

## A FEW WORDS ABOUT UNDERSTANDING COLLAPSE

*To the best of our knowledge, humanity faces an unprecedented global crisis within a timescale that calls for a different approach than simply addressing it as a potentially soluble set of isolated problems.*

Our civilization is an extraordinary thing.

Compared to other civilizations in the past (say, the Maya or the Roman Empire), ours is vastly, vastly more colossal and more intricate than any of these.

The graph depicts our per capita wealth and population stretching back two thousand years. There is a sharp divergence about 1800, when the scale and resources associated with the human enterprise begin to grow at a sustained and exponential rate.

Because our experience of time as a species tends to be shaped by our recent experience, we look at this extraordinary inflection, and say it is normal. When we say we expect our civilization to continue we are implying a continuation of two lines can keep growing.

But in human terms this two-hundred-year-old spur of growth is exceptional and thus we should be wary of taking its continuation for granted.

We have already entered a period when the risks we face are becoming more extreme in their impacts, more probable in their likelihood and potentially irreversible in their duration.

We should be mindful that whatever the anxieties of the moment, our human system – our civilization – is not broken.

It is highly organized and coherent, being remarkably efficient at solving problems. We have transportation, food supply chains, raw materials and manufacturing, public security, the financial system, sanitation, health and welfare, energy generation, power grid and many other things are intact and functioning incredibly well. The mere ability fact that we can buy food in the supermarket tomorrow or plan a meeting at the other end of the planet and reasonably expect to be there half a year from now implies a casual acceptance of the stability of highly complex conditions.

We have this tighter and tighter, more efficient machine running under the hubcap of our normal lives. It brought us many benefits. We don't notice it, because it works. But it is building a vulnerability within itself.

### **Intrinsic vulnerability.**

As civilization evolves, it is increasing in complexity, interdependence, the speed of processes and delocalization of the systems we have come to depend upon.

The vulnerabilities can be generally seen in complexity – which is the number of inputs required to operate or build any good or service at a level of a product and the infrastructure of a country or civilization as a whole (i.e. all the diverse parts); interdependence – meaning different parts of the whole depend on other parts for their viability (just as, in an organism, the heart is interdependent with lungs or liver); delocalization – meaning that no country controls conditions of its own functionality and cannot be resilient on its own; an speed – everything from the speed from financial transactions to just-in-time logistics, to social media contagion.

At small scales we have seen that financial shocks can traverse the globe in seconds. Or, natural disasters can cripple a factory shutting down production on the far side of the globe as just-in-time inputs fail to appear.

At a larger scale there is the growing concern that a cyber-attack on critical infrastructure – such as the grid – could shut down financial systems, sanitation, the operation of businesses, and so on – in a reinforcing spiral.

Or, as in 2008 – had governments and central banks not being able to save the financial system, and this was never certain – it could have collapsed the global economy which quite probably could have led to famine and disease, such as cholera, appearing in OECD countries.

It is increasingly being recognized that the complex societies *are much more* vulnerable to the impact of large-scale system failure, irreversible tipping points and phase shifts.

## **Stressors**

At the same time there is a range of stressors, the trajectory of which is poised to increasingly test this vulnerability.

Broadly speaking, we can think of three types of stressors. Input stressors – which are constraints on the flows of ecological inputs required for the evolution and stability of civilization (the big ones include food and energy/oil). Output stressors – the impacts associated with the output, or waste, of civilization (including toxification, CO2, nitrogen loading, etc.). And, internal stressors – which are the impacts associated with critical civilizational processes, especially debt loading, social and political legitimacy and trust, declining marginal returns to problem-solving (it is getting harder and harder to solve problems – for example, antibiotics).

## **Convergence**

It is the interaction of those two processes (the vulnerabilities of our system and the stressors), and the cumulative impact of their interactions that has become the principal driver of human risk.

Impacts across many scales (from families to businesses to nations and the whole of civilization) are likely to become non-linear and undermine the human system's capacity to recover and adapt.

As systems are repeatedly stressed and lose resilience, a tipping point may be crossed and cause to the failure of localized interdependent systems leading to synchronous food security, critical infrastructure, financial, social and political crisis.

Such local failures can ramify globally through supply chains, migrant flows, and financial shocks.

## **Three phases**

In broad terms we can lay out three phases of civilizational discontinuity.

**The Pre-collapse phase**, where general system still functions, but is subject to more stresses and is having more and more difficulty just keeping things going. We know from many complex systems – both

in society and nature – that systems prior to a collapse show heightened volatility and more problems recovering from small shocks.

This period has some general features. A deepening rift between expectations and the emerging realities. In such a context, no government, no matter how selfless and astute, is able to meet these expectations. Secondly, increasing tension between the natural response of in-group identification and globalized interdependency. Thirdly, rising discount rates that express themselves as more trade-off between the need to maintain immediate stability at the cost of undermining near-future stability. And, finally, cognitive and institutional paralysis, or panicked responses, which additionally undermine administrative control.

**The collapse phase** is generally when a critical system fails causing cascading failure through other critical systems. The most severe impact is a shut-down the flow of goods and services. That is a freeze in the operation of civilization: food, water, infrastructure, governance, production. Such a failure could happen quickly – even over a period of months – and be irreversible.

This period also has some general features. One is forced localization. Another – reduced ability to harness and use energy and other resources, expressed as an irreversible transition to a state of much lower complexity. Societies principal concern will no longer be how do we get back, but how do we get by.

**Post collapse** is not the end but represents a reordering of how people sustain themselves. Post collapse can generate diverse pathways for societies, determined by their ecological conditions, social trust and preparedness.

### **Where is the biggest risk?**

We have huge promises to the future in the forms of debt (but ultimately all financial assets). The implication of all of these financial claims is that they can be exchanged at some time in the future for something real – be it a material good or service. So, by implication, the value of our financial assets is a claim on the future production of civilization. That requires the operation and stability of the human system, and the continues flow of energy and resources, which are the different stressors we mentioned earlier.

In other words, we make more and more claims on the future, while the prospects of the future are being rapidly undermined. The implication of all of this is that a catastrophic credit – and general financial – crisis is almost certain.

In other words, the financial system is insolvent. At the moment it is held together by our wishful thinking.

### **Food shock**

Let's take a closer look at collapse through the example of food. The foundations of food security entail production, access and exchange (money). Our problem with food is collapse compromises every part of this resulting in a multi-fronted failure.

Production becomes a problem. We have a system that depends on inputs of fertilizers, commercial seeds, machinery, pesticides, veterinary services, if you can't get those products or services because the system has broken down and/or you have no tender or means for paying for them, the implication would be a catastrophic drop in food production.

It is also where we discover the damage we have wrought to our environment in terms of degraded soils, monocultures, the decimation of pollinators. Because it was civilization that enabled us to displace these constraints. Only when we lose civilization, we come face to face with them.

Access is the ability to preserve, transport, package and distribute is likely to be compromised by a collapse of the system.

Exchange. If the financial system has collapsed, we have a problem not only with availability but the acceptability of the coins or money of whatever sort (remembering that our money has no intrinsic value – it is an act of faith).

Another problem at this moment in advanced complex economies is that only about one percent of people are involved in direct agricultural production. Ninety nine percent of people could not grow a carrot for more than one crop-year. What do they exchange with the farmer when the conditions are such that what everybody wants is mainly food and water?

## **The Gap**

There is currently no governmental, intergovernmental nor institutional capacity to deal with the consequences – *not mitigation* – of the convergence and growing-magnitude of stress vectors.

Most, if not all, efforts today are not in concordance with the reality we are facing. They are at best focused on reducing risks or mitigating of the stressors; and not on the impacts of and preparedness for a convergence of risks which are likely to be more persistent, graver and potentially irreversible.

There is no mechanism today allowing nations to confront large scale failures in complex society. We basically just keep shoveling problems around.

## **Societal Response**

There is an imperative to protect the foundations of human security as systems become increasingly stressed, temporarily disrupted, or permanently fail.

Societies can respond wisely or stupidly, with foresight or fear.

They can work towards narrowing the rift between expectations and reality; legitimize grave concerns that are currently lying outside the established social norms; creating robust, institutional structures that can operationalize risks management in a timely manner; engendering a sense of shared vulnerability and common purpose internationally; to contain contagion; responsibly occupying areas of potential fear, and by doing so shutting down the space for dangerous political actors; increasing the chances of better, strategic, pro-social crisis management; having realistic, properly anticipated, well-rehearsed, logistically sound, long-emergency plans; demonstrating that by responding pro-actively to what may appear an overwhelming challenge, is in itself an act of hope, and a call to collective purpose – which is central to preserving social cohesion.

The first step in this forthright and positive engagement with the world as it is.