

Participatory Innovation Praxis

An original method that makes high-complexity problems governable

- Humanity and planet Earth are overwhelmed by ‘high-complexity’ problems, from local to global scales: climate crisis, poverty, inequality, migrations, biosphere destruction, organised crime, and more.
- Each high-complexity problem involves large numbers of inter-dependent actors, conflicts, themes, interpretations, relevant disciplines, and cultures.
- Scientific disciplines can only make much simpler problems understandable and thus governable. Engineering builds metro lines, medicine heals diseases, economics runs central banks. These are ‘complex-tame’ problems that have been tamed by their global knowledge networks; but the disciplines can hardly work together for lack of common logic and common language.
- The Participatory Innovation Praxis method makes high-complexity problems understandable by means of ‘strong participation’ workshops, ie, methodical, future-directed, multi-actor and synergic dialogues that harness the astounding ability of human minds and natural human language to process complex meanings.
- It also makes them governable by gradually establishing ‘future-building communities’, which identify, design, and implement dozens or hundreds of social, institutional, and technological innovations. Successful applications of this method have saved thousands of lives and have made significant impacts at all scales.

From local to global scales, high-complexity problems are out of control: climate change, hunger, poverty, migrations, organised crime, inequality, desertification, pollution, etc. High-complexity problems are those involving large numbers of actors, conflicts, themes, relevant disciplines, interpretations, and cultures. Figure 1 illustrates this for road traffic crashes, which kill some 1.3 million people worldwide every year, according to WHO; notice the inter-dependence: changing any component affects them all.

Policy-makers usually deal with these problems through four common-sense approaches: simplification (the leader’s priorities), analysis (some discipline’s relevant variables), trial-and-error (learning from one experiment), and committees (proposals from a few actors). But they clearly fail: the above problems keep proliferating.

Dr Alfredo del Valle has done theoretical and practical work into this severe failure over 50 years, and has created an original alternative. His Participatory Innovation (PI) Praxis is a natural-intelligence method that makes high complexity understandable and thus governable. Being a praxis it prescribes no social, political, or economic model to follow; rather, it is a learning guide for a social system to transform itself from within. It involves principles, concepts, tools, processes, and methodological agency. In principle it is applicable in any field and place, at any scale.

An experience with a quarter-century impact
Chile’s road safety policy was formulated with Del Valle’s methodological guidance between 1993 and 1997. Its group of convenors included seven ministries and the national police, and its future-building community had 200 representative participants: transport engineers, judges, police officers, bus drivers,

Being a praxis it prescribes no social, political, or economic model to follow; rather, it is a learning guide for a social system to transform itself from within.

High-complexity characterisation of the road traffic crashes problem (based on Chile’s road safety policy experience)	
Aspect	Components
Actors	Bus services; civil society organisations; consulting firms; courts; driving schools; firemen; insurance companies; media; ministries: education, health, justice, public works, regional development, transport, urban development; municipalities; police; suppliers of services; truck companies; universities; etc.
Conflicts	Daily and deadly conflicts over the use of road space between drivers, pedestrians, cyclists, and road managers.
Themes	Alcohol; automobiles; bicycles; buses; car drivers; communications; crash hotspots; drivers; driving licenses; drugs; education; fatalities; financing; fines; forensic advice; hospitals; information; infraction; injured people; insurance; investigation; license suspension; motorcycles; pedestrians; policing; political will; public awareness; regulations; road traffic crashes; roads; speeding; statistics; traffic lights; traffic signals; technologies; trucks; etc.
Relevant disciplines	Economics; health sciences; journalism; law; management sciences; pedagogy; police sciences; psychology; sociology; transport engineering; urban planning; etc.
Interpretations	A different interpretation of the road safety challenge can be built from the perspective of each relevant discipline: law studies legal disobedience; sociology studies competing discourses of irresponsibility and safety; engineering studies crash energies; public health studies epidemiology of road fatalities; management science studies insurance policies; etc. Some interdisciplinary interpretations exist, which are very far from considering all elements in this table.
Cultures	Active citizen; business; journalistic; judicial; medical; police; political; public service; technological; transport trade associations; etc.
Interdependence	Each one of these elements is directly or indirectly related to all others, and any change in it has repercussions on them all.

Fig 1. High-complexity characterisation of Chile’s road safety challenge.

The Chilean road safety experience:
around 20,000 lives saved, and 300,000
injuries avoided
A historical trend and a culture transformed

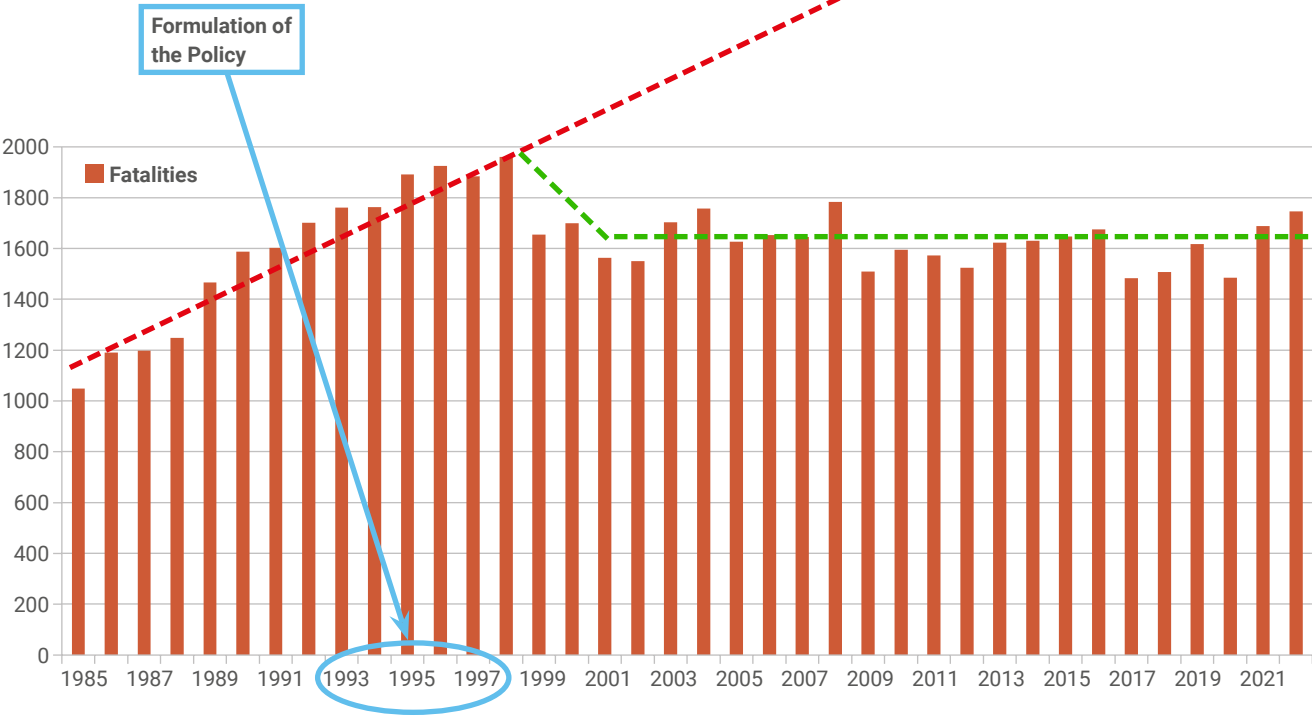


Fig 2. Evolution of road traffic fatalities in Chile, 1985–2021.

etc. They closely interacted to generate a strategy with 129 institutional and social innovations, which was implemented in the subsequent years. As shown in Figure 2, it dramatically changed the road fatalities trend; so far some 20,000 lives have been saved and injuries to 300,000 people have been avoided, in this country of 20 million. The policy also changed traffic culture, since drivers now give way to pedestrians and cyclists at designated places, which is apparently unique in Latin America. Its economic benefits were hundreds of times larger than its costs, following WHO and World Bank criteria.

The simple law of
complexity governance

What is the rationale behind this impact? In the 1950s, the British cybernetician Ross Ashby discovered a general law that explains how complex systems are actually governed in nature, and also in society when well done. He specified a measure of complexity, called variety: the number of distinguishable states in which some entity can be (a traffic light has three states: green, amber, red; an interacting group of people is complex and has a huge number of possible states). Ashby's law of requisite variety is clear and intuitive: A can only govern B if A's variety is equal or larger than B's variety; otherwise A will miss many of B's states. For instance,

a master chess player beats a regular one by knowing far more positions: his variety is much greater. This is a logical law that is always in force.

Del Valle has found that Ashby's law explains why common sense fails, and also provides the key to governing high complexity in practice. Why does it fail? Because the varieties of high-complexity problems are astronomically large and the usual approaches can only consider a few possible states: they are reductionist. Thus, common sense is very far from understanding any high-complexity problem, let alone governing it.

How can this limitation be overcome? First, by developing a high-variety understanding of the problem that effectively matches its whole complexity; and second, by using it as grounds for a future-directed governance system. The PI Praxis does this by methodically working with human minds and human language. It harnesses the astounding ability of human minds to process complex meanings when they interact on natural language. Human brains have 80 billion neurones, each linked to other 5,000 to 200,000 neurones; and the English language involves 171,000 words in use. Mind-word combinations into phrases, sentences, and texts give rise to varieties of meaning that

are more than astronomically large. PI combines them via participatory exercises that also build high commitment from the actors involved.

Del Valle provides a paradox: 'Governing high complexity needs no big bureaucracy, as common sense believes. It does need powerful systemic tools based on natural language, a strong participatory process, and competent guidance. Our team for Chile's road safety policy had 11 members.'

Participatory Innovation
in practice: tools, process,
and agency

The PI Praxis makes high complexity understandable through the action map, a one-page verbal tool. Figure 3 illustrates it for the Chilean road safety experience. This one has 9 dimensions (A, B ... I) and 57 lines of action (A-1, A-2 ... I-5) that show all permanent actions that should be under way to achieve road safety. The 9 upper-case lines are those established at that time, with actors in charge, regular activities, and impact; they reflect past innovations, while the remaining lines show where innovations are needed for the future. This amounts to both a governance diagnosis and a vision of future. This particular map shows a consensus of 120 participants who enriched and validated a previous version.



Plenary session of a strong participation seminar on agricultural sustainability in the Valparaíso Region, Chile, 2015.

Action Map (1993):

The National Road Safety System of Chile

A Training and certification of drivers A-1 Training professional drivers A-2 Training particular drivers A-3 CERTIFICATION OF DRIVERS A-4 Training driving instructors A-5 CERTIFICATION OF INSTRUCTORS A-6 Certification of examiners A-7 CONTROL OF DRIVING SCHOOLS A-8 Permanent qualification of drivers	D Management of transport services D-1 Compensation regime D-2 Working hours and conditions of service D-3 Permanent qualification of drivers D-4 Stowage and dangerous loads D-5 School transport conditions E Enforcement E-1 CONTROL OF DRIVERS E-2 Inspection of vehicles E-3 Inspection of road conditions E-4 Control of transport services E-5 Control of pedestrians E-6 Enforcement by the citizens F Judicial Action F-1 PENALISING INFRACTIONS F-2 Effective system of penalties F-3 Broadening competences of local judges F-4 Administrative decongestion of lower courts F-5 ACCIDENT INVESTIGATION AND EXPERT REPORTING F-7 Civil accountability	G Accident care and insurance G-1 Integrated rescue system G-2 Integrated rehabilitation system G-3 Insurance coverage H Research and information H-1 Integrated information system H-2 REGISTER OF DRIVERS AND OFFENDERS H-3 REGISTER OF VEHICLES H-4 Register of accidents H-5 Register of instructors and examiners H-6 Studies of accident-producing factors H-7 Effective information to users I Education and communications I-1 Incorporation into the curriculum I-2 Training of teachers I-3 Preparation of teaching material I-4 Protection of school children I-5 DISSEMINATION CAMPAIGNS
--	---	--

Fig 3. The action map of Chile's National Road Safety System (1993).

Social system

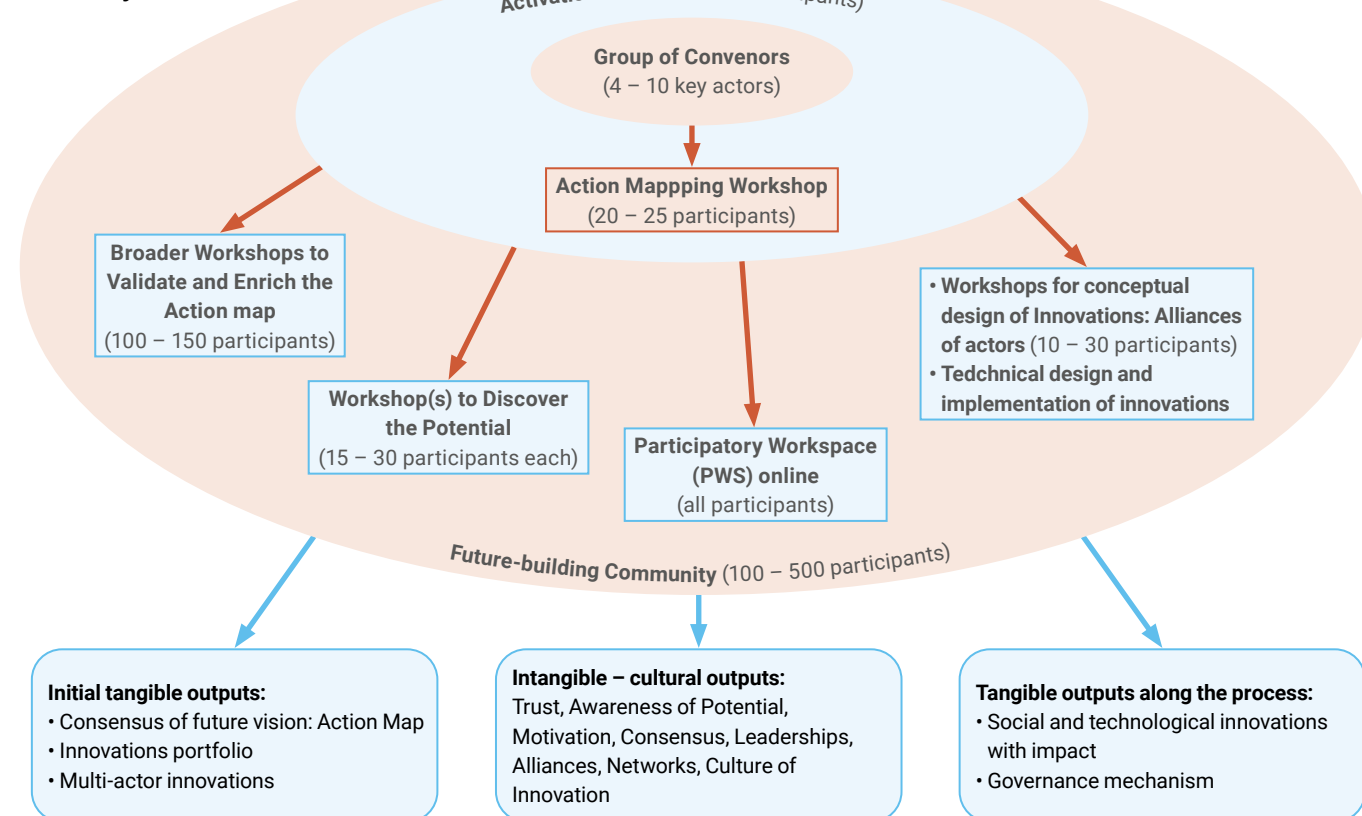


Fig 4. The participatory transformation process.

Action maps are initially formulated in one-day workshops by 20 to 25 representative participants.

Figure 4 synthesises the process that makes a high-complexity problem governable. Its body is a future-building community of 100 to 500 participants that gradually evolves within the relevant social system – a city, a region, a country's roads, etc. This community identifies, designs, and implements the innovations that impact the system from within and eventually transform its operations, structure, and culture. The process starts by creating a group of convenors with 4 to 10 key actors to

provide legitimacy and strategic guidance, and proceeds through a series of methodical workshops that apply the action map and the other three verbal tools of the PI Praxis. An activation team mobilises the participants to the workshops. Once the group of convenors is established, it takes only six to twelve months to formulate an effective and legitimate strategy for the longer term, with all innovations defined, and to start implementing it.

There is a deeper layer in this process that is not explicit in Figure 4, but is essential. It is the soul that gives life to its body-community, and is called strong participation. It consists

in a future-directed and synergic dialogue between all participants at the workshops, which produces on consensus all visions and proposals along the process, without any prior blueprint. This widely differs from weak participation, the common-sense practice that summons people to validate or marginally improve existing proposals from public or private entities. It is strong participation that explains the deep cultural changes shown at the bottom-centre of Figure 4. As a final, key note, it takes a special type of methodological agent, called the animator, to conduct these transformation processes with competence and with ethics.

Personal response

Besides road safety in Chile, where else has the PI Praxis been applied?

I have conducted around 80 experiences in Chile and other countries at different scales, involving some or all the tools of the PI Praxis. These are a few: at the municipal scale, a local development plan; at the medium business scale, five PI processes; at the active citizen scale, the bike-culture process that gave rise to Chile's social movement of cyclists and to 2,000 km of cycle routes; at the metropolitan scale, the participatory plan to improve Santiago's air quality, with no emergencies since 1999; at the river basin scale, the Chilean – British pilot strategy to reverse soil erosion in the Rapel basin, with participants from Argentina, Brazil and Mexico; at the national scale, Chile's energy efficiency policy; at the continental scale, the strategic plan of the Latin American Co-operation of Advanced Networks (CLARA); and at the global scale, the linkage of green and inequality agendas in the context of the Green Economy Coalition.

Why do you call these problems 'high-complexity' rather than just 'complex'?

This is a special class of problems that can't be understood from a single discipline. Other complex problems can: engineering operates transport systems, pedagogy teaches children, medicine heals diseases, economics runs central banks; these are 'complex-tame' problems that have been tamed by the global knowledge networks of the disciplines. But every high-complexity problem is unique and needs knowledge from several disciplines. However, today's disciplines can hardly work together because they lack a common logic and a common language; each one is a separate universe. The PI Praxis is trans-disciplinary: it provides high-complexity problems with the common logic of future-creating action, and it works with the common language of the people who face each problem.

What was the origin of the PI Praxis?

I am a citizen of the global South and I can't accept poverty and inequality as fate. Early on in my career I decided that I wanted to understand our lack of development at a deeper level than economics, which can only describe and measure it, but can't explain it. I did study economics, to learn its logic and language, and I was privileged to work several years at the United Nations. Then I went into social systems thinking in my PhD, and later on into the fundamental concept of culture by working closely with social scientists; the intentional transformation of cultures is a key outcome of the PI Praxis processes.

What are its theoretical grounds?

The PI Praxis is a part of the post-Cartesian renewal of thinking and action, which aims at overcoming the fragmentation of knowledge that the Cartesian (or analytical or simplifying) paradigm has imposed upon humanity and planet Earth over the last four centuries. This fragmentation is at the root of today's high-complexity problems. The PI Praxis is based on six great contemporary thinkers: Russell Ackoff on systems thinking; Ross Ashby on complexity governance; Stafford Beer on managerial cybernetics; Edgar Morin on complex thinking; Hasan Ozbekhan on futures building; and Edgar Schein on the formation of cultures. I had the privilege of working directly with Ackoff, Beer and Ozbekhan. The PI Praxis takes a step forward from these authors, in both theory and practice.

What were its empirical and practical grounds?

In my 80 PI Praxis experiences I performed the role of methodological agent, or animator, and I only applied the method's evolving principles, concepts, tools, and processes, to test, validate, and improve them. These experiences involved hundreds of strong participation workshops with

thousands of participants; they identified almost 2,000 potential innovations in public policy, non-profit and business processes; and they led to materialising several hundred innovations. They also led to a number of books, journal articles, research papers, technical reports, seminars, conference papers, invited presentations and MA theses.

How can somebody learn to apply this method?

Learning to apply the PI Praxis, and to become a competent animator, can only take place in the context of an application experience. This learning involves cognitive contents, skills, and attitudes. I have recently systematised the cognitive contents in a book that is being published in Spanish and is ready for translation into English. The skills correspond to conducting the strong participation workshops and using the PI verbal tools; such skills are transferred through practice. Regarding attitudes, the key ones are self-knowledge, eco-humanist values and non-violent communication. All application processes must include the training of animators; for this reason every group of convenors should have a university among its members.

Any closing message to your readers?

My closing message is related to non-violence. Human violence is so pervasive in the 21st century that it no longer calls our attention. We take it for granted in our streets and our screens. While high-complexity problems usually involve violence, I have found that they also hide a singular wealth: the potential of the respective system. Such potential consists in dozens or hundreds of potential innovations, which the future-building communities of the PI Praxis can discover and can materialise. If widespread across the world, these communities could be a strong antidote to violence. I warmly invite interested readers to get in contact for exploratory conversations about this matter.

Details



e: adelvalle@innovacion-participativa.org
w: www.innovacion-participativa.org

Bio

Professor Alfredo del Valle, PhD social systems sciences, Wharton, University of Pennsylvania; MA economics, New York University; civil-industrial engineer, Catholic University of Chile. He is member of and consultant to universities, research centres, international agencies, business companies, government agencies, and civil society organisations. Author of the Participatory Innovation Praxis. Del Valle has 155 publications including books, journal articles, and conference papers.

Further reading

- Del Valle, A, (2023) *Participatory Innovation Praxis: A trans-disciplinary method for conducting high-complexity social transformations*. *Societal Impacts*, 1(1-2).
- Del Valle, A, (2024) *El arte de gobernar la complejidad. Pensamiento y acción para construir futuro en comunidad*. Santiago, JC Sáez Editor, 2024, ISBN 978-956-306-186-4