Faculty of Design

2022

Global Elephants in the Room: A reflexive prospective following 50 years of the Global Problematique

Jones, Peter

Limits to Growth at 50 Years: Reframing the predicament

Peter Jones

OCAD University, Toronto

Fifty years have passed since the original *Limits to Growth* report to the Club of Rome. Since then, many of the original controversies triggered by the dire scenarios produced by the MIT research team have been accepted as current outcomes of their prediction, anchoring its position as prescient in climate and economic policies, as well as in foresight studies. Yet many of the original critiques also remain justified, as several significant predictions were not realised. The World Model simulation project was the winning proposal of two programmes offered in response to the original Club of Rome prospectus, *The Predicament of Mankind*. Also known as the global problematique, the predicament was a multi-crisis problem framing Continuous Critical Problems produced by Hasan Özbekhan. After 50 years, the technocratic approaches of systems thinking still pervade methodology and design approaches to the megacrisis. The inherent assumptions of Western globalism in the problematique have rarely been, if ever, criticised. With rapidly developing, non-aligned economies in the Global South, these assumptions ought to also be reconsidered. I discuss alternative non-Western frames that indicate differences in priorities if the Global South is centred instead of the West. The original view of "the global" is critiqued as originating from the Club of Rome expert-centred framing, and the Western policy mindset is contrasted with a social systemic stakeholder-centred view.

Introduction

This year (2022) recognises the 50th anniversary of the report for The Club of Rome's "Project on the Predicament of Mankind," and report, *The Limits to Growth* (Meadows et al., 1972), a milestone attended by several recent studies that have assessed its original predictive models (Higgs, 2022, Hall, 2022, Herrington, 2021, Branderhost, 2020, Lajus, 2020). Over this period, the work and its authors have had an enormous influence on society and Western environmental and population policies, as well as systems science and other scientific disciplines. The original scenarios developed from system modelling presented in *The Limits to Growth* (LtG) are even more concerning today because the scenarios have demonstrated significant predictive power over time, and critical confluence points of the scenarios are apparently underway.

Early critiques of LtG assessed that there were problematic issues with biased assumptions and cherry-picked data (i.e., a small number of selected variables from which to model global predictions). At the time, John Warfield (1972) questioned why there was no explanation of how the particular variables were "abstracted from a conceivable larger set of candidates" (p. 558). Because the World3 Model was based on the problematique, the assumptions represented embedded values and preferences from the Club of Rome's direction. Among these values were changes in the paradigms of scientific and policy impact. Thiemann (1972), a Club of Rome founder, proposed values that sound familiar today:

> Companies would no longer emphasise growth as the sole criterion of success. Governments would recognise that other elements besides GNP growth were essential for well-being, and a constructive approach to the future would arise. (p. 5)

The LtG model (and report) are the most well-known product from any systems thinkers. Its use of systems dynamics modelling was considered technological mastery at the time. The MIT Earth System Model (MESM) has become well-established after many of the disconcerting portents of the model apparently manifested within the first decade of the forecast. There were several major reviews and updates to the book, including a major 30-year update published by the LtG team 20 years ago (Meadows et al., 2007, 2012). Most, but not all, of the reviews are fully supportive of the findings and modelling process, and deep criticisms of the values basis and model variables are rarely presented. New models based on LtG tend to redefine variables to align with contemporary issues, as climate change and energy were not major variables in 1970.

My analysis does not provide a deep critique of LtG per se. The World3 system dynamics model was perhaps the most successful, certainly best known, application of systems science, and like all simulations, it has flaws, some technical, some conceptual. Many authors have pointed out that the predictions of the "standard run" were remarkably consistent with the unfolding of contemporary events. The business-as-usual scenario shows satisfactory global welfare levels ending near the year 2020 and collapsing near 2030, as many expect to happen now. The predicted overshoot and collapse scenario predicted by population ecology is also becoming apparent in Western nations, with the overshoot in consumption of non-renewable energy resources (oil, gas) and a subsequent collapse of energy-intensive industrial output.

The assumptions we make or ignore in the modelling are not directly available in the simulations and arguments based on these models. If we continue to build on the guidance from normative models without updating the underlying assumptions and hypotheses with changes in reality, we may treat these relationships as if they were facts of the world. The policy risks faced when using biased models are consequential—if the models show a continuing decrease in resources and an increase in population growth on a world basis, it's likely that world leaders will embrace these findings as political concerns. Decisionmakers may seek validation of expected problems in order to plan for, or exploit the (modelled) crisis, especially if the results support their policy agendas.

As can be seen in a simple representation (Figure 1), during the 2020 decade, five (selected) variables are steeply changing and crossing each other, signalling a major crisis period or at least significant instability. If this was our predominant model guiding future agendas and long-term planning, all national leaders would be challenged with the same complex crisis dynamics. With the prevailing discussion of a confluence of declared concerns, currently called the *global polycrisis*[1] (Homer-Dixon et al., 2021), a continuing evolution of critical problem contexts is reified for policymakers.
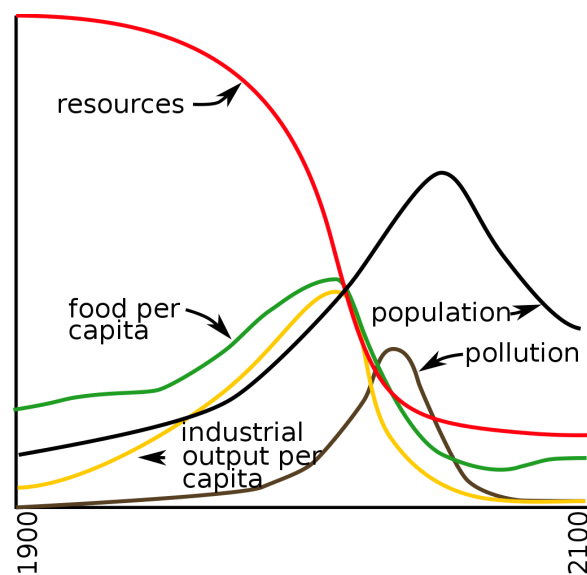
Figure 1. World3 Model, Standard Run. Source wikipedia.org/wiki/World3.

Yet based on the history of the problematique, I would claim that these multiple crises are manifestations of the same mix of continuous problems that Ozbekhan insisted (in 1970) would merge into a single complex. Therefore the problematique is more of a single, extended period of constant complexity, and not a specific articulation of several distinct problems. Ozebkehan cautioned against the attempt to solve the emerging complex of issues as distinct named problems, because of their interrelationships in a complex problematique. Designers and planners, with some opportunities to address these concerns, must allow for reframing, especially to distinguish between

---

[1] According to Homer-Dixon et al. (2021). "Research is urgently needed, because the ultimate result of such unrecognized processes could be a global polycrisis—a single, macro-crisis of interconnected, runaway failures of Earth's vital natural and social systems that irreversibly degrades humanity's prospects" (p. 3).

highly-influenced outcomes and generative causes. The "polycrisis" is already presented by many as an attempt to frame environmental outcomes as a more significant crisis opportunity than the root causes and issues driving the outcomes. Where people may be motivated by environmental concerns, the real drivers affecting the mix of impacts are not always well understood. Ozbekhan believed that a requisite variety of stakeholders would hold more knowledge than technocratic experts in identifying high-leverage influential points for change, and they would accept responsibility for productive action.

The argument of my analysis is that these critical problem positions are selected representations from sociocultural choices and that deeper drivers and ignored causal factors may be responsible for both measured and perceived states of change. After all, these variables were originally defined for the 1970 project (and evolved over time), and they are modelled without serious support from data research informing updates to the original variables or updates to them.

Design for crisis, or the design role in a crisis?

A crisis or problematic position is not a description of an objective state, but rather we can see it as the trends or concerning issues to a person who defines the crisis as a position for action. From the original set of 49 Critical Continuous Problems (CCPs) to the crossing curves expressed on the LtG model, every challenge statement or variable derives from an individual's definition. Those definitions became accepted for inclusion in the set of critical concerns.

The rationale for this case is based on observations in systemic design practice and extends from a commitment to expand the intellectual freedom for design practice to frame better inquiries into critical future contexts. If designers *must* start from the position that a certain crisis exists, the onus is on design teams and stakeholders to address the effects of the crisis as defined. We are called to problem-solve or even save people from crisis or problematic positions. Rarely, if ever, are we asked to examine and resolve the formal causes that led to the effects that circumscribe the crisis. Whether dealing with a weather emergency or at the scale of a war or pandemic, a crisis is declared as a political issue, but I would argue that a crisis should not be a scientific

position. Science explores phenomena existing in the universe or social reality and can develop deep insights and compelling evidence to support the declaration of a crisis. But science—and design—are also implicated in the investigation process. Our own methodological biases and epistemological commitments can become part of the problem—or the solutions if we are fortunate.

The declaration of a crisis actuates a status enacted to afford governments (and allied actors) the latitude to address a definite *immediate* concern as an emergency situation. If a crisis continues beyond a certain, ambiguous yet realisable threshold, the capacity for holding public attention and organising action erodes. An "extended emergency" or even a long crisis would be a misnomer, and its declaration indicates a mistake in policy. A permanent crisis would be an intolerable claim upon the goodwill of any public. The temporal duration of any extraordinary policy declarations must be carefully considered.

The focus on a given crisis state, as in the case of a war, a financial crisis, or pandemics, can be treated as a mode of framing. When a single threat, concern, or position is presented as a critical concern without options for reframing, the creative responses of strategic options are necessarily limited. A society or public is thrown (in Heidegger's sense of an unreflective, involuntary state of default actions) into a long-term, often unbounded ambiguous situation without the latitude to reframe or redirect attention. Such a condition calls for an ontological orientation to system design.

In many such cases, when we are presented with an authoritative model sans source data or the request to replicate, the available options remanded to a design team become severely limited. We are asked to "help fix the problem," to design responses to an overwhelming complex model, which is not an empowering state from which to initiate framing. With high-authority models being commonly employed to identify and claim crisis states, such as with the original promotion of LtG, we rarely are given the latitude to seek or analyse alternative models from which we can compare or make reasoned observations. Usually, such excursions beyond a struct boundary are not ever countenanced. Such social framing pressure significantly limits the creative options available to a design team to best use their unique problem-solving capacities.

Our analyses are not separate from the phenomena observed, and the closer we work with human interpretive situations, the more we become participants in the system of concern. This position, known as *Third Phase Science* (Bausch, 2014), suggests we are not observers of social phenomena but are constructing the phenomena through our participation, as well as observation. Without the feedback from a non-participating observer, how would we know whether we were generating the results desired from our own biases and interests? This raises the necessity to become cognizant of the effects of the framing, predispositions, and purposes of our stakeholder engagements.

To clarify this concern in light of the polycrises of our times, in other words, if we as designers/researchers fail to critique the formulation of a given problem frame, and declare a crisis state to be the case, we reinforce a judgement and pass through embedded biases into the engagement, limiting deeper understanding and resolutions that might result from disclosure of tacit values in the framing. The framing of a crisis, as opposed to other frames, expresses a demand for certain societal outcomes and conveys the urgency of implied moral pressure, and social or societal risks. The psychological forces of crisis language compress the allowable temporal boundaries of the problem context. By framing issues as crisis situations, we arrogate to ourselves a social power that can be misleading or misoriented, a position that can lead to misguided activism or at larger scales, neocolonial intervention, as described in Klein's (2005) accounts of disaster capitalism. Activism assumes that solutions are achievable through taking direct action, but it's deeper risk is the marshalling of design attention toward interventions that only address an outcome problem (such as climate change) without assessing the complex multicausal relationships leading to the perceived manifestations of a problem system, believing that "any action is better than no action." IIf we pursue agendas instead of open framing, an activist orientation risks distorting the deliberation and stakeholder participation of systemic design. If we heed Tony Fry's (2009) orientation toward futuring and the use of redirection in our power to lead design, we might pivot from a crisis frame toward a futuring frame that enhances our capacity to collaborate in long-term commitments that transcend the tyranny of the urgent, the "fixation on fixing."

Taking a long view of Limits to Growth

Examining the World3 Model from *Limits to Growth* (LtG), we see some of the primary variables apply primarily to Western nations, for example, births, death rate, food per capita, and industrial output. Pollution and resource use are underdefined, or we should say, must be redefined to remain consistent with changing conditions and resources. These are not fixed categories with linear flows. On a qualitative basis, we can judge that their curves would differ significantly, in the West at least, as pollution was significantly reduced over the decades. Even resource use—because it includes all critical resources—is not critically challenged on a worldwide basis, but only if Western uses are aggregated globally. In plain terms, the hegemonic mid-century Western development model was assumed in the underlying definitions and estimates. I argue that "we" find LtG to be consistent with our observations because we make observations consistent with our deeply-engrained Western ideology.

These variables would show different trajectories in different countries, especially if resources were also defined as *energy.* As Hall (2022) suggests, the LtG model has a particular normative effect on Western nations, but the material effects of energy availability and resources will affect all industrial countries. But the entire model might change significantly if we ran other variables or drew on other (valid yet overlooked) assumptions. According to Judge (2018), only one analyst has heretofore reported on non-Western correlations to the LtG, namely Chichilnisky's (1983) Bariloche models, which represented alternative estimates of outcomes with a set of selected similar variables but based on qualitatively different assumptions. One function discovered in Bariloche was the paradoxical effect of increasing exports, lowering prices, and eroding the economic advantage of developing countries. Chichilnisky (1990) changed key positions in the modelling of economic variables of exports based on North-South relations in other development scenarios, finding other paradoxes that overturn our partial understanding of world development. While not mentioned in the literature, her studies suggest useful counter-intuitive insights that might contribute to positive developments for the UN's 17 Sustainable Development Goals.[2]

---

[2] https://sdgs.un.org/goals

Yet most readers of LtG will not know or appreciate the history of the project, and how it was originally proposed and framed. Systemic designers may hold a design (solution) disposition toward addressing problematic effects identified by this (or any) predictive models. We may be predisposed to reformulate framing but not to change what we believe are facts. Designers should persist in questioning the assumptions of scientific models that are provided as findings of fact, even if we cannot conduct the research for independent assessment. As Özbekhan might suggest, the discovery and engagement of committed stakeholders with deeper knowledge than ourselves might lead to better resolution proposals. As Christakis (2014) said, "unless the stakeholders own the definition of their Problematique, progress towards its resolution is not plausible" (p. 44).

Framing and frameworks

Systemic design has developed by integrating a normative design disposition toward complexity with methodologies capable of sustained stakeholder co-creation and futuring. Problem framing is a normative intervention conducted early in a design process to examine and reassess the problem as given, reimagine its proposed goals and possible outcomes, and uncover assumptions.

Many design scholars will be familiar with Dorst's (2015) approach to framing as an innovation process; Paton and Dorst (2011) developed a model of framing wherein a design problem is contested through abductive reasoning and designerly methods to identify new metaphors and the discovery of a "better problem" to resolve than the problem as given. Systems scientists are more familiar with boundary critique (Midgley et al.,1998), a constructivist assessment that comes into play in any process among stakeholders interested in improving a system situation.

There are often multiple aims involved in boundary framing, including the necessity for consensus on understanding complex situations. From a design perspective, the aim can be seen as *problem finding* or discovering the most effective fit between a concept and its target environment. Fit requires an iterative process of selecting boundaries and reflectively considering the associated meanings entailed by the boundary frame. For example, climate change entails an innumerable range of possible boundaries.

Productive systemic design, and dialogue, require participants to exchange their perspectives to understand the possible effects of action. In the example of climate change, boundary frames might range from individual behaviours to effects on our region to national climate adaptation.

Lakoff's (1999) analysis of framing in political and contested domains reveals how the cognitive imprint of a frame creates a nearly inescapable focus and will have persistent effects over time. Lakoff argues that frames play a crucial role in shaping our thoughts, feelings, and behaviours. The framing process influences how we present a concept and interpret it in the wild, and the resulting frames influence how people respond to images and information. A frame will hold a lasting influence on decision-making processes. Therefore, reframing, or questioning and reassembling the frame with updated mental models, is one of the most powerful processes we can use to reshape the understanding of complex problems in multi-stakeholder decision and design contexts.

As designers, planners and organisers, we are in powerful positions to choose and exploit some frames and to privilege some problems over others. Even the design team values are privileged in that we grant the design process degrees of freedom for creative exploration but also have the power to constrain processes if they lead into extensive dialogue that might exceed the boundary of expected practices.

Systems thinking, due to the preference for multiple perspectives and systems reasoning, tends to buffer the political implications of framing. By reference to boundaries and the integration of all stakeholder positions, the political conflicts roiling just below the surface of crises can be avoided. Multiple boundaries (or worldviews) are encouraged in the problematising processes of systems inquiry, and many methods are defined in the literature for these processes. Yet we may also discover that politics are inherent in the models, in the choice of variables, assumptions and sources of input data. The curves and numbers generated from Monte Carlo simulations or system dynamics modelling paint a scientific gloss of neutrality over these choices. But we typically accept the findings of such models, oddly as it may seem, on faith. We choose not to challenge the composition of models as we may not understand which components or choices have consequential biases. We would not even know what questions to ask.

Framing the Limits to Growth Project

Hans Thiemann (1973) also stated a clear framing of the purpose of the organisation as "the general objective of helping to re-think and reformulate values and to define broad goals for society" (p. 5). In the post-war era, such a mandate claimed for itself might have been unsurprising and uncontested—the 1960s were a time of societal embrace of modernisation, characterised by high social respect for scientific elites (Latham, 2000).

While the 49 Continuous Critical Problems may remain with us in their continuity, they are not the only relevant framing of systemic concerns. Western society has changed much after 50 years, and we might consider reframing the purposes, societal goals, and values assumed in LtG, by also disassembling the original prospectus from which LtG was based, *The Predicament of Mankind* (1970) and the global problematique.

Many potential positions for reframing can be seen in the development of LtG in its origin story, its history of discourse, and its current adoption as guidance to form themes that construct our desired world. A reflection of LtG taken from a 21st-century point of view serves as an opportune position from which to re-examine how policies derived from it should be ethically and systemically informed. I suggest a series of questions that raise potential inquiries and design frames:

- What concerns might systemic design/planners have for global modelling in general, and for the World3 modelling produced for LtG, in particular?
- Do the modelled dynamics from LtG actually apply to the entire planet? If the models are biased toward Western studies (data sources), what can we learn from models informed by other world regions, similar models, and outlier models?
- What are we learning from the years of development of models we use to inform the perception of crisis situations?
- Could we be at risk of deploying policies somewhat blindly from the LtG (and derived) models without having re-assessed the underlying variables from which the LtGmodel was developed?
- Have we assessed the models and tracked their verisimilitude to relevant measures over time?

- Have we unpacked the issues within the Limits programme sufficiently to ensure design proposals based on surface knowledge would not have unintended consequences?
- Are we at risk of potentially imposing Western technocratic solutioning to situations or nations where the findings do not apply?

As with other programmes of analytical modelling intended to inform policy platforms, the intended stakeholders for the decisions manifesting from technical simulations should be identified. Perhaps the stakeholders, however, engaged, are insufficient to inform and critique such a consequential policy proposal. As in any ethical technology research, the range of people affected materially and the roles and values of different participants ought to be seriously encountered. A deliberate search might be taken using guidance from social ontological variety to identify the core and the various ranges of people who might be informed, interested, and affected by the issue.

A *Global Problematique*

The *Limits to Growth* was the report resulting from the MIT team, initiated by Jay Forrester (1971) and led by Dennis Meadows, from their proposal to the Club of Rome to model critical factors and system flows relevant to industrial, welfare, and environmental policy. Their system dynamics model proposal was the response to the Club of Rome's prospectus, essentially the grand challenge of *The Predicament of Mankind*. It was also an early use of the "global[3]" context to inform public policy stakeholders about problems that were proposed as global and systemic in nature.

Hasan Özbekhan prepared the *Predicament of Mankind* (1970) as the prospectus for the Club of Rome's award, a grant from the Volkswagen Foundation to the winning proposal. It was a framing document developed by the advisors to the Executive

---

[3] While the term global is used so frequently today as to diminish its distinctive meaning, but the concept of global problems suggests a political frame as opposed to a shared world context, Global was not a common term of art in the 1960's during the formative period of the Club of Rome, and was used commonly in mathematics papers, e.g. as a global variable. The term "world," especially in regard to worldwide problems, appears to have been preferred by a factor of 10 or more (based on Scholar searches). Today the term "planetary" is often preferred when describing geophysical earth contexts, such as climate and environment.

Committee, a team that included social systems theorists Alexander Christakis and Erich Jantsch. Özbekhan proposed the concept of the global problematique as a list and definitions of the 49 Continuous Critical Problems (CCPs), established as self-evident, clearly defined issues identifiable across the world.

Christakis (in Benking, 2009) said of the Club of Rome prospectus:

> "The Predicament of Mankind was very advanced conceptually and was, as you mentioned, an architectural design, as compared to an engineering blueprint, which has more specificity or details." (p. 2)

The Özbekhan team also submitted a proposal to the Club of Rome committee. The Meadows proposal might have won because it proposed a neatly-defined outcome and a high-tech methodology with superior credibility from a university team. Forrester had already been developing similar models and the project had the benefit of appearing to have precedent. Christakis (Benking 2009) also noted the Executive Committee was persuaded by Eduardo Pestel, a systems engineer on the committee, toward the technocratic direction of the modelling project.

> "Pestel was very fascinated by the system dynamics model that was promoted by a mathematical statistics and modeling professor, Jay Forrester. So Pestel was persuasive and was able to convince other members of the Executive Committee of the Club that the Limits to Growth approach was the right way to go; however, that was a compromise to the vision and the architecture of the Predicament of Mankind proposal which was primarily oriented towards dialogue and stakeholder engagement. That was the fundamental principle in that proposal, and it was trying to make sure that the diversity of viewpoints of the stakeholders and their voices to be integrated into what you might call a systemic approach versus the systems analysis approach of the Limits to Growth." (p. 2)

We can see in this decision, and the effects on subsequent work, how Özbekhan's 1970 prospectus became a foundation for both the hard and soft systems thinking schools that followed after the LtG got started. While the influence of LtG in 1972 on hard systems thinking (e.g. system dynamics) is clearly indicated by references, the influence on soft systems is not so clear. The Club of Rome advisory team all went on to develop

methodologies and advances in social systems design and practice in their own institutions,[4] and over time, these became the origins of what we can now see as the social systems school of thought. As Christakis (Benking, 2009) himself recounted:

> "We thought that compromising the principles of the original proposal was not appropriate and Hasan and I left - right there. We left and resigned from the Executive Committee. Hasan went to worked for the Wharton School at the University of Pennsylvania. Russell Ackoff was running there a very interesting program called the Social Systems Sciences, called the "S Cube", and I joined the Battelle Memorial Institute, and we started something called The Academy for Contemporary Problems."

Working with collaborator John Warfield at Battelle, Christakis developed methodologies for stakeholder engagement known as interactive management and dialogic design, formulating approaches responsive to the ideas that Özbekhan had proposed in his proposal to the Club of Rome.

The CCPs—Continuous Critical Problems

The global problematique was composed to present the mission of the Club of Rome and its call for responses to address the problematique as a whole and the problematic trends, termed *Continuous Critical Problems* (CCPs). Written before 1970, most of these are read with utmost familiarity today, and few are unexpected. All are so-called wicked problems (Rittel & Webber, 1973) as they are largely without endpoints, and their progress globally would be difficult to ascertain. Together, they express normative "matters of concern" (Latour, 2008) relevant to the Western world, and they frame an early account of a true global context. Figure 2 shows a snapshot of the original 28 CCPs from Özbekhan's *General Theory of Planning* (1969), the concept that preceded the 49 CCPs developed for the *Predicament of Mankind*.

---

[4] Hasan Özbekhan went to the University of Pennsylvania and founded a program of interactive management. After working with the urban planner Doxiadis, Alexander Christakis (2014) joined Battelle, taught at George Mason University and other schools, and formed a consulting practice in interactive management. Erich Jantsch continued at University of California in Berkeley and published influential works such as Design for Evolution (1975) until his early death in 1980. All three thinkers envisioned the use of design processes with stakeholders in systems practice.
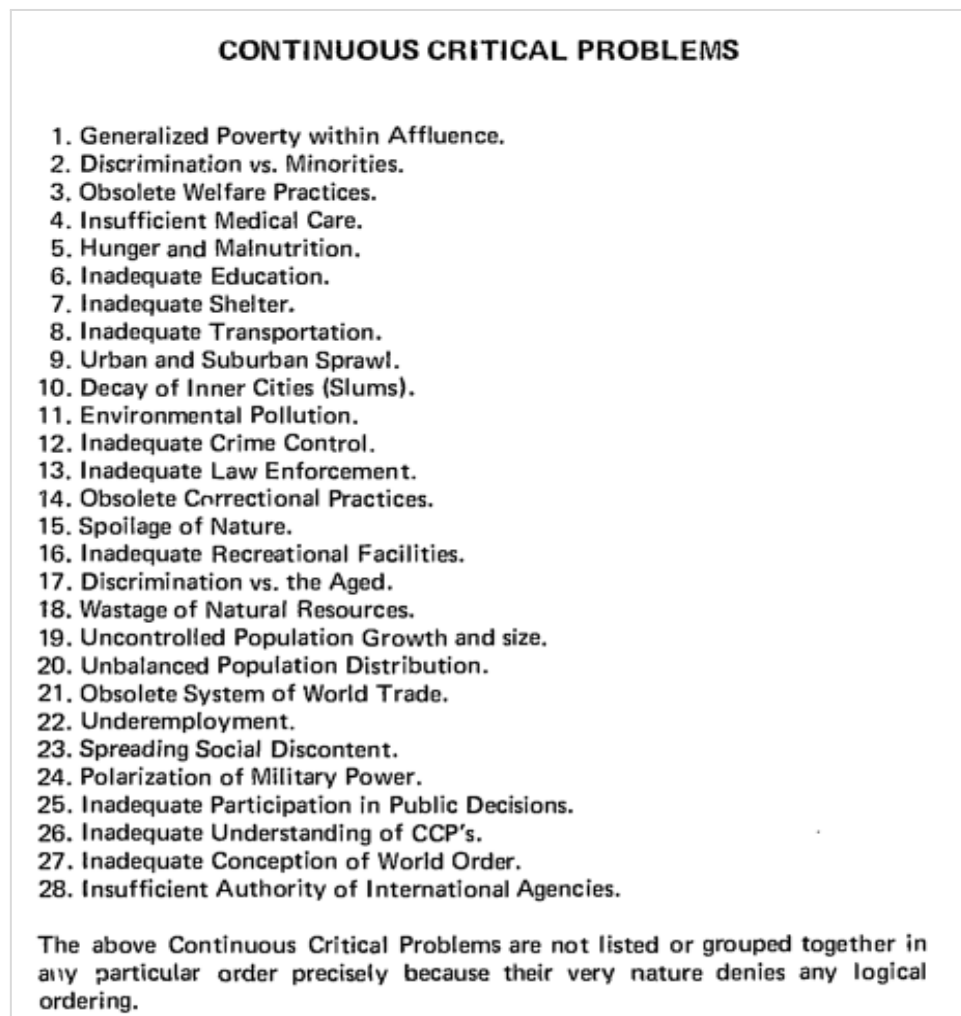
CONTINUOUS CRITICAL PROBLEMS

1. Generalized Poverty within Affluence.
2. Discrimination vs. Minorities.
3. Obsolete Welfare Practices.
4. Insufficient Medical Care.
5. Hunger and Malnutrition.
6. Inadequate Education.
7. Inadequate Shelter.
8. Inadequate Transportation.
9. Urban and Suburban Sprawl.
10. Decay of Inner Cities (Slums).
11. Environmental Pollution.
12. Inadequate Crime Control.
13. Inadequate Law Enforcement.
14. Obsolete Correctional Practices.
15. Spoilage of Nature.
16. Inadequate Recreational Facilities.
17. Discrimination vs. the Aged.
18. Wastage of Natural Resources.
19. Uncontrolled Population Growth and size.
20. Unbalanced Population Distribution.
21. Obsolete System of World Trade.
22. Underemployment.
23. Spreading Social Discontent.
24. Polarization of Military Power.
25. Inadequate Participation in Public Decisions.
26. Inadequate Understanding of CCP's.
27. Inadequate Conception of World Order.
28. Insufficient Authority of International Agencies.

The above Continuous Critical Problems are not listed or grouped together in any particular order precisely because their very nature denies any logical ordering.

Figure 1. Continuous Critical Problems. From Özbekhan (1969).

Özbekhan defined entire problem systems as separate CCPs, such as "widespread poverty throughout the world." He proposed a conceptual model of the global world system in the prospectus, anchored in the rationale that only a planetary effort would hope to resolve the problematique:

> "The functional attributes of today's world system necessarily involve normative elements which, being planet-wide, transcend sectoral, political, or regional differences; and the recognition that our current methods of description as well as our social and institutional structures are not designed to operate effectively in a system which is world-wide." (1970, p. 24)

The 49 CCPs were defined as the challenge space according to a theory that they were overlapping over time into a single problem system (his meaning of problematique). They were folding together into a complex megacrisis that could no longer be addressed by solving 49 distinct issues, but rather as 49 overlapping wicked problems.

> "The continuation of these trends would seem to have turned such contiguities into clusterings and overlaps, which we may perceive superficially but whose real structure and dynamics escape us.
>
> In actual fact the situation tends increasingly to appear as a single complex system whose internal relationships, interactions, fields of force, and overlaps are extremely confused and impossible to delineate without a very serious attempt to model it in its entirety." (1970, p. 11)

The major difference between the LtG team and the Özbekhan social systems founders was not methodological; these were entirely different philosophies and directions in systems science. While both positions are valid and valuable, they represent different worldviews, applications, approaches to intervention, and implications for design. Özbekhan's own proposal was a plan for stakeholder engagement in large-scale social system design. The methodology can be considered an early development of Third Phase Science[5] (de Zeeuw, 1996), a context wherein the observers are full participants in constructed interventions, and social constructors of the observations made. The LtG (and other models) presume the observation of constructed interactions, a typical form of Second Phase Science (socially constructed, but presumed to be objectively observed, such as in modelling). LtG was a lab modelling study that presented its findings as a Eureka moment of technocratic expertise, but did not involve human interaction at all.

---

[5] "Third phase science assumes that our many individual subjective, bodily experiences generate valid viewpoints on what we are collectively observing." Bausch, K. (2015). Third Phase Science and DDS - Cyprus talk.

Reframing the Problematique

Hasan Özbekhan critiqued the reductionism of the technocratic mindset and challenged the methods of conventional problem-solving. He was the originator of a model of policy design he called normative planning[6] and considered planning and systems intervention as a complex design approach. Alexander Christakis has observed that Özbekhan was the first systems thinker to strongly advocate for the full engagement of stakeholders in the design of their social systems. In the principles of dialogic design (Christakis, 2014), the Engagement Axiom attributed to Özbekhan states that "Designing social systems without the authentic engagement of stakeholders is unethical, and results in inferior plans that are not implementable" (p. 57). This commitment influenced Christakis and Warfield's development of tools for engagement and structured deliberations in the early 1970s at Battelle, which evolved into Interactive Management (Warfield & Cardenas, 1994) and, later, Structured Dialogic Design.

As the LtG outcomes and data have been re-assessed and supported in recent studies, we can and should also revisit the global problematique. We might inquire into the assumptions and presumptions made in the *Predicament of Mankind* that, 50 years later, many take for granted.

Systems scientists are reconsidering the significance of LtG, and debating its comparative value as a foresight platform. The publicity and platform accorded the LtG represented the emerging hard systems perspective that became understood as the predominant school of systems thinking. The global problematique has also been acknowledged for its role at the 50-year mark.

The social systems field directly emerged from Özbekhan and his team of dissident Club of Rome advisors. All three thinkers explicitly developed models of *designing* for systems, which signified a major epistemological difference from the system dynamics approach of systems analysis. They individually developed different design methodologies, whether as

---

[6] "With the Global Problematique the societal normative aim was to achieve "ecological balance" through understanding deep system relations and designing new policies. To a great extent this is the normative aim of all these models, even the multinational developmental approach of the SDGs." Jones, P. (2020, November 23). The Global Problematique – A Lindy Megacrisis. Design Dialogues. https://designdialogues.com/critical-crisiscon/

envisioning (Özbekhan), evolutionary design (Jantsch), or design through dialogue (Christakis) by self-organising stakeholder coalitions. The social systems school was predicated on constructivist epistemologies and design principles, with veridiction of truth warranted by direct involvement in the discourse and lifeworlds of affected stakeholders. The hard systems approaches that dominated the field adhered to analytical, expert-led positivism that warranted truth claims by reference to the implied neutrality of objective data.

We can observe that the modern era has significantly changed in the 50 years since the global problematique was first presented. In a decidedly postmodern culture, the claims of technocratic expertise might have less potency to define policy agendas. In a recent framing of the global challenge context, Louis Klein (Klein et al., 2022) published a 2023 agenda for the systems community that reviewed the original global problematique and reframed our contemporary issues as responding to the question: What purposeful action will aid human flourishing, create and sustain a viable space for humanity, in our ongoing co-evolution with the Anthropocene–Biosphere?

The agenda proposal further states their approach to open dialogue, as opposed to policy modelling:

> Today, the Global Problématique is an invitation to participate in a transdisciplinary process of co-inquiry. It is not about knowing all the details. It is about understanding the interconnectedness and interdependence of an emerging whole. (2022, p, 1105)

As noted previously, in my analysis, I find Ozebkhan's unveiling of the concept of a global context to be representative of an "early global." In 1970 we might be excused for ignoring universalist assumptions within problematic analysis and policy recommendations, as the West was unchallenged in its orientation toward universal values of progress. The few objections that surfaced to policy discourse were easily suppressed by normal discourse between elite commentators. Yet now, with globalisation having peaked (Flew, 2018) and its consequences being challenged around the planet, how should a new global problematique, one that is defined by and for stakeholders, best be developed and positioned?

Limits to understanding

I admit to my own biases regarding the LtG project. While it was a powerful demonstration of the effectiveness of system dynamics modelling, it was also an exemplary model for technocratic and global governance. While the original global problematique revealed 66 critical problems (later reduced to 49 for the *Predicament of Mankind*), the World Models, by the necessity of modelling constraints and including corresponding variables, used 43 variables. Jay Forrester was known to say that the single underlying cause of all the effects produced in the model was, in fact, *growth*. When we examine growth dynamics qualitatively (in classroom assessments, among other analyses), there are many underlying causes for the observed reinforcing patterns of growth, from obsolete institutions, to globalised finance, to plain human greed. As others have critiqued from the first publication (e.g., Nordhaus, 1973) to recently, the findings from LtG are highly sensitive to the definitions of variables, and their applicability to different regions of the world, as the aim of the modelling was a global representation.

The purpose of this argument is not to deconstruct or even criticise LtG modelling, variables, or assumptions. While systems scientists and economists have done so, with technical criticisms from Nordhaus, Warfield (1972) and others, as well as the pro-growth business community that criticised the entire idea of LtG since its publication. However, the scientific critiques have nothing in common with the political critiques—and we should never allow our own political commitments to reject scientific analysis because they might allow a victory for our opponents. A genuine critical analysis should stand on its own merits. Our shared goal ought to be to formulate ever-better model runs that enable policy and decision-makers to learn, ask better questions, and make better-informed decisions.

The LtG was actually so broadly accepted within the systems (and design) disciplines that the system dynamics modelling methodology (hard systems) became the exemplary epistemology for systems thinking for three decades following. Although insightful challenges were made by thoughtful peers and reviewers, such as Warfield (1972), it was most successful in its agenda framing—creating a slate of global issues of concern that have been reproduced for 50 years.   However, entirely different approaches to complex systems and modelling have become possible. While there will always be errors and

biases embedded in any particular model, the improvement of modelling practices should be based on running different mixes of variables, adjusting assumptions, and updating data sources.

Models such as World3 might be run for their value as scenarios for deliberation rather than used as policy-driven predictions. This would require an earnest attempt to select different sets of interacting variables (to identify counterintuitive interactions) and to run contra-directional variables (e.g., what if resources were nationalised in Global South nations and no longer cheaply available globally). Models can be aggregated or compared for a better understanding of possible outcomes based on different trends and interventions.

There are several continuous insidious issues to address in the discourses informed by the Club of Rome's global campaign. After 50 years, the technocratic disposition inherited from first-generation systems thinking still pervades methodology and even design. Social systems are routinely managed as expert-driven processes and institutions rather than as complex human-technological ecosystems, as complex artefacts with a disregard for their composition by participants. Large-scale systems projects have limited avenues to enable the agency of system stakeholders to lead in design. Citizens and grassroots interest groups have little or no access to informing policies owned by government agencies (or think tanks), and participatory approaches to the most life-affecting policies and programs (health, media, foreign policy) are rarely allowed.

The globalism inherent in the Club of Rome project, including the global problematique, remains pervasive in the assumptions taken up into systems change or crisis-driven policy. Design continues to sustain the myth that an assumed "we" can appoint ourselves to redress and solve these issues, following an activist orientation. For many systems change projects, the customary recruitment of stakeholders in engagement is driven by change enthusiasts, and the participants do not reflect the requisite variety in the social system, which admittedly is an expensive process and difficult to scale, but this is our problem to deal with openly, as designers.

Özbekhan's stakeholder-centred vision may actually be achievable today, but who are the authentic stakeholders for these problems? The future practice evolved from the

problematique ought to model and start with the values base, as Özbekhan suggested (1970), but not on a global scale. The values base, the basis of shared and contested social and human values of the people associated with the desired outcomes, is neither local nor global. With rapidly developing new economies in the Global South, the multipolar and non-Western world systems, the assumptions of a "benevolent global" must be reconsidered and challenged. While the global problematique provides a basis for considering the widest possible range of concerning issues across our civilisation, we have to also reconsider the framing of civilisation itself. Civilisational theorists suggest the world now sustains as few as ten or as many as 15 distinct worlds as civilisational entities. The mixing of these peoples within a Western-driven values base and worldview presents systemic design (and systems practices) with a significant ethical dilemma. How do we proceed with so-called global problematic issues, such as in the problematique, that transcend national boundaries and are considered too complex to be addressed by any single national project? Continuing research into new ecological economics, cultural flourishing, new international relations, public management, and civilisational evolution are all implicated in this challenge. And suffice it to say these are research issues raised by the current inquiry, to be addressed in future studies.

Conclusion

I remain an advocate of Hasan Özbekhan's alternative proposal to the Club of Rome, which was not selected by the Executive Committee in 1970. When examining Ozbekhan's proposal, we can see many overlooked opportunities and continuing challenges entailed in our models of systems thinking that persist from this time. He presented an early challenge to address the world system in a normative, non-technological way. He was a proponent of a coordinated approach to the design of new institutions, not to model and promote policies that would take half a century to consider: "The investigatory part of the work should lead to, or be accompanied by, the design of the system which represents the problematique in its world-wide generality" (1970, p. 29).

Systemic design has always balanced between methodology-led and participant-led practices, but as a practice can be subject to the same expert-driven technocratic policies of any advisory. As systemic design becomes more successful at advising policies and

programs that become implemented, we will find ourselves adjacent to centres of power and will profoundly face the dilemmas of ethical advising.

Özbekhan's stakeholder-centred approach has gained acceptance, but in my observation is due more to the influence of creative design thinking workshops than formal systems methodology. However, this remains a significant platform from which ethical design decisions can be facilitated.

After 50 years, we may now be able to deliver on the Özbekhan promise of stakeholder action on the CCPs of the problematique.

References

1. Branderhorst, G. (2020). *Update to Limits to Growth: Comparing the World3 model with empirical data*. Dissertation.
2. Bausch, K. C. (2014). The theory and practice of third phase science. In G. Metcalf, (Ed.), *Social Systems and Design* (pp. 129-145). Springer Japan.
3. Benking, H. (2009). Learnings and vistas based on revisiting 40 years of the "Global Problematique." Interview with Alexander Christakis. https://www.academia.edu/es/1834745
4. Chichilnisky, G. (1990). Global models and North-South relations. *International Political Science Review, 11(*2), 177-185.
5. Chichilnisky, G. (1983). The transfer problem with three agents once again: characterization, uniqueness and stability. *Journal of Development Economics. 13*, 237-248.
6. Christakis, A. N. (2014). An epic learning journey: From the Club of Rome to dialogic design science and Demosophia. In G. Metcalf (Ed.), *Social Systems and Design*, 37-69. Springer Japan.
7. De Zeeuw, G. (1996). *Three phases of science: A methodological exploration*. Centre for Systems and Information Sciences, University of Humberside, ISBN 186050, 250 (0).
8. Dorst, K. (2015). *Frame innovation: Create new thinking by design*. MIT Press.
9. Flew, T. (2018). Post-globalisation. *Javnost - The Public*, *25* (1-2), 102-109.
10. Forrester, J. W. (1971). *World dynamics*. Cambridge, MA: Wright-Allen Press.

11. Fry, T. (2009). *Design futuring*. Sydney: University of New South Wales Press.

12. Hall, C. A. (2022). The 50th anniversary of the Limits to Growth: Does it have relevance for today's energy issues? *Energies, 15*(14), 4953.

13. Herrington, G. (2021). Update to Limits to Growth: Comparing the World3 model with empirical data. *Journal of Industrial Ecology, 25*(3), 614-626.

14. Higgs, K. (2022). A brief history of the Limits to Growth debate. In *Sustainability and the New Economics* (pp. 123-136). Springer.

15. Homer-Dixon, T., Renn, O., Rockstrom, J., Donges, J. F., & Janzwood, S. (2021). *A call for an international research program on the risk of a global polycrisis*. TR 2022-2, version 1.0. Cascade Institute.

16. Judge, A. (2018). Club of Rome reports and bifurcations: A 50-year overview. https://www.laetusinpraesens.org/links/clubrome.php

17. Klein, N. (2005). The rise of disaster capitalism. *The Nation*, May 2. https://thenation.com/article/archive/rise-disaster-capitalism/

18. Klein, L., Buckle, P., Nguyen, N., Preiser, R., & Ison, R. (2022). Growing a community of conversation and understanding: The 2023 agenda for the systems community. *Systems Research and Behavioral Science, 39*(6), 1103–1107. https://doi.org/10.1002/sres.2919

19. Lakoff, G. (1999). *Metaphorical thought in foreign policy. Why strategic framing matters.* Berkeley, CA: Rockridge Institute.

20. Lajus, J. (2020). Soviet official critiques of the resource scarcity prediction by Limits to Growth report: The case of Evgenii Fedorovâ's ecological crisis rhetoric. *European Review of History: Revue Europienne d'Histoire, 27*(3), 321–341.

21. Latham, M. E. (2000). *Modernization as ideology: American social science and" nation building" in the Kennedy era.* Raleigh, NC: Univ of North Carolina Press.

22. Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). *The Limits to Growth. A report for the Club of Rome's project on the Predicament of Mankind.* Geneva: Club of Rome.

23. Meadows, D. H., & Meadows, D. (2007). The history and conclusions of The Limits to Growth. *System Dynamics Review: The Journal of the System Dynamics Society*, *23*(2-3), 191-197.

24. Meadows, D., & Randers, J. (2012). *The Limits to Growth: The 30-year update.* Routledge.

25. Midgley, G., Munlo, I., & Brown, M. (1998). The theory and practice of boundary critique: Developing housing services for older people. *Journal of the Operational Research Society, 49*(5), 467-478.

26. Nordhaus, W. D. (1973). World dynamics: Measurement without data. *The Economic Journal, 83* (332), 1156-1183.

27. Özbekhan, H. (1970). *The Predicament of Mankind: A quest for structured responses to growing world-wide complexities and uncertainties*. Geneva: Club of Rome report.

28. Özbekhan, H. (1969). Toward a general theory of planning. In E. Jantsch (Ed.), *Perspectives of Planning*. OECD, Paris.

29. Paton, B. & Dorst, K. (2011). Briefing and reframing: A situated practice. *Design Studies*, *32*(6), 573-587.

30. Thiemann, H. (1972). World Problematique. *Europhysics News, 6*, 4-5. https://europhysicsnews.org/articles/epn/pdf/1972/06/epn19720306p4.pdf

31. Warfield, J.N. (1972). World dynamics. *IEEE Transactions on Systems, Man, and Cybernetics*, (4), 558-559.

32. Warfield, J. N. & Cárdenas, A. R. (1994). *A handbook of Interactive Management*. Ames, IA: Iowa State University Press.