

IFORS 2002

Final plenary presentation
Edinburgh, July 12, 2002

**OPERATIONS RESEARCH AND
MANAGEMENT SCIENCES FOR
DEVELOPMENT IN A FRACTURED
GLOBAL ORDER**

Francisco Sagasti
Agenda: PERU

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- Grateful and welcome opportunity of sharing thoughts, ideas and experiences on the practice of our profession
 - Will cover three sets of topics:
 - A conception of Operational Research
 - Recent examples of the application of OR/MS/SA approaches
 - Reflections on the emerging global order and the role of OR

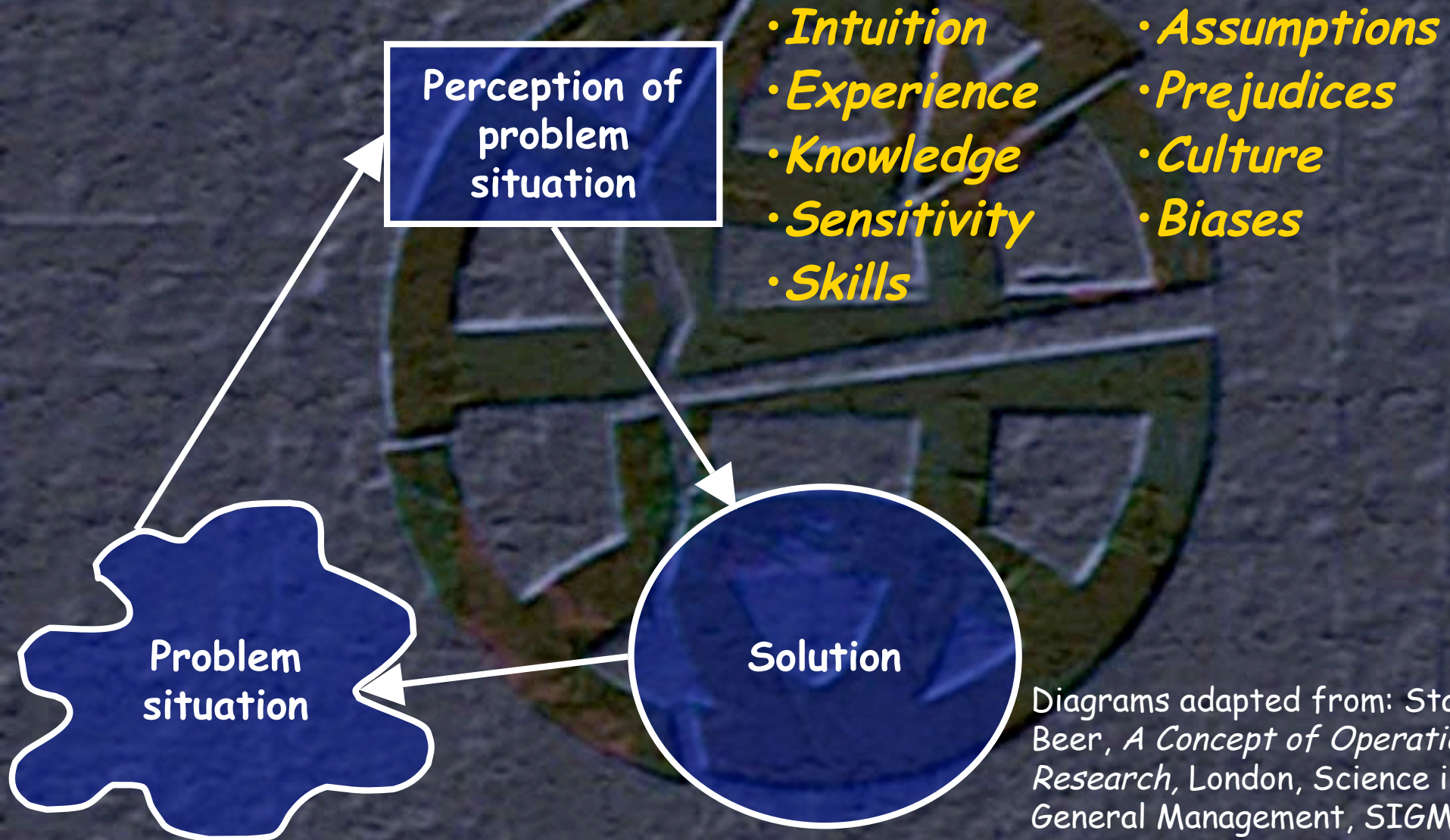


A Conception of Operational
Research/Management
Sciences/Systems Analysis

Background to Operational Research/Management Sciences/Systems Analysis till the early 1950s:

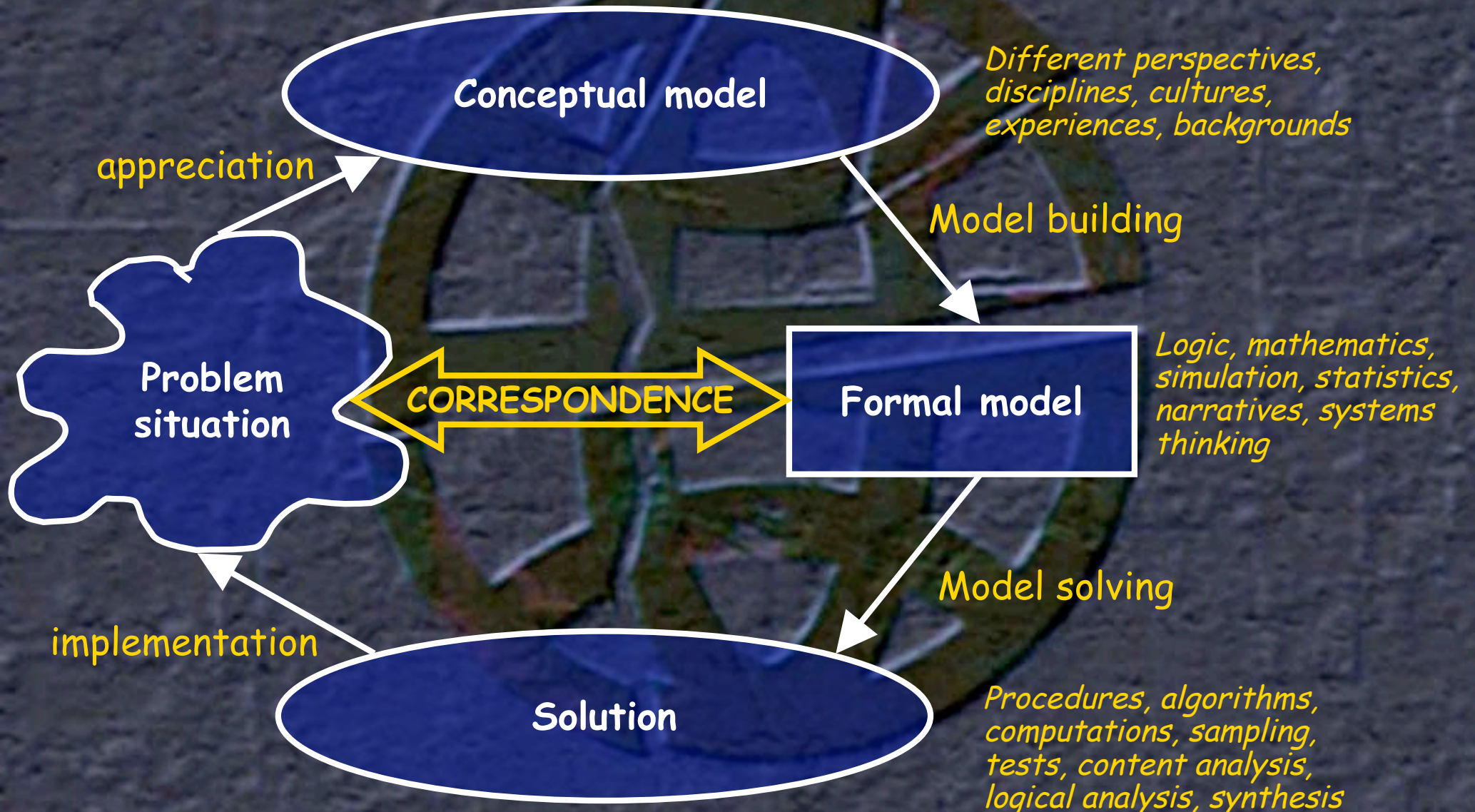
- World War II experience: emphasis on the application of science to operational problems in the war ("OR is quantitative and rigorous common sense"; P.M.S. Blackett, J. D. Bernal)
- Advances in mathematical and statistical techniques, advances in the social and behavioral sciences
- Availability of reliable statistics
- Idea that success in wartime OR could be readily transferred to non-military operations

Manager/Decision maker



Diagrams adapted from: Stafford Beer, *A Concept of Operational Research*, London, Science in General Management, SIGMA, 1964

OR/MS/SA Professional



Problems of OR/MS/SA at the international level and in developing countries



Evolution of the OR/MS/SA Profession

TECHNIQUES AND METHODS (early '50s)

- Mathematical statistics
- Computer applications
- Simulation
- Algorithms
- Model building
- Resource planning methods
- Interactive planning
- Strategic choices
- Robustness
- Soft systems

ACADEMIC WORK

INTERVENTION MODES (early '70s)

- Consultant
- Insider
- Partner
- Teacher / Trainer
- Participant
- Advocate / Activist
- Subversive
- Missionary
- Power broker
- Confident
- Socratic advisor
- Therapist / Analyst
- Guru / Shaman

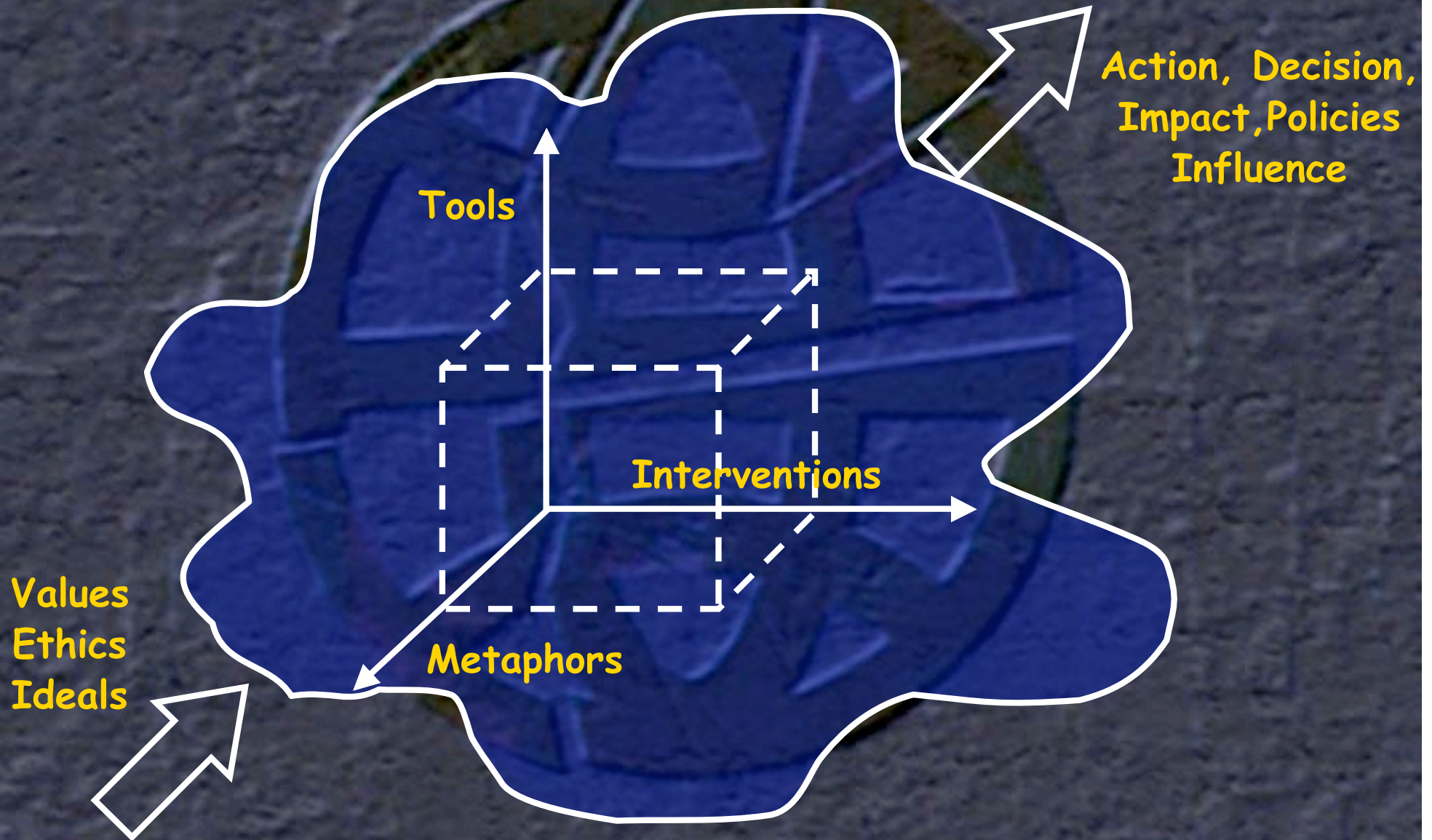
*APPRENTICESHIP,
ACTION LEARNING*

METAPHORS, PERSPECTIVES (early '90s)

- Rigid structure
- Stable system
- Decentralized conglomerate
- Ecosystem in dynamic equilibrium
- Chaotic organization
- Evolving organism
- Rapidly changing network
- Global multilevel entity
- Social fabric

*EXPERIENCE,
REFLEXION*

Perspectives on OR/MS/SA





Examples of the application of
OR/MS/SA in international
situations and in developing
countries

Recent examples of the use of OR/MS/SA in developing regions and at the international level

1. **Agenda: PERÚ**; Designing a long-term development strategy at the national level
2. Foresight and policy study of the **multilateral development banks**; study of the **provision and financing global public goods**
3. Operational research models for **poverty reduction** at the Social Compensation Fund (FONCODES) in Peru

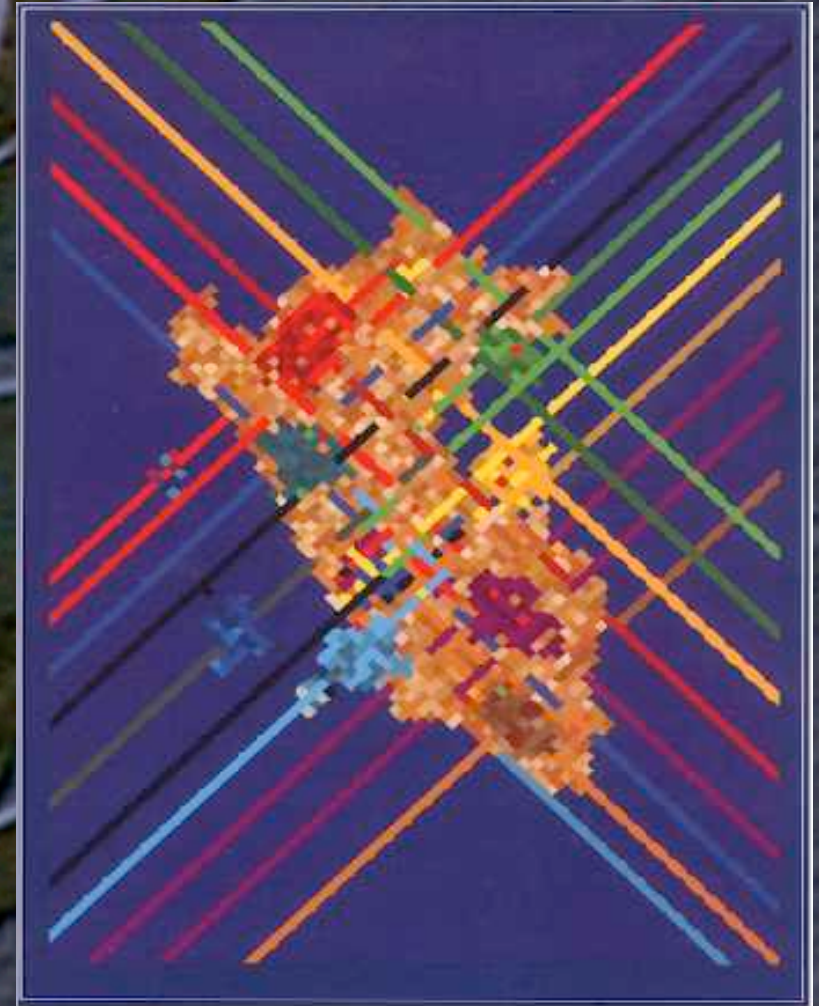
1. OR/MS/SA in developing regions and at the international level - Agenda: PERÚ

- Three main components in the **Agenda: PERÚ** methodology:
 - Integrative research
 - Consultations with experts and citizens
 - Dissemination (one and two-way)
- Produced books, a reader for students, papers and articles, newspaper inserts and magazine supplements, radio programs, a web page and a CD-ROM with all the results of the project
- Significant impact on policy and decision making

1. OR/MS/SA in developing regions and at the international level - Agenda: PERÚ

Development Strategies for the 21st century: The case of Peru

- Main synthesis report of the project
- Provides a framework for strategic choices in Peruvian development with a 20-year horizon
- Is widely used in the country



Metaphor:
*Reweaving the
social fabric*

Reform of the
private sector

Reform of civil society
organizations

Productive
transformation
and
competitiveness

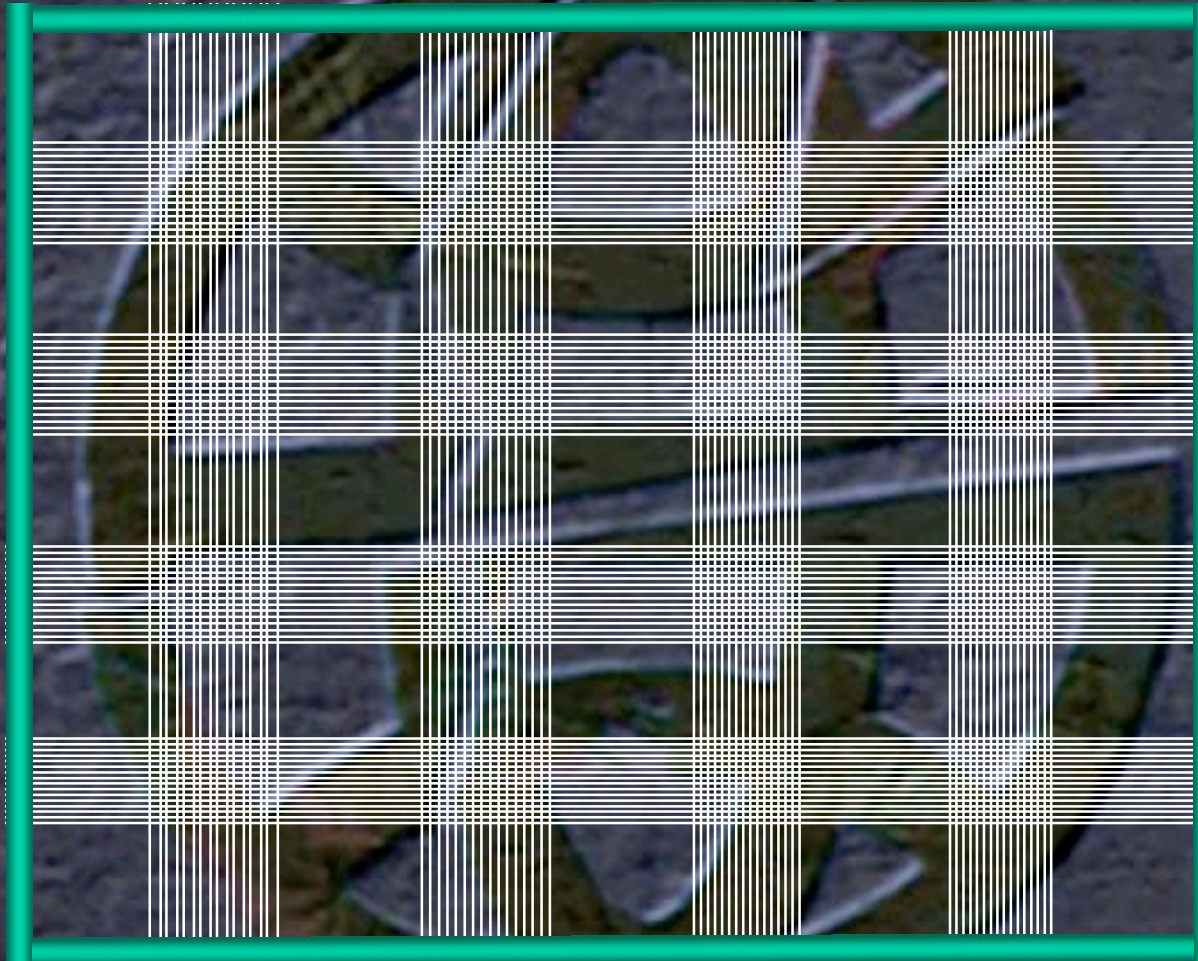
Management of
environment
natural
resources, S&T

Equity,
integration
and social
justice

Land
management and
physical
infrastructure

Reform of the
State

Reform of
security
institutions



1. OR/MS/SA in developing regions and at the international level - Agenda: PERÚ

ASSESSMENT

- **Tools:** Systems thinking, simple statistical methods, search conferences, small group facilitation, focus groups, opinion polls (builds on models constructed by others)
- **Interventions:** Varied during the decade the program lasted (facilitators, researchers, advocates, propagandists, articulators, persuaders, synthetists, advisors, consultants)
- **Metaphor:** Reweaving the social fabric

2. OR/MS/SA in developing regions and at the international level - MDBs and GPGs

- Foresight and policy study of the **multilateral development banks**; study on the **financing and provision of global public goods**
- Requested by the Swedish government for use in international meetings, conferences and events on development financing
- Aimed at influencing international policy making, negotiations and agreements

2. OR/MS/SA in developing regions and at the international level - MDBs and GPGs

Multilateral development banks (MDBs)

- A most useful 50-years old institutional innovation urgently needing updating
- Examine them as a system: World Bank, regional development banks, and sub-regional development banks should be viewed as a whole; their relations with other source of development financing (IMF, bilateral agencies, private sector) should also be considered
- Examine the interactions between their three main functions: financing, development and provision of public goods (overlap, duplication, division of labor)

2. OR/MS/SA in developing regions and at the international level - MDBs and GPGs

Challenges to the multilateral development banks:

- Emergence of fractured global order
- More diverse stakeholders
- Expanding and conflicting demands
- Management problems and criticisms

Responding to the challenges:

- Maintaining relevance of MDBs, expanding the product line, division of labor (with private sector, development agencies, other MDBs), securing access to financial, new relations with borrowers

2. OR/MS/SA in developing regions and at the international level - MDBs and GPGs

Need to clarify the concept of "Global Public Goods" (GPGs) and determine how to provide and finance these goods.

- Demand for rigor in determining what is a GPG; focus on essential features (non-rivalry, non-excludability, global reach)
- Concept of "Delivery System" for the provision of GPGs and identification of its components (from global to local)
- Focus on missing components and international action

2. OR/MS/SA in developing regions and at the international level - MDBs and GPGs

- Construct an "Exploratory Decision Tree" for financing options
- Carry out case studies to determine applicability of approach (biodiversity, climate change, HIV/AIDS vaccine, peace and security, international financial stability)
- Derive conclusions across case studies and examine policy implications
- Promote international agreements to provide GPGs (UN Task Force, UNDP initiatives)

2. OR/MS/SA in developing regions and at the international level - MDBs and GPGs

ASSESSMENT

- **Tools:** systems thinking, statistical techniques, in-depth interviews, stakeholder analysis, contextual assessment, decision tree analysis, impact matrices
- **Interventions:** researcher, synthesist, advocate, adversary, persuader, champion
- **Metaphors:** disconnected system, dysfunctional extended family, integrated delivery system, open-ended exploratory and learning process

3. OR/MS/SA in developing regions and at the international level - Poverty reduction

Design and implementation of a poverty reduction strategy for Peru (1995-1998):

- Need to focus on poor in Peru (50 percent of the population under the poverty line for more than a decade, 20 percent below critical poverty line)
- Decisions on how to allocate resources of Social Compensation Fund (FONCODES) to localities, project lines and specific projects
- Need to reduce political pressures and corruption
- Supervision of thousands of small projects

3. OR/MS/SA in developing regions and at the international level - Poverty reduction

Approach:

- Institutional redesign: decentralization; community participation, transparency
- Application of **Operational Research models** to improve resource allocation process and project selection
- Use of information technologies to help in project monitoring and supervision
- Development of software tool: SALTO - (*Sistema de Apoyo a la Transparencia de las Operaciones*).
- Prepared by **Dr. Alejandro Afuso**, former Executive Director of the Social Compensation Fund.

3. OR/MS/SA in developing regions and at the international level - Poverty reduction

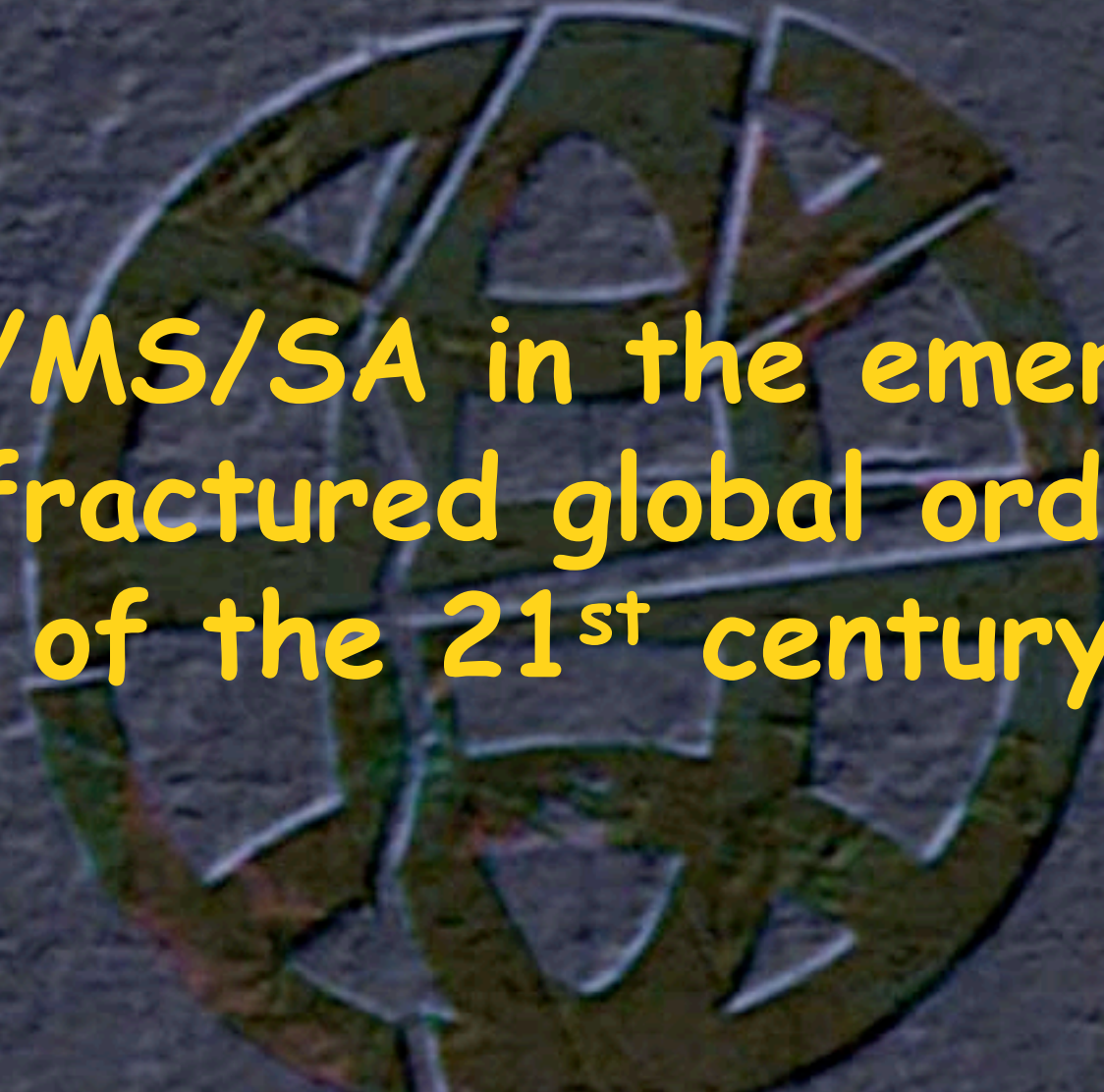
Operational research models are used to:

- Systematize poverty reduction interventions
- Establish links between objectives, criteria and the poverty situation at the level of local communities
- Allocate resources to geographical regions and lines of investment in poverty reduction interventions
- Select specific projects among the proposals received from the local communities
- Types of models: mean-value technique, analytical hierarchy, decision choice model with multiple objectives, network flows model, ELECTRE IV model

3. OR/MS/SA in developing regions and at the international level - Poverty reduction

ASSESSMENT

- **Tools:** mean-value functions, analytical hierarchy process, impact matrices, network flow models, ELECTRE IV model, information systems, institutional redesign
- **Interventions:** government executing agency, financer, facilitator, provider of technical assistance, evaluator
- **Metaphor:** government as servant of the people, empowering the members of poor communities



OR/MS/SA in the emerging
fractured global order
of the 21st century

Problems of OR/MS/SA at the international level and in developing countries



Problems of OR/MS/SA at the international level and in developing countries

Different situations:

- Developed countries had relative stability with regards to **institutions**, **context** and **vision**, and could focus on **activities** and **resources**
- Developing countries have always faced institutional instability, contextual uncertainty and blurred vision: *OR/MS/SA approaches had to deal with these problems and conditions from the beginning*
- Situation has changed for all: developed and developing countries now face similar problems of instability, uncertainty and lack of direction

OR/MS/SA in a new international context: A fractured global order

Emergence of a fractured global order:

- Order that is global but not integrated
- Puts all of us in contact with each other, but creates and maintains deep fissures between groups of countries and peoples within countries
- Multiple fractures of economic, social, environmental, security and technological nature
- Benefits a small percentage of the world's population and segregates the majority
- Creates the conditions for violence and chaos

OR/MS/SA in a new international context: A fractured global order

New demands for OR/MS/SA:

- No longer possible to focus only on **resource allocation** and on setting priorities for **activities** within stable institutions and contexts
- Necessary to **examine institutions** and focus on **institutional redesign**
- It becomes essential to continuously assess the impact of a **rapidly changing context**
- Essential to **articulate visions**, explicitly considering **values** and **aspirations**

OR/MS/SA in a new international context: A fractured global order

Transition from the 20th to the 21st century:

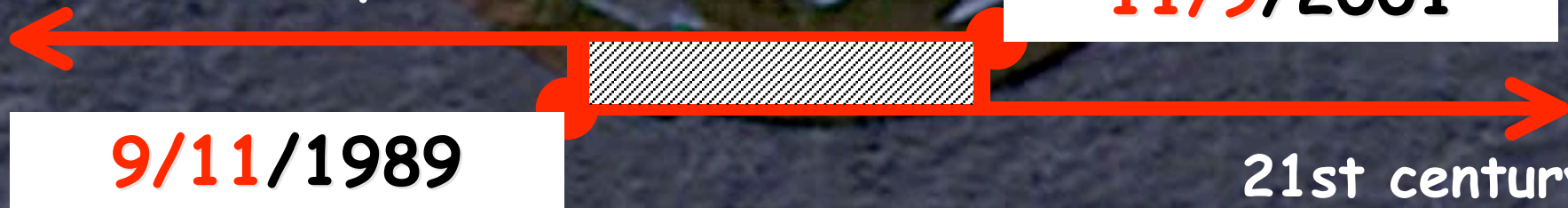
- From the "Cold War" to the "War on Terrorism"
- New organizing principle for fractures in world order: from **East-West**, to **Included-Excluded** and to **Rich-Poor**
- Took World War I, the Great Depression, Nazism, Fascism, Stalinism, the Holocaust and World War II to mobilize human solidarity (Welfare State, Marshall Plan, development cooperation)

20th century

11/9/2001

9/11/1989

21st century



OR/MS/SA in a new international context: A fractured global order

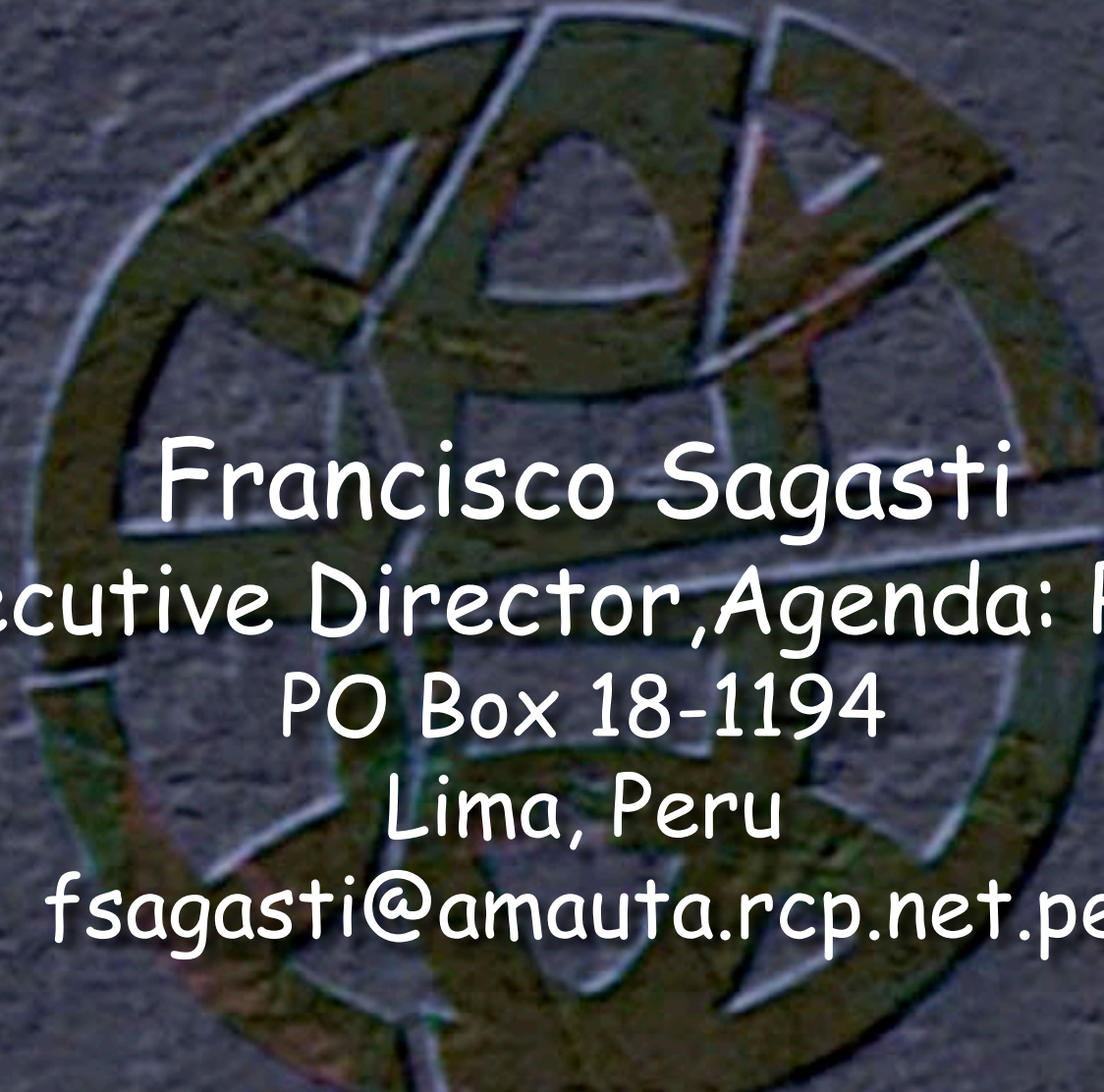
Challenges for the future:

- Let us not wait until the emerging fractured global order leads to disasters and chaos before taking action
- Operational Research was born at a time of crisis and of extreme danger: we are facing a similar situation now
- Need to marshal our knowledge, talents and resources to use OR/MS/SA for the benefit of humanity

For additional information please contact:

- **Agenda: PERÚ** - www.agendaperu.org.pe
- **MDBs and GPGs** - www.utrikes.regeringen.se/inenglish/policy/devcoop/financing.htm
- **FONCODES** models for poverty reduction - aafuso@amauta.rcp.net.pe

For additional information please contact:



Francisco Sagasti
Executive Director, Agenda: PERU
PO Box 18-1194
Lima, Peru
fsagasti@amauta.rcp.net.pe