HORIZON SCANNING

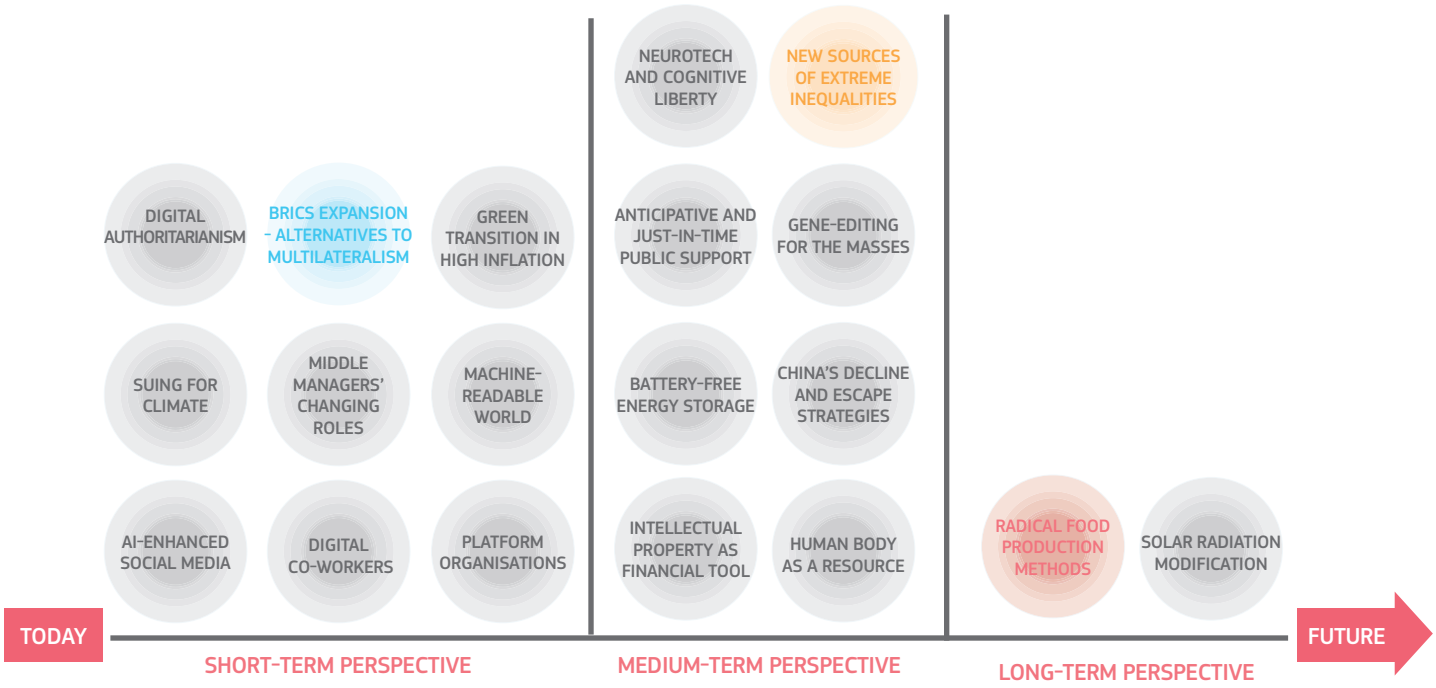
EMERGING ISSUES FOR EU POLICYMAKING

Issue 03

This is the third report resulting from an ESPAS horizon scanning process which looks at "signals of change" - **emerging trends and issues** that may appear marginal today but could become important for the EU in the future. The ESPAS network (European Strategy and Policy Analysis System) launched the process, led by the Joint Research Centre and European Parliamentary Research Service, in 2022.

These emerging issues (signals of change) were identified and developed via a series of workshops with participants from across the EU institutions and bodies digging into the recent developments in various domains. These may be considered as new lenses through which we can get a different perspective on the challenges and opportunities the EU is facing now and in the coming years. Over three months of scanning and sense-making workshops, participants identified nineteen signals of change most relevant for EU policymaking. These are presented in the graph below and detailed in the Annex.

Figure 1: Overview of the selected signals of change



Secondly, from the list of nineteen signals of change, three emerging issues were selected. These three were perceived to have the greatest policy impact. They were selected through a survey followed by a prioritisation workshop with policy-makers and have been analysed in more depth. The three highlighted emerging trends are:

BRICS EXPANSION
ALTERNATIVES TO MULTILATERALISM

NEW SOURCES OF
EXTREME INEQUALITIES

RADICAL FOOD
PRODUCTION METHODS

The following brief analysis offers a first exploration of questions, problems or new solutions that can emerge from the three selected emerging trends. They are not meant to be exhaustive, merely an indication of issues that may merit further examination, always based on existing sources and references.

ESPAS

BRICS expansion – alternatives to multilateralism

The BRICS (group of emerging markets — Brazil, Russia, India, China, and South Africa) plans to decide in 2023 whether to admit new members and which criteria they would have to meet, with Iran and Saudi Arabia having formally requested to join. The expansion of the BRICS cooperation format to Iran and Saudi Arabia, as well as potential future expansion, could have significant negative implications for the Western influence in the world while advancing the influence of China and Russia. The inclusion of Iran and Saudi Arabia in the BRICS group would bring together some of the world's largest oil-producing nations, and would give the BRICS group a greater presence in the Middle East, thus potentially challenging Western influence in the region as well as the global energy market[1]. This expansion could also help members circumvent the WTO and UN in international dispute settling and coordination, thus potentially advancing an alternative economic and political order to the Western-established international system[2][3].

How can it change our optics?

In a world where confidence in multilateral international organisations (UN, WTO) and the new multipolar context is decreasing, structured political cooperation among major global and regional powers will increasingly happen outside the channels that the EU and its Member States have been used to.

What is this relevant for?

International, defence, security, energy, trade, custom policies.

Futures Wheel: An indication of potential consequences

What if the EU...?

... alongside promoting multilateralism, put forward its candidature to the new international organisations/channels developed by non-Western countries and became one of its regular members or had observer status?

1 https://www.dw.com/en/a-new-world-order-brics-nations-offer-alternative-to-west/a-65124269
2 https://www.middleeastmonitor.com/20230116-china-urges-israel-to-stop-i...
3 https://www.theglobeandmail.com/world/article-brics-expansion-membership/

New sources of extreme inequalities

Present and future innovations can offer solutions and freedoms of all kinds, but can also lead to new types of inequalities resulting from social, ethical and accessibility considerations that these new developments entail. As the richest 1% of the society captures an increasingly large share of new wealth created around the world[4], their resources give them access to increasingly powerful tools that are out of the reach for most in our societies. This is the case for the potential availability of genome editing techniques not only for therapeutic, but also enhancement purposes, as well as access to longevity treatments etc.[5] Building private luxury bunkers or vaccine tourism to secure a privileged position in a world of increasing man-made and natural disasters is also reflected in the tech billionaires' behaviours.[6]

How can it change our optics?

Addressing economic inequalities focuses on median income, but less on the extreme ends of the distribution. With technologies (biotech, AI etc.) transforming our societies, they will compound the current effects of inequalities making extremes more dire.

What is this relevant for?

EU social and legal systems, health, education, climate and technology policies.

Futures Wheel: An indication of potential consequences

What if the EU...?

... focused in its just and fair transition not only on the effects for the most vulnerable but also the most advantaged and resource-rich part of the society to mitigate how extreme and interlinked inequalities could potentially be?

4 https://www.cnbc.com/2023/01/16/richest-1percent-amassed-almost-two-thirds-of-new-wealth-created-since-2020-oxfam.html
5 Veit, W. (2018). Cognitive enhancement and the threat of inequality. Journal of cognitive enhancement, 2(4), 404-410.
6 https://www.theguardian.com/news/2022/sep/04/super-rich-prepper-bunkers-apocalypse-survival-richest-rushkoff

Radical food production methods

As global demand for food is increasing and growing conditions become more and more challenging due to the climate crisis, humans are using more radical methods for production. New crop varieties cultivated in the space could help farmers adapt to climate change and boost food supplies[7]. Developments in close-environment, vertical farming are enabling new systems. Underground greenhouses are emerging as another option to produce food. Due to geothermal energy, products could be protected from extreme weather events and food production could be ensured through the entire year[8]. There are also experiments with underwater biospheres for plant cultivation. These approaches foresee radically more difficult conditions for food production in the future.

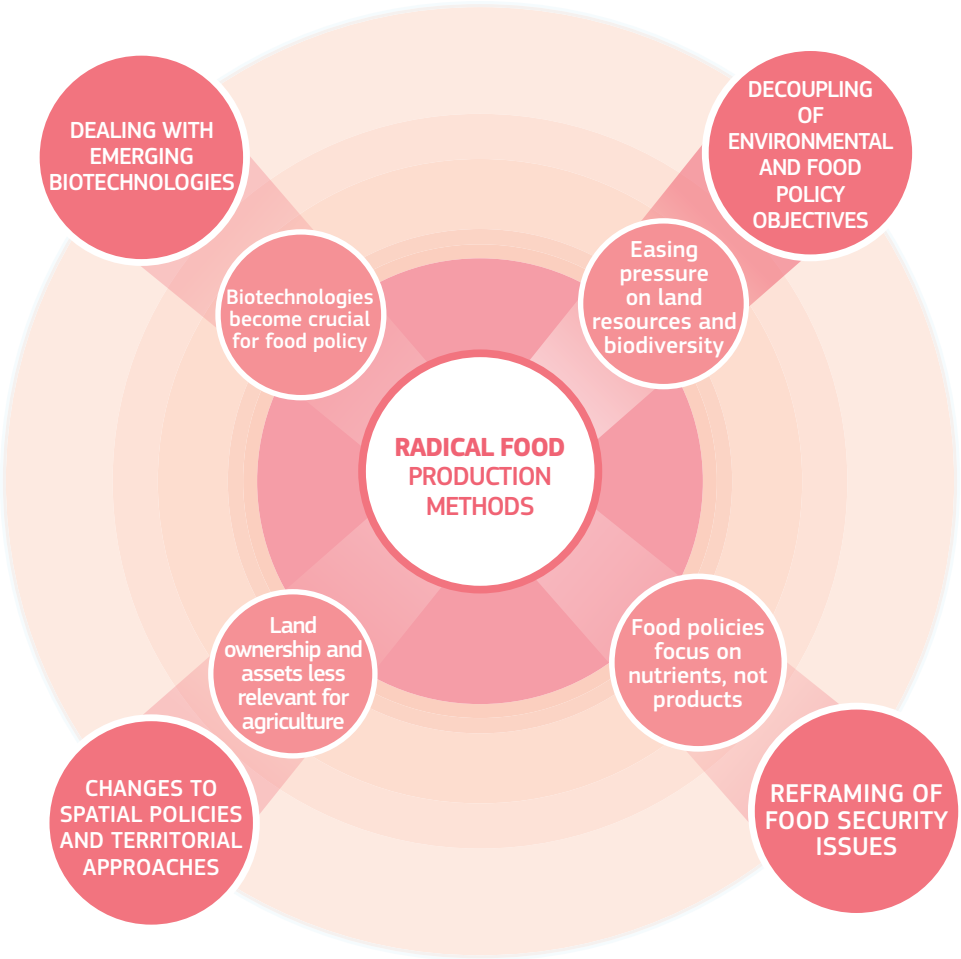
How can it change our optics?

Decoupling food production from its current association with land, farmers, rural areas and environmental pressures could reframe how we deal with food security, food systems and biodiversity loss.

What is this relevant for?

Climate and environmental, health, trade, social, research and innovation policies.

Futures Wheel: An indication of potential consequences



What if the EU...?

... conducted a wider review of the food production processes which are currently assumed to be intrinsically linked and require difficult trade-offs, but have the potential to be decoupled and better targeted individually?

7 https://www.iaea.org/newscenter/pressreleases/iaea-and-fao-send-seeds-t...
8 https://www.theguardian.com/environment/2022/dec/03/south-dakota-reserv...

ANNEX: OTHER PRIORITISED SIGNALS

NEUROTECH AND COGNITIVE LIBERTY

With considerable improvements in technology and safety of brain implants, non-invasive brain monitoring and neurotechnology applications (devices that interface with the nervous system to monitor or modulate neural activity) are increasingly being adopted beyond the medical field. The "bossware" or employee surveillance tools are making use of neural sensors to get productivity and wellbeing data from workers' brains, promising increased productivity and safety (already offered by start-ups like InnerEye[9] or Emotive[10])[11]. These "brain wearables" (earbuds, headbands, watches, tattoos) are also marketed as consumer devices promising improved focus, creativity or relaxation, and removing cravings. Significant ethical issues are being raised in such cases, especially with regard to privacy[12][13]. A new concept of cognitive liberty is emerging in order to protect our freedom of thought and rumination, mental privacy and self-determination over 'brainjacking'[14].

HUMAN BODIES AS A RESOURCE

Although the respect for the human body, cultural and religious rituals, and surrounding death remains a principal consideration, bodies can increasingly take a role of a resource. While voluntary organ donation is one of the first things that comes to mind, a bill proposed in Massachusetts (United States) suggests organ donation in exchange for reduced sentences[15]. While medical progress makes it plausible for donating bodies for gestational purposes[16], preserving sex cells in deceased people's bodies for posthumous reproduction is possible.[17] Finally, the revived interest in cryonics (over 500 people preserved across the world) also bears witness to increased interest in the human body as a resource.[18][19]

MACHINE-READABLE WORLD

The trend towards "smartification" of our surroundings means that our environment needs to be interpretable to non-human agents[20]. With the rise of autonomous agents which navigate the physical world (autonomous transport, robots, drones etc.), the infrastructure will need to be adapted not only to human needs, but also increasingly to the needs of those autonomous agents. From the proposal that traffic lights should have a fourth white light to increase the effectiveness of autonomous vehicles to various smart road signs and other vehicle-to-infrastructure communication ideas – designing infrastructures increasingly takes into account machines and are less people-centred.[21][22] Digital twins of physical objects and systems also serve as a way of making the physical world machine-readable. Finally, not only physical but also social and legal systems are changing, with initiatives like "law as code", machine-readable reporting or standards.[23][24]

GENE EDITING FOR THE MASSES

In the early days, CRISPR technology[25] was used to make cuts in DNA. Today, it's being tested as a way to change existing genetic code, by inserting all-new chunks of DNA or possibly entire genes into someone's genome. These new techniques mean CRISPR could potentially help treat many more conditions. While newer innovations are still being explored in lab dishes and animals, CRISPR treatments have already entered human trials. In July 2022, for example, Verve Therapeutics launched a trial of a CRISPR-based therapy that alters genetic code to permanently lower cholesterol levels. Verve's cholesterol-lowering treatment uses base editing, as other several experimental therapies do. A company called Beam Therapeutics, for example, is using the approach to create potential treatments for sickle-cell diseases and other disorders. And then there's prime editing, or "CRISPR 3.0." This technique allows scientists to replace bits of DNA or insert new chunks of genetic code. It has only been around for a few years and is still being explored in lab animals, but its potential could be significant[26].

9 https://innereye.ai/
10 https://www.emotiv.com/
11 Are You Ready for Workplace Brain Scanning? - IEEE Spectrum
12 Robinson, J. T., Rommelfanger, K. S., Anikeeva, P. O., Etienne, A., French, J., Gelinas, J Picard, R. (2022). Building a culture of responsible neurotech: Neuroet hics as socio-technical challenges. Neuron, 110(13), 2057-2062. doi:10.1016/j.neuron.2022.05.005
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17 We can now use cells from dead people to create new life. But who gets to decide? | MIT Technology Review
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20 Dodge, M., & Kitchin, R. (2005). Codes of life: Identification codes and the machine-readable world. Environment and Planning D: Society and Space, 23(6), 851-881. doi:10.1068/d378t
21 https://www.weforum.org/agenda/2023/02/traffic-signals-self-driving-cars/
22 https://journals.sagepub.com/doi/full/10.1177/03611981211026650
23 https://joinup.ec.europa.eu/collection/endorse/law-code-and-interoperability
24 https://trends.oecd-opsi.org/embracing-innovation-in-government-global-trends-2019.pdf
25 CRISPR (short for "clustered regularly interspaced short palindromic repeats") is a technology that research scientists use to selectively modify the DNA of living organisms.
26 Next up for CRISPR: Gene editing for the masses? | MIT Technology Review
https://curio.io/publications/MIT-Technology-Review/jessica-hamzelou/next-up-for-crispr-gene-editing-for-the-masses

AI-ENHANCED SOCIAL MEDIA

While creating misinformation requires time and effort, using AI tools makes it much more efficient and accessible. AI enhanced social media will increasingly be flooded with deepfake photos, videos and posts[27]. This is reinforced with the growing presence of virtual influencers – conversational AI agents that can generate millions of personalised messages[28]. To counterbalance this evolution, new "spot disinformation" influencers are becoming vocal by generating online content about how people can recognise and inoculate themselves against misinformation[29].

BATTERY-FREE ENERGY STORAGE

The world is set to add as much renewable power over 2022-2027 as it did in the past 20 years, according to the International Energy Agency. This is making energy storage increasingly important, as renewable energy cannot provide steady and uninterrupted flows of electricity[30]. Apart from batteries, other energy storage systems are actively being developed – electrochemical (super capacitors), electrical (superconducting magnetic energy storage), thermal modules, mechanical (compressed air, hydro storage, flywheels) or combined in hybrid systems. Although they still require significant improvements, they will likely play a more important role in the energy transition[3132].

DIGITAL CO-WORKERS

The fast increasing use of collaborative robots in manufacturing and logistics and of AI chat bots/virtual assistants in office work is raising the issue of interactions between people and machines at the workplace. AI working as a teammate could augment human teams by enhancing coordination, knowledge sharing and learning, supporting decision-making, as well as evaluation and team performance; concerns related to social and machine teammate interaction, design, privacy and ethics currently exist.[33] Although most of the focus is on the acceptance, performance and effectiveness of such collaboration[34], it is expected to have an important impact on the meaningfulness of work and job satisfaction in the longer term. Preliminary research suggests that working with a human is perceived as more motivating and meaningful compared to the relation with a machine[35], although the success of hybrid teams work depends on the place of digital co-worker in the team (leader, equal or subordinate role)[36]; for example, attributing to AI the job of delegating tasks can improve both efficacy and job satisfaction[37].

INTELLECTUAL PROPERTY AS A FINANCIAL ASSET CLASS

In the current economic volatility, new types of assets which are not correlated to economic activity and with stable yields are of particular interest to investors. Music royalties have been the first to receive recognition as an asset class with financial instrument markets creating specific funds and marketplaces (such as ANote Music platform operating in Europe)[38], possibly expanding to other types of royalties. Treating other forms of intellectual property as an asset, such as patents and copyrights, would require increased standardisation, clear valuation and generating reliable revenue streams or relying on derivative products (such as IP insurance)[39]. At the same time, as much of the modern business practice revolves around intellectual property, tying it directly to financial markets is likely to create new business models and innovative financing.

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29 https://theconversation.com/youtube-how-a-team-of-scientists-worked-to-...
30 https://www.weforum.org/agenda/2023/01/renewable-energy-storage-innovations-batteries/
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39 https://www.iam-media.com/article/intellectual-property-not-asset-class-ip-insurance-might-be

MIDDLE MANAGERS' CHANGING ROLE

Middle managers used to just manage. They were responsible for getting their teams to complete projects on time and within budget, but the bulk of their work was about keeping things running smoothly: ensuring that work was done properly, that employees were following protocol and that everyone was working hard enough. But as times have moved on and resources have become scarce, middle managers are shifting and honing their focus on employee retention and training. Through technological advances and leaner organisational design, employees are often expected to do more with less. The result is a new role for middle managers. They are now charged with ensuring that the benefits of organizational change are communicated to those who implement it. [40] This has been a real challenge as middle managers are also contending with their own learning needs, shifting from being technical experts and doers to influencers and leaders, as well as the changing nature of work and employee culture[41].

PLATFORM ORGANISATIONS

Platform economy has created not only new business models, but also new operating models and structures. There are some common principles used by companies that adopt platform business models: data-driven, agile, design-led, team of teams, and customer-focused. However, some Chinese companies have started to completely reorganise themselves as internal platforms for innovation[42]. Platform organisations, also called "digitally enhanced directed autonomy" have three characteristics: granting employees' autonomy at scale, underpinning this autonomy with specialised digital platforms instead of middle management, and coupling autonomy with single-threaded leadership.[43] As practiced in such companies as Haier or Handu Group, teams are encouraged to form organically to create new products, features or business ideas. They are given access to technology and a service platform and instead of middle management, they are openly monitored and ranked with all other teams. Finally, the role of the leaders is to focus on specific temporary goals to achieve. [44] [45]

GREEN TRANSITION IN HIGH INFLATION

The sustained high levels of inflation have spurred discussions about various interactions between inflation and the green transition. The response of monetary policy through increasing interest rates can be seen as a potential hindrance to the green investment needed for the transition, however it is also argued that the costs of high inflation will outweigh those of measures to fight it.[46] There are also inflationary pressures related to both effects of climate change and green transition with "climateflation", or increased number of climate-related extreme weather events, but also higher taxation of fossil fuels, price of emissions and costs of green investments.[47] This also creates differences of views on the wider role of central banks, where the EU Federal Reserve has maintained its narrow definition of sticking to fiscal policy, while the European Central Bank sees a bigger environmental role for itself.[48] On the other hand, consumer research suggests that inflation can lead to increased focus on prices, disregarding environmental opportunities, but is seen also as an opportunity to reduce and rethink consumption and waste.[49]

SUING FOR CLIMATE

The number of climate litigation cases in the world has more than doubled since 2015. The total number of cases was over 2,000 in May 2022, with approximately one fourth of them being filed between 2020 and 2022. Legal cases have been brought against fossil fuel companies, especially outside the United States, but also other corporate actors are increasingly targeted in the food and agriculture, transport, plastics and finance sectors[50].

High-profile lawsuits against consumer brands, particularly around plastics, deforestation and biodiversity, are expected to increase as activists seek to apply legal pressure to accelerate companies' decarbonisation and sustainability efforts. This will be over and above waste, pollution and toxicity litigation that energy, extractive and chemicals companies have long faced, or similar suits against governments. Regulators and investors will also become more active in holding companies to task for 'greenwashing'[5152].

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41 How flexibility made managers miserable - BBC Worklife
42 https://hbr.org/2023/03/how-chinese-companies-are-reinventing-management
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50 https://climate-laws.org/
51 https://www.lse.ac.uk/granthaminstitute/publication/global-trends-in-climate-change-litigation-2022/
52 https://www.theguardian.com/environment/2023/jan/04/why-2023-will-be-a-watershed-year-for-climate-litigation

SOLAR RADIATION MODIFICATION

Increasing voices are calling for and preparing alternative "emergency" options to keep global temperature rise in check. Among actions under examination is Solar Radiation Modification (SRM), and in particular Stratospheric Aerosol Injection (SAI) – which aims to cool the planet by reflecting sunlight back into space or by allowing more infrared radiation from Earth to escape, in order to reduce Earth's temperature. It includes numerous proposed methods which differ significantly. None are ready for deployment.

SRM is a complex, controversial and under-studied group of technologies. Yet some scientists and companies are accelerating towards deployment: empirical research and experimentation are being pursued, and technologies and schemes are being discussed at the highest levels, without a full understanding of the implications. This is contrary to the precautionary principle, which must be applied in the case of a technology that would modify the atmosphere[53][54].

DIGITAL AUTHORITARIANISM

Autocratic leadership, being public or private, is being reinvented for the digital age, as many emerging digital technologies have made power and control much more efficient and subtle. While emerging technologies have empowered leaders around the globe to communicate with their people, employees and communities, understand and support them, the same technologies have given to individuals, companies and governments unprecedented capabilities to control them and (re)conquer power. Digital autocracy could take many forms: from offering a fake autonomy to citizens, to controlling online discourse, harassment, disinformation, cyberattacks, digital violence and discrediting[55][56].

ANTICIPATIVE AND JUST-IN-TIME PUBLIC SUPPORT

Predictive analytics has been heralded as an opportunity to increase the efficiency of government services, but mostly through automation and personalisation of outdated procedures and policy instruments, which led to biased decisions in eligibility checks and targeting and enforcement[57][58]. At the same time, predictive analytics, together with nowcasting (predicting near future situation) hold promise for increasingly important fields of providing support for crisis and disaster management. Among such initiatives are Raincoat, which offers parametric insurance (payments based on indicators, not losses) to allows immediate pay out support after disasters. GiveDirectly worked with Google to map out neighbourhoods likely to be hardest hit by a hurricane, and facilitate urgent and direct cash transfers[59]. Other approaches include anticipative cash transfers for recipients to improve their resilience just before extreme weather hits. [60] Just-in-time and anticipative support could bring new tools for government to improve resilience and adaptation.

CHINA'S DECLINE AND ESCAPE STRATEGIES

Structural issues including demographic decline and real-estate collapse, combined with societal and resource-related problems such as its 'lying flat' movement and energy shortages, could cause Chinese economic downturn[61][62]. China's aging population and shrinking workforce, as well as its vacant properties and debt among developers, are posing significant strains on the Chinese economy[63]. Without a solution on the horizon, this could greatly impact global trade. To counter this trend, China may invest more aggressively, protect and expand its hold over new technologies in addition to boosting its domestic consumption to reduce its reliance on exports[64]. This risks to further exacerbate the unbalanced dependencies between China and Europe. China's economic troubles combined with its growing military capabilities could come to challenge regional and global stability. This would particularly be the case if China adopts a more aggressive posture in pursuing its interests, including on Taiwan, to deflect domestic attention away from internal issues through the pursuit of conflict with external enemies.

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60 Anticipatory cash transfers are a neglected climate change solution - Vox
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