



Understanding the Threats to Biological and Cultural Diversity



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FOREWORD

The University of Guelph takes great pleasure in presenting this published version of the first annual Hopper Lecture in International Development. The lecture and publication are made possible through a generous endowment from the International Development Research Centre (IDRC). The Hopper Lecture gives distinguished speakers an opportunity to share their experiences and reflections in international development with the public.

Named in honour of David Hopper, IDRC's first president, the lecture is administered by the University of Guelph and offered each year at Guelph and another Canadian university. The partner institution in 1993 was the University of Manitoba.

The inaugural lecturer, Dr. Vandana Shiva, is a distinguished environmentalist and feminist who champions the cause of grassroots participation in developing countries. As director of the Research Foundation for Science, Technology and Natural Resource Policy in Dehra Dun, India, she has had considerable impact at home and in other countries of the South and North. Her degrees in science and philosophy have helped to equip her for her varied and versatile career. She has a bachelor's degree in physics, an MA in philosophy from the University of Guelph and a PhD in the philosophy of science from the University of Western Ontario. She is the author of: *Staying Alive: Ecology and Politics of Survival*; *Ecological Audit of Eucalyptus Cultivation*; *The Violence of the Green Revolution*; *Monocultures of the Mind*; co-author of *Ecofeminism and Cultivating Diversity*; and editor of *Biodiversity: Social and Ecology Perspectives*; and *Close to Home: Women, Health and Ecology*.

J.C.M. Shute, Director
Centre for International Programs

INTRODUCTION OF LECTURE SERIES

It is a great honour for me to speak to you on behalf of Keith Bezanson, President of the International Development Research Centre (IDRC), at the inauguration of the David Hopper Lecture on International Development. Dr. Bezanson has asked me to present his warmest greetings to this assembly and to our speaker, Dr. Vandana Shiva.

David William Hopper was the first President of IDRC, which he served from 1970 until 1977. During his career, he served with distinction in a wide range of institutions and positions related to international development. Most recently he was Vice-President, Policy, Planning and Research of the World Bank.

Had he been able to attend this lecture, David Hopper would not have wished to divert attention from our speaker, a renowned development worker from the frontlines in the struggle for sustainable and equitable development. He would want us to see this lecture not as a celebration of David Hopper but as a manifestation of a unique Canadian institution that he nurtured and guided in its early days.

David Hopper recently accepted the position of chairman of Ontario Hydro International, the global marketing arm of Ontario Hydro. He has taken the challenge to place Ontario Hydro, Ontario and Canada in the big leagues of the international power business. He accepted a similar challenge in 1970 when he returned from India to launch the IDRC, drafting plans for its structure and strategy and identifying key staff who would transform a marvellous concept to a working organization and source of Canadian pride.

The stakes were high. Canada - enlivened by Centennial optimism and increasingly recognized as a peacemaker and reasonable voice in international affairs - was sensitive to criticism that it was showing a tendency to withdraw into continentalism. IDRC was an exciting and bold new approach to the international development element of its foreign policy, designed to assist the developing regions to build up the research capabilities, the innovative skills and the institutions required to solve their own problems. Success would encourage other developed countries to follow suit and change the conventional approach to international development. Failure would strengthen the established assumption that only by transferring northern technologies and techniques would "development" happen.

The Toronto Daily Star in May 1970 announced "This man is moving Canada into the big leagues of aid foundations." The story compared the creation of IDRC to that of the Rockefeller and Ford Foundations in the USA. But David Hopper wanted to improve on the techniques of those famous problem-solving think tanks. The Star pointed out that "new institutions depend for success more on the abilities and personalities of their leaders than on the hopes and good intentions of governments putting up the money." David Hopper was seen to have the right combination - "expertise and stature in the world community of foreign aid, coupled with the independence of spirit needed to break loose from bureaucracy."

His track record gave clear indications of what he wanted. Experience in India led him to challenge the conventional wisdom that Indian

peasant farmers lacked the ambition or intelligence to accept the advice of Western experts on how to improve their crops. For David Hopper, the trouble was not with the Indian farmers, it was with the Western experts whose ideas did not work in Indian conditions. This insight underlies the basic principle that has guided IDRC's strategies and activities for 23 years. Sustainable answers for Southern problems must be found and applied by the South. IDRC's role is to understand, support and co-operate.

Times have changed since those heady days of the 1970s and the Centre - like all publicly funded institutions - has had to adjust. Each president (Ivan Head and Keith Bezanson followed David Hopper) has brought a particular vision and brand of leadership to the work of the Centre, which is carried out with the support of a Board of Governors of outstanding Canadian and international scientists, academics and business people. IDRC received a vote of confidence at the Rio Earth Summit in June of 1992 when the Prime Minister made a commitment to core funding of a billion dollars for the Centre over the next 10 years and assigned a mandate to implement Canada's formal engagement in the renewed search for sustainable and equitable development- the global action plan known as Agenda 21. It is fitting that this event is based at the University of Guelph. David Hopper's first job after graduation was as an agricultural economics faculty member at the university. William Winegard, former president of the university, Lila Engberg and Janet Wardlaw all served on the IDRC Board of Governors. And today's speaker, Vandana Shiva, received her Master's degree in the philosophy of science from the University of Guelph. It is fitting as well that the inaugural lecture is delivered by a guest from India, the country where David Hopper gained the insights into international development that informed his leadership at IDRC. With this inaugural lecture, we honour David Hopper and Canadians like Lester Pearson who met the challenge of finding a new approach to understanding and rectifying global inequalities. In the same spirit of innovation, we anticipate that this series of lectures will provide an annual forum for the presentation of ideas that challenge the status quo and urge all who care for the state of the world to renew their efforts for a better way.

Pierre Beemans Director General
Corporate Affairs and Initiatives Division
International Development Research Centre (IDRC)

UNDERSTANDING THE THREATS TO BIOLOGICAL AND CULTURAL DIVERSITY

The emergence of the concern for conserving diversity is in my view the most significant breakthrough in our times. Diversity offers us the opportunity to undo three colonizations simultaneously:

- the colonization of nature;
- the colonization of women; and
- the colonization of the Third World.

The difference between human and non-human species, between white and coloured peoples and between men and women has been treated as a reason and justification for the rule of the white man over all non-human species, over women and over all non-white races and non-western cultures.

The treatment of difference and diversity as inequality has been based on the effort to shape this culturally and biologically diverse world of ours on the preferred image of one class, one race and one gender of a single species. It has created what I have called monocultures of the mind. These monocultures are becoming an unimaginable threat to diversity even before we start to wake up to the need for protection.

Cultural and Ecological Impoverishment

Monocultures impoverish culturally and ecologically. They breed an intolerance for the diversity that is the very condition of this planet and its people. They unleash violence in a world characterized by cultural and biological diversity because only through violence can homogeneous structures be imposed on diverse ones. When violence becomes the only response from cultures and ecosystems whose integrity and diversity is violated, spiralling cycles of violence are the consequence. Besides unleashing unimaginable levels of violence, monocultures also generate vulnerability. They have a tendency to social and ecological breakdown and their maintenance requires high levels of external control and coercion.

Monocultures are thus also associated with centralized control and authoritarianism. They do not allow an effective democracy, participation and self-organization. Because of the inherent instability of monocultures, control is possible only through deepening the level of violence used to enforce a false order of uniformity in a context of diversity. All institutions we are building - be they in agriculture, economics, politics or knowledge - are producing monocultures at the global level.

The world, however, is not biologically, culturally, epistemologically, economically or politically uniform. In a diverse and plural world, monocultures of the mind do not merely create uniformity, they create apartheid. One model of biological organisms, economic and political structures, or knowledge systems imposed on a world characterized by diversity and plurality creates hierarchy, domination and even dispensability. Difference translates into inequality, first in perception, then in concrete structures of domination. Monocultures force us into the ecological and political stand that plants and people have to be the same to be equal. If they are different, they are inferior. For the dominated, it creates two equally violent options. Either you become like the dominated, or you are dispensed with.

The treatment of diversity as a disease as a condition of inequality - is the tacit and underlying assumption of all projects based on monoculture thinking. It is this threat to cultural and biological diversity that I am trying to grapple with at the local, national and global levels.

Disappearance of Alternatives

The main threat to living with diversity comes from the habit of thinking in terms of monocultures. Monocultures of the mind make diversity disappear from perception, and consequently from the world. The disappearance of diversity is also a disappearance of alternatives - and gives rise to the TINA (There Is No Alternative) syndrome.

How often in contemporary times has the total uprooting of nature, technology, communities and entire civilizations been justified on the grounds that there is no alternative? Alternatives exist, but they are denied or excluded. Their inclusion simply requires a context of diversity. Shifting to diversity as a mode of thought, a context of action, allows multiple choices to emerge. Diversity enriches our world. Monocultures impoverish it. Diversity offers us a survival option. Monocultures threaten life in all its richness.

The Green Revolution: A Biological Monoculture

My concern about monocultures began with the Chipko movement in the Garhwal Himalaya where I come from. The peasant women of Garhwal knew that monoculture pine plantations are not forests. They cannot perform the multiple functions of providing water and soil conservation services, and providing diverse communities of species for food, fodder, fertilizer, fibre and fuel that natural mixed forests of oak, rhododendron and pine provide.

The second experience with the impoverished and impoverishing nature of monocultures was associated with an ecological audit of eucalyptus plantations, especially in the semi-arid zones of Karnataka state. A World Bank social forestry program there was causing the erosion of farm diversity and a consequent erosion of water and soil, livelihoods and supply of biomass for local use. In 1983, the farmers' movement - the Raitha Sangha - started to uproot eucalyptus seedlings in forest nurseries. In their place, they planted seedlings of diverse species like mango, tamarind, jack fruit and pongamia, which are ecologically and economically more appropriate for the semi-arid tracts of India. In *Ecological Audit of Eucalyptus Cultivation* (1987), I have shown how the myth that eucalyptus is fast growing is maintainable only in a monoculture situation. In situations of diversity, many indigenous species emerge as high yielding and fast growing. A later study of the Green Revolution in agriculture done for the United Nations University showed that it was primarily a recipe for the introduction of monocultures and the destruction of diversity. This was also linked to the introduction of centralized control of agriculture and the erosion of decentralized decision-making about agriculture and cropping patterns. Uniformity and centralization made for social and ecological vulnerability and breakdown, a process that I have analysed in *The Violence of the Green Revolution* (1991).

Creating Negative Pluralities

Diverse communities - co-operating with each other and the land - become different communities competing with each other for the conquest of the land. The homogenization processes of development do not fully wipe away differences. Differences persist, not in an integrating context of plurality, but in the fragmenting context of homogenization. Positive pluralities give way to negative dualities, each in competition with every other, contesting for the scarce resources that define economic and political power. The project of development is unleashed as a source of growth and abundance. Yet by destroying the abundance that comes from the soil and replacing it with resources of the state and profits of the marketplace, new scarcities and new conflicts for scarce resources are created. Scarcity, not abundance, characterizes situations where nothing is sacred but everything has a price. Meaning and identity shift from the soil to the state and from plural histories to a singular history. When this happens, ethnic, religious and regional differences are forced into the straitjacket of narrow nationalism. Instead of identity being rooted in the soil and the earth, uprooted communities root themselves in models of power presented by the nation state and the marketplace. Diversity is mutated into duality, into the experience of exclusion, of being in or out. The intolerance of diversity becomes a new social disease, leaving communities vulnerable to breakdown and violence, decay and destruction. The intolerance of diversity and the persistence of cultural differences set one community against another in a context created by a homogenizing state and homogenizing markets. Difference - instead of leading to richness of diversity - becomes the base for diversion and an ideology of separatism.

'Successful' Experiments Crucibles of Violence

In the South Asian region, the most 'successful' experiments in economic growth and development have become crucibles of violence and civil war in less than two decades. Culturally diverse societies, engineered to fit into models of development, have lost their organic community identity. From their fractured, fragmented and false identities, they struggle to compete for a place in the only social space that remains - the social space defined by the modern state and the global market. The upsurge of ethnic religious and regional conflicts in the Third World today may not be totally disconnected from the ecological and cultural uprooting of people deprived of their identities and pushed into a negative sense of self with respect to every other community. Punjab, the exemplar of the Green Revolution miracle - and until recently one of the fastest growing agricultural regions of the world - is today a region riddled with conflict and violence. More than 20,000 people have lost their lives there in the last few years. In 1986, 598 people were killed in violent conflicts. In 1987, the number was 1,544. In 1988, it had escalated to 3,000. Punjab is the most advanced example of the disruption of links between the soil and society. The Green Revolution strategy integrated Third World farmers into the global markets of fertilizers, pesticides and seeds. It disintegrated their organic links with soils and communities. The progressive farmer of Punjab became the farmer who could most rapidly forget the ways of the soil and learn the ways of the market. One outcome was environmental degradation - violence to the soil resulting in water-logged or salinated deserts, diseased soils and pest-infested monocultures. Another outcome was violence in the community, especially to women and children. Commercialization, linked with cultural disintegration, created new forms of addictions and new forms of abuse and aggression. In a situation of monoculture, biotechnology and the gene revolution in agriculture and forestry threaten to worsen the trends toward erosion of diversity and centralization that began with the Green Revolution. What this will mean for social structures has not even been imagined, let alone assessed.

Seeds of Other Ways of Thinking

It is in this context of the production of uniformity that the conservation of biodiversity needs to be understood. Conservation of diversity is, above all, the production of alternatives. Protecting native seeds is more than conservation of raw material for the biotechnology industry. The diverse seeds now being pushed to extinction carry within them seeds of other ways of thinking about nature, and other ways of producing for our needs. Uniformity and diversity are not just patterns of land use; they are ways of thinking and ways of living. It is a modern myth that monocultures are essential for solving problems of scarcity and that there is no option but to destroy diversity to increase productivity. It is not true that without monoculture tree plantations there will be famines of fuel wood, and without monocultures in agriculture there will be famines of food. Monocultures are, in fact, a source of scarcity and poverty - both because they destroy diversity and alternatives and also because they destroy decentralized control on production and consumption patterns. Diversity is an alternative to monoculture, homogeneity and uniformity. Living diversity in nature corresponds to a living diversity of cultures. The natural and cultural diversity is a source of wealth and a source of alternatives. Monocultures first inhabit the mind, and are then transferred to the ground. Monocultures of the mind generate models of production, which destroy diversity and legitimize that destruction as progress, growth and improvement. From the perspective of the monoculture mind, productivity and yields appear to increase when diversity is erased and replaced by uniformity. From the perspective of diversity, however, monocultures are based on a decline in yields and productivity. They are impoverished systems, both qualitatively and quantitatively. They are also highly unstable and non-sustainable Systems. Monocultures spread not because they produce more, but because they control more. The expansion of monocultures has more to do with politics and power than with enriching and enhancing systems of biological production. This is as true of the Green Revolution as it is of the gene revolution or the new biotechnologies.

More Not Necessarily Better

Monocultures of the mind make us think in terms of monotonic values. The assumption is that more is always better than less. "Improvement" and "growth" in a monoculture paradigm block our thinking about enoughness, balance, appropriateness. As Gregory Bateson pointed out in *Mind and Nature* (1988; 56) "desired substances, things, patterns, or sequences of experience that are in some sense 'good' for the organism - items of diet, conditions of life, temperature, entertainment, sex and so forth - are never such that more of the something is always better than less of the something. Rather, for all objects and experiences, there is a quantity that has optimum value. Above that quantity, the variable becomes toxic. To fall below that value is to be deprived." The Green Revolution was based on monotonic values, whether chemical inputs, water inputs or crop production. More chemical use was considered better than less. More water use was considered better than less. More uniformity in cropping patterns was considered better than less. The legacy was growth of chemical pollution, growth of desertification, waterlogging and salinity, and acceleration of genetic erosion in terms of species and varieties cultivated.

Losing the Broad Perspective

Monoculture thought eclipses these processes. It numbs our ability to think in terms of the breadth of diversity - what in Indian Systems of knowledge has been called "brhad," the wide perspective. As a result, it excludes things, processes and functions and simultaneously makes us blind to those exclusions.

When Green Revolution wheat and rice were released as "miracle" and high-yielding varieties, no one bothered to find out whether the local varieties they were displacing and wiping out were actually inferior in yields, or whether the mixed cropping systems were actually less productive and less remunerative. The work of the Plant Genetic Resources Centre in Ethiopia and our work through Navdanya, a people's biodiversity conservation program in India, is revealing that local varieties and mixed cropping systems have falsely been assumed to be low-yielding. In fact, their yields are often comparable and sometimes superior to Green Revolution varieties. This is the case for Mokdo Chinnai, Surya, Assam Chudi in Bastar and Ghiyasu, Rikhva, Anjana and Hansraj in Garhwal. Mixed and rotational cropping is also productive if the productivity takes multiple outputs into account.

Monocultures of the mind encourage increase of quantities to levels of toxicity and decreases of diversity to levels of impoverishment and extinction, but that is not all. They also promote non-sustainability. Monocultures in biological and social systems make for instability and vulnerability. Diversity allows for self-organizing. Monocultures force centralized and external control, which breeds tension, conflict and resistance, calling for more violent means of control. In agriculture and society, breakdown and vulnerability - not stability and resilience - are the features of monoculture systems. Staying within the limiting and limited framework of uniformity and homogenization reduces the options for survival of the people and the planet.

Monocultures are not just reducing the rich biological diversity. They are reducing the way diverse societies organize themselves politically, the way they produce and consume goods and services, and the diverse ways they seek knowledge and innovation.

Monocultures of The Economy

There are two histories that the monoculture mind simultaneously erases - that of the struggle for survival of Third World peoples and that of the real economic interests that drive the only existing superpower to force its vision and will on all peoples and nations of the world.

When Francis Fukuyama (1992) talked of the end of history, he was writing about this silencing and the beginning of a new historical period based on monocultures and apartheid. As Jacques Attali recognized in *Millennium: Winners & Losers in the Coming Order* (1992), "this new order will not put an end to history. It will not be a utopia, harmonious and placid. Indeed, conflict is more likely now that the cold war has ended and the market has triumphed. For inequality will cleave the new world order as surely as the Berlin wall once divided the East and West."

It is this global apartheid that is being forced on us by the globalization of a single political and economic model for the entire world in the new world disorder. Whether it is structural adjustment of the World Bank and International Monetary Fund, or the Dunkel Draft of the General Agreement on Tariffs and Trade (GATT), the paradigm is a monoculture of the economic mind that excludes and does away with alternatives. For example, it ignores the self-provisioning in the survival economies of the South in which large numbers of our brothers and sisters are engaged. The imposition of the model of western market economies on diverse kinds of economic activities, guided by diverse goals and shaped by diverse conditions, does not create a uniform and equal world. It creates a brutalized and unequal world that robs millions of their very right to survival.

Across the world, the threat of ongoing structural adjustment programs to the survival of the Third World people has been recorded in country after country. Structural adjustment is, in fact, an adjustment to a monoculture model with only two consequences:

- either you get integrated into the global market economy dominated only by the objective of profits; or
- you are thrown out of all economic options for survival.

Adjustment Needed for Survival

Adjustment is needed in our economic Systems if the people and this planet are to survive. This adjustment, however, has to be in the direction of making the market economy subservient to - rather than dominant over - the people's survival economy and nature's economy. Economists often forget that there are not one but three economies:

- the market economy organized around the profit motive;
- the sustenance economy organized around the provisioning of sustenance and care;
- nature's economy organized around essential ecological processes.

The latter two are as diverse as the cultures and ecosystems in which they evolve. The monoculture of the economy is destroying the economies of people's sustenance and nature's sustainability. It is destroying domestic production and consumption systems by neglecting the economies of households, communities and even nations. It is reducing economics to global trade. This adjustment to a global economic monoculture must by its very nature threaten the survival of the poor and of the environment.

Level Playing Field Metaphor for Uniformity

The Uruguay Round of GATT aims to establish an economic monoculture worldwide. The metaphor of the level playing field is a metaphor for uniformity. It makes the economic culture and objectives of transnational corporations the measure for the economic activity of diverse economic actors. The level playing field is created by adding the prefix "trade-related" to sectors as varied as services, investment and even ideas and intellectual property, and calling the health, environmental and worker protection policies of each country "non-tariff trade barriers." The result - given that the world is riddled by economic inequality, especially the increasing inequality between the North and South - is not a level playing field. It is economic apartheid.

Free trade is not about the mobility of all factors of production. It is about the mobility of capital, not labour. The free trade model of the Uruguay Round is based on two protectionisms:

- The South is told to give up its borders, to sacrifice national sovereignty, to give foreign investors and professionals national treatment. But such national treatment is not available for the economic actors of the South. For them, Northern borders are closed. The North transfers services and investment. The South merely transfers immigrants.
- At the level of ideas, the situation is the reverse. Ideas from the South travel freely to the North. Ideas from the North - even when originally derived from indigenous knowledge of Third World farmers and herbalists - are protected by Intellectual Property Rights (IPRs).

In both cases, the North demands protection for itself, but refuses equal and similar protection to the South. This asymmetric economic order has at its root the racist assumptions of apartheid. The denial of the knowledge and production of the millions of Third World people is only defensible in a racist worldview. The consequences of this racism are what we associate with apartheid that the resources of the entire planet should be accessible for Northern economic interests. The poor of the South are denied access to both the resources of the planet and the resources of their own countries. Ultimately, one-sided free trade means freedom for the Northern economic powers and increasing

poverty and pollution in the South.

Projections Create False Hope

The projection of a \$200 billion increase in growth, with \$95 billion going to the developing countries and former centrally planned economies is now recognized to be a mirage. The Organization for Economic Co-operation and Development put out the figures as a "pretty theoretical study." The authors acknowledge, however, that on this false basis, "people are hoping for the moon." The figure should in any case be seen in perspective. It will be achieved only after 10 years, and is just five per cent of world trade. The South will not gain new markets through this small and uncertain increase of trade through GATT

The exaggerated claim that the South would derive benefits of \$25 billion through GATT concessions on tropical products has since been corrected by the United Nations Conference on Trade and Development (UNCTAD). According to UNCTAD, the estimated direct trade efforts added up to a total of \$332.87 million, just 2.2 per cent of the trade in these products. Of this relatively modest amount, the industrialized countries got the most - \$24330 million. Asia, principally ASEAN (Malaysia, Thailand, Singapore, Indonesia, the Philippines and Brunei), gained \$81.14 million, Latin America \$10.76 million and Africa sustained a \$1 million loss.

The absence of benefits from the Uruguay Round contrasts totally with the continued drain of \$500 billion from South to North in terms of debt and interest payments, low commodity prices etc. This reverse financial drain would be further increased by the proposal in GATT's text on the trade-related aspects of intellectual property (TRIPS). The US Government has estimated that changes in GATT rules could increase the South's subsidy to Northern research and development by between \$43 and \$102 billion each year. This alone could double the Third World debt burden.

Monocultures of Knowledge

Intellectual property rights are supposed to be property rights to products of the mind. If IPR regimes reflected the diversity of knowledge traditions that account for creativity and innovation in different societies, they would have to be plural. Intellectual modes, property systems and systems of rights lead to an amazing richness of permutations and combinations. However, intellectual property rights as currently discussed in global platforms such as GATT and the Biodiversity Convention, or as unilaterally imposed through the Special 301 clause of the US Trade Act, are a prescription for a monoculture of knowledge.

These instruments are being used to universalize the US patent regime worldwide, which would lead to an intellectual and cultural impoverishment through

displacement of other ways of knowing, other objectives for knowledge creation and other modes of knowledge sharing.

The TRIPs treaty of the Draft Final Act of GATT is based on a highly restricted concept of innovation. By definition, it is weighted in favour of transnational corporations, and against citizens in general, and Third World peasants and forest dwellers in particular. People everywhere innovate and create. In fact, the poorest have to be most innovative, since they have to create survival while it is daily threatened.

Reduction of Intellectual Property Rights

Intellectual property rights as construed in the trade negotiations, however, have been restricted and reduced at a number of levels:

- The first restriction is the shift from common rights to private rights. As the preamble of the TRIPs agreement states, intellectual property rights are recognized only as private rights. This excludes all kinds of knowledge, ideas, and innovations that take place in the intellectual commons - in villages among farmers, in forests among tribals and even in universities among scientists. TRIPs is therefore a mechanism for the privatization of the intellectual commons, and a de-intellectualization of civil society, so that the mind becomes a corporate monopoly.
- The second restriction of intellectual property rights is that they are only recognized when knowledge and innovation generate profits, not when they meet social needs. Article 27.1 of the TRIPs agreement refers to the condition that to be recognized as an IPR, innovation has to be capable of industrial application. This immediately excludes all sectors that produce and innovate outside the industrial mode of organization of production. Profits and capital accumulation are recognized as the only ends to which creativity is put. The social good is no longer recognized. Under corporate control, a de-industrialization of production takes place in small-scale informal sectors of society.
- The third and most significant reduction of intellectual property rights occurs when the prefix "trade-related" appears. Most innovation in the public domain is for domestic, local and public use, not for international trade. In fact, only multinational corporations innovate exclusively to increase their share in global markets and international trade. As a result, TRIPs in GATT will only be an enforcement of the rights of multinational corporations to monopolize all production, all distribution and all profits at the cost of all citizens, small producers worldwide and Third World countries.
Article 27.3.5 (b) of the TRIPs text of the Dunkel Draft of GATT refers to the patenting of life. The article states:
Parties may exclude from patentability plants and animals other than microorganisms, and essentially biological processes and microbiological processes. However, parties shall provide for the protection of plant varieties, either by patents or by an effective sui generis system or by any combination thereof. This provision shall be reviewed four years after the entry into force of the Agreement.

The problem with the TRIPs text of GATT is that while it appears to be an agreement about exclusion of living organisms from patentability, it will in fact put every country on the slippery slope of patenting of life forms already travelled in the U.S. Patent Office and U.S. courts. In any case, it is a tragedy that an issue that is directly related to the ecological and ethical fabric of our society, and to the economic options of survival of our people, should be left to a Ministry of Commerce. GATT - TRIPs is not only about trade. It is also about the ethics of how we relate to other species and what we hold as moral and cultural values in our civilization. It is about how our biodiversity is used and controlled by local communities who have protected it, or by corporations that have found new ways to exploit and own it.

In our culture, and according to our patent laws, life cannot be patented because it cannot be owned and it is not manufactured. GATT will force us to give up our moral values, our economic priorities and our sovereignty. GATT - TRIPs pushes us into making all living organisms the property of a handful of corporations. On first reading, it appears that the article is about the exclusion of plants and animals from patentability. Although the phrase "plants and animals other than microorganisms" exists in U.S. patent law, it has not prevented the U.S. from allowing patents for plants and animals. The problem is that the phrase does not cover parts of animals and plants, nor does it include altered plants and animals. As a result, it allows the patenting of biological organisms.

Further, the words "other than microorganisms," exclude microorganisms from patentability, making the patenting of microorganisms compulsory. Since microorganisms are living organisms, making their patenting compulsory is the beginning of a journey down what has been called the slippery slope to the patenting of all life. The best example of this slippery slope can be seen in the recent history of United States patent law where the granting of patents to microorganisms signalled the taking of a first step to granting patents to so-called higher life forms.

Shuffling Genes

In 1971, General Electric and one of its employees, Ananda Mohan Chakiabarty, applied to the U.S. for a patent on a genetically engineered

Pseudomonas bacterium. Taking plasmids from three kinds of bacteria, he transplanted them into the fourth. "I simply shuffled genes, changing bacteria that already existed," he explained.

The patent office rejected the application on the basis that animate life forms were not patentable. The case was appealed in the Court of Customs and Patents Appeals office and in the Supreme Court nine years later. Chakrabarty was granted his patent on the grounds that the microorganism was not a product of nature, but Chakrabarty's invention and therefore patentable. Andrew Kimbrell, a leading U.S. lawyer, recounts: "In coming to its precedent-shattering decision, the court seemed unaware that the inventor himself had characterized his 'creation' of the microbe as simply 'shifting' genes, not creating life" (Kloppenborg, 1991).

Rush to Patent All Life Forms

On such slippery grounds the first patent on life was granted and in spite of exclusion of plants and animals in U.S. patent law, the U.S. has since rushed on to grant patents on all kinds of life forms. It is this inexorable rush for patenting all life forms that will be extended to India through the openings provided by GATT-TRIPs in its present draft. At an informal dinner with Dunkel, Indian officials suggested a footnote to article 27.3.5 (b) as follows:

It is understood that naturally occurring biological material such as chromosomes, plasmids, DNA/RNA sequences, segments or parts thereof, howsoever derived, are not patentable subject matter.

However, as the Chakrabarty case illustrates, the term "naturally occurring" is ambiguous. All that genetic engineers really do is "shuffle genes around." They do not create life. Literally speaking, therefore, no life forms should be patentable. However, patent offices and courts have interpreted modification as creation. This allows the ownership of any altered biological material. The term "naturally occurring" does not prevent such patenting of life because the term does not cover altered biological materials. It is, in fact, vacuous in preventing the patenting of biological organisms and materials.

The second part of Article 27.3.5 (b) states: "parties shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof. This provision shall be reviewed four years after the entry into force of the Agreement."

Third World Models Not Recognized

This is the part that will most directly affect farmers' rights as innovators and plant breeders and their community ownership of seed and plant material. TRIPs recognizes only the western industrialized model of innovation and has failed to recognize the more informal, communal system of innovation through which Third World farmers produce, select, improve and breed a plethora of diverse crop varieties. Farmers' seeds reflect the ingenuity, inventiveness and genius of the Indian people. The protection of the collective intellectual property of Third World farmers does not, however, even find a place in TRIPs.

While the phrase sui generis gives the impression that each country is free to set up its own intellectual property rights system, the key term "effective" makes the adoption of a global regime necessary. This word was inserted by the U.S. in the Biodiversity Convention and in the TRIPs agreement. The first sentence of that draft refers to the need to "promote effective and adequate protection of intellectual property rights." The same phrase is in Section 301 of the Trade and Competitiveness Act of 1988, which has been used to retaliate against countries whose intellectual property laws do not conform to U.S. standards. The term was defined by the office of the U.S. Trade Representative. The use of the term "effective" in all negotiations related to intellectual property rights and biodiversity is a result of U.S. attempts to globalize American intellectual property rights regimes that allow patenting of all life, including plants and animals. In the Dunkel text, the phrase "effective sui generis system" implies that such a system will not be determined by countries, but by GATT.

Given the trend of the developments in international negotiations, the only system recognized as "effective" at the international level is the system of plant breeders' rights as codified in the International Convention for the Protection of New Varieties of Plants. Plant breeders' rights as recognized in the convention give monopoly markets to breeders of new varieties.

The 1991 amendments increased the monopoly role of breeders' rights. The farmers' exemption, which gave farmers the right to save their own seeds, has also been removed from the amended version of the convention. Farmers now have to pay royalties for saving seed on their own farms even under breeders' rights regimes. Whether it is patents or "effective sui generis systems," farmers' rights are threatened. The farmers' movement in India has been resisting GATT-TRIPs because of these far-reaching implications. On October 2, 1992, the farmers of Karnataka started the Seed Satyagraha at their 500,000-thousand-strong rally in Hospet. In March, 1993, farmers from across the country gathered in Delhi at the historic Red Fort grounds to reject the Dunkel Draft and burn it. The farmers are not satisfied with weak government statements that India will negotiate to allow farmers the right to save and exchange seed noncommercially. For farmers, the right to seed is a positive right, not a negative one. It is a right by assertion, not a concession.

They have started to assert farmers' rights to seed through common intellectual property rights. The first public demonstration of the positive assertion of farmers' rights took place on Independence Day, August 15, 1993 when farmers declared that their knowledge and biodiversity are protected by a "Samuhik Gyan Sanad." The farmers maintain that companies using their local knowledge or resources without the permission of local communities are engaging in intellectual piracy.

The positive assertion of "collective intellectual property rights" creates an opportunity to define a sui generis system centred on farmers' rights that arise from their role in protecting and improving plant genetic resources. Effectivity then has to be interpreted to mean effective in the specific context of different countries. Diversity of intellectual property rights Systems would then become a possibility.

Only such legal diversity can protect the biological and cultural diversity of peasant societies across the Third World. Intellectual property rights diversity that has room for plurality of systems - including regimes based on common intellectual property rights - would reflect different styles of knowledge generation and dissemination in different contexts. Sui generis Systems would have to develop:

- a positive protection system for farmers' rights as plant breeders;
- a relationship between common intellectual property rights that reflect Third World farmers' concerns and intellectual property rights regimes that have evolved with the western bias toward individualized and juridical application procedures, which are not sympathetic to the style of inventiveness common to Third World rural societies. The relationship would need to be effective in preventing the systematic exploitation of Third World biological resources and Third World biological knowledge, while maintaining the free exchange of knowledge and resources among Third World farming communities.

Assumption of Biodemocracy

Sui generis systems that protect common intellectual property rights must necessarily be based on the assumption of biodemocracy, which assumes that all knowledge and production systems that use biological organisms have equal validity. The TRIPs text is based on the assumption of bioimperialism, which assumes only the knowledge and production of western corporations need protection. If unchallenged, TRIPs will become an instrument for displacing and dispensing with the knowledge, resources and rights of Third World farmers. Intellectual property rights regimes as construed in trade platforms are the most important instrument for incapacitating communities attempting to conserve biodiversity.

From the ecological and ethical point of view, there are two main reasons that these actions to coerce Third World governments to adopt intellectual property rights regimes are inconsistent with the objectives of Biodiversity conservation:

- The conservation of biodiversity at the most fundamental level is the ethical recognition that other species have rights and do not

merely derive value from economic exploitation by the human species. Patenting and ownership of life forms ethically state the opposite belief. Patenting of life derives from the world view that non-human species have no rights and their value is a function of the power of economic exploitation by a narrow group of the human species.

- Biodiversity conservation is a product of the cultural contribution of communities that have respected other species and have evolved the knowledge of diverse species and their interactions to allow utilization in harmony with the objectives of conservation.

Intellectual property rights regimes in their current form fail to recognize, reward, reinforce and reproduce these cultures, their values, their rights systems and their knowledge systems. This denial of rights of other species and cultures is a threat to biodiversity. Intellectual property rights actions in the biodiversity domain are coloured with cultural, racial and species prejudice and arrogance. They are becoming a moral, ecological and cultural outrage that has no regard or respect for other species and cultures. Intellectual property rights are a sophisticated name for modern piracy.

Nothing illustrates this piracy better than the case of the beautiful neem tree, *Azadirachta indica*, a native of India used for centuries as a biopesticide and medicine. In some parts of the country, people start the new year by eating the tender shoots of the tree. In other parts, the neem is worshipped as sacred. Every day, everywhere in India, people begin their day by brushing their teeth with the neem datun (toothbrush), which has medicinal and antibacterial properties. Communities have invested decades and centuries of care, respect and knowledge in propagating, protecting and using neem on fields, field bunds, homesteads and common lands.

Today, this material and knowledge heritage is being stolen under the garb of intellectual property rights. U.S. and Japanese companies have been granted protection for an Indian innovation, based on an Indian resource. The myth of discovery has robbed our farmers and their civilization of our contribution. The *Capital Times* of Madison, Wisconsin called neem "a state man's pesticide," referring to businessman Tony Larson who got the first intellectual property rights claim on the biopesticide properties of neem. This in turn was licensed to W.R. Grace and Company of Florida. That company will come to India, rob our communities a second time by taking away their neem resource to process 20 tons of neem a day for export to the United States.

The journal *Ag Biotechnology News* (February, 1993) called this the "world's first neem-tree-based biopesticide facility." This is false. Every home and village in India has biopesticide facilities. Our cottage industry organization, Khadi and Village Industries Commission, has been using and selling neem products for 40 years. Private entrepreneurs too have launched pesticides such as *Indiara*. Neem toothpaste and Margol soap have been manufactured for decades by *Calcutta Chemicals*, an indigenous company.

Condoning Theft of Knowledge

Allowing Larson intellectual property rights protection and calling Grace and Company's plant a first-ever facility amounts to condoning a theft of knowledge and resources of the Indian people. It is illogical, illegitimate and obscene. The common acronym for intellectual property rights - IPR - has been called Intellectual Piracy Rights by Indian farmers. This piracy from nature and from non-western cultures denies intelligence and innovation. It is, after all, nature's production of properties and Third World knowledge of those properties and their use that lie at the core of patents that claim to have created the properties and the knowledge.

The investments made in terms of capital by Larson or Grace are nothing compared to the investments made by our culture in generating knowledge about the properties of neem, knowledge that has been made available to the poorest and most marginal individual in our society. It is also nothing compared to the investments of ecological care given to the neem by our communities so that the tree flourishes in spite of World Bank and government projects that have propagated species like eucalyptus and have devalued indigenous species like neem. It is to these communities that royalties should go. Theirs is the real investment.

Disregard for our cultural and ecological contributions to the neem, and the neem's contribution to our society, amounts to treating commonly disseminated knowledge as non-knowledge, and non-commercial investments of time and care as non-investments. This epistemic and economic reductionism is a basic threat to sustenance and survival. It cannot be the basis of Biodiversity conservation.

Ethical, Ecological and Economic Grounds

Intellectual property constituted on the basis of intellectual and material theft, as in the case of neem, has no place in a global treaty to protect the biological and cultural heritage of this planet. Farmers of India are resisting IPRs on these ethical, ecological and economic grounds.

In biodiversity conservation action, it is crucial to recognize that the material and intellectual contribution of communities far exceed any contribution that capital can make. It is intellectual and physical labour that has nurtured biodiversity and allowed it to flourish. Without this input, biodiversity would have disappeared long ago. Without it, biodiversity cannot be saved for the future.

The conservation of cultures that have conserved biodiversity is the most effective means to protect the richness and variety of life. An example is the *Akti Festival* in Chhattisgarh in Madhya Pradesh, which is a centre of diversity of the *indica* varieties of rice. On *Akti Day*, farmers worship their diverse paddy varieties at the site of the village deity. The rice varieties are then shared among farmers. The ritual reinforces many core principles of Biodiversity conservation:

- It is a celebration of diversity.
- It is a celebration of the renewal of diversity.
- It reinforces the principle of seed as a shared resource, not private property.

The tribals of Chhattisgarh do not merely share their seed with each other, they also share it with other species. In India, birds are not a farmer's enemy, they are friends. Each year at harvest, women weave paddy into beautiful designs to hang up outside their homes during the rains when the birds do not find grain in the fields.

Stopping Bees Usurping The Pollen

How deeply this contrasts with a statement of a Cargill executive who claimed they have succeeded in "stopping bees from usurping the pollen" or with David Pearce's thesis that the protection of biodiversity cannot have concern for the rights of other species because of scarcity of resources. In his recently published *World Without End* (1993; 394), he says: "It is important to establish the value of biodiversity to humankind so that priorities for protection can be determined. Such an approach is self evidently anthropogenic - it affords no concept of inherent rights of species other than humans to exist. The problem with the rights-based approach to biodiversity conservation is precisely that it does not face the reality of limited resources for protection."

Biodiversity cannot be protected within a worldview that sees other species as usurpers or competitors with humans. Biodiversity conservation action demands a biodiversity ethic that respects the rights of other species and gives them space to flourish and multiply. Biodiversity conservation cannot be ensured by worldviews, legal systems and technologies based on trampling the rights of other species/cultures. It will not be achieved by an unrestrained urge to own, control, manipulate and exploit life forms.

Actions to protect life's diversity can only come from the spirit of sharing and compassion from a larger vision and values. Paradoxically, it is the poorer Third World communities that have this large vision and compassion for other species and are able to create space for them through their practices. The rich and powerful have narrowed their world through monocultures of the mind. They think and live in imagined scarcity, even while accumulating limitless wealth. In the process, they create real scarcity and extinction.

A movement for the conservation of biodiversity is inevitably a movement for the protection of cultural diversity. The view that diversity is a disease that must be cured is becoming a social and ecological threat in our times. Ethnic and religious "cleansing," crop monocultures and genetic uniformity are symptoms of a worldview that fuels the intolerance of diversity in culture and nature. Cultivating diversity is no luxury in our times. It is a survival imperative.

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