### ROB

#### The rob is comparative worlds – 1) education, we have to know how the real world works. If we argue about random phil arguments that don’t apply, we create masses and masses of debaters with no real world lens, 2) clash, better debates are made when debaters talk about which argument is better instead of mindset (a mindset is nothing without action), 3) policy action, they spec on government, government must have a policy action because they are not 1 being with a concious

### Framework

#### The value is morality and the standard is maximizing expected well-being. Prefer for:

#### 1] Actor specificity –

#### A] Governments must aggregate because all policies benefit some and harm others so the only non-arbitrary way to prioritize is by helping the most amount of people

Mack 4 [(Peter, MBBS, FRCS(Ed), FRCS (Glasg), PhD, MBA, MHlthEcon) “Utilitarian Ethics in Healthcare.” International Journal of the Computer, the Internet, and Management Vol. 12, No.3. 2004. Department of Surgery. Singapore General Hospital.] SJDI

Medicine is a costly science, but of greater concern to the health economist is that it is also a limitless art. Every medical advance created new needs that did not exist until the means of meeting them came into existence. Physicians are reputed to have an infinite capacity to do ever more things, and perform ever more expensive interventions for their patients so long as any of their patients’ health needs remain unfulfilled. The traditional stance of the physician is that each patient is an isolated universe. When confronted with a situation in which his duty involves a competition for scarce medications or treatments, he would plead the patient’s cause by all methods, short of deceit. However, when the physician’s decision involves more than just his own patient, or has some commitment to public health, other issues have to be considered. He then has to recognise that the unbridled advocacy of the patient may not square with what the economist perceives to be the most advantageous policy to society as a whole. Medical professionals characteristically deplore scarcities. Many of them are simply not prepared to modify their intransigent principle of unwavering duty to their patients’ individual interest. However, in decisions involving multiple patients, making available more medication, labour or expenses for one patient will mean leaving less for another. The physician is then compelled by his competing loyalties to enter into a decision mode of one versus many, where the underlying constraint is one of finiteness of the commodities. Although the medical treatment may be simple and inexpensive in many instances, there are situations such as in renal dialysis, where prioritisation of treatment poses a moral dilemma because some patients will be denied the treatment and perish. Ethics and economics share areas of overlap. They both deal with how people should behave, what policies the state should pursue and what obligations citizens owe to their governments. The centrality of the human person in both normative economics and normative ethics is pertinent to this discussion. Economics is the study of human action in the marketplace whereas ethics deals with the “rightness” or “wrongness” of human action in general. Both disciplines are rooted in human reason and human nature and the two disciplines intersect at the human person and the analysis of human action. From the economist’s perspective, ethics is identified with the investigation of rationally justifiable bases for resolving conflict among persons with divergent aims and who share a common world. Because of the scarcity of resources, one’s success is another person’s failure. Therefore ethics search for rationally justifiable standards for the resolution of interpersonal conflict. While the realities of human life have given rise to the concepts of property, justice and scarcity, the management of scarcity requires the exercise of choice, since having more of some goods means having less of others. Exercising choice in turn involves comparisons, and comparisons are based on principles. As ethicists, the meaning of these principles must be sought in the moral basis that implementing them would require. For instance, if the implementation of distributive justice in healthcare is founded on the basis of welfare-based principles, as opposed to say resource-based principles, it means that the health system is motivated by the idea that what is of primary moral importance is the level of welfare of the people. This means that all distributive questions should be settled according to which distribution maximises welfare. Utilitarianism is fundamentally welfarist in its philosophy. Application of the principle to healthcare requires a prior understanding of the welfarist theory as expounded by the economist. Conceptually, welfarist theory is built on four tenets: utility maximisation, consumer sovereignty, consequentialism and welfarism. Utility maximisation embodies the behavioural proposition that individuals choose rationally, but it does not address the morality of rational choice. Consumer sovereignty is the maxim that individuals are the best judge of their own welfare. Consequentialism holds that any action or choice must be judged exclusively in terms of outcomes. Welfarism is the proposition that the “goodness” of the resource allocation be judged solely on the welfare or utility levels in that situation. Taken together these four tenets require that a policy be judged solely in terms of the resulting utilities achieved by individuals as assessed by the individuals themselves. Issues of who receives the utility, the source of the utility and any non-utility aspects of the situation are ignored.

#### B] No intent-foresight distinction for governments – deliberating over an action requires analysis of foreseen consequences which could be prevented which makes them intrinsic to state action.

#### C] Governments aren’t singular rational agents which makes theories about individuals irrelevant – only consequentialism solves by analyzing ends divorced from an actor.

#### 2] No act-omission distinction – governments are culpable for omissions cuz their purpose is to protect the constituency – otherwise they would have no obligation to make murder illegal. Actor spec o/w – different agents have different ethical standings that affect their obligations and considerations.

#### 3] Extinction outweighs – moral theories converge under extinction to preserve human life.

Pummer 15 [Theron, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford. “Moral Agreement on Saving the World” Practical Ethics, University of Oxford. May 18, 2015] AT

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake. Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter. Even John Rawls wrote, “All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.” Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view. They’d thus imply very strong reasons to reduce existential risk, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk. It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. We should also take into account moral uncertainty. What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I’ve just argued that there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.” (From chapter 36 of On What Matters).

## Contention 1: India

#### Private sector development is happening now and is necessary to scale up and lock in India’s status as a powerhouse in space.

EdexLive, 06-25-2020, "Opening space sector will enable India to play important role in global space economy: ISRO chief," New Indian Express, https://www.edexlive.com/news/2020/jun/25/opening-space-sector-will-enable-india-to-play-important-role-in-global-space-economy-isro-chief-12874.html TDI

SRO chief K Sivan on Thursday stated that opening the space sector for private enterprises will help scale up benefits from space technology and enable Indian industry to be an important player in the global space economy. "If the space sector is opened (for private enterprises), the potential of the entire country can be utilised to scale up benefits from space technology. It will not only result in the accelerated growth of the sector but also enable Indian industry to be an important player in the global space economy," the Indian Space Research Organisation chief said. Sivan said that far-reaching reforms in space technology in India will put the country in the league of the select countries. "As part of longer socio-economic reform, space reforms will improve access to space-based services for India's development. Far-reaching reforms will put India in the league of few countries with efficient promotional and authorisation mechanism for private-sector space activities," he said. Talking about reforms that the government is planning to implement in the country's space sector, he said, "Space sector, where India is among a handful of countries with advanced space technology, can play a significant role in boosting the industrial base of India." "The government's decision is to implement reform measures to leverage ISRO's achievement by opening the space sector for private enterprises," he added. He further said that "Department of Space will promote sector space activities to enable it to provide end to end space services, including building and launching of rockets and satellites as well as providing space-based services on a commercial basis." "With this, there is an opportunity for large scale employment in the technology sector and India becoming a global technology powerhouse," ISRO chief added. Sivan also talked about the government's decision to establish an autonomous nodal agency for taking independent decisions for regulating the activities of private companies. "Government has approved the establishment of an autonomous nodal agency - Indian National Space, Promotion and Authorisation Centre - for taking independent decisions with respect to permitting and regulating the activities of private companies in the space sector," said ISRO chief. "It will act as a national nodal agency for handholding and promoting the private sector in space endeavours and for this ISRO will share its technical expertise as well as facilities," he added.

#### India private sector is key to space success – low cost operations, transparency, and accountability.

Rajagopalan ’20 [Dr Rajeswari (Raji) Pillai Rajagopalan is the Director of the Centre for Security, Strategy and Technology (CSST) at the Observer Research Foundation, New Delhi., 5-24-2020, "India’s Space Programme: A role for the private sector, finally?," ORF, <https://www.orfonline.org/research/indias-space-programme-a-role-for-the-private-sector-finally-66661/>] TDI

India’s finance minister Nirmala Sitharaman announced last week that India’s private sector will play a key role in augmenting India’s space programme, and that the government intends to share the facilities of the Indian Space Research Organisation (ISRO) with the private sector. This announcement was part of the Narendra Modi government’s call for new and bold reforms in an effort to promote its ‘self-reliant India’ mission. It is the fourth segment of the Rs 20 lakh crore Aatma Nirbhar Bharat Abhiyan special economic stimulus. Sitharaman’s announcement entails a role for the private sector, possibly with the goal of greater investments in technology development and acquisition, capacity-building and space exploration, including planetary exploration. The minister, while announcing these reforms, appeared to understand that the private sector can help augment India’s space capability. While praising the work done by ISRO, she also pointed out that the private sector is also doing a lot of work in developing space technology. She also acknowledged that the existing regulations prevent private entities from using or even testing their products. Therefore, to level the playing field, the government “will make a provision for the private sector to benefit from the assets which are available to ISRO and for India (in general) to benefit from.” The minister also said the new reforms would allow the private sector to play an active role in “satellites, launches and space-based services”. But as always, implementation is key. Properly executing these reforms will require enabling policies and appropriate regulatory frameworks. That the new reforms will allow private sector players to use ISRO facilities is a big deal. This indeed must be music to the ears of commercial players who have been seeking to get a fair share of the pie in terms of manufacturing of satellites and propellant technologies, among other areas. It should not be too difficult for India’s private space sector because there is a sizeable talent pool available outside ISRO. More importantly, the entry of the private sector, as in the telecom sector, can bring several advantages in terms of cost and access. Following the announcement, ISRO tweeted that it will follow the government’s guidelines to allow the private sector to undertake space activities in the country. Though this did not seem particularly welcoming of the government’s initiative, ISRO’s support is critical to making it a success. ISRO has in the last few years been opening up to the Indian private space sector in a gradual manner – mostly as a matter of compulsion because ISRO simply does not have the in-house capacity to address India’s growing requirements. Today, the Indian space programme is not just about civilian applications for remote-sensing, meteorology and communication, as in the early decades. India’s space sector and its requirements have grown enormously in the last decade to include television and broadband services, space science and exploration, space-based navigation and, of course, defence and security applications. Among others, Ambassador Rakesh Sood has articulated the need for legislation to facilitate ISRO’s partnership with industries and entrepreneurs. Narayan Prasad and Prateep Basu, two prominent faces in the Indian space start-up segment, have argued that despite ISRO’s successes, “India’s space competitiveness has suffered from the absence of a globally reputed, private space industry.” The private sector, especially the NewSpace industry and start-ups, have an advantage in terms of low-cost operations, which itself should be a big incentive for the government to make it an active stakeholder. A certain amount of democratisation of space technology with the participation of the private sector can ensure costs are kept low. And expanding the number of stakeholders will also ensure more transparency and better accountability and regulatory practices. This has been missing in India’s space sector. The same agency has undertaken promotion, commercialisation and regulatory functions – which is not healthy.

#### India space key to soft power.

Hickert 17 Cameron Hickert, Harvard’s Belfer Center for Science and International Affairs, Schwarzman Scholars, "Space Rivals: Power and Strategy in the China-India Space Race - Schwarzman Scholars", August 14, 2017, <https://www.schwarzmanscholars.org/events-and-news/space-rivals-power-strategy-china-india-space-race/> TDI

The regional rivalry between India and China has long simmered, and the next frontier increasingly appears to be space. Beyond the hard power dimension, this regional space race has taken on many of the soft power characteristics of the competition between the U.S. and U.S.S.R. during the Cold War. It should not be forgotten, “a major factor in the Asian space race is prestige, as rapidly developing countries there use technology to jockey for status. Space technology in particular, being flashy and complex, often captures the most cache.” Because soft power is about perception and attraction, demonstrating prowess in space capabilities is a crucial step in building this power regionally. Many of the feats that China and India are pursuing have already been achieved by the U.S., so mistakes are costlier in terms of international credibility – failures are perceived as worse when another nation has already been successful. Yet the attraction power of spaceflight achievements is more lucrative than in the past, as private entities around the world face tighter competition and shorter timelines in launching satellites, and are therefore willing to bring their business to any nation that can demonstrate the ability to launch cargo safely and cheaply. A prime example is India’s recent launch of 20 satellites on a single rocket; this mission included satellites from around the world, including the United States. The increased soft power borne out of a successful space program therefore is not only useful in the struggle for regional prestige, but also paves the way for increased economic success in a fast-growing industry.

#### India k2 taking up the climate change and alternative energy cause

GPC 17 [(Greater Pacific Capital, investing institution designed to identify and develop investing opportunities in and between India and other international economies), “Path to Power: India’s Great Opportunity in the Changing World Order,” 7/17/17, Greater Pacific Capital, <https://greaterpacificcapital.com/path-to-power-indias-great-opportunity-in-the-changing-world-order/>]TDI

Taking up the Climate Change and Alternative Energy Cause**.** The US withdrawal from the Paris Climate Accord has left a serious gap in climate change leadership that has yet to be filled.  While the rest of the world has vowed to continue without the US and China has signalled its willingness to play a greater role in the process, the size of the challenge facing the world exceeds any one country’s ability to lead alone on the matter. India, as the world’s fifth largest producer of energy has a strong position to be one of a small number of countries to lead the way in fighting climate change. India is targeting to grow renewable energy production fourfold within five years, and with its low-cost base can become a core source of mass-produced cost effective renewable solutions for the rest of the world.

## Contention 2: Inequality

## Contention two is the inequality of resources

**The shortage of commonplace and multi use minerals prove we need to look into space for answers now**

**Cohen 07** [David Cohen, President of the Academic Board Field of Research: Exploration and environmental geochemistry. Earths Natural Wealth: An Audit, NEW SCIENTIST, May 23, 2007, at 3441, available at https://www.newscientist.com/article/mg19426051.200-earths-natural -wealth-an-audit/ Accessed July 14, 2021]

This could prove lucrative, but Prichard is motivated by something far more significant than the chance of a quick buck. **Platinum is a vital component not only of catalytic converters but also of fuel cells – and supplies are running out.** It has been estimated that if all the 500 million vehicles in use today were re- equipped with fuel cells, operating losses would mean that all the world's sources of platinum would be exhausted within 15 years. Unlike with oil or diamonds, there is no synthetic alternative: platinum is a chemical element, and once we have used it all there is no way on earth of getting any more. What price then pollution-free cities? It's not just the world's platinum that is being used up at an alarming rate. The same goes for many other rare metals such as indium, which is being consumed in unprecedented quantities formaking LCDs for flat-screen TVs, and the tantalum needed to make compact electronic devices like cellphones. How long will global reserves of uranium last in a new nuclear age? Even reserves of such commonplace elements as zinc, copper, nickel and the phosphorus used in fertiliser will run out in the not-too-distant future. So just what proportion of these materials have we used up so far, and how much is there left to go round? Perhaps surprisingly, given how much we rely on these elements, we can't be sure. For a start, the annual global consumption of most precious metals is not known with any certainty. Estimating the extractable reserves of many metals is also difficult. For rare metals such as indium and gallium, these **figures**are **kept a closely guarded secret by mining companies**. Governments and academics are only just starting to realise that there could be a problem looming, so studies of the issue are few and far between. Armin Reller, a materials chemist at the University of Augsburg in Germany, and his colleagues are among the few groups who have been investigating the problem. He estimates that we have, at best, 10 years before we run out of indium. Its impending scarcity could already be reflected in its price: in January 2003 the metal sold for around **$60 per kilogram**; by August 2006 the price had shot up to over **$1000 per kilogram**. Uncertainties like this pose far-reaching questions. In particular, they call into doubt dreams that the planet might one day provide all its citizens with the sort of lifestyle now enjoyed in the west. A handful of geologists around the world have calculated the costs of new technologies in terms of the materials they use and the implications of their spreading to the developing world. All agree that the **planet's booming population and rising standards of living** are **set to put unprecedented demands on the materials that only Earth** itself can provide. Limitations on how much of these materials is available could even mean that some technologies are not worth pursuing long term. Take the metal gallium, which along with indium is used to make indium gallium arsenide. This is the semiconducting material at the heart of a new generation of solar cells that promise to be up to twice as efficient as conventional designs. Reserves of both metals are disputed, but in a recent report René Kleijn, a chemist at Leiden University in the Netherlands, concludes that current reserves “would not allow a substantial contribution of these cells” to the future supply of solar electricity. He estimates gallium and indium will probably contribute to less than 1 per cent of all future solar cells – a limitation imposed purely by a lack of raw material.

**The plethora of asteroid resources means asteroid mining will not be fruitless**

**Erlank 16** [Wian Erlank, North-West University "Property Rights in Space: Moving the Goal Posts so the Players don't Notice" PER / PELJ 2016(19) - DOI http://dx.doi.org/10.17159/1727- 3781/2016/v19n0a1505 11-16-16 Accessed Jul 13, 2021]

The first aspect of mining in space that is usually mentioned in literature, and especially in the popular media, is that **asteroids contain** precious m**etals such as platinum, gold**, rhodium, **iridium**, rhenium, osmium, ruthenium, **palladium**, and germanium, which have been found in meteorites and will therefore also be found in asteroids.44 Iron ore is also expected to be extremely bountiful.45 **This** is of **interest** to **mining companies not** only **because the metals** and other **minerals** are present on the asteroids, **but** because **they are present in extremely high concentrations.** For example, **Planetary Resources estimates** that platinum-rich asteroids 500 meters across could contain more than the total known reserves of platinum on Earth; and a **200 km wide Asteroid, 16 Psyche**, from the asteroid belt between Mars and Jupiter, **is estimated to contain enough nickel-iron ore to satisfy demand for millions of years**.46 Even **small asteroids** could **meet** the **demand** **for** such metals for **centuries**. Questions have been raised (and answered)47 about the commercial viability of such space-mining operations,48 since the number of platinum ore-bx`earing near-Earth asteroids has been estimated by Elvis (using an impressive mathematical formula) to be 10.49 However, the number of asteroids containing water is a much more impressive 9000.50 Elvis also notes that "... the knowledge of which NEOs are ore-bearing could itself become commercially valuable intellectual property".51 This astute observation raises some rather difficult questions about the non- appropriation principle and if this principle should extent to such intellectual property.

**Asteroid mining is both economically and environmentally better–hurting the earth for minimal resource repletion isn’t just**

**MacWhorter 16** [MacWhorter, Kevin, J.D. Candidate, William & Mary Law School. “Sustainable Mining: Incentivizing Asteroid Mining in the Name of Environmentalism”. 02-2016. William & Mary Law School Scholarship Repository. https://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1653&context=wmelpr. Accessed 7-12-2021]

One may question whether asteroid mining is desirable, or even possible. There are many compelling reasons to suggest that it is: **mining on Earth is incredibly destructive to the environment** and to many societies;9 the private space industry is booming with investment and government contracts;10 and technology has come far enough to warrant serious inquiry into the future of space mining.11 This section examines each point in turn. In the next sixty years, scientists predict that certain elements crucial to modern industrysuch as **platinum, zinc, copper, phosphorous, lead, gold, and indiumcould be exhausted** on Earth.12 **Many** of these **have no synthetic alternative**, unlike chemical elements such as oil or diamonds.13 Liquid-crystal display (LCD) televisions, cellphones, and laptops are among the various consumer technologies that use precious metals.14 Further, green technologiesincluding wind turbines, solar pan- els, and catalytic convertersrequire these rare elements.15 As demand rises for both types of technologies, and as reserves of rare metals fall, prices skyrocket.16 Demand for nonrenewable resources creates conflict, and consumerism in rich countries results in harsh labor treatment for poorer countries.17 In general, the mining industry is extremely destructive to Earthsenvironment.18 In fact, depending on the method employed, **mining can destroy** entire **ecosystems** by **polluting water sources and contributing to deforestation**.19 It is by its nature an unsustainable practice, because it involves the extraction of a finite and non-renewable resource.20 Moreover, by extracting tiny amounts of metals from relatively large quantities of ore, the mining industry contributes the largest portion of solid wastes in the world.21 **The Environmental Protection Agency** (EPA) **describes**the **industry** as the **source of** more **toxic and hazardous** waste than any other industrial sector [in the United States], **costing billions of dollars to address** the **public health** and environmental **threats** to communities.22 Poor regulations and oxymoronic corporate definitions of sustainability, however, make it unclear as to just how much waste the industry actu- ally produces.23 **Platinum** provides an excellent case study of the issue, because it **is a**n extremely **rare and expensive metal**an **ore** expected to exist in vast quantities in asteroids.24 Further, production of platinum has increased sharply in the past sixty years in order to keep up with growing demand for use in new technologies.25 In fact, despite their high costs, **platinum** group **metals** **are** so **useful** **that [one] of [four] industrial goods on Earth require them in production**.26 Scholars do not expect demand to slow any time soon.27 Among other technologies, industries use platinum in prod- ucts such as catalytic converters, jewelry production, various catalysts **for chemical processing, and hydrogen fuel cells**.28 While there is no con- sensus on how far the Earths reserves of platinum will take humanity, many scientists agree that platinum ore reserves will deplete in a rela- tively short amount of time.29 With the rate of mining at an all-time high,30 it is increasingly clear that historical patterns of mineral resources and development cannot simply be assumed to continue unaltered into the future.31 The **platinum mining industry**, however, has a strong incentive to increase its rate of extraction as profits grow with the rate of demand. Without any alter- native, this destructive practice will continue into the future.32 So-called platinum-group metal (PGM) ores are mined through underground or open cut techniques.33 Due to these practices, all but a very small fraction of themined platinum ore is disposed of as solid waste.34 The environmental consequences of platinum production are thus quite significant, but like **the mining industry** in general, **the amount of waste is typically under-reported**.35 While this is due to high production levels at the moment, those levels will only increase given the estimated future demand of platinum.36 In spite of the negative consequences, mining continues unabated because it is economically important to many areas.37 The future environmental costs provide a major challenge in creating a sustainable system. Rele- gating at least some mining companies to near-Earth asteroids would reduce the negative effects of future mininglevels on Earth. The economic benefits of mining need not be sacrificed for the sake of the environment.38 For most of the Space Age, the role of private companies has been as that of government contractors.39 During the past fifteen years, how- ever, space flight has become increasingly the realm of private industry.40

**Earth Mining destabilizes the earth’s environment, contaminates water sources and permanently ruins the soil**

**Earth.org 20** [Earth.org, Environmental News, Data Analysis, Research & Policy Solutions. “How Rare-Earth Mining Has Devastated China's Environment”. 07-14-20. Earth.Org - Past | Present | Future. https://earth.org/rare-earth-mining-has-devastated-chinas-environment/. Accessed 7-18-2021]

It’s challenging to mine and process rare earths without harming the environment. The problems are related to the two primary extraction methods. The first involves removing the topsoil, transporting it to a leaching pond, **and adding chemicals** (such as ammonium sulfate and ammonium chloride) to separate out the metals. The chemicals used in this separation process can **create air pollution, cause erosion, and leach into groundwater.** The **second** processing method involves **drilling holes into the ground,** inserting PVC pipes and rubber hoses **and pumping chemicals** to flush out earth. The resulting slurry is then pumped into leaching ponds to separate out the rare-earth metal. This method **creates** the same problems as with **topsoil removal** with the addition of the PVC pipes, rubber hoses and other sundry used by mining crews remaining littered in the mines. Abandoned mines pose ongoing environmental hazards. **Remaining chemicals** can **continue to leach into groundwater.** Mines may also contain pools of wastewater that can potentially pour into local waterways. For example, **in** its **2016 report**, **China Water Risk highlighted** an **abandoned mine in Ganzhou where** untreated **chemicals flow from leaching ponds** when it rains. Problems in China The **pollution** resulting **from rare-earth** mining has **created soil** **incapable of** supporting **crops** and water supplies have been contaminated. Chinese officials have attempted to counteract these threats by shutting down a large number of mines, especially the smaller and the illegal ones, but there are still severe, large-scale threats that remain unresolved.