IPEN Submission

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Thank you for the opportunity to provide input and comment to the UNCSD Secretariat's preparation of the zero draft for the outcome document for adoption by governments at Rio+20.

IPEN

The International POPs Elimination Network (IPEN) was formed in response to the global recognition of the need to eliminate persistent organic pollutants. Since its inception in 1998, IPEN has grown to a global network of over 700 public interest non-governmental organisations (NGOs) from more than 100 countries united in support of the common goal of a 'toxics-free future.' IPEN facilitates the engagement of public interest NGOs in efforts to eliminate POPs and other persistent toxic substances (PTS), and works for a world where exposure to chemicals is no longer a significant source of harm to public health and the environment. IPEN has emerged as a broad-based international chemical safety network with a global reach. It has the ability to translate chemical policy into concrete action on the ground and provides developing country NGOs with a voice at international forums.

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Introduction

The chemical industry plays a significant role in the global economy with sales in 2007 of more than three trillion U.S. dollars.[1] A steadily increasing share of the world's chemical production is shifting to developing and transition countries [2] and by 2020 developing countries are expected to lead in high-volume chemicals production.[3] The United Nations Environment Programme (UNEP) has noted rapidly rising import and use of chemicals in developing countries and estimates that by 2020, they could account for one-third of global consumption.[4] Almost all developing countries are increasing their use of pesticides and industrial chemicals, including substances contained in consumer and commercial products such as plastics, paints, adhesives, dyes, metals, and so forth.[5]

To achieve a sustainable future where individuals and societies can truly have green livelihoods, a sustainable chemical industry is essential. Many chemicals still on the market are simply unmanageable and industry can no longer be allowed to outsource its harmful impacts and expect communities to pay the 'costs'. Achieving a sustainable chemical industry is a significant challenge for Rio+20. This submission will address this challenge and identify expectations and desired outcomes of Rio+20.

Expectations for the outcome of Rio+20

Expectation 1 - Taking Stock a Generation On

A prime expectation of Rio+20 is a 'taking stock of progress' against the goals and objectives of the previous Rio Earth Summit in 1992 and the outcomes of the World Summit on Sustainable Development (WSSD). It has been a generation since Rio and it is time to both assess progress and reinvigorate the Rio Principles of intergenerational equity, precaution, right to know, polluter pays and participation.

In 1992, governments meeting at the Rio Earth Summit acknowledged that chemical contamination could be a source of "grave damage to human health, genetic structures and reproductive outcomes, and the environment."[6] The subsequent Chapter 19 of Agenda 21 focused on Environmentally Sound Management of Toxic Chemicals, and in particular, the needs of developing

[1] International Council of Chemical Associations, *ICCA Review 2007–2008*, 2009, http://www.icca-chem.org/ICCADocs/01_icca_review2007_2008.pdf
[2] OECD, *OECD Environmental Outlook to 2030,* 2008.
[3] OECD, *OECD Environmental Outlook for the Chemical Industry,* 2001.
[4] Governing Council of the United Nations Environment Programme, *Financing Options for Chemicals and Wastes* (UNEP/GCSS.XI/INF8), December 18, 2009, http://www.unep.org/dec/pdf/chemicalfinancing/k0953863-%20gcss-xi-inf8.pdf
[5] Joe Digangi, Civil Society Actions For A Toxics-Free Future, *New Solutions*, Vol. 21(3) 433-445, 2011
[6] Agenda 21, Chapter 19, Environmentally Sound Management of Toxic Chemicals, Including Prevention of Illegal International Traffic in Toxic & Dangerous Products, Section 19.2 Available at http://www.un.org/esa/dsd/agenda21/res_agenda21_19.shtml

countries when faced with the chemical hazards of their rapidly industrialising economies.
Yet, 20 years on, toxic chemicals contaminate all living things, including vulnerable populations such as children and indigenous peoples. Since1992, many more new synthetic chemicals have been manufactured and released into the environment, with estimates of over 1,500 new chemicals being introduced each year. Approximately 80,000 are currently in use. The vast majority of pesticides and industrial chemicals have still not been adequately tested for their long term health and environmental impacts, particularly in terms of emerging concerns such as endocrine disruption and the impacts of mixtures of chemicals, which is how they occur in the environment. The little information that does exist is often not available to workers and exposed communities, particularly in developing countries and countries with economies in transition.

The developing world still faces dirty industries setting up in countries with limited capacity and compliance, as well as the escalating threats of ever increasing waste streams and illegal dumping by developed countries. In particular, the quantity of hazardous electronic waste finding its way to developing countries is still growing exponentially.

A generation on, our water, soil, air and food chain are contaminated with toxic persistent chemicals and 'toxic trespass' of our bodies and those of wildlife continues unabated!

It is essential that Rio+20 reviews its past and takes stock of progress against Chapter 19 of Agenda 21. It should also assess the lack of progress in regards to the WSSD 2020 goal and incorporate activities that would address the systematic failings into its outcomes.

To achieve a sustainable future, Rio+20 will need to develop a program to eliminate the toxic legacy faced by countries as a result of unsound chemicals management and provide concrete and measureable deadlines crucial to ensure focus, credibility and public trust.

4. Specific Elements: a. Objectives of the Conference:

Reinvigorate Rio Principles and WSSD Objectives Pertaining to Chemicals and Waste

Rio+20 provides an appropriate opportunity to reinvigorate the original Rio principles and WSSD objectives pertaining to chemicals and waste. Chapter 19- "Environmentally Sound Management of Toxic Chemicals"- focused on the generation, harmonisation and dissemination of chemical data, and strengthening capacity for chemical management. It contained specific reference to the right of communities to chemical information and the obligations on industry and governments to generate and provide that information. It was acknowledged that it is in the public interest for the community to be informed, to exercise their right to understand, to make

informed choices and to participate in informed decision-making. Informed consumers can help drive cleaner production and reduce the generation of hazardous waste.

Right-to-know was also supported by the Arhus Convention and the Strategic Approach to International Chemical Management (SAICM), which aimed to ensure that information about chemicals throughout their life cycle, including chemicals in products, was available to all stakeholders.[7] There is a clear acknowledgement that right-to-know is essential to implement the WSSD 2020 goal; "to achieve the sound management of chemicals throughout their life-cycle so that, by 2020, chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment." [8]

Despite this, two decades after the Rio Earth Summit, the rhetoric of community right-to-know and access to chemical information still outstrips the reality. In many countries, information on product ingredients is still withheld under commercial confidentiality regimes. While some countries have implemented right-to-know initiatives like the Pollution Release Transfer Registers, their effectiveness is restricted by the limited number of chemicals covered and their dependence on industry estimations. Environmentally sustainable chemical management requires reliable, comprehensive and accessible information, yet legal and regulatory frameworks still often do not allow for an open and equal exchange of information among stakeholders.

The application of the Precautionary Principle is crucial to the assessment of chemicals and new technologies; nevertheless, new and emerging technologies including bio-engineering and nanotechnology have been introduced with little or no oversight or assessment. The principles of substitution and elimination of hazardous substances as envisaged by SAICM, established to implement the WSSD Plan of Action for chemical management, are integral to protection of vulnerable populations, like agricultural workers, indigenous peoples and children.

Rio+20 must reinforce a global commitment to the Rio principles, their implementation by all governments and to the WSSD 2020 goal. These are essential to achieving a sustainable future and green livelihoods.

Rio+20 must reaffirm the central role of sustainable development in the international agenda and revive public trust in sustainable development as a policy that can finally make a positive breakthrough.

It is necessary to acknowledge that certain industries, which cannot fulfill these principles, cannot be part of a sustainable future. Clear criteria need to be developed to encourage sustainable investments into chemical industry that will help to phase out unsustainable chemical production.

[7] SAICM Overarching Policy Strategy, para 15 (b) (i)
[8] Strategic Approach to International Chemicals Management (SAICM), Overarching Policy Strategy, paragraph 13

Commitment to the chemical management objectives to ensure intergenerational equity

Two decades after the Rio Earth Summit, babies are born pre-polluted with hundreds of manmade toxic chemicals present in their small bodies. The developing foetus is contaminated by chemicals bio-accumulated in the mother's body and that readily cross over the placental barrier. Newborns take more in through breast milk or formula, and as they grow are exposed to hazardous chemicals through residues in their food, indoor and outdoor air pollution, and through household products and contaminated house dust.[9] Many of the synthetic chemicals they are exposed to are persistent and bio-accumulative, remaining in the human body long after exposure. There are still no regulatory approaches to assess the combined impacts of the chemical soup to which children are exposed.

The unique vulnerability of children to hazardous chemicals was recognised by the Intergovernmental Forum on Chemical Safety, the Word Health Organisation (WHO), the United Nations Children's Fund (UNICEF) and UNEP[10] when they identified a growing number of children's health impacts from chemical exposure. These include asthma, birth defects, (eg, hypospadias), behavioural disorders, learning disabilities, autism, cancer, dysfunctional immune systems, neurological impairments, and reproductive disorders.[11] The WHO has estimated that three million children under the age of five die every year due to environmental hazards.[12] All children, both in the developing and developed world, are affected by exposure to hazardous chemicals. In 2004, the European Union's Ministerial Conference on Children's Environmental Health concluded that reducing exposure to hazardous chemicals could save the lives of many children.

For Rio+20, to achieve real sustainability, the impacts of our chemical activities, products, and waste on future generations must be addressed in the Rio+20 outcomes. All governments and intergovernmental organisations will need to ensure a long term, sustainable, intergenerational commitment to chemical reform.

[9] Lloyd-Smith, Mariann; Sheffield-Brotherton, Bro, 'Children's Environmental Health: Intergenerational Equity in Action—A Civil Society Perspective.' *Annals of the New York Academy of Sciences*, Volume 1140, Number 1, October 2008, pp. 190-200(11)

[10] IFCS Children and Chemical Safety Working Group. 2005. Chemical Safety and Children's Health: Protecting the world's children from harmful chemical exposures - a global guide to resources, October.

[11] UNEP, UNICEF & WHO. 2002. Children in the New Millennium: Environmental Impact on Health. Available at www.unep.org, www.unicef.org and www.who.int.

[12] World Health Organization / Children's Environmental Health. Available at http://www.who.int/ceh/en/ Accessed 23/3/2009

Specific Elements:

Sound Management of Chemicals to Achieve Sustainable Development

In February 2006, Ministers of over 140 governments endorsed the Strategic Approach to International Chemicals Management (SAICM) High Level Declaration, which states:

> *The sound management of chemicals is essential if we are to achieve sustainable development, including the eradication of poverty and disease, the improvement of human health and the environment and the elevation and maintenance of the standard of living in countries at all levels of development.*[13]

Many developing and transition countries continue to face bourgeoning industrial growth as industries, many of them hazardous, set up where there are few regulations and little capacity to control effluent, air pollution and waste. While there is a global consensus that sound management of chemicals is an integral part of the sustainable development agenda and that an inability to manage chemicals can negatively affect development and poverty reduction initiatives, sound chemicals management has not been successfully integrated into development assistance. Some of the problems stem from limited resources, the multitude of other obligations, and the urgent need to address other global environmental issues such as climate change. However, another obstacle includes the view that chemicals management is an environmental issue not a health and development concern. Hence there is not a strong demand by developing countries to include chemical safety in development assistance. While donor countries insist on country driven programs, there remains a disconnect between chemical safety and the development agenda.

As sound chemical management is essential to achieve the Millennium Development Goals, Rio+20 outcomes must ensure that chemical safety and chemical policy reform occupies a place at the core of the economic and development policy agenda. Rio+20 must recommend that sound chemical management be taken into account while determining the direction of all international development assistance.

In order to achieve this, IPEN offers the following model for Rio+20 activities:

In 2007, IPEN collaborated with UNEP Chemical and the SAICM Secretariat to initiate and coordinate the Global NGO SAICM Outreach Campaign.[14] The purpose of the campaign was to raise awareness about SAICM and to secure commitments from NGOs in all regions to undertake efforts to elevate the threats posed by toxic chemicals. The campaign targeted not only

[13] United Nations Environment Programme, *Strategic Approach to International Chemicals Management: SAICM texts and resolutions of the International Conference on Chemicals Management*, 2006, http://www.saicm.org/documents/saicm%20texts/SAICM_publication_ENG.pdf

[14] See Global SAICM Outreach Campaign. Available at http://www.ipen.org/campaign

environmental NGOs, but also organisations from other sectors including health, agriculture and labour. As a result of the campaign, more than one thousand NGOs in over 100[15] countries endorsed a civil society statement supporting SAICM and its objectives, committing themselves to contribute to the SAICM implementation. The campaign spread the message for the need for chemical management to ensure the protection of human health and the environment but also human rights and national development.

This model could be utilised as an activity from Rio+20 to assist in achieving greater awareness of the role of chemical management in sustainable development.

Sound Management of Chemicals to Ensure the Protection of Human Rights

The protection of the environment is a vital part of contemporary human rights doctrines. It affects the right to life and the right to health. The International Court of Justice has found that damage to the environment undermines all human rights spoken of in the Universal Declaration and other human rights instruments.[16]

In 2001, the United Nations Human Rights Committee found that 'living in a pollution-free world is a basic human right'[17] and those who pollute violate these rights. It was noted that, 'human rights cannot be secured in a degraded or polluted environment' and that 'the fundamental right to life is threatened by exposures to toxic chemicals, hazardous wastes, and contaminated drinking water.'

The rise of chronic diseases such as cancer, heart disease, diabetes, degenerative diseases and mental health have all shown to have links to pollution of air, water and/or food. WHO has assessed almost a quarter of all disease is caused by environmental exposure, which can be averted.[18] Their report, 'Preventing disease through healthy environments - towards an estimate of the environmental burden of disease,' shows that in one way or another, the environment significantly affects more than 80% of major diseases.

The Convention on the Rights of the Child[19] recognises the dangers of environmental pollution[20] and places an onus on all parties to ensure the

[15] See http://www.ipen.org/campaign/signed.html
[16] Case Concerning the Gabcíkovo-Nagymaros Project (Hungary v Slovakia), 1997 ICJ Rep 7; (25 September; sep op., Judge Weeramantry), 4. ; Also see Per C G Weeramantry J, in his separate opinion in the International Court of Justice's decision in Gabcikovo-Nagymaros Project (Hungary v Slovakia) 1997 ICJ 97 at 110; 37 ILM 162 at 206 (1998).
[17] Press Release, 27 Apr 2001 'Living In A Pollution-free World A Basic Human Right' Available at http://www.grida.no/news/press/2150.aspx
[18] WHO Media Release 'Almost a quarter of all disease caused by environmental exposure' 16 JUNE 2006 | GENEVA Available at http://www.who.int/mediacentre/news/releases/2006/pr32/en/index.html
[19] Convention on the Rights of the Child, opened for signature 20 November 1989, 1577 UNTS 3 (entered into force 2 September 1990). Australia ratified the CRC on 17 December 1990.
[20] Article 24 2(c) To combat disease and malnutrition, including within the framework of primary health care, through, iner alia, the application of readily available technology and through the provision of

healthy development of the child, to the maximum extent possible. To achieve this, the epigenetic basis of health and disease must also be considered, for once there is a mutation in a gene, this intergenerational impact cannot easily be remedied. All children have a right to a healthy, toxic-free environment with clean air, clean water and food free from chemical residues, as well as safe and toxic-free toys.

The human rights of indigenous people are also badly affected by chemical contamination. Under the *Declaration on the Rights of Indigenous People* 2007,[21] indigenous people have the right to practice and revitalise their cultural practices, customs and institutions; however, the ongoing contamination of the food chain seriously threatens indigenous peoples' right and need to consume traditional foods.

In the *Stockholm Convention on Persistent Organic Pollutants* (POPs) 2001 preamble, Arctic peoples are given special consideration which acknowledges that the Arctic ecosystems and indigenous communities are particularly at risk because of the biomagnification of POPs in their traditional foods. The blood and breast milk of Arctic peoples are contaminated with the full suite of POPs chemicals and their metabolites. The level of perfluorooctanoate (PFOA), a carcinogen and immunotoxin, is doubling in the Arctic environment every 5 years. Perfluorooctanesulfonate (PFOS), a newly listed POPs chemical with no known breakdown, already contaminates every aspect of the Arctic environment and its inhabitants. Despite this, governments permit the continuation of this pollution by allowing a wide range of acceptable uses and exemptions for PFOS.

Rio+20 outcomes must include active support for activities to reduce chemical contamination to protect basic human rights. They need to facilitate the phase-out of all ongoing uses and exemptions for POPs, which are transboundary, intergenerational poisons that cannot be managed.

Rio+20 must provide a clear pathway for global phase-out of particularly hazardous chemicals, specifically PBTs (persistent bioaccumulative toxins), vPvBTs, (very persistent, very bioaccumulative toxins), genotoxics, carcinogens, chemicals affecting the immune and nervous system, and endocrine disruptors. The SAICM emerging policy issue on endocrine disruptors needs to be supported.

Recommendations for Rio+20 Specific Chemical Safety Activities needed to achieve a sustainable future

- Life Cycle Analysis and Polluter Pays -

To achieve a sustainable future, Rio+20 outcomes must support a move away from the standard risk assessment paradigm to an assessment of the

adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution;

[21] See United Nations Declaration on the Rights of Indigenous Peoples, GA Resolution 61/295, UN Doc A/61/L.67 (2007) at article 5, 9 and 11

complete life cycle of a chemical, product or activity. Understanding the systems of production, distribution, use, and disposal reveals a more complete view of chemical relationships and where a given chemical may create threats to human health or the environment.[22]

Through a life cycle approach, the full cost of a product or activity can be properly assessed, ensuring extended producer responsibility for all aspects and impacts of the chemical's life cycle. A polluter pays approach is essential, as countries can no longer afford to pay the bourgeoning costs of chemical contamination and hazardous waste management in terms of adverse environmental health impacts and the economic imposts on the public purse.

Currently, much of the cost of chemical production, use and waste management has been externalized as costs to governments and society. These encompass legacy issues such as obsolete stockpiles, contaminated sites and children whose development has been impaired as a result of pre-natal and post-natal chemical exposure; others whose health has been injured as a result of chemical exposure, eg, workers; those providing health care services to such people; property owners or users whose property value decreases as a result of chemical contamination; fishers, hunters, small farmers, and others whose livelihoods are impaired by chemical contamination; indigenous peoples whose way of life has been undermined through contamination of their traditional foods; people whose water supply is contaminated; and others.

Externalities of modern industrial agriculture include depletion of water, soil, and biodiversity; pollution by pesticides and fertilizers; loss of livelihoods and knowledge, and the resulting economic and social costs to communities. These externalities retard economic productivity, harm the environment, and impose additional burdens on a country's health delivery and education systems.

While the Polluter Pays Principle and its internalization of costs helps address these impacts, economic instruments that internalize costs of chemicals management have not been widely implemented.

Rio+20 outcomes should provide support for cost internalization mechanisms as an effective method to provide the resources needed to establish infrastructure and foster investment in safer practices and in the substitution of less hazardous chemicals and materials. Rio+20 outcomes must support a cradle-to-cradle approach to product design, giving due consideration to the chemical components and an acceptance of what is not recyclable, should be degradable.

- Substitution and elimination of hazardous substances in consumer products -

[22] Geiser, K., Redesigning Chemicals Policy: A Very Different Approach**,** *NEW SOLUTIONS*, Vol. 21(3) 329-344, 2011

In most countries, the consumption of products containing hazardous chemicals is increasing, resulting in a growth in emissions from the manufacture and use of products as well as a massive growth in the waste generated. SAICM acknowledged fundamental changes are needed in the way products are manufactured, consumed and managed in their waste or recycling phase.

Many low quality products are supplied to and also made in developing countries and economies in transition, including cosmetics, household goods, paints, toys and other goods for children that are contaminated with a range of heavy metals and chemicals. In most cases, no information on contents of hazardous chemicals in products is available to governments or civil society and there remains inadequate public awareness of health risks associated with many products.

Lead content in paint is a pertinent example. Lead levels in paint sold in developing countries are significantly higher than those of developed countries. Lead is renowned for its toxic effects, particularly on children, and the removal of lead from paint is an iconic intergenerational and equity issue, which needs immediate global attention.

While right-to-know about product ingredients will help drive cleaner production, the onus must remain with manufacturers and governments to ensure hazardous substances are eliminated from consumer products and substituted with safer ingredients.

Rio+20 outcomes will need to ensure not only a reduction in product obsolescence but chemical management reforms based on green product design, substitution and the elimination of toxic substances. A primary outcome of Rio+20 outcomes must be a complete phase-out of toxic substances from all children's products, including toys, by 2020.

- Addressing the Toxic Ewaste Trade -

Many developing countries already facing their own domestic waste pressures are experiencing import of hazardous waste, particularly electronic waste, from other countries, including developed countries. The export of old computers to 'bridge the digital divide' is still being used as an excuse for toxic waste dumping on some of the poorest communities and countries in the world. It is estimated that between 50% and 80% of ewaste collected for recycling in the developed countries each year is being exported.

Developed countries have not invested in adequate ewaste recycling/treatment facilities and have not provided adequate legislation, monitoring and compliance to stop the toxic exports. The lack of adequate infrastructure in developing countries to manage ewaste safely results in the burning of ewaste in open air or dumping in sewers, rivers or on the ground, with global impacts.

The phenomenal growth in ewaste requires that all countries develop sound capacity to prevent, minimise, re-use or recycle materials from ewaste. Active support must be given to green product design to design-out toxic components in electronics, as well as green procurement policies.

To achieve sustainability, Rio+20 outcomes need to support countries and help build capacity for the prevention, management and recycling of ewaste.

Rio+20 should encourage all Governments to ensure prompt ratification and entry into force of the Basel Ban Amendment by 2016 at the latest to assure developing countries are not dumping grounds for external toxic waste.

- Hazardous Stockpiles and Destruction Technologies -

Many developing and transition countries have large stockpiles of obsolete pesticides that pose a serious threat to human health and the environment in these countries themselves and in neighbouring countries as well. These legacy stockpiles need an international approach to ensure their destruction using environmentally sound techniques.

In the last decade, the availability of non-incineration destruction facilities has been seriously impaired through a lack of institutional support. While these technologies are still available, the market approach has resulted in the preference for what appears to be cheaper incineration options. This is despite emitting air pollutants and producing toxic ash requiring permanent storage, as well as ongoing public opposition in all continents.

Rio+20 outcomes need to provide support for non-incineration destruction technologies to urgently address the legacy wastes. Rio+20 outcomes must provide awareness-raising and capacity-building for developing countries and countries in transition to help them resist the attempts to push through old incineration technologies.

- Ban Highly Hazardous Pesticides -

The agricultural use of pesticides that are highly hazardous to human health and the environment is long overdue for replacement by sustainable alternatives. As part of its commitment to implementing the objectives of SAICM, the Food and Agriculture Organisation (FAO) has called for the global phase-out of highly hazardous pesticides and has developed criteria to identify them. These include pesticides that are highly acutely toxic (WHO Classes 1a and 1b), carcinogenic, mutagenic, reproductive toxins, those listed under the Stockholm or Rotterdam Conventions, or pesticides with active ingredients and formulations that have shown a high incidence of severe or irreversible adverse effects on human health or the environment.[23]

[23] http://www.fao.org/agriculture/crops/core-themes/theme/pests/pm/code/hhp/en/

FAO has also called for the use of these pesticides to be replaced by an ecosystem approach to agriculture based on biological process and the use of pesticides only as a last resort.[24] This approach echoes that of the UN Special Rapporteur on the Right to Food, who found that in order to combat hunger and malnutrition, states should implement policies to adopt agroecological practices, as agroecology raises productivity, reduces rural poverty, improves nutrition and contributes to adapting to climate change.[25]

A World Bank report on community managed sustainable agriculture in India found that non-pesticide management of the agro-ecosystem significantly increases farmers' net income, improves household food security and reduces environmental damage.[26] The agroecological approach to agriculture in place of the use of highly hazardous pesticides is also supported by the United Nations Conference on Trade and Development (UNCTAD);[27] the United Nations Environment Programme (UNEP) in its report on the Green Economy;[28] and the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), a World Bank initiative in partnership with FAO, UNEP, UNDP, WHO, governments, civil society, the private sector and scientific institutions. [29]

Despite this high level support for replacing hazardous pesticides with an agroecological approach to food production, little progress has been made. Many governments and others continue to believe, despite abundant evidence to the contrary, that chemical-based agriculture is the only way to feed the world. In ignorance, many farmers continue to use highly hazardous pesticides, poisoning themselves, their families, future generations and the environment, usually also diminishing their potential returns and food security.

Rio+20 outcomes must provide a process for the global phase-out of highly hazardous pesticides and endorse and actively support an agroecological approach to agriculture.

- Achieving Mercury Phase-Out through a Global Treaty -

The impacts on human health from exposure to mercury are well documented, with children most at risk from its neurotoxicity. The current

[24] FAO. 2010. *Report of the twenty-second session of the Committee on Agriculture, Rome, 29 November – 3 December 2010.* Rome. Also see FAO, 2011. Save and grow: A policymaker's guide to the sustainable intensification of smallholder crop *production. http://www.fao.org/ag/save-and-grow*

[25] *Rep*ort to UN Human Rights Council, March 2011, by UN Special Rapporteur on Right to Food, Oliver De Schutter: *Agro-ecology and the Right to Food*)

[26] Kumar TV, Raidu DV, Killi J, Pillai M, Shah P, Kalavadonda V, Lakhey S. 2009. Ecologically Sound, Economically Viable Community Managed Sustainable Agriculture in Andra Pradesh, India. The World Bank, Washington DC.

[27] United Nations Conference on Trade and Development (UNCTAD), Feb 2011: "Assuring Food Security in Developing Countries under the Challenges of Climate Change: Key Trade and Development Issues of a Fundamental Transformation of Agriculture" http://www.unctad.org/en/docs/osgdp20111_en.pdf

[28] UNEP Green Economy report: Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, 2011 http://www.unep.org/greeneconomy/v2/GreenEconomyReport/tabid/29846/Default.aspx

[29] IAASTD: The International Assessment of Agricultural Knowledge, Science and Technology for Development, 2008. http://www.agassessment.org/

negotiations need to result in a convention text that covers the full life cycle of mercury in all media, including in products and waste streams. BAT/BEP (best available techniques/best environmental practice) should be required for all new and existing release sources, as well as adequate financial and technical assistance for developing and transition countries to assist them in meeting BAT/BEP requirements and other aspects of treaty implementation.

All Parties should be required to develop a national goal consistent with treaty goals for reducing and eliminating its mercury emissions, and implement education, training and awareness-raising with regard to the action plan.

The treaty should address both large and small scale mining and refining operations, and in particular address artisanal small scale gold mining (ASGM). Mercury imports and other sources of mercury supply for ASGM should be banned and measures to prohibit, restrict, or discourage should include child labour. Importantly, all mercury waste must be covered by the treaty.

Rio+20 outcomes should support the development of an effective and comprehensive mercury treaty.

- Interaction of Climate Change and Chemicals -

In 2011, UNEP acknowledged that chemical management reform needs to be undertaken in the context of the growing interaction of climate change on chemical releases, transport, degradation, exposure and toxicity.[30] The report by the United Nations Environment Program (UNEP) and the Arctic Monitoring and Assessment Programme (AMAP) Expert Group, 'Climate Change and POPs: Predicting the Impacts,' concludes that higher temperatures increase primary emissions and releases of POPs. Temperature also changes rates of mobilisation from materials, products or stockpiles and alters use patterns, eg, increased demand for disease vector control/DDT. It was demonstrated that increased exposure to POPs also results from secondary re-volatilisation and re-mobilisation from sinks, eg, melting of ice, glaciers and permafrost, flooding of contaminated lands, waste sites and landfills, as well as increase partitioning of POPs from water to atmosphere. There is already evidence of increased remobilization of POPs and heavy metals from glacial and permafrost melt. While enhanced degradation of POPs due to temperature increases is possible, if microorganisms have a higher degradation capacity, this could also lead to increased formation of toxic transformation products.

POPs exposure has direct impacts on individuals and populations, including endocrine effects on reproduction, immunosuppression and epigenetic effects (heritable changes) at cellular level. Temperature has been shown to affect POPs toxicity, and climate change impacts on salinity, ocean acidification, eutrophication and water oxygen levels could (either alone or in combination) enhance the toxic effects of POPs.

[30] *Climate change and POPs: Predicting the Impacts,* Report of the United Nations Environment Program (UNEP)/Arctic Monitoring and Assessment Programme (AMAP) Expert Group, January 2011 Available http://chm.pops.int

Rio+20 outcomes must ensure a coordinated and global response to counteract immediate, medium and long-term effects on human health and ecosystems of concurrent exposure to POPs and changing climates.

Rio+20 outcomes should endorse the precautionary approach to guide development of policy actions to address combined negative impacts of climate change and POPs, including support for mitigation activities with co-benefits.

- Support for Zero Waste and Recycling and the Removal of Single Use Plastics -

To achieve sustainability, societies and governments must succeed in implementing Zero Waste policies,[31] which requires improvement of product design and content to better ensure the ease and safety of recycling. Industries and governments have argued that recycling costs are in some cases more than the production of new items, but this fails to assess the full costs of the life cycle impacts including the waste phase and the impact on finite resources.

A pertinent example is the cost of plastic marine debris. The plastic 'gyres' of the Pacific, Atlantic and Indian oceans are growing as the result of low recycling rates for plastic. Either via direct dumping, river transport or unsecured landfill, waste plastics find their way to the ocean vortices. As plastics do not biodegrade easily in the environment, the amount of plastic in the vortices is increasing substantially. About 250 billion pounds of plastic raw material are produced annually worldwide with unintentional releases to the environment during manufacturing and transport. Plastic pellets are now widely distributed through the world's ocean along with plastic wastes.[32] The plastic accumulates pollutants including nonylphenols, DDE and PCB, which can be up to one million times more concentrated on the surface of the pellets than in the ambient seawater. This high accumulation potential means that plastic resin pellets serve both as a global transport medium and a source of toxic chemicals in the marine environment. Mortality due to plastic ingestion is now common in seabirds, marine mammals and sea turtles. The extent to which the ingestion of hazardous chemical components attributes to wildlife deaths is not available.

To achieve sustainability, Rio+20 outcomes will need, as a priority, to ensure single use plastics are phased-out and provide a clear path to a global reduction of plastic use and disposal.

[31] Zero waste is a philosophy that encourages the redesign of resource life cycles so that all products are reused. SAICM agreement refers to "zero waste resource management, waste prevention, substitution and toxics use reduction, to reduce the volume and toxicity of discarded materials"

[32] Mato, Isobe, Takada, Kahnehiro, Ohtake, and Kaminuma. Plastic Resin Pellets as a Transport Medium for Toxic Chemicals in the Marine Environment *Environ. Sci. Technol*. 2001, 35, 318-324

- Ensure Precautionary Principle and Adequate Assessment is applied to Nanotechnology and Nanomaterials -

In recent years, a wide variety of nanomaterials (substances smaller than 100 nanometers in size) have been added to an increasing numbers of consumer products used in day-to-day life, eg., food packaging, sunscreens, clothing (odor-resistant textiles), pharmaceuticals, cosmetics, agrochemicals, household appliances, and medical devices. This is despite the lack of adequate toxicity assessment, labeling, government regulation or environmental monitoring; and despite the SAICM requirement for publically available information about all stages of a chemical's life-cycle, including in products.

There is huge uncertainty regarding the health impacts and toxicity of nanoparticles.[33] Without mandatory labelling and registration of nano-products, no one, not even governments, knows which products contain nanoparticles. Surveys show that many companies do not conduct risk assessments.[34] Yet both *in vitro* and *in vivo* studies have shown that manufactured nanoparticles, now in widespread commercial use, pose new toxicity risks[35] including asbestos-like pathogenicity and the onset of mesothelioma in test mice,[36] and granulomas, lesions, cancer or blood clots.[37] There is evidence that some nanoparticles can cross the placenta, posing particular risks to developing embryos.[38] Nanoparticles have been shown to have a potential for biomagnification and bioaccumulation in the environment,[39] and a recent study provides clear evidence that nanoparticles

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[34] Helland A et al., (2008) Risk Assessment of Engineered Nanomaterials: A Survey of Industrial Approaches. *Environ. Sci. Technol*. 42 : 640–646 ; Helland A. et al., (2008) Precaution in Practice: Perceptions, Procedures, and Performance in the Nanotech Industry. *J Ind Ecol* 12(3):449-458.

[35] For example see Ashwood P, Thompson R, Powell J. 2007. Fine particles that adsorb lipopolysaccharide via bridging calcium cations may mimic bacterial pathogenicity towards cells. *Exp Biol Med* 232(1):107-117; Brunner T, et al., (2006) In Vitro Cytotoxicity of Oxide Nanoparticles: Comparison to Asbestos, Silica, and the Effect of Particle Solubility. *Environ Sci Technol* 40:4374-4381 ; Limbach L, Wick P, Manser P, Grass R, Bruinink A, Stark W. 2007. Exposure of engineered nanoparticles to human lung epithelial cells: Influence of chemical composition and catalytic activity on oxidative stress. *Environ Sci Technol* 41:4158-4163; Long T, Saleh N, Tilton R, Lowry G, Veronesi B. 2006. Titanium dioxide (P25) produces reactive oxygen species in immortalized brain microglia (BV2): Implications for nanoparticle neurotoxicity. *Environ Sci Technol* 40(14):4346-4352.

[36] Poland C, Duffin R, Kinloch I, Maynard A, Wallace W, Seaton A, Stone V, Brown S, MacNee W, Donaldson K. 2008.Carbon nanotubes introduced into the abdominal cavity display asbestos-like pathogenic behaviour in a pilot study. *Nat Nanotechnol*, Published online: 20 May 2008 (doi:10.1038/nnano.2008.111); Takagi A, Hirose A, Nishimura T, Fukumori N, Ogata A, Ohashi N, Kitajima S, Kanno J. 2008. Induction of mesothelioma in p53+/- mouse by intraperitoneal application of multi-wall carbon nanotube. *J Toxicol Sci* 33: 105-116.

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[38] Takeda K, Suzuki K, Ishihara A, Kubo-Irie M, Fujimoto R, Tabata M, Oshio S, Nihei Y, Ihara T, Sugamata M. 2009. Nanoparticles transferred from pregnant mice to their offspring can damage the genital and cranial nerve systems. *J Health Sci* 55(1):95-102.; Tsuchiya T, Oguri I, Yamakoshi Y and Miyata N. 1996. Novel harmful effects of [60]fullerene on mouse embryos in vitro and in vivo. *FEBS Lett* 393 (1): 139-45.

[39] SCENIHR (Scientific Committee on Emerging and Newly Identified Health Risks). 2009. Risk

can build up in a terrestrial food chain;[40] even in important staple crops like rice where transmission of nanoparticles from plant to seed to the next generation was demonstrated.[41] The potential impacts of these processes on both food safety and the environment are unknown.

The United Kingdom's Royal Society, the world's oldest scientific institution, has recommended that given the emerging evidence of serious nanotoxicity risks, nanoparticles should be subject to new safety assessments prior to their inclusion in consumer products, and the release of nanoparticles into the environment should be avoided as far as possible.[42] Still, the overwhelming majority of nanoproducts are reaching the marketplace without specific safety assessments, and with the workers handling nanoparticles not informed of this fact. No nano-containing products are required to be labeled, and as uses continue to expand, the societal and environmental exposure to nanomaterials, both deliberate and unintentional, will inevitably increase.

Current international efforts, such as the OECD nanomaterials sponsorship program, focus on only a fraction of the nanomaterials already in circulation or nearing commercialization, and are not expected to provide results that can assist risk assessment for some years. It is likely that nanotechnology will do little to redress the systemic causes of poverty, hunger or pollution, and developing countries may even disproportionately bear nano-risks, by hosting manufacturing that wealthy countries reject, or becoming dumping grounds for waste.

Rio+20 outcomes must ensure the precautionary principle is applied throughout the life cycle of manufactured nanomaterials, and that global governance and assessment processes for nanomaterials are transparent, inclusive, equitable and driven by sustainability.

Rio+20 outcomes must ensure consumers' and workers' right-to-know and right-to-choose in respect to nanotechnologies and nanomaterials be respected, as well as a country's right to reject particular applications or uses of nanotechnologies and nanomaterials.

In conclusion -

In this time of increasing globalisation, there is a growing acceptance of the need for a social license and community consent for industrial activities, including new and emerging technologies, to go forward. This is critical for a sustainable future and for the protection of the environment, intergenerational equity and basic human rights. Taking into account Agenda 21 requirements, industries must function within these parameters and have no right to operate

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assessment of products of nanotechnologies, 19 January 2009.

[40] Jonathan D. Judy, Jason M. Unrine, & Paul M. Bertsch, Evidence for Biomagnification of Gold Nanoparticles within a Terrestrial Food Chain, *Environ. Sci. Technol.*, 2011, *45* (2), pp 776–781

[41] Sijie Lin, Jason Reppert, Qian Hu, JoAn S. Hudson, Michelle L. Reid, Tatsiana A. Ratnikova, Apparao M. Rao, Hong Luo & Pu Chun Ke, Uptake, Translocation, and Transmission of Carbon Nanomaterials in Rice Plants, *Communciations Cellular uptake* 2009, 5, No. 10, www.small-journal.com

[42] Recommendations of the Royal Society and The Royal Academy of Engineering, UK (2004). Nanoscience and nanotechnologies. Available at http://www.royalsoc.ac.uk/

unless they satisfy social needs and meet the requirements for a safe, toxic-free environment.

With the added pressure on the planet posed by climate change and world population, the limits of sustainability in a 'business as usual' model have been reached. The urgency has never been greater for sound chemical management, environmental protection and social justice. If a sustainable future is to be possible, the protection of our global commons and, in particular, our shrinking resources of clean air, water and soil, is paramount.

While communities and civil society view a social license in terms of a dynamic, ongoing relationship between companies, government, stakeholders and communities, many regulators still see a 'social license' in terms of a formal permission linked to the regulator granting the 'license.' This is simply not adequate. There are many worrying examples of the failure of this model, for example, in many parts of the world, mining activities and the search for unconventional gas (shale gas, coal seam gas) has resulted in companies undertaking activities that contaminate the global commons and the life support systems on which we all depend. Regulation has not stopped the intentional release of vast quantities of unassessed industrial chemicals into waterways, aquifers and airsheds. The time when an industrial activity can be undertaken purely for profit or economic growth has gone. Sustainable futures depend on access to clean water, soil, air, food and products as well as the right to be protected against toxic trespass. These are basic inalienable human rights for all peoples of the planet and to ensure and protect them is the real challenge for Rio+20.