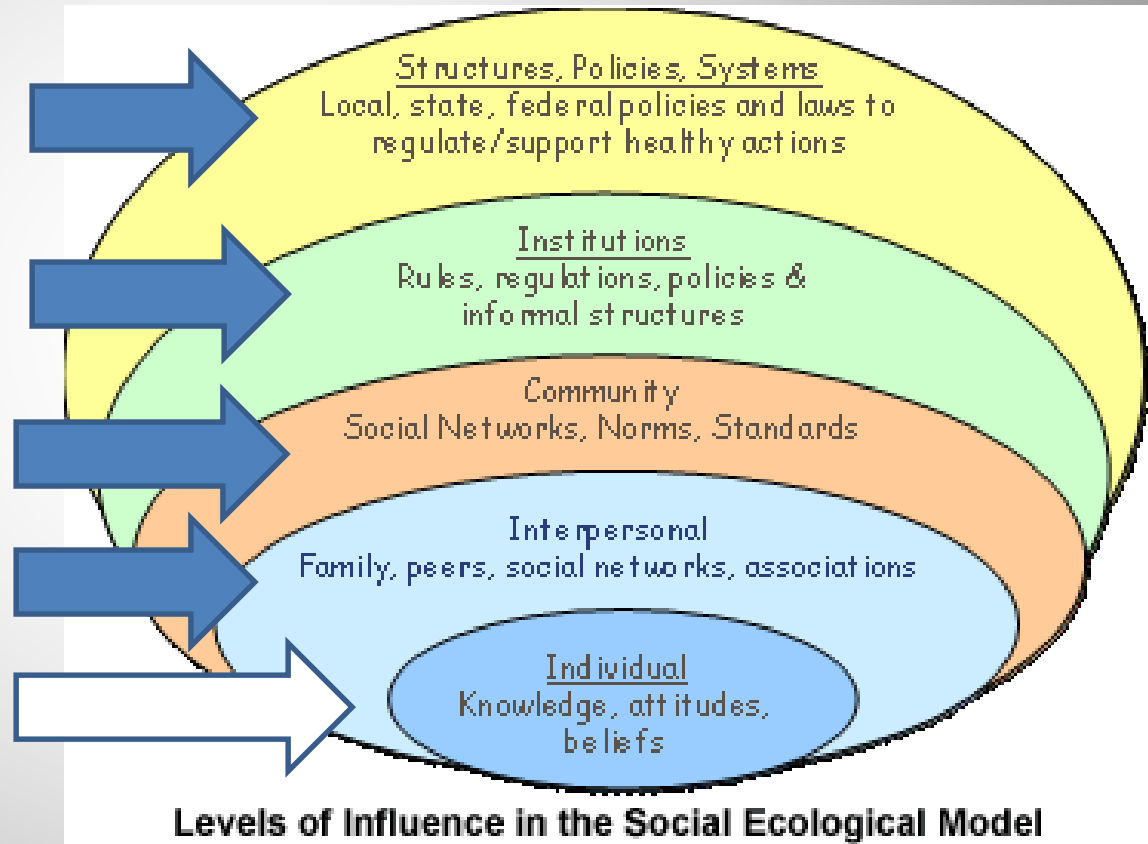
Number focusing on individuals: 80

Policy/program-focused symposia: 2

What We Study: New Objects and Questions

New Questions

- How are these formed?
- How do they change?
- What do they do?
- How are they implemented?
- What are their effects?
 - Intended
 - Unintended
 - Positive
 - Negative



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Using Our Socio-Ecological Models: Bottom Line Message

“Standard public health planning models share several attributes: an objective epistemology, an assumption that planning and implementation are two separate linear sequential activities, and an assumption that social systems change can be predicted and controlled. “

Sanderson, I. 2000, “Evaluation in complex policy systems,” *Evaluation*, Vol. 6, No. 4, pp. 433-454

Complex Adaptive Systems

“I think the next century will be the century of complexity”

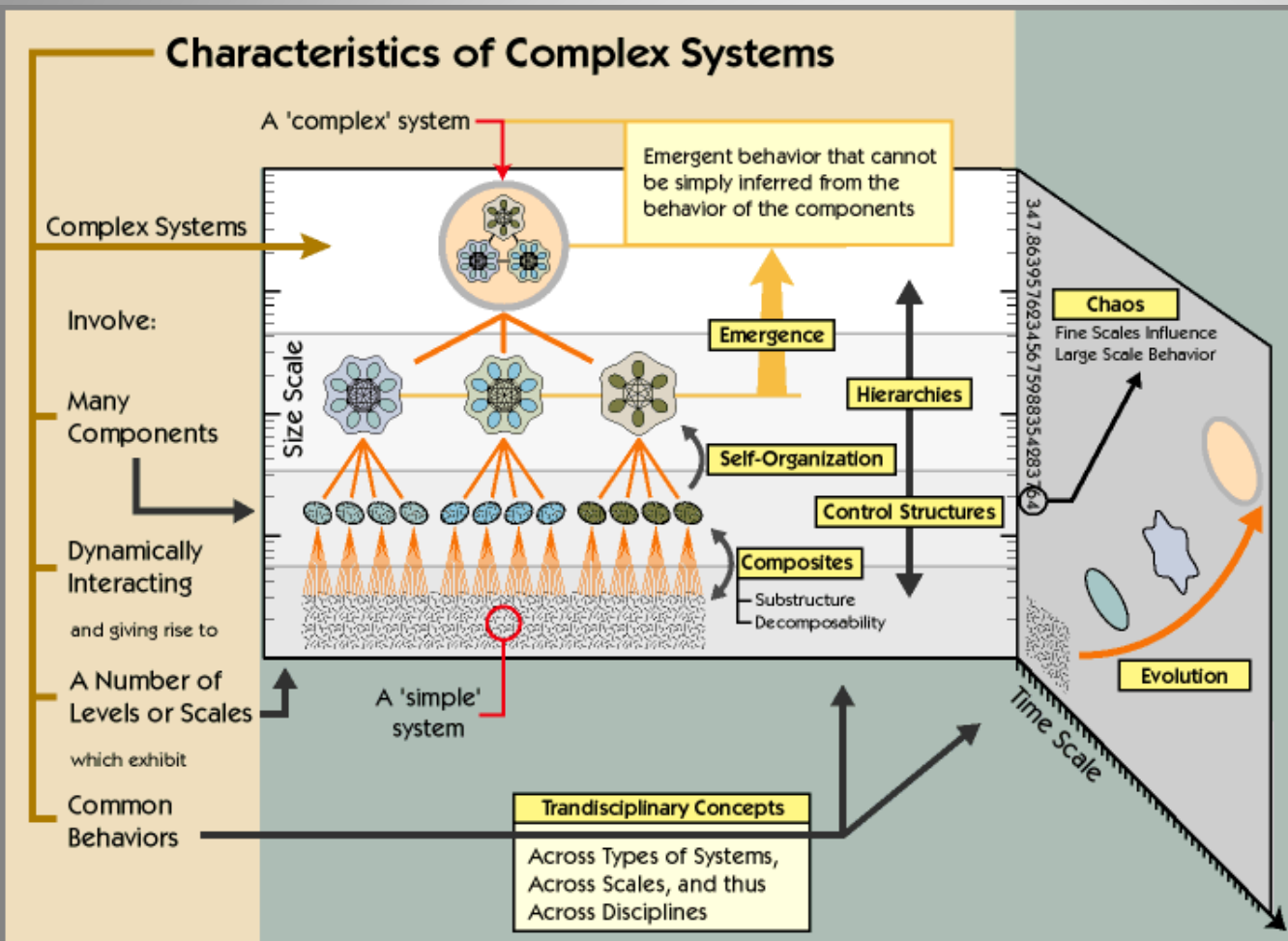
S. Hawking

“Every PhD student in everything should get to grips with the ‘chaos/complexity’ programme, not for reasons of fashion or even legitimate career building, but because this is the way the world works and we need to understand that”

D. Byrne

In: Complexity and the Social Sciences

Complex Adaptive Systems



Properties of Complex Adaptive Systems

- diverse agents that learn
- nonlinear interdependencies
- self-organization
- emergence
- co-evolution w/ environment

Systems in Public Health

Towards a complexity framework for managing projects

Ashok K Pundir; L Ganapathy; Narayanasamy Sambandam

Emergence : Complexity and Organization; 2007; 9, 4; ABI/INFORM Global

REVIEW

Evaluating health systems strengthening interventions in low-income and middle-income countries: are we asking the right questions?

Taghreed Adam,^{1*} Justine Hsu,² Don de Savigny,³ John N Lavis,⁴ John-Arne Rottingen⁵ and Sara Bennett⁶

Health Policy and Planning 2012;27:iv9–iv19

Implications of complex adaptive systems theory for the design of research on health care organizations

Health Care Manage Rev, 2009, 34(2), 191-199

Systems thinking for strengthening health systems in LMICs: need for a paradigm shift

Taghreed Adam^{1*} and Don de Savigny²

Health Policy and Planning 2012;27:iv1–iv3

Interdisciplinarity and Systems Science to Improve Population Health

A View from the NIH Office of Behavioral and Social Sciences Research

Patricia L. Mabry, PhD, Deborah H. Olster, PhD, Glen D. Morgan, PhD, David B. Abrams, PhD

Am J Prev Med 2008;35(2S)

Systems Thinking to Improve the Public's Health

Scott J. Leischow, PhD, Allan Best, PhD, William M. Trochim, PhD, Pamela I. Clark, PhD, MSPH, Richard S. Gallagher, BS, Stephen E. Marcus, PhD, Eva Matthews, MPH

(*Am J Prev Med* 2008;35(2S):S196–S203)

Complexity and its Properties

EDITORIAL

Complexity, simplicity, and epidemiology

Neil Pearce^{1,2*} and Franco Merletti²

International Journal of Epidemiology 2006;35:515–519

“It is difficult, nowadays, to open a popular science magazine, or a leading science journal, without reading about complexity, the approach to science that is expected to ‘define the scientific agenda for the 21st century’.¹ Complexity theory is influencing fields as diverse as physics,² cosmology,³ chemistry,⁴ geography,⁵ climate research,⁶ zoology,⁷ biology,⁸ evolutionary biology,⁹ cell biology,¹⁰ neuroscience,¹¹ clinical medicine,¹² management,¹³ and economics.¹⁴ However, it has to date had relatively little influence on the theory and practice of epidemiology.¹⁵ In this paper we review the basic concepts of complexity theory and discuss their relevance to epidemiology.”

An Example from Obesity

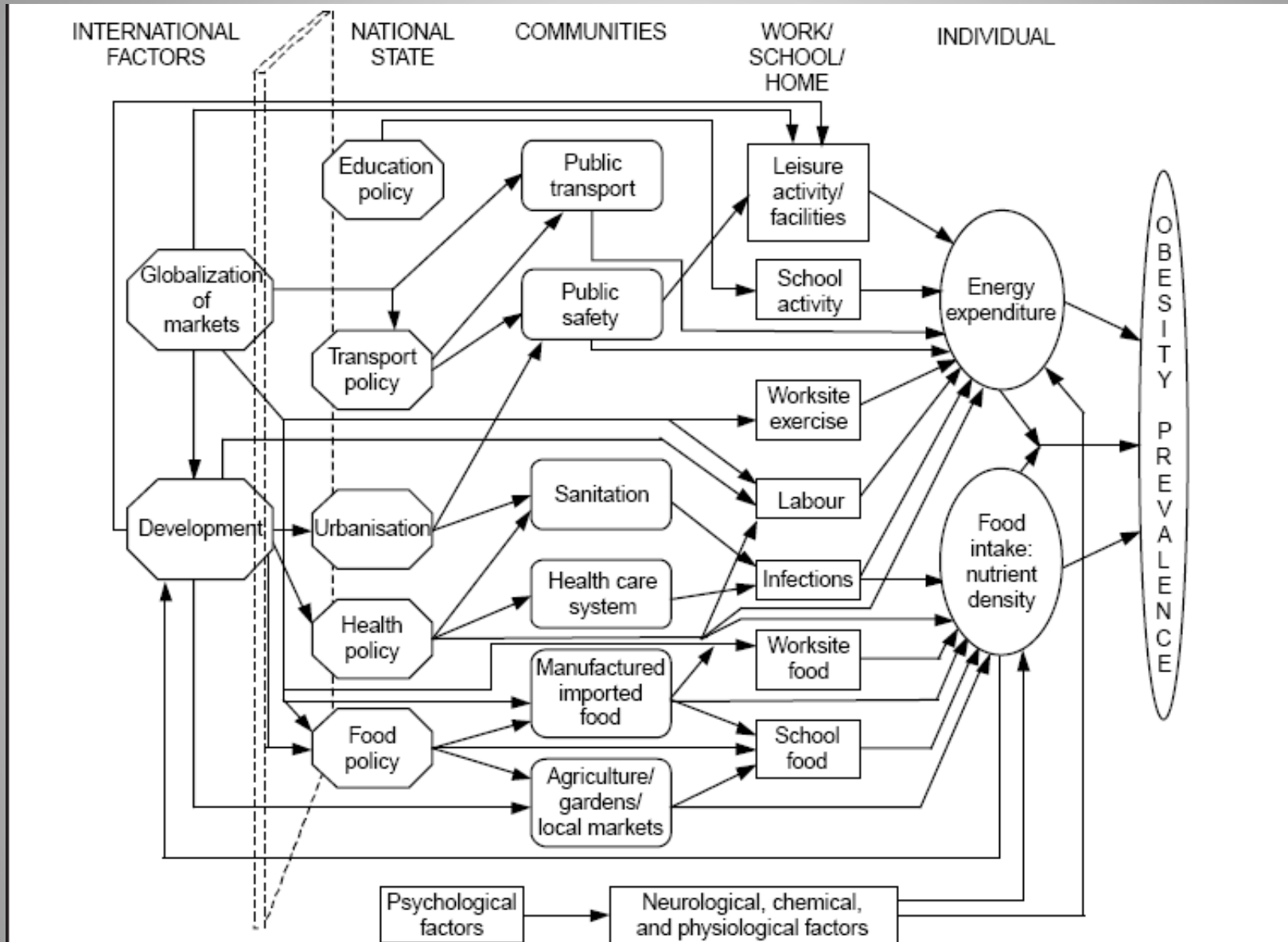


Fig. 2 Causal web of societal influences on the prevalence of obesity. *Source:* International Obesity Task Force website; figure developed by C Ritenbaugh, S Kumanyika, A Morabia, R Jeffrey and V Antipatis, 1999

The Obesity System

From the Foresight Project: <http://www.bis.gov.uk/foresight>

<http://www.shiftn.com/obesity/zoom-map.html>

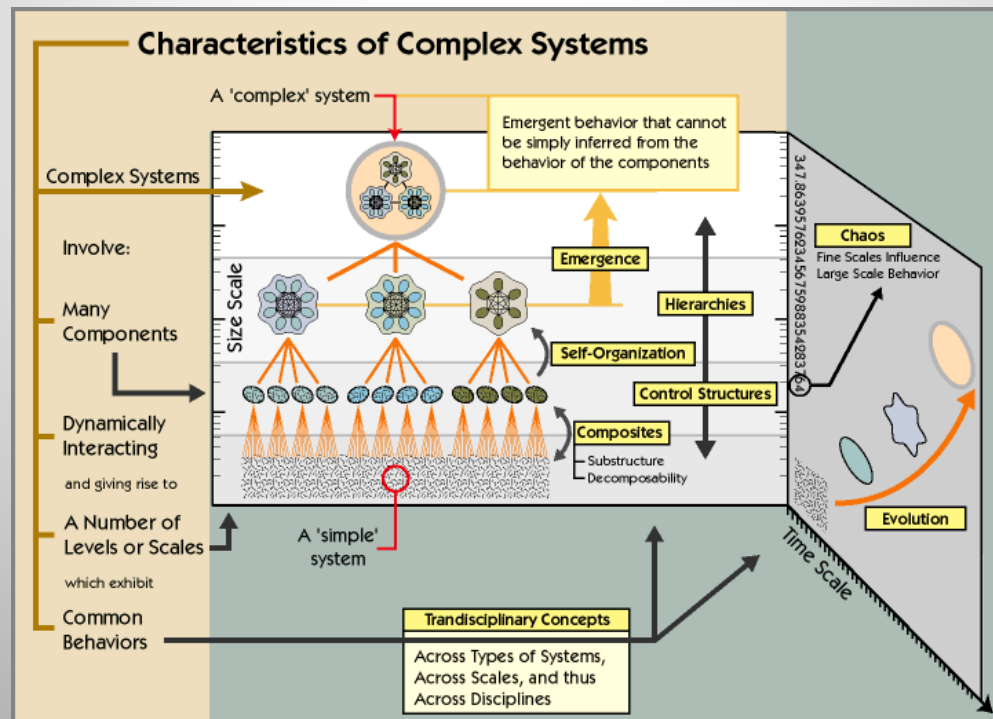


Table 1 Properties of mode-1 and mode-2 science

Mode-1 science	Mode-2 science
Academic	Academic and social
Mono-disciplinary	Trans- and interdisciplinary
Technocratic	Participative
Certain	Uncertain
Predictive	Exploratory

The central elements of sustainability science:

- inter- and intra-disciplinary research
- co-production of knowledge
- co-evolution of a complex system and its environment
- learning through doing and doing through learning
- system innovation instead of system optimization

Interdisciplinarity and Systems Science to Improve Population Health: A View from the NIH Office of Behavioral and Social Sciences Research

Programmatic Direction #1. Next-Generation Basic Science

- Gene–environment interactions
- Environmental effects on physiology
- Technology, measurement, and methodology
- Social integration and social capital
- Complex adaptive systems
- Social movements and policy change

Programmatic Direction #2. Interdisciplinary Research

Programmatic Direction #3. Systems Science and Health

Programmatic Direction #4. Population Impact

Research on Wicked Problems and Complex Adaptive Systems

“Much of the research and scholarship, as substantive as it may seem, remains largely a repetitive description of the social reality of wickedness, rather than well-grounded theoretical explorations or empirical investigations.

“Aside from substance, the peer reviewed scholarly publications on wicked problems remain modest in quantity—our recent survey found a total of 332 cited papers on the Scopus database in the Elsevier Editorial System, and 162 on Web of Science. They are also geographically scattered, presenting a huge disparity across the world.”

Table 1

Articles on wicked problems by continents.

Continent	Articles	Percentage
Africa	3	0.9
Asia	24	7.2
Europe	113	34.0
North America	135	40.7
Oceania	54	16.3
South America	3	0.9
Total	332	100

Trends in Science: Bottom Line Messages

“I think the next century will be the century of complexity”

S. Hawking

“Every PhD student in everything should get to grips with the ‘chaos/complexity’ programme, not for reasons of fashion or even legitimate career building, but because this is the way the world works and we need to understand that”

D. Byrne

“If you want to truly understand something, try to change it.”

Kurt Lewin

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Illustrations

Selected Research Projects

Where	When	Who	What	How/ Methods	How/ Approach
W. Samoa	1982-84	Male laborers	CHD risk factors	Surveys	Mode 1
NYS	1984	W,I,C; Seniors; Homeless	Unmet need	Data systems	Participant-observer
Malawi	1985-88	Govt	Response to disaster	Experience	Participant-observer
Global	1988-96	Children	Mortality	Meta-analysis	Mode 1
NYS	1989-99	Communities	Planning	Experience, Q-method	Participant-observer/ PAR
US	1998-06	FDA	Policy formulation	Documents, interviews	Detached
US/FD	2010-p	5 Comm Orgs	Fd System Change	Multiple	Partic-obs/PAR
5 LICs/MNI	2006-9	National policy comms	Policy formulation	Experience, interviews	Participant-observer
5 LICs/PAG	2009-p	Implementers	Policy implementation	Experience, surveys	Participant-observer
4 LICs SuNCaP	2012-p	National policy comms	Strategic cap. Adaptive mgt.	Multiple	Developmental evaluation/PAR

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Global	1988-96	Children	Mortality	Meta-analysis	Mode 1
NYS	1989-99	Communities	Planning	Experience, Q-method	Participant-observer/ PAR
US	1998-06	FDA	Policy formulation	Documents, interviews	Detached
US/FD	2010-p	5 Comm Orgs	Fd System Change	Multiple	Partic-obs/PAR
5 LICs/MNI	2006-9	National policy comms	Policy formulation	Experience, interviews	Participant-observer
5 LICs/PAG	2009-p	Implementers	Policy implementation	Experience, surveys	Participant-observer
4 LICs SuNCaP	2012-p	National policy comms	Strategic cap. Adaptive mgt.	Multiple	Developmental evaluation/PAR

Selected Research Projects

Where	When	Who	What	How/ Methods	How/ Approach
W. Samoa	1982-84	Male laborers	CHD risk factors	Surveys	Mode 1
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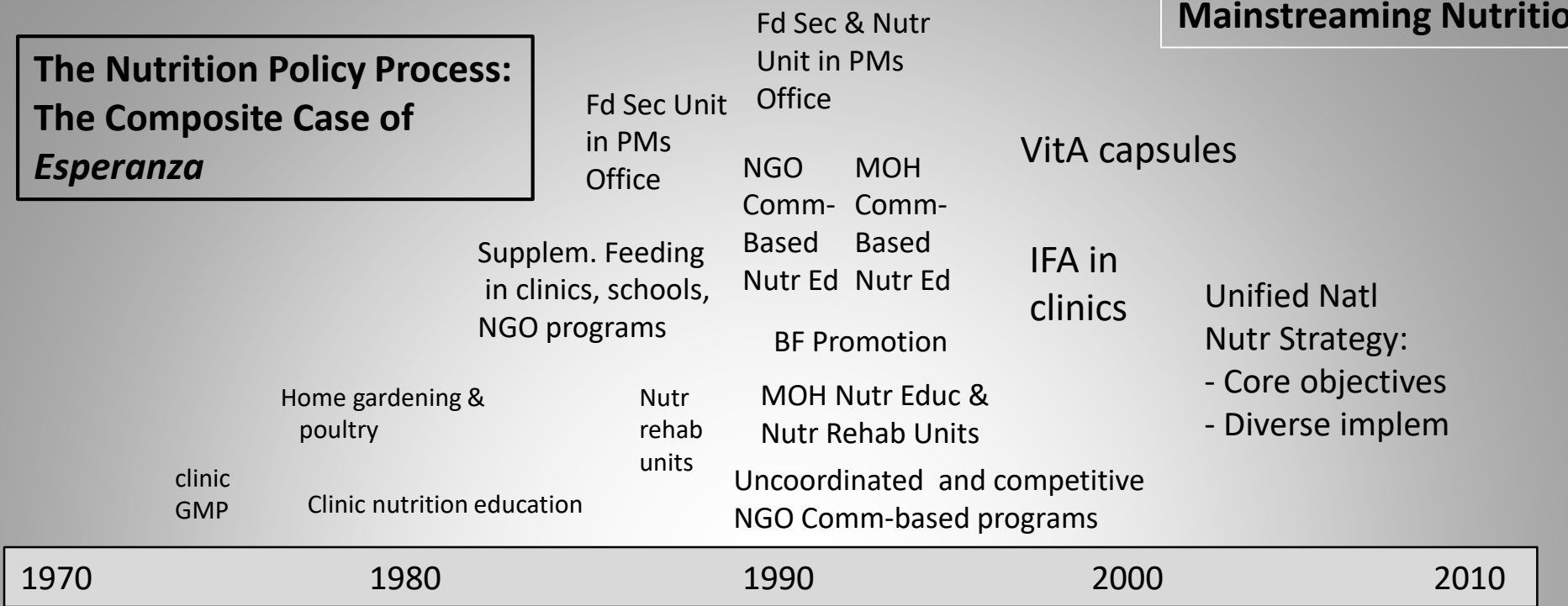
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Recent and Current Research

- Mainstreaming Nutrition Initiative
- Program Implementation
- SuNCaP

**The Nutrition Policy Process:
The Composite Case of
*Esperanza***



NPP: dynamic, contingent, emergent, non-linear, multi-scale, chaordic, open systems (“complexity”)

Seasonal and chronic food insecurity

Weak networking Skills in FSNU USAID BF Program

World Bank nutr in health sector reform

Weak/no evaluations

NGO networking, sharing, voluntary coordination, trust building, advocacy

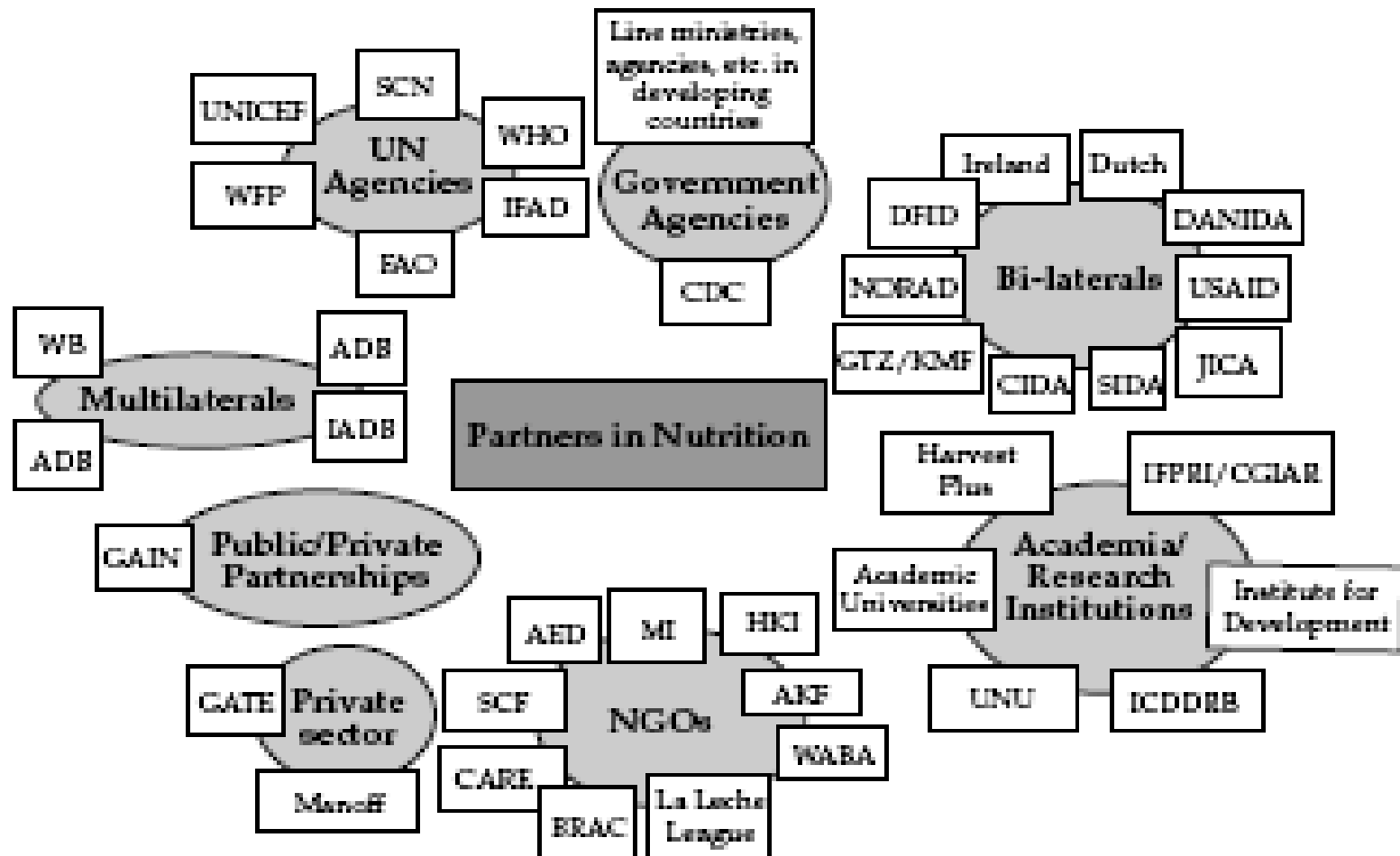
Alliance for Nutr

turnover

Donor Conflicts resume

“The international nutrition system – made up of international and donor organizations, academia, civil society, and the private sector – is fragmented and dysfunctional.”

Morris et al., Lancet Nutrition Series, Paper 5, 2008



Mainstreaming Nutrition Initiative

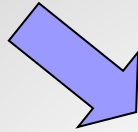
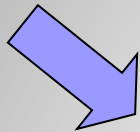
- Funded by World Bank nutrition section
 - ICDDR,B, Cornell: 2006-8
 - Objective: develop approaches and experience in moving nutrition from the status of a marginal issue with time-limited funding to a permanent feature on policy agendas and in MCN programs and policies
1. Cross-country study (interviews, written case studies, observations)
 - 30 respondents (nationals, researchers, NGOs, donors)
 - 18 country experiences
 2. Focal countries (participant-observer and interviews):
 - Bolivia, Guatemala, Peru
 - Vietnam, Bangladesh
 3. Conflict and consensus sub-studies (interviews)
 - Bolivia
 - Guatemala

Societal
Conditions

Catalytic
Events

Structural
Factors &
Behaviors

Points of
Contention



Strategies & Tactics



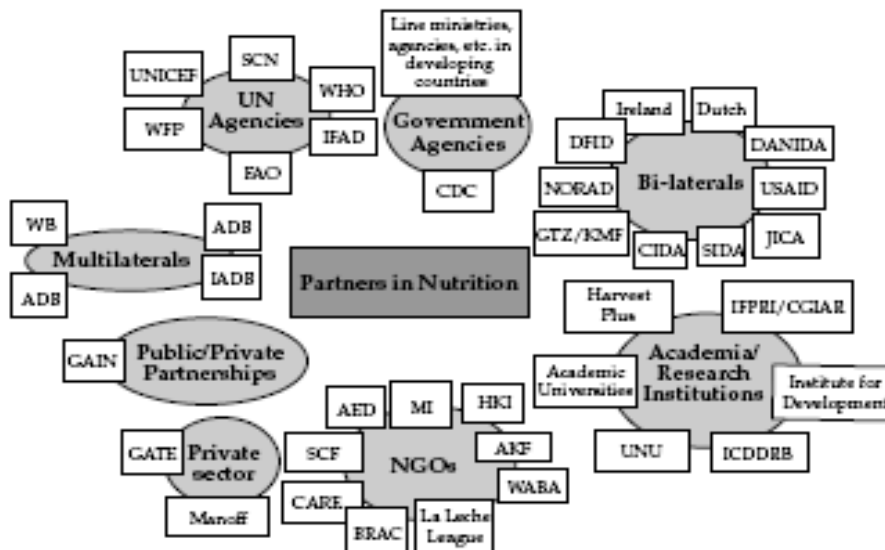
Diminished commitment,
coherence, coordination and
support for the national nutrition
agenda

Enhanced commitment,
coherence, coordination and
support for the national nutrition
agenda

Points of Contention

“[] the donors and NGOs basically could not get their act together because they were all arguing for their own special interest or their own view of how things ought to be handled for nutrition.” (International researcher and consultant to countries)

Figure 5.1 Principal development partners supporting nutrition





Strategies and Tactics

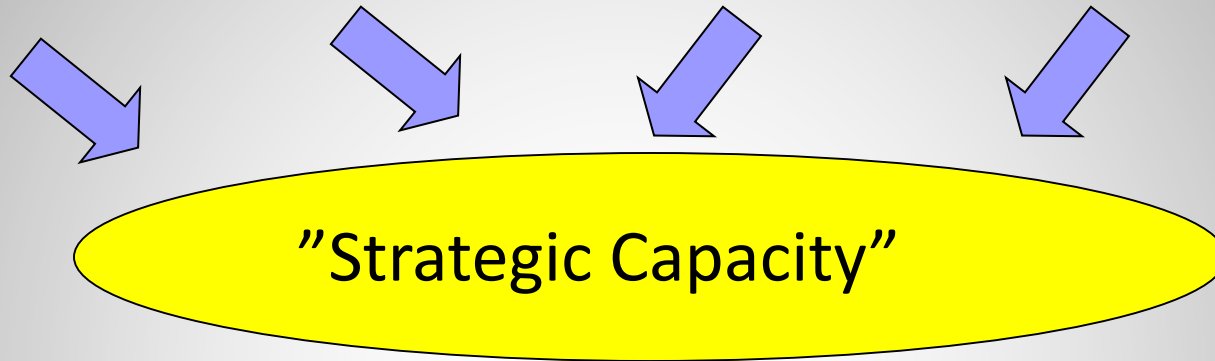
“[] they had a lot of disagreements but they always went ahead with one voice. They sat behind closed doors and didn’t get out, but then they put on a good face when they came out and had one recommendation. (Donor agency)

Societal
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Diminished commitment,
coherence, coordination and
support for the national nutrition
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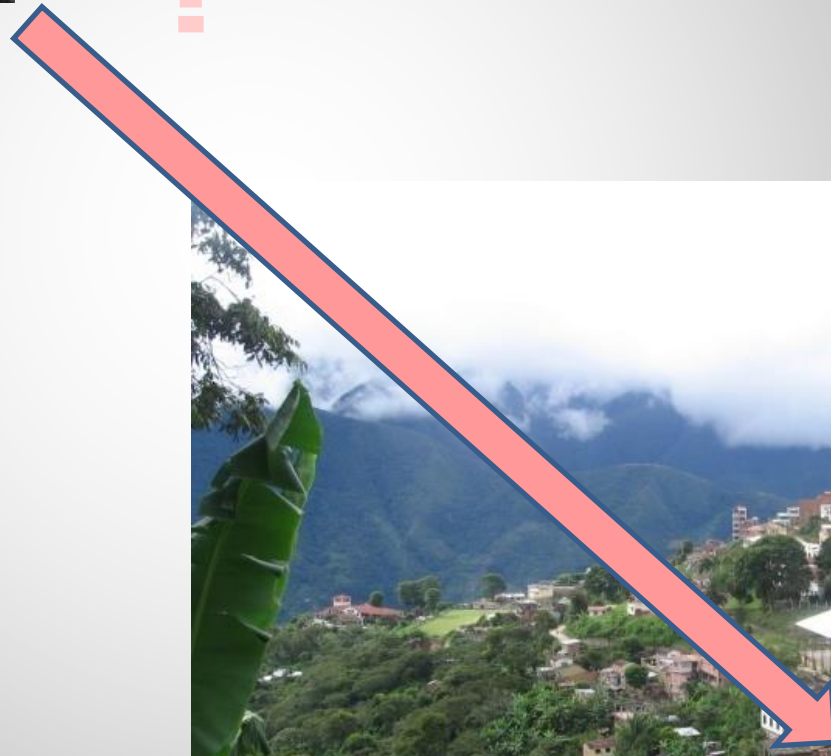
Enhanced commitment,
coherence, coordination and
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Strategic Capacity

The human and institutional capacity to:

- build commitment, vision and consensus towards a long-term national nutrition agenda,
 - broker agreements,
 - resolve conflicts,
 - respond to recurring challenges and opportunities,
 - build relationships,
 - undertake strategic communications,
 - strengthen operational capacities and implementation as part of the national nutrition agenda
- i.e. the ability to work within a Complex Adaptive System!!!

The Challenge



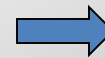
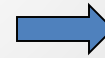
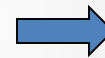
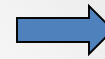


Program Assessment Guide (PAG)

Processes

Participatory Procedures To Strengthen:

- The Systematic Integration Of Evidence, Contextual Knowledge & Experience
- Shared understanding, commitment, ownership, motivation & capacity to advance the micronutrient agenda
- Links with the broader nutrition and health agendas in the country



Outputs

1. Action Plan to Address Barriers & Enablers

2. Operations Research Agenda

3. Issues for Inclusion in M&E

4. Strategic Plan to Build Support, Capacity & Sustainability

Applications of the PAG

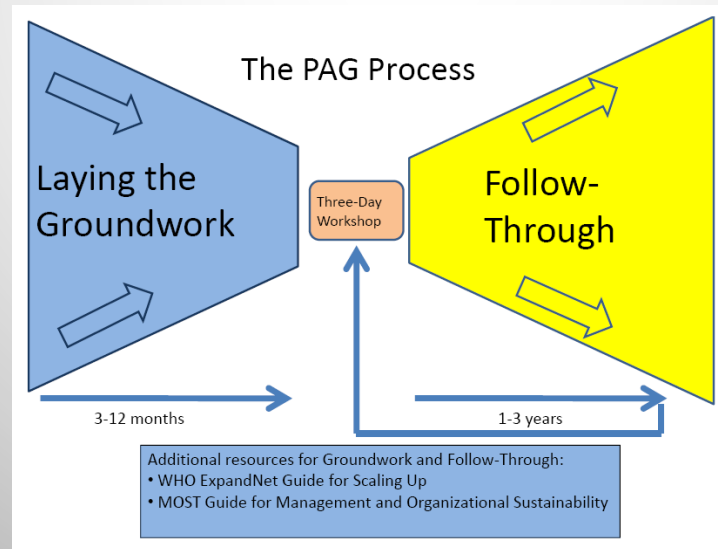
1. Kyrgyzstan (micronutrient powders)
2. Bolivia (micronutrient powders)
3. Nepal (iron-folate supplements)
4. Tanzania (iron-folate supplements)
5. Haiti (mobile clinic w/ IFA)
6. Haiti (community-based programs
w/ multiple interventions)
7. Haiti (Child Health Weeks w/ vit A)

Lessons Learned

1. Sponsorship, Responsibility, Commitment, Follow-up
2. Timing
3. Preparation
4. Participants
5. Contextuality (selection and sequencing)
6. Time constraints
7. Facilitation

Before the workshop

During the workshop

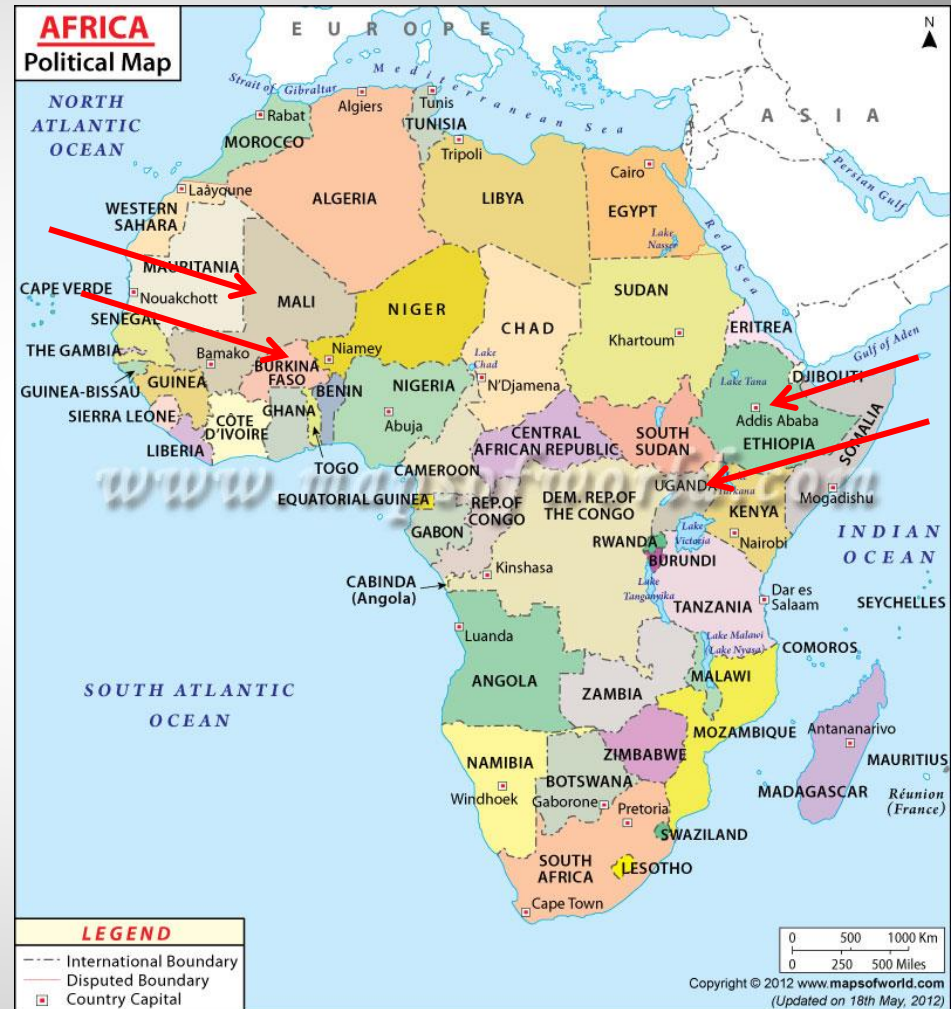


SuNCaP

(Sustainable Nutrition Capacities Project)

- UNICEF/EU, 3 year project
- Build on MNI and PAG
- Focus on:
 - Strategic capacities
 - Adaptive Management
 - Developmental Evaluation

“Never doubt that a small group of thoughtful, committed people can change the world. Indeed, it is the only thing that ever has.” ~ Margaret Mead



The Nature of Frontiers

- Detailed maps do not exist – they are vague, sketchy and made during exploration and settlement
- Explorers must be willing to embrace uncertainty, danger, hardship and hunger, so the tangible rewards (and/or the quest for discovery) must be substantial
- New tools, skills and relationships will be needed to survive and thrive in the new lands
- Native inhabitants, fellow travelers and explorers from other lands possess valuable knowledge to aid the process
- Frontiers move in many directions and over varied terrains, so diversity in focus and approach is warranted

Summary

- Nutrition has “arrived”
- “Nutrition” is no longer just “nutrition”
- How can we deliver results at-scale?

“We can't solve problems by using the same kind of thinking we used when we created them.”
Einstein

“I think the next century will be the century of complexity”
S. Hawking

“If you want to truly understand something, try to change it.”
Kurt Lewin

“Every PhD student in everything should get to grips with the ‘chaos/complexity’ programme, not for reasons of fashion or even legitimate career building, but because this is the way the world works and we need to understand that”
D. Byrne

“Never doubt that a small group of thoughtful, committed people can change the world. Indeed, it is the only thing that ever has.” ~ Margaret Mead

Dimension	Current Tendencies	Frontiers
Why	<i>Generalizable/ fundamental knowledge re. scientific questions</i>	Actionable knowledge of concern to stakeholders, organizations, communities, or publics at various scales
What	<i>nutrients, nutritional status, food and nutrient intake, food insecurity, behavior..</i>	laws, regulations, norms, programs, organizations, systems, change processes in communities, programs, policies, etc.
Who	<i>women, infants, children, elderly, consumers..</i>	policy makers, managers, implementers, leaders, networks, coalitions, private sector actors, citizens, universities
How (methods)	<i>limited range of quant and qual methods: Interviews, focus groups, regression, trials...</i>	social network analysis, discourse analysis, Q methodology, document analysis, media analysis, process tracing, stakeholder analysis, influence mapping, program impact pathways, etc
How (approach)	<i>detached, objectivist, positivist, reductionist, behaviorist, hypothesis testing</i>	engaged, participatory, action research, CBPR, participant-observer, reflection in action, embedded, emergent, systems- and complexity-oriented, reflexive, etc
Disciplines	<i>Nutrition, epi/biostatistics, biomedicine, psychology, social psychology...</i>	economics, sociology, anthropology, policy analysis, law, urban planning, political science, organizational behavior, management sciences..

