Intellectual Property, Bioeconomy, Multiplicity: An Inquiry into Spatialities of Governance, Power and Subjectivity

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Abstract

This thesis discusses how law, especially intellectual property and biodiversity laws, mediates the operation of the bioeconomy by 'thinking through' the philosophy of Gilles Deleuze/Felix Guattari. As experimental thinkers, Deleuze/Guattari were committed to bring movement in concepts, that is, to experiment with concepts. Hence, the thesis deploys the concept of 'desiring-machine' to explain the operation of the bioeconomy. In this respect, the thesis focuses on the Bt. brinjal controversy in India – a specific instance of bio-economic production. Techno-scientific and legal discourses in the controversy have highlighted the risk and uncertainty surrounding modern bio-technical science and its regulation. A more interesting narrative, however, is the discourse of biopiracy, which claims that a number of global/local entities appropriated local germplasm illegally to produce the Bt. brinjal. And so, the thesis looks at the controversy as an 'event' in which heterogeneous elements, along with law, co-exist, co-function, form alliances and work in symbiosis. Pointing out the connection and relation between the elements, the thesis suggests that the bioeconomy operates in a connective fashion, through machinic conjunctions. Said otherwise, the bioeconomy is a 'machine' – each element functions in conjunction with others. It follows that the Bt. brinjal controversy is an effect of machinic assemblage. And yet, the question is: what establishes machinic conjunctions between the elements? The thesis observes that the bioeconomy is founded on desire because it is desire that connects, couples, assembles, creates chains and produces intensities. In what follows, the elements of the machine relate to each other through the continuous movement of desire. The argument, then, is that the bioeconomy is a 'desiring-machine'. Its operation, however, is mediated by law. In view of this, the thesis sheds light on a number of issues by unfolding the controversy. In particular, the thesis shows how the desire to propertise, to normalise appropriation, to capture, to contest, to produce transformed subjects and more importantly, to expand the spaces of bio-economic production move and flow through disparate legal mechanisms and practices. To be more specific, the thesis highlights how law mediates the movement of desire, which establishes machinic conjunctions between an array of elements located in dispersed spaces, and by doing so, spatialises materiality, normalisation, power and subjectivity. The Bt. brinjal controversy, from this point of view, has 'multiple dimensions'.

Since the aim of this research is to experiment with concepts, the thesis 'thinks through' the concept of 'multiplicity' to construct the dimensions. As a topological concept, the term 'multiplicity' puts emphasis on constructing the 'multiple' by adding elements successively through conjunctions. In this vein, the thesis thinks rhizomatically – a style of thinking that moves in all directions to connect and link dispersed elements, thereby organises and arranges the relations between the 'many' in semiotic chains. As such, the essence underlying the thesis is deeply topological or spatial because it not only connects the 'many' through conjunctions and actualises their relations in extensive series, but also links up and combines one concept with another. Thus, while Deleuze/Guattari's philosophical thinking remains the enduring thread throughout the thesis, a number of other concepts, specifically from Michel Foucault and Georges Canguilhem, are added successively. To this effect, the thesis combines the concept of de/re-territorialisation with the analytics of 'governmentality' and 'normalisation', brings 'desire' in conversation with 'power', and links up 'becoming' with 'subjectivity' to multiply and expand the dimension of the controversy. The composition, then, itself becomes an articulation of the spatialisation of thought. Consequently, the thesis moves beyond the confines of the case discussed and relates the latter to broader issues concerning the operation of the bioeconomy. In fact, the Bt. brinjal controversy becomes a conduit for a theoretical exploration and explanation of how the bioeconomy operates as a desiring-machine; and how law mediates such operation in a global/postcolonial context. More broadly, the thesis engages with spatiality and spatialisation in a serious manner by focusing on how law spatialises materiality, normalisation, power and subjectivity, and to this end, offers a different way of critiquing law and its relation with the bioeconomy.

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Declaration

I, Mizanur Rahaman, certify that this thesis has not been submitted for any other degree or professional qualification. It is solely my own work and composed by me.

Abbreviations

ABLE	Association of Biotechnology Led Enterprises
ABSP	Agricultural Biotechnology Support Project
FSB	Fruit and Shoot Borer
BIO	Biotechnology Innovation Organisation
BP	The Bioeconomy Project
Bt.	Bacillus Thuringiensis
CBD	Convention on Biological Diversity
COP	Conference of the Parties
DBT	Department of Biotechnology
DNA	Deoxyribonucleic Acid
DST	Department of Science and Technology
EC	European Commission
EPC	European Patent Convention
EPO	European Patent Office
ESG	Environment Support Group
EU	European Union
GATT	General Agreement on Tariffs and Trade
GEAC	Genetic Engineering Approval Committee
GM	Genetically Modified
GMOs	Genetically Modified Organisms
ICAR	Indian Council of Agricultural Research
IFP	International Futures Programme
IPC	Intellectual Property Committee
IPR	Intellectual Property Rights
IUCN	International Union for the Conservation of Nature and Natural

	Resources
KBB	Karnataka State Biodiversity Board
KIA	Knowledge Initiative in Agriculture
Mahyco	Maharashtra Hybrid Seeds Company Private Limited
MNEs	Multinational Enterprises
MoEF	The Ministry of Environment and Forests
MST	The Ministry of Science and Technology
NBA	National Biological Authority
NGOs	Non-Governmental Organisations
NIPGR	National Institute of Plant Genome Research
OECD	Organisation for Economic Co-operation and Development
PCT	Patent Cooperation Treaty
PFC	Patent Facilitating Centre
PIL/SAL	Public Interest Litigation/Social Action Litigation
RAFI	Rural Advancement Foundation International
RCGM	Review Committee on Genetic Manipulation
SP	Scoping Paper
TEC	Technical Expert Committee
TNAU-C	Tamil Nadu Agricultural University-Coimbatore
TRIPs	Trade-Related Aspects of Intellectual Property Rights
UAS-D	University of Agricultural Sciences-Dharwad
UN	United Nations
UNCED	The United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
US	United States

USAID	United States Agency for International Development
USPTO	United States Patent and Trademark Office
WIPO	World Intellectual Property Organisation
WTO	World Trade Organisation

Contents

Introduction

The central argument of this thesis is that the bioeconomy is a 'desiring-machine'.[1] The thesis, then, intends to provide an account of how the machine operates; and how law, especially intellectual property and biodiversity laws, 'mediates'[2] such operation? To explore these questions, the thesis 'thinks through' the philosophy of Gilles Deleuze/Felix Guattari. For Deleuze/Guattari, production is always machinic production – when something is produced, it is an effect of machine. Although comprised of heterogeneous elements, a machine is a composite unit. It operates in a connective fashion. Yet the components of a machine connect and relate to each other through the continuous flow of desire. Put otherwise, it is desire that establishes machinic conjunctions between the component parts. A machine is thus a 'desiring-machine'. And production is always desiring-production. It follows that a desiring-machine is an infrastructure or a social formation in which heterogeneous elements co-exist, co-function, form alliances, and work in symbiosis through the movement of desire. It is important, therefore, to see the desiring-machine as a 'multiplicity'[3] or an 'assemblage'.[4] To flesh out these insights, I look at the Bt. brinjal controversy in India as a case in point. I argue that the Bt. brinjal, a specific instance of bio-economic production, is an effect of machinic assemblage. To this end, I explain how disparate elements connect, interact and relate to each other in the controversy. What is more, I show how desire moves through disparate elements, and how law mediates such movements. With this in mind, the thesis narrates the relations between heterogeneous entities situated in dispersed locations. To take it even further, the thesis reveals the 'multiple dimensions'[5] of the controversy, specifically by

[1] I discuss the concept in more detail below, specifically in the section 'Why Deleuze/Guattari?'.

[2] To avoid confusion, it is necessary to emphasise upfront that by saying law is mediator I am following Gilles Deleuze. For Deleuze, mediators are fundamental, nothing happens without them and they can be people, things, plants, animals, whether real or imaginary, animate or inanimate (Deleuze 1990/1995, p 125).

[3] A multiplicity can be understood as an organisational and differential relation belongs to the many that must be actualised in diverse spatio-temporal relationships (Deleuze 1968/1994, pp 182-183; Deleuze 1973/2001; Deleuze 2002/2004, p 177). I elaborate and move this understanding in a different direction in chapter 2.

[4] According to Deleuze/Guattari, an 'assemblage' is a constellation of heterogeneous elements that are selected, organised and stratified by deducting from the flow. An assemblage, from this point of view, increases the dimension of a multiplicity (Deleuze and Guattari 1980/2004, pp 9 and 448). The meaning of the term will become more clear in chapter 2.

[5] Although the meaning of the terms 'multiple' and 'dimension' will become clearer as the thesis progresses, it is necessary to emphasise these two terms early on. By 'multiple' I do not mean an opposition between the one and the many, but rather 'multiplicity'. And by 'dimension' I mean

illustrating how relations multiply and expand, and by doing so, spatialise materiality, appropriation, power and subjectivity. In short, the thesis describes how the bioeconomy operates as a desiring-machine, and how law mediates such operation in a 'global/postcolonial'[6] context by looking into an event – the Bt. brinjal controversy.

While I discuss Deleuze/Guattari's distinct style of doing philosophy below in detail,[7] it is necessary to emphasis briefly at this stage that as philosophical thinkers, their approach to philosophy was experimental, that is, to experiment with concepts – to create new concepts by unmaking and remaking their own concepts. But Deleuze/Guattari were experimental thinkers, they were committed to bring movement in thought, to bring movement in concepts. So their experimentation was never limited to the creation of new concepts. It was equally oriented towards moving, combining and linking one concept with another because a concept has a number of components that not only function in conjunctions, but also link up with other concepts. And how to link or when to connect one concept with another appear in the flow of thought. Hence, for Deleuze/Guattari, establishing links or creating joints between the concepts is an act of thinking, an act of experimentation. Therefore, in this thesis 'thinking through' their philosophy means experimenting through their concepts. That is, to deploy their concepts and link them up with a host of other concepts in order to multiply and expand the dimension of the controversy.

The Bioeconomy Project (BP)

We are aware that modern biotechnology, from its inception to experimental successes in the laboratories of industrialised countries, has rapidly become a global

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change in relationship, which changes according to the change in variables or co-ordinates in a multiplicity (Deleuze 1968/1994, pp 182-183). Taken together, 'multiple dimensions' means multiplication, multiplying, and expanding the relations between heterogeneous elements.

[6] In general, the term 'postcolonial' alludes to both the impact and legacies of formally disposed imperial regimes and to new forms of exploitative global relations (McNeil 2005, p 106). Thus, the expression can be used to signify the contested spaces of globalisation – 'at once an extension of the world systems of modern capitalism and colonialism and a newer network that presents a complicated picture of national and transnational agents, capital and labour, suppliers and markets, NGOs and multilateral agencies' (Loomba et al. 2005, p 2).

[7] In the section 'Why Deleuze/Guattari?' below.

technology promising enormous benefits not just to the world's poor but also to the biotech industry. To put it another way, not only does biotechnology promise to deliver new technological possibilities and solutions (plants and seeds with improved resistance to pests or insects, disease free plants, abiotic stress resistance plants, or plants with improved nutritional content) to overcome hunger, malnutrition, disease, environmental degradation and loss of biodiversity in the developing world; it has also created promising new markets for these technologies with increasing returns to the life sciences industry engaged in the production of genetically modified plants and seeds. We can find a clear manifestation of this rhetoric in the OECD's Bioeconomy Project. In a 2006 Scoping Paper (SP), the OECD describes the Bioeconomy Project (BP) as 'the aggregate set of economic operations in a society that use the latent value incumbent in biological products and processes to capture new growth and welfare benefits for citizens and nations' (OECD 2006, p 3). Although humans have always had a bioeconomy, current thinking emphasises the use of cutting-edge science and technology to realise the economic potential of biological resources in terms of supporting growth and well-being (Frow et al., p 18). For instance, in a report published in 2009, the OECD – an inter-governmental organisation of thirty industrialised countries, proposes to transform the world through biotechnological inventions and innovation. The report, entitled *The Bioeconomy to 2030: Designing a Policy Agenda* (OECD 2009), points out that the 'bioeconomy can be thought of as a world where biotechnology contributes to a significant share of economic output' (OECD 2009, p 22). Thus, the Report, a strategic policy document produced under the International Futures Programme (IFP) of the OECD, aims to promote biotechnologically designed and manufactured materials for sustainable growth in both developed and developing countries. In this direction, the Report identifies the key trends and transformative forces of modern biotechnology and prescribes long-term strategies to help governments formulate policies in order to capture the potential economic and social benefits of the bioeconomy. Further, the Report points out that the bioeconomy 'covers a broad range of economic activities, each benefiting from new discoveries, related products and services arising out of the biosciences' (OECD N.D., p 1).

The productive logic of the bioeconomy can be traced back in the 1970s. During this period, the US economy went through radical restructuring. In the face of declining profit in heavy industries based on Fordist mode of mass and standardised production, 'it was claimed that in order to assert its world dominance, the United States would need to move from heavy industry to an innovation-based economy, one in which the creativity of the human mind (a resource without limits) would replace the mass-production of tangible commodities' (Cooper 2008, pp 17-18). In response to this speculative impulse, biological sciences and technologies started to play a commanding role in reformulating economic strategies, and research and development policies along post-industrial lines. The possibility to modify, alter or recombine the genetic, cellular or molecular elements of life through recombinant DNA technique,[8] and its successful application in novel ways to produce chemical and herbicide tolerant plants and seeds, opened up new spaces for capital investment. From this point of view, new developments in molecular biology, cell biology, and microbiology marked a turning point in the US economy. Modern bio-technical science thus not only became the new strategy of economic imperialism (Jasanoff 2006, p 276), but also 'transformed biological production into a means for creating surplus value' (Cooper 2008, p 23). What is significant about these developments is that policies were geared towards bringing science, technology and economy into a tighter alliance to create a new regime of accumulation based on bio-technical materialisation of living substances that relocated production at the genetic, cellular and microbial level.

The emerging bioeconomy is primarily concerned with optimising the economic value and latent forces of bio-genetic resources and, therefore, the transformation that came with it is widespread and remains deeply embedded in economy, society and culture. The OECD Report claims that the emerging bioeconomy is global in scope, in the sense that it leads to far-reaching changes not only in economic and

[8] Though fermentation practice is regarded as the oldest instance of microbial biotechnology, the recombinant DNA technique or genetic engineering is significantly different, since it allows biologists to mobilise the specific reproductive processes of bacteria as a way of generating new life forms. Thus, recombinant DNA technique allows biologists to create chimeric organisms by moving genetic sequences across the barriers of species and genus, transferring DNA from plants and animals to bacteria and back again through transversal processes of bacterial recombination and therefore, differs from traditional breeding methods, which is based on vertical transmission of genetic information (sexual compatibility). For details, see Cooper 2008, p 33.

scientific activities, but also in institutional and legal arrangements globally. Thus, there is a continuing emphasis on legal mechanisms with specific reference to – (1) sustainable access and utilisation of bio-genetic resources; and (2) protection of commercial investments in biotechnological research and inventions through intellectual property rights, mainly from developed countries and bio-tech industries. For example, the SP contends that in order to capture the benefits of bio-revolution, governments have to address a number of scientific, technical, economic, industrial, social and governance issues, and identify areas where public policy can be effective in removing barriers (OECD 2009). Given the OECD's role in providing a roadmap for governments and industry to capture the latent value of biological products and processes, the policy concern is mainly with existing legal and regulatory provisions, both at the local and the global level, which hinder or are having a negative impact on the future development of the bioeconomy (OECD 2006, p 13). Accordingly, the BP fleshes out that governments need to adjust regulatory provisions because sustainable access to biological resources and exchange of these materials openly by the industry is necessary to 'transform plants into "factories" that can produce everything from modified foods to commodity chemicals' (ibid., p 8).

There is no doubt that biotechnology poses a serious challenge for governance and regulation (see, for example, Forbes 2006; Black 1998), but for the BP, governance and regulation have a different dimension: harnessing biological resources to the market by removing impediments. For instance, in a Report published in 2003 titled *Harnessing Markets for Biodiversity: Towards Conservation and Sustainable Use*, the OECD points out that there is an emerging private market of biodiversity goods and services, such as genetic resources and therefore, policy-makers should consider the market as an integral part of biodiversity policies (OECD 2003, p 9). These policies should be geared towards biodiversity conservation and its sustainable use because traditionally extraction of biological resources and its exchange has taken place on an informal basis, which does not recognise its potential economic or market value. This absence of regulation by way of well-defined property rights has created the problem of over-exploitation and unprecedented rate of biodiversity loss. Therefore, the first step in the process of biodiversity conservation, according to the Report, is to identify the potential market value of biodiversity by creating markets

(ibid., p 7). In this respect, the key element for the development of markets for biodiversity is enforceable regulations because without regulation the market fails to recognise the exchange value of genetic materials (ibid., p 25). To ease this uncertainty, the Report suggests, first, regulation needed to be developed to allow for commercial exchange of bio-genetic resources (ibid., p 10). And second, property rights are fundamental for creating markets. If property rights are clearly established and enforced, and if trading is permitted, markets can in principle develop (ibid., p 27). However, the main impediment in the commercial exchange of bio-genetic resources through market is the absence of regulation. Therefore, the absence of a potential market for bio-genetic resources is a failure or crisis in governance. Hence, for the OECD, this crisis in governance demands the creation of a new process or arrangement for governing – a new structure or an order which will regulate the exchange of bio-genetic resources in the market.

However, what is more interesting about this narrative is that this concern with lack of governance mechanisms to regulate the appropriation and utilisation of biological resources for economic development was very much on the political agenda as early as in 1972.[9] It was reasserted vigorously in a number of United Nations (UN) reports, conferences and declarations during the 1990s,[10] culminating into the Convention on Biological Diversity 1992 (CBD) – a global governance mechanism that prescribes legal arrangements for the appropriation and exploitation of bio-genetic resources. Moreover, the attempt to re-define juridical institutions for creating a secure environment for capital investment in life sciences research and worldwide market for new bio-technologies was equally on the agenda during the same period. More specifically, rapid advances in agro-biotechnology in the US and other developed economies proved to be a strong justification for the creation of a new proprietary regime that would institutionalise the propertisation of living substances in the interest of their own biotech industry. Therefore, the reasons behind the creation of a new proprietary regime by way of patents on artificially manufactured living substances need to be understood in the larger context of high-tech euphoria and

[9] United Nations Conference on the Human Environment 1972 (the Stockholm Declaration).
[10] Such as the World Charter for Nature 1982, the Brundtland Report 1987 (*Our Common Future*), the IUCN Draft Convention 1988, the Rio Declaration and Agenda 21, 1992.

utopian impulse surrounding the 'biotech revolution' and its promise to overcome all ecological and economic limits in the production and reproduction of biological life and capital on earth (Cooper 2008, p 00). Thus, a series of changes were made in intellectual property legislations to include innumerable life forms manufactured through biotechnological alteration or manipulation within the scope of patentable invention. The argument was, as Cooper points out, that

> 'In the absence of any tangible assets or actual profits, what the biotech start-up can offer is a proprietary claim over the future life forms it might give rise to, along with the profits that accrue from them. In essence then, what these reforms have formalised is the prospective value of promise, turning life science speculation into a highly profitable – indeed rational – enterprise' (Cooper 2008, p 28).

Intellectual property law, then, brought a paradigm shift in the ever expansive spaces of bio-economic production and shaped the future course of the emerging bioeconomy. The possibility to separate, modify, extract and recombine biological potentialities of living substances through recombinant DNA technique not only make visible the commoditisation of life and its innermost properties; it further highlight the emergence of an economy of growth based on the promise and potentiality of bio-innovation. As Palsson observes, 'clearly, with modern biotechnology the "natural" capacities of the body have been turned into instruments of production, redefining both human[biological] labour and human[biological] bodies' (Palsson 2009, p 298). Put simply, genetic engineering is based on the premise that natural capacities of living organisms can be re-shuffled, re-programmed and engineered on the molecular level to generate bio-economic value (Thacker 2001, pp 1-3). Thus, uncovering the secrets of productive bodies and their propertisation through intellectual property law become the only 'drive' in the bioeconomy. As Franklin notes, 'extracted from the body, cellular functionality has become a field of property speculation, in the sense that cells are seen both to *have* new formal properties, and to *be* valuable as new property forms; that is, as various forms of biocapital' (Franklin 2005, p 63; original emphasis). In this sense, biocapital is simultaneously a continuation, an evolution and a subset of capitalist production (Sunder Rajan 2006, p 10) that transforms biological capacities into commodities or material objects.

Ownership of knowledge thus becomes increasingly important in the bioeconomy and intellectual property law, more specifically patent law, as a market device is instrumental in capturing and safeguarding the 'biovalue' either generated from artificially isolated and manipulated gene and protein sequences, or embedded in artificially manufactured living organisms, such as genetically modified and improved plants and seeds.[11] By 'biovalue', Waldby refers to 'the yield of vitality produced by the biotechnological reformulation of living processes' (Waldby 2002, p 310). She explains further that 'the production of "biovalue" is caught up with the production of capital value. The process of producing "biovalue" is also the process of technical innovation that enables the patenting of cell lines, genes and transgenic organisms as inventions, securing their status as intellectual property and possible sources of profit for their inventors' (ibid.; see also Waldby and Mitchel 2006, pp 32-33). And yet what is crucial here is not just to understand the transformation of biovalue into intellectual property as capital value but also an understanding of how the 'drive' or 'desire' to produce, appropriate, and propertise operate, function and expand, how desire connects and assembles heterogeneous entities, and how law mediates these operations in a global/postcolonial context.

Bt. Brinjal

In this thesis, I have chosen to focus on Bt. brinjal controversy in India. The Bt. brinjal/aubergine is a genetically modified (GM) food crop and therefore, it is a new life form. The production of Bt. brinjal was started in 2000 by Maharashtra Hybrid Seeds Company Private Limited (Mahyco) under a collaborative partnership with global biotech firm Monsanto, a pioneering but controversial figure in the field of

[11] For example, between 1991 and 2002, biotechnology patent application grew by 8.3% a year, while total EPO patent application grew by 5.7%. In 2002, more than 5,800 biotechnology patents were filed at the European Patent Office (EPO), most of which originated from the United States (39.9%), Europe (34.5%) and Japan (14%). Similarly, New Zealand, Denmark and Australia have a very high ratio of biotechnology patent applications to the EPO (more than 10%). See van Beuzekom and Arundel 2006, p 44.

agricultural biotechnology.[12] The genealogy of this collaborative relationship can be traced back in the production of Bt. Cotton, in the sense that it involves the supply of same Bt. gene (Cry1AB – Cry1AC)[13] to Mahyco – a bio-technically engineered living organism patented by Monsanto. By inserting the chimeric Bt. gene into the cell of brinjal plant, Mahyco produced a genetically modified brinjal plant that promises to express lethally toxic resistance to lepidopteran pests, such as brinjal 'fruit and shoot borer' (FSB). The Bt. brinjal was ready for field trial by 2002. However, in March 2003, a collaborative relationship developed between Mahyco and a number of other entities, such as Tamil Nadu Agricultural University, Coimbatore (TNAU-C), University of Agricultural Sciences, Dharwad (UAS-D), Cornell University, the United States Agency for International Development (USAID), and the Department of Biotechnology (DBT). This collaboration was forged with the support of Agricultural Biotechnology Support Program (ABSP) II – a US Government strategic policy initiative to promote agricultural biotechnology in developing countries and create new markets for the US biotech industry.[14] Accordingly, Sathguru Management Consultants[15] was appointed as the South Asian Region co-ordinator of ABSP II. The initial funding for this collaborative relationship came from the DBT, Government of India, to develop a pro-poor open pollinated variety for distribution to resource constrained farmers at marginal cost. However, it was decided that Mahyco was free to sell a hybrid variety at a higher price in order to recover its investment. Subsequently, the USAID provided funding to bring the product into the market 'because the pro-poor strategy and the shared partnership were particularly attractive' to the U.S. Agency (Shelton 2010).

[12] Mahyco's Letter to Karnataka State Biodiversity Board (KBB), 25th June 2010 (on file with the author). For more details on Monsanto's risky ventures and associated controversies, see Innovest 2005; Robin (2010).

[13] *Bacillus thuringiensis* (Bt.) is a gram positive, spore forming bacteria that exist in diverse locations, such as soil, plant surfaces, insect cadavers and in grain storage dusts. For details, see Lenin et al. 2007.

[14] For more details, see chapter 1. It is important to point out that the Agricultural Biotechnology Support Project (ABSP), launched by the USAID in 1991, is a consortium of private corporations and public research institutions. The Project was launched to identify ongoing GM crop research projects at US public research institutions and corporate laboratories, and to push these projects in developing countries in collaboration with public research institutions. So the main purpose of the Project was not only to create new markets for US bio-tech corporations, but also to promote US style intellectual property legislations in developing countries. The ABSP II Project is managed by Cornell University and its private sector partners include leading agro-biotech corporations, such as Asgrow, Monsanto, Pioneer Hi-Bred, and DNA Plant Technology (DNAP). For details, see GRAIN 2005.

[15] A management company based in Hyderabad, India. The company provides advisory service to public, private and academic institutions regarding technology transfer, public-private partnerships, and collaborative research programmes.

The Bt. brinjal was approved for commercial cultivation on 14 October 2009 by the government-controlled Genetic Engineering Approval Committee (GEAC), a regulatory agency of the Ministry of Environment and Forests (MoEF), Government of India. Just after its commercial release, brouhaha erupted throughout the nation against the GEAC's decision. On the next day, Jairam Ramesh (then Minister of Environment and Forests) faced with extreme public outrage imposed a moratorium on its commercial release on the ground of scientific uncertainty and inadequacy of risk assessment. What is significant about the Bt. brinjal controversy is that from its inception in 2000, it has attracted enormous attention from concerned civil society actors and generated heated debates among concerned citizens and scientists, mainly because it was the first GM food crop to be released in India for commercial cultivation. However, these concerns and debates were limited to the risk and uncertainty of bio-technical science, which I will discuss in more detail in chapter 1. But to illustrate the point briefly here, even before the commercial release of Bt. brinjal, a number of civil society actors in Public Interest Litigation (PIL) at the Supreme Court of India highlighted the potential health and environmental risks, and the social and economic implications associated with GM crops field trials.[16] Responding to the petitioners, the Supreme Court imposed a moratorium on large scale field trials in 2006. Although it was lifted in 2007, the Court re-imposed the moratorium on the recommendation of the Technical Expert Committee (TEC).[17]

In contrast, Environment Support Group (ESG), a civil society actor based in Bangalore, India, that fights for environmental social justice (and its new leafy green web site[18] provides ample evidence of it), made a submission pointing out some legal issues in the approval of Bt. brinjal to Minister Jairam Ramesh.[19] The main

[16] Gene Campaign and Another v. Union of India and Others, Writ Petition (Civil) Nos. 115/2004 and 606/2007; Aruna Rodrigues and Others v. Union of India and others, Writ Petition no. 260/2005 (on file with the author).

[17] Aruna Rodrigues and Others v. Union of India and others, Writ Petition no. 260/2005 (on file with the author); GMWatch (2013) Indefinite moratorium on GM field trials recommended in India, available at: http://www.gmwatch.org/news/archive/2013/14866-indefinite-moratorium-on-gm-field-trials-recommended-in-india.

[18] www.esgindia.org

[19] Just after imposing the moratorium, Minister Jairam Ramesh announced that he will conduct a series of consultations in all major cities in India to collect opinions and concerns from concerned

contention of ESG was that Mahyco/Monsanto and their collaborators have accessed and appropriated local brinjal germplasm in the production of Bt. brinjal, for which prior approval of National Biodiversity Authority (NBA) is necessary. Therefore, this unauthorised appropriation of bio-genetic resources is illegal and amounts to an act biopiracy in terms of the Biological Diversity Act, 2002. The ESG further contented that this violation denies local farming communities who have protected and cultivated these local brinjal varieties from their right to receive compensation or benefit according to the CBD and the Biological Diversity Act – two global/local legal mechanisms that govern the access and appropriation of bio-genetic resources. Thus, instead of focusing primarily on the risk and uncertainty of bio-technical science, the ESG brought attention to the issue of unauthorised appropriation, 'prior informed consent' and the right to receive compensation or benefit arising from commercial exploitation of local germplasm. However, there are a number other more pressing issues, such as Mahyco/Monsanto's desire to propertise a new life form and its future progeny, the desire to normalise appropriation, the desire to contest, and the desire to produce proprietary subjects that remain enveloped in the controversy. This brief description suggests that in the controversy, heterogeneous elements co-exist, co-function, interact and relate to each other. The Bt. brinjal controversy, then, has 'multiple dimensions', it is a multiplicity.

Why Deleuze/Guattari?

Gilles Deleuze/Felix Guattari have a distinct style of doing philosophy, that is, not just to create new concepts, but also to bring movement in concepts. Throughout their philosophical oeuvre, they have consistently searched for new layers, new dimensions and developed mixed forms. Accordingly, their philosophy is differential, constructionist and experimental. In the initial period, Deleuze was mostly concerned with writing a history of philosophy by engaging with a particular author's philosophical thinking, such as David Hume, Friedrich Nietzsche, and Henri

citizens regarding the commercialisation of Bt. brinjal. He conducted these consultations in the months of January and February 2010, which I will discuss in chapter 1.

Bergson.[20] In subsequent texts, however, he was more interested to develop his own philosophy of thought or image of thought, either by enfolding or folding his thought with other philosophers' thinking. For Deleuze, the 'image of thought' is a style of thinking that orientates oneself in thought, to stretch out, run out along the horizon, and to keep pushing thinking further. In short, it guides the creation of concepts (Deleuze 1990/1995, pp 147-148). This is clearly noticeable in *Difference and Repetition* (1968/1994), a book that marks the beginning of Deleuze's distinctive style of doing philosophy – 'the most insane creation of concepts ever seen or heard' (ibid., p xx). Weaving Kant's doctrine of faculties, Bergsonian notion of multiplicity, and Nietzsche's ontology of eternal return together and folding them with mathematical concepts and contemporary structuralism, Deleuze sets out his metaphysics of difference which, according to him, is a form of experimentation with asymmetrical ideas that makes repetition possible, and in turn produces conceptual difference. He points out that defining problems in terms of finding possible solutions is a dogmatic image of thought. Thus, rather than defining problems as questions, one must practice problematising, which views ideas as problematic because an idea has differential relations to its objects and these relations are actualised in extensive series (ibid., pp 169-173 and 245). In other words, difference is not a concept, but rather a process of 'different/*c*iation' (Boundas 2006, p 4) or what Deleuze calls 'transcendental empiricism'. Deleuze was an empiricist, that is, a pluralist and empiricism, for him, explains the abstract, the aim of which is not to rediscover the eternal or the universal, but to find the conditions under which something new is produced (Deleuze and Parnet 1977/1987, p vii). Empiricism, from this point of view, is a practice of thinking in which the intelligible or understanding comes from the senses. It is an open-ended thinking, an experimentation or, a patchwork. As Deleuze and Parnet observe,

> 'Empiricists are not theoreticians, they are experimenters: they never interpret, they have no principles. If one takes the exteriority of relations as a conducting wire or as a line, one sees a very strange world unfold, fragment by fragment: a Harlequin's jacket or patchwork, made up of solid parts and voids, blocs and ruptures, attractions and divisions, nuances and bluntnesses, conjunctions and separations, alternations and

[20] In conversation with Raymond Bellour and Francois Ewald, Deleuze acknowledges, 'yes, I did begin with books on the history of philosophy' because history of philosophy was not 'a particularly reflective discipline' (Deleuze 1990/1995, p 135).

interweavings, additions which never reach a total and subtractions whose remainder is never fixed' (ibid., p 55).

Hence, Deleuze evokes a process of thinking that engenders thought, as he notes, 'to think is to create – there is no other creation – but to create is first of all to engender "thinking" in thought' (Deleuze 1968/1994, p 147). However, for him, thinking was never just a theoretical matter, but rather experimenting, not interpreting but experimenting (Deleuze 1990/1995, pp 105-106) because the task of philosophy is not just to deal with concepts but to invent, to create new concepts (ibid., pp 32, 122 and 136). Thus, in his later works, he was concerned with creating new concepts in relation to a specific problem, and then moved these concepts into new directions, different contexts or problems. He has repeatedly asserted this aspect of his philosophy in numerous texts. For instance, in *Difference and Repetition* he points out, 'I make, remake and unmake my concepts along a moving horizon, from an always decentred centre, from an always displaced periphery which repeats and differentiates them' (ibid., p xxi). Similarly, in *The Logic of Sense* he observes, 'the genius of a philosophy must first be measured by the new distribution which it imposes on beings and concepts' (Deleuze 1969/1990, p 6). The most detailed exposition on experimentation through concepts can be found in *What is Philosophy?* (1991/1994) written with Guattari.[21] Concepts, according to Deleuze/Guattari, are philosophers' friend; the philosopher forms, invents, fabricates concepts and thinks through them. However, forming, inventing or fabricating is not a simple art of philosophy, but rather it involves creation because the object of philosophy is to create concepts that are always new (ibid., p 5). In this sense, Deleuze/Guattari advocate for a philosophy, which is constructionist – every creation has to be a construction connected to problems without which they would have no meaning (ibid., pp 7 and 16). However, for them, the contour of a concept is defined by the sum of its components, which come from other concepts 'because each concept carries out a new cutting-out, takes on new contours, and must be reactivated or recut' (ibid., p 18). As Deleuze/Guattari further explain,

[21] It is important to point out that the book was written somewhat differently because Guattari worked from the manuscript that Deleuze sent to him, making suggestions, corrections, and defining new directions. Thus, Robert Maggiori remarked 'Guattari is in it throughout, in the way that aspirin dissolved in water is everywhere' (see Dosse 2007/2010, pp 14-15).

> ‘In fact, having a finite number of components, every concept will branch off toward other concepts that are differently composed…, answer to problems that can be connected to each other, and participate in a co-creation. A concept requires not only a problem through which it recasts or replaces earlier concepts but a junction of problems where it combines with other coexisting concepts’ (ibid.).

Take, for example, the concept of ‘desiring-machine’ Deleuze/Guattari introduced in *Anti-Oedipus* (1972/1977) – a concept that simultaneously talks about machinic organisation and investment of desire in the social field. A desiring-machine is not a metaphor, but rather a binary machine, a social-technical machine that obeys a set of rules governing associations (ibid., p 5; Guattari 2009, p 106). According to Deleuze/Guattari, when something is produced, it is always a product of a machine and thus, they were interested to understand how the machine works, how it functions, and how it operates (Deleuze and Guattari 1972/1977, p 2; Deleuze 1990/1995, pp 21-22). For them, a machine operates in a connective fashion, in successive layers or segments but one needs to understand how these connections are formed or produced. The machine as a whole is a composite unit and a decomposition of the whole reveals that it is composed of heterogeneous elements – the essential parts of the machine. These elements ‘are at once component parts and products of the process of decomposition that are spatially localised only at certain moments’ (Deleuze and Guattari 1972/1977, p 40). However, these component parts are related to one another and therefore, establish aberrant paths of communication between themselves to form the ‘whole’. This does not mean that the machine or the whole is a unity or totality because the component parts are fragments and partial objects that cannot be glued together to form the whole. But rather each component coexists and functions in conjunction with other parts. And their conjunctions are materialised or actualised through the investment of desire in social, economic and political processes. In short, the desiring-machine is a historically determined product of desire (ibid., p 29). However, the desiring-machine also produces – it produces empty spaces or creates lack. In other words, the desiring-machine functions according to the dominant market economy and in doing so, it deliberately invests desire in wants and needs, making them dependent upon real production and reproduction (ibid., p 28).

From this account of desiring-machine, it becomes clear that desire is inseparable from machinic complexes, it 'constantly couples continuous flows and partial objects that are by their nature fragmentary and fragmented. Desire causes the current to flow, itself flows in turn, and breaks the flow' (ibid., p 5). In this sense, for Deleuze/Guattari, desire is not an instinctual energy, but rather the drives that result from a highly developed, engineered setup rich in interactions (ibid., p 35; Deleuze and Guattari 1980/2004, p 237). Accordingly, there are two-fold movements: decoding or deterritorialising the flow of desire, such as moving the desire to produce in all directions, and its violent recoding or reterritorialisation in ancillary apparatuses, such as institutions, and forces of law and order (Deleuze and Guattari 1972/1977, pp 34-35).[22] Thus, de/re-territorialisation of desire fuses the component parts, produce functional synthesis and coordinates. From this point of view, desire is productive, it produces an unlimited number of connections and intensities, it traverses the entire surroundings and joins with flows of every sort, introducing therein breaks and captures (ibid., p 292). Hence, in contrast to the investment of need or interest, desire becomes invested in the entire social field and in so doing, it constructs an infrastructure (social formation) within which one can pursue her interests, take actions and realise her freedom in a rational way (ibid., pp 28-29). Put differently, it is desire that aggregates and connects the component parts, and determines their co-existence and co-functioning to form a complex arrangement. The desiring-machine, therefore, 'is nothing other than a multiplicity of distinct elements or simple forms that are *bound together* on the full body of a society' (Guattari 2009, pp 112-113; original emphasis).

The point that I want to emphasise is that the concept of 'desiring-machine' is a new concept Deleuze/Guattari created by not just by remaking or reactivating their earlier concepts, but also added a number of new components to it. For instance, Deleuze has never talked about 'machine' or 'desire' in his previous writings; he was more interested in 'structure'. In *Difference and Repetition*, he has described ideas in terms of structure and multiplicity, as he explains, 'a structure or an idea is a "complex

[22] Here, Deleuze/Guattari used the word 'code' not in the sense of 'codification' or 'legal code', but rather as 'genetic code', which carries and transmits information. Felix Guattari emphasised this understanding in a later publication. See Guattari 1975, p 90.

theme", an internal multiplicity' (Deleuze 1968/1994, p 183). Further, in the essay *How Do We Recognise Structuralism?*, he points out that a structure is defined by the nature of certain atomic elements which claim to account both for the formation of wholes and for the variation of their parts (Deleuze 1972/2004a, p 173). Hence, in structuralism elements specify each other reciprocally in relations (ibid., p 176). Every structure, therefore, is an infrastructure, it is a multiplicity of virtual coexistence (ibid., pp 178-179). On the other hand, Guattari was more interested in the concept of 'machine'. In the essay *Machine and Structure*, Guattari argues that a machine is inseparable from its structural articulations. However, whereas structure positions its elements by way of a system of references that relates each one to the others, desire becomes focalised in the totality of structures at a particular point of history. Therefore, the term 'machine' is more appropriate because the components of the structure are organised through the machinic organisation of desire (Guattari 1971, pp 111 and 117). And this organisation takes place in a plane of consistency that establishes diagrammatic conjunctions between elements. In other words, consistency affirms coherence, the consistency of process whenever a multiplicity unfolds, but this consistency depends on the de/re-territorialising power of desire, which remains inscribed in machinic complexes (Guattari 1972, pp 120 and 128). In conversation with Catherine Backes-Clement, Deleuze affirms,

> '…I was working solely with concepts, rather timidly in fact. Felix has talked to me about what he was already calling "desiring machine" …So I myself thought he'd gone further than I had. But for all this unconscious machinery, he was still talking in terms of structures, signifiers, the phallus, and so on' (Deleuze 1990/1995, p 13).

From this point of view, for Deleuze, desire or drive becomes a part of the infrastructure (ibid., p 19; see also, Deleuze and Guattari 1972/1977, p 63).[23] What we can discern from this discussion is that the concept of desiring-machine has a number of components – desire, deterritorialisation/decoding, movement, flow/transmission, reterritorialisation/recoding. The concept also relates to a host of other concepts. For Deleuze, there is no place for ideology in the desiring-machine, but rather what matters is the 'organisation of power' in the infrastructure that

[23] The influence of Guattari is clearly visible here, in the sense that 'Guattari's idea of machine replaced the idea of structure and provided Deleuze with a possible way out of structuralist thinking, something that he had already started in *The Logic of Sense*' (Dosse 2007/2010, p 11; see also Lecercle 2002, p 180; Alliez 2011, p 38).

Foucault called ‘microphysics of power’, and Guattari ‘micropolitics of desire’ (Deleuze 1973/2004b, p 263; Guattari 1975; Deleuze 1990/1995, p 86). Thus, Deleuze writes, ‘today, we’re not asking what the nature of power is, but rather, along with Foucault, how power exists itself, where it takes shape, and why it is everywhere’ (Deleuze 2001/2007, p 11).

Deleuze/Guattari’s distinct style of doing philosophy, that is, to experiment with concepts, achieved its height in *A Thousand Plateaus*. Many of the components, concepts and themes developed in previous works reappeared in this extended essay, but were redefined and reconfigured to situate them in different contexts. Speaking on *A Thousand Plateaus*, Deleuze points out that it is an illustrated book – each plateau has to map out a range of circumstances; that’s why each has an imaginary date and an illustration, an image too. It’s a book of concepts, an open tool box, a set of split rings; you can fit any one of them into any other (Deleuze 1990/1995, pp 25-26). Thus, the themes of ‘machine’ and ‘multiplicity’ that Deleuze/Guattari emphasised throughout their previous works and more specifically, in their understanding of desiring-machine, were reintroduced through the concept of ‘rhizome’ and ‘assemblage’.[24] More precisely, the concept of ‘machine’ paved the way for introducing the idea of ‘rhizome’ and ‘assemblage’ because a machine operates in a connective fashion; it organises the component parts, produces functional synthesis and consistency.[25] Deleuze/Guattari observe that a rhizome, as opposed to tree or root, ‘assumes very diverse forms, from ramified surface extension in all directions to concretion into bulbs and tubers’ (Deleuze and Guattari 1980/2004, p 7). It ceaselessly establishes connections between heterogeneous elements and in so doing, moves in all directions. A rhizome, in this sense, is a map because it has multiple entryways; it operates by variation, expansion, conquest, capture, offshoots (ibid., p 23). This movement in their conceptual thinking is

[24] Like the concept of ‘machine’, the term ‘assemblage/*agencement*’ appeared in Felix Guattari’s writing much before it becomes a central concept in joint works with Deleuze. Initially, Guattari used the term informally to express his frustration in the final stages of preparing the manuscripts for publication of *Anti-Oedipus* (see Dosse 2007/2010, p 12), and later, as a concept (see Guattari 1973/1984, p 257 and 1974/1984, p 138).

[25] The terms machine, multiplicity, rhizome and assemblage appeared together for the first in *Kafka: Toward a Minor Literature*. According to Deleuze/Guattari, Kafka’s writing is a ‘rhizome, a burrow’, which was later described as ‘machine’, ‘multiplicity’ or ‘assemblage’ (Deleuze and Guattari 1975/1986, pp 3, 7 and 37). These terms or concepts, in other words, were used synonymously.

significant. It remains the case that although a machine is a multiplicity, the challenge is to describe how the components of a machine connect, co-function and form alliances. In short, how to demonstrate that a machine operates in a connective fashion, or how to describe that a machine is a multiplicity? The way out, for Deleuze/Guattari, is the concept of 'rhizome' – a style of thinking that puts emphasis on connection, heterogeneity, assemblage, rupture, and cartography (ibid., pp 7-15).[26] However, the point to be stressed here is that while de/re-territorialisation were important parts of desiring-machine, as Deleuze/Guattari emphasised in *Anti-Oedipus*; in *A Thousand Plateaus* they become parts of 'abstract machine' – a machine that operates within concrete assemblages (Deleuze and Guattari 1980/2004, p 562). In what follows, the movements of de/re-territorialisation were resituated to describe assemblages – a complex constellation of heterogeneous elements, which is simultaneously and inseparably machinic assemblages of desire and collective assemblages of enunciation (ibid., pp 25 and 555). Then, one can conceive the desiring-machine as an assemblage of heterogeneous elements, and the assemblage is formed through the de/re-territorialising flows of desire because it is desire that establishes machinic conjunctions between the elements. Moreover, since a machinic assemblage is also an assemblage of enunciation (statement) (ibid., p xix), one needs to take statements into account.

It follows, then, that the voices that enter into the make-up of the machine become components of the machine (Guattari 2009, p 94). These voices or statements are to be found in judgements, expressions, assertions, narratives, and affirmations or, what Deleuze/Guattari call 'indirect discourses' (Deleuze and Guattari 1980/2004, p 85). From this perspective, there are no individual statements, but rather an interlocking of different statements or a constellation of heterogeneous voices – an assemblage that freely appears in indirect discourses. Put otherwise, indirect discourses explain all the voices present within a single voice (ibid., p 88). This suggests that while a desiring-machine is formed through a complex assemblage or organisation of desire, this desire can be found in acts and statements, which in turn can be found in indirect discourses. In other words, to understand how the desiring-machine functions or

[26] I discuss and elaborate this point in chapter 2.

operates, one needs to find out how desire flows through a multiplicity of voices, acts and statements, and in so doing, connects, binds and interlocks them to form a complex arrangement or assemblage. A desiring-machine, then, is a deterritorialised machinic assemblage – a social-technical arrangement or an 'apparatus of capture' (Deleuze and Guattari 1980/2004, p 495) that not only integrates heterogeneous material forces, but also captures whatever flows through, whatever passes through the machine phylum. Consequently, by entering the machine, the subject of desire, the subject of enunciation becomes attached to the machine, thereby makes the machine viable (Guattari 2009, p 106). It follows that the desiring-machine is inseparable from the process of subjectification; it not only establishes machinic conjunctions, but also produces desiring-subjects. This emphasis on subjectification brings Deleuze/Guattari once again in close contact with Foucault. However, while for Foucault, the subject emerges through subjection to power, a process of 'becoming'; Deleuze/Guattari were more interested to understand how this 'becoming' is shaped and produced by an assemblage of heterogeneous elements. As Deleuze/Guattari observe, '…the analysis of indirect discourse confirms…that subjectifications are not primary but result from a complex assemblage' (Deleuze and Guattari 1980/2004, p 87). In this sense, the concept of 'becoming' that Deleuze/Guattari elaborate in *A Thousand Plateaus* (ibid., p 263) relates back to desiring-machine (Deleuze and Guattari 1972/1977, pp 16-17).

Further, it is also essential to emphasise the concept of 'event' because events play a crucial part in the operation of desiring-machine. Elaborating on desiring-machine, Guattari points out that 'temporalisation penetrates the machine on all sides and can be related to it only after the fashion of an event' (Guattari 1971/1984, p 112). While organisation takes place through machinic conjunctions, the links in the process of deterritorialisation are the events (Guattari 1972/1984, p 129). This suggests that a machine, as an assemblage of symbiosis, is dynamic and diachronic; it is characterised by the events of which it is the site. Put differently, since heterogeneous parts co-function in a machine, it is a site for the emergence of events (Lecercle 2002, p 181). Events, as Deleuze has already elaborated in *The Logic of Sense*, are not things or facts, but rather incorporeal entities, they subsist and inhere, and they result from actions and passions. (Deleuze 1969/1990, p 4). The concept

was reintroduced in *A Thousand Plateaus*, though very briefly (Deleuze and Guattari 1980/2004, p 95). It was again moved in a different direction in *The Fold: Leibniz and the Barque*, where Deleuze argues that events are produced in a chaotic multiplicity and thus, what remains enveloped or folded in an event are heterogeneous, simultaneous components. As he observes, 'the multiple is not only what has many parts but also what is folded in many ways' (Deleuze 1988/1993, p 3). And these components always retain certain cohesion and are inseparable from each other. The multiple is thus inseparable from a unity or an event that envelops it (ibid., pp 22-23, 31 and 74). In this sense, to unfold an event means to decompose the unity of the whole, to reveal the component parts; it is to increase them, to make them grow (ibid., p 8). Unfolding an event is thus crucial for understanding how the desiring-machine operates or works because it is composed of heterogeneous elements.

The discussion above suggests that Deleuze/Guattari were committed to bring movements in concepts, to create mobile concepts that can be moved, set in motion, altered, combined, rearranged to describe the zones of continuous variation or a series of different contexts (Deleuze 1990/1995, pp 122 and 124). As Deleuze states, 'style in philosophy is the movement of concepts' (ibid., p 140). This commitment to experiment with concepts is the hallmark of their distinct style of doing philosophy. Hence, their suggestion 'so experiment' (Deleuze and Guattari 1980/2004, p 277) is the basis of this research. And I carry out this experimentation by 'thinking through' their concepts, which also involves linking and combining them with the thinking of a number of other philosophers, specifically Michel Foucault and Georges Canguilhem.

'Thinking through' Deleuze/Guattari

Given that Deleuze/Guattari were committed to experimenting with concepts, to develop experimental philosophy, their philosophical thinking is built upon heterogeneous conceptual bits, 'each initially introduced in relation to a particular

problem, then reintroduced into new contexts, seen from new perspectives' (Rajchman 2000, p 21). Consequently, these various conceptual bits (somewhat) lack coherence because they shift from one work to the next as new concepts are added and fresh problems are addressed (ibid.). Thus, the bits, as Rajchman points out, do not work together or form a coherent narrative, and this movement from one concept to another, this nomadic roaming about, is in itself a kind of empiricism (ibid., p 22). And this nomadic roaming through heterogeneous concepts is the most puzzling feature of their philosophy because as they move from one problem to another, the concepts also undergo continuous variation. By doing this, they have not only characterised thinking as open-ended, but also laid down a thousand trails (Colombat 1991). This was absolutely necessary for them because they were committed to a practice of thinking that is both critical and experimental. But this nomadic or rhizomatic practice of thought presents a particular problem: how to read their work or how to follow their philosophical thinking, especially because, as Patton points out, neither there is such as a thing as Deleuze's definite philosophy, nor his work turns around a single fundamental idea (Patton 2010, p 10). More importantly, as Deleuze/Guattari are experimental thinkers, there is always movement and discontinuity in their thinking (ibid.). Then, the question how should one follow their philosophical thinking resonates with Deleuze/Guattari's own questions, 'what is the best way to follow the great philosophers? Is it to repeat what they said or *to do what they did*, that is, create concepts for problems that necessarily change?' (Deleuze and Guattari 1991/1994, p 28; original emphasis).

A significant number of legal scholars have engaged with Deleuze's philosophical thinking. Some have relied on Deleuze's sporadic and anecdotal but critical remarks on law, rights, and jurisprudence (Deleuze 1967/1989, pp 81-90; Deleuze 1968/1994, pp 1-8; Deleuze 1990/1995, pp 152-153 and 169-173; Deleuze 2002/2004, p 19) to develop a specifically 'Deleuzian jurisprudence' or 'Deleuzian legal theory'. For instance, relying on Deleuze's critique of a dogmatic image of thought and his remarks on jurisprudence as creative, Alexandre Lefebvre has attempted to develop a 'positive philosophy of adjudication or juridical law' which, according to him, is creative and therefore, is a 'new image of law' (Lefebvre 2005; see also Lefebvre 2006, 2007 and 2008). Following the same path (Deleuze's critique of a dogmatic

image of thought and judgement), Edward Mussawir has moved on to develop a 'procedural jurisprudence' of jurisdiction (Mussawir 2010 and 2011). In a slightly different manner, while Paul Patton has argued for a Deleuzian approach to human rights (relying on Deleuze's remarks on jurisprudence and rights) (Patton 2012; see also Lefebvre 2011); Jamie Murray, on the other hand, has drawn from Deleuze and Guattari's concept of emergence to construct a semiotics of 'emergent law' or 'nomo law' (Murray 2006 and 2007). There are others who have engaged with Deleuze's thinking more broadly to reconstruct a Deleuzian philosophy of law, but the underlying inspiration remains the same: either Deleuze's critique of a dogmatic image of thought and judgement or his remarks on law, jurisprudence and rights (see, for example, de Sutter and McGee 2012). Some exceptions are obviously there. For instance, Claire Colebrook suggests that 'thinking with' Deleuze may open up new avenues to think law otherwise (Colebrook 2009). In this direction, Andreas Philippopoulos-Mihalopoulos has experimented with the concept of 'fold', and drawn broadly from Deleuze and Guattari's thinking to provide a Deleuzian(Guattarian)-inspired understanding of law and justice which, according him, is spatial, immanent and posthuman (Philippopoulos-Mihalopoulos 2010, 2012, 2013a and 2013b, 2014, 2015). A more sustained attempt has been made by Nathan Moore to bring Deleuze and Guattari's thinking in critical legal scholarship. He has engaged with their thinking and concepts (such as diagram, control society, affect, image of thought) more systematically and demonstrated very effectively the potential of Deleuze/Guattari's thinking in renewing the critical tradition in legal studies (Moore 2000, 2004, 2007, 2010 and 2012; see also Bottomley and Moore 2008 and 2012).

My approach, to an extent, is akin to these latter scholars because I have no ambition to develop a specifically Deleuzian jurisprudence or Deleuzian legal theory, neither do I rely on Deleuze's critical remarks on judgement, law and rights, nor on jurisprudence. However, my approach also differs significantly from these latter scholars. In this respect, I take Ian Buchanan's suggestions into account. Buchanan suggests that to be Deleuzian one must abandon Deleuze. By this he means to choose between two things, both of which result in a turning away:

> ‘either one must bring other philosophical systems to bear on his corpus and enter into the very critical practice he so loathed or, if this faithfulness reviles, one must take to heart Deleuze and Guattari’s axioms that philosophy progresses only by succession. Deleuze’s work must then be treated as an arrow that has hit its target and now waits to be fired once more from a newly strung bow’ (Buchanan 1999, p 2).

In this thesis, I follow Buchanan’s second suggestion, that is, to treat Deleuze/Guattari’s work as an arrow and fire it once more to investigate a different problem in a different context: how the bioeconomy operates as a desiring-machine; and how law mediates this operation in a global/postcolonial context. Thus, rather than ‘thinking with’, I ‘think through’ (Young 1995, p 173) their concepts. By this I am not suggesting that this is the only way of reading Deleuze/Guattari, but rather to experiment with their concepts the way they did. As pointed out above, for Deleuze/Guattari, a concept is a composite whole and its decomposition reveals heterogeneous components that relate to each other. Moreover, a concept and its components link up or branch off toward other concepts. Brian Massumi has emphasised this aspect of Deleuze/Guattari’s philosophy, as he says, a concept is by nature connectible to other concepts, and when and how to connect or relay one concept into another appear in the flow of thought (Massumi 2002, p 20). And, for Deleuze/Guattari, creating links or constructing joints is an act of thinking, an act of experimentation. Further, like other legal scholars I do not give any undue priority to Deleuze, rather I treat Deleuze and Guattari on equal footing because Deleuze has acknowledged that the best books he has written are with Guattari.[27] In addition, none of the legal scholars cited above have experimented with Deleuze/Guattari’s concepts to provide an account of how law mediates the movement of desire between disparate elements in the bioeconomy in a global/postcolonial context.[28] Though

[27] It has rightly been pointed out by Francois Dosse that ‘the tendency today is to forget Guattari’s name and remember only Deleuze’s. Yet *What is Philosophy?* cannot be read as a return to “true” philosophy by Deleuze without Guattari. Its contents, style, and concepts make it impossible to imagine how the book could be “de-Guattarized to make Deleuze its sole author’ (Dosse 2007/2010, p 15). Moreover, in a number of occasions Deleuze has clearly asserted the brilliance of Guattari. Consider, for example, Deleuze’s remarks on working with Guattari, ‘I have never met anyone who is so creative, or who produces more ideas’; on *Anti-Oedipus*, ‘the book at times took on a powerful coherence that could not be assigned to either one of us’, and again, ‘I could tell you who came up with this particular theme or that particular idea, but from my perspective, Felix had these brainstorms, and I was like a lightning rod’; on *A Thousand Plateaus*, ‘under Felix’s spells, I could perceive unknown territories where strange concepts dwelt’ (Deleuze 2001/2007, pp 238-240).

[28] Except Paul Patton’s attempt to develop a ‘jurisprudence of colonialism’ through Deleuze/Guattari’s concepts (Patton 2000 and 2010).

postcolonial legal studies scholars[29] have referred to Deleuze/Guattari sporadically, they are yet to 'think through' their concepts.[30] 'Thinking through' Deleuze/Guattari thus can contribute meaningfully to scholarships on 'Deleuze/Guattari and law', law and globalisation, and postcolonial legal studies.

The bioeconomy, as narrated above, is comprised of heterogeneous elements, such as bio-tech corporations, global institutions, government and inter-governmental agencies, academic/research institutions, legal norms (intellectual property and biodiversity laws), biotechnologies, bio-genetic resources, and new biological materials. It is a combinatory system. Seeing it this way, the bioeconomy can be described as a 'structure' or a 'machine' in which all the elements co-exist and communicate reciprocally in a complex way. As Deleuze observes, 'an economic structure never exists in a pure form, but is covered by the juridical, political and ideological relations in which it is incarnated' (Deleuze 1973/2004a, p 181). Since the bioeconomy is a combination of disparate elements, its decomposition reveals that each element functions in conjunction with others. Simply stated, the elements connect and relate to each other. Yet the question is: how does the elements connect or what establishes conjunctions between the elements? Certainly, the bioeconomy is founded on desire – the desire to produce, to propertise, to appropriate, to capture, to normalise appropriation and more importantly, to expand the spaces of bio-economic

[29] It is difficult to provide a detailed account of postcolonial legal studies because it is not a unified body of legal scholarship. Different legal scholars have approached the issue of law and post/colonialism from different perspectives. I can only direct to some postcolonial legal studies literatures that have referred to Deleuze and Guattari (Fitzpatrick 1992; Baxi 2002 and 2007) or, set forth the main approaches (see de Sousa Santos 1995; Comaroff 2001; Merry 1991 and 2004; Otto 1996 and 1999; Cossman 1997; Fitzpatrick 1990, 2001, 2003 and 2014; Fitzpatrick and Darian-Smith 1999; Ruskola 2002; Orford 2003; Rajagopal 2003; Seuffert and Coleborne 2003; Duncanson 2003; Baxi 1992, 2000 and 2003; Anghie 2005; Pahuja 2005 and 2011; Darian-Smith 1996, 2004, 2013 and 2015).

[30] The reason could be that Deleuze/Guattari said very little about colonialism or, it might be Gayatri Spivak's scathing attack on Foucault and Deleuze for devising a theory of the subject that failed to consider the relations between desire, power and post/colonial subjectivity (Spivak 1988). However, Robert JC Young has shown how Deleuze/Guattari's concept of 'desiring-machine' can be helpful in thinking about the operation of capitalist desire in colonial expansion (Young 1995, p 167). Other postcolonial studies scholars, such as Graham Huggan (1989) and Arjun Appadurai (1990 and 1991) have used the concept of 'deterritorialisation' in different ways. Moreover, in a sustained engagement with Spivak's critique, Robinson and Tormey point out that her critique is based on a somewhat cursory reading of Deleuze/Guattari's work (Robinson and Tormey 2010). And recently, Deleuzian and postcolonial studies scholars have demonstrated how Deleuzian philosophy can be brought in fruitful conversation with postcolonial theory and contribute to postcolonial studies, see Bignall 2010; Bignall and Patton 2010; Burns and Kaiser 2012).

production. In what follows, there is a continuous movement of desire in the bioeconomy, which establishes conjunctions, aberrant paths of communication and functional synthesis between the elements. In this light, it can be said that in the bioeconomy, disparate elements co-exist, and their aggregation and co-functioning are organised or arranged through the investment of desire.[31] The bioeconomy thus operates in a connective fashion, through machinic conjunctions. Then, the argument is that the bioeconomy is a desiring-machine – an infrastructure, a highly engineered arrangement in which all the elements function in symbiosis. It is an assemblage or a multiplicity. However, as I have indicated, multiplicities remain folded in events. It follows that we need to unfold an event to understand how the bioeconomy operates. In this vein, I look at the Bt. brinjal controversy in India as an 'event'. An unfolding of the event reveals how heterogeneous elements, along with law, co-exist, co-function, interact and form alliances in the controversy. It is important, therefore, to see the Bt. brinjal controversy as an effect of machinic assemblage.

Since the aim of this research is to understand how desire moves and flows in the bioeconomy, and how law mediates such movements, I shed light on a number of issues that remain folded in the event. To be specific, by unfolding the event, I bring to attention how desire moves through disparate elements in the controversy. Consider, for example, Mahyco/Monsanto's desire to produce and propertise Bt. brinjal and its future progeny. Certainly, the desire to propertise, new life forms in particular, remains folded in the Euro-American idea of materiality. But Mahyco/Monsanto's property claims over Bt. brinjal reveals the movement of this desire to a distant location. And this movement was mediated by disparate elements, such as the Bt. gene, the Trade-Related Aspects of Intellectual Property Rights (TRIPs) Agreement, the Patent Cooperation Treaty (PCT) and the Indian Patent Act. To elaborate further, chapter 3 'thinks through' the concept of de/re-territorialisation and shows how the movement of the idea of materiality brought into existence an emergent space of property in India.

[31] Deleuze clearly points out that desire should not be confused with interest because interests depend on desire for their determination and distribution (Deleuze 1973/2004b, p 263).

Consider also, ESG's desire to contest unauthorised appropriation through the discourse of biopiracy. Two competing modalities remain folded in ESG's desire. On the one hand, ESG's desire to govern access and utilisation of bio-genetic resources through legal norms, which is clearly evident in its invocation of the CBD and the Biological Diversity Act. This desire to govern through law is nothing new, but rather remains folded in governance mechanisms, such as the CBD and its local counterpart, the Biological Diversity Act. The argument, then, is that these governance mechanisms have legitimised the desire to appropriate and by doing so, deterritorialised and spatialised the desire to normalise. To emphasise further, can we link up the analytics of 'governmentality' and 'normalisation' with the concept of 'expansion' (de/re-territorialisation)? Chapter 4 thus attempts to combine Deleuze/Guattari's line of thought with Foucault's and Canguilhem's to show how the desire to appropriate is normalised, deterritorialised and spatialised through the expansion of governance.

Consider, on the other hand, ESG's desire to contest. What exactly ESG is contesting? Is it unauthorised appropriation or something else? The point is that contestation is never singular; it always exists in relation with other forces. What this means is that the discourse of biopiracy emerged in direct opposition to the expansive strategies of the bioeconomy. That is, the desire to expand the spaces of bio-economic production through appropriation and propertisation. This suggests that the ESG has mobilised the discourse of biopiracy to contest a specific power/knowledge regime that expands through the TRIPs Agreement, which is accommodated, integrated and reterritorialised in a distant location by institutions, such as the Department of Science and Technology (DST) and the DBT. ESG's discourse of biopiracy in the Bt. brinjal controversy, from this point of view, is a differential power/desire. In particular, ESG's desire to contest brings to light how differentiated relations of power/desire operate in the bioeconomy. Although Deleuze has emphasised the primacy of desire over power, he points out that power arrangements would be a component of the assemblage. This does not mean power assembles; on the contrary, the assemblage of desire would disseminate power formations according to one of its dimensions (Deleuze 2001/2007, p 125). Chapter 5, then, attempts to integrate Foucault's analysis of power with Deleuze/Guattari's

understanding of desire to demonstrate how the two (power and desire) co-function, move together, become co-extensive and deterritorialised.

Consider, however, ESG's desire to heal injustice through rights claim, an important aspect of its discourse of biopiracy. Interestingly, the ESG has mobilised rights discourse through the CBD and the Biological Diversity Act. Thus, while ESG's desire to contest may, at first sight, appear a different becoming, it has never become different because the claims and demands were articulated through the component parts of bioeconomy. This not surprising, however. Because the legal mechanisms through which ESG has mobilised its contentious claims are designed to produce transformed subjects. ESG's desire to heal injustice through legal rights, then, is not a different becoming, but rather becoming a part of the bioeconomy – an emergent subjectivity. To substantiate this observation, chapter 6 once again brings Foucault in close contact with Deleuze/Guattari, specifically by linking Foucault's analysis of subjectivity with Deleuze/Guattari's concept of 'becoming'.

A brief elaboration above shows how desire connects disparate elements in the controversy. This research, therefore, seeks to examine two questions. First, how the bioeconomy operates as a desiring-machine – a smaller machine operating within the larger capitalist machine (Deleuze 1973/2004b, p 267). And second, how law mediates such operation in a global/postcolonial context. To briefly emphasise the latter, the desire to propertise, to normalise appropriation, to contest, and to produce transformed subjects move through disparate legal mechanisms and practices. In fact, in the bioeconomy, desire depends on law for its articulation and movement. Therefore, it is law that mediates the movement of desire, which establishes machinic conjunctions between an array of elements situated in dispersed locations, and by doing so, spatialises materiality, normalisation, power and subjectivity. This in turn suggests that the Bt. brinjal controversy has 'multiple dimensions'. To describe the dimensions, the thesis formulates four sub-questions:

- How does the desire to propertise bring into existence an emergent space of property?

- How do governance mechanisms normalise, deterritorialise and spatialise the desire to appropriate?
- How do differentiated relations of power/desire operate in the bioeconomy? And where do we situate ESG's desire to contest?
- How does an assemblage of desire shapes emergent subjectivities in the bioeconomy?

Overview of Chapters

Chapter 1 provides a detailed description of the event – the Bt. brinjal controversy. Since unfolding means developing infinite tiny folds that are agitating in the background, the chapter begins with a brief outline of the emerging bioeconomy in India. The discussion reveals that official policy prescriptions and bio-economic discourses clearly assert the desire to produce, to propertise and to appropriate, and at the same time, put emphasis on the role of law and legal norms. After narrating the actualisation of this desire in the production of Bt. brinjal, the chapter dwells upon the actual controversy in which a number of highly charged narratives are circulating. While the first narrative made the issue of risk and uncertainty surrounding modern bio-technical science as the primary target of criticism, the second narrative brought to attention the issue of uncertainty in the regulatory governance or the legal regulation of risk. These narratives of uncertainty, the chapter points out, are primarily based on facts, and this reliance on facts, both in techno-scientific and legal discourses, produces a 'factish epistemology of law and science'. Leaving this factishm aside, the chapter delves into the third narrative – the allegation of biopiracy, which claims that a number of global/local entities appropriated local germplasm illegally to produce the Bt. brinjal. Specifically, the chapter highlights the desire to appropriate and the operation of biodiversity law that remain folded in the discourse of biopiracy. Thus, by unfolding the event, the chapter brings into view how heterogeneous elements co-exist, co-function, interact, form alliances and work in symbiosis in the controversy. The chapter, however, reiterates that a number of other issues remain folded in the event, such as the desire to propertise, to contest, and to produce transformed subjects. Accordingly, the chapter

concludes by observing that the Bt. brinjal controversy has ‘multiple dimensions’, it is a multiplicity.

So there are multiple dimensions. And these dimensions come into view as the thesis moves on to examine how law mediates the movement of desire and by doing so, spatialises materiality, normalisation, power and subjectivity. Since this mediation, movement and spatialisation are occurring in a global/postcolonial context, the thesis follows a very specific methodological approach to construct the dimensions of the ‘multiple’. Chapter 2 thus delineates the methodological approach of this research. In this vein, the chapter discusses how the term ‘multiple’ or ‘multiplicity’ is used and theorised in contemporary ‘law and globalisation’ scholarship. The chapter observes that law and globalisation scholars provide interesting and provocative perspectives on how law operates in the global legal order. However, they have used the term multiple or multiplicity to denote plural or many legal orders, fields, levels and spaces. By contrast, the chapter proposes to illustrate and think about the ‘multiple’ or the ‘many’ through the concept of ‘multiplicity’. As a topological concept, the term ‘multiplicity’ puts emphasis on constructing the ‘multiple’ by adding elements successively through conjunctions. To this end, the chapter emphasises the importance of ‘thinking rhizomatically’ – a practice of thinking that moves in all directions to link and connect disparate elements, thereby organises, arranges and stabilises the relations between the ‘many’. By doing so, rhizomatic thinking constructs an assemblage – a constellation of heterogeneous elements that relate to each other. This approach also paves the way for linking up and combining one concept with another. The chapter, then, sets forth an approach through which the thesis connects an array of elements through conjunctions (including disparate concepts) and actualises their relations in extensive series. In other words, the approach provides a way to multiply and expand the dimension of the controversy. And, to make the dimensions legible, the chapter highlights Deleuze/Guattari’s emphasis on drawing a map or cartography of various interacting lines, movements and flows. This methodological understanding, the chapter argues, has implication for how we understand the globalisation of law because, in the global legal order, the law not just operates, regulates or governs at multiple scales or levels, but rather

operates through conjunctions. In addition, the chapter outlines the research method that this thesis adopts, that is, case study and discourse analysis.

Having outlined the methodological approach, the subsequent chapters narrate the dimensions of the bioeconomy, Bt. brinjal controversy in particular. To this effect, chapter 3 discusses how Mahyco/Monsanto's desire to produce and propertise Bt. brinjal and its future progeny brought into existence an emergent space of property in a distant location. The focus of the chapter is on relations, especially tracing the movement of the idea of materiality, which establishes connections between heterogeneous elements. In this direction, the chapter pays attention to Euro-American material and intellectual property law in which the idea of materiality is territorialised. What remains folded in the idea of materiality, the chapter shows, is the desire to propertise. The chapter moves on to illustrate how this idea of materiality or the desire to propertise is deterritorialised by the TRIPs Agreement. And then, reveals its reterritorialisation in India's patent law. To emphasise further, the chapter looks into Mahyco/Monsanto's desire to propertise emergence. The point, however, is that this de/re-territorialisation was mediated by dispersed elements. The chapter thus suggests that de/re-territorialisation is a 'movement in process', which brings into view continuity, consistency, dispersion and mediation.

Chapter 4 focuses on another dimension of the controversy – the issue of governing appropriation through legal norms. ESG's discourse of biopiracy, to an extent, highlights how the desire to appropriate operates in the bioeconomy. Indeed, the bioeconomy intends to grow and expand its operations by normalising appropriation through a juridical order, a point emphasised by Canguilhem in a different context. The chapter observes that the desire to appropriate moves through global/local governance mechanisms, such as the CBD and the Biological Diversity Act. After all, the desire to normalise appropriation remains folded in governance mechanisms. In order to elaborate this observation, the chapter links up Deleuze/Guattari's emphasis on 'expansion' with Foucault's analysis of governmental intervention, which equally has an expansive dimension. More precisely, Foucault has emphasised

that the purpose of a governance mechanism or a framework of law is to create a secure environment, to normalise movement so that the spaces of the market can be expanded. Bringing different lines of thought together, the chapter sets out to demonstrate how the CBD has expanded the spaces of bio-economic production by normalising appropriation through the expansion of governance. In what follows, the chapter shows how the idea of bioeconomy emerged and gained traction during CBD's negotiation process. And, to be more specific, how a new global legal mechanism was devised to normalise appropriation 'at a distance'. In consequence, the CBD not only legitimised the desire to appropriate, but also deterritorialised and spatialised the desire to normalise. The chapter substantiates this understanding by throwing light on the Biological Diversity Act, which has normalised the desire to appropriate in India. Viewing it this way, the chapter concludes that the CBD is an 'apparatus of capture' – it has legitimised the desire to normalise and at the same time, prescribes mechanisms to normalise the desire to appropriate.

Chapter 5 looks more closely into ESG's allegation of biopiracy. The discourse of biopiracy emerged in direct opposition to the expansive strategies of the bioeconomy. Certainly, the desire to expand moves through the CBD and the TRIPs Agreement. ESG's contestation, then, is a differential desire. And so, the biopiracy discourse brings to attention how differentiated relations of desire operate in the bioeconomy. To flesh out this insight, the chapter combines Foucault's analysis of power relations with Deleuze/Guattari's emphasis on desire. Specifically, Foucault has shown that power moves through legal norms, traverses heterogeneous spaces and equally, invites resistance. Taking these observations into account, the chapter moves on to explore how power and domination operate or move through the TRIPs Agreement. Remarkably, some scholars view the TRIPs regime as an effortless extension or a unidirectional movement of power and domination from a global institution with an identifiable centre to the periphery. Instead, the chapter suggests that we need to look at the mediated relationality of power. That is, how the TRIPs Agreement mediates the desire to expand a specific space of power/knowledge across the globe. Yet this expansion is not effortless. Rather, it depends on other institutions to integrate, accommodate and mediate the desire in a distant location. The chapter, therefore, shows how two institutions in India – the DST and the DBT,

have expanded the space of power/knowledge. As a differential desire, the biopiracy discourse moves in opposite direction because it emerged to contest the expansionist tendencies of the bioeconomy. In this sense, the desire to contest is a counter-power, which comes to light as the chapter narrates how contentious claims and demands were mobilised through heterogeneous spaces. Nevertheless, the chapter concludes on a different note. It remains the case that ESG has invoked the component parts of the bioeconomy (CBD and Biological Diversity Act) to articulate claims and demands. Thus, what remains folded in ESG's desire to contest is the emergence of desiring-subjects.

Chapter 6, the last chapter, narrows down the focus on ESG's desire to heal injustice through rights discourse. The argument is that an emergent subjectivity remains folded in ESG's articulation of claims and demands in terms of legal rights. Even further, this emergent subjectivity is a becoming – not becoming different, but rather becoming a part of the desiring-machine. To carry this observation forward, the chapter invokes Foucault's analysis of subjectivity and links it up with Deleuze/Guattari's concept of 'becoming'. For Foucault, subjectivity emerges through subjection, specifically through techniques and mechanisms, which ensure subjection and in doing so, transform the subjects. Subjectivation, then, is a process of becoming a transformed subject. Keeping this insight in mind, the chapter once again looks into OECD and DBT's policy prescriptions which, rather counter-intuitively, are intended to transform the economic behaviours and activities of the subjects. However, the analysis moves in a slightly different direction because the main aim is to understand how a multiplicity shapes emergent subjectivity in the bioeconomy. In this spirit, the chapter brings diverse threads together to demonstrate that an assemblage of desire created a condition for the emergence of desiring-subjects. The chapter emphasises this understanding by looking into ESG's desire to redress injustice through 'benefit-sharing' arrangement and 'prior informed consent'. These legal mechanisms, prescribed by the CBD and the Biological Diversity Act, are designed to normalise appropriation. And so, what remains folded in them is the desire to produce transformed subjects, so that the spaces of bio-economic production can be expanded. Consequently, ESG's mobilisation of rights discourse

through the component parts of the bioeconomy, the chapter argues, is an assimilation in the assemblage or becoming a part of the infrastructure – an emergent subjectivity, shaped by disparate elements through which desire moves and flows.

CHAPTER 1

Bt. Brinjal Controversy in India: Emerging Bioeconomy, Factish Epistemology and Discourse of Biopiracy

'Every statement has to be understood within the pre-established area of exclusive bi-polar values…'

Felix Guattari[32]

'And what we were both looking for was a discourse…'

Gilles Deleuze[33]

1.1: Introduction

The bioeconomy is comprised of heterogeneous elements. So my argument is that these elements co-exist, co-function, interact, connect and relate to each other. Following Deleuze/Guattari, I have suggested that we can think about the bioeconomy as an 'infrastructure' or a 'machine' in which each element functions in conjunction with another. If we accept this understanding, then it can be argued that the bioeconomy operates in a connective fashion, through machinic conjunctions. Thus, we can say roughly that the bioeconomy is an 'assemblage' – a constellation of disparate entities, or a 'multiplicity' – an organisational relationship that belong to the many. However, as emphasised in the Introduction, multiplicities remain folded in events. This chapter, therefore, narrates the operation of the bioeconomy by unfolding an event – the Bt. brinjal controversy. Events, according to Deleuze, are initiatives, they grow and become, and it is the mixtures of bodies that determine the dimensions of an event (Deleuze 1969/1990, p 6). Accordingly, one needs to unfold an event to understand how the bioeconomy operates because unfolding brings into view the relations between actual things, bodies and happenings (Fraser 2006, p 129). This in turn suggests that unfolding is not the contrary of folding, nor its effacement, but rather the continuation or the extension of its acts (Deleuze 1988/1993, p 35). As Deleuze further elaborates, 'unfolding sometimes means that I

[32] Guattari 1975, p 105.
[33] Deleuze 1990/1995, p 15.

am developing – that I am unfolding – infinite tiny folds that are forever agitating in the background …' (ibid., p 93). The next section thus provides a brief outline of the emerging bioeconomy in India. Then, I discuss in detail the production of Bt. brinjal. In my discussion, I mainly focus on statements or discourses because, for Deleuze/Guattari, certain statements are socially devoted to the accomplishment of certain actions. Hence, statements simultaneously express incorporeal transformations and immanent acts (Deleuze and Guattari 1980/2004, p 87). The subsequent section moves on to examine existing narratives of the controversy in political and scientific discourses. To be specific, some sections of the political, scientific, and academic community have made the lack of scientific and legal certainty in the regulatory governance of Bt. brinjal as their primary target of criticism. By doing this, they have mobilised ample intellectual and critical energy to detect the facts and prejudices hidden beneath the production of Bt. brinjal and produced a linear narrative of risk discourses. While these swiftly demystifying narratives of facts and certainty in scientific, political and academic discourses are enlightening, I argue that these narratives are premised on a science/society axis. After assessing the critical equipment deployed by the critics, I show that these commentators are making a similar gesture, in the sense that they have naturalised facts and certainty in the regulatory governance of biotechnology prematurely. Consequently, these scientific and legal discourses produce a 'factish epistemology' of law and science. To move beyond this factishm, I focus on ESG's allegation of biopiracy. Leaving aside facts and certainty, ESG's allegation brings into view how heterogeneous entities situated in disparate locations formed alliances to appropriate bio-genetic resources in the production of Bt. brinjal. In other words, the discourse of biopiracy reveals that the Bt. brinjal controversy is not simply a matter of facts and certainty, but rather involves interaction between disparate entities, and more importantly, law's mediation of interactions and relations in the bioeconomy. However, I argue that this revelation is partial because a number other pressing issues remain folded in the controversy, such as the desire to produce and propertise, and the desire to normalise appropriation through legal norms. Moreover, ESG's desire to contest not only shows how differentiated relations of desire operate, but also provides indication of the production of emergent subjectivities in the bioeconomy. The Bt. brinjal controversy, therefore, has 'multiple dimensions'. I conclude the chapter by suggesting that since unfolding means developing infinite

tiny folds that remain folded, one needs to construct the dimensions by adding elements successively through conjunctions.

1.2: The emerging Bioeconomy in India

There is some weight in the OECD's prophetic claim that developing countries such as India will play a growing role in future biotechnology research and development (OECD 2009, p 138). The bioeconomy, in terms of OECD's projection, is a promising enterprise and India is a promising new market for manufactured bio-materials. In other words, India provides lucrative opportunities for global bio-tech corporations to conquer and invest in new territories for capital accumulation. Accordingly, there is a growing investment in biotechnological research that brings disparate global/local entities together, in terms of co-operation and collaboration, technology transfer, and sharing of technical knowledge and expertise. This interaction and collaboration has another dimension – increasing the utilisation of biogenetic resources in the production of commercially profitable transgenic crops which, however, depends on juridical institutions and legal mechanisms relating to access, appropriation and propertisation of bio-genetic resources.

While biotechnological research and innovation in India are nothing new (see, for example, Rao 2002), the ongoing mediation between global/local bio-tech industries, and transformations in intellectual property and biodiversity laws make visible that India intends to become a global player in the bioeconomy. Thus, in a recent report, the Working Group on Biotechnology proposes to transform India into a producer of 'biovalue' (DBT 2011). The Report points out that the main strategy of the 11th Plan (2002 – 2007) was to make India globally competitive in the emerging bioeconomy and toward this end, it formulated policies to globalise biotechnological research and promote bio-industry and trade, global connectivity for collaborative innovation, and public-private partnership and regulation. The 11th Plan was thus aimed at laying a foundation for progress in basic and translational work in all sectors of biotechnology including bio-engineering and design, bio-resources mapping and

prospecting, gene discovery and manipulation, molecular crop breeding, and intellectual property and patent law (ibid., pp 1-2). Keeping this techno-scientific and bio-economic impetus in mind, the National Biotechnology Development Strategy 2007 brought a paradigm shift in biotechnological research and development and created an ecosystem for bio-innovation. Between 2007 and 2011, the DBT has implemented 2410 research and development projects, out of which 22 per cent were in agriculture and allied areas of biotechnology, and 19 per cent were in bioresources and bioprospecting (ibid., p 2). The direct result of this strategic initiative is the development of a number of genetically improved or modified varieties of crops through public sector research, such as insect resistant chickpea, rice, and brinjal, drought tolerant groundnut and sunflower, mustard with hybrid vigour and protein rich maize (ibid., p 5). Similarly, during this period, 312 national/international patents were filed and 110 patents have been granted, 105 technologies developed, 21 transferred to industry and 5 commercialised (ibid., p. 3). The Report notes that the Indian Biotech industry recorded 21 per cent growth and touched US$ 4 billion mark and in the next 5 to 10 years, it is expected to reach a market size of US$ 10 billion (ibid., p 13). Charting this unprecedented progress in bio-economic activities and their accumulative potential and promise, either by way of profit or intellectual property rights (biological patents), the Working Group on Biotechnology unveiled its overall strategy for the 12th Plan (2012 – 2017). The basic mantra of this strategy is to accelerate the pace of research, innovation and technology transfer, so that biotechnology as a strategic area can reach globally competitive levels and expand the overall growth of the bioeconomy (ibid., p 118). Keeping in mind global developments, the Report's emphasis is on putting in place a system of mapping intellectual properties arising out of growing investments in bio-innovation and thus, the Report states, 'we have to harness the leads we generate, the ideas we create for bio-economy' (ibid., p 12). The overall growth of the bioeconomy, therefore, would depend not just on the production of biovalue, but rather on legal mechanisms that would transform these knowledges into intellectual wealth or properties. In other words, intellectual property law and to a greater extent, patent law will play an important role in accelerating the overall growth of the bioeconomy because it is widely believed (as well as commented upon) that strong intellectual property protection remains the lethal force behind America's global bio-tech success story. As one commentator remarks, 'the Indian biotechnology sector is poised for a

tremendous growth and IP protection is necessary for India to make it to the top as a global competitor'. In line with this argument, a recent World Intellectual Property Organisation (WIPO) led study on India reveals that a stricter patent regime does indeed stimulate patenting activity in research-intensive industries in developing countries, and many bio-tech corporations have taken initiatives to promote intellectual property as a policy (Verma and Muralidhar Rao N.D., p 16). Similarly, at the BIO India conference held in Mumbai, the biotech industry expressed the view that policies and in particular, strong intellectual property protection and regulatory mechanisms, are necessary to promote innovation, collaboration and investment in the biotech sector.[34] More importantly, the US bio-industry representatives urged the Indian government to respect intellectual property and other legal rights. What is significant about these discourses is that the DBT and the biotech industry believe that to transform India into a globally competitive producer of bio-technical knowledge, India needs to attract commercial capital in the bio-tech sector and forge collaborative relationships with global bio-tech corporations. However, the realisation of this ambition depends on 'legislative stewardship' that would not only transform bio-genetic resources and associated knowledges into intellectual properties, but also provide legal protection to global intellectual properties in India.

These developments indicate that India is on the verge of becoming a knowledge-driven economy, and biotechnological knowledge will contribute to a significant share of national and global economic output. However, this transition from a colonial loser to a postcolonial winner – producer of proprietary biotechnological knowledge, depends on several other factors. On the whole, the rate and pace of biotechnological research and innovation, private capital investment decisions, and increasing interactions between global/local bio-tech firms, government and inter-governmental agencies, and public/private research institutions will depend on legal arrangements. To be more specific, legal mechanisms are necessary to normalise the uninterrupted supply of raw materials to the bio-tech industry for appropriation.

[34] The conference was organised by Biotechnology Industry Organisation (BIO) in partnership with the Association of Biotechnology Led Enterprises (ABLE). 'BIO urges India to respect intellectual property', available at: http://www.biospectrumasia.com/biospectrum/news/22179/bio-urges-india-respect-intellectual-property; also 'U.S. and Indian Biotech Industry Find Common Ground on Key Issues at BIO India', available at: https://www.bio.org/media/press-release/us-and-indian-biotech-industry-find-common-ground-key-issues-bio-india.

Equally important is strong intellectual property protection because new biotechnological inventions are 'bio-assets' or 'biovalue' that must be protected and traded through exclusive property rights. To begin with, this means greater access to bio-genetic resources and their transformation into industrial raw materials and intellectual properties. It also entails the reformulation or re-definition of local intellectual property law in line with global standards, or the localisation of global intellectual property standards, so that propertisation and exploitation of newly manufactured living organisms (such as transgenic plants and seeds) can be normalised through legal norms. Thus, in the past few years, we have seen the proliferation of new or the re-definition of old legal mechanisms, specifically in the arena of intellectual property rights and biodiversity laws. For instance, radical changes were made in the Indian Patent Act 1970 in 2002 and 2005 to bring artificially manufactured life forms within the scope of patentable inventions. Similarly, the Biological Diversity Act 2002 not only prescribes mechanisms for the appropriation and utilisation of bio-genetic resources by global/local bio-tech industries, but also normalises the commoditisation and propertisation of these resources though intellectual property rights. In the next section, I discuss how these vision, rhetoric and discourses are actualised in the production of Bt. brinjal.

1.3: Production of Bt. Brinjal

Brinjal (*Solanum melengena Linn*) or Aubergine or Eggplant (as it is known in other parts of the world) belongs to Solanaceae family. It is a popular vegetable throughout Asia (Samuels 2012) and widely cultivated in India. Brinjal is a versatile crop, adapted to different agro-climatic conditions and can be grown throughout the year (Abdul Ahad et al. 2010). The major brinjal producing states in India are West Bengal, Orissa, Gujarat, Bihar, Maharashtra, Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Karnataka, Assam, Haryana and Tamil Nadu (Kumar et al. 2011). Along with tomato and onion, brinjal is the second most important vegetable in India. Brinjal is an affordable vegetable, so it is consumed in a wide variety of popular dishes throughout India (Shelton 2010). It is featured in the dishes of virtually every household in India, regardless of food preference, income level and social status

(Bandopadhyay et al. 2012). Brinjal accounts for 8.4 percent of total vegetable production and covers 8.14 percent of land under vegetable cultivation (Kumar et al. 2011). A number of cultivars are grown in the country, consumer preference being dependent upon fruit colour, size and shape (Abdul Ahad et al. 2010). Low in calories (24 kcal/100 gm) but high in nutrition and water content, brinjal is a very good source of fibre, calcium, phosphorus, folate, and vitamins B and C (Bandopadhyay et al. 2012). Brinjal is also believed to have certain medicinal properties and used in ayurvedic medicine for treating diabetes, hypertension and obesity (ibid.; Shelton 2010). Moreover, many folk songs (such as Konkani songs in Maharashtra and Bihu folk songs in Assam) often allude to brinjal, and its significance in religious rituals has also been recognised. For instance, traditional varieties cultivated in the Udupi District in Karnataka (such as Mattu Gulla) are offered to the main deity at the Sode Matha Temple (CEE/MoEF N.D., p 2). Brinjal thus plays an important role in social, cultural and economic life. Though there is a difference of opinion, the widely accepted view is that brinjal/eggplant was domesticated in the Indian subcontinent, and India is a centre of diversity for brinjal (Duanay et al. 2001; Samuels 2011). A wide variety of traditional landraces (such as Mattu Gulla from Karnataka) and other popular varieties are available in many regions (Bhat and Vasanthi 2008). The National Gene Bank in New Delhi, India has 2782 landraces of brinjal and 530 wild and weedy accessions from all over the subcontinent (Sharma et al. 2010). In India, a large number of brinjal varieties are grown by small, marginal and resource poor farmers throughout the year.

It is widely reported in the scientific literature that pests cause severe damage to brinjal crops throughout their life cycle. Most serious and extensive damage is caused by fruit and shoot borer (FSB; *Leucinodes orbonalis*). Thus, growers in India are generally dependant on insecticides as their main method of control, spraying upwards of 40 times per season for the control of FSB (Shelton 2010). However, it is estimated that FSB causes yield loses of 60 – 70 per cent even after repeated insecticidal sprays, resulting into significant crop loses and hazards to human health and biodiversity (Chaudhary and Gaur 2009). In order to improve the productive

inefficiency (biological and economic) – a genetically transformed and improved[35] 'new life form' known as Bt. Brinjal, was produced by Mahyco in 2002 with the assistance of Monsanto's proprietary Bt. gene. However, in 2003, a collaborative relationship was established between Mahyco/Monsanto and a number of other entities (such as TNAU-C and UAS-D) to develop a pro-poor variety of Bt. brinjal. It is worth pausing on the two material transfer agreements that provide the basis for the collaborative relationship. The first agreement was reached between Mahyco and TNAU-C in March 2005.[36] A month later, a similar agreement was also finalised between Mahyco, UAS-D and Sathguru Consultants, a mouthpiece of the USAID.[37] The first Agreement states that TNAU-C approached Mahyco and agreed to supply eggplant germplasm 'developed, owned and controlled' (referred as TNAU material) by itself for transformation so that a genetically modified variety of brinjal can be produced. Mahyco, in return, agreed to produce a pro-poor transgenic variety by backcrossing its 'proprietary' insect tolerant eggplant lines into 'TNAU Material' in a laboratory setting. The resultant progeny (referred as 'Products') was tested for the presence of Bt. gene. In terms of the Agreement, Mahyco and TNAU 'perceive a common objective in the development and delivery of pro-poor varieties of insect tolerant Bt. eggplant, with a view to facilitate technology access to resource-constrained farmers'. The Agreement further points out that 'the term Bt. gene…shall mean the DNA molecule encoding a Bt. Protein, which upon incorporation into the genome of an eggplant plant confers tolerance to certain insects in the resulting transgenic plant and progeny thereof'. Moreover, the Agreement prohibits TNAU from backcrossing the Bt. gene into any other eggplant germplasm or public bred germplasm or third party germplasm.

In the second agreement, Mahyco, UAS-D and Sathguru Consultants rehashed the 'pro-poor rhetoric' of the collaborative effort under the ABSP II, the main mission of which is to support the production and commercialisation of bio-engineered food

[35] Initially, the term 'genetically engineered' was used to describe transgenic crops but by the late 1980s, language shifted to 'genetically modified', a term to denote modest improvement upon nature, which is now replaced by 'genetically improved' in some publicity materials. See Levidow 1995, pp 168-169; Levidow, 2001, p 77.

[36] Material Transfer Agreement between Mahyco and TNAU-C, 2005 (on file with the author).

[37] Sub-License Agreement between Mahyco, UAS-D and Sathguru Management Consultants Private Limited, 2005 (on file with the author).

crops in developing countries.[38] In line with the previous agreement, Mahyco vigorously reinforced its property rights over Bt. protein produced by Cry1Ac gene contained in the transgenic brinjal plant. In particular, the insertion of Cry1Ac gene into the genome of brinjal plant and finally, the production of a transgenic brinjal plant by recombinant DNA technique (known as genetic modification) has been described as EE-1 Event and refereed as MHSCL Technology. By way of clarification, the Agreement mentions that MHSCL Technology shall mean certain eggplant event containing the Bt. gene including the MHSCL proprietary germplasm in the crop specie transformed using the recombinant DNA technology to exhibit insect tolerance for the purpose of further breeding activities and commercialisation of transgenic product. The property rights that Mahyco claims, therefore, also extend over any active fragment, modification, deletion, or mutation, including seeds or other parts of the genetically modified eggplant. In addition, the Agreement reiterates that intellectual property, which Mahyco (i.e. MHSCL Technology) and Monsanto (i.e. Bt. gene) own and control, will be infringed by making, using or selling the bio-engineered brinjal plant containing the MHSCL Technology or Monsanto Technology. The Agreement states that UAS-D shall not reverse engineer, isolate, modify or use the Bt. gene or other recombinant DNA that is part of the MHSCL Technology and also, shall not transform the transgenic brinjal plant using the MHSCL Technology, including the Bt. gene. In this direction, the Agreement further points out that any technology, proprietary information, know-how, data, intellectual property, trade secrets, germplasm, biological and other physical material owned or held by and exchanged between the parties shall be treated as 'confidential information' whether disclosed in writing or other tangible form, including samples of the material. This means that the Cry1Ac gene and brinjal germplasm – a biological material in its natural and artificially improved form, shall be treated as informational as well as economic objects because these materials are exchanged between and owned by the parties. The UAS-D, therefore, shall use its best efforts to prevent the theft or loss of Monsanto and/or MHSCL Technology, and make sure that the farmers will only use the bio-engineered brinjal plant to produce commodity

[38] This 'pro-poor rhetoric' has subsequently been rehashed by Mahyco, UAS-D and Sathguru Consultants in several documents submitted to the Karnataka State Biodiversity Board, Department of Forest, Ecology and Environment, Bangalore. Such as, UAS-D letter to KBB, 17th May 2011, Mahyco's letter to KBB, 29th April 2011, and Sathguru Management Consultants Limited's Letter to KBB, 21st April 2011, (on file with the author).

eggplant crop within the territory.[39] More importantly, the Agreement demands adequate assurance of protection for commercial and intellectual property rights, including effective legal protection for Bt. gene, MHSCL Technology, and bio-engineered brinjal plant by implementation or amendment of legislations. The legislation, in other words, would provide protection for 'patented technology incorporated in living organism'. This reference to 'patented technology' means that legal protection should be provided to Monsanto's intellectual property rights over Bt. protein, which is naturally produced by Cry1Ac gene inserted into the genome of brinjal plant. It also means that Monsanto/Mahyco's rights over bio-engineered brinjal plant and its future progeny carrying their proprietary technology should be protected through intellectual property rights. Thus, the Agreement states, if the laws and regulations in the territory do not provide an assurance of effective legal protection, Mahyco may terminate the agreement.

Two things I want to highlight at this point before moving on to discuss the actual controversy. First, this collective of heterogeneous entities kept the widely advocated pro-poor rhetoric of the bioeconomy intact. At the same time, however, TNAU-C and UAS-D supplied eggplant germplasm 'developed, owned and controlled' by themselves for improvement. Further, Mahyco not only produced the Bt. brinjal by crossing with its 'proprietary insect tolerant lines', but also reinforced Monsanto/Mahyco's ownership over bio-engineered products, such as isolated DNA molecules or protein sequences, Bt. brinjal and its future progeny. Second, this collective agenda by heterogeneous entities to produce and commercialise bio-engineered brinjal plant invisibly pushed India to create a juridical-economic order to protect intellectual property rights over artificially manufactured bio-materials. In other words, by appropriating the pro-poor rhetoric of the bioeconomy, this collective of heterogeneous global/local entities produces a particular juridical-economic rationality that transforms biological resources (herein eggplant germplasm) into material objects that should be exchanged, protected, and available for commercial exploitation exclusively through juridical norms.

[39] It was agreed under the Agreement that UAS-D would receive a certain amount of modified seeds containing the Cry 1Ac gene from Mahyco. The UAS-D acknowledged the receipt by a letter to the National Bureau of Plant Genetic Resources, 13th January 2006, (on file with the author).

1.3: Debate between Science and Society

The description of the production of Bt. brinjal suggests that heterogeneous entities situated in dispersed spatial locations established connections, formed alliances, and co-functioned under the ABSP II Project with a collective agenda – to produce and market a bio-technically manufactured brinjal plant. The UAS-D requested permission twice from the DBT to conduct multi-location field trials of Bt. brinjal in the States of Karnataka, Maharashtra, and Goa.[40] In 2007, the RCGM (Review Committee on Genetic Manipulation) and the GEAC (Genetic Engineering Approval Committee) examined the application of UAS-D and approved the request to conduct confined field trials. But in 2009, the RCGM in a letter to UAS-D stated that in light of the policy decision, the primary focus of genetically modified (GM) crop trials should be on biosafety issues and not on agronomic performance. Therefore, UAS-D's request has not been approved because the UAS-D developed Bt. brinjal through technology transfer from Mahyco and the biosafety assessment of Mahyco's Bt. brinjal is still under review. However, on 14 October 2009, the GEAC, comprising mainly bureaucrats and scientists, gave the final nod to the environmental and commercial release of Bt. brinjal in India.

As a specific instance of bio-economic production, the decision to commercialise Bt. brinjal received mixed response from the public, politicians, media, scientists, civil society actors and the judiciary. The debate as it unfolds remains exclusively tied to technoscientific advancement, socio-economic progress and scientific certainty – the capacity of science to distinguish reliable from unreliable facts. On the one hand, some scientists, politicians and biotech industry players were very quick to rehash the well-established rhetoric of modern biotechnology to assure the public that Bt. brinjal is safe for consumption because it contains Cry1Ac gene, which is isolated from soil bacterium *bacillus thuringiensis* and incorporated in several edible crops (such as Bt. corn, potato, tomato, and rice) in other parts of the world. For instance, C Kameswara Rao[41] has argued,

[40] DBT's letter to HOD, Biotechnology, UAS-D, 23rd July 2007 and 19th May 2009, (on file with the author).

[41] Executive Secretary of the Bangalore based Foundation for Biotechnology Awareness and Education.

> 'The safety and efficacy of so-called "Bt. technology" … has been investigated for repeatedly by the mandatory regulatory regimes of every one of the 25 countries that commercialised these crops in the past decade-and-a-half. Genetically modified food is widely available in the United Sates, and will soon be in Europe, too. … If anything, the Indian Government should be cheering on this kind of innovation'.[42]

Similarly, just before the commercial release of Bt. brinjal, K V Thomas (then Minister of State for Agriculture) stated that 'in the near future we expect many GM crops that have been modified for better availability of vitamins, iron, micronutrients, quality proteins and oils, which would secure the nutritional security of the masses' (Grain 2010). Likewise, shortly before GEAC's decision, Mahyco's managing director claimed on the company's website that Bt. brinjal 'has the same nutritional value and is compositionally identical to non-Bt. brinjal, except for the additional Bt. protein which is specific in its action against the BFSB' (ibid.).

On the other hand, opposing this techno-economic logic, another section of the scientific and political community, in addition to civil society organisations, have expressed serious concern over the health and safety issues associated with the commercial and environmental release of transgenic brinjal, and brought to attention the risks and uncertainty of bio-technical science. Consider, for example, the media report that according to Pushpa Bhargava,[43] the GEAC not only ignored the dissenting opinions of three of its members, but also ignored enormous scientific literature in a haste to clear the first genetically modified food crop because the clearance of Bt. brinjal was pre-planned.[44] In other words, the release was 'not driven purely by scientific and social merit, but rather by political and financial incentives' (Bhargava 2010, p 177). Consider again, Jairam Ramesh's strong message (then Minister of Environment and Forests) to Sharad Pawar (then Minister of Agriculture) that the government has every right and, in fact, has a basic responsibility, to take the

[42] Roa, C K (2010) 'Why Is India Shunning Safer Food?', available at: http://www.wsj.com/articles/SB10001424052748703862704575099042296849572.
[43] Former director of the Centre for Cellular and Molecular Biology, Hyderabad, India.
[44] 'Controversial Bt brinjal cleared for entry as first GM food', available at: http://infochangeindia.org/environment/news/controversial-bt-brinjal-cleared-for-entry-as-first-gm-food.html.

final decision when critical issues of human safety are involved.[45] He further adds that 'I cannot go against science but in this case science is inadequate'. In this scenario, it is my duty to adopt a cautious, precautionary and principle-based approach until scientific tests can guarantee the safety of the product.[46] Therefore, 'my decision to impose a moratorium is responsible to science and responsive to society'.[47] Consider once again, the report of the Parliamentary Standing Committee on Agriculture that slammed the government for clearing GM crops without proper scientific scrutiny of their impacts. It stated that transgenic food crops would be fraught with unknown consequences and has recommended a fresh roadmap for ensuring food security without the use of GM food so that the biodiversity, livestock health and safety of human health is not jeopardized or compromised.[48] In a similar way, the Supreme Court appointed TEC in its interim report unanimously recommended a 10-year moratorium on field trials of all GM food crops.[49] Addressing health, environmental and other socio-economic issues, the final report of the TEC suggested that a moratorium should be in place until an independent committee of experts and stakeholders examines the potential impact of herbicide tolerant technology on Indian agriculture, and India puts in place a strong biosafety regulatory system.[50]

Confronted with scientific uncertainty, opponents have pointed out a number of flaws in the regulatory mechanism of biotechnology. Thus, the opponents argue, as

[45] MoEF (2010a) 'Jairam Ramesh's Letter to Sharad Pawar', 21st January 2010, (on file with the author).
[46] 'India refused genetically modified crops, citing 'inadequate' science', available at: http://www.rawstory.com/2010/02/india-refuses-genetically-modified-crops-citing-inadequate-science/.
[47] 'India puts on hold first GM food crop on safety ground', available at: http://news.bbc.co.uk/2/hi/south_asia/8506047.stm.
[48] 'Proper tests not done before giving nod to Bt Brinjal: Parliamentary Panel', available at: http://articles.economictimes.indiatimes.com/2012-08-10/news/33137843_1_bio-technology-gm-crops-food-crops.
[49] 'SC panel for 10-yr moratorium on all field trials of GM crops', available at: http://www.business-standard.com/article/pti-stories/sc-panel-for-10-yr-moratorium-on-all-field-trials-of-gm-crops-112101900590_1.html. The final report, however, recommends for an indefinite moratorium on field trials of Bt. crops. 'Indefinite moratorium on GM field trials recommended', available at: http://www.downtoearth.org.in/news/indefinite-moratorium-on-gm-field-trials-recommended-41730.
[50] 'Battle line sharpen over GM', available at: http://www.thehindu.com/opinion/op-ed/battle-lines-sharpen-over-gm/article6268776.ece; also 'Put genetically-modified crop trials on hold for now: Supreme Court Panel', available at: http://articles.economictimes.indiatimes.com/2013-07-23/news/40749288_1_open-field-trials-bt-food-crops-interim-report.

science-based risk assessment is biased and remains in a state of uncertainty, a precautionary approach should be adopted.[51] While the opponents are guided by the 'heuristics of fear' (Jonas 1985), the proponents insist on well-documented scientific facts, such as extensive agronomic efficacy and benefits, and biosecurity evaluation of Bt. brinjal (Kolady and Lesser 2006; Chaudhary and Gaur 2009; Rao 2009a and 2009b). Since the biosafety data was evaluated by two expert committees, the proponents argue that the concern over risk and uncertainty is not based on objective science, but rather on social values. For proponents, this is an inadequate understanding of bio-technical science because instead of relying on scientific experts, the moratorium was imposed due to political expediency (Rao et al. 2011, p 60) and therefore, it is an encroachment of politics into the 'republic of science' – an idealised and self-governed community of scientists which, according to Polanyi, upholds and exercise the authority of science over the public (Polanyi 1962, p 60). Thus, proponents contend that politically corrupted opinions have no place in the realm of objective science because important scientific decisions, such as biosecurity and safety, should be left in the hand of science experts to decide and are not for public and political judgements. For example, P C Kesavan, (MSSRF, Chennai) has argued in favour of releasing the Bt. Brinjal after conducting necessary tests. Some others, such as H S Gupta (Indian Agricultural Research Institute, Delhi) and V S Chauhan (Centre for Genetic Engineering and Biotechnology, New Delhi) were of the opinion that the debate over scientific uncertainty and insufficiency in risk assessment are based on pure assumptions and not on scientific facts (Yadugiri 2011). Echoing the view of scientists, agriculture minister Sharad Pawar moved on to argue that opposition to GM crops should not be based on unfounded apprehensions, and that government should give adequate and fair opportunity to scientific efforts to develop GM crops by allowing field trials.[52] Similarly, the Scientific Advisory Committee to the Prime Minster (SAC-PM) lamented that there is a lack of science-

[51] MoEF (2010b) 'Decision on Commercialisation of Bt-Brinjal', 9th February 2010, (on file with the author); TERI 2010; 'Bt Brinjal poses a risk to health, environment: Greenpeace report', available at: http://www.thehindu.com/sci-tech/energy-and-environment/bt-brinjal-poses-a-risk-to-health-environment-greenpeace-report/article3371450.ece.

[52] 'Food security on mind, Power plans push for GM crops', available at: http://www.hindustantimes.com/StoryPage/Print/929565.aspx

informed, evidence based approach in the debate on genetic engineering in agriculture.[53]

There is nothing new in this debate, of course, since we are well aware that modern technologies always go through some sort of social assessment. What requires our attention, however, is that this bland conventional wisdom harbours deep and far-reaching differences of meaning and vision (Wynne 2002). First of all, we can say that in this debate both proponents and opponents have explicitly or implicitly supplemented risk discourses with those of ethics (Levidow and Carr 1997). While proponents have argued that society is at risk of failing to realise the potential of nature's bounty, by delaying or impeding biotechnological solutions to feed the world; opponents have used the term 'risk' to highlight the unwanted side-effects or potential harm that are unacceptable. In this account, for proponents, agro-biotechnology becomes a utilitarian ideal – a moral or ethical imperative that not only reifies technological possibility and economic benefits, but also imposes a specific model of socio-natural order. Opponents, on the other, have deployed the language of risk to scrutinise the legitimacy of technological development – a form of moral responsibility or mode of ethical rationale that is concerned with environmental, economic and scientific uncertainties.[54] We can also say that in this debate, risk is presented and defined as a scientific issue and in straightforwardly biophysical terms (Anderson 2001; Jasanoff 2000). Consequently, science-based risk assessment and precautionary approach become the normative criteria to deal with problems of uncertainty. Thus, while technocratic experts direct our attention to available scientific data to remove misunderstanding surrounding bio-technical inventions; the counter-experts point out uncertainties, inadequacies and ambiguities in tests conducted so far. From this point of view, the concern over risk voiced by concerned publics can be eliminated by further tests and field trials. In this dominant narrative, scientific tests are presented as the generator of certainty, when it is properly conducted (Collins 1987, p 709). Accordingly, the technocratic experts become the nation state's modernising agents, actively engaged in shaping and

[53] 'Debate over GM crops takes centre stage in India, top court says wait for a decision', available at: http://blog.indoasiancommodities.com/?p=600

[54] For detailed analysis, see Levidow 1995; Levidow and Carr 1997; Levidow 1998; Levidow 2001.

supporting the state bureaucratic ideal (Nowotny 2000, p 10). A corollary of this is that experts as well as counter-experts stress the reliability of their scientific knowledge and believe that more information or intense scientific knowledge will provide route to better control of risks and help to settle the disagreements about uncertainty (Pinch 1981, p 132; Campbell 1985, p 429; Wynne 1992a, p 116; Levidow 1998).

Nothing surprising in this. The point, however, is that scientific knoweldge has been institutionalised as a decision technology by jealously guarding the power of experts to define the public understanding of risk and warding off various manifestations of 'pseudo-science' (Wynne 1988, p 148; Jasanoff 1987, p 196). One implication of this cognitive presumption of risk is that scientific experts define risk in a way that is traceable, measurable, and amenable to their own method of scientific investigation of defined uncertainties. This institutional exaggeration of the power of scientific knowledge to presume public perceptions of risk is imbued with, and shaped by, imaginations of publics as intellectually vacuous and threatening and thus, more wide-ranging, multivalent and rich human meanings, which constitute public concerns are dismissed as emotive fantasy and excluded from official institutional discourses of technology appraisal, as if they were solely instrumental simple-realist questions of controlling risk pragmatically defined by the prevailing science (Wynne 2008, p 23; Wynne 2002, p 462). The reduction of the complex multidimensional understanding of risk by publics to scientifically defined risk and uncertainties, Wynne points out, is a serious mistake with far-reaching ramifications; and one perpetrated not only by scientific and policy institutional powers, but also by too many social scientists. He further adds that the issues of public understanding of science, and of public risk perceptions, are not so much about public capabilities in understanding technical information and therefore, are not predominantly concerns about being illegitimately disqualified and excluded from expert debate and decisions, on a propositional knowledge-question such as 'what are the risks?'. Neither are they a naïve demand for certainty, nor of ethics per se, as some ethical experts demonstrate. Rather, public concerns are more about the endemic predicament of institutional science, that is, whether the forms of innovation, development, exploitation and regulation are sufficiently trustworthy to defend the

public interest. In other words, the concern is about the hegemonic imposition of technoscientific knowledge, and scientific spokespersons or institutions, which define and dominate the policy agenda (Wynne 1992b; Wynne 2001; Wynne 2008). Indeed, it becomes explicit that in the Bt. brinjal controversy, the debate has overlooked more complex 'social dimensions of uncertainty' and in so doing, systematically ruled out certain 'less tangible social risks' (Jasanoff 2000, pp 278-279), which are thought to be incompatible with the neutrality of science policy making. The debate, in other words, posed the issue of risk in reductive terms, as one of whether or not to release Bt. brinjal on the basis of science-based risk assessment, ignoring broader social issues, such as food security, appropriation and propertisation of bio-genetic resources, the dominance of multinational corporations, and post-colonial power relations between developed and developing nations.

Finally, if we are to take seriously the insistence of Michel Callon and others that socio-technical controversies mix together sciences, technologies, and societies without restraint, then the present controversy can be described as a 'hybrid forum', in the sense that there are spokespersons of science representing things of nature, others lobbying for biotech industries, and still others representing the publics (Callon et al. 2001/2009; Latour 2011, p 4). The imposition of the moratorium, public consultation and mobilisation of public concerns are certainly a victory for concerned citizens over the promised salvation by benevolent scientific experts – a result of our collective experimentation and therefore, a step towards democratising expertise. However, it can be argued that in this trickling down model of science production, experts have assembled to take action through scientific knowledge but without adding much to it, except its final application and realisation – a modernist way of imagining rational decision (Latour 2011, p 12). This is mainly because the clash between these two opposing poles revolves, to put it in the words of Bruno Latour, around the 'matters of fact' – between disputable (theories, opinions, interpretations, values) and indisputable (science, objectivity, risk) ingredients of modernity (Latour 2004a, p 244).[55] The issue, as Latour remarks, is that whenever

[55] Here, what becomes visible is that science no longer enters society to put an order or to put an end to its controversies. It enters society to add new and uncertain ingredients to all other ingredients that make up the controversy. In so doing, science is not putting an end to the confusing mixture of facts

there is a conflict between facts and moral and ethical values, facts as opposite to values are used surreptitiously to impose preferences that the user does not dare admit or discuss frankly (ibid., p 100). The danger in such a case is that decisions are taken too quickly, in too small a committee, with too few people; certain facts or values are renounced or denied their dues, and some voices are missing from the roll call (ibid., p 106). Thus, what we notice in this complicated choreography of risk science is that an obfuscating obsession with scientific certainty produced a singular narrative of science-based risk discourse that oscillates between the axis of risk, certainty, and objectivity resulting in an increased intermingling of science, politics and society, on the one hand, and a division between scepticism and progress, deviant and objective science, on the other.

1.4: Factish Epistemology of Law and Science

Much like the scientific and political community, academic commentators attentive to the normative uncertainties and politicisation of risk science, astonishingly projected science as the main actor and the stage upon which the transgenic brinjal controversy has unfolded (Shah 2011; Gupta 2011). While Shah and Gupta have questioned and critically assessed the epistemological basis of the consequentialist frame and role of science in anticipatory risk governance, which is at once compelling and illuminating, they failed to point out that the transgenic brinjal is not just a progeny of bio-technical science but rather, arises out of an assemblage of heterogeneous elements. Though their attempt to provide a better understanding of the politicisation of risk science is noteworthy, they have failed to come out of the usual narrative of scientific certainty – a familiar terrain of science-based risk discourses already explored by many scholars in the context of Bt. cotton controversy in India and elsewhere (Newell 2002 and 2003; Scoones 2002 and 2003).[56] Considering these existing scholarly interventions, there is no effort on their part to register a different account of the controversy in postcolonial India. They have argued rightly that we need to move beyond the familiar terrain of science-

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and values, objectivity and subjectivity, neither marching towards modernity, nor has it produced a better society but many beautiful ruins (Latour 1998a).

[56] See, generally, Newell 2002 and 2003; Scoones 2002 and 2003.

based risk assessment to a 'society' oriented causes and objectives. However, their effort to offer a different narrative of the controversy remains marginal. Quite simply, their society-oriented approach remains embedded within the narrow confines of risk and scientific certainty or, to borrow from Bruno Latour, within the 'matters of fact' (Latour 2004b, p 227). The ambiguous term 'fact' refers to something objective and out there waiting to be revealed (Latour and Woolgar, 1979/1986, p 175). Facts, in other words, are constructed and fabricated to generate scientific certainty and thus, do not reveal what sort of agencies or entities are occupying the spaces of the controversy surrounding non-humans, such as Bt. brinjal (Latour 2004a, p 95; Latour 2005, p 110). At the most basic level, Shah and Gupta never directed their attention to the conditions – for instance, an unexpected gathering, mode of production and the manufacture attached to a bio-material object – that made the production of Bt. brinjal possible (Latour 2004a, p 231; Latour 2004b, p 244). These commentators offer very little or, as Latour has argued, only very partial, very polemical, very political renderings of matters of concern (Latour 2004a, p 232).[57]

Similarly, academic commentators attentive to legal issues involved in the controversy, mainly focused on the transparency and certainty in the regulatory governance of biotechnical science, i.e., the legal basis for the assessment of health and safety issues of genetically modified organisms (GMOs) in general and Bt. brinjal in particular. After assessing the current legal basis of GEAC's controversial science-based risk assessment, some commentators argue that the MOEF's decision to place a moratorium on the commercialisation of Bt. brinjal creates a precedent that will increase uncertainty in the regulatory governance of agricultural biotechnology in India (Chowdhury and Srivastava 2010). Accordingly, they conclude, as agricultural biotechnology is an area of long-term research investment, it is important to create legal certainty and transparency in regulatory policymaking. By legal certainty, they mean predictability, applicability and coherence of the regulatory system (ibid.). The crucial point for these commentators is to achieve certainty,

[57] Latour has further argued that risk is 'an understatement of the entanglements' that ensue as 'we live with non-human entities brought into our midst by laboratories at MIT and Monsanto' (Latour 2001, cited in Fischer 2007, p 562)

predictability and coherence in the applicability of legal rules, and this can be achieved by creating an objective regulatory system for the overall growth of commercially viable and thriving agro-biotech industry devoid of any social and economic concerns.

While this argument for certainty and predictability in the regulatory governance of agricultural biotechnology is attractive and may persuade policy-makers and legislators, it is inevitably driving or pushing us to adopt and revive a particular brand of juristic thinking that is essentially based on facts. Though not delineated explicitly, this view is symptomatic of the normative understanding of law as an efficient instrument to perfect the market, in the sense that the law should be construed and applied to remove the obstacles to market exchange.[58] If we push a little further, the inspirational evocations of this legal thinking, however, come from one of the major, if not the major, conceptual or analytical apparatuses of modern law, i.e., legal positivism/formalism.[59] Legal positivism stresses that it is the facticity that makes something law (Green 2003) or the truth of legal proposition consists of facts about legal rules (Dworkin 1978, p vii). For analytical-normativist, the law as a formal system is autonomous, rationally determinate and logically organised social institution, labelled by Luhmann as 'self-referring' system because it finds justification in its general form and proceed to produce itself from social facts without paying any attention to other social institutions, such as the economy, politics, or morality (Luhmann 1988, p 160; also Teubner 1993). As an epistemically autonomous social institution, the legal system is a closed or 'gapless system of rules of positive law' that should be applied mechanically to 'concrete fact situation'

[58] A typical characteristic of the law and economics movement associated with Richard Posner and Ronald Coase. See, for example, Fiss 1986.

[59] Although there is a significant difference between 'legal formalism' (theory of adjudication) and 'legal positivism' (theory of law), here I am not concerned with the difference between these two schools of legal thought. Rather, my concern is with the particular tradition of legal thinking these two schools adopt and promote that stresses on the certainty, determinacy and predictability of legal rules devoid of any social, economic and political issues. Emphasising the formal and conceptual characteristics of legal rules, these schools of legal thought treated law as a distinct social phenomenon emanating from fact or legal norms are facts as they operate in society without any reference to social concerns (borrowing from the later philosophy of Ludwig Wittgenstein, semi-positivist legal theorist HLA Hart developed this line of thinking and Hans Kelsen, another positivist jurist, shared this jurisprudential assumptions). For a comparison between Herbert Hart and Hans Kelsen, see, Bix 2006, pp 61-62. For a detailed account on 'legal formalism', see, generally, Horwitz 1975; Kennedy 2001; Tamanaha 2009; Schauer 1989; Weinrib 1988.

(Weber and Rheinstein 1954, p xliii) in order to achieve certainty, uniformity, determinacy and predictability of legal rules – a 'mechanical jurisprudence' in the words of Roscoe Pound (Pound 1908).[60] To put it differently, these 'mechanical sociologists'[61] (Pound 1921, p 161) are committed to produce a constructivist social epistemology of law because they view 'law as essentially a matter of social fact' (Green 2003). However, their overt emphasis on the stability, specificity and consistency of rules, on the one hand, and instinctive trend towards fact-finding to achieve legal certainty,[62] on the other, produce 'rule-fetishism' (Frank 1930) or, as Fuller puts it, an 'utopia of legality' in which all rules are perfectly clear and consistent (Fuller 1969, p 41). They posit certainty as the sole end of law (Wade 1940-41, pp 188-189; Pound 1921, p 84) and therefore, 'assume that tightly specified rules increase legal certainty' (Braithwaite 2002, p 50). Certainty, we are told, comes from observing rules and this juristic thinking is 'largely influenced by the positivistic conception of scientific method, according to which the latter consists exclusively in observing facts and extracting from them laws and uniformities' (Cohen 1931, p 357). Thus, it is not surprising that in the spirit of legal positivism/formalism, these commentators argue in favour of creating a predictable, coherent and uniform system of legal rules that will provide certainty in the application of law to the matters of fact – a juristic tendency that refuses to recognise the slightest creative capacity in jurisprudence resulting in virtual denial of social and economic reality (Bourdieu 1987, p 851).[63] But if we accept the critical stance of socio-legal scholars toward legal certainty, then the appealing aspect of the argument presented by these commentators can be summarised in the following way: 'formal law and legal certainty is part of the drama of regulatory governance' of agricultural

[60] Bourdieu argues that this Weberian understanding of mechanical application of rational law, which is predictable and calculable, doubtlessly arise more than anything else from the consistency and homogeneity of the legal habitus. See Bourdieu 1987, p 833.

[61] Although the term can be labelled against all legal positivist/formalist, here I am specifically referring to Herbert Hart who described his work as 'descriptive sociology' (Hart 1994, p v) and to Max Weber's interpretive or descriptive topology of law, according to which, a positive law is a formal rational system of gapless and internally consistent norms applicable to concrete fact situation. See Weber and Rheinstein 1954; Kennedy 2001, p 8636; Green 2003.

[62] Including Ronald Dworkin, a self-proclaimed liberal legalist or, an apologist for welfare state capitalism whose 'model of rules' has been described by others as 'reconstructed/sophisticated formalism' (see Dworkin 1967 and 1978; Leiter 2009 and 2010; Alberstein 2009); Joseph Raz's 'institutionally reasoned or exclusive normativism (see Raz 1972 and 1979); and Richard Posner's 'naively formalistic legal pragmatism' (see Posner 2003; Ralston 2012; Alberstein 2009).

[63] Bourdieu here seems to agree with Deleuze as they both put emphasis on the creative capacity in jurisprudence which, for Deleuze, is to create new concepts and, for Bourdieu, to apply law on a case by case basis by taking into account broader social and economic realities. On Deleuze, see Introductory chapter.

biotechnology, 'the trivial or murderous drama of breaking eggs to make omelettes' (Kennedy 2001, p 8637).

Implicit in the arguments on Bt. brinjal controversy highlighted above is the assumption that the regulatory state can manage the uncertainty in regulatory science and legal rules popularised in the narrow discourse of risk through its preoccupation with 'science and law as mechanisms of ascertaining the facts of the matter as accurately as possible' (Jasanoff 2008, p 775). This striking proposition in scientific and legal discourses brings into view the epistemic authority of law and science, which transmutes factual normalcy into legal normalcy – an 'ontological glorification' of facts promoted by juridical and scientific institutions (Bourdieu 1987, p 846). At issue, after all, is what I have pointed out above: since scientific certainty depends on the construction of facts, uncertainty in scientific discourse is inevitable because facts are constructed, created, and fabricated. Likewise, if we accept that law as a normative system of gapless rules is essentially a matter of social fact, and certainty in law comes from exclusively observing facts, then like scientific discourse, uncertainty in legal discourse is inherent because facts are made, produced, constructed, and fabricated. In what follows, facts become the cornerstones of juridical and scientific edifices and therefore, overt emphasis on them in the controversy produces 'factish'[64] epistemology of law and science in isolation from intrusive social factors and concerns.

[64] I have put the word 'factish' within inverted commas because the word itself demonstrates complex connection between fact and fetish. My argument here, is quite similar to Bruno Latour, who attacks modern iconoclastic gestures which, according to him, produce factishes – a rather bizarre mixture of facts and fetishes or solidifying opinions and positions into hard facts – the fetishist cults in laboratory practice that remains, on above, infinitely distant or hidden but necessarily present in their arguments, articulation and fabrication of facts. Thus, for Latour, facts are inseparable from fetishes because they move together (Latour 1998b; also Latour 1998c). One can find similar projections in Marx and Benjamin, though in a very different manner. From Marx's point of view, fetishism is a peculiar characteristic of bourgeois political economy, as it shelters, worships and utilises the exchange value of an object, which masks or represses the living human labour of the producer and the critique of political economy reveals the insanity of this belief. The fetish, therefore, assumes the character of a false God that is worshiped. It is an artifice, a fact, something made – it comes into existence through the production of desire (Nancy 2001). This faith like dimension of capitalist production prompted Benjamin to argue that capitalism is the celebration of a cult *sans reve et sans merci* [without dream or mercy] (Benjamin 1996). Similarly, my argument is that facts are artifice, it is made, produced and fabricated and therefore, it becomes a fetish in science and law, and the way we worship, utilise, and put our faith on facts in scientific and legal discourses, it assumes a cultic character. Consequently, the epistemic concern surrounding the factual in scientific and legal discourses produces factish epistemology, which can equally be described as a cultic form of fact-ishm.

1.5: Beyond Factishm

On 16th October 2009, Jairam Ramesh (then Minister of Environment and Forests) took an unprecedented decision to conduct a series of public consultations with scientists, agricultural experts, farmers' organisations, consumer groups, NGOs and lay individuals in seven cities in India – Kolkata, Bhubaneshwar, Ahmedabad, Hyderabad, Bangalore, Nagpur, and Chandigarh (MoEF 2010b). In a letter addressed to Sharad Pawar (then Minister of Agriculture), he justified his decision to conduct public consultations by stating that,

> 'in a democracy like ours, we have to take decisions that have far-reaching consequences with the greatest degree of caution, with the greatest degree of transparency and after ensuring that all stakeholders have been heard to their satisfaction. This is what I have sought to ensure ever since the GEAC recommendations reached me' (MoEF 2010a).

He further stated, 'my objective is to arrive at a careful, considered decision in the public and national interest. This decision will be made only after the consultation process is complete and all stakeholders are satisfied that they have been heard to their satisfaction' (MoEF 2010b). Minister Jairam Ramesh conducted the consultation process in the month of January and February 2010.[65] It is important to point out that engaging the public in technology assessment is not new. It has been experimented extensively in Europe and in a limited extent in other developed countries (such as US, Japan, South Korea). However, in India the trend is more recent. This is not to say that the culture of protest or countervailing processes of grassroots activism for people's participation in governmental decision-making is new in India. Indeed, as Sheth points out, significant countervailing processes in the form of political and social movements at the grassroots have been active in different parts of India for over three decades, working on disparate issues, albeit all concerning the struggles of the economically marginalised and the socially excluded poorer populations. These micro-movements expanded the arena of politics beyond the representational institutions of elections and political parties and made the issues

[65] MoEF (2010c) 'National Consultation on Bt Brinjal Report', 10th February 2010, (on file with the author).

of participatory democracy a part of their ongoing struggles (Sheth 2005, p 1). But the present political exercise to engage the public in decision making over a controversial biotechnological innovation is unprecedented in terms of political intent, national importance, resource mobilisation and participation.

The first consultation was held on 13th January 2010 and the last chapter of this consultation process took place on 6th February 2010 in Bangalore. The consultation process offered a much needed platform to the public to express their concerns, insights and opinions. Nearly 6000 participants registered for the seven consultations and an estimated 2000 more attended or demonstrated outside the venues. More than 9000 written submissions were presented to Minister Jairam Ramesh. He personally chaired more than 25 hours of heated consultations. Some of these concerns were not limited to Bt. brinjal but extended to the larger issues of genetically modified (GM) crops, dependency on multinational seed corporations, seed sovereignty, loss of biodiversity and associated knowledge and practices, and appropriation and ownership of bio-genetic resources (MoEF 2010c). Interestingly, in the Bangalore session, the ESG contented that Mahyco/Monsanto and their collaborator UAS-D have appropriated six local or traditional varieties of brinjal germplasm to produce the Bt. brinjal (by inserting the Bt. gene and backcrossing). The ESG pointed out that since these local brinjal varieties are 'cultivars' and 'folk varieties' in terms of Section 41 of the Biological Diversity Act 2002, prior approval of the NBA is necessary to obtain any biological resource occurring in India or knowledge associated thereto for the purposes of research or commercial utilisation.[66] In the present case, no prior approval was obtained and therefore, any appropriation of these local varieties by way genetic manipulation or modification and commercial utilisation by the respective parties is illegal and amounted to an act of 'biopiracy'. The ESG further brought to attention a Gazette Notification issued on 26 October 2009. The Notification excludes 190 plants (including brinjal plant) from protections prescribed by the Biological Diversity Act 2002 because in terms of Section 40 of the Act, these plants are 'biological resources normally traded as commodities'. This

[66] ESG (2010a) 'An enquiry into certain legal issues relating to the approval of Bt Brinjal by the Genetic Engineering Approval Committee of the Union Ministry of Environment and Forests', ESG's submission to Minister Jairam Ramesh at Bangalore, 6th February 2010, (on file with the author).

exclusion from protection, the ESG has argued, is nothing but a gateway of plunder of genetic wealth of India, either directly, or through a variety of technologies, including genetic manipulation.[67]

Further, in a letter to the Karnataka State Biodiversity Board (KBB), the ESG alleged that Bt. brinjal has been produced by a collaborative initiative between Mahyco/Monsanto, UAS-D and Sathguru Consultants without authorisation from the NBA, which is a blatant violation of Sections 7 and 18 of the Biological Diversity Act, 2002.[68] Thus, according to ESG, this violation denies the local communities who have cultivated and protected these varieties from time immemorial from their due right to benefit from the commercial gains that would be made from the access and use of these biological resources. The ESG demanded a comprehensive enquiry to fix the responsibilities and liabilities, establish the nature and extent of unauthorised access, and initiate criminal proceedings against the violators according to the law. Taking this allegation into account, the KBB in its 13th Board Meeting discussed the issue of unauthorised appropriation. The Board expressed the opinion that any Bt. crop which endangers local and traditional varieties raised by farmers and others for centuries will not be acceptable. Hence, the Board decided to refer the matter to the NBA for opinion because the issue of commercialisation and the involvement of foreign firm were of paramount concern.[69] The NBA directed the KBB to gather detailed information from the alleged violators and submit it to NBA's fact finding committee for examination.[70] Furthermore, responding to a request for clarification, the NBA clearly intimated to the KBB that if Mahyco has incorporated the Bt. gene into local brinjal varieties and transferred the resultant product to UAS-D, then the collaborators have violated section 3 of the Biological Diversity Act, which mandates prior approval of the NBA is necessary for obtaining

[67] ESG (2010b) 'Environment Minister's Decision on Bt Brinjal Welcome, Scientifically Sound, but Sketchy and Legally Weak', Press Release, 10th February 2010, (on file with the author).
[68] ESG (2010c) 'Violation of Biological Diversity Act, 2002 in matters relating to access and utilisation of local brinjal varieties for the development of Bt Brinjal by M/s Mahyco and ors. [sic], and related issues', ESG's Letter to KKB, 15th February 2010, (on file with the author). A copy of this complaint was also forwarded to the NBA, and the NBA acknowledged the receipt of the complaint in a letter to ESG. The ESG has pointed this out in a subsequent letter to the NBA. ESG's Letter to NBA, 9th August 2011, (on file with the author).
[69] Proceedings of the 13th Board Meeting of KBB, 26th February 2010, (on file with the author).
[70] NBA's Letter to KBB, 28th March 2011, (on file with the author).

any biological resources occurring in India.[71] After thoroughly investigating the issue,[72] the KBB confirmed in a letter to the NBA that six local brinjal varieties are accessed by the collaborators without prior approval for the KBB or the NBA.[73] Thus, in its 18th Board Meeting, the KKB observed that the decision to initiate legal proceedings against the violators remains with the NBA.[74] Taking note of KBB's finding, the NBA decided to proceed legally against Mahyco/Monsanto and other collaborators, and informed ESG that its complaint is under 'advanced stage of lodging'.[75] However, the ESG has challenged KBB's decision to not initiate criminal proceedings in a letter to the Chief Minister of Karnataka.[76] The ESG alleged that KBB's decision goes against the statement of the Chief Minister of Karnataka in the media that Karnataka will not tolerate any violation of laws protecting biodiversity, farmers' rights, and biopiracy as they threaten seed sovereignty of the country. In addition, the ESG has filed a PIL suit at the High Court of Karnataka in 2012. Highlighting the shocking state of biodiversity conservation in India, the PIL urged the Court to direct attention to widespread biopiracy and violation of laws, such as the Biological Diversity Act, 2002 and the CBD, 1992.[77] What is implicit in ESG's allegation of biopiracy is that the production of Bt. brinjal is not a simple affair of facts and certainty as it is depicted in the linear narrative of regulatory governance of risk. Rather, the production involves appropriation of local bio-genetic resources by heterogeneous entities situated in dispersed locations. Further, the allegation of biopiracy reveals how law mediates the relations between dispersed elements in the bioeconomy. This is clearly evident in ESG's invocation of the CBD and the Biological Diversity Act, which not only govern the access and utilisation of bio-genetic resources, but also prescribe legal mechanisms through which unauthorised appropriation can be challenged and contested.

[71] NBA's Letter to KBB, 25th April 2011, (on file with the author).
[72] KBB's Letters to Mahyco and Sathguru Consultants, 6th April 2011; Sathguru Consultants' Letter to KBB, 21st April 2011; Mahyco's Letter to KBB, 29th April; UAS-D's Letter to KBB, 17th May 2011, (on file with the author).
[73] KBB's Letter to NBA, 28th May 2011, (on file with the author).
[74] Proceedings of the 18th Board Meeting of KBB, 14th September 2011, (on file with the author).
[75] NBA's Letter to ESG, 21st May 2012, (on file with the author).
[76] ESG's Letter to Chief Minister of Karnataka, 23rd May 2012, (on file with the author).
[77] ESG (2012a) 'Public Interest Litigation in Karnataka High Court challenging callous disregard for biodiversity protection', Press Release, 16th October 2012, (on file with the author).

1.6: Conclusion

As emphasised in the Introduction, for Deleuze/Guattari, production is always an effect of machine. More importantly, production is always desiring-production because it is desire that connects, assembles, couples and creates chains. Although it is not yet apparent how desire moves through disparate elements and by doing so, establishes machinic conjunctions between them, the unfolding of the event reveals the co-existence and co-functioning of, and interaction between, heterogeneous entities. In this vein, I have provided a detailed description of Bt. brinjal and narrated the controversy surrounding its production. The science/society debate in the controversy revolves around science-based risk assessment and certainty in legal regulation. This concern with risk and uncertainty, I have argued, is based on facts and therefore, techno-scientific and legal discourses in the controversy produce a 'factish epistemology' of law and science. To move beyond this factishm, I have dwelt upon ESG's allegation of biopiracy, which potently laid bare the unauthorised appropriation of bio-genetic resources. Although it remains implicit in ESG's allegation, the discourse of biopiracy provides an indication of how the desire to appropriate operates in the bioeconomy. This desire becomes more apparent in my discussion of the emerging bioeconomy in India. To be more specific, the narratives of the bioeconomy that we find in official discourses show how desire operates – the desire to appropriate bio-genetic resources, to produce 'new biologicals', to transform them into intellectual properties, to change intellectual property legislation, and to transform India into a global player in the production of 'biovalue'. A clear manifestation of this desire can be found in the production of Bt. brinjal, specifically the 'desire to produce' through which dispersed elements formed alliances and worked in symbiosis. And the 'desire to protect and propertise' through legal norms that remain folded in Mahyco/Monsanto's property rights claim over the Bt. gene, Bt. protein, Bt. brinjal and its future progeny. Equally important is to emphasise ESG's desire to contest biopiracy. Two competing modalities remain folded in ESG's desire. On the one hand, the ESG has invoked CBD and Biological Diversity Act to govern access and utilisation. This provides an indication of how the desire to normalise appropriation operates through governance mechanisms. On the other, I look at ESG's desire to contest as a differential desire or counter-power, which brings into view how differentiated relations of power/desire operate in the

bioeconomy. However, instead of viewing ESG's contestation as becoming different, becoming resistant or becoming contentious, I would argue that what remains folded in this becoming is emergent subjectivities, that is, the desire to produce transformed subjects. An unfolding of the event thus reveals how desire co-functions and moves through disparate elements. In the bioeconomy, therefore, each element functions in conjunction with others and it is desire that establishes machinic conjunctions between them. Put otherwise, the elements of the bioeconomy relate to each other through the continuous movement of desire. The bioeconomy is thus a desiring-machine. It has 'multiple dimensions' which, however, demands a piece by piece construction – the dimensions need to be constructed by adding elements successively through conjunctions.

CHAPTER 2

Methodological Approach and Research Method

'The essential thing, from the point of view of empiricism, is the noun *multiplicity*, which designates a set of lines or dimensions which are irreducible to one another.'

Gilles Deleuze and Claire Parnet[78]

'To attain the multiple, one must have a method that effectively constructs it, no typographical cleverness, no lexical agility, no blending or creation of words, no syntactical boldness, can substitute for it.'

Gilles Deleuze and Felix Guattari[79]

2.1: Introduction

In chapter 1, I have provided a detailed account of the event – the Bt. brinjal controversy. My analysis of the event shows that heterogeneous elements co-exist, co-function, work in symbiosis and relate to one other in the controversy. These elements are the component parts of the bioeconomy, which operate in a connective fashion, through machinic conjunctions. So the controversy has 'multiple dimensions'. And these dimensions come into view once we look into how law mediates the movement of desire between dispersed elements and in doing so, spatialises materiality, normalisation, power and subjectivity. However, as the second quote above suggests, to attain the multiple, one must have a method because the multiple – Deleuze/Guattari refer to 'multiplicity' – needs to be constructed. Simply stated, one needs a method to construct the multiple. This chapter, therefore, delineates the methodological approach through which this thesis constructs the dimensions of the 'multiple'. Since mediation, movement and spatialisation, which are fundamental in describing the dimensions, are occurring in a global/postcolonial context, section 2 discusses in detail how the multiple or multiplicity is understood and theorised in contemporary 'law and globalisation' scholarship. I show that while law and globalisation scholars have adopted a variety of approaches (extension and diffusion, global/transnational/spatial legal pluralism, fragmentation, and general

[78] Deleuze and Parnet 1977/1987, p vii (original emphasis).
[79] Deleuze and Guattari 1980/2004, p 24.

jurisprudence) to understand and provide an account of the globalisation of law, global legal order, and global legal processes, the multiple or multiplicity has been theorised in terms of the plural and equated with the 'many'. Thus, by multiple, law and globalisation scholars understand plural or many legal orders, fields, levels, and spaces. By contrast, I emphasise and think about the 'multiple' through the concept of 'multiplicity'. As a topological concept, the term 'multiplicity' puts emphasis on constructing the 'multiple' by adding elements successively through conjunctions. Section 3, therefore, details a Deleuze/Guattarian understanding of multiplicity, which puts emphasis on thinking, composition and mapping. Through this understanding, I demonstrate that to compose and describe a multiplicity, one needs to follow three interrelated steps: think rhizomatically, construct an assemblage, and draw a map. Following this discussion, section 4 outlines the method of analysis this study adopts, specifically a qualitative research approach. In this direction, I put emphasis on case study methods and discourse analysis, and discuss why these two methods are followed in this research.

2.2: Approaching Globalisation and Law

Some may argue that the term 'globalisation' does not need introduction because scholars from a variety of disciplinary backgrounds have already elaborated on the term in extensive detail. There is no consensus among scholars, however. By globalisation, scholars refer to social, economic, cultural and spatial processes that are taking place not just within nations, but occurring on transnational or global level. Thus, for some, globalisation reveals various generative processes that have increased interdependencies (Featherstone 1990, p 6); or led to the intensification of world-wide social relations (Giddens 1990, p 64), transnational connections (Hannerz 1996, p 4), and global interconnections and flows (Tsing 2000). For others, globalisation signifies deterritorialisation, homogenisation and heterogenisation of production (Appadurai 1990 and 1996, p 188); fluidity, indeterminacy and hybridisation (Pieterse 1995); time-space compression or glocalisation (Robertson 1995 and 2012); and privatisation, deregulation and de-nationalisation of transactions, policy and authority (Sassen 1998, 2000 and 2004). The term also

entails, as Kearney points out, the reconfiguration of relationships and sharp boundaries between centres and peripheries, giving rise to a multidimensional global space with unbounded, often discontinuous and interpenetrating sub-spaces (Kearney 1995, p 549). Echoing this understanding, some scholars insist on spatialities, materialities and complexities of the global. For these scholars, globalisation is a complex material and spatial phenomenon. Hence, these scholars put emphasis on networks of activity, interaction, and exercise of power (Held 1995, p 20; Held et al. 1999, p 16), multiple processes and overlapping orders (Sassen 2000), materially heterogeneous networks of elements (Law and Hetherington 2000), and topological and relational practices (Amin 2002) that have brought dramatic transformations in the spatial organisation of relations and transactions. The term 'globalisation', therefore, means less about territorial boundaries and states, and more about interconnections, interactions, networks, movements and flow. The global comes to constitute its own domains, and many individuals and organisations that come together to enact the global appear to possess and demonstrate a global character (Law and Urry 2004). Thus, the global is usually assumed to be complex because of its high degree of interconnectedness (Law 2004), prompting some scholars to conceive of the global as an assemblage of multiple determinations (Collier and Ong 2005, p 12) or, of territory, authority and rights (Sassen 2008). On the other hand, postcolonial studies scholars articulate globalisation as the extension of neoliberal market ideology over an increasing swath of nations. In this sense, globalisation, especially in its neoliberal form, signals at the very outset the legitimisation of economic and cultural domination in the name of development and progress – a continuation of the legacy of colonial expansion (Krishna 2009, pp 2-4). Postcolonial studies, from this point of view, interrogate the global through the local and provide a more nuanced view of globalisation that developed from its understanding of the complexities of imperial relationships (Ashcroft 2009, p 89).

This brief discussion suggests that different scholars conceive of and conceptualise globalisation differently. This diversity and pluralism is equally evident in the legal literature on globalisation, in the sense that legal scholars have adopted diverse approaches to study the impact of globalisation on law. In legal studies, however, the central focus remains on global or transnational legal regulation and process. This

means that legal scholars recognise that law is heavily implicated in the process of globalisation (Flood 2002; Haliday and Osinsky 2006). This is clearly visible in the development of new legal forms and regimes (Snyder 2004) or, in the enhanced role for law, lawyers and legal institutions in transnational political and economic matters (Garth 2008). Noting this paradigm shift, one legal scholar argues, globalisation is not outside the law, but rather it is as much a product of the law as it influences the law (Michaels 2013). On this score, by globalisation of law, some scholars refer to a specialised set of legal phenomena set into the globe (Shapiro 1993); to transnational legal processes and law making (Merry 1992; Koh 1996), to the globalisation of regulation (Drahos and Braithwaite 2001) or to the globalisation of a specific legal *langua* (Kennedy 2006). For others, the globalisation of law signals the emergence of transnational legality and a transnational legal or normative space (de Sousa Santos 1987; Aleinikoff 2008; Lhuilier 2013); the internationalisation of legal fields (Trubek et al. 1994); a global law without a state (Teubner 1997a); transnational governance or regulatory regimes (Zumbansen 2012), and even the emergence of transnational legal communities (Cotterrell 2008). These are interesting and provocative perspectives, which clearly demonstrate ambitious developments in our understanding of global legal processes. The sheer diversity of perspectives, however, makes a coherent analysis difficult. Nevertheless, I single out four different approaches to look more closely how the term 'multiple' or 'multiplicity' is used in contemporary law and globalisation scholarship. In particular, my discussion highlights that these scholars theorise 'multiple' in terms of many or plural legal orders, scales, fields, levels and spaces.

2.2.1: Extension and Diffusion

According to some legal scholars, diffusion of law is an integral part of globalising processes (Shapiro 1993; Westbrook 2006; Twining 2006). For Shapiro, globalisation of law means extension and diffusion of certain legal rules and practices throughout the world, especially commercial and human rights law (Shapiro 1993, p 39). Thus, a single set of legal rules becomes globalised through the globalisation of markets and business practices of multi-national corporations.

Accordingly, by globalisation of law, one can refer to the extension of American commercial law practices and individual rights and their diffusion, reception or incorporation in transnational business practices, global human rights documents, and in legal practices of other jurisdictions. In this sense, globalisation of law is nothing other than a vertical integration of different markets and legal systems, which occurs through the expansion of international trade and movement of corporate capital (ibid., p 40). This understanding is reiterated by David Westbrook, though very differently. According to Westbrook, laws are influencing one another in many ways and thus, by diffusion of law, he evokes a spatial imagination in which law is somehow transported from one place to another (Westbrook 2006, p 492). For him, diffusion is a modernising process that brings change or transformation in law, which occurs through the expansion of legal norms and their adoption in a legal system. Hence, diffusion comes into view when a legal system changes according to the examples and models provided by other legal systems. A pivotal aspect of diffusion, as Westbrook observes, is a sense of core and periphery, of leading and developing nations (ibid., p 499). There are other perspectives that provide an account of diffusion by looking into how certain legal ideas are incorporated and integrated in national legal fields, mainly through the practices of lawyers and judges. For instance, by pointing out a shift in the application, production and interpretation of law in multiple national legal fields in several parts of the world, Trubek et al. argue that this shift or transformation has occurred through the practices of legal professionals (lawyers, judges, arbitrators, administrative officials, legal academics), who transmit, incorporate and integrate global legal knowledge in national legal practice (Trubek et al. 1994). In a somewhat different manner, Anne-Marie Slaughter talks about 'judicial globalisation', which emphasises judicial interaction, cooperation, cross-fertilisation and exchange of legal ideas between different judicial institutions across borders. These interactions, according to her, are shaped by the globalising forces of commerce, international treaties, face-to-face meetings among judges, and judicial training in many fledgling democracies – highlighting the vertical relations between national and international tribunals and horizontal relations across national borders (Slaughter 2000). Globalisation of law, therefore, is about diffusion – the outward movement of law, its expansion and crossing of levels – a process that often involves reciprocally interacting agents of change (Friedman 2001; Twining 2006).

2.2.2: Global/Transnational/Spatial Legal Pluralism

Diffusion of law as a process, according to William Twining, is integrally linked to legal pluralism because both typically involve interaction between two or more normative orders (Twining 2006, pp 512-513). The term 'legal pluralism' suggests the co-existence of two or more legal systems or orders in the same social field (Moore 1973; Griffith 1986; de Sousa Santos 1987; Merry 1988). An early understanding of legal pluralism was proposed by Leopold Pospisil. For Pospisil, every human society possesses as many legal systems as there are functioning subgroups. Accordingly, there is a multiplicity of legal systems within a given society that necessarily differ from each other in some respects, which Pospisil describes as different 'legal levels' (Pospisil 1967, pp 3 and 9). John Griffiths, however, argues that legal pluralism is a descriptive concept rather than a normative system in which more than one rule is applicable to the same situation. As an attribute of a social field, it refers to the normative heterogeneity attendant upon the fact that in any social field more than one legal order is observable because social action always takes place in a context of multiple, overlapping semi-autonomous social fields (Griffiths 1986, p 38). In this direction, Sally Merry points out that plural normative orders are found in virtually all societies and therefore, research on legal pluralism places at the centre of investigation the relationship between the official legal system and other forms of ordering (Merry 1988, p 873; see also Griffiths 2002). An important aspect of legal pluralism, from this point of view, is that two or more legal orders coexist and are participating in the same social field. While this understanding of legal pluralism reveals the existence of different legal spaces within a legal system, de Sousa Santos argues that in addition to revealing their coexistence, one needs to analyse how these legal spaces interact and intersect with each other and in so doing, produce different legalities (de Sousa Santos 1987, p 287). For de Sousa Santos, law operates not just on a single scale, but rather different legalities are operating simultaneously on different scales – local, national and transnational. And their interaction and intersection not only bring into view different regulation patterns, but also produce 'interlegality' (ibid., p 288). Thus, according to de Sousa Santos, we live in a polycentric legal world in which multiple networks of

legal spaces are superimposed, interpenetrated and mixed, and legal pluralism is the key concept through which one can understand the intersection between different legalities (ibid., pp 297-298).

The relative coupling of different legalities, together with the understanding that law operates on different scales, prompted de Sousa Santo to conceptualise the globalisation of the legal field as 'postmodern plural legality'. The debate on legal pluralism, de Sousa Santos points out, has broadened because law now operates on suprastate, global legal orders, which coexist in the world system with both state and infrastate legal orders (de Sousa Santos 2002, p 92). Thus, a number of updated or reconceptualised versions of legal pluralism are clearly visible in recent legal scholarship. For instance, keeping an eye on the globalised legal theatre, Francis Snyder asserts that globalisation is 'governed by a totality of strategically determined, situationally specific, and often episodic conjunctions of a multiplicity of sites throughout the world…The totality of these sites represents a new global form of legal pluralism' (Snyder 1999, pp 334-335; Snyder 2004, p 625). While for Snyder, global legal pluralism involves a variety of institutions, norms, and dispute resolution processes located and produced at different structured sites around the world (Snyder 1999, p 342); Paul Schiff Berman, on the other hand, proposes a jurisprudential theory which he calls 'cosmopolitan pluralism' – a conceptual framework for understanding a situation in which multiple legal and normative orders overlap, interact and conflict (Berman 2012, pp 10-11). The main concern of these strands of pluralist thinking is to provide a better understanding of multiple legal orders. Accordingly, the main preoccupation is with governing globalisation, making sense of networks of legal sites, and managing disputes or conflicts. Scholars, however, argue that as an analytical concept, global legal pluralism is limited in its application because it not only defines every type of legal order in relation to the state (Michaels 2013), but also propounds an instrumental version of pluralism devised to govern problematic interactions among different layers of legal orders (Croce and Goldoni 2015, p 9).

This dissatisfaction prompted some scholars to look for a new term to provide an account of transnational legal relations originating outside the territorial jurisdiction of the nation-state. The term 'transnational law', therefore, emerged to address legal norms that do not clearly fall within the traditional conception of national or international law (Shaffer 2012, p 232) – a theory of law beyond the state (Calliess 2002; Michaels 2013). In this sense, transnational law is 'global law without a state' (Teubner 1997a, p 3), which goes beyond 'traditional thinking about inter-state relationships by pointing to the myriad forms of border-crossing relations among state and non-state actors' (Zumbansen 2006, p 738). However, since globalisation has already entered into the lexicon of legal scholars, the term has become a 'proto-concept' (Scott 2009) for describing the 'status and role of law in an increasingly inchoate, globe-spanning web of regulatory regimes, actors, norms and processes' (Zumbansen 2011, p 3). In other words, the basic focus of transnational law remains on the change in the legal or regulatory landscape – regulation of transnational legal relations, transnational dimensions of regulatory problems, and transnational legal practices, systems, regimes, architecture, processes, orders and governance (Calliess 2002; Zumbansen 2009, 2011 and 2012; Cotterrell 2008, 2009 and 2012; Shaffer 2012). Thus, for some scholars, to adequately understand the 'new pluralistic world of law, created by legal transnationalism' (Cotterrell 2009, p 485), one needs to devise a pluralistic conceptual framework that can deal with the plurality of legal regimes emerging in transnational arenas (Gunther 2008). Peer Zumbansen, therefore, advocates for 'transnational legal pluralism' which, according to him, is a methodological approach to study evolving transnational regulatory governance (Zumbansen 2010). Transnational legal pluralism, as Zumbansen contends, focuses on 'actors, norms and processes' as building blocks of transnational governance and regulation (Zumbansen 2009, 2012 and 2015). Thus, transnational legal pluralism is concerned mainly with illustrating the transnational nature of law, norms creation, and forms of legal ordering occurring in global regulatory spaces. In short, Zumbansen's proposed analytical framework seeks to capture the shift from state-based, nationally defined regulation, to transnational processes of norm creation and institutionalisation (Zumbansen 2012, p 335).

While transnational legal pluralist idioms have shed much light on norms and actors engaged in the transnationalisation of law, a number of scholars have pointed out that these studies often conflate transnational or transnationalised law with the globalisation of law (Benda-Beckmann and Benda-Beckmann 2007); that they remain confined to the analyses of transnational law and regulatory governance; and that they fail to trace the significance of transnationalised legal forms through various socio-political and pluralist legal fields, such as nation state legal order, which itself is plural. Thus, they contend that transnationalised laws vary considerably in the geographical scope of validity and actual spatial extension. The globalisation of law, therefore, refers to the spatial expansion or spreading of transnationalised law, legal processes and governance; it indicates the mobility of law. This suggests, according to them, that one needs to pay attention to spatial coverage of transnational legal process; the chains of interdependent actors or networks through which laws spread transnationally; and the actual physical space in which such transnational legal forms, regulations, relations and interactions operate and occur. There is thus a plural set of legal conditions or multitude of social fields – global, sub-national, national and local, the understanding of which is incomplete without a spatial analysis of plural or multiple legal constellations. Hence, law and space occupy the central position in legal pluralism and their spatial distribution become visible in the map of transnationalised plural legal orders (Benda-Beckmann et al. 2005 and 2009; Benda-Beckmann and Benda-Beckmann 2007). More recently, Anne Griffiths has reiterated this understanding in her review of legal pluralism, as she argues, under 'current conditions of globalisation, law is highly mobile and cuts across local, regional and national boundaries, engendering more transnational forms of law and ordering' (Griffiths 2013, p 269). These fluid and shifting domains raise questions about how law is spatialised – an instance of legal pluralism that not only provides an understanding of how legal spaces are embedded in broader social and political disputes, but also highlights the multispatial contextualisation of law (ibid., pp 270 and 284). In this direction, Sally Merry observes, 'if we add space to global legal pluralism, it produces an even more useful way to theorise this complex legal field' (Merry 2008, p 159). Therefore, a spatial version of legal pluralism, according to her, provides a way to conceptualise the state as embedded within a global regime of law; it emphasises how law is different in different kinds of spaces, and recognises

the multiplicity of law and spatial dimensions of legal fields (ibid., pp 159-160 and 165).

2.2.3: Fragmentation

Closely linked to pluralist concepts is the idea of fragmentation. According to Gunther Teubner, transnational law of economic transactions (*lex mercatoria*) has developed far beyond the nation-state and this development can be seen in various sectors of world society that are developing a global law of their own (Teubner 1997a and 1997b). He suggests that there are a number of inchoate forms of global law, such as global labour law and human rights law, none of which are created by states. There is thus a normative transformation – a transition from nationally organised legal order to a gradual emergence of global law – a legal order, which is highly fragmented and contradictory (ibid.; Teubner 1992 and 1998; Fischer-Lescano and Teubner 2004; see also Koskenniemi 2006, p 13). And this fragmentation brings into view collision and conflict not between distinct nations but between different rules, normative orders, and legal principles. However, this legal fragmentation depends upon more fundamental processes of fragmentation within a global society. Thus, there is no normative unity of global law, but rather a confusing variety of autonomous legal fields (Fischer-Lescano and Teubner 2004, pp 1002 and 1004). The emergence of global law, therefore, reveals decentralisation and dispersion of legislative sovereignty, multitude of fragmented legal orders, and contradictory multiplicity of law's identities. It exposes the impressive architecture of layers of rule-making authority that not only irritates law's binding arrangements, but also destructs law's sovereign bodies (Teubner 1997b and 1998). The immediate consequence is the emergence of global legal pluralism, which not only expresses deep contradictions between colliding sectors of a global society, but also redirects normative consistency towards operative 'inter-legality' (Fischer-Lescano and Teubner 2004, pp 1004 and 1008).

2.2.4: General Jurisprudence

Interlegality – the interaction and intersection of different legalities (de Sousa Santos 1987) or, interwovenness of fragmented legal orders (Teubner 1992), has equally become a central theme in William Twinings's understanding of law in global context. However, instead of proposing or reconceptualising a specific concept, Twining provides a broader analytical jurisprudential framework for analysing the implication of globalisation on law (Twining 2009a and 2009b). According to him, globalisation presents challenges to our understanding of law, which cannot be grasped through conventional conceptual framework and legal vocabulary. He points out that the picture of law in the world today is more complex because it involves developing, nascent and resurgent forms of legal orderings. The traditional focus of Anglo-American legal theory, that is, on municipal state law and public international law, therefore, is inadequate. What is required, then, for Twining, is a conceptual clarification, more particularly the construction of a conceptual framework and meta-languages that can transcend legal cultures (Twining 1996, pp 7 and 9). This, in turn, prompts him to restate the nature and role of jurisprudence – the enterprise of understanding and theorising law. And this theorising involves a variety of tasks: surveying the legal field or some parts of it, constructing and clarifying conceptual frameworks, models, and ideal types, and constructing general concepts, principles, and taxonomies (ibid., pp 11-12). On this view, according to Twining, theorising is an activity directed to the posing, reposing, answering and arguing about general questions relating to law, which 'takes place in and is influenced by the general characteristics of the legal milieu and its prevailing climate of opinion in a given time and place' (Twining 1974, p 150; 1996, p 13; 2009a, p 8). From this point of view, theorising performs a specific task – it keeps the discipline of law in a healthy state (ibid.). It is at this juncture, Twining argues, that we need to adopt a global perspective to adequately interpret and address legal issues arising in the context of globalisation. This means, for him, to revise and extend the cannon of juristic thought that is available in our heritage of legal texts and thinkers. What is needed, therefore, is a global jurisprudence, which can be found in the idea of 'general jurisprudence' – a term he uses to refer to 'discourse about two or more jurisdictions or legal orders from the micro-comparative to the universal' (Twining 2002, p 5).[80]

[80] The term 'general jurisprudence' has also been used by other legal scholars, such as for Costas Douzinas and Adam Gearey, 'critical jurisprudence' is a form of general jurisprudence, which adopts a much wider conception of legality and addresses all those issues that classical philosophy examined

The purpose of general jurisprudence, from this point of view, is to construct overviews of legal phenomena in the world as a whole – a global mapping of law that deals with all levels of legal ordering and their interrelations. In this respect, it seems clear that general jurisprudence has to come to terms with normative and legal pluralism because a global mapping of law includes not only municipal and international law, but also global, regional, transnational and local orderings (ibid.; Twining 1996, pp 38 and 40).

To Twining, reviving the idea of general analytical jurisprudence is nothing but the development of a localised globalism in jurisprudence. Accordingly, Twining suggests that this development requires reinterpretation of texts within the existing juristic canons and the exploration of their geographical reach and cross-cultural fit. In other words, for him, a revived conception of general jurisprudence is not just about reviving the juristic thinking of traditional analytical jurisprudence, but is also about constructing key concepts from this thinking and expanding them to provide an account of transnational legal discourse. This is clearly visible in his elucidation of the term 'general jurisprudence': as he notes, the term 'general' in general jurisprudence means a theorising that significantly traverses legal traditions, cultures or even jurisdictions (Twining 2009b, p 32). Hence, Twining claims, general jurisprudence is universal, since it is the same in all places, at all times and embraces more than one perspective (Twining 2005, p 7). In short, as opposed to particular or local, general jurisprudence is a flexible term that has the capacity to encompass a variety of legal cultures, levels, processes, and jurisdictions, which should be examined through concepts, models or frames derived from analytical jurisprudence (Twining 2009a, p 18; Twining 2005, p 8). Put differently, in the emerging global legal order the contexts, levels and processes are many – international, transnational, regional, sub-national, supra-national, national and local. A global perspective on law, therefore, must be concerned with all levels of relations and legal ordering in the world as a whole (Twining 2009b, p 24; Twining 2009a, p 15). This prompts him to explore both legal concepts (such as duty, responsibility, person, rights, contract, used in the formulation of laws) and analytical concepts used in describing,

under the titles of law and justice (Douzinas and Gearey 2005, p 10). Here, however, I limit my discussion to Twining's proposed framework.

analysing, explaining and evaluating legal institutions and phenomena (Twining 2005, p 9). The crux of this exploration, however, is to find out how concepts travel far and well, and how this travel takes place across legal cultures, languages, jurisdictions, levels, and even fields of law (ibid.). This suggests that Twining is primarily concerned with developing a 'vocabulary and conceptual apparatus for studying and generalising about law transnationally and cross-culturally' (Twining 2009a, p 35). In this respect, he takes into account a number of concepts already elaborated by other legal scholars to construct a 'framework that may be useful for giving general accounts of legal phenomena and analysing them from a global perspective' (ibid., p 64). Hence, he not only talks about 'mapping law' which, according to him, provides an overview or total picture of law in the world as a whole, but also explores the idea of 'diffusion', 'interlegality' and 'levels of law' (ibid., pp 67 and 69). The central point is that there are different levels of normative and legal ordering that co-exist, overlap, intersect, and interpenetrate, and therefore, the idea of normative legal pluralism is essential for understanding the migration and diffusion of laws, and the complexities of interlegality (Twining 2009a, pp 69-70; Twining 2002, pp 245-251).

The discussion above shows how law and globalisation scholars use the term 'multiplicity' and theorise the 'multiple'. While these scholars do not form a specific school of legal thought, my discussion suggests that there are notable points of convergences in their respective theorisation of the 'multiple'. Each scholar has attempted to develop a new understanding and provide new perspectives on global/transnational legal regulation and processes. More precisely, all suggest that in the emerging global legal order law operates at multiple levels, scales or through different layers. Put differently, the background of their analysis of global legal processes is the idea that globalisation has brought a paradigm shift in the operation of law. Thus, what we notice is that multiple (semi)autonomous, fragmented or plural legal orders, fields or spaces situated across different levels are operating and interacting with each other. This interaction, co-existence and intersection of multiple or plural legal orders, according to these scholars, bring into view diffusion, inter-legality, global, transnational and spatial legal pluralism. Howsoever interesting these insights are, a number of other narratives, according to postcolonial legal

studies scholars, are missing from these accounts. For instance, according to Susan Silbey, globalisation is a form of postmodern colonialism in which the distribution, consumption, production and interpenetration of Western cultural products into the peripheries of the world system are organised through legal devices to constitute a form of domination (Silbey 1997, p 219). Similarly, Eve Darian-Smith argues that analysts of law and globalisation often fail to address the extent to which Western legal concepts, categories, and discourses become dominant in a global world. And, as a result, the full implication of asymmetrical power relations between North and South, West and East, developed and developing nations remain somewhat unquestioned in legal literature on globalisation (Darian-Smith 2000, pp 817-818). Surely, this inattention calls for new approaches which, for Sundhya Pahuja, should not only explore norms and concepts, but also examine how certain regulatory practices reproduce old oppressions in new forms (Pahuja 2003, p 73). In a similar vein, while Adam Gearey focuses on 'legal imperialism', that is, on how certain economic and power relations are privileged and preserved by international institutions (Gearey 2005, p 12); Eve Darian-Smith advocates for 'radical legal pluralism' which not only explores the complexity of legal processes operating at multiple scales (supranational, transnational, international, global and local), but also pays attention to interactions, contradictions and inequalities produced through such processes (Darian-Smith 2013a, pp 4-6). She therefore challenges the state-centred understanding of law that underpins much of the contemporary law and society scholarship and suggests to focus on 'laws, societies and contexts' to overcome ethnocentric biases in modern Western law (Darian-Smith 2013b, p 524). Thus, she argues for 'new ways of thinking' to understand the relations between law and globalisation which, for her, entails a 'global socio-legal perspective' (ibid., p 526). While her approach might be more flexible and broader, there is little difference between her proposed framework of analysis and other scholars discussed above, in the sense that she intends to provide a global perspective on law by looking into spatial scales, multiple levels or fields, and relations of legal interactions (ibid., pp 525-526). Ultimately, however, what remains less explored and under theorised in law and globalisation scholarship is the multiple or multiplicity, which I elaborate below.

2.3: Multiplicity

The discussion above reveals that in contemporary literature on law and globalisation, legal scholars have focused on multiple, plural and heterogeneous legal levels, spaces, fields, and processes that overlap, interact, and intersect with each other. Thus, in law and globalisation scholarship, the understanding of the multiple becomes inseparable from the plural. Put differently, as opposed to one, the term multiple or multiplicity has been used to signify plural or many autonomous and semi-autonomous legal fields. In contrast, by multiple I refer to 'multiplicity' – a term Deleuze used to articulate his philosophical thinking or image of thought, as he observes, 'I see philosophy as a logic of multiplicities' (Deleuze 1990/1995, p 147). This is an empiricist logic, which starts with a completely different evaluation of the states of things because empiricism, as William James points out, explains the wholes by parts (James 1909, pp 7-8). However, this does not mean that there are several states of things, neither that each state of things is in itself multiple, but rather, that it is necessary to define things in the making, to see how things evolve and grow through conceptual decompositions (ibid., pp 263-264). Empiricism, therefore, is linked to a logic – the logic of multiplicities (Deleuze and Parnet 1977/1987, pp vii-viii). The point, then, is how to think about the multiple, not in terms of an opposition between the one and the many (monism and pluralism), but rather through multiplicities, which implies a theory and practice of thinking about the organisational and differential relations that belong to the many (Deleuze 1968/1994, pp 182-183; Deleuze 1973/2001, p 95). Thus, for Deleuze, 'there is nothing that is one, there is nothing that is multiple, everything is multiplicities' (Deleuze 1973/2001, p 99).

It becomes evident that Deleuze puts forward a very different understanding of multiplicity. The term was first introduced by Deleuze in *Bergsonism* (1966/1988) and later developed jointly with Guattari. In *Bergsonism*, Deleuze points out that a decomposition of the composite reveals two types of multiplicity. One is represented by space or by homogeneous time. It is a multiplicity of exteriority, of simultaneity, of juxtaposition, of order, of quantitative difference, and for him, it is a numerical

multiplicity, which can be divided into the one and the many. The other type is an internal multiplicity of succession, of fusion, of organisation, of heterogeneity, of qualitative discrimination, which Deleuze terms qualitative or continuous multiplicity (Deleuze 1966/1988, p 38). Qualitative multiplicity has three properties: continuity, heterogeneity, and simplicity (ibid., p 43). The latter, according to Deleuze, belongs to the sphere of duration or whole, and contains a fairly large number of elements. The whole, however, is not an aggregate of many parts, but rather a zone or a space of continuity, 'which designates a set of lines or dimensions which are irreducible to one another' (Deleuze and Parnet 1977/1987, p vii). In a multiplicity, therefore, what counts are not the elements, but a set of relations which are not separable from each other (ibid., p viii). Deleuze further explains that in continuous multiplicity there are two movements of actualisation: contraction and expansion (Deleuze 1966/1988, p 66). Movements are attributed to things and hence, in continuous multiplicity, we only find expansion because heterogeneous elements move through lines. In this sense, for Deleuze, multiplicity begins with a certain idea of movement and lines (ibid., p 79). Therefore, as against the predictive relation of the one and the many, a multiplicity is an affirmation that heterogeneous bits or parts constitute a unity and yet this unity does not unify the parts (Deleuze and Guattari 1972/1983, p 42). Thus, rather than viewing 'multiplicity' as an aggregate of numerous units, the term refers to the formation of a whole in which heterogeneous elements come together through lines and movement which, however, are irreducible to any sort of unity. As Deleuze/Guattari observe,

> 'Let us return to the story of *multiplicity*, for the creation of this substantive marks a very important moment. It was created precisely in order to escape the abstract opposition between the multiple and the one, to escape dialectics, to succeed in conceiving the multiple in the pure state, to cease treating it as a numerical fragment of a lost Unity or Totality…and instead distinguish between different types of multiplicity' (Deleuze and Guattari 1980/2004, p 36; original emphasis).

The crucial point here is that Deleuze/Guattari put emphasis not on quantitative but on qualitative multiplicity. What this means is that while a multiplicity contains heterogeneous elements, the issue at stake, however, is to identify and describe their dispersion, their movements, their relations, and their dimensions (ibid., p 37). This emphasis on movement, dispersion and dimension is important, for it suggests that

the notion of multiplicity that Deleuze/Guattari propose is spatial in character. This understanding is very much evident in *Difference and Repetition*. Though Deleuze used the term multiplicity in a Bergsonian sense, its use was deeply influenced by mathematician Bernhard Riemann. More precisely, he points out that every idea is a multiplicity or variety. In this Riemannian usage of the word 'multiplicity', the utmost importance must be attached not to the combination of the many and the one, but rather to an organisation belonging to the many (Deleuze 1968/1994, p 182). Significantly, by referring to Riemann, Deleuze appeals to qualitative, continuous, non-numerical multiplicity which, in a Riemannian sense, can be understood as 'manifolds' (Patton 1994, p xii). Therefore, the term multiplicity, as used by Deleuze/Guattari (Deleuze and Guattari 1980/2004, pp 36 and 526), needs to be viewed as deeply topological or spatial because Riemann defined mathematical objects as continuous manifolds, whose elements, such as 'points', may function mathematically as spaces. Hence, for Riemann, a continuous manifold is a conglomerate of local spaces or subspaces, which allows one to define any space as continuous by referring to the relationships between spaces, not necessarily subspaces but also other spaces, specifically through the notion of 'neighbourhood'. From this point of view, Riemann considers continuous manifolds as having infinite dimensions (for details, see Plotnitsky 2006 and 2009).

Deleuze and Deleuze/Guattari gave a philosophical inflection to this understanding, which is evident not just in their conception of philosophy, but also the way they conceptualised multiplicity. For instance, as discussed in the introduction, every concept is not only inseparable from its heterogeneous components, but also relates back to other concepts. It means that a concept has zones of neighbourhood, which define its 'endoconsistency' (internal consistency between components) and 'exoconsistency' (external consistency with other concepts) (Deleuze and Guattari 1991/1994, pp 19-20). The components of a concept, therefore, are inseparable from each other. Hence, ordering these components, linking them to other concepts or relating one concept to another by zones of neighbourhood is nothing but the construction of a bridge on the same plane, as Deleuze/Guattari note, 'we go from one concept to another by a kind of bridge' (ibid., p 19). Therefore, 'zones and bridges are the joints of the concept' (ibid., p 20) and creation of these joints is an act

of thinking. Deleuze further explains that new concepts have to be brought in all the time to trace uncharted channels, new connections, and new pathways but this does not mean that concepts cannot be repeated. Quite the contrary, a concept's power comes from the way it is repeated, that is, from the way one concept links up with another concept (Deleuze 1990/1995, pp 147 and 149). This linkage is essential because the creation of bridge or joints, according to Deleuze/Guattari, is an act of thinking. Thus, 'it's not a matter of bringing all sorts of things under one concept but rather of relating each concept to variables that explain its mutations' (ibid., p 31). As a consequence, Deleuze/Guattari point out, every concept has components and therefore has a combination. It is a multiplicity (Deleuze and Guattari 1991/1994, p 15). This is a clear manifestation of their philosophical thinking, which is conceptual and at the same time, it is spatial, in the sense that they were committed to bring movements not just in concepts, but also in thinking.

This spatial logic becomes clearer in their conceptualisation of multiplicity as continuous, non-metric and intensive which, according to them, must be defined by the number of lines and dimensions it has (Deleuze and Guattari 1980/2004, pp 270 and 275). Since variations and dimensions are essential characters of a multiplicity, the latter is composed of heterogeneous elements (ibid., p 270), but this composition is in no way homogeneous. It is rather a mixing, weaving and interlacing or patchwork – a piece by piece construction through successive additions of fixed and mobile elements that occurs in an open smooth space. However, 'smooth' does not mean homogeneous; on the contrary, for Deleuze/Guattari, it is literally a Riemannian space in which an amorphous collection of juxtaposed pieces can be joined together in an infinite number of ways (ibid., p 526). A smooth space, from this point of view, possesses a greater power of deterritorialisation – a 'movement by which "one" leaves the territory' (ibid., pp 530 and 559). But movement is a translation in space (Deleuze 1983/1986, p 8) and thus, each time there is a movement, there is qualitative variation and transformation which, according to Deleuze/Guattari, is a mode of spatialisation (Deleuze and Guattari 1980/2004, p 532). A multiplicity, therefore, is non-metric, qualitative and continuous when relations or links are established between elements located in heterogeneous spaces so that one becomes part of another. As Deleuze/Guattari observe,

> ‘It follows that two neighboring observers in a Riemann space can locate the points in their immediate vicinity…. Each vicinity is therefore like a shred of Euclidian space, *but the linkage between one vicinity and the next is not defined and can be effected in an infinite number of ways*…. It is possible to define this multiplicity without any reference to a metrical system…. In short, if we follow Lautman’s fine description, Riemannian space is pure patchwork. It has connections, or tactile relations. …Heterogeneous, in continuous variation, it is a smooth space, insofar as smooth space is amorphous and not homogeneous’ (ibid., pp 535-536; original emphasis).

The above observation suggests that the notion of multiplicity that Deleuze/Guattari propose is equally a conceptualisation of spatiality, which requires a very different operation in thought.[81] Since a multiplicity, from a Deleuze/Guattarian point of view, implies a qualitative order, it requires one to focus on linkages, connections, encounters and series of movements through which the ‘many’ or the ‘multiple’ come together and acquires their own status, not as a unit, but rather as an assemblage/arrangement. This means that a multiplicity is not just a mere aggregation of heterogeneous units, levels, fields, processes, norms or actors because ‘it is not the elements or the sets which define the multiplicity’ (Deleuze and Parnet 1977/1987, p 34). Instead, the components of a multiplicity are connectives or coordinates that open up ‘new points of connection’ (Rajchman 2000, p 56). These connections, in other words, open up new lines and tracks, the multiplication of which must be grasped and discerned by combining, recombining and knotting together heterogeneous elements. But to connect heterogeneous elements, to multiply their relationship, to discern such multiplication, one needs a conjunction and for Deleuze, this conjunction is ‘AND’. As Deleuze points out, ‘multiplicity is never in the terms, however many, nor in all the terms together, the whole. Multiplicity is precisely in the “and”, which is different in nature from elementary components and collections of them’ (Deleuze 1990/1995, p 44). From this point of view, ‘AND’ becomes a logical connector and accordingly, it brings into view new connections, lines, directions, and flows. Since multiplicities remain folded or enveloped in an event, one needs to decompose or unfold the event to discern how ‘AND’ constitutes

[81] This understanding has influenced a number of geographers to argue for a post-structuralist/representational geography or spatiality, which views space as manifold, relational or multiplicity (see, for example, Doel 1999 and 2000). More precisely, as Doreen Massey observes, ‘the very concept of multiplicity entails spatiality’ (Massey 2005, p 91).

the multiplicity because 'AND brings in all relations, there are as many relations as ANDS' (ibid.).

In the introduction, I have emphasised this understanding through the bioeconomy. I have argued that the emerging bioeconomy is a multiplicity, not just because it is a combination of heterogeneous elements, but rather it is an organisation or arrangement that belongs to the many. However, as pointed out above, what matters in a multiplicity is not only the co-existence and co-functioning of elements, but their dispersion, relations and linkages. Thus, in the bioeconomy heterogeneous elements situated in dispersed spaces relate to each other, but these relations need to be established through successive addition of elements because a multiplicity is a piece by piece construction. Hence, I have argued that the 'many' or the 'multiple' in the bioeconomy operate or function through conjunctions. However, since a multiplicity must be defined by dispersion, expansion, movement and dimensions, I construct, multiply and expand the dimension of the controversy by establishing conjunctions between the 'many': desire AND production, AND propertisation, AND appropriation, AND normalisation, AND capture, AND power, AND contestation, AND subjectivity, AND becoming. The point here is that a multiplicity comes into view not just because the 'many' co-exist and co-function in the bioeconomy or the Bt. brinjal controversy, but because of the conjunctions, which multiply, ramify and expand relations between the 'many' in extensive series.

The conjunctive synthesis, elaborated above, has implication for how we understand law's spatialisation, and how we theorise the operation of law in the global legal order. Certainly, disparate legal entities co-exist, co-function, interact, and work in symbiosis in the global legal order. And yet, this does not mean that we always need to describe the 'global legal order' in terms of inter-national, trans-national, multiple, plural or fragmented legal orders. Because such theorisations only reveal law's inevitable transition, paradigmatic shift, situatedness, linear incremental progression, as well as the changing geopolitics of the production of law. Thus, instead of focusing on how law operates, regulates and governs at multiple legal orders, fields, levels, spaces or scales, we can look at how law operates through conjunctions. That

is, how law establishes conjunctions and produces functional synthesis between disparate elements, and by doing so, multiplies and expands legal relations. After all, law's spatialisation is not simply a matter of geographical reach, diffusion or scale of its operation, but rather how it establishes conjunctions between an array of elements situated in dispersed locations and to this effect, how it re/organises, re/configures, and re/stabilises the relations between the many. However, to carry this understanding forward, one needs to adopt a practice of thinking that brings movement in thought.

2.3.1: Rhizomatic Thinking

The construction of a multiplicity requires movement in thought because 'multiplicities are rhizomatic' (Deleuze and Guattari 1980/2004, p 8). A rhizome, according to Deleuze/Guattari, 'has neither beginning nor end, but always a middle (*milieu*) from which it grows and which it overspills'. It is made of lines and constitutes linear multiplicities (ibid., p 23; original emphasis). In a rhizome, 'there are only lines', and these lines of flight or deterritorialisation (ibid., pp 9-10) run through a multiplicity to connect and combine disparate entities to bring new effects. From this point of view, a rhizome assumes diverse forms, extends in all directions and ceaselessly establishes connections. In this sense, a multiplicity has neither subjects nor objects, but only determinations, magnitudes, and dimensions. Significantly, for Deleuze/Guattari, rhizome implies a style of thinking that allows one to construct a multiplicity through conjunctions: 'and…and…and…' (Deleuze and Guattari 1983, p 57). This suggests that the rhizome encourages one to move thinking in all directions to provide insights into how relationships between disparate entities grow, multiply and expand. In other words, rhizomatic thinking provides an account of the multiple, not by continuously adding a higher dimension, but by following the principles of connection, heterogeneity, assemblage/*agencement*, and cartography/mapping (ibid., pp 10-28).

A key principle of rhizomatic thinking is to establish connections between disparate elements. Accordingly, it follows lines of flight or movements of deterritorialisation,

and in so doing, arranges the 'many' in semiotic chains to form an 'exclusive alliance' (ibid., pp 12 and 57). Drawing and reweaving disparate entities together, therefore, is an essential attribute of rhizomatic thinking which, however, does not totalise or unify them, but rather measures and maps out their dispersion and paths of becoming part of the infrastructure or desiring-machine. So, in this thesis, I arrange the components parts of the desiring-machine through conjunctions and thus, the only unity I pay attention to is that of co-functioning, of symbiosis, of alliances (Deleuze and Parnet 1977/1987, p 69). The rhizome, as Colman points out, 'is a concept that maps a process of networked, relational and transversal thought' (Colman 2010, pp 232-233). Thus, instead of focusing on one particular element, I look for linkages and connections between disparate elements. At the same time, I link and combine one concept with another through conjunctions to multiply and expand the dimension of the controversy. And so, my thought is not fixed, rather it moves through conjunctions. For instance, in chapter 3, I link the concept of de/re-territorialisation to the idea of materiality in Euro-American material and intellectual property law to provide an account of how an emergent space of property comes into existence in a distant location. Similarly, in chapter 4, I combine the concepts of 'governmentality' and 'normalisation' with 'expansion' to demonstrate how appropriation becomes deterritorialised, normalised and spatialised. Likewise, chapter 5 brings the concept of power/desire in conversation with de/re-territorialisation, although implicitly, to provide insights into how 'differentiated relations of power/desire' operate in the bioeconomy. I expand this analysis through the concepts of 'becoming' and 'subjectivity', and thus, chapter 6 shows how emergent subjectivities are produced and shaped by co-existence and co-functioning of heterogeneous elements. What remains implicit in this composition is a rhizomatic writing which, as Colman observes, is not simply a process that assimilates things, but rather gives form to evolutionary environments where relations alter the course of how flows and collective desire develop (ibid., p 235). This observation is important, as it suggests that rhizome is a vocabulary that emphasises how heterogeneous bits and pieces connect and could evolve in creative mutations. Thinking rhizomatically, from this point of view, implies that one needs to adopt a style of composition in which thinking operates as a logical connector – it moves here and there, connects this and that to develop relational ideas and actualise these ideas in extensive series. Consequently, there is always movement in thought, which

indicates a continuous process of deterritorialisation and spatialisation. The composition, therefore, becomes a description that not only narrates this movement, but also articulates the spatialisation of thought.

2.3.2: Assemblage

Rhizomatic thinking adopts a style of composition in which elements are added successively to construct the multiple. But the point is that this continuous addition of elements multiplies, increases and expands the dimension of the multiple. And, for Deleuze/Guattari, 'an assemblage is precisely this increase in the dimensions of a multiplicity that changes in nature as it expands its connections' (Deleuze and Guattari 1980/2004, p 9). This suggests that by moving here and there, linking this and that, rhizomatic thinking forms an 'assemblage'. As pointed out in the introduction, while the term '*agencement*/assemblage' appeared first in Guattari's writing, in *Kafka: Toward a Minor Literature* (1975/1986) the term was used synonymously with 'machine' and 'rhizome'. Since a machine is constituted by disparate elements, the constituent parts relate to each other. A machine, therefore, operates in a connective fashion, it is 'an assemblage of symbiosis, defined by the co-functioning of heterogeneous parts' (Deleuze and Parnet 1977/1987, p 70). However, what establishes functional relations between these parts is desire. Deleuze has emphasised this understanding, often in great detail, in a number of occasions. For instance, in *Dialogues*, Deleuze and Parnet point out that desire assembles, connects, creates chains, mobilises forces, organises and develops forms, and produces intensities. Desire, in other words, constitutes a machine – an assemblage of heterogeneous elements. Every machine, therefore, is an assemblage of desire, not in the sense of mechanical functions, but rather grouping or assembling of disparate terms. In retrospect, every assemblage is a machine and thus, 'we must describe the assemblage in which such a desire becomes possible, gets moving and declares itself' because '*desire only exists when assembled or machined*' (Deleuze and Parnet 1977/1987, pp 78-79, 89, 92, and 96-97; original emphasis). Deleuze has elaborated this understanding further in 'D as in Desire' in *L'Abecedaire*; as he explains, desire is constructivism – it is a process of constructing an assemblage, which is nothing

other than putting several factors into play (Deleuze 1988-1989/1996).[82] Thus, I have argued that the emerging bioeconomy is a 'desiring-machine', it is a multiplicity, but to understand how desire constitutes the machine, we need to construct an assemblage because desire only exists when assembled.

Initially, the term assemblage was used to give a sense of the connections between a concept and the text or a state of affair and the statement that often come in unpredictable ways (Deleuze and Guattari 1975/1986, pp 81-88). However, elaborating the concept, Deleuze and Parnet point out that an assemblage is a multiplicity which is made up of many heterogeneous terms and which establishes relations between them. The assemblage's only unity is that of co-functioning: it is a symbiosis (Deleuze and Parnet 1977/1987, p 69). Thus, in *A Thousand Plateaus*, Deleuze/Guattari observe,

> 'In a book, as in all things, there are lines of articulation or segmentarity, strata and territories; but also lines of flight, movements of deterritorialization and destratification. Comparative rates of flow on these lines produce phenomena of relative slowness and viscosity, or, on the contrary, of acceleration and rupture. All this, lines and measurable speeds, constitutes an *assemblage*. A book is an assemblage of this kind and as such is unattributable. It is a multiplicity – but we don't know yet what the multiple entails when it is no longer attributed, that is, after it has been elevated to the status of a substantive' (Deleuze and Guattari 1980/2004, p 4; original emphasis).

The term 'assemblage', as we find in the above passage, has four components or constituent elements: state of things, statements or enunciation, territories or spaces, and movements of de/re-territorialisation. Thus, Deleuze concludes that it is within these components that desire flows (Deleuze 1988-1989/1996). This suggests that an assemblage is a social-technical machine, which is spatial, in the sense that it is an arrangement or *agencement* of an array of elements. An assemblage, however, does not mean simple arrangement, organisation or random collection of things, but rather

[82] *L'Abecedaire* is an eight-hour series of interviews between Gilles Deleuze and Claire Parnet filmed by Pierre-Andre Boutang in 1988-1989. These were broadcasted on the Arte channel between November 1994 and spring 1995 with Deleuze's permission.

it is a process of arranging, organising, and fitting together (Wise 2005, p 77; Livesey 2010, p 18; Phillips 2006). By arranging complex constellations of things, statements, expressions, qualities, and spaces that come together, an assemblage creates new ways of functioning. As Deleuze/Guattari explain, 'we will call an *assemblage* every constellation of singularities and traits deducted from the flow – selected, organised, stratified – in such a way as to converge (consistency) artificially and naturally; an assemblage, in this sense, is a veritable invention' (Deleuze and Guattari 1980/2004, p 448; original emphasis). And certainly, 'it can be explained only if one takes apart to examine both the elements that make it up and the nature of its linkages' (Deleuze and Guattari 1975/1986, p 53). Accordingly, I have argued that the emerging bioeconomy is a deterritorialised machinic assemblage, but to understand how this assemblage is formed, one needs to arrange the component parts, describe how desire flows through them, and 'follow' the lines of de/re-territorialisation because lines of deterritorialisation, Deleuze/Guattari suggest, are the cutting edges that carry the assemblage away (Deleuze and Guattari 1980/2004, p 98).

2.3.3: Deleuze/Guttarian Cartography

Rhizomatic thinking is open-ended, it flows in all directions, connects an array of elements and in so doing, it produces a multiplicity, constructs an assemblage. From this perspective, a multiplicity has neither subject nor object, but there are only connections, chains, lines of flight or movements of deterritorialisation. Put differently, a multiplicity or an assemblage is constituted by lines, movements and spaces. However, to show how these lines, movements and spaces converge, one needs to make a map, a cartography of the assemblage because 'unlike tracings, the rhizome refers to a map that must be produced or constructed' (Deleuze and Guattari 1983, p 48).

In a most straight forward way, maps as spatio-cultural artefacts represent the earth's surface, in the sense that 'maps are more or less permanent, more or less graphic artefacts supporting the descriptive function in human discourse linking territory to other things' (Wood and Krygier 2009, p 421). In this view, maps are generally

understood to have an ability to embody and affirm the existence of a bewildering variety of things. Thus, a map says, 'this is here' and 'that is there', and in so saying, it affirms the existence of things and their locations. In effect, then, a map is actually a system of propositions, an argument about existence (ibid., p 429). Hence, a map can be used as a tool that 'helps us to navigate, plan, and control the world out there'. It can be 'employed to chart explorations, administer cities, foster trade, bound nations, regulate property transfer, locate people, places or events, and to link us to the world' (Perkins 2009, p 126). Maps, therefore, portray relevant information accurately that a map reader can analyse and interpret, and it is this science of mapmaking, from which the discipline of cartography emerged after the World War II (ibid.). The general understanding is that cartography as a practice largely consists of representing the surface of the earth and as an academic pursuit, it is concerned with theorising how best to represent spatial data (Kitchin and Dodge 2007, p 331).

Deleuze/Guattari, however, used the word 'map' in a diagrammatic sense because 'a map fosters connections between fields' (Deleuze and Guattari 1980/1987, p 13). A map or a diagram, according to Deleuze, is a set of various interacting lines. He further explains, that

> 'There are of course many different kind of lines…Some weave through a space, others go in a certain direction. Some lines, no matter whether or not they're abstract, trace an outline, other don't.…We think lines are the basic components of things and events. So everything has its geography, its cartography, its diagram' (Deleuze 1990/1995, p 33).

And untangling these lines means, in each case, preparing a map, a cartography, a survey of unexplored lands (Deleuze 2001/2007, pp 338-339).[83] From this standpoint, a map has multiple entryways, in the sense that lines and connections always come back to the same entry point. Thus, it is a method that *tracing* should always be put back on the map because tracing translates the map, it expresses what one journeys through and in doing so, organises and stabilises the multiplicity

[83] Implicitly or explicitly, this understanding has inspired a number of cartographers who view mapping as a process of constant de/re-territorialisation that unfolds, connects and relates disparate parts spatially distributed. See, for example, Corner 1999; Kitchin and Dodge 2007; Kitchin, Gleeson and Dodge 2013.

(Deleuze and Guattari 1980/2004, pp 12-15; Deleuze 1993/1997, p 61). Since different sorts of lines constitute different configurations of space, rhizomatic thinking arranges the components of an assemblage along lines or movements of de/re-territorialisation. In this sense, Deleuze/Guattari invoke a cartography of an event or assemblage in which disparate elements relate to each other. Deleuze/Guattarian cartography, therefore, operates at two levels: on the one hand, it organises or arranges the component parts in terms of their co-existence, symbiosis and co-functioning. And on the other hand, it 'posits a plane of experimentation, a mapping of extensive relations and intensive capacities that are mobile and dynamic' (Gatens 1996, p 169). In an assemblage, each part is in constant relation with other parts, and thus, these parts are inseparable from the relations they create which, in turn, increase their capacity to move, act, affect and being affected. A Deleuze/Guattarian cartography, from this point of view, maps relations and connections between the 'many'. To put it differently, the emerging bioeconomy is a multiplicity, a deterritorialised machinic assemblage. However, as pointed out above, the multiple needs to be created and rhizomatic thinking produces the multiple, constructs an assemblage by adding elements successively and through conjunctions, which are actualised in extensive series. This suggests that map-making is an essential element of rhizomatic thinking (Stivale 1984, p 22). Thus, whenever one traces the lines, movements, connections and interactions, a new map must be constructed, a map of the machine or assemblage (Guattari 1979/2011, pp 170-171). This thesis, therefore, maps and charts the conjunctions, spaces and pathways through which the components parts of the bioeconomy connect, move, interact and relate. In other words, this thesis produces a cartography, constructs a map, which brings into view the dimensions of the bioeconomy.

2.4: Research Method

In this thesis, I adopt a qualitative research method and practice. Qualitative inquiries are 'designed to explore the human elements of a given topic, where specific methods are used to examine how individuals see and experience the world' (Given 2008, p xxix). Given that qualitative research is followed in a range of social science

and humanities discipline, the methods available to the researcher are very broad. Thus, 'there is no single, accepted way of carrying out qualitative research' (Ormston et al. 2014, p 2). The choice of methods depends upon a range of factors, such as beliefs about the nature of the social world, nature of knowledge and how it can be acquired, the purpose and goals of the research, the audience of the research, and the positions and environments of the researchers themselves (ibid.). There are, however, theoretical leanings and methodological preferences because a number of subdisciplines (cultural anthropology, symbolic interactionism, Marxism, ethnomethodology, feminism, cultural studies) have played an active role in the continued development of qualitative research (Lockyer 2008, p 706). This indicates that qualitative research is flexible, in the sense that there is no theory or paradigm that is distinctly its own (Denzin and Lincoln 2011, p 6). Rather than privileging a single methodological practice over another, qualitative research combines multiple theoretical paradigms, methods, empirical materials and perspectives in a single study, which add rigour, breath, complexity, richness and depth to the inquiry (ibid., p 5). Accordingly, in qualitative research projects, researchers draw on the approaches of phenomenology, hermeneutics, feminism, rhizomatics, deconstructionism, ethnographies, psychoanalysis, cultural studies, and so on, and use various methods to gather and analyse data, such as observation, interviews, focus groups, life histories and narratives, analysis of discourse, documents and texts, and survey research, among others (ibid., p 6). A qualitative approach, therefore, is creative and sensitive to the context in which the data is analysed, it is typically used to explore and add meaning to new phenomena (Given 2008, p xxix). However, methods are no more than ways of acquiring data, though they often come together with discussions about theory and methodology (della Porta and Keating 2008, p 28). Thus, faced with choices, the researcher needs to be clear as to what methods are to be used to accomplish what aspects of research and why (Chenail 2011, p 1714). In the next two sections, I discuss my chosen research methods, namely, case study and discourse analysis.

2.4.1: Case Study

As emphasised earlier, I look at the Bt. brinjal controversy as an event in which multiplicities remain folded. Therefore, the event – the Bt. brinjal controversy is an

exemplary case that can be approached through the case study method to understand how the bioeconomy operates as a desiring-machine. Case studies, according to Robert Stake, 'are useful in the study of human affairs' (Stake 1978, p 5) because 'a significant part of what we know about the social and political world comes from case studies' (Vennesson 2008, p 223). The role of case study as a rigorous qualitative method has already been recognised in a number of social science disciplines because it enables the researcher to investigate a contemporary phenomenon through detailed contextual analysis. As Bromley points out, a case study is a 'systematic inquiry into an event or a set of relevant events which aims to describe and explain the phenomenon of interest' (Bromley 1990, p 302). A case study, from this point of view, is an empirical inquiry in which one or a few instances of a contemporary phenomenon are studied in depth (Blatter 2008, p 68) and as a method, it is particularly useful 'when the boundaries between phenomenon and context are not clearly evident' (Yin 2009, p 18).

'Case studies are performed for various purposes' (Fidel 1984, p 273). While some researchers use case study as a specific method for field research; for others, it is a 'qualitative inquiry' (Stake 2005, p 443), which allows the researcher to explore a phenomenon using a variety of data sources (Baxter and Jack 2008, p 544). Hence, there is no consensus on the characteristics of case studies because they are diverse in their objectives, characteristics and results (Blatter 2008, p 68; Vennesson 2008, p 225). However, as a qualitative method, it is an in-depth strategy that enables the investigator to closely examine and understand complex issues within a specific context. Thus, in some case studies, a single case is investigated in-depth through direct observation, interviews, or available documents to provide comprehensive understanding and theoretical implications. In others, multiple cases are studied and analysed over a period of time to generate concrete findings, hypotheses and problems. In this respect, the selection of a case is important because for a sustained investigation the case must be unique and interesting. The term 'case' has multiple overlapping meanings and can be approached from a variety of viewpoints (Ragin 1992). Robert Yin points out that a 'case' is generally a bounded entity (a person, organisation, behavioural condition, event, or another social phenomenon). Correspondingly, a case serves as the main unit of analysis, the boundary of which,

in contextual, spatial and temporal dimensions, may be blurred (Yin 2012, p 6). A case, therefore, must be significant, unique, interesting, or a revelatory event, which can be explored and investigated through compelling theoretical framework (ibid., p 7).

The use of case study method depends on the research questions that a research is trying to address. It becomes pertinent when a research addresses either descriptive questions, such as 'what is happening or has happened?', or explanatory questions, such as 'how or why did something happen?' (ibid., p 5). A case study, therefore, investigates conceptually and empirically the 'why', 'what', and 'how' questions to bring out and elucidate the nature of the event and its consequences. This suggests, as Vennesson observes, that a case is not just a unit of analysis or an observation, understood as a piece of data, but rather, a theoretical category. In the sense that a case does not have to be contemporary, it can be a past event, which is not spatially delimited, but its delimitation can be achieved through theoretical conceptualisations or choices made by the researcher (Vennesson 2008, pp 226-227). Viewing in this way, it can be said that a case study can be used to provide a context for the evaluation of other data, offering insights into broader configurations in which an event is implicated, and developing theoretical explanations. However, this depends on the nature of case study which, following Robert Stake, can be divided into three categories: intrinsic, instrumental and multiple or collective case study. According to Stake, an 'intrinsic case study' is one in which the researcher undertakes to study a particular case, not because the case illustrates a particular problem or trait, but because the case itself is of interest. 'Instrumental case study', on the other hand, examines a case mainly to provide insight into an issue. Though the case still is looked at in-depth, it is of secondary interest. Its contexts are scrutinised and detailed because it plays a supportive role, and it facilitates our understanding of something else. He further emphasises the 'multiple case study' which, according to him, focuses on a number of cases jointly in order to investigate a phenomenon, population, or general condition (Stake 2005, p 445).

As pointed out above, in this research I look into the Bt. brinjal controversy as an event or a case, both in theoretical and empirical sense, because it is unique, interesting and revelatory. It is unique, significant and interesting because it tells a story of what has happened and how it happened, which I have elaborated in chapter 1. It is also revelatory because it shows how heterogeneous elements co-exist, co-function, connect, interact and relate to each other in the bioeconomy. Thus, the next four chapters describe what is happening and how it is happening. Put differently, the case brings into view how desire connects and operates through disparate entities, it reveals the multiplicities, which remain folded in an event. In short, it highlights how the bioeconomy functions as a desiring-machine. The Bt. brinjal controversy as an event or a case, therefore, is spatially delimited. Its delimitation, however, is emphasised through theoretical and methodological conceptualisations. Consequently, it provides theoretical and empirical explanations of the functioning of the bioeconomy in a global/postcolonial context. By looking into the Bt. brinjal controversy in this way, this research has followed a combined case study method, in the sense that it is intrinsic as well as instrumental because the case itself is interesting and at the same time, the context of the case plays a supportive role, it facilitates our understanding and provides insight of what is happening and how it is happening.

A good case study, as Yin suggests, benefits from multiple sources of evidence, such as direct observation, interviews, documents, participant-observation (Yin 2012, p 10). In this research, however, I only analyse documents because of two reasons. First of all, the case study is about a past event the details of which are only available in textual and virtual forms, such as newspapers, official agreement documents, official and unofficial reports, and web sites. Second, a case study is a qualitative method of investigation and therefore, ‘a considerable proportion of all data is impressionistic, picked up informally as the researcher first becomes acquainted with the case’ (Stake 1995, p 49). Hence, a researcher has the privilege to pay attention to what s/he considers worthy of attention. This suggests that data collection and its triangulation are guided by the research questions (ibid., pp 49-50). Since this research investigates how desire connects and operates through disparate elements and, as pointed out in the introduction, this desire is to be found in discourses,

analysis of texts or documents becomes relevant, which I carry out by following a specific research method, i.e., discourse analysis.

2.4.2: Discourse Analysis

In a Foucaultian fashion, Deleuze/Guattari observe that desire is to be found in 'statements' or 'indirect discourses'.[84] Analysing discourse is thus essential for understanding how desire operates in the bioeconomy. In contemporary social science, the concept of discourse plays an increasingly significant role (Howarth 2000, p 1). But what is discourse? In the social sciences, discourses, in general terms, are understood as things that make up the social world, including our very identities because our experience is largely shaped by a multitude of conflicting discourses of which we are a part (Phillips and Hardy 2002, p 2). In its simplest form, by discourse, social scientists refer to the data that comes from talk, conversation, communications and discursive events. By indirect discourse, however, Deleuze/Guattari refer to acts, voices, judgements, affirmations, narratives and expressions and this understanding is close to Foucault's because for Foucault, discourses are voices, words or enunciations, which can be found in language use, pronounced or written (Foucault 1970/1981). Thus, discourse, in the most general sense, is language as it is used in society expressed either through conversations or in documents (Cook 2008, p 216). The study of discourse, therefore, is the study of language in use because 'social reality is produced and made real through discourses' (Philips and Hardy 2002, p 3). In other words, discourse analysis takes discourses into account to understand social interactions. Since discourses evolve over time, discourse analysis places emphasis on processes through which such discourses are produced, maintained, disseminated, shared and accepted in society. Discourse analysis, in this sense, 'refers to the process of analysing signifying practices as discursive forms' (Howarth 2000, p 10). Discourse analysts treat a wide range of linguistic and non-linguistic materials – speeches, reports, events, policy statements, recorded conversations, video recordings, ideas, organisations, institutional practices, diaries, archival records, judicial pronouncements, legislations as 'texts' or

[84] As Foucault writes, 'Desire says: I should not like to have to enter this risky order of discourse…' (Foucault 1970/1981, p 51).

'writings'. This suggests that discourses are gleaned from texts or written documents, and these texts vary from context to context depending on the purpose and nature of research.

Given that discursive activity does not occur in a vacuum, but rather emanates out of social interactions, discourse analysis looks for meaning in objects, words and practices, and in doing so, analyse texts within a specific context. Discourse analysis, from this point of view, differs significantly from conventional analysis of interviews, conversations, or documents. While linguistic data such as interviews are widely used in qualitative research, there is a belief that the social content of such data can be read off without attention to the language itself (Fairclough 1992, p 2). Similarly, it can be distinguished from strict conversation analysis because the primary focus of discourse analysis is on meaning, and not on grammar, sentence structure, or word choice (Cook 2008, p 216). Further, while discourse analysis is concerned with text, this concern is directed towards understanding the connection between discourse and social reality, to discover social meaning in a particular context because 'discourses do not just reflect or represent social entities or relations, they construct or constitute them' (Fairclough 1992, p 3). In this sense, discourse analysis also differs from documentary analysis – a well-known technique of data gathering that follows the same line of thinking as observing or interviewing (Stake 1995, p 68).

Since discourse analysis treats events as texts, this research looks into the Bt. brinjal controversy not just as a 'case', but also as a 'text' because it has a highly textual character, in the sense that a multiplicity of discourses remains folded in the event. More importantly, what remains enveloped in these discourses is desire, which connects and brings heterogeneous elements together to constitute a machine or an assemblage. This research, therefore, analyses various texts (patent documents, reports and policies, legal agreements, official/unofficial communications, judicial pronouncements, legislative texts, political and scientific statements, claims, and assertions) to show how desire operates or functions in the bioeconomy through

numerous discourses, specifically in productive, appropriative and propertising practices, power relations, and subjection.

2.5: Conclusion

In this chapter, my main concern was with the methodological framework, specifically with adopting a methodological approach that supports and enriches the objective of this research, that is, to describe how the emerging bioeconomy operates or functions as a desiring-machine in a global/postcolonial context. In this direction, first, I have discussed in detail the understanding and theorisation of the multiple in law and globalisation literature. My analysis shows that law and globalisation scholars have theorised the multiple in numerical or quantitative terms and in doing so, created a dichotomy between the one and the many. In contrast, my theorisation of the multiple follows Deleuze/Guattarian approach, which defines the multiple in qualitative terms, that is, to think about the multiple in terms of a multiplicity. The understanding of multiplicity that Deleuze/Guattari propose requires a very different operation in thought and style of composition because one needs to construct and describe the multiple by adding elements successively through conjunctions. In other words, the construction or composition of a multiplicity is a practice of thinking that is rhizomatic. In a sense, thinking moves in all directions to constitute an assemblage and draws a map of the multiple by following lines, movements and connections. By doing so, it puts emphasis not on quantitative, but on qualitative dimensions of a multiplicity. That is, continuity, consistency, expansion and spatialisation that need to be actualised in extensive series, and this will become apparent in the next four chapters. In addition, this chapter has outlined the method of analysis that this research follows. It has already become clear that this thesis constructs a multiplicity from an event – the Bt. brinjal controversy – to describe how desire establishes machinic conjunctions between an array of elements. Since this desire is to be found in heterogeneous discourses, ‘case study’ and ‘discourse analysis’ become suitable research methods because I look into the event not only as a ‘case’, but also as a ‘text’.

CHAPTER 3

Tracing Connections: Materiality, Movements, and Emergent Spaces of Property

‘It is tracings that must be on the map, not the opposite.’

Gilles Deleuze and Felix Guattari[85]

'I only look at the movements.'

Soren Kierkegaard[86]

3.1: Introduction

In 2007, Mahyco filed a patent application (international application or PCT application) for Bt. brinjal and its future progeny at the Receiving Office of the WIPO in Geneva. [87] In the application, Mahyco claimed that it has invented a new life form and therefore, it has intellectual property rights over Bt. brinjal as well as its seeds and future progeny. This property rights claim over Bt. brinjal brings into view Mahyco's desire to produce and propertise new life forms in a distant location. Before 2005, in India there were no intellectual property rights over life forms produced through bio-technical processes. Thus, a number of changes were made in 2002 and 2005 in India's intellectual property legislation to bring new life forms within the purview of patentable inventions. Interestingly, these changes were made after 2002, the year Mahyco started the production of Bt. brinjal, which involves Monsanto's Bt. gene – a proprietary living organism. In this sense, Mahyco's desire to produce a genetically modified life form and protect it through intellectual property rights brought into existence an 'emergent' space of property in India. I use the term 'emergent' to signify the non-existence of property rights over new life forms because, according to Donna Haraway, emergents are categories that did not exist before (Haraway 2003, p 298).

[85] Delueze and Guattari 1980/2004, p 23.
[86] Kierkegaard 1843/2006, p 31.
[87] The Patent Cooperation Treaty (PCT) concluded in 1970 provides a single window procedure for filling patent application at the Receiving Office of the WIPO in Geneva to protect inventions in each of the contracting states of the PCT. At present, 148 contracting states are bound by the PCT and India became a party on 7 December, 1998.

This chapter, therefore, 'traces'[88] how an emergent space of property comes into existence in a distant location – an exercise in 'rhizomatic thinking' that focusses on 'movements in process' (continuity, consistency and dispersion) to understand emergence. In this respect, the chapter deploys the concept of 'deterritorialisation' – a term that Deleuze/Guattari used to signify movements by which one (thought, desire, idea etc.) leaves the territory (Deleuze/Guattari 1980/2004, p 559). Since movement is always from one territory to another, deterritorialisation not only means initial territorialisation, but also reterritorialisation. To be more precise, de/re-territorialisation occur simultaneously because there are two-fold movements through which desire establishes machinic conjunctions between disparate elements. I argue that these two-fold movements brought into existence an emergent space of property. Put otherwise, Mahyco/Monsanto's desire to produce and propertise was mediated by disparate elements. And so, the movements of de/re-territorialisation occur in a 'smooth space' in which heterogeneous entities situated in dispersed locations connect, combine, form alliances and work in symbiosis.

To emphasise briefly, without the movement of Monsanto's proprietary Bt. gene from the US to Mahyco's laboratory in India, the production of Bt. brinjal would have been a distant reality. This observation not only suggests the territorialisation of the idea of 'materiality'[89] in Euro-American material and intellectual property law, but also its deterritorialisation through the movement of patented bio-technical artefact. Similarly, without reterritorialisation of the idea of materiality in India's patent law, Mahyco's proprietary claim over Bt. brinjal and its future progeny would have never moved or reached the WIPO. Further, this de/re-territorialisation would not have been possible without the TRIPs Agreement that not only brought the Euro-American idea of materiality within the global intellectual property regime, but also moved the idea to distant locations through the World Trade Organisation (WTO). Likewise, reterritorialisation would not have been possible without the changes in

[88] A few words regarding the tern 'tracing'. Indeed, Deleuze/Guattari made a distinction between 'tracing' and 'mapping', as Anne Bottomley and Nathan Moore point out (Bottomley and Moore 2012), but they also insist that 'tracing' should be put back on the map because it not only charts what one journeys through, but also organises the multiplicity. I have emphasised this point in chapter 2.

[89] By 'materiality' I refer to practices, in the sense that materiality is an analytic that explains the practices through which subjects and objects proliferate, be they social, technical, biological or legal. For an extensive analysis of different approaches to materiality, see Miller 2005; Trentman 2009. In relation to law, see Pottage 2006a and 2012; Philippopoulos-Mihalopoulos 2014.

India's intellectual property legislation. So there are heterogeneous elements (Monsanto, Bt. gene, Mahyco, Bt. brinjal, patent law, WTO-TRIPs Agreement) that mediated the movements of de/re-territorialisation.

In the next section, I discuss the territorialisation of the idea of materiality in Euro-American property law. Then, I trace its movement or deterritorialisation through Euro-American intellectual property law and the global intellectual property regime, such as the TRIPs Agreement. From there, I move on to show how its reterritorialisation has been achieved, first, by focusing on the changes made in India's patent law, and then, by throwing light on Mahyco/Monsanto's property rights claim over Bt. brinjal and its future progeny. In so doing, I emphasise how this reterritorialisation is mediated by heterogeneous entities. I conclude the chapter by arguing that the movements of de/reterritorialisation should not be equated with 'extension and incorporation' because while the latter pay attention only to unidirectional movement; the former signify 'movements in process', mediated by interactions, that bring qualitative transformations. In other words, an emergent space of property comes into existence through movements, which is mediated by the co-functioning of an array of elements located in dispersed spaces.

2.2 Objects, Rights, and Relations

In this section, I discuss the initial territorialisation of the idea of materiality in Euro-American property law and practice. In *Modest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™*, Donna Haraway observes that

> 'Property is the *kind of rationality* that poses as *the-thing-in-itself*, the commodity, the thing that can be exhaustively measured, mapped, owned, appropriated, disposed. Something of an unreconstructed and dogged Marxist, I remain very interested in how *social relationships* get congealed into and taken for *decontextualized things*' (Haraway 1997, p 8; my emphasis).

The description of 'property' that Haraway provides in the above passage might sound unconvincing to many normative property theorists. This is because the argument that property is a kind of rationality that can be employed to measure, map, own, appropriate, and dispose an object not only disturbs the modern rationality of liberal philosophical and political traditions, but also disrupts the orthodox views held in legal theories and doctrines about persons and things. In contemporary Euro-American jurisprudence, property theorists start from the premise of Roman law that there is a distinction between persons (*personae*) and things (*res*).[90] As Pottage points out, 'in law, the *res* was first and foremost a discursive artefact, a "name" that was shaped by arguments that abstracted the observable, material, qualities of a thing into legal qualities…' (Pottage 2011, p 635). For instance, Pollock argues that 'a thing is, in law, some possible matter of rights and duties conceived as a whole and apart from all others, just as, in the world of common experience, whatever can be separately perceived as a thing'. He further explains, 'a thing which belongs to nobody is of no legal importance until something happens to bring a person into relation with it, and make it the subject-matter of enforceable rights' (Pollock 1894, pp 318 and 320). A thing, in this view, is inseparable from the legal conception of property that confers on legal subjects the right to control their proprietary objects (Delaney 2001, p 489). The division between subject and object is thus a foundational aspect of the Western understanding of property because the ontological separation between the two has long been achieved in the Western philosophical tradition. Taking this division as natural and therefore legitimate, normative property theory clothes legal subjects with all rights and duties, and treats things as mere objects that should move and function within the boundaries of Hohfeldian 'jural opposites and correlatives' (Hohfeld 1913 and 1917).[91] The ontological character of

[90] Property rights over tangible objects received enormous attention in philosophical, political-economic, and socio-legal writing. While some have critiqued the right to property over tangible objects in some form; others have justified this right on the basis of natural or legal right to own. To get a glimpse of these arguments, see Macpherson 1962 and 1978; Pennock and Chapman 1980; Ryan 1984; Waldron 1988; Harris 1996 and 1997; and Penner 1997. Although these literatures critically examined and analysed the right to property from various angles and contributed enormously in the development of critical property law scholarship, the division between persons and things remains outside their critical analyses. Thus, Pottage argues, 'however critical they might be in other respects, the distinction between persons and things continues to function as an untheorised premise, much as it does in orthodox legal doctrine and theory (Pottage 2004, p 2).

[91] It would be unfair to direct this accusation only to normative legal theorist alone because early anthropologists (with the exception of probably Marcel Mauss and Bronislaw Malinowski; see Mauss 1925/1954; Malinowski 1926) equally took the Roman law distinction between persons and things as pre-given. For instance, Henry Maine in his studies of ancient law has shown that property rights and

property, according to this view, is an exclusive right to control material objects, but what remains folded inside this right is the right to exclude others, sell, transfer and make profit. In short, it is a 'bundle of rights' over a thing (Honore 1961) that remains folded inside the normative conception of property. A classic example of this assertion can be found in Kevin Gray's following account, 'when I sell you a quantum of airspace the whole point is that – apart from molecules of thin air – there is absolutely nothing there…The key is, of course, that I have transferred to you not a thing but a "bundle of rights", and it is the "bundle of rights" that comprises the "property"' (Gray 1991, p 259). What is important in this argument is that property is not a thing; neither is it a transfer of things from one to another. Rather, it is a right to control material objects that give rise to legal relationships between persons.

Property rights lay down parameters, they define our right to appropriate, control, and transfer material objects. Put differently, law or legal norms justify our right to

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ownership in early Indian village communities differ significantly from the Roman law idea of private property. But he left the Roman law distinction between the law of persons and the law of things untouched (Maine 1861/1906, pp 258-318). While he has criticised the Roman law classification of legal rules into law of persons, law of things, and law of actions in his later works, his criticism was not directed toward the distinction between persons and things. Rather, he presented a positivist account of property in terms of rights (Maine 1883, chapters X and XI). Similarly, Robert Lowie (according to Bronislaw Malinowski, one of the highest anthropological authorities in the United States) adopted a narrow positivist approach to examine primitive law and placed the primitive form of ownership within the Hohfeldian boundaries of rights and privileges without questioning the distinction (Lowie 1920/1929, chapter IX; Lowie 1934, pp 276-283). In a similar fashion, two early legal anthropologists, Hoebel and Gluckman have followed Hohfeld's analysis of rights and privileges very closely, and defined property in terms of 'bundle of rights' (Hoebel 1949/1958, pp 431-449; Hoebel 1954, chapter 4; Gluckman 1965/1972, chapters 3, 4 and 5). It can be said, then, the 'theoretical work on property by anthropologists has drawn heavily on legal traditions' (Hann 2005, p 111) and left the Roman law distinction between persons and things intact until recently. This is not to say that anthropologists (and equally legal theorists) lack critical acumen. The real problem is in the approach that legal theorists and anthropologists adopt in examining a particular social, economic or legal institution. Sally Falk Moore has pointed out rightly that 'many lawyers and law professors view law as an instrument for controlling society and directing social change, but most anthropologists are concerned with law as a reflection of particular social order' (Moore 1978, p 244). Thus, when anthropologists borrow normative understanding of law (without critically assessing them) and describe property relations in legal theorists' narrow instrumental conception of ownership, they ultimately reproduce the jurisprudential orthodoxy of the Western law. Similarly, normative legal theorists' bias toward instrumental function of the Western law keeps them away from the broader and contextual anthropological analysis of property relations. The result, as Annelise Riles observes, though now anthropologists and legal theorists are sitting across in academic conferences and citing one another in print regularly, the distance between them actually increased because they have two very different conceptions of the means and ends of knowledge (Riles 2004, pp 775-776). On this point, it is worth remembering Greetz's observation that '…one would imagine lawyers and anthropologists were made for each other and that the movement of ideas and arguments between them would proceed with exceptional ease. But a feel for immediacies divides as much as it connects…It is their elective affinity that keeps them apart' (Geertz 1983, pp 167-168).

appropriate and control material objects through the rubric of rights. As Pollock writes, 'what we call the law of Property is, in the first place, the systematic expression of the degrees and forms of control, use, and enjoyment, that are recognised and protected by law' (Pollock 1961, p 93). Accordingly, the legal subject as a right holder relates herself with the object through the language of law. However, law recognises such relationship only through the language of ownership. For instance, Honore has argued, 'the idiom which directly couples the owner with the thing owned is far from pointless; where the right to exclude others exists, there is indeed (legally) a very special relation between the holder of right and the thing' (Honore 1961, p 134). In my view, the argument that there exists a very special relation between subject and object in law is a mystification. In the eye of the law, objects do not exist. Objects come into existence through the idiom of ownership and law defines ownership in terms of control, exclusion and appropriation. In other words, law merely recognises the ontological status of objects, and in terms of normative property theory such existence is only incidental to property relations.

From this normative understanding of property rights, we can say that objects represent economic value and this value is subject to enforceable legal rights. Accordingly, the institutionalisation of control and appropriation become a rational enterprise, which assumes that it is essential to control material objects in the interest of the economy. Therefore, it becomes necessary to establish a legitimate basis for appropriation, and one such legitimate basis is to recognise the rights of legal subjects to own and dispose material objects. The right to possess material objects is thus an essential attribute of legal subject[92] and this possessive attribute is protected by the notion of ownership for 'an orderly relation of exchange' (Macpherson 1964, p 3). Property rights, in this sense, invest legal subjects with the power to appropriate and control material objects. As Davies and Naffine put it,

[92] The primacy of subject as social actors and the bearer of freedoms, liberties and rights, remains embedded in much of the liberal philosophical and legal scholarship. For instance, as Pollock puts it, 'a material object is really nothing to the law, whatever it may be to science or philosophy, save as an occasion of use or enjoyment to man, or as an instrument in human acts' (Pollock 1894, p 320). Similarly, John Finnis, a prominent natural law theorist, observes, 'persons, their well-being, and their intentions matter in ways that nothing else in our environment does' (Finnis 2000, p 1). Hence, Delaney argues, 'it seems reasonable to suggest that popular conceptions of nature and of human relationships to nature are both deeply *informed* and *given expression* by legal concepts such as property and, specially, rights' (Delaney 2001, p 489; original emphasis).

> ‘A property right enables the proprietor to exercise control over a thing, the object of property, against the rest of the world. Property thus defines the limits of our sphere of influence over the world; it defines the borders of our control over things and so marks the degree of our social and legal power’ (Davies and Naffine 2001, p 6).

Right to control and appropriate material objects occupy a special position in the semantic structure of normative property theory. And this normative relationship between subjects and objects, Pottage argues, ‘are staged as encounters between subjects set against a background of resources or things which, however they might be represented or valued, are ultimately decomposable into a finite set of basic ontological elements’ (Pottage 1998, p 337). Property right is thus a legal construct[93] that builds on the distinction between subjects and objects. As Mauss points out, ‘we live in a society where there is a marked distinction…between real and personal law, between things and persons. This distinction is fundamental; it is the very condition of part of our system of property, alienation and exchange’ (Mauss 1925/1954, p 46). The categorisation of subjects and objects into two separate entities brings into view the ontological structure of normative property theory that ‘attached persons (*personae*) to things (*res*) by means of a set of legal forms and transactions (*actiones*)’ (Pottage 2004, p 4). Put differently, by attaching subjects with objects through legal rights, normative property theory promotes reification or objectification, in the sense that objects are seen to assume a particular form and meaning through the language of property rights (Strathern 1999, p 13). What we notice here is that in Euro-American understandings of property rights, the subject is regarded as an entity to which objects are external and this externalisation not only gives the legal subject the right to exercise control over proprietary objects, but also legitimises the right to treat material objects as ‘commodity’.[94] This commoditisation of material objects through property rights makes visible the economistic rationality

[93] Consider here the view expressed by Jeremy Bentham that ‘property and law born together, and die together. Before laws were made there was no property; take away laws, and property ceases’ (Bentham 1931, p 113). Similarly, Kevin Gray claims that ‘property is a category wholly constructed by law and, like any other legal category, is a fiction. That is, it does not reflect, but rather constructs, its objects’ (Gray 1991, p 252).

[94] Here, I have used the term ‘commodity’ in a broader sense to simply denote objects with economic value, leaving the question of how objects acquire exchange values unexamined. One can consult Marx’s *Capital: A Critique of Political Economy, Vol. 1* (1867/1976) to understand how objects acquire exchange values. Later in the chapter, however, I will use the term in a narrow sense to refer to objects or products that are intended for exchange in the market.

embedded in the normative figuration of property law. Implicit in this figuration is the assumption that subjects possess agency (will, consciousness, freedom, liberty) to assert their power to control and exercise ownership rights against others. As Strathern argues, '…Western image of control depends on concepts of ownership and property' (Strathern 1990, p 103). And it is the function of property law to rationalise and institutionalise such power and rights. Hence, we can say that materiality emerges through legal processes and practices. More specifically, normative property theory ascribes materiality to objects through the language of rights and ownership. It should be noted, however, that what remains folded in Euro-American idea of materiality is the desire or drive to appropriate and propertise, that is, the desire to transform the material physics of things into objects of legal rights. In fact, this drive to propertise becomes more evident as we look into the normative framework of modern intellectual property law.

2.3 Materialising the Intangibles through Law

From the beginning of the twentieth century a great bulk of literature focused specifically on the creation of ownership over abstract ideas or immaterial objects. Though the origin of intellectual property rights dates several centuries back (specifically patents and copyrights),[95] the advancement in the physical and

[95] The idea of intellectual property is not new. Anthropologist Robert Lowie suggests that primitive communities, such as Koryak of the Andaman Islands, Kai of North America and Nootka of British Columbia jealously guarded the transmission of their valuable intangibles and recognised some form ownership rights of singers over their songs, of creators over their magical formulas, and of poets over their compositions (Lowie 1920/1929, pp 224-232; Lowie 1928; Lowie 1934, pp 281-282). Following Lowie, Hoebel also expressed similar views (Hoebel 1942; Hoebel 1949/1958, pp 447-448). But it remains doubtful whether such forms of protection or ownership can be regarded as intellectual property in the modern sense of the term because in primitive societies property relations was much more complex than the positivistic approach adopted by Lowie and Hoebel to understand primitive forms of ownership (as evident in Bronislaw Malinowski's critique of Lowie's understanding of primitive law; Malinowski 1926, p 13). Similarly, Pamela Long (1991) in her historical study of the origin of the idea of inventor/authorship points out that some components of the notion of intellectual property regarding arts and craft knowledge were present in antiquity. But these components cannot be regarded as intellectual property the way we understand it now because the commercial aspects of property rights were completely missing. During this period, knowledge was treated as ongoing, progressive and cumulative, and by implication cooperative. And therefore, authors or inventors do not appear to bestow on her any special ingenuity or credit. Moreover, an explicit separation of tangible from intangible aspects of the work was missing. Authors or inventors were not concerned with the commercial exploitation of their writings or inventions, and never viewed their creations as commodities with a market value. They took pride in their skills and knowledge, and most of the time lived their life on wages or other livelihood, such as rewards consisting of more food, greater safety, and relief from backbearing labour. According to Long, the proprietary attitude towards craft knowledge developed in the medieval period. The understanding that craft processes are intangible

biological sciences in the early and mid-twentieth century became the main stimulus behind the creation of modern intellectual property law. Taking inspiration from Euro-American liberal philosophical tradition and normative property theory, most literature provides strong justification for or against the creation of intellectual property rights over immaterial objects. As Coombe points out,

> 'Even today, when the development and expansion of intellectual property protections is justified or criticized, the Western philosophical tradition is generally evoked; appeals to natural rights, Lockean labour theory of property, and Kantian or Hegelian theories of personality abound. Alternatively, economic principles and utilitarian rationales are drawn upon to *rationalize* or question intellectual property laws as incentive structures that produce a socially optimal supply of intellectual creations'. (Coombe 1998, p 7; my emphasis)

Economic theories, for instance, put strong emphasis on market and welfare. These theories provide cost-benefit analysis and strongly argue that without intellectual property rights people will not engage in the creation of immaterial objects and therefore, society will lose valuable creative works. Intellectual property rights are the best way to provide incentives and reward human creativity. According to these theories, protection of abstract objects through intellectual property rights will stimulate creativity and invention, and in return, it will bring overall welfare to society.[96] Similarly, legal literature on intellectual property rights is burdened with philosophical and economic overtones. Relying on economic theory, some legal scholars have focused on the commercial aspects of intellectual property rights.

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property with significant commercial value led to the emergence of patents. More specifically, the connection between individual authorship and intellectual property was made, first with regard to material invention in the 15th century (the Council of Venice granted patent to Franciscus Petri for fifty years in 1416 for structures with pestles for fulling fabrics) and later, to writings in the 16th century. Regarding author's copyright, Long disagrees with Woodmansee (1984), Rose (1988) and Hesse (1990). These scholars locate the origin of author's copyright in the 18th century. However, regardless of the period of origin, these scholars agree on one fundamental point: the institutionalisation of the inventor/author as individual proprietor of her creation, or to abuse Foucault, this 'privileged moment of individualization' (Foucault 1977, p 115) emerged with the rise and expansion of a 'possessive market society' (Macpherson 1964, p 271) in ideas and knowledge. This rise and expansion of the market in knowledge can equally be characterised as a moment of disconnection – the death of the author and the beginning of writing (Barthes 1977, p 142). In a sense, the inventor/author will no longer be known in relation to her unique creation; but rather, her creations will be known as intellectual properties that can be appropriated, materialised and exploited to make profit. It therefore signals the death of the inventor/author and the beginning of her property.

[96] See, for instance, Friedman, Landes and Posner 1991; Dam 1994, Landes and Posner 2003, Kaplow and Shavell 2002.

Though these scholars recognise human effort in the creation of intellectual objects, their main justification for protection is to encourage commercialisation of new ideas and inventions (Laddie 2004, p 91). Others, mainly normative intellectual property theorists, rely on philosophical and political theories and strongly justify intellectual property rights on the basis of natural right to property (Hughes 1988; Spector 1989; Hettinger 1989; Drahos 1996, chaps 2 and 3). These scholars put great weight on human creativity and argue that abstract ideas or intellectual objects are the products of human mind or creative endeavour of human labour. Therefore, just as labour belongs to human body and mind, the products of labour also naturally belong to an individual. It is legitimate for the producer to claim property rights over intellectual objects that arise naturally from human body and mind. There are still others, who extend the normative understanding of property rights and advocate that creativity and inventions are the assets of individual genius and as such, they are private properties that must be protected through legal rights. For example, Harris argues,

> 'The law takes an intangible thing and builds around it a property structure modelled on the structure which social and legal systems have always applied to some tangible things. By instituting the trespassory rules whose content restricts uses of the ideational entity, intellectual property law preserves to an individual or group of individuals an open-ended set of use-privileges and powers of control and transmission characteristic of ownership interests over tangible things' (Harris 1996, p 44).

Intellectual properties, in this view, are intangible objects and they must be protected in the same way as rights over tangible objects are protected through law. Intellectual property law, therefore, reproduces the instrumental reason of Euro-American property law that rationalises and institutionalises the rights of legal subject to control, exploit and make profit from their material objects. What becomes evident here is that 'in both these moral and utilitarian arguments, scholars address intellectual property laws purely abstractly, as promoting reified rights in unremarkable and indistinguishable intangibles' (Coombe 1998, p 7).

What Coombe suggests is that in contemporary literature on intellectual property law, we only find accounts of rights and relations that promote the reification of immaterial objects. Take, for example, the argument of Peter Drahos that 'we should bear in mind that modern intellectual property rights relate to the grant of property rights in some things as well as constituting a set of relations between individuals' (Drahos 1996, p 17). The understanding that intellectual property rights are legal rights over some things, which give rise to social, economic and legal relationships, is essentially based on normative property theory that I have discussed in the previous section. It further suggests, though remains implicit, that in order to claim intellectual property rights over immaterial objects, an abstract idea or intangible effort must be translated into things (Bainbridge 1999, p 45; Sherman and Bently 1999, p 47). Davies and Naffine put this argument more eloquently when they say that 'property is seen as an extension of the person and as a means by which the person can relate freely and transparently with others. Property is seen to mediate our social relationships' (Davies and Naffine 2001, p 6). Interestingly, in these arguments, the material physics of things is reinvented in such way as to warrant the conventional understanding of property that ascribed to things a materiality of its own making and a mode of existence (Pottage 2011, p 636). So the understanding that persons relate to each other through intellectual property rights is an extension of the Euro-American insistence that individuals must translate their intellectual endeavours and efforts into material objects, and control, appropriate and exercise rights over such immaterial objects in order to create social, economic and legal relations. However, the paradox is that instead of relating persons, Euro-American notions of intellectual property rights justify and legitimise control, appropriation and exploitation of immaterial objects. As Strathern writes,

> 'If property is part of the way in which people in modern industrial economies (Euro-American societies) connect to the world, then it must both shape and take the shape of the way the world is perceived. To the extent that the world is thought of as an assemblage of material things, it follows that property can only be claimed over material things. Property in this view *is* the condition of appropriating things from the world' (Strathern, 2006, p 153; original emphasis).

In Euro-American understanding of intellectual property rights, ideas and knowledge are regarded as products of intellectual efforts, skills, and practices. Hence, their materialisation and translation into tangible objects are treated as creative and inventive. Accordingly, the creative and inventive subject is entitled to claim property rights and exercise control over her intellectual creations. This proprietary rationality embedded in modern intellectual property law brings into view a particular form of materiality that treats creativity and invention as objects produced by the act of individual genius and therefore, they must be protected, controlled and appropriated by the creative genius through intellectual property rights. As Strathern observes, '[the] (Euro-American) form of materiality is the condition under which perspective, a person's point of view, creates an object ("out there"). We could conclude that what is material about property is a function of an epistemological grasp of the world, that is, of knowing it as an object' (ibid.). However, instead of treating this transformation as merely an extension of liberal individualism, which encourages objectification, we need to view this move to immateriality as a drive or desire to appropriate that remains folded in the idea of materiality.

2.4 Deterritorialising Materiality

The discussion above shows how modern intellectual property law territorialised the drive to propertise. In this section, I intend to show this drive moves, operates and becomes deterritorialised through the global intellectual property regime, especially the TRIPs Agreement. Rapid transformation in the past few decades, specifically in life sciences research, corporate capital investment in biotechnological 'inventions', and global trade in biogenetic innovations become a powerful impetus behind the creation of a global intellectual property regime. The idea of treating intellectual property rights as instruments of global trade was first proposed by some developed country members during the meeting at Punta del Este, Uruguay in 1986 and the contracting parties to the GATT (General Agreement on Tariffs and Trade) agreed to negotiate the proposal in forthcoming trade rounds. More specifically, a handful of US corporations formed the Intellectual Property Committee (IPC) to put pressure on the US government to include intellectual property rights in the Uruguay Round of

multilateral trade negotiations and Monsanto was one of them.[97] As May points out, 'the IPC essentially drafted the TRIPs agreement while the actual negotiations fine-tuned the text and made some concessions to developing countries' negotiators' (May 2007, p 28-29). What is significant about the TRIPs Agreement[98] is that it introduced a brand new era of intellectual property regulation based on the concepts of protection and exclusion rather than dissemination and competition (Sell 2002, p 79). In essence, the Agreement is global in its scope and reach, and brought the governance of intellectual property within the global trade regime overseen by the WTO (May 2000, p 67). The Agreement starts with the language of 'international trade' and 'rights' and prescribes measures for the effective and adequate protection of intellectual property rights, including patents over micro-biological processes and products in all member countries of the WTO. Since the Agreement is a legally binding global instrument, the member countries are obliged to follow the standards of protection prescribed and implement changes in domestic intellectual property legislation. These prescribed changes are intended to bring greater convergence between the global and the local because the purpose of the Agreement is to remove differences and barriers in the conduct of 'legitimate trade' in intellectual properties. While some argue that the Agreement sets out minimum standards of protection that member states must observe and enforce (Maskus and Reichman 2005, p 5); others point out that the Agreement was formulated by a handful of developed countries (US, Europe and Japan) and their corporate elites. Therefore, the TRIPs regime prescribes standards which were previously available only in developed states. Thus, these scholars argue that in the name of harmonisation and bringing greater convergence, these knowledge-economy elites imposed their own intellectual property standards to all member states through a binding legal instrument. In so doing, the TRIPs regime not only expanded the economic interests, private authority, juristic rationality, and power of developed countries and their corporations, but also went well beyond earlier global standards (such as Paris Convention 1883) (Sell 1999 and 2002; May 2000, chap. 3; Ryan 2002; Drahos 2003; Dutfield 2003, chaps. 1 and 8; May and Sell 2006, p 168). Further, Macmillan observes that given the

[97] Other corporations that were involved in the formation of IPC are Bristol Myers, DuPont, General Electric, General Motors, IBM, Merck and Time Warner.

[98] After eight years of intense negotiation, persuasion, coercion and lobbying, the developed and developing countries agreed to the final text and signed the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs Agreement) in 1994 at Marrakech, Morocco. The Agreement was a component to the Final Act establishing the WTO and came into force on 1 January 1995.

extensive evidence of developed country dominance and corporate stranglehold over intellectual property today, it seems reasonable to argue that the TRIPs Agreement was not concerned with international innovation, but rather with the protection of corporate investment and its judicialisation through the free trade regime promoted by the WTO (Macmillan 2011). Likewise, Alessandrini points out that since high technology is one of the most valuable assets in the capital structure of multinational enterprises (MNEs), the protection of intellectual property becomes a crucial source of gains for subsidiaries investing abroad. The TRIPs Agreement, therefore, encourages the liberalisation of investment flows through the protection of investor's technology (Alessandrini 2010, p 157). It is beyond the scope of this chapter to elaborate these critical observations in detail, but I will pursue some of these arguments and discuss them at some length in chapter 5. Nevertheless, these observations are crucial for understanding how legal norms, practices and rationalities developed in some domestic jurisdictions were moved and mobilised to create a global intellectual property regime which is deterritorialising in nature, in the sense that the TRIPs regime promotes the movement and wider geographical dispersion of intellectual property norms and practices. Then, arguably, the Agreement reproduced and deterritorialised the notion of materiality embedded in Euro-American intellectual property law and this deterritorialising nature becomes more evident as we look more closely into some of its provisions.

The most crucial aspect of the TRIPs Agreement is that it mandates positive legislative action to establish intellectual property rights over ideas and knowledge. According to the Agreement, intellectual properties are private property of natural or legal persons.[99] As the Agreement further states, the purpose of protection and enforcement of intellectual property rights is to promote technological innovation, transfer and dissemination of technology and technological knowledge in a manner conducive to social and economic welfare.[100] The understanding that knowledge and ideas are economic assets of legal persons and therefore, they must be protected through property rights to conduct legitimate trade in technological innovations and

[99] Preamble and Article 1(3) of the Agreement. These provisions were virtually taken from Article 58 of the European Patent Convention (EPC) 1973.
[100] Article 7 of the Agreement

knowledge globally, is a legal rationality and practice developed mostly in Euro-American jurisdictions. This expansion of private property rights over knowledge and idea, Burch observes, 'promotes the vocabulary of rights and property and the liberal conceptual framework they help define' (Burch 1995, p 215). By placing emphasis on individual rights and global trade through alienable property rights (May and Sell 2006, p 163), the Agreement clearly expanded and deterritorialised the right to control, materialise and exploit intellectual efforts and creativity ingrained in Euro-American intellectual property law. The promoters of the Agreement believed that intellectual efforts and knowledge are the objects of global trade and securing property rights over such objects through a legally binding document is important to impose Euro-American proprietary rationality on a global scale. In doing so, the Agreement reproduced the Euro-American practices of materialisation in a new mould and this becomes evident once we look into how Article 27 of the Agreement expanded the rights of global bio-tech corporations to propertise bio-genetic resources and their protection through patent rights globally. According to Article 27(1) of the Agreement, patents are available for new 'inventions' in all fields of technology including biotechnology. However, to qualify for a patent right, such inventions must be new, involve an inventive step, and have to be capable of industrial application.[101] So intellectual property rights, such as patents, are available for any process or product if they arise from technoscientific research. Since Article 27(1) states that patent rights are enjoyable and, I add, commercially exploitable irrespective of the place of invention, it is not unreasonable to argue that the Agreement promotes and protects the commercial exploitation of proprietary technoscientific products and processes through a seamless web of property rights between the global and the local. In other words, the Agreement in general, and Article 27 in particular, deterritorialised the right to control and protection of commercial exploitation of intellectual properties.

More striking is Article 27(3), which for the first time recognised intellectual property rights over artificially manufactured biological substances in a global legal instrument. More specifically, Article 27(3)(b) of the Agreement made it mandatory to grant patents for micro-organisms as well as plants and animals produced through

[101] This language is a virtual reproduction of Article 52(1) of the EPC 1973. Inventive steps and industrial applications are defined in terms of 'non-obviousness' and 'useful' respectively.

non-biological and microbiological processes.[102] What this provision means is that patents are available not only for whole organisms, such as genetically modified or altered plants and seeds, but also for artificially isolated living substances, such as DNA sequences, viruses, plasmids, and cell lines because they are manufactured through bio-technical processes and technoscientific ideas and knowledge are embodied in them. The grant of patent rights over 'new biologicals' (Franklin 2001, p 303),[103] therefore, not just conflates artificial with the natural, and material with the biological, but these so-called 'life patents' (Gibson 2008, p 3) were brought within the purview of TRIPs to stabilise, extend and move the definition of patentable 'subject matter' to disparate locations in the globe through a binding legal document. Thus, genetically modified plants and seeds, or naturally occurring but artificially isolated, manipulated and altered bio-chemical substances, such as bacteria, viruses, algae, DNA sequences and cell lines become mandatory 'subject matter' of patents in all member countries of the WTO. The legal rationality underlying Article 27 of the TRIPs Agreement comes from judicial rhetoric put forward in some high profile court cases, mainly in the US.[104] For instance, in *Diamond v. Chakrabarty* the US Supreme Court ruled that a bio-technically modified oil eating bacteria is a new composition of matter. Since this new life form is novel (non-obvious) and has industrial application, it is a product of biotechnological ingenuity and therefore, subject to patent rights.[105] Consider again the observations of the US Court of Appeals in *Amgen Inc. v. Chugai Pharmaceuticals Co. Ltd. And Genetics Institute* that 'a gene is a chemical compound, albeit a complex one, and it is well established in our law that conception of a chemical compound requires that the inventor be able to define it so as to distinguish it from other materials, and to describe how to obtain

[102] This provision of the Agreement resembles very well with Article 53(b) of the EPC 1973.
[103] Franklin uses the phrase 'new biologicals' to describe new entities, such as cryopreserved human embryos, cloned transgenic animals, genetically modified seeds, and patented gene sequences.
[104] It is important to note that during the TRIPs negotiation, the European approach differed from the US. As Watal points out, while the US believed that anything made by man is patentable, the EU was grappling with strong internal resistance to patents on living organisms. Since the debate had not yet been settled in Europe, the WTO members agreed to endorse the minimum criteria (Watal 2001, p 131).
[105] 100 S. Ct. 2204, 65 L. Ed. 2d. It should be noted that before 1980, living organisms were outside the field of patents because it was thought that living organisms could not satisfy the criterion of novelty. The principle was that 'even if humans intervened in their development, living organisms exist before human action and, moreover, they can reproduce on their own'. But in this case, the US Supreme Court stated, 'anything under the sun that is made by man' can be patented. For details, see Robin 2010, pp 202-203.

it'.[106] These court rulings have received standing ovation from the bio-tech industry and equally been reiterated by academic legal scholars. For example, Straus argues,

> 'It should be suffice to note that DNA-sequences, despite their double nature, on the one hand, the physical carrier of information – the molecule – on the other hand, the information itself, have been and are treated as biochemical substances by virtually all courts and patent offices' (Straus 2004, p 132).

Like a 'traditional mechanist',[107] he further argues that 'it also should be recalled that the nucleotides themselves represent complex structures and therefore there is no substantial difference to be seen between a "normal" chemical formula and DNA sequence' (ibid.). So according to these observations, there is no difference between the organic functionalities of biological substances and the mechanical functions of a machine body. Rather, the organic functions of biological substances are similar to that of mechanical functions of steam engine and hydraulic pumps. Since there is no difference between a DNA sequence and a normal chemical formula, an inventive genius can separate and detach biological substance from the living body and claim proprietary rights over it just the way we claim proprietary rights over a chemical formula. 'This conceptualisation of life as essentially chemical, embodied in – and promoted through – the discourse of biotechnology', Dutfield observes, 'is undoubtedly appealing to those who esteem modern science for its progressiveness and rationality' (Dutfield 2003, p 136).

Given that modern biotechnology's hallmark, as Rabinow points out, lies in its potential to get away from nature and to construct artificial conditions in which specific variables can be manipulated and remade according to our norms (Rabinow 1996, p 20), it seems plausible for legal practitioners and some scholars to conceptualise living substance as essentially a biochemical formula or compound. Thus, it is not surprising that Article 27 of the TRIPs Agreement reproduces and promotes a particular view of 'mechanical jurisprudence' inherent in the Euro-

[106] 927 F.2d 1200 (59 USLW 2575, 18 U.S.P.Q.2d 1016).
[107] I have borrowed the phrase from Donna Haraway. By 'traditional mechanist', Haraway refers to those who find similarities between an organism and actual machines, such as steam engine, hydraulic pump, or a system of levers and pulleys (Haraway 1976, p 205).

American patent doctrine. In their historical study of the development of modern patent law, Pottage and Sherman observe that 'the doctrinal sense of the invention was modelled on the paradigm of the machine: inventions were things that looked or worked like machines' (Pottage and Sherman 2010, p 15; also Pottage 2011, pp 630-631). Later, this paradigm was extended to biological inventions by a single act of judicial legislation. Referring to the *Chakrabarty* decision, they argue that for the US Supreme Court, 'a "new" organism was every bit as "novel" as a "new" machine' and consequently, in terms of biological inventions, biotechnology becomes an intrumentalising technology in the post-*Chakrabarty* period. Looked at this way, modern biotechnology instrumentalises animate nature and turns organisms into manufactures, just the way mechanical and chemical sciences instrumentalised inanimate nature (ibid., pp 180-181). Consequently, from the 1980s onward, 'patent law had firmly taken the stance that biological artefacts are chemical processes' (Carolan 2010, p 42). The grant of property rights over modified biological materials is, therefore, based on the understanding that they are products of intellectual labour and patent is necessary to control access to the ideas and innovations embodied in them (Parry 2002, p 684). Or, we can say, adapting Biagioli that isolation, manipulation, modification and re-creation of biological substances become inventive ideas in the post-*Chakrabarty* period and as inventive ideas, they have secured a firm place in the republic of patent (Biagioli 2006).[108] Modern patent law, from this point of view, reduces living bodies (humans, animals or plants) into chemical laboratories in which the inventive genius can isolate and purify biological substances through bio-technical processes to produce new biologicals. Purification, Carolan suggests, looms large in patent law today because in the eyes of the courts and USPTO (United States Patent and Trademark Office) it implies human intervention, manipulation and ingenuity (Carolan 2010, p 43).[109] Hence, as products of bio-technical intervention and ingenuity, new biologicals are defined as

[108] Mario Biagioli points out that modern patent law gradually transformed the notion of invention from object to idea and in so doing, expanded the scope and coverage of patents to include inventive ideas. Hence, he argues, that it is the definition of invention in terms inventive ideas that allowed the geographical expansion of the patent system because ideas travel, move and flow from one place to another. And though this expansion was carried out by international patent agreements, those agreements were made possible precisely by the shift from the material logic of the privilege to the idea-based regime of patent law (Biagioli 2006, p 1156).

[109] See, for example, *Amgen Inc. v. Chugai Pharmaceuticals Co. Lt.* (927 F.2d 1200), in which the subject matter of claim was a purified and isolated DNA sequence coding human EPO (Erythropoietin).

'inventions' and therefore, their commercial value reside in patents. This is because patents on new biologicals promise exclusivity in the market, equivalent to the patent protection a pharmaceutical firm obtains over a new compound. Accordingly, patents on biological substances seem analogous to patents on new chemical entities (Eisenberg 2000, p 784). By materialising biological substance through property rights, patent law not only defamiliarised, but also denaturalised the 'biological' from and within the biological bodies. And this reductionism suggests patent law already has a materialist explanation for life. It leads us to believe that biological substances must be made 'pseudo-inanimate' so that they can become fungible with others types of things propertised under the patent law (Garforth 2008, pp 34-35). Caught in the materialist credo of production, modern patent law transforms living substances into inert matter and in so doing, it has not only made it possible to do things that global bio-tech corporations do in their laboratories today (Carolan 2010, p 3), but also granted rights to control proprietary biological substances throughout the world. As Dutfield points out, 'this way of imagining life to base arguments for extending protectable subject matter to microorganisms, plants and animals played a significant role in the evolution of patent law in various countries from the 1980s, and ultimately in the global regime too' (Dutfield 2003, p 136). Article 27 of the Agreement thus deterritorialised the Euro-American understanding of materiality and this deterritorialisation allowed patented biological artefacts as well as legal practices and rationalities associated with them to move and flow freely from their territories to distant locations in the globe.

2.5: Locating Reterritorialisation

The TRIPs Agreement prescribes a single framework of protection for all member countries of the WTO and, consequently, acted as a powerful vector for the transmission of specific, culturally determined systems for codifying knowledge globally (Parry 2002, p 680). In light of this observation, it seems reasonable to argue that the Agreement explicitly replaced locally determined solutions to the question of making knowledge and information property with a set of standards developed elsewhere (May and Sell 2006, p 163). The Agreement, therefore, attempted to deterritorialise the system of intellectual property ownership through the movement

of Euro-American idea of materiality. Given the way protection and exploitation of new biologicals are extended in Euro-American patent law, and deterritorialised by the Agreement, the member countries of the WTO had to accept and reterritorialise the materialist underpinnings of Article 27 in their domestic legislations. For instance, the European Community (EC) Biotechnology Directive (98/44/EC), issued in 1998, states: 'an element isolated from the human body or otherwise produced by a technical process is not excluded from patentability since it is the result of technical processes used to identify, purify and classify it and to reproduce it outside the human body, techniques which human beings alone are capable of putting into practice and which nature is incapable of accomplishing by itself'. Moreover, Articles 52 (patentable inventions) and 53 (exceptions to patentability) of the EPC 1973 were substantially revised in 2000.[110] The aim of this revision was to take into account developments in international law, in particular the TRIPs Agreement and this understanding is very much evident in the views expressed by delegates attending the revision conference.[111] Further, in the Second 16(c) Report, the EC observes that legal and technical experts felt there were no differences between DNA sequences and chemical substances and therefore, there was no objective reason for limiting the traditional protection granted by patent law to inventions relating to sequences or partial sequences of genes isolated from the human body (COM 2005 312 final). Interestingly, in these technoscientific and legal discourses, the EPC and the EC reproduce and reiterate the instrumental rationality of modern patent law and biotechnology mobilised by the US judiciary to propertise new biologicals produced by global bio-tech corporations. Since the EU acted as a catalyst for bringing the governance of new biologicals in the global intellectual property regime, these transformations and arguments are not accidental; rather, they are deliberate steps taken by the EU. So what we find here is that there is a reterritorialisation of the materialist underpinnings of Article 27 in regional documents. As Blakeney explains, global intellectual property rights exist not only as a consequence of domestic legislation or jurisprudence, but also because of international, multilateral, bilateral and regional obligations (Blakeney 2004, p 3). And in the context of TRIPs, this

[110] European Patent Convention, 15th edition, September 2013.

[111] See, for example, Diplomatic Conference for the revision of the EPC, available at: https://www.epo.org/law-practice/legal-texts/archive/documentation/diplomatic-conference.html; Conference of the Contracting States to Revise the 1973 European Patent Convention, Munich, 20 to 29 November 2000 (MR/24/00); and Act Revising the Convention on the Grant of European Patents, Munich, 29 November 2000.

jurisprudence came mainly from a handful of developed countries and was deterritorialised through international or multilateral obligation that comes with the WTO membership. In other words, global intellectual property law plays an important role in changing domestic substantive and procedural rules and this is particularly the case with TRIPs Agreement, which prescribes domestically enforceable norms for the protection of intellectual property rights as a condition of membership of the WTO (ibid.). Put differently, all member countries of the WTO are obliged to reterritorialise the materialist underpinnings of global intellectual property regime by making changes in their domestic legislations. From this point of view, the TRIPs Agreement performs a double act. On the one hand, it deterritorialises the Euro-American understanding of materiality or facilitates the movement of legal practices and rationalities from one place to another; and on the other, forces member countries to reterritorialise these practices and rationalities through legal obligation.

This reterritorialisation becomes more visible once we look more closely into some of the provisions of the Indian Patents Act, 1970 that were changed through successive amendments in 1999, 2002 and 2005 to bring India's patent regime into compliance with the WTO TRIPs Agreement. Before 1999, a patent was available only for new and useful process, method and manner of manufacture, and machine and substance produced through such manufacture.[112] However, a method of agriculture or any process to make animals and plants disease free, or to increase their economic value and production, was outside patent claims.[113] In addition, patents were also not available for substances intended for use or capable of being used as food, medicine or drug, and produced through chemical processes.[114] Reading these provisions together, it becomes clear that neither the bio-technical methods or processes of isolation, manipulation, recombination and re-creation of biological substances, nor any new products or biologicals manufactured through such processes were patentable. Put simply, isolated and recombined or re-created DNA sequences, cell lines, viruses or genetically modified animals and plants were

[112] The Patents Act 1970, section 2(1)(j).
[113] Section 3(h) and (j).
[114] Section 5

non-patentable inventions in India before 2002. While the Patents (Amendment) Act 1999 introduced product patent (though implicitly) for new substances intended for use or capable of being used as medicine or drug,[115] it is the Patents (Amendment) Act 2002 that extended the definition of 'invention' to include new products in addition to processes. The Act further added the criteria of 'invention step' and 'industrial application'. In terms of this amendment, microorganisms or living organisms (such as single or multicellular bacteria, archaea, protozoa, fungi, algae, and pathogens) produced through microbiological or bio-technical processes are patentable inventions. Moreover, the processes through which those products are manufactured also become patentable because the Act implicitly recognises patents over bio-technical or recombinant processes used for improving plants and its products.[116] The Act is explicit regarding the non-patentability of plants and animals in whole or any parts thereof (including seeds, varieties and species) produced through biological processes.[117] However, it can be argued that transgenic plants, seeds, isolated and recombined DNA sequences and cell lines as products of bio-technical ingenuity are manufactured through non-biological processes. And if these products are manufactured through processes that involve technical advance and have economic significance (inventive step), then they might be treated as 'new inventions' and become patentable under the amended Patents Act, 1970.[118] Leaving the technicalities of law aside, we can say that these transformations in India's patent jurisprudence make visible the reterritorialisation of the materialist underpinnings of Euro-American intellectual property law in a distant location. More importantly, this practice of de/re-territorialisation promoted through the WTO-TRIPs Agreement is a clear indication of the creation of a condition in which legal norms, practices and rationalities associated with a patented biological object can move freely between the global and the local.

[115] The Patents (Amendment) Act, 1999 added a new sub-section to section 5 of the 1970 Act. The Act was passed with retrospective effect from 1 January 1995, the day India becomes member of the WTO. However, section 5 was completely deleted by the Patents (Amendment) Act 2005.
[116] Section 4 of the Patents (Amendment) Act, 2002 and Section 3(i) and (j) of the amended Patents Act, 1970.
[117] Section 3(j) of the amended Patents Act, 1970.
[118] The Patents (Amendment) Act, 2005 introduced a new definition of 'inventive step' (section 2(1)(ja) of the amended Patents Act 1970), a criteria first introduced by the 2002 Amendment Act. The act also substituted the content of old clause (l), which now defines 'new invention'.

While one might view this de/re-territorialisation of Euro-American materiality and the production of Bt. brinjal as two isolated incidents, these incidents are in fact intimately connected to each other. Consider the global bio-tech corporation Monsanto, which not only played a major role in framing the TRIPs Agreement that simultaneously de/re-territorialised Euro-American materiality, but was also an active partner in the production of Bt. brinjal. Recall that gene isolation and transformation of the brinjal plant was started by Mahyco under a joint initiative with Monsanto in 2002 and the supply of Monsanto's patented Bt. gene was part of this collaborative relationship. It was also the year India brought radical changes in its patent laws to grant intellectual property rights over bio-technical processes and products. Though these two incidents might be a mere coincidence, it seems reasonable to argue that legal norms, practises and rationalities that came with the movement of Monsanto's patented Bt. gene invisibly pushed India to transform its patent laws and create a hospitable place for proprietary living substances manufactured through bio-technical processes. This transformation becomes more evident as we look into Mahyco's patent claim over new biologicals in India. In 2007, Mahyco moved to the Receiving Office of the WIPO in Geneva with an international application (PCT application) for patent rights over Bt. brinjal (WO 2007/091277 A2). In its patent application, Mahyco claimed that it has invented an insect tolerant brinjal plant by inserting a transgene (cry1Ac gene isolated from Bacillus thuringensis) into the genome of the brinjal plant. The transgenic plant was produced using the *Agrobacterium*-mediated transformation method which, according to Mahyco, is not only an efficient method for transforming plants, cells and tissues to confer insect resistance, but the method is also used for detecting the presence of transgene in the modified brinjal plants, seeds and progeny. So the method used for producing the insect tolerant transgenic brinjal plant, Mahyco claims, is an invention. And since the modified brinjal plant is produced through an inventive method and its seeds and future progeny would carry the cry1Ac gene isolated from Bt, Mahyco's bio-technical ingenuity also extends to them. Hence the application claims, both the process and the products (modified brinjal plant, its seeds and future progeny) are inventions and therefore, Mahyco has patent rights over them. What is interesting about an international application with the WIPO is that once a patent application is filed under the PCT, the claim becomes valid in all contracting states of the PCT designated in the application and India is one among

106 designated countries. Thus, Mahyco's intellectual property rights claim over Bt. brinjal and its future progeny extends to India and comes within the purview of Indian patent law. The point, however, is that the amendments made in 2002 and 2005, did not just reterritorialise the Euro-American understanding of materiality in Indian patent law, but also transformed India into a hospitable place for Monsanto's patented Bt. gene as well as for Mahyco's proprietary claim over new biologicals.

2.6: Emergent Spaces of Property, Propertising Emergence

In the previous section, I have explained how the reterritorialisation of the idea of materiality has occurred through interactions and connections between heterogeneous entities. The point, however, is that these interactions and connections brought into existence an emergent space of property in a distant location, and this becomes more apparent not only from Mahyco/Monsanto's property rights claim over Bt. gene and Bt. brinjal, but also from Mahyco's desire to propertise emergence. Consider, for example, the ownership of Bt. gene by the global biotech firm Monsanto, which prohibits farmers in India from reproducing the genetically modified brinjal plant containing the Bt. gene. To put it another way, Monsanto's intellectual property or patent rights over an artificially manufactured biological artefact shall not be infringed either by reproducing the Bt. brinjal in any manner, or by isolating, modifying and transforming any parts or fragments of it. Consider also Mahyco's vigorous intellectual property rights claim over bio-technical process and Bt. brinjal in India. Mahyco not only reiterated and defended Monsanto's patent rights over the Bt. gene, but also reinforced its proprietary claim over brinjal germplasm containing the Bt. gene. Mahyco claimed that the MHSCL technology (the recombinant process of inserting the Bt. gene into the genome of brinjal plant and the modified brinjal germplasm) is a proprietary technology and therefore, its intellectual property right extends to any active fragments, mutation, seeds and future progeny. Mahyco further demanded effective legal protection by way of intellectual property rights over the 'patented technology incorporated in living organism' (Bt. gene), MHSCL technology and bio-technically engineered brinjal plant, either by implementation or by amendment of existing intellectual property legislation. This is particularly evident in the changes made by 2002 and 2005 amendments, and it

becomes clear that these amendments were made to provide intellectual property protection to biotechnological processes and products, such as genetically modified plants and the future life form it would produce. More importantly, Mahyco's intellectual property rights claim over future progeny brings into view its desire to propertise emergence. In other words, by making proprietary claim over future life forms (seeds and progeny), which the modified brinjal germplasm would produce, Mahyco not only propertised the regenerative processes and capacities of the modified brinjal plant, but also propertised 'potentiality'. According to Strathern, potentiality is 'the capacity of development as yet unrealised' (Strathern 1996, p 17). For Mahyco, potentiality of the transgenic germplasm is an asset, and establishing intellectual property rights over it, is a way of securing control over potential property, which is yet to be realised. As Strathern further notes, there is an emerging constellation of (Euro-American) property interests in potentiality – a field dominated by a well-established (legal) category, viz. intellectual property rights (ibid.). In this sense, the Bt. brinjal is not just an 'emergent' life form and an 'emergent' property form that were not there before, but it gives rise to potential property. Though the birth of Bt. brinjal resulted from the effort to produce an insect tolerant brinjal plant, it was a carefully crafted scientific and corporate plan between Mahyco and Monsanto to produce a commercial transgenic plant and create new market for transgenic food crops in India. However, their desire to propertise emergence through intellectual property rights transformed India into an emergent space of property. Accordingly, we can say that an emergent space of property comes into existence through interactions and connections between heterogeneous entities situated in diverse locations.

2.7 Conclusion

In this chapter, I have traced the connection between materiality, movement and an emergent space of property. My aim has been to understand how an emergent space of property comes into existence through the de/re-territorialising flows of desire, which was mediated by disparate elements. As discussed in chapter 1, existing narratives on the production of Bt. brinjal revolve around the risk and uncertainty of bio-technical science. These narratives not only neglected Mahyco/Monsanto's desire to propertise emergence, but also failed to see how an emergent space of

property comes into existence through interaction and connection between heterogeneous elements. To provide an account of this transformation, I have specifically focused on de/re-territorialisation through which the idea of materiality moves from one location to another. In particular, I have emphasised the role of Monsanto, its proprietary Bt. gene and the TRIPs Agreement in the deterritorialisation process. However, I have pointed out that to understand the significance of this movement, one needs to look into how the idea of materiality is reterritorialised in a distant location. Ultimately, what remains folded in the Euro-American idea of materiality is the desire to propertise that not only established machinic conjunctions between the elements, but also moved through dispersed spaces. From this point of view, de/re-territorialisation of the idea of materiality spatialised the desire to propertise emergence. This in turn suggests that de/re-territorialisation denotes movement in process and not simply 'extension and incorporation'. While the latter terms pay attention only to unidirectional movement, the former brings into view heterogeneity, mediation, movement and interaction, in the sense that heterogeneous components co-function, form alliances, relate to each other to bring qualitative transformation in a distant location. Thus, I have not only pointed out the changes made in India's intellectual property legislation, but also emphasised Mahyco/Monsanto's desire to propertise emergence. In other words, an attention to movement in process reveals the mediation between and co-functioning of disparate entities. In the next chapter, I discuss another dimension of this de/re-territorialisation by focusing on the desire to normalise appropriation through global/local governance mechanisms.

CHAPTER 4

Deterritorialising Appropriation: An Inquiry into Spatialities of Governance and Normalisation

‘The art of government could only spread and develop in subtlety in an age of expansion…’

Michel Foucault[119]

‘…one cannot get free of the *actio in distans*’

Friedrich Nietzsche[120]

4.1: Introduction

In chapter 3, I have shown how an emergent space of property comes into existence in a distant location through the de/re-territorialisation of the idea of materiality. Specifically, I have emphasised that this de/re-territorialisation process is mediated by heterogeneous entities situated in diverse spaces. In this chapter, I discuss another dimension of de/re-territorialisation by looking into normalisation of appropriation through the expansion of governance. In its allegation of ‘biopiracy’,[121] the ESG has pointed out that Mahyco/Monsanto and their collaborators have accessed local brinjal germplasm in the production of Bt. brinjal. Since no authorisation from the NBA was obtained for this appropriation, it is an act of biopiracy. This argument has been reiterated by ESG in a PIL suit at the Karnataka High Court in Bangalore.[122] The contention was that the production of Bt. brinjal is an act of biopiracy because it is produced without complying ‘with the provisions of the Biological Diversity Act, 2002 that governs access to bio-resources in India’ (ibid.). Indeed, ‘curtailing biopiracy of sovereign bio-resources and knowledge associated with it’, according to the PIL, ‘is one of the fundamental reasons for ratifying the CBD, 1992 and the

[119] Foucault 1978/1991, p 97.
[120] Nietzsche 1968, p 332 (original emphasis).
[121] The term ‘biopiracy’ was first proposed by Rural Advancement Foundation International (RAFI, a Canada-based NGO and now the ETC Group). According to ETC Group, ‘biopiracy’ is the appropriation of knowledge and genetic resources of farming and indigenous communities by individuals or institutions who seek exclusive monopoly control (patents or intellectual property) over these resources and knowledge (ETC 2002). Later, the term was used by activists and academics alike to illustrate the appropriation and exploitation of bio-genetic resources of the South by global biotech corporations and intellectual property institutions from the Western hemisphere. I discuss it in detail in chapter 5.
[122] Environment Support Group and Others v. National Biodiversity Authority and Others, Writ Petition No. 41532/2012, (on file with the author).

enactment of Biological Diversity Act in 2002' (ibid.). Thus, for ESG, the issue is with governance because appropriation has taken place without complying with the CBD and the Biological Diversity Act.

In this chapter, I look closely into the issue of governing access and utilisation of bio-genetic resources that ESG highlights in its allegation of biopiracy. The emerging bioeconomy involves a broad range of economic activities. It is founded on the desire to access and appropriate, to capture the potential economic value of bio-genetic resources, and to expand the spaces of bio-economic production. Hence, its viability and expansion rest on unparalleled access to bio-genetic resources and new markets in disparate locations of the globe. Thus, the desire to capture and expand requires a shift in thinking, new ordering mechanisms, new legal arrangements. In short, it requires a new governance mechanism or what Foucault called 'governmentality' (Foucault 1978/1991) that would normalise the appropriative and expansionist logic of the bioeconomy. Here, I use the term 'expansion' in a Deleuze/Guattarian sense: as they observe, a rhizome operates by variation, expansion, capture and conquest (Deleuze and Guattari 1980/2004, p 23). Expansion and capture, from this point of view, occur through deterritorialisation, which denotes movement and flow. Therefore, economy, institutions and legal norms expand and become deterritorialised by moving and flowing in every direction. And 'normalisation', as Georges Canguilhem points out, is carrying out appropriation according to the norms of law or through establishing juridical order (Canguilhem 1966/1989, pp 126-127; Canguilhem 1994, pp 351 and 374-375). In what follows, I argue that this normalisation and expansion are achieved through global/local governance mechanisms, such as the CBD and the Biological Diversity Act. However, the point is that expansion depends on movement. The expansion of the bioeconomy, therefore, occurs through the expansion of governance and what remains folded in governance mechanisms is the desire to normalise appropriation. Global/local governance mechanisms, therefore, normalised the movement of desire and in so doing, expanded the spaces of bio-economic production. And this expansion through movement, I would argue, deterritorialised and spatialised the desire to normalise appropriation.

To pursue these arguments, first, I take inspiration from Michel Foucault's work to elaborate the concept of 'governance' and demonstrate that governance has a spatial dimension. Then, I move on to show that this spatial dimension of governance becomes visible once we look more closely into how laws, legal mechanisms and practices as tactics of rational intervention move and expand from one place to another in the emerging bioeconomy. To carry this understanding forward, I deploy the metaphor 'governance at a distance' proposed by Miller and Rose (1992), and demonstrate that the CBD is a global governance mechanism that normalises the appropriation of bio-genetic resources at a distance. I locate this normalisation in India's Biological Diversity Act, 2002. Furthermore, borrowing insights from Deleuze/Guattari, I argue that the CBD is not just a 'governance at a distance' mechanism, but rather an 'apparatus of capture' that prescribes legal arrangements to capture the economic value of bio-genetic resources and in so doing, it has expanded the spaces of bio-economic production through the normalisation of appropriation. I conclude the chapter by observing that in the bioeconomy, expansion, normalisation and spatialisation are related to each other because they are parts of a simultaneous process.

4.2: Governmentality

As emphasised above, the viability and expansion of the bioeconomy require a shift in thinking, or governance mechanisms that would normalise appropriation. Governance, from this point of view, is a component part of the bioeconomy. The term 'governance' can be understood as 'a change in the meaning of government, referring to a *new* process of governing; or a *changed* condition of ordered rule; or the *new* method by which society is governed' (Rhodes 1996, pp 652-653; original emphasis).[123] While we do not find the term 'governance' in Foucault's vast corpus of philosophical writing, his detailed analysis of the shift in governmental thinking at

[123] According to the Commission on Global Governance, governance '…is a continuing process through which conflicting or diverse interests may be accommodated and co-operative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest (Commission on Global Governance 1995, p 2). For a different social-theoretic perspective on governance, see Kooiman and Van Vliet 1993; Stoker 1998.

the end of eighteenth century and its continuation to present day neo-liberalism (Foucault 1978/1991) is useful for thinking about how governance functions in the bioeconomy. Foucault introduced the analytic of 'governmentality' to offer a genealogical account of the shift in the style of governing and in so doing, he paid particular attention to economic-juridical rationality underlying such a shift. In his oft-cited essay '*Governmentality*', Foucault observes that the 'art of government' discovered in the eighteenth century was concerned mainly with a sort of complex comprising of men and things – men in their relations, their links, their imbrication with those other things such as wealth, resources, means of subsistence, the territory with its specific qualities, climate, irrigation, fertility, etc. (ibid., p 93). In other words, things must be disposed and for government it is not a question of imposing law on men, but of disposing things: that is to say, of employing tactics rather than laws, and even of using laws themselves as tactics – to arrange things in such a way that, through a certain number of means, such and such ends may be achieved (ibid., pp 94-95). What we notice here is that the appearance of new problems and new objectives, and the main purpose of the 'art of government' was to deploy new techniques and mechanisms capable of bringing economic relations within the realm of political practice (ibid., p 92; Foucault 1994/1997, p 67). Thus, 'government' can be understood as an 'activity' (ibid.), a '*techne*' (technique or technology), a 'way of doing' – a framework of political rationality governed by a conscious goal (Foucault 1994/2000, p 364; Foucault 1981, pp 353-354). And as an activity, 'government' refers to the way in which the conduct of individuals or groups might be directed. To govern, in this sense, is to structure the possible field of action of others (Foucault 1982, p 221).[124]

[124] Over the past few years, a number of scholars have emphasised the term 'governmentality'. According to these scholars, 'governmentality' is a certain way of thinking and acting about the kinds of problems that can and should be addressed by various authorities. This thinking and acting is embodied in attempts to know and govern the wealth, health and happiness of populations (Miller and Rose 1990, p 2; Rose and Miller 1992, p 174; see also Dean 1999, p 16). In this sense, 'governmentality' is the 'conduct of conduct': a form of activity or practice aiming to shape, guide or affect the conduct of individuals or a collective of economic agents (Gordon 1991, pp 2-3; Burchell 1996, p 19; Rose 2000, p 322; see also Inda 2005, p 1-11; Lemke 2001, p 191). Thus, the neologism 'governmentality' consists distinct rationalities, forms of conduct, and fields of practice, which aim to control individuals and collectivities in diverse ways. It is a more or less systematised, regulated and reflected mode of power, which following a specific form of reasoning defines the telos of action or adequate means to achieve it (Lemke 2002, p 53; Lemke 2003, p 176).

Foucault has further elaborated this analytical concept in detail in his 1978 and 1979 lectures.[125] These lectures, published more recently, show an important shift in his thinking and attention, and more importantly, he points out that economic activities are the contingent creations of legislation (Foucault 2004/2008, p 161). In the 1978 lectures titled *Security, Territory, Population*, Foucault begins with the notion of 'biopower' by which he tried to understand how, starting from the eighteenth century, 'a set of mechanisms through which the basic biological features of the human species became the object of political strategy, of general strategy of power' (Foucault 2004/2007, p 1). But he quickly shifted his focus to mechanisms of security and the form of normalisation associated with it (ibid., pp 4 and 11). He observes that in the second half of the eighteenth century, a major change took place in the techniques of government – a new mechanism was deployed, which rather than disciplining (enclosing, protecting and regulating), expanded the market space (ibid., pp 34 and 45). Foucault calls this new mechanism 'apparatuses of security' and the essential function of security is to regulate free movement of people and things without prohibition (law) or prescription (discipline), but possibly using some instruments of law and discipline (ibid., pp 47 and 49). Accordingly, the apparatus of security normalises movement but it is fundamentally different from disciplinary normalisation because in case of discipline, normalisation consists of trying to get people, movements, and actions to conform to specific norms (ibid., p 57). In

[125] It is important to note that Foucault's analysis of governmental technique or rationality was not new in these lectures. Colin Gordon locates Foucault's occupation with this theme in *Discipline and Punish* (1975/1979), in which Foucault recounts the growth of disciplinary techniques designed to observe, monitor, shape and control the behaviour of individuals situated within a range of social and economic institutions. Foucault understood these governmental techniques as 'techniques of power' or 'power/knowledge' and later began to study power relations by introducing the term 'biopower' or 'biopolitics' in *The History of Sexuality, Vol. 1* (1976/1998) and reintroduced this theme in his 1978 lectures on 'biopolitical government' (Gordon 1991, pp 3-5). Stephen J Collier, while agrees with Gordon to certain extent, argues that though Foucault's initial analysis of political government in 1976 (*The History of Sexuality, Vol. 1* and *Society Must Be Defended*) shares a great deal with the approach developed in *Discipline and Punish* (1975/1979), his elaboration of the concept in later lectures (1978-79) shows an important modification in Foucault's method and diagnostic style, most notably, a shift in focus from the 'mechanisms of normalisation' (discipline and regulation) in 1975 and 1976 to 'mechanisms of security' in 1978 and 'biopolitics as a problem space' in 1979 (Collier 2009, pp 79-93). My reading of Foucault here diverges from Gordon and Collier because in my view, Foucault developed the theme of governmental technique or rationality much earlier in his studies of madness (Foucault 1988b, p 19; see also White 1973, p 43). So in *Madness and Civilisation* (1961/1973), Foucault shows that the emergence of scientific confinement as a new institution in the nineteenth century has to be understood not only in terms of social and moral imperatives, but rather as an economic organisation concerned with increasing the productivity of the labouring subject and to organise them according to the need of the economy. Foucault reintroduced the theme in *Discipline and Punish* and continued this line of analysis in his 1978-79 lectures with an important shift in focus: rather than looking inside, he shifted his attention outside the institutions, the state (Foucault 2004/2007, pp 116-119).

contrast, security normalises by allowing circulation (exchange) to take place freely and ensuring that things are always in movement, constantly moving around, continually going from one point to another (ibid., p 65). Thus, we can observe a change in the 'art of government': a correlation or triangle between law, discipline and security. In a sense, there is not a succession of law, then discipline, then security, but governmental management is a way of making the old armatures of law and discipline function in addition to the specific mechanisms of security (ibid., pp 8, 10 and 107). Interestingly, in the 1979 lectures titled *The Birth of Biopolitics* (2004/2008) Foucault describes this emerging rationality in governmental practices as 'modern governmental reason' (ibid., p 10). And for Foucault, this rationalisation of governmental practices is an 'art of governing' or 'reasoned way of governing' that consists in arranging things through intellectual instruments: political-economic reflection (interventionist social policies) and the redefinition of juridical institutions (rules governing the market). Foucault terms this economic-juridical complex 'neo-liberalism'. He further points out that the redefinition of juridical institutions was a necessity for regulating economic activities because the rules were not in tune with the competitive market economy. Hence, the problem was in the law (ibid., p 160). Therefore, the creation of a legal order that can constantly adapt to the progress of economic organisation is a technique of bringing law and the economy together. As Foucault writes, 'the juridical gives form to the economic, and the economic would not be what it is without the juridical' (ibid., p 163). In other words, economic processes and legal institutions call on, support, modify and shape each other in ceaseless reciprocity (ibid., p 164). That is to say, economic processes cannot be dissociated from a juridical ensemble and accordingly, the economy becomes a set of regulated activities determined by legal institutions. The market must function within a juridical-institutional framework guaranteed by the state. This suggests that legal institutions or a system of law frames the economy and provides a framework within which economic agents can freely make their decisions (ibid., pp 166-173). It is worth quoting Foucault at length on this point:

> 'Liberalism probably did not derive any more from a juridical reflection than from an economic analysis. It was not given birth by the idea of a political society founded on a contractual relationship. Rather, in the search for a liberal technology of government, regulation by means of a juridical form appeared to constitute a far more effective instrument than wisdom or the moderation of the governing…. This

> regulation was in the "law" after which liberalism sought, not at all because the juridical was natural for it but rather because the law defined forms of general intervention which were exclusive of particular, individual, exceptional measures and because the participation of the governed in the elaboration of that law through a parliament constituted the most effective system for a governed economy' (Foucault 1981, p 357).

The crucial point is that Foucault understood 'governmentality' as a method of rationalising governmental practices through economic-juridical ensemble that appeared and took shape in relation to liberalism and neo-liberalism from the eighteenth century onwards (Foucault 1981, pp 353-354). This economic-juridical ensemble emerged in response to a crisis in government. The main concern of this ensemble was 'how' to govern the complex comprising of men and things according to rational knowledge and reflection. Government is thus an 'art of rational intervention' (Foucault 1979/1981, pp 243 and 248) and as an economic-juridical ensemble, the art of governing is formed by institutions, procedures, methods, reflections, techniques, and tactics that allow complex and multiple practices to operate and intervene (Foucault 1978/1991, p 102; Foucault 1981/1991, p 176; Foucault 1984, p 338). Viewed in this way, the notion of government highlights a complex and heterogeneous assemblage of mechanisms through which authorities of various sorts have sought to shape, normalise and instrumentalise the conduct, thought, decisions and aspirations of others to achieve the objectives they consider desirable (Miller and Rose 1990, p 8). Thus, governmentality refers to a historically specific way of thinking and acting that emerged in the eighteenth century and more specifically an approach to governance (Brady 2014, p 19).[126]

[126] In a 1993 publication, Hunt proposes that we need to depart from the term 'government' and focus on 'governance'. The focus on 'governance', he argues, opens up a space that allows us to think of government as a process rather than an institution and to break with the habits long instilled by the dominance of the nation-state in our experience that only governments govern. He further suggests that his intention is to articulate a conception of governance that starts from the interrogation of law as a mode of regulation, and in so doing, he intends to avoid an either-or choice between the global and the local, between state and civil society (Hunt 1993, pp 305-309; see also Hunt and Wickham 1994, chapters 4 and 5). Here I do not follow his/their proposed theoretical framework for two reasons: first, I agree with Baxter that rather than illuminating how Foucault's work can help us to understand government as a specific approach to governance or how laws are used as tactics of governance, Hunt and Wickham moved away from Foucault too quickly and turned toward their own research project 'sociology of law as governance' (Baxter 1995-96). Second, Hunt and Wickham propose their approach to law as governance on the basis of Durkheimian understanding that the 'social' is an independent category that can be found everywhere and law as distinct social phenomena, is a specific area of study. They also find a connection between Durkheimian tradition in the study of the social

4.3: Spatialities of Governance

At this juncture, I want to stress two points. First, government as an economic-juridical ensemble involves tactics of rational intervention (see also Miller and Rose 1990, p 7; Lemke 2001, p 191) and Foucault points out that laws can be used as tactics to arrange things. More specifically, law as a mechanism of security can be used to expand the market space, or legal institutions can be used to support, modify, and shape economic activities, which Foucault calls 'legal interventionism' (Foucault 2004/2008, p 167). Much energy has already been spent on 'bringing Foucault into law and law into Foucault' (Baxter 1995-96) and I do not find it necessary to revisit this old debate here.[127] The point that I want to emphasise here is that Foucault was concerned with 'how' and not with 'what' questions (see, for example, Gordon 1991, p 7; Dean 1999, p 16). His concern was with 'how law operates' (Foucault 1976/1998, p 144), 'how law expands the market space', 'how law shapes economic activities' and not with 'what law is'. Foucault points out that law increasingly operates as a 'norm' and by this he means to suggest that normalisation tends to be accompanied by an astonishing proliferation of legislation. The norm, then, is not opposed to law; rather, law can operate by formulating norms (Ewald 1990, p 138).[128] Accordingly, in contemporary regimes of government and control, Rose and Valverde argue, law is connected up to, and dependent upon, a matrix of apparatuses whose function is mainly regulatory and therefore, we need to analyse the role of legal mechanisms, legal arenas, legal forms of reasoning and so on in strategies of regulation (Rose and Valverde 1998).

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and Foucaultian understanding of governmentality (Hunt and Wickham 1994, p 78). It is true that Durkheim understood the 'social' as an independent category but as Levi-Strauss points out, without taking heed that this new category entails all sorts of specificities corresponding to the various aspects through which we apprehend it (Levi-Strauss 1973/1978, p 6). Thus, my approach to governance is Foucaultian (governance as an assemblage of diverse mechanisms) because Foucault explicitly rejected a Durkheimian study of the social (see, for example, Foucault 1981-82/2007, p 155).

[127] To get a glimpse of this debate, see de Sousa Santos 1985; Hunt 1992 and 1993; Hunt and Wickham 1994; Baxter 1995-1996; Tadros 1998; Munro 2001; Wickham 2006; Golder 2008; Golder and Fitzpatrick 2009; Golder 2013. For an overall assessment of Foucault's contribution to socio-legal scholarship, see Valverde 2010.

[128] According to Ewald, in the first volume of the *History of Sexuality*, Foucault suggests that law increasingly operates in the form of norms and in so suggesting, he made a distinction between 'the juridical' (monarchical law) and 'the normative' (legislation) (Ewald 1990, p 138). In my view, Ewald's interpretation is right that Foucault understood law increasingly operates as norms, but we do not find the distinction between 'juridical' and 'law' in his 1978-79 lectures. Rather, he has used the terms 'juridical', 'law', and 'legal institutions' interchangeably.

Second, the practice of government involves multiple authorities that govern in different sites through an elaborate network of relations formed by a complex assemblage of forces: institutions, organisations, programmes, aspirations, techniques, procedures, and documents (Rose and Miller 1992, p 183; Rose 1996a, p 42; Rose, O'Malley and Valverde 2006, p 85; Huxley 2007 and 2008). Thus, some scholars suggest that under an emerging order of globalism, there is a concomitant proliferation of governmental practices of spatial ordering in which the state and the market are reconfigured in novel ways (Perry 2000, p 66; Perry and Maurer 2003, pp xiii-xiv). Indeed, one finds new practices of global governmentality, which are dispersed in character. And as new ordering mechanisms, these new practices increasingly rely on dispersed, marketised, globalised mode of regulation (Perry and Maurer 2003, p xiv; Fraser 2003, p 167). These new forms of governance, which Sally Merry calls 'spatial governmentality', flow and move from one place to another and therefore, govern spaces rather than persons (Merry 2001, pp 16 and 18).

The point is that Foucault puts specific emphasis on the spatial aspect of governance, as he writes, 'the art of government could only spread and develop in an age of expansion, free from military, political and economic tensions' (Foucault 1978/1991, p 97). Expansion, as pointed out above, has spatial dimensions and, if for Foucault government spreads and develops through expansion, then laws as tactics of intervention and normalisation also move, expand, and flow from one place to another and in so doing, establish relations between practices and spaces that are spatially separated. This expansive nature of the art of governing suggests that we need to pay attention to spatialities of governance. An attention to spatialities of governance will help us to understand how new spaces, objects, and sites in far flung locations are opened up for intervention to achieve certain ends, and how spatially separated practices and sites get connected or bound up with one another through the expansion of governance.

4.4: Normalising Appropriation, Spatialising Governance

The concept of 'bioeconomy' covers a broad range of appropriative activities. More specifically, the bioeconomy as a global project and dream intends to capture the economic value of biological processes and products through bio-technical modification and intellectual property rights. However, the absence of regulation creates insecurity in the market because without enforceable regulation there is no sustainable access to bio-genetic resources, and without sustainable access it is not possible to produce bio-technically modified or manufactured products. In short, without enforceable regulation there is no viable future for the bioeconomy and, as emphasised in the introductory chapter, this absence has been described as a crisis in governance, which must be mitigated through the redefinition of juridical institutions. Enforceable regulation, in this sense, becomes a new technique or mechanism of governing, and as a method of rational governmental intervention, it operates as a 'mechanism of security'. The essential function of law in the bioeconomy, therefore, is to govern the movement of biological materials – to ensure that biological materials are continuously moving from one place to another. In other words, the purpose of law is to normalise appropriation of bio-genetic resources in the production of new biologicals. Thus, it is legal institution or a framework of law, which functions as a mechanism of normalisation, in the sense that law supports, modifies, and shapes appropriative activities, and in so doing, normalises the desire to appropriate.

Governance, however, is an art of disposing things, an art of rational intervention. The operation of governance, therefore, depends on the identification of objects, sites or spaces it intends to govern. And in the bioeconomy, these objects and spaces are dispersed. Since the bioeconomy intends to expand the spaces of bio-economic production – to deterritorialise the desire to capture and appropriate, it depends upon a framework of law that can normalise the appropriation of bio-genetic resources situated in disparate locations. Then, the question that begs for exploration is: how does a framework of law governs appropriation in dispersed sites. Put otherwise, how does the desire to appropriate move and expand through a framework of law.

Here I follow the observation of Rose and Miller that 'government depends upon calculations in one place about how to affect things in another' (Rose and Miller 1992, p 185). It means that we need to look at 'action or governance at a distance'. For Nietzsche, 'action at a distance' comes from the inner will, it is an insatiable desire to manifest power or exercise power, it is a force from which there is no escape, not even an empty space is outside its grip (Nietzsche 1968, pp 332-333). 'Action at a distance', from this point of view, can be understood as a strategy to govern dispersed spaces. Miller and Rose, however, suggest that 'governance at a distance' is a complex mechanism in which one actor adopts a particular way of thinking and acting and convinces other actors that their problems or goals are intrinsically linked, that their interests are consonant, that each can solve their difficulties or achieve their ends by joining forces or working along the same line. Thus, by persuasion or compulsion, one actor comes to construe problems in allied ways and convinces other actors that their fate in some way is bound up with one another. In this way, objects and practices that are separated by time, space and territorial boundaries can be aligned and in so doing, it is possible to act from a centre of calculation such as government office or the headquarters of an inter-governmental organisation, on the desires and activities of others who are spatially separated (Miller and Rose 1990, pp 9-10; also Rose, O'Malley and Valverde 2006, p 89). Taken together, these observations suggest that governance mechanisms or laws can be framed not only to govern objects situated in dispersed spaces and shape the activities of others at a distance, but also to normalise and mediate the movement of desire to disparate locations.

The emergence of ordering mechanisms designed to govern at a distance is not entirely a new phenomenon, especially if one considers the proliferation of an array of global legal artefacts in the past few decades, mainly from the headquarters of global institutions (such as the WTO, WIPO, UN). However, we can look more closely into one such ordering mechanism to understand how it expands the bioeconomy to disparate locations at a distance. I specifically focus on the CBD, a global and strategic legal instrument proposed and formulated by the United Nations Environment Programme (UNEP), an umbrella organisation of the United Nations situated in Geneva. This is not to say that there is a dearth of scholarly and critical

analysis of this global legal artefact in the academic literature. Indeed, scholars from a variety of disciplinary backgrounds have dwelt on this global instrument to provide a critical account of the regimes of environmentality and appropriation of bio-genetic resources in the context of global environmental governance.[129] But as Duffy observes, much research and writing on global environmental governance focuses on the outcomes, or on the structural/global power relations that are embedded in international conventions and institutions (Duffy 2014, p 126). Very few dwell on how decisions are made at international fora, how ideas about conservation emerge, gain traction, are contested and debated, how compromises are made, and how bargains are struck. In essence, most work on conventions analyses which agreements are made rather than how they are produced in the first place (ibid.). Therefore, the analytic of 'governance at a distance' is useful for thinking about how a governance mechanism framed at a particular location assumed a global character. That is, how it normalised the desire to appropriate and at the same time, mediated the movement of this desire to dispersed locations. The argument, then, is that a closer look into the CBD's negotiation process between 1988 and 1992 would reveal how a group of experts working under the UNEP adopted a particular way of thinking and acting, defined problems as common concern and found solutions in common interest, and convinced others that these problems could be solved by designing a global legal mechanism. More precisely, I am interested to look at how ideas about the bioeconomy emerged and gained traction during the negotiation process, or how a group of experts devised a global legal mechanism to govern

[129] Geographical and spatial aspects of environmental governance received extensive attention in human and environmental geography, and in anthropology. More specifically, drawing insights from Foucault's work on neoliberal governmentality, some scholars have analysed the neoliberalisation of biodiversity conservation policies and practices as embodying distinct 'environmentalities'. These policies and practices, according to these scholars, are a form 'green governmentality', which intends to generate 'geo-power' through rational insertion of natural and artificial bodies into the machinery of production. Further, these scholars argue that the way nature is conceived, acted up and managed in these discursive regimes of environmentality, one can clearly find disciplinary interventions where power/knowledge operates to inculcate an environmental ethic by means of which people will self-regulate their behaviour in conservation friendly ways (see Luke 1995, 1999a, 1999b; MacDonald 2005; Rutherford 2007; Fletcher 2010). Others have focused on new global agreements or regulatory regimes for the environment which, in their view, enact a new form of governance or art of eco-government to regulate relationships between people and things on a global scale. These governance regimes, in view of these scholars, as new modalities of power/knowledge are disciplinary in nature, and therefore, circulate and expand through multiple sites of encounter. In so doing, these disciplinary regimes produce environmental subjects either by compelling them to participate in neoliberal processes of eco-government or by forcing them to mobilise opposition against the politics of global environmentalism (see Gupta 1998; Goldman 2001 and 2006; Agrawal 2005a and 2005b).

appropriation at a distance. And in doing so, normalised and deterritorialised the desire to appropriate.

In 1988, the Executive Director of the UNEP established an Ad-Hoc Working Group of Experts to investigate the desirability and possibility of an umbrella convention to 'rationalise' activities in the field of biological diversity. The Working Group of Experts on Biological Diversity first met in November 1988 at headquarter of the UN in Geneva. In the first meeting, the Working Group discussed matters of mutual concern and expressed the belief that certain measures should be explored and adopted to realise the conservation and sustainable use of bio-genetic resources. By emphasising the urgent need of actions and measures at the global level, the Working Group proposed to identify gaps in the existing machinery and determine methods by which those gaps could be filled. A conclusion was reached that existing instruments and programmes could not adequately meet the aim of conservation and consequently, a legally binding mechanism was needed to deal with the conservation of biological resources at the global level. In this direction, the Working Group proposed to examine further the question of access to and ownership of, and placing appropriate economic value on, bio-genetic resources (UNEP/Bio.DIV.1/3 1989). A number of sessions were convened in 1990. The Working Group met in Geneva for its second session to advise further on the contents of the new legal instrument and requested the Executive Director to commence a number of studies to address outstanding issues: of particular importance was the study of the need and costs of global conservation and access to genetic resources and technology. There was a consensus that access to genetic resources, knowledge, data, new varieties and related technologies are important for conservation and therefore, the question of access must be addressed in the planned legal instrument. It was decided that access should be based on mutual agreement respecting the permanent sovereignty of States over natural resources. However, the relationship between intellectual property rights, access to genetic resources and ownership of biotechnology by private and public sectors needed to be further examined. Thus, the Working Group concluded that there is a need to incorporate an innovative mechanism in the international legal instrument that would facilitate the access to biological resources and new technologies (UNEP/Bio.Div.2/3 1990). Reports of these studies were presented in

the third session held in Geneva. The report titled *Biodiversity: Global Conservation Needs and Costs* stressed that a global strategy is required for the conservation of biological resources and it can only be achieved through an international agreement. But the main concern was with implementation because the success of a global strategy depends on the formation of consensus on global priorities, and global as well as regional plans and programmes, which would promote local adaptation and implementation (UNEP/Bio.Div.3/3 1990; UNEP/Bio.Div.3/Inf.1 1990).

A number of reports have addressed the issue of access to genetic resources and its relationship with intellectual property rights and biotechnology. There was a common consensus that the full potential of biological diversity can best be realised if genetic resources remain accessible to all users because biological diversity is a collective asset, even if in geographical terms it belongs to one region of the world or another. It was agreed that access to bio-genetic resources should be 'paid open access'. But the terms of access must be formulated in the spirit of co-operation between gene-rich developing and technology-rich developed countries and must facilitate the acquisition of genetic resources (UNEP/Bio.Div.3/12 1990). This turn towards open but paid access was a response to an increasing pressure from gene-rich developing countries not to make their wild plants and local varieties available free of charge (UNEP/Bio.Div.3/Inf.4 1990). Thus, farmers who have conserved and improved wild plants and local varieties would get payment for making their plant genetic resources available for commercial exploitation. But the negotiation on terms and conditions should be global and must be developed jointly. Moreover, the argument was that gene-rich countries should have access to technologies that would enable them to realise the potential economic value of genetic resources through commercialisation (UNEP/Bio.Div.3/8 1990). Therefore, emphasis was placed on the development of biotechnology, since biotechnology could alter the value of capital stock of known and unknown genetic resources (UNEP/Bio.Div.3/6 1990). More importantly, biotechnology could speed up the evaluation of germplasm for specific traits and it could be funded by enterprises that profit from the use of biotechnology (UNEP/Bio.Div.3/4 1990). In other words, the proposed global legal mechanism was a promising avenue for the promotion of biotechnological research and solutions in developing countries. However, while industrialised countries depend heavily on

developing countries for germplasm they need for biotechnological research, most biotechnological solutions are developed by private sectors in industrialised countries and protected by intellectual property rights. The proposed legal mechanism, therefore, promised to play a 'brokering' role for the bio-industry located in developed nations and also for developing country governments that are interested in building their national biotechnology programmes (UNEP/Bio.Div.3/7 1990). The Sub-Working Group on Biotechnology presented their final report at UNEP Headquarters in Nairobi in November 1990.

In its report, the Sub-Working Group categorically pointed out that biotechnology plays an important role in the production of new plant varieties and therefore, biotechnology needed to be promoted for the development of genetically engineered food crops. The report emphasised that industrialised countries have a responsibility to guarantee the transfer of biotechnology to developing countries, and participation by multinational corporations in transferring biotechnology should be increased. To achieve this purpose, it is necessary to maintain a wide genetic base for the future of biotechnological innovations but access to genetic resources should not be free-of-charge. Similarly, access to biotechnology and know-how must be paid by developing countries. Thus, there was a general agreement that the question of intellectual property rights should be reflected in the proposed legal mechanism and the development of strong national intellectual property regimes should be promoted to assist in the flow and development of biotechnology (UNEP/Bio.Div/SWGB.1/5/Rev.1 1990). In other words, the legal mechanism would act as a facilitator for bio-tech corporations in developed countries to transfer their technology to relevant institutions and individuals in developing countries, on the one hand, and for the transfer of genetic resources from developing countries to bio-industries in developed nations, on the other (UNEP/Bio.Div.3/4 1990). Management of biological resources, therefore, needs a global law, the basis of which must be provided by a global agreement (UNEP/Bio.Div.3/Inf.4 1990). The aim of such a legally binding instrument would be to govern biological resources in areas beyond national jurisdictions (UNEP/Bio.Div.3/12 1990).

In the first session held in Nairobi (November 1990), the Ad Hoc Working Group of Legal and Technical Experts on Biological Diversity re-emphasised that an innovative mechanism should be incorporated in the legal instrument to facilitate access to resources and new technologies and discussed in detail the elements that should be included in the draft agreement (UNEP/Bio.Div/WG.2/1/4 1990; UNEP/Bio.Div/WG.2/1/3 1990). The Ad Hoc Working Group prepared the first draft and received detailed comments, suggestions and proposal for amendments from the member countries of the UN. An account of these response and suggestions were presented in the second session held in Nairobi (UNEP/Bio.Div/WG.2/1/4/Add.1 1991; UNEP/Bio.Div/WG.2/2/2 1991). Taking these suggestions and proposals into account and on the instructions of the Ad Hoc Working Group, the UNEP prepared a revised draft of the Convention on Biological Diversity. The revised draft was reviewed by a group of lawyers representing a balance between the regions to produce a concise and coherent legal text (UNEP/Bio.Div/WG.2/3/3 1991). Between November 1990 and May 1992, the representatives from the member countries of the UN attended seven 'intergovernmental committee' (as the Ad Hoc Working Group came to be known) sessions – highly structured battlegrounds spreading across Nairobi, Madrid and Geneva, to intensely discuss, debate and negotiate the uses of words and phrases, their meaning and interpretation, and the ordering of provisions.[130]

The most contentious issues debated and negotiated were access to and ownership of bio-genetic resources, intellectual property rights, biotechnology and technology transfer, fair and equitable sharing of benefits and the rights of farmers. These intergovernmental sessions were preliminary consensus building activities where the developed and the developing nation-states as actors assembled to debate critical issues facing our planet, to challenge competing ideals and showcase the strength of their arguments. In short, these sessions were 'trial of strength' to challenge each other, build consensus and forge alliance, all sponsored by the United Nations. Accordingly, the draft convention went through several revisions, deletions, inclusions of new provisions, and redrafting to address the concerns and issues

[130] See UNEP/Bio.Div/WG.2/3/6 1991; UNEP/Bio.Div/WG.2/3/7 1991; UNEP/Bio.Div/INC.4/2 1991; UNEP/Bio.Div/N4-INC.2/5 1991; UNEP/Bio.Div/N5-INC.3/3 1991.

raised, and implement the amendments proposed. Finally, an agreed text of the Convention on Biological Diversity was adopted in the Nairobi Conference on 22 May 1992 and the Convention was opened for signature at the United Nations Conference on Environment and Development (UNCED known as Rio Earth Summit) in Rio de Janeiro on 5 June 1992.

The Rio Conference was the outcome of preparation and preliminary negotiations over a period of three years. Though the text of the Convention was negotiated in advance, the main purpose of the Conference was to bring diverse actors from spatially disparate locations in a space of negotiation and endorse a global legal mechanism that would govern appropriation or normalise the desire to appropriate at a distance. According to one account of the event, [131]

> 'UNCED began on 3 June with a formal inauguration in the plenary hall of the newly renovated Rio-Centre complex. The formal signing of the two conventions was initiated and continued until the last day of the conference. …the negotiating sessions were held in a series of simultaneous, closed meetings in which the official delegates negotiated the final form of the three declaratory documents under consideration. …Ten days of intense negotiations among the official national delegations were capped by a three-day summit meeting attended by 117 heads of state and government – a world record. In two days of plenary sessions, the world leaders gave 107 consecutive 7-minute speeches filled with superlative phraseology. In a dazzling display of pretentious discourse, various leaders claimed that the Rio Conference was the most important event in human history while others warned that it was the last chance to save humanity from destruction. …In this regard, UNCED was a global magic act, in which the leaders of the world supposedly solved their problems through the evocation of discursive catchwords' (Little 1995, pp 267-268).

In one sense, therefore, in Rio the local became the global. And in another sense, the event brings into view that the global is an assemblage of multiple locales, and entities or actors that participate in the construction of the global also assume global character. However, the point of the above discussion is to demonstrate how a group of experts sitting at the headquarter of the UN adopted a particular way of thinking

[131] For a more detailed account of the negotiating process, see Bell 1993; Downes 1993; Chasek 1994; Lipietz 1995; Koester 1997; Tolba and Rummel-Bulska 1998; Henne and Fakhir 1999.

and acting, defined problems, brought diverse entities together from disparate locations, and convinced other actors to make compromises, build consensus, and find solutions in common interest. In so doing, these actors have devised a global legal mechanism and since the purpose of this mechanism is to govern or normalise appropriation in disparate locations, it has spatialised and deterritorialised the desire to appropriate. Put otherwise, a group of experts has devised a global legal mechanism that mediated the movement of desire through the expansion of governance.[132]

4.5: Spatialising Normalisation

The emergence of 'governance at a distance' mechanism, such as the CBD, is a defining moment in the expansion of the bioeconomy. The CBD, as the above discussion shows, was shaped by dominant economic interests of developed countries and global bio-tech corporations, that is, to normalise appropriation. Viewed in this way, it can be said that by normalising appropriation, the CBD laid down the future path of the emerging bioeconomy. Though the purpose of the Convention was to promote sustainable use of biodiversity and conservation, it happens to become a global governance mechanism and thus, brings into view a shift in thinking and governing that incorporated economic rhetoric and an emerging juridical apparatus to normalise the desire to appropriate. It was a major step in the institutionalisation of economic interests of global bio-tech corporations over bio-genetic resources and it is not difficult to see how the Convention aligned biotechnology and emphasised the role of transnational corporations within the overall scheme of sustainability and conservation. As Coombe observes,

[132] Pottage argues that the CBD is a 'framework convention' and therefore, its normative programme emerges from an ongoing succession of meetings of the Conference of Parties. Since it is an ongoing process of transnational law making, which joins heterogeneous actors in associations, it has no centre or apex (Pottage 2006, p 151). I am a bit hesitant to accept this argument because the discussion of negotiation and drafting process demonstrate that the ideas about the Convention emerged from a centre or the headquarter of a global institution. It might be argued that negotiations took place in disparate locations, final acceptance in another location, the CBD Secretariat is situated in a different location, and the ongoing meetings of the COP also take place in different locations and thus, the CBD has no centre or apex. But perhaps we could say that the 'centre' is mobile or fluid rather than saying there is no centre at all.

> ‘The biotechnology industry requires certainty for commercial transactions and regulatory regimes that facilitate access to genetic resources, local knowledge, and ecosystem expertise so as to price these undervalued resources and create market-based incentives for their trade. The CBD, arguably, is first and foremost a legal regime designed to meet these economic needs’ (Coombe 2003, p 283).

In essence, the Convention legitimised the entrance of biotechnology and bio-tech industries in the management of bio-genetic resources and encouraged global bio-tech corporations to move their technologies to developing countries. And this movement has to be channelled through the newly devised global legal process that aligns the ideologies of technoscientific modernism with the desire to appropriate. This means that the Convention is structured in such a way as to make room for global bio-tech industries to access and utilise genetic resources in the development of new bio-tech products and move their new technologies to disparate locations (Article 1). This point is important in understanding the entrance of the bio-tech sector in the appropriation of genetic resources and the consequent expansion of the spaces of bio-economic production. My point here is that the Convention framed an interventionist form of global governance that institutionalised the participation of global bio-tech industries in the appropriation of biodiversity. In so doing, it authorised bio-tech corporations to access and utilise genetic resources in return for a sustainable technology, such as the development of transgenic crops which, bio-tech industries argue, have huge ecological benefits in terms of reducing the use of hazardous pesticides and chemicals.

In other words, the desire to normalise the appropriation of genetic resources located in diverse spaces was part of an overall strategy in the formulation of governance at a distance mechanism and it is clearly evident in the statement I have highlighted above that the aim of this globally binding legal document is to govern appropriation in areas beyond territorial borders. The intention to involve global bio-tech actors in this governance initiative was clearly revealed at the drafting stage. This intention becomes clear from the emphasis placed on modern biotechnology’s ability to alter the economic value of genetic resources; and the fact that this evaluation and alteration should be funded by transnational enterprises that generate profit from the use of biotechnology, specifically, from the production and marketing of transgenic

technologies or crops. This attempt to introduce a facilitating mechanism for the appropriation and commercialisation of bio-genetic resources aligns very well with the 'business in and with biodiversity' approach adopted by bio-tech industries. In response, the bio-tech industry reacted proactively and began to expand its bio-economic activities into disparate locations either directly by participating in public or public/private biotechnology programmes, or by moving their proprietary bio-technologies to public and private bio-tech institutions in developing countries.

The CBD, therefore, embraced and accommodated the mission of the global bio-tech industry to expand its desire to appropriate throughout the globe; and this has happened through an ideological alignment of 'market-based paradigm of environmental management' (McAfee 2003, p 210), most apparently visible in the access to bio-genetic resources and sharing of profits from their commercialisation (Article 1). Here then we find the manifestation that the Convention encouraged the bio-tech industry to commercialise bio-genetic resources. More importantly, this commercialisation has not only acquired legitimacy through a global legal instrument, but it was a part of the overall strategy of global governance. To understand the significance of this shift and the coordination between the desire to appropriate and expand that underlie the 'governance at a distance' mechanism, we need to look more closely into some of the provisions of the Convention. The Convention recognises the economic and scientific value of biological diversity and its components (Preamble) and defines biological resources 'as the natural stock of genetic material within an ecosystem' (Heller and Escobar 2003, p 157) that have actual or potential value (Article 2). Acknowledging the loss of biological diversity because of unsustainable use or appropriation, the Preamble further recommends the development of scientific, technical and institutional measures for its protection. In other words, the Convention expressed concern regarding unsustainable appropriation, but as pointed out above, this concern is mainly with insufficient or complete absence of governance mechanism that would govern the appropriation of bio-genetic resources. Said differently, unsustainable appropriation of bio-genetic resources has been defined as a problem of non-existent or inadequate regulation, which demands a new governance mechanism. Thus, regulation of appropriation becomes an issue of governance.

Accordingly, the access and utilisation of bio-genetic resources have been transferred from the realm of 'common heritage' to the boundaries of sovereign jurisdiction. Recognising the sovereign states' right to exploit their bio-genetic resources, the Convention mandates that contracting parties shall develop national strategies, plans and programmes for sustainable access and utilisation (Articles 3 and 6). This shift in understanding is intriguing because the principle of national sovereignty has been deployed to invite nation-states to efficiently map, monitor and create a juridical condition that will enable the security of possession necessary for contractual relations involving its exploitation (Coombe 2003, p 283). More importantly, this legitimisation of the right to exploit by nation-states suggests that appropriation or exploitation of bio-genetic resources should be carried out according to the norms of law. Put differently, as a form of rational intervention, a framework of law should be deployed to arrange, shape, support and expand the spaces of appropriative or exploitative activities. Hence, appropriation becomes sustainable once it is channelled through the governing mechanisms of the state. Consequently, the emphasis on normalising appropriation through the regulatory apparatus of the state has animated in the text of the Convention in a curious rhythm (Deleuze and Guattari 1980/2004, p 469). Not surprisingly, then, the authority to normalise appropriation rests with the state and is subject to states' legislative, institutional and economic policies. However, such legislative measures must not impose undue restrictions on access; rather, they should create conditions to facilitate appropriation and exploitation by other contracting parties. These conditions may include further development of such bio-genetic resources through biotechnological research and such research might be carried out within the territory and with the full participation of the resource provider. In addition, such legislative measures must establish a mechanism, which will enable the providing country or community to secure a 'fair and equitable' share of the benefits arising from the commercial utilisation of such research and development, either by way of monetary compensation, or through transfer of biotechnological processes and products that have been developed. And if such biotechnologies are commercialised and protected by patents, then the transfer of such technologies must be carried out according to international and domestic intellectual property norms (Articles 15, 16, 19 and 20).

Taken together, these provisions suggest that the essential function of governance mechanism prescribed by the CBD is to establish an 'apparatus of security' that will ensure the circulation and movement of bio-genetic resources from fields to laboratories and then from the laboratory to fields and other laboratories in disparate locations of the globe, either in the form of raw materials, or in the form patented biological objects. And these activities should be carried out through 'benefit sharing' arrangements – a pseudo-legal concept designed to compensate communities and nation-states for the shift of resources as well as ownership rights to bio-tech industries (Peterson 2001, p 78).[133] But, as McAfee points out, the equation of benefits with genetic resources represents an instrumentalist economic paradigm. It reduces bio-genetic resources into commodities that must be privatised and traded before benefits can be shared, and therefore, intellectual property rights to genetic information are the conceptual cornerstone of proposals for the allocation of 'biodiversity benefits' under the CBD (McAfee 1999, pp 144-145). In other words, the Convention as a governance mechanism is designed to arrange the field of action for bio-tech industries and in so doing, it has normalised the movement of desire in all its hidden forms. As Parry observes, both the CBD and its more contemporary counterpart, the OECD bioeconomy policy agenda, intend to create an ostensibly 'normative' framework within which the intensive biotechnological exploitation of bio-genetic resources might be facilitated under the legitimising rubric of 'sustainable development' (Parry 2007, p 388).

[133] While the concept of 'benefit sharing' is well intentioned, Parry argues that such arrangements are not always successful for a variety of complex reasons. For instance, compensation is usually disbursed in three phases: small amount at the time of collection, then for infrastructure development necessary for collection and finally, royalties which typically consist of one or two per cent of all net profit generated from the commercialisation of products derived from the collected genetic resources. Moreover, compensations are paid when the resource remain in biological form and once it is transformed into informational or artifactual forms, the compensatory paradigm collapse (Parry 2006, pp 29-30). Further, Pottage observes, there is 'too much' ownership in the Convention, in the sense that on the one hand, the Convention recognises the ownership rights of communities and nation states over their bio-genetic resources, and on the other, there is a 'legal-economic representation of the axis of natural products innovation, which imagines the progressive reduction of natural structures to properties and properties to industrial functions'. Hence, 'ownership narratives continue to proliferate around genetic resources' (Pottage 2006b, p 151).

It has already become clear how the CBD has normalised the desire to appropriate or, to reiterate Canguilhem's argument, it becomes easy to understand how the normalisation of appropriative activities is related to the juridical order. However, the CBD is a 'governance at a distance' mechanism which, as emphasised above, is designed not only to shape and govern the activities of others in dispersed locations, but also to mediate the movement of desire. Thus, while the CBD operates and governs at a distance, it overcomes distance by specifying actions and practices, which the distant other needs to follow and adopt. The point is that the Convention is aimed at normalising appropriation through domestic legal arrangements so that appropriative activities can be carried out in disparate locations with the support of state apparatuses. From this point of view, it can be argued that the CBD as a global governance mechanism becomes 'the capitalist axiomatic' – it is capable of instrumentalising the state apparatuses and make them operational to expand the capitalist logic of the bioeconomy, and consequently, it 'organizes its Third World' (Deleuze and Guattari 1980/2004, p 482). Consider, for example, the Indian Biological Diversity Act 2002. The Act not only reaffirms the sovereign rights of the Indian State over its bio-genetic resources, but also reproduces the rhetorical virtue of the 'global', that is, to normalise appropriation through legal norms, in a locally binding document. For instance, the Act states that plants, animals, micro-organisms and their genetic materials with actual or potential value should be collected and extracted for commercial utilisation, and such utilisation includes the use of genes for improving crops and livestock through biotechnological intervention (Section 2). However, the access to bio-genetic resources, their transfer for research and development, and commercial utilisation of such research is subject to prior application, approval and permission of the NBA and the State Biodiversity Board (Sections 3, 4, 7, 19 and 20).[134] Such permission and approval must ensure the equitable sharing of benefits arising from the access and commercial utilisation (including any inventions and patents) of bio-genetic resources, either in the form of joint ownership of intellectual property rights, technology transfer, setting up venture capital fund, or monetary compensation and other non-monetary benefits (Sections 6

[134] But these requirements are not applicable to collaborative research projects between institutions from India and other countries, if such collaborative projects are approved by and conform to the policy guidelines of the Central Government (Section 5).

and 21). Given that the production of Bt. brinjal started in 2002 and radical changes were made in the Patent Act in the same year, the inclusion of these provisions in the Biological Diversity Act is not surprising. Rather, the Act implicitly recognises the propertisation and commercialisation of 'new inventions' or new biologicals (such as transgenic crops) produced through the access and utilisation of bio-genetic resources by global/local bio-tech corporations. The Act, therefore, embraced and accommodated the desire to normalise appropriation in a local legislation.

What is significant here is that this desire moves through the regulatory apparatus of the state, which is not only designed to capture whatever it can, all that is possible, but also mimics the global legal mechanism (Deleuze and Guattari 1980/2004, p 482). The CBD is thus having a spatial co-existence, it is concerned with the simultaneous exploitation of different territories and therefore, it is inseparable from a process of relative deterritorialisation (ibid., pp 486-487). Consequently, 'the law in its entirety undergoes a mutation…because the State apparatus is faced with a new task, which consists less in overcoding already coded flows than in *organizing conjunctions of already decoded flows as such*' (ibid., p 498; original emphasis). Hence, the CBD performs two operations: on the one hand, it has normalised the desire to appropriate through legal norms; and on the other, by directing nation-states to accommodate normalisation through domestic legal arrangements, it has expanded, deterritorialised and spatialised the desire to normalise. These two-way operation, is what Deleuze/Guattari call an 'apparatus of capture' because it consists in capturing while simultaneously constituting a right to capture (ibid., p 495).

4.6: Conclusion

In this chapter, my main aim was to show how the spaces of bio-economic production expand. Borrowing insights from Deleuze/Guattari and Canguilhem, the chapter observes that this expansion occurs through the desire to normalise appropriation through legal norms. Thus, my focus was on how does the desire to normalise move; and how its movement was mediated by law. The desire to normalise, I have argued, moves through global/local governance mechanisms, such

as the CBD and the Biological Diversity Act – two component parts of the machine. To demonstrate this understanding, first, I have discussed Foucault's analytic of 'governmentality' in detail and highlighted Foucault's crucial observation that governance is an 'economic-juridical' ensemble that operates as a mechanism of security. The essential function of governance is to normalise movement and in so doing, it expands the market space. Its operation, however, depends on juridical institution or a framework of law because the law shapes and governs economic activities. Since governance normalises movement and expands the spaces of the market, it has spatial dimension. Taken together, I have suggested that we need to understand how does the desire to normalise move and expand through governance mechanisms or a framework of law because the bioeconomy intends to expand the spaces of bio-economic production. Thus, by deploying the analytic 'governance at a distance', I have shown that the CBD is a complex ordering mechanism devised to govern and normalise the appropriation of bio-genetic resources situated in dispersed sites. The CBD, in other words, normalised the desire to appropriate. In particular, I have located this desire to normalise in India's Biological Diversity Act. Hence, by mediating the movement of desire to a distant location, the CBD has deterritorialised or spatialised the desire to normalise. From this viewpoint, the CBD has a spatial existence because it has expanded the spaces of bio-economic production by normalising the desire to appropriate through a seamless web between the global and the local. Accordingly, the bioeconomy becomes dispersed and deterritorialised; it expands ceaselessly in all directions through the expansion of governance. This in turn suggests that expansion, normalisation and spatialisation are relative and take place simultaneously.

CHAPTER 5

Mapping the Spaces of Power: Knowledge, Transformation and the Condition of Possibility

'…in all events a *will to power* is operating.'

Friedrich Nietzsche[135]

'… space is fundamental in any exercise of power.'

Michel Foucault[136]

'Desire is power; power is desire'.

Felix Guattari[137]

5.1: Introduction

In chapter 3, I have discussed the deterritorialisation of the Euro-American idea of materiality and its reterritorialisation in a distant location. My focus was on de/re-territorialising flows of desire, especially how the desire to propertise Bt. brinjal and its future progeny established connections between disparate elements and in so doing, brought into existence an emergent space of property. In chapter 4, I have shown another dimension of this de/re-territorialisation, which was concerned with revealing how the desire to normalise appropriation, capture the economic value, and expand the spaces of bio-economic production are operating through governance mechanisms. Thus, I have argued that it is the desire to capture and expand that normalised appropriation, and this normalisation takes place through the expansion or de/re-territorialisation of governance. As indicated in the Introduction, for Deleuze, an assemblage of desire will include power arrangements but these must be located among the different components of the assemblage (Deleuze 2001/2007, p 125). This chapter, therefore, describes how 'power' or 'differential force relations' (Deleuze 1986/1988, p 75) operate or move through different components in the bioeconomy. It is necessary to emphasise, however, that Deleuze/Guattari understood power in terms of desire – an essential part of the infrastructure that 'consists in reducing the multiplicities of desire into a single undifferentiated flux' (Guattari 1975, p 85). These differential force relations, therefore, need to be viewed as 'differential relations of desire'.

[135] Nietzsche 1887/1966, p 78 (original emphasis).
[136] Foucault 2002, p 361.
[137] Guattari 2009, p 286.

ESG's contestation of unauthorised appropriation through the 'discourse of biopiracy' brings into view the operation of differential power/desire relations in the bioeconomy.[138] It is well-known that Foucault dealt with power relations in detail in his works: how power operates through relations, how it unfolds in heterogeneous spaces, and how it moves through legal norms and institutions. Another important aspect of Foucault's analysis of power is that power always elicits acts of resistance. In the next section, therefore, I discuss in detail how Foucault theorised these relations. Against this background, I examine the operation of power in global/local intellectual property regimes and evaluate how this operation is analysed in the contemporary literature on intellectual property law. A number of scholars have analysed critically how the global intellectual property regime, brought into existence by the TRIPs Agreement, becomes a vehicle of power and domination (Whitt 1998; Arup 2000; Shiva 2000; Drahos and Braithwaite 2002; Lander 2006; Mattei and Nader 2008). Yet, these analyses remain within the self-imposed limit of documenting the global/local power relationship, and the imperialist or neo-colonial tendency of global intellectual property regime. Put differently, these scholars situate their analyses and investigation of power and domination within a centre/periphery framework. I argue that this top-down approach leaves out the mediated relationality of power, in the sense that it provides little understanding of arrangements, interactions, connections and mediations through which power unfolds in heterogeneous spaces. Thus, rather than treating global intellectual property law or the WTO-TRIPs as an instrument of power and domination, we need to view the TRIPs regime as a space of power/knowledge, which expands in every direction through interaction and mediation between heterogeneous entities. To substantiate this argument, I discuss how two institutions – DST and DBT integrated, mediated and accommodated the TRIPs regime in a distant location and in so doing, expanded the space of power/knowledge. And this expansion and spatialisation through deterritorialisation becomes clear once we look into ESG's contestation through the discourse of biopiracy. Elaborating on Foucault's analysis, Deleuze points out that different forces co-exist in relation or in opposition to each other and these forces

[138] In this chapter, I use the concepts of 'power' and 'desire' interchangeably because for Deleuze, 'power is an affection of desire' (Deleuze 2001/2007, p 125).

express themselves in different manifestations in any given encounter (Deleuze 1986/1988, p 70). Thus, following Deleuze, I argue that ESG's contestation should not be viewed as merely an opposition to unauthorised appropriation, but rather a 'differential power/desire'. In other words, ESG's contestation is an encounter, an effect because it emerged in opposition to the desire to expand the spaces of power/knowledge. I demonstrate this understanding by discussing how ESG has mobilised its contention, demands and claims through heterogeneous spaces. The chapter concludes by arguing that as a differential power/desire, ESG's contestation has the potential to become different. However, by invoking legal mechanisms that have normalised appropriation, the ESG itself becomes a part of the infrastructure.

5.2: Power and Multiplicity

'Power' remains a recurrent theme in Michel Foucault's thought. He has analysed power in relational terms as it emerged through governmental techniques and practices.[139] In this regard, there are three important aspects in his analysis of power. First, he has emphasised the importance of space in understanding the operation of power. Second, he has pointed out that power and domination operate through legal norms and institutions. And third, he has argued that power always elicits acts of resistance. I discuss these three aspects in detail because his insights are important resources for thinking about how differential relations of power/desire emerge or unfold in the bioeconomy through interactions and mediation between heterogeneous entities, such as the WTO-TRIPs, DST, DBT and ESG.

As discussed in Chapter 4, government is an art of rational management which, according to Foucault, is not repressive and dominating, but rather involves techniques and mechanisms of governing relations composed of men and things. However, what remains hidden in these techniques and mechanisms is the operation of power. Indeed, Foucault intends to 'investigate what might be most hidden in the relations of power; to anchor them in the economic infrastructures; to trace them not

[139] Foucault has explicitly pointed this out in his 1977-1978 lectures *Security, Territory, Population* (2004/2007, pp 108 and 247-248) and in 1978-1979 lectures *The Birth of Biopolitics* (2004/2008, pp 131, 276 and 304).

only in their governmental forms but also in the infra-governmental or para-governmental ones; to discover them in the material play' (Foucault 1988a, p 119). Thus, his focus is on the operation of power, and he asserts that this operation of power is most clearly visible in the relationship between individuals and institutions. Therefore, in his analysis of power, he focuses mainly on the effects of various institutions on individuals. For instance, Foucault never uses the word 'power' explicitly in his analysis of madness (Foucault 1961/1973). However, he points out later: 'in my analysis of madness or the prison, it seemed to me that the question at the centre of everything was: what is power? And, to be more specific: how is it exercised, what exactly happens when someone exercises power over another' (Foucault 1988c, pp 101-102 and 103). In *Discipline and Punish* (1975/1979), Foucault recounts the growth of disciplinary mechanisms in the eighteenth century – a new class of power that colonised the legal institution (ibid., p 231). Discipline, he observes, is a type of power and a modality for its exercise. It comprises of a whole set of instruments, techniques, procedures, levels of application and targets. It may be taken over either by specialised institutions or by institutions that use it as an essential instrument for a particular end. In short, power has infiltrated a multitude of institutions, and it is institutions that bring the effects of power to the most distant elements. And, for Foucault, disciplinary techniques are connected to economic, juridico-political and scientific institutions that assure the infinitesimal distribution of power relations (ibid., pp 215-216 and 218). Hence, he argues, power goes much deeper than one suspects; there are centres and invisible, little-known points of support and therefore, we must unmask the workings of institutions, which always exercise power obscurely (Chomsky and Foucault 1974/2006, p 41). Thus, he refuted the idea that power is something possessed and held by those in a position to control the desires and activities of others. Instead, he observes,

> 'Power must be analysed as something which circulates, or rather as something which only functions in the form of a chain. It is never localised here and there, never in anybody's hands, never appropriated as a commodity or piece of wealth. Power is employed and exercised through a net-like organisation' (Foucault 1980, p 98).

What is important here is that power is exercised through a net-like organisation; it is dispersed throughout society and the locations of power are multiple. Power is not located within particular institutions; rather, it circulates and assumes diverse forms. However, this does not mean that institutions are not important. Foucault understood power in relational terms and, for him, power is diffused rather than emanating from a particular location, or 'moving from above to below and from the centre to the periphery' (Foucault 1988a, p 119). He was more interested to understand how power is enacted in interactions. From this point of view, his focus was primarily not on institutions, but on interactions between individuals and institutions, and the way institutions exercise power upon individuals (Mills 2003, p 52).

It is also important to point out that for Foucault, 'space is fundamental in any exercise of power' (Foucault 1994/2000, p 361). He argues that from the nineteenth century on, a new thinking about space emerged, that extends far beyond the limits of urbanism and architecture. More specifically, with the emergence of new technologies (railroads and electricity) and new economic processes, one finds the birth of new problems – governing the relations between men and things spread over heterogeneous spaces. In other words, Foucault was interested to see how the spatial distribution of the exercise of power plunged into the field of social relations that brought about some specific effects (ibid., p 362). Thus, in *Madness and Civilization* (1961/1973) Foucault reveals the emergence of various spaces of confinement (workhouses, asylums, mental hospitals, prisons) that segregated certain categories of people (lunatics, insane and mentally ill) and sociospatially excluded them from the normal sites of interaction in society. In *The Birth of the Clinic* (1963/1973), he not only begins with the remark that 'this book is about space' (ibid., p ix), but further observes that 'for us, the human body defines, by natural right, the space of origin and of distribution of disease: a space whose lines, volumes, surfaces, and routes are laid down, in accordance with a now familiar geometry, by the anatomical atlas' (ibid., p 1). In short, he was concerned with anatomical space and the spatialisation of disease and medical knowledge. Similarly, he uses a number of spatial metaphors in *The Order of Things* (1966/1970) and one finds a vivid description of the spatialisation of knowledge in the seventeenth century (Foucault 1994/2000, p 362). In *Discipline and Punish* (1975/1979) Foucault, the new

cartographer, shows how power is exercised, how it controls the body and operates in carceral spaces. He made us aware that discipline 'is a type of power, a technology, that traverses every kind of apparatus or institution, linking them, prolonging them, and making them converge and function in a new way' (Deleuze 1986/1988, p 26). In brief, Foucault draws up a new topology of power in which power no longer resides in a privileged place; but rather, it is simply operational and diffused, it traverses and passes through disparate spaces and coextensive with the whole social field.[140] In other words, he was interested to analyse the mechanisms of power and in so doing, he focused on questions pertaining to how power operates, circulates, and traverses through various institutional spaces. Thus, he writes 'a whole history remains to be written of *spaces* – which would at the same time be the history of *powers*' (Foucault 1980, p 149; original emphasis).

Foucault saw power as productive, widely distributed and dispersed in a multitude of forms. He argues that a society is not a unitary body in which one power and one power only exercises itself. Rather, a society is an archipelago of powers and the forms of power are heterogeneous. There is a juxtaposition, coordination and liaising of different powers and therefore, we must speak of powers and try to localise them in their historical and geographical specificity (Foucault 1981-82/2007, p 156). In this sense, for Foucault, 'power is co-extensive with the whole social body' (Foucault 1980, p 142), 'it acts…over the whole surface of the social field according to a system of relays, modes of connections, transmission, and distribution' (Foucault 1979, p 59). We find a fairly detailed elaboration of these arguments in the first volume of *The History of Sexuality* (1976/1998). In the chapter titled 'Method', he categorically argues,

> 'It seems to me that power must be understood in the first instance as the multiplicity of force relations immanent in the sphere in which they operate… and lastly, as the strategies in which they take effect, whose general design or institutional crystallization is embodied in the state apparatus, in the formulation of the law, in

[140] Even an unapologetic critic such as Jean Baudrillard acknowledges that 'this time we are in a full universe, a space radiating with power but also cracked, like a shattered windshield still holding together. …The reference of power, which has a long history, is discussed again today by Foucault at the level of dispersed, interstitial power as a grid of bodies and of the ramiform pattern of control' (Baudrillard 1977/2007, pp 48-49).

> the various social hegemonies. Power's condition of possibility, or in any case the viewpoint which permits one to understand its exercise, even in its more "peripheral" effects…is the moving substrate of force relations which, by virtue of their inequality, constantly engender states of power, but the latter are always local and unstable.…Power is everywhere; not because it embraces everything, but because it comes from everywhere (ibid., pp 92-93).

Thus, for Foucault, power has no centre; rather it has infinitesimal mechanisms, techniques, and tactics, which are invested in numerous institutions. The integration of these practices and mechanisms, and their interconnections delineate the general conditions of domination. By domination, Foucault means multiple forms of domination that can be exercised in a society and, for him, the system of right (laws, apparatuses, institutions, rules) and the judiciary are permanent vehicles for relations of domination, and for polymorphous techniques of subjugation. Foucault articulates this argument more explicitly; as he puts it, 'the system of right, the domain of the law, is permanent agents of these relations of domination, these polymorphous techniques of subjugation' (Foucault 1980, p 96). Hence, we can say, adapting Foucault, that power 'has become one with the law'; the law is not the principle or inner rule of power. It is the outside that envelops power; law is the shadow through which power advances and law itself is a shadow of the advancing power (Foucault 1986/1987, pp 34, 35 and 38). However, for Foucault, power or domination always elicits acts of resistance. As he writes, 'where there is power, there is resistance' or 'there are no relations of power without resistances' (Foucault 1976/1998, p 95; Foucault 1980, p 142). What is important is that Foucault understood resistance not as the negation of power, but rather as productive – a counter-power that opposes dispersed techniques, mechanisms and practices (Foucault 1975/1979, p 219; Foucault 1980, p 56). In this sense, for Foucault as well as for Deleuze/Guattari, differential relations of power/desire operate in society, which become visible in encounters, interactions, and mediation between heterogeneous entities. What we need to show, then, is how power/desire relations are organised in the infrastructure, that is, to trace their movements and reveal their differential forms. Thus, in the rest of the chapter, I discuss how power/desire operates and moves through the global intellectual property regime, such as the WTO-TRIPs, and how this operation is

mediated, accommodated and expanded by other institutions, such as the DST and the DBT, and finally, ESG's desire to contest the power/knowledge regime through the discourse of biopiracy.

5.3: Spaces of Power I: WTO-TRIPs

For Foucault, 'power in its exercise goes much further' than the state and thus, an exclusive focus on state power overlooks 'all the mechanisms and effects of power which don't pass directly via the state apparatus, yet often sustain the State more effectively than its own institutions, enlarging and maximising its effectiveness' (Foucault 1980, pp 72-73). Hence, he suggests that 'one cannot confine oneself to analysing the state apparatus alone if one wants to grasp the mechanisms of power in their detail and complexity' (ibid., p 72). This observation becomes apparent if we examine closely the WTO-TRIPs Agreement which, according to some scholars, has destabilised and shifted the locus of power (Sell 1999 and 2002; Dutfield 2003; May and Sell 2006). Their argument is that power has shifted from its organisational centre of the state to a global institution which, on the one hand, becomes a vehicle of power and domination and on the other, influences, sustains and maximises the effectiveness of state's institutions. In this section, I will mainly dwell upon how a global institution becomes an instrument of power and domination, and in the next section, I will focus on how this power is influencing and sustaining the effectiveness of state's institutions in a distant location.

In Chapter 3, I have described the process of deterritorialisation/reterritorialisation of global intellectual property law through movement, interaction and mediation. In particular, I have shown how the Euro-American idea of materiality has moved to a distant location through global intellectual property regime or the TRIPs Agreement. Further, I have highlighted a number of critical observations made by scholars, which point out that by moving intellectual property norms and practices developed in Euro-American jurisdictions to dispersed locations of the globe, the TRIPs regime has expanded the economic interests, dominance and power of developed countries and their corporations. So power and domination move, operate and function through

global institutions and legal practices, such as the WTO or global intellectual property norms. Or, we can say that since power is dispersed and heteromorphous, it is adapted, re-inforced and transformed by global strategies to form global domination (Foucault 1980, p 142). Said differently, for Foucault, law as tactics of exercising power is a subset of a global strategy or is a part of an apparatus (*dispositif*) and hence, law becomes a vehicle of domination or, becomes a part of the polymorphous techniques of subjugation.[141] The TRIPs Agreement, therefore, functions as an operating mechanism, it integrates the power of developed countries and their corporations, and it organises the field for power and domination to operate.

A number of scholars have elaborated on this operation of power and domination through global intellectual property regime. For instance, Arup points out that the TRIPs Agreement demands member countries to adopt trade-friendly approaches to intellectual property protection and in so doing, the agreement shows the tendency to enhance global market power (Arup 2000, p 41). Global intellectual property law, in this view, becomes a source of market power that enables the technology-rich global corporations to profit from monopolistic market price. But this understanding leaves out what Hilgartner defines as 'configuration power', that is, the 'ability to influence how technologies are intertwined with the social world' (Hilgartner 2009, p 212). He argues that rather than only conveying market power, intellectual property rights also convey power that can be exerted in negotiations, which shape technological artefacts, infrastructures, or systems (ibid.). In other words, in addition to market power, intellectual property rights yield power to shape decision making, such as setting conditions for transferring technologies protected by intellectual property rights. Thus, he observes, power 'radiate[s] outward from the invention itself to encompass a variety of decisions aimed at shaping the terms under which the invention is intertwined with broader' (ibid., p 213) economic, techno-scientific and legal orders, including technology transfer, foreign direct investment, and changing

[141] Here, I have borrowed my understanding from Rabinow. He points out that 'a tactic, apparently, is a subset of a strategy' (Rabinow 2003, p 52). I am not very convinced with Jacques de Ville's proposition that Foucault understood law in the broadest sense to include apparatuses, institutions and rules. I agree with him that we need to see how law becomes a vehicle of domination (de Ville 2011, p 214), but in my view, for Foucault, law as tactics of governmental intervention (I have emphasised this point in chapter 4) is a subset of a strategy and therefore, an ensemble of 'apparatus' – an assemblage of heterogeneous elements (Foucault 1980, p 194).

local legislations to grant patents over new biologicals. Put otherwise, intellectual property law can serve as a vehicle for asserting domination over the social and economic relations surrounding it (ibid.). This is because 'information and knowledge constitute the building blocks of culture, industry, and science' (Haunss and Shadlen 2009, p 1), and legal norms that govern the access to knowledge and information have tremendous influence on how the actors can access knowledge-intensive products, such as seeds, which affects food security and poverty reduction strategies. Thus, intellectual property law affects the trajectories of global technological and economic development and diffusion (ibid.). In this scenario, global intellectual property law making as a collective decision was meant to consider and take into account different economic situations and social aspirations. However, by forcing developing countries with different socio-economic conditions to adopt a 'universal template', the TRIPs Agreement deprived these countries of their ability to tailor intellectual property systems to local conditions (Yu 2002, p 3). Even worse, this global legal instrument is a product of an epistemic community the dominant core of which, according to Braithwaite and Drahos, is comprised of transnational elites and their lawyers. These 'lawyers, by virtue of their technical knowledge, are a driving force in this epistemic community' (Braithwaite and Drahos 2000, p 75). As Mattei and Nader further elaborate, while power sometimes uses outright propaganda, professionalism proves more effective and therefore, at the international level, particular professional elites acquire the influence necessary to provide legitimacy to hegemonic power and to be sure, help in the construction of a legal consciousness coherent with imperialism (Mattei and Nader 2008, pp 82-83). For these elites, the TRIPs Agreement was a major step in the globalisation of standards of patents, trademarks and trade secrets (Drahos 2003). The IPC succeeded in getting most of what it wanted in the TRIPs Agreement, since their demands are reflected clearly in the final agreement (Sell 2002, p 97). And what this epistemic community demanded and promoted through the TRIPs is a 'maximalist rights-culture', which is based on the assumption that protection of intellectual property rights will automatically promote innovation, and in that process, the more rights the better (Boyle 2004, p 2).

Intellectual property rights, Drahos and Braithwaite argue, are government tools for regulating markets in information and therefore, the TRIPs entails more than global intellectual property protection. While for Drahos and Braithwaite, the TRIPs Agreement promotes 'information feudalism' – a source of private authority and power over informational resources (Drahos and Braithwaite 2002, pp 3 and 12); Shiva argues that intellectual property rights under the WTO are a tool for the recolonisation of the Third World by western powers (Shiva 2000, p 502). She further observes that TRIPs recognises private rights over the knowledge and creativity that take place in the scientific realm and in so doing, it promotes 'monocultures of the mind' (Shiva 1993), which displace, disqualify and deny other ways of knowing and the creativity of other cultures (Shiva 1998, p 15). This view has been reiterated by a number of other scholars. For instance, Whitt has used the term 'biocolonialism' to describe the extraction and commodification of bio-genetic resources from developing countries by modern bio-tech science that transforms them into intellectual properties, aided and abetted by the western legal system, most strikingly by intellectual property law. She argues that since modern intellectual property law treats technoscientific knowledge as inventive, original and innovative, it is sharply at odds with other knowledge systems and this division emphasises the power relations integral to western knowledge systems and legal concepts. Hence, law is a central factor in the knowledge/power equation (Whitt 1998, pp 33-34). In a similar vein, Lander argues, since the Eurocentric colonial assumption is that the only possible knowledge is Western industrial knowledge, all indigenous and rural knowledges and technologies involving the selection, combination, and preservation of diverse species are devalued by modern bio-tech science and intellectual property law (Lander 2006, pp 202-203). Likewise, Kuchler points out, 'the Eurocentrism of [modern intellectual property law] often devalues creative expressive forms which are produced collectively, intergenerationally, or in unfamiliar media, by those with non-European cultural traditions' (Kuchler 2004, p 235).

Taken together these observations suggest that modern science, bio-tech science in particular, and intellectual property law produced a linear and unitary vision of progress, creativity and knowledge production. This economistic and proprietary rationality underlying technoscientific progress and creativity, however, came with

capitalist or corporate science because 'the first step in the capitalisation of science is to secure knowledge as private property…Thus property in knowledge with potential economic value must be captured quickly to secure value from it' (Etzkowitz and Webster, 1995, p 482). Consequently, any creativity, invention and knowledge that do not meet the criteria of capitalist science or fall outside its rationality are treated as valueless, unscientific, and non-creative, and dismissed as traditional or primitive. As Watson-Verren and Turnbull put it,

> 'By and large, past cross-cultural work has taken Western "rationality" and "scientificity" as the bench mark criteria by which other culture's knowledges should be evaluated. So-called traditional knowledge systems of indigenous peoples have frequently been portrayed as closed, pragmatic, utilitarian, value laden, indexical, context dependent, and so on, implying that they cannot have the same authority and credibility as science because their localness restricts them to the social and cultural circumstances of their production. These were accounts of dichotomy where the great divide in knowledge systems coincided with the great divide between societies that are powerful and those that are not' (Watson-Verren and Turnbull 1995, pp 115-116).

In other words, it is science that draws the borderline between 'modern' or 'scientific' and 'primitive' or 'other' knowledge systems. So, in terms of modern science, traditional or indigenous knowledge[142] is a 'defeated knowledge' (Visvanathan 2005, p 90) or 'subjugated knowledge', in the sense that it has been disqualified as inadequate to meet the criteria of modern technoscience and as such, remains 'beneath the required level of cognition or scientificity' (Foucault 1980, p 82). 'Such a hierarchy or devaluation', Visvanathan argues, 'creates the possibility of the museumisation or appropriation of these knowledges' (Visvanathan 2005, p 91).

[142] The meaning of the term 'traditional or indigenous knowledge' is contestable because the tern 'traditional' or 'indigenous' has been used differently in different literature, contexts, countries and organisations to describe various communities situated in dispersed locations. As Devy points out, 'no single term can describe them with any degree of semantic assuredness, nor can any universal definition of an invented descriptive term stretch without fatigue beyond the margins of single nation or continent' (Devy 2009, p xi). In recent intellectual property rights literature, the terms 'traditional knowledge', 'indigenous knowledge' and 'local knowledge' have been used interchangeably. Stephen Brush has provided a broader definition of 'indigenous knowledge'. According to this definition, 'indigenous knowledge' 'refers to popular or folk knowledge that can be contrasted with formal and specialised knowledge that defines scientific, professional, and intellectual elites in both Western and non-Western societies. Broadly defined, indigenous knowledge is the systematic information that remains in the informal sector, usually unwritten and preserved in oral tradition rather than texts' (Brush 1996, p 4). Here, I have used the term to denote this broader meaning.

And, as I have pointed out above, law, specifically intellectual property law, is complicit in maintaining and managing this hierarchy because it only protects the knowledges produced my modern technoscience. Thus, as a boundary keeper, global intellectual property law legitimises the power and domination of developed countries and their technoscientific enterprise resulting in the further restructuring of global geographies of control and domination (Carolan 2007, pp 126 and 134). As Mattei and Nader observe, 'nobody would genetically modify seeds without guarantee that the legal system would help impose such technology on farmers world-wide, forcing them to abandon communitarian practices of seed sharing and swapping' (Mattei and Nader 2008, p 84). The global legitimacy of intellectual property rights over 'new biologicals' propagated by the WTO-TRIPs, therefore, formalises the disparity of wealth and power that technology yields, and serves the needs of powerful corporate actors (ibid.). And an important corollary to this is that 'by coding certain outcomes and practices as legal and others not', global intellectual property law restructures the relationship between developed and developing countries (May 2002, p 138). Thus, how 'law shapes power and power shapes law' (Halliday 2009, p 266) is crucial in understanding the materiality of power in law and its operation through global legal mechanism, such as the TRIPs Agreement.

Literature discussed above clearly shows that global intellectual property law becomes a vehicle of power and domination, or how power and domination operate through global intellectual property regime. Moreover, it is also evident how global intellectual property law becomes a target of powerful actors, where that influence comes from, and how the TRIPs Agreement expanded or deterritorialised the power and domination of developed countries and their corporations to dispersed locations. Nevertheless, an important slippage persists in these accounts because these literatures present a binary or centred view of power, one which tends to assume that global institutions or global intellectual property law embody a rational-legal authority that channels power in particular directions (Barnett and Finnemore 1999, p 669) – from centre to the periphery, from global to the local. This is an easy template, as Allen points out, for understanding the location, whereabouts, and reach of power, or sheer concentration of capabilities in big corporations or global institutions, and is far from unique. In this somewhat exaggerated view, he further

argues, ‘power is perhaps portrayed rather unthinkingly as something which radiates out from an identifiable central point, with a reach that appears almost effortless’ (Allen 2004, p 19). Therefore, we should no longer simply assume that expansion, distribution and reach of power across distances is effortless because reach, distance, proximity and presence are not straightforward givens, they involve a topological mix of distanciated and proximate actions (Allen 2009, p 198). The argument, then, is that an analysis which simply narrates the spatially-centred notion of power and its effortless expansion to dispersed locations through global institutions or legal mechanisms is contrary to a Foucaultian understanding of power, which emphasises the unfolding of power in heterogeneous spaces through relations, interactions and connections. Hence, a top-down approach to spatiality of power inevitably runs the risk of leaving out the mediated relationality of power and in doing so, it provides little understanding of connections, interactions and relations between heterogeneous entities through which power moves and unfolds in heterogeneous spaces.

This means that we need to move our attention not only towards heterogeneous entities, but also towards mediated relations, symbiosis and alliances between them. What this argument suggests is that rather than treating global intellectual property law as simply an instrument or vehicle of power and domination, the TRIPs regime should be viewed as a space of power/knowledge, in which a very specific form of knowledge becomes global. A ‘knowledge space’, Turnbull argues, emerges from the collective work of knowledge producers. To move knowledge from its site of production to other places, producers deploy a variety of strategies and in so doing, establish connections between otherwise heterogeneous actors (Turnbull 1997, p 553). In this sense, the space of knowledge that the TRIPs regime protects and expands to dispersed locations of the globe is the knowledge space of Euro-American jurisdictions, and its dispersal is achieved by deploying a specific legal strategy (Euro-American intellectual property law) that defines this knowledge space as superior and universal. Thus, by globalising and enforcing a Euro-American framework of knowledge/property developed in a very specific geopolitical milieu, the TRIPs regime promotes a certain way of seeing, knowing and understanding the world, while delegitimising or subsuming others (Wright 2005, p 907). And when knowledge is defined and analysed in terms of region, domain, displacement and

transposition ‘one is able to capture the process by which knowledge functions as a form of power and disseminates the effects of power’ (Foucault 1980, p 69).

The TRIPs regime, therefore, becomes a space of power/knowledge, which is not only shaped by Euro-American framework of knowledge, but also provides mechanisms for evaluating knowledges of other jurisdictions. Accordingly, in this space of power/knowledge, a very specific framework of knowledge becomes a point of reference, a framework of all places (Wright 2005, p 906), which effectively manifests the power of developed countries and their corporations. But transforming a specific knowledge space into a space of knowledge/power and its expansion, and making its presence felt in dispersed locations of the globe was not a straight forward process and certainly, not an effortless extension of Euro-American power/knowledge over a flat surface. Rather, it was an outcome of extensive and intensive negotiations, lobbying, forming committees, building coalitions and alliances, and drawing developing country actors through persuasion, coercion or pressure spanning over eight years. In other words, as Wright points out, a space of power/knowledge

> ‘…becomes possible, among other things, due to the power of pro-IPR countries in the WTO, the changing discourses of “fairness” around global trade rules and effective lobbying strategies of business coalitions. It is, in short, the result of a will to power and a profound illustration of the power of defining a situated knowledge as global and anti-place’ (ibid.).

Thus, a space of power/knowledge that defies the global/local binary emerged through a collective effort of distanciated and proximate actors and actions and therefore, in the next section, I intend to show how this space of power/knowledge has expanded and made its presence felt in a distant location through connections and relations.

5.4: Spaces of Power II: DST and DBT

As discussed above, heterogeneous actors pushed hard to develop global intellectual property rights and to produce an operational space, which is not just global but extends to disparate locations of the globe. The expansion of the space of operation to a distant location, however, depends on local institutions organising the field for global intellectual property law to operate. Thus, institutions that organise the field in local settings are coterminous with the emergence of power/knowledge regime. But institutions are neither the sources of power, nor practices or operating mechanisms that explain what power is or who has power. Rather, institutions are the agents of stabilisation, integration, and actualisation (Deleuze 1986/1988, p 75). Hence, new spaces of power emerge through institutions that are acting on behalf of the state or other institutions. These new spaces are important sites for understanding how the power/knowledge regime has been accommodated, expanded and made its presence felt in a distant location. In Chapter 1, I have shown that the Bt. brinjal arises out of an assemblage of heterogeneous entities situated in disparate locations. The initial funding for this collaborative relationship came from the DBT – a regulatory institution functions under MST, Government of India. The DBT agreed to fund the collaboration after a proposal was submitted by the ABSP II Project to promote biotechnologies (Monsanto's Bt. gene) to produce insect resistant or tolerant brinjal plant in India. The arrival of DBT and utilisation of Monsanto's proprietary Bt. gene in the production of Bt. brinjal suggest that influence comes from specific location and more importantly, action is overtaken by or distributed to others.

I would like to focus my investigation on two institutions – the DST and the DBT that have organised the field for power to operate. The DST was established in 1971, with the objective of promoting new areas of science and technology, and to function as a nodal institution for organising, coordinating and promoting science and technology activities in India. It is responsible for specific projects and programmes, including the formulation of policies relating to science and technology with special emphasis on the promotion of new and emerging areas. The DST also coordinates the activities of other departments working under its aegis.[143] Further, it provides support to basic and applied research, and financially sponsors scientific and

[143] http://dst.gov.in/about_us/intro_DST.htm

technological research and development. In addition, commercialisation of technology, fostering international cooperation in science and technology, and supporting technology entrepreneurship are the activities that fall within its mandate.[144] In the Science and Technology Policy 2003, a DST policy document, the President of India (then Dr A P J Abdul Kalam) states,

> 'Basically we have come a long way since our independence, from mere buyers of technology to those of who have made science and technology as an important contributor for national development and societal transformation. In a world where powers are determined by their share of the world's knowledge, reflected by patents, papers and so on, the WTO starts to play a crucial role in the economic development. It is important for India to put all her acts together to become a continuous innovator and creator of science and technology intensive products' (DST 2003).

To make this vision a reality, the Policy Document further states that India's science and technology system has to be infused with new vitality, and to meet present needs in the era of globalisation, India needs 'to encourage research and innovation in areas of relevance for the economy and society, particularly by promoting close and productive interaction between private and public institutions in science and technology' (ibid.). The Document recognises the importance of knowledge as a source of economic might and power and therefore, special importance was placed on information technology, biotechnology and material sciences and technologies. In this direction, further emphasis was placed on transforming new knowledges into commercial successes for achieving high economic growth and global competitiveness (ibid.). Towards this end, the Policy document proposed to establish an intellectual property rights (IPR) regime which would provide full protection of intellectual properties generated from research and development. The regime would also provide a strong, supportive and comprehensive policy environment, and further, intellectual property legislations would ensure maximum incentives for individual inventors, scientific and technological communities (ibid.). The Policy Document notes that intellectual property rights have to be viewed not as a distinct domain, but rather 'as an effective policy instrument that would be relevant to wide

[144] http://dst.gov.in/about_us/mandate_DST.htm

ranging socio-economic, technological and political concepts' (ibid.). More interestingly, while the Document is critical about the propertisation of collective knowledge of societies for commercial profit of a few and keen to protect traditional knowledge systems through national policies and international actions; its plan to document, evaluate, further develop and harness traditional knowledge of natural resources and biodiversity for the purposes of wealth creation somehow contradicts its critical ethos.

In a more recent Policy Document, the DST invigorated this vision to position India among the top five global scientific powers by 2020 (DST 2013). The Science, Technology and Innovation Policy 2013 points out that economic investment in scientific research generates knowledge, and innovation converts knowledge into wealth and/or value. In the sense, science, technology and innovation exist separately in disconnected spaces and it is their integration that leads to new value creation (ibid.). The aim of this recent policy guidance, therefore, is to attract investment in science, science-led technology and innovation to produce economic wealth. Towards this end, the policy guidance puts emphasis on changing the mindset and value systems to recognise, respect and reward performances which create wealth from science and technology derived knowledge (ibid.). And this recognition and reward through the intellectual property rights system is not entirely an innovative idea because a Patent Facilitating Centre (PFC) was set up by the DST in 1995. The PFC was created to keep track on new developments and issues in the area of IPR and make them known to policy makers. It also organises awareness workshops relating to patents and provides patent facilities to scientists and technologists in the country. It becomes clear, after visiting its web site, that PFC brought a new dimension in the promotion of research and development programmes because for PFC, 'intellectual property protection plays a key role in gaining an advantageous position in the competitive technological game for achieving economic growth'.[145]

[145] http://pfc.org/in/abt.htm

However, what is interesting in these techno-economic discourses is that both documents reiterate the widely accepted understanding of knowledge as the source of economic wealth and power, reflected by intellectual property rights. Further, the 2003 policy document acknowledges the role of WTO in economic development and proposes to utilise traditional knowledge of natural resources and biodiversity for wealth generation. In other words, according to these policy documents, there is an intricate relationship between knowledge, power and intellectual property, and this insistence is a clear indication that the space of knowledge/power that emerged through the TRIPs regime has expanded and made its presence felt in a distant location. And this expansion and presence become more evident as I reflect on another institution – the DBT, which played an active role in the production of transgenic brinjal. As pointed out above, the DBT is a regulatory institution, which promotes research, development and innovation in the field of biotechnology. It was established for the benefit of society, entrepreneurs, trade and industry, and therefore, it funds and supports all Indian universities, research organisations, corporations or industries working in the field of biotechnology (FICCI 2015). For instance, the DBT provides fund to The National Institute of Plant Genome Research (NIPGR) – an autonomous institution started functioning in 1998. The Institute was established to undertake, promote and coordinate research in basic and applied plant molecular biology. To fulfil its objectives, the Institute utilises molecular biology approaches (such as tissue culture and genetic engineering) to identify important genes and manipulate these genes for producing transgenic plants with improved agronomic traits and stress resistance.[146] In recent times, the DBT has achieved significant growth in the area of agricultural biotechnology and established strategic partnership with many countries in the EU (FICCI 2015).

The DBT also formulates strategic policy and vision documents periodically. In a strategic document, announced recently, the DBT has pointed out that biotechnology has the potential to be a globally transformative intellectual enterprise (DBT 2014). It defines 'biotechnology' as the application of science and technology to living organisms as well as parts, products and models to alter living or non-living

[146] http://www.nipgr.res.in/about_us/institute.php

materials for the production of knowledge, goods and services. Therefore, the DBT's renewed mission is to provide impetus for new understanding of life processes, utilise the knowledge to produce biotech products and create a strong infrastructure for commercialisation to establish India as a world class bio-manufacturing hub in the emerging bioeconomy. To achieve this goal, the DBT proposes to launch a national mission on bioprospecting. And the aim of this mission is to facilitate bioprospecting of natural resources, its utilisation for developing new products, and explore global markets for these products. According to the DBT, these would be manufactured biomaterials are intellectual assets and therefore, a system of intellectual property rights must be in place to protect them (ibid.). What we notice here is that the DBT equally places strong emphasis on knowledge creation through modern biotechnology – a technoscientific enterprise that appropriates the biological potentiality of living organisms to manufacture new biologicals. And these newly produced biologicals are the symbol of technoscientific progress and economic wealth; they need to be protected through intellectual property rights because in the emerging bioeconomy, power is reflected by patents.

Here, DBT's emphasis on intellectual property rights is not surprising because Monsanto not only played an active role in the formulation of TRIPs Agreement, but it was also a corporate partner of the ABSP II Project and a collaborator with Mahyco in the production of Bt. brinjal, which involves its proprietary Bt. gene. However, given that collaborative relationships developed between heterogeneous entities in 2002 and 2003 to produce Bt. brinjal, with India preparing to implement the TRIPs Agreement in 2005, this emphasis on transforming bio-genetic resources into intellectual properties in policy documents from 2003 onwards is interesting. It emphasises the willingness of institutions to integrate the space of power/knowledge in a distant location. And this, in turn, highlights how these institutions became the agents of integration and prepared the field for power/knowledge regime to operate and expand, and brings into view the mediation, interaction and connection between heterogeneous entities. Yet this integration, accommodation and expansion of the space of power/knowledge in a distant location would not have been possible without the relative de/re-territorialisation of Euro-American intellectual property law by the TRIPs Agreement. From this point of view, de/re-territorialisation of the space of

power/knowledge established connections between global/local institutions situated in disparate locations – global/local spaces of power/knowledge co-function and operate in symbiosis. And this co-functioning of and symbiosis between de/re-territorialisation reveal the spatialisation of the power/knowledge regime. Put differently, space is fundamental in de/re-territorialisation because power, legal practices and norms move through heterogeneous spaces and in so moving, they create spatial relations. However, this spatialisation is not merely an outcome or the effect of de/re-territorialisation; rather, it brings into view movement, flow, alliance and co-functioning through which the spaces of power/knowledge integrate and emerge.

5.5: Transformative Spaces and the Condition of Possibility

In the preceding two sections, I have elaborated how the power/knowledge regime becomes deterritorialised through mediation, connections and interactions between heterogeneous entities. In particular, I have emphasised how the spaces of power/knowledge expand through global intellectual property norms, and co-functioning and co-presence of global/local institutions. In this section, I dwell on other spaces of power, specifically space(s) of counter-power. As Deleuze observes, 'alongside (or rather opposite) particular features of power which correspond to its relations, a diagram of forces presents particular features of resistance…' (Deleuze 1986/1988, p 89). Thus, I view ESG's contestation as a 'differential power/desire' because what remains enveloped in ESG's discourse of biopiracy is a desire to contest or oppose the expansion of the power/knowledge regime. This desire to contest comes into view once we look into how ESG has mobilised its contention through heterogeneous spaces. These spaces are effects that emerged in direct opposition to the power/knowledge regime promoted by the TRIPs Agreement and therefore, they are transformative spaces.

As detailed above, the emergent power/knowledge regime has devalued indigenous or traditional knowledges and technologies of farming and rural communities developed collectively and intergenerationally. In terms of this power/knowledge

regime, a very specific form of knowledge is creative, inventive and superior, and knowledge and technologies that fall outside this form are defined as unscientific and inferior. In so doing, this power/knowledge regime not only disseminates the power of Western technoscience and intellectual property law, but also promotes appropriation and propertisation of traditional knowledge and bio-genetic resources associated with it by the former, which civil society activists and subaltern actors have described as 'biopiracy'. According to Kloppenburg, 'biopiracy' as an appropriative activity has deep historical roots because corporations and countries of the North have realised enormous benefits by appropriating crop genetic resources and medicinal plants taken from peasant farmers and indigenous peoples without payments and with the justification that such materials are the "common heritage of mankind"' (Kloppenburg 2000, p 512). However, the appropriation of biological resources and their propertisation through modern intellectual property law by chemical and pharmaceutical industries of the North made developing countries increasingly aware of the value of bio-genetic resources located within their territorial borders. Thus, as pointed out in Chapter 4, the access, utilisation and propertisation of biological resources become a contentious issue during the negotiation process of the CBD. The developing countries were no longer willing to make their bio-genetic resources available to industrialised countries free of cost which meant that access to and utilisation of wild plants and germplasm of local varieties are subject to payments. This demand for payment or compensation culminated into the 'access and benefit sharing' provisions in the CBD, which states that access should be based on mutually agreed terms including a fair and equitable sharing of benefits arising from such access and utilisation (Article 15). Relying on this provision, a number of private and public-private 'bioprospecting' initiatives were formalised with countries in Africa, Asia and Latin America in the 1990s to explore and assess wild plants and indigenous genetic materials for commercially valuable biochemical properties (Oldham 2007, p 122). However, these initiatives become extremely controversial due to their exploitative, commoditising and commercialising nature, specifically through modern bio-tech science and intellectual property rights. Though the issues of corporate control and the growth of intellectual property rights over agricultural inputs, such as pesticides and seeds, were early on the agenda of activists working in the area of biodiversity conservation, in the 1990s this activism was extended into the wider domain of

biological diversity (ibid.). Thus, in a 1993 Communique, RAFI (now ETC) used the term 'biopiracy' to describe the patenting or ownership of indigenous knowledge and germplasm from the south without compensation (RAFI 1993). In subsequent years, the term became extremely popular in advocacy circles both in the North as well as the South and achieved a global dimension leading to powerful campaigns against biopiracy that prompted the revocation or withdrawal of a number of controversial patent claims, such as PNG patent, Basmati, Neem, and Turmeric Patents (for details, see Cunningham 1998; Shiva 1998).

Significantly, in their activism, advocacy groups have continuously highlighted the centrality of modern bio-technical science and intellectual property law in commoditising and propertising bio-genetic resources from the South and by doing so, drawn attention to power and domination associated with Euro-American cultural and legal forms. Hence, the power/knowledge constellation that systematically reproduces power and knowledge in new forms are resisted or subverted by social movements, which become, themselves, the site of important counter-discourses (Escobar 1993, p 56). Accordingly, the discourse of biopiracy, which from the 1990s onwards became extremely popular and polyvalent in activism against modern biotechnology and intellectual property law, needs to be viewed as a strategy adopted by advocacy groups to resist and destabilise the expansion of the power/knowledge regime. The biopiracy discourse, therefore, emerged as a 'counter-discourse' against the expansionist agendas, the unfair and inequitable access to and monopolisation of bio-genetic resources by global bio-tech corporations (Robinson 2010, p 43). It is, in short, emerged as a reaction or in opposition to dominant ideologies embedded in the power/knowledge regime. Alternatively, we can say that the biopiracy discourse as a strategy of resistance is a form of 'counter-power', a contingent outcome of the tensions that exist in relations of power or 'entanglements of power' (Sharpe et al. 2000, p 1). In this light, it can be said that ESG's allegation of biopiracy in the production of Bt. brinjal is a strategy adopted to resist and contest unfair and inequitable access and utilisation of local brinjal varieties by an assemblage of heterogeneous entities. And this resistance through the discourse of biopiracy brings into view the operation of power/desire in the production of Bt. brinjal. Thus, it can be argued that ESG' resistance to biopiracy is a relational effect of the

power/knowledge regime – a form of counter-power/desire that reveals the mutual constitution of power and desire. Hence, resistance is 'neither outside of nor independent from the systems of power'; rather, it tells us 'more about forms of power and how people are caught up in them' (Abu-Lughod 1990, pp 42 and 50).

While this resistance to the power/knowledge regime through the discourse of biopiracy gives us the means to understand the presence and operation of power/desire in the controversy surrounding Bt. brinjal, the existence of protest and other struggles aimed at achieving social and economic equality, and scrutinising elite interests embedded in economic and development policies, have been active in India for a long time. The concern with ecological damage, cultural destruction, and inequitable access to land and natural resources were central to these struggles. For instance, in the 1970s, while the government representatives and environmental experts were debating the issue of environmental and ecological problems in Stockholm (Stockholm Conference, 1972) and other forums, a number of movements emerged in India that contested the dominant views and faith in the use of modern science and technology in economic progress and development, such as Chipko and later, Appiko movements against the commercial exploitation of local forest resources. In later years, a number of other struggles highlighted the displacement of local population, destruction of natural resources, and environmental pollution (for example, Narmada Valley Project and Bhopal Gas Disaster). In each of these struggles, voice arising from the margins managed to demonstrate the pitfalls of modern technoscience and capitalist vision in development related projects and programmes. By their very nature, these struggles brought heterogeneous modes of interventions together to bring changes in policies and raise consciousness about rights. Thus, while at the base, the burden of mobilisation was with those directly affected; their contentions acquired mass mobilisation and credibility through the involvement of voluntary organisations, advocacy or pressure groups, media, scientists, activist academics, lawyers, and sympathetic policymakers. Together these actors employed various strategies of confrontations with the intention to bring transformations across social and economic landscapes in postcolonial India. What followed was a remarkable ideological transformation, and also a concomitant shift occurred in movement activism (Ray and Katzenstein 2005, p 21). Consequently, three related strategies were adopted and articulated in these activisms – lobbying,

through the press and related institutions, the policymakers and political representatives, litigation in courts, and involving scientific experts to provide research-based knowledge and suggest alternatives (Sethi 1993, p 137). What is crucial, however, is that in ecological activism, 'action remains located dominantly in the framework of rights and justice', in the sense that acts of confrontation demanded the redefinition of rights and entitlements through legal interventions and economic policies (ibid., pp 128 and 145).

The above discussion suggests that social movements, advocacy groups and subaltern actors seek to influence policies and raise consciousness about injustice and legal rights. Here the term 'social movement' deserves a bit more elaboration. While ordinary people often emerge into the streets and join forces to engage in confrontations with elites, authorities and powerful opponents, these are not social movements. Such confrontations as contentious politics are normal in a democratic polity. But when such confrontations and contentious politics develop a repertoire of contention and the capacity to maintain sustained challenges against powerful opponents, social movement emerges (Tarrow 1998, p 2). Thus, at the base of every social movement, protest or acts of resistance, there is contentious politics backed by a cycle of contention and collective action frame, which take many forms. In other words, 'contentious collective action' becomes the basis of social movements or acts of resistance (ibid., p 3). In acts of resistance, advocacy groups and subaltern actors mobilise contentions, demands, elaborate ideologies, and construct collective identities through 'concerted campaigns of collective action' (ibid., p 4). However, as Touraine points out, to term a collective action as social movement, it is essential that it challenges a mode of generalised social domination (Touraine 2004, p 718). Hence, in acts of resistance, collective action not only mounts collective challenges and builds solidarity against powerful opponents, but also produces alternative narratives of development, progress, and justice, which are most clearly visible in counter-discourses. More sharply, by raising voice, acts of resistance seek to create a space of hearing as well as a space of transformation, which should not be dismissed lightly because these are the spaces where 'people at the grassroots' or 'social majorities' challenge and counter the oppressive monoliths expanding through the power/knowledge regime promoted by 'social minorities' (Esteva and Prakash 1998,

p 4). From this perspective, ESG's resistance to biopiracy in the production of Bt. brinjal – a form counter-power that challenges the dominant ideologies embedded in the power/knowledge regime, can be described as contentious politics because it has mobilised a number of contentious demands and claims that become the basis of sustained collective action. While ESG's contentious politics cannot be termed social movement in its own right, it remains inherently tied to the broader discourse of biopiracy, which emerged from the ecological movements in India and elsewhere.

The point, however, is that confronting the power/knowledge regime through the discourse of biopiracy draws our attention to a shift in the configuration of power, and more importantly, its articulation in the production of Bt. brinjal is a characteristic feature of contentious politics that disrupts the expansion of power/knowledge regimes. Accordingly, the controversy surrounding the production of Bt. brinjal becomes an 'arena' of confrontations or a space of struggle where contentions, demands and values vie for attention. In speaking about resistance or counter-power, we are looking through the eyes of those engaged in acts of resistance or confrontations. In the Bt. brinjal controversy, advocacy groups and subaltern actors mobilised and moved their contentious politics or counter-power through a range of spaces, which following Cornwall can be designated as 'popular spaces' and 'invited spaces' (Cornwall 2002a and 2004).[147] As pointed out above, in any act of resistance, protest or opposition, social actors develop a repertoire of contention based on collective action frame and therefore, framing plays an important role in contentious collective action. Framing issues in terms of opposition – diagnose causes and problems, identifying the opponents, pointing out injustice, formulating claims, adopting strategies for actions, motivate social actors to challenge and confront powerful opponents. In short, the framing of issues for resistance and opposition is an act of counter-power. Thus, as discussed in Chapter 1, in the Bt. brinjal controversy, initially the discourses of opposition were premised on the risk and uncertainty of bio-technical science, in the sense that advocacy groups, general public and concerned scientists opposed the commercialisation of Bt. brinjal

[147] According to Cornwall, 'popular spaces' are venues where social activists normally express their concerns and protest against a social issue, such as on the street, newspapers, public meetings. 'Invited spaces', on the other hand, are forums where concerned publics are formally invited to express their concerns and lodge complaints.

on the ground of health, safety and environmental concerns associated with GMOs. In other words, these opposing discourses were framed in terms of two competing ideals of science and society, especially as general public dissents that moved through 'popular spaces', such as protesting on the street, newspapers and other electronic media, organising public meetings and protest in front of political office.

However, on the insistence of concerned policy makers and advocacy groups, the nature of this dissent and opposition changed subsequently and traversed through various 'invited spaces'. For instance, as pointed out in Chapter 4, in 2010 Jairam Ramesh (then Minister of Environment and Forests) conducted a series of public consultations in seven cities in India. These public consultations were organised on behalf of the MoEF to hear all views and consider all issues, both for and against, before making a decision regarding the commercialisation of Bt. brinjal. In these public consultations, concerned citizens, scientists, NGOs, individual farmers and farmers' organisations, agricultural experts, environmentalists, representatives of Mahyco and different political parties actively participated and discussed various issues associated with modern biotechnology. And these issues were not just limited to risk and uncertainty surrounding bio-technical science and its regulation, but rather moved towards broader concerns, such as loss of biodiversity, dependency on multinational seed corporations and monopolistic control over agricultural inputs, intellectual property rights over living organism and farmers' rights, unauthorised appropriation/biopiracy, collective rights over germplasm and protection of traditional knowledge, food sovereignty and autonomy.[148] What we notice here is that advocacy groups, subaltern actors and concerned citizens have diagnosed a number of problems and articulated opposition through a repertoire of dissents, contentious claims and demands, and in doing so, they have framed issues and mobilised their opposition to a power/knowledge regime in much broader terms. Out of these heterogeneous concerns and demands, the discourse of unauthorised appropriation or biopiracy became most contentious and strongly articulated by ESG not just in one of these consultative sessions (discussed in Chapter 1), but also in a number of other spaces. For instance, in February 2010, ESG formally lodged a

[148] MoEF (2010c) 'National Consultation on Bt Brinjal Report', 10th February 2010, (on file with the author).

complaint with the KBB alleging unfair and inequitable utilisation of local brinjal varieties by Mahyco/Monsanto and their collaborators in the production of Bt. brinjal.[149] Further, in a complaint to the NBA, the ESG has reiterated this contention.[150] In both these complaints, ESG alleged biopiracy by leading transnational corporations, universities and powerful bilateral financing agencies of the world. Similarly, in 2012, the ESG has moved a PIL to the Karnataka High Court in Bangalore, in which it has contended that the entire project of developing Bt. brinjal constitutes a theft of the genetic wealth of India.[151] The ESG, therefore, not only pointed out the injustice created through such illegal activities, but also demanded a comprehensive inquiry to establish the nature and extent of violations of the Biological Diversity Act 2002, fix responsibilities and liabilities, and initiate criminal proceedings against the violators as required by law.

There is no doubt that these sites of resistance have expanded the spaces of contention and created a condition of possibility for activists and subaltern actors to bring transformation in the power/knowledge regime. However, the spaces made available by powerful actors remain infused with existing relations of power that permit only limited influence and marginalise voices leading to the legitimisation of interventions or policy prescriptions of the powerful (Cornwall 2002a, p 51; Cornwall 2002b, pp 8-9). Thus, while the MoEF imposed an indefinite moratorium on the commercialisation Bt. brinjal, the decision was based not on the allegation of biopiracy, but rather on the risk and uncertainty of bio-technical science (MoEF 2010b). This emphasis on science as the main actor not just reproduces the power of modern technoscience, but systematically ignores social struggle against the power/knowledge regime. In contrast, the judiciary is more concerned with biopiracy and in turn, the protection of biodiversity, traditional crops and knowledges. For instance, in pursuance to a PIL suit filed by Gene Campaign in 2005, the Supreme

[149] ESG (2010c) 'Violation of Biological Diversity Act, 2002 in matters relating to access and utilisation of local brinjal varieties for the development of Bt Brinjal by M/s Mahyco and ors. [sic], and related issues', ESG's Letter to KKB, 15th February 2010, (on file with the author).
[150] ESG's Letter to NBA, 9th August 2011, (on file with the author).
[151] Environment Support Group and Others v. National Biodiversity Authority and Others, Writ Petition No. 41532/2012, (on file with the author).

Court of India in a 2010 order directed the Indian government to demonstrate what steps it has taken to protect traditional crops (ibid.). In a similar vein, acknowledging the PIL brought by ESG in 2012, the Karnataka High Court observed that 'dharnas [protest] must be organised against the United States of America for its continued intransigence in complying with global biodiversity norms, highlighting that such action might perhaps be necessary in tackling challenges to global biodiversity conservation' (ESG 2012).[152] While these latter strategies to contest and resist power and domination through law, it might be argued, are trivial as compared to all-encompassing nature of the power/knowledge regime, they nevertheless bring into view law's ambivalent relationship with power because law becomes a tool of contestation and a space of resistance, and at the same time, it mediates the desire to expand the power/knowledge regime.

Two central features can be marked out from this discussion of the operation of differential power/desire relations in the bioeconomy. These heterogeneous elements came together through the de/reterritorialising flow of desire. On the one hand, Mahyco/Monsanto, their collaborators, WTO-TRIPs, DST and DBT are connected through the desire to produce, propertise, appropriate, and expand the spaces of bio-economic production and power/knowledge. The ESG and other subaltern groups, on the other hand, came together through the desire to contest or oppose this expansion. Thus, it is desire that connects and brings these heterogeneous elements in contact with each other. Likewise, while the desire to expand the power/knowledge regime has moved through dispersed institutional spaces, the desire to contest moved from familiar popular spaces to 'transient consultative events' (Cornwall 2004, p 2) to other invited, though more permanent and domesticated, legal avenues. These interactions between disparate elements, in other words, bring into view how differential power/desire operates in the bioeconomy.

5.6: Conclusion

[152] ESG (2012b) 'Karnataka High Court Issues Notice in PIL Highlighting Egregious Biopiracy and Governmental Apathy', Press Release, 21st November 2012, (on file with the author).

This chapter shows how power/desire moves and operates in the bioeconomy through dispersed spaces. Thus, my focus was on co-presence, co-functioning, interactions and mediation between distanciated and proximate entities. In this direction, I have emphasised that in the bioeconomy, power operates through the global intellectual property regime, such as the WTO-TRIPs. But rather than treating the WTO-TRIPs as an instrument of power, I have argued that it is important to view the TRIPs regime as a space of power/knowledge because it is deterritorialised and spatial. However, this deterritorialisation and spatialisation would have not been possible without the support of institutions, such DST and DBT that have integrated, accommodated and mediated the TRIPs regime. In other words, these institutions organised the field for TRIPs regime to operate in a distant location. And by doing so, they have not only reterritorialised the desire to expand, but also emerged as new spaces of power/desire. Since my purpose was to examine differentiated relations of power/desire, I have looked into ESG's contestation as 'differential power/desire' which, I have argued, is not merely an opposition to unauthorised appropriation, but rather an effect, a counter-power/desire that emerged in direct opposition to the desire to expand the power/knowledge regime. Accordingly, I have demonstrated that the Bt. brinjal controversy is a discursive space in which the desire to contest has emerged in a multitude of forms. But paradoxically, law figures prominently in this discursive space of counter-power, in the sense that law has become an instrument that mobilises resistance and at the same time, an arena of contestation. The formulation of challenge in legal terms not only brings into view the injustice and unjust nature of prevailing socio-economic relations, but also provides an indication of the cognitive transformation at play in constructing desire. Thus, I argue that this contestation through the discourse of biopiracy is a form of 'becoming' – the desire to become different, to become resistant, to become contentious against the expansion of the power/knowledge regime. However, this becoming has been articulated through and mediated by the CBD and the Biological Diversity Act which, as I have shown in chapter 4, have normalised the desire to appropriate, to capture the economic value, to deterritorialise the spaces of bio-economic production. ESG's desire to contest unauthorised appropriation through the CBD and the Biological Diversity Act, therefore, is a failure or a loss of power. Put otherwise, ESG's desire to contest has the potential to become different, to choose a different line of flight. However, by relying on legal mechanisms that have normalised

appropriation, ESG's desire to contest or resist becomes imprisoned and assimilated in the assemblage, that is, becoming proprietary subjects, which is nothing other than becoming part of the desiring-machine, becoming part of the infrastructure – an emergent subjectivity that I discuss in the next chapter.

CHAPTER 6

Spaces of Becoming: Assemblage of Desire and Emergent Subjectivity

'We should try to grasp subjection in its material instance as a constitution of subjects.'

Michel Foucault[153]

'"Subjection" signifies…the process of becoming a subject.'

[153] Foucault 1980, p 97.

Judith Butler[154]

'…all these heterogeneous elements compose "the" multiplicity of symbiosis and becoming.'

Gilles Deleuze and Felix Guattari[155]

6.1: Introduction

Chapter 5 shows how differential power/desire relations operate in the bioeconomy. This operation becomes visible once we look into the discourse of biopiracy as an effect of or, an opposition to the expanding power/knowledge regime. In the Bt. brinjal controversy, ESG's contestation highlights deprivation, exclusion and loss of identity. ESG's contestation, from this point of view, is a 'differential power/desire' – a counter-hegemonic subject position, which ESG and other social activists choose to convey their discontents and to articulate a sense of injustice. However, while subaltern actors employ various tactics (public demonstration, media publicity, street plays and mass petition to mobilise protest), legal norms and formal institutional representations, such as litigation, often become more useful in translating demands and claims into rights. This rights consciousness is very much evident in ESG's mobilisation of law and legal strategies. That is, the rights of local communities to receive a 'fair' share of the benefits (monetary or otherwise) arising out of the commercial utilisation of local brinjal germplasm as set out in the CBD, the Biological Diversity Act, and other legal instruments (Bonn Guideline and Nagoya Protocol). The point here is that the ESG has invoked legal norms and practices prescribed by global/local governance mechanisms. These mechanisms, as discussed in chapter 4, have deterritorialised, normalised and spatialised appropriation. A provocative argument, perhaps, but the discourse of biopiracy as a differential power/desire has the potential to become different, to follow a different line of flight. Paradoxically, however, the discourse was mobilised through the component parts of the bioeconomy. The discourse of biopiracy thus never becomes different and this is

[154] Butler 1997, p 2.
[155] Deleuze and Guattari 1980/2004, p 275.

clearly visible in ESG's articulation of rights claim. To be specific, the demand to heal injustice by way of receiving a share of the benefits arising from exploitative activities is a move that welcomes and accommodates the desire to normalise appropriation and propertisation.

I see this transformation as a rupture in the discursive space of counter-power/desire giving rise to emergent subjectivities. This chapter, therefore, aims to provide an understanding of how emergent subjectivity, that is, subjectivity in its nascent state (Guattari 1996, p 195), takes shape in the bioeconomy. The starting point is Foucault's analyses of the relation between subjection and subjectivation. For Foucault, subjection creates a condition for the emergence of transformed subjects. Put differently, the transformed subjects emerge through a subtle mix of coercion technologies and self-technologies prescribed by various governmental agencies, which ensure subjection. Simply stated, various mechanisms and practices create a condition in which the subjects can transform themselves – a process of subjectivation or, a process of becoming a subject (Butler 1997, p 2). Taking note of this understanding, I delve into OECD and DBT's policy prescriptions and show that these prescriptions are aimed towards transforming the behaviours and conducts of the subjects – to produce transformed subjects. My analytical point of departure, however, is slightly off to the track because I am interested to understand how a multiplicity shapes emergent subjectivity in the bioeconomy. With this in mind, I emphasise how desire moves through disparate elements and in so doing, establishes machinic conjunctions between them. Thus, I focus on the movement of desire in the Bt. brinjal controversy, especially through the mechanisms and practices prescribed by the TRIPs and the CBD. I argue that this continuous movement of desire between the component parts of the bioeconomy create a condition for the emergence of desiring-subjects – a process of becoming. I set out to explore this argument further, precisely by looking into ESG's articulation of legal rights in the discourse of biopiracy. In particular, ESG's rights discourse puts emphasis on 'benefit-sharing' and 'prior informed consent' to redress injustice. I analyse these highly charged assertions and illustrate that subjectivity in the bioeconomy emerges through mechanisms and practices, which the subjects invoke to articulate their claims, demands and rights. After all, what remains folded in these mechanisms and

practices is the desire to produce transformed subjects. Indeed, the mobilisation of rights discourse is an indication of transformation – an assimilation with the dominant ideals of the bioeconomy. This assimilation, I argue, is a becoming – becoming part of the infrastructure, becoming part of the desiring-machine – an emergent subjectivity, shaped and produced by a multiplicity.

6.2: Subjection and Subjectivation

The discourse of biopiracy, I have argued, gives rise to emergent subjectivity, and this subjectivity remains folded in propertising and appropriative mechanisms through which the desire to expand the spaces of bio-economic production moves. The modern subject, according to Foucault, emerges at the intersection of subjection and subjectivation. He terms this process '*assujetissement*' (Foucault 1975/1979) which, as Butler explains, 'denotes both the becoming of the subject and the process of subjection – one inhabits the figure of autonomy only by becoming subjected to power, a subjection which implies radical dependency' (Butler 1997, p 83). Subjectivation thus signifies the process of becoming a subject. This becoming, however, depends on subjection because it is subjection that transforms the subjects. Hence, in the essay *The Subject and Power*, Foucault writes that his objective was not to analyse power, but to understand how human beings are made subjects (Foucault 1982, pp 209). As he observes,

> 'It is a form of power that makes individuals subjects. There are two meanings of the word "subject": subject to someone else by control and dependence, and tied to his own identity by a conscience or self-knowledge. Both meanings suggest a form of power that subjugates and makes subject to' (ibid., p 212).

Foucault was interested to understand what happens when someone exercises power over another (Foucault 1988c, p 102). His attention was on the effects of power, and he analysed these effects through subjection. Although Foucault puts emphasis on subjection (*assujettissement*), it becomes clear that he articulates the process through which subjectivities take shape. Therefore, subjection should not be viewed only in terms of subjugation or subordination. Rather, it needs to be understood as a process of subjectivation – subjection leads to the activation or production of subjectivity.

Foucault analysed this process of subjectivation in a very different fashion in his later works, such as *The Use of Pleasure* (1984/1992), and also in the recently published annual College de France lecture series *The Hermeneutics of the Subject* (2001/2005) and *The Birth of Biopolitics* (2004/2008).[156] Specifically, in these later works, Foucault examines how a calculated orchestration of techniques can be used to transform human beings. These techniques, according to him, are 'technologies of the self', which permit 'individuals to effect by their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality' (Foucault 1988b, p 18). To Foucault, acting upon the self are the modes through which human beings construe and shape their activities, thoughts and desires. Thus, in *The Birth of Biopolitics*, he shows that at the end of the eighteenth century certain techniques were put into practice to transform individuals into *homo oeconomicus* – an entrepreneur of himself (Foucault 2004/2008, p 226). Accordingly, certain arrangements were made to lodge individual's life within the framework of a multiplicity of diverse enterprises connected up to and entangled with each other so that their actions, decisions and choices have meaningful and perceptible effects (ibid., p 241). In other words, these arrangements were put into place to transform as well as to get hold of the economic behaviour of individuals. The subject, therefore, is considered *homo oeconomicus* once she transforms her behaviour into rational conduct, pursues her own interest and at the same time, her interest converges with the interest of others (ibid., p 270). Put otherwise, *homo oeconomicus* is someone who transforms her behaviours, desires, thoughts, and activities according to the needs of the economy. The crucial point is that *homo oeconomicus* is an 'enterprising self' – an active self and at the same time, a calculative self that calculates about itself and that acts upon itself in order to better itself (Rose 1996b, p 154). This transformation of human beings into enterprising selves is driven by techniques of the self, which are integrated into the structures of coercion or domination (Foucault 1980/1993, p 203). In a sense, the subjects are tied to a multiplicity of techniques and, according to Foucault, this versatile equilibrium between techniques through

[156] Foucault further elaborated the concept of subjectivation in *The Care of the Self* (1984/1986) and few other annual College de France lecture series, such as *The Government of Self and Others* (2008/2010), *The Courage of the Truth* (2008/2011), and yet to be published *Subjectivity and Truth*. It is beyond the scope of this chapter to discuss these works here.

which the self is constructed or modified 'is a mode of subjection, a new production of subjectivity' (Read 2009, p 32).

A detailed elaboration of this understanding can be found in *The Hermeneutics of the Subject* (Foucault 2001/2005), in which he points out that the notion of 'care of oneself' (*epimeleia heautou*) is 'an attitude towards the self, others, and the world'. It is a certain way of considering things, undertaking actions and having relations with other people (ibid., p 10). It also 'implies a certain way of attending to what we think and what takes place in our thought'. He further explains that it is not simply a general attitude or form of attention turned on the self, but rather designates a number of actions and practices by which one changes, purifies, transforms and transfigures oneself (ibid., p 11). Since the subject is a form and not a substance (Foucault 1984/1987, p 121), he refers to a whole domain of complex and regulated activities that the subject was given to enable her to fight all her life (Foucault 1994/1997, pp 95 and 97). The care of the self, then, is both a duty and a technique of taking care of the activities that permit individuals to change and transform (Foucault 1988b, p 25). And, for Foucault, these practices of 'attending to oneself' or 'taking care of oneself' (Foucault 1994/1997, p 93) are 'practices of subjectivation' (Davidson 2001/2005). Foucault further elaborated this understanding in *The Use of Pleasure* (Foucault 1984/1992), as he observes, that these rules of conduct or rules of action are a complex interplay of elements recommended by various prescriptive agencies according to 'which one ought to "conduct oneself" – that is, the manner in which one ought to form as an ethical subject' (ibid., pp 25-26). Thus, one can transform herself into an ethical subject through practices, which may include the 'movements of desire in all its hidden forms, including the most obscure' (ibid., p 27). And the formation of ethical subject or transformation of one's own mode of being on the basis of recommended conduct and practices, according to Foucault, is a form subjectivation that subjection ensures (ibid., pp 28-32).

The techniques of 'care of the self' were oriented toward the discovery and the formulation of truth concerning oneself (Foucault 1980/1993, p 204). These techniques, in other words, were complementary to governmental ensemble because

as a part of 'self-technology', the purpose of 'care of the self' was to assure 'coercion and processes through which the self is constructed or modified by himself' (ibid.). Then, the techniques and practices through which the power/desire functions and operates may, at first glance, appear to be external to the subject, slowly internalised and embraced by the subject to inaugurate her emergence, as Deleuze observes, 'the relation to oneself that is self-mastery, "is a power that one brought to bear on oneself *in* the power that one exercised over others"' (Deleuze 1986/1988, p 100; original emphasis). Foucault has emphasised this point, as he explains, 'power consists in complex relations: these relations involve a set of rational techniques, and the efficiency of those techniques is due to a subtle integration of coercion technologies and self-technologies' (Foucault 1980/1993, p 204). The integration of techniques and practices that demands subjection as well as enables the subject to transform themselves is the condition in which the subject of desire emerges. As Foucault states, his intention was to 'analyze the practices by which individuals were led to focus their attention on themselves, to decipher, recognise, and acknowledge themselves as subjects of desire' (Foucault 1984/1992, p 5).

6.3: Emergence of Desiring Subject

Foucault's insights suggest that subjectivation is a process of becoming, which construes, transforms and shapes the activities, thoughts and desires of individuals. The subjects of desire, then, are 'gradually, progressively, really and materially constituted through a multiplicity of organisms, forces, energies, materials, desires, thoughts etc.' (Foucault 1980, pp 97-98). This observation is important, since it highlights the importance of looking into an ensemble of techniques and practices that demands subjection and by doing so, ensures the transformation of the subject. Put otherwise, subjection transforms the actions, behaviours and conducts of the subjects and in the bioeconomy, this subjection occurs through the techniques and practices prescribed by various global/local institutions. While these techniques and practices are oriented toward the overall well-being of the subjects, they are designed to transform economic behaviours, so that the actions and conducts of the subjects align with the needs of the bioeconomy. Simply put, these techniques are put in place to transform the subject into *homo oeconomicus*. For instance, in its vision of the

emerging bioeconomy, the OECD puts emphasis on capturing the latent value of biological resources to support economic growth and social well-being, and in this direction, recognises the importance of biotechnological inventions and innovation. To realise this vision, it prescribes long-term strategies, concerned mainly with the governance of access and utilisation of bio-genetic resources. An important aspect of this policy prescription is the emphasis on market. The OECD considers market as an integral part of biodiversity conservation because once the commercial value of bio-genetic resources is recognised, their exploitation would become sustainable. Accordingly, policies should be geared towards creating new markets in bio-genetic resources. Yet, the creation of new markets depends on governance mechanisms, which not only regulate access and utilisation, but also recognise well-defined property rights. The policy concern is thus with existing legal mechanisms and practices that are essential for the governance of appropriative activities, conducts and behaviours. Or, consider for example, the increasing emphasis on intellectual property rights and bioprospecting in India's biotechnology strategies discussed in chapter 1. In a number of policy documents, the DBT has clearly pointed out the importance of capturing the accumulative potential of biological resources to expand the spaces of bio-economic production. This means transforming bio-genetic resources into industrial raw materials and intellectual properties. Consequently, the role of intellectual property and biodiversity laws become paramount in legitimising access and appropriation. However, the point is that transforming bio-genetic resources into tradable assets depends on economic behaviours and activities. So the conducts, thoughts, and desires of the subject must be transformed and this transformation should be achieved by re-defining existing laws and norms.

This continuing emphasis on governing access and utilisation, and property rights in policy prescriptions is significant. In particular, what these policy prescriptions reveal is a notion of subjectivity. There is a tacit assumption that the subjects would transform their behaviours, actions, thoughts, and decisions according to the practices recommended. Or we might say that the subjects ought to conduct their activities in a way that they can be aligned with the aspirations of the bioeconomy. Strictly speaking, these prescriptions are 'technologies of the self', which permit the subjects to transform themselves into enterprising selves or *homo oeconomicus*.

Hence, these policies are geared towards creating a condition in which the activities of the subject can be governed and regulated. This is particularly evident in global/local legal arrangements, such the WTO-TRIPs, the Indian Patent Act, the CBD and the Biological Diversity Act, which prescribe mechanisms and practices to normalise appropriation and propertisation of bio-genetic resources. But what remains enveloped in these mechanisms and practices is a process of subjectivation because they demand subjection. This means that the subjects need to transform their appropriative and proprietary activities according to the needs of the bioeconomy. These mechanisms and practices, then, are practices of subjectivation, they are designed to produce transformed subject.

Nonetheless, the underlying rationale of these practices goes much deeper. In a sense, while the practices of subjectivation transform the subject, this subjectivation is shaped by interactions and relations between heterogeneous elements. Consequently, subjectivity in the bioeconomy is inseparable from a multiplicity. After all, the bioeconomy is comprised of disparate elements that connect and relate to one another through lines and movement. An affinity and alliance of the subject with these lines activate the process of subjectivation or becoming. Put differently, a multiplicity contains a large number of elements, and these elements establish connections, form alliances, and work in symbiosis; it is a space of continuity. Hence, what matters in a multiplicity is a set of relations, which are inseparable from each other. And the mechanisms and practices through which these relations take shape are the points of subjectivation that transform the subject according to the supposed ideals of the assemblage. This means that desire is not internal to a subject, but rather, it is a process of construction in which heterogeneous elements combine. The emergence of desiring-subject, therefore, is shaped by a combination of disparate elements, it is an effect of assemblage and thus, we need to 'describe the assemblage in which such a desire becomes possible, gets moving and declares itself' (Deleuze and Parnet 1977/1987, p 97).

6.4: Assemblage of Desire

The bioeconomy operates in a connective fashion, through machinic conjunctions. It is a deterritorialised machinic assemblage. I have emphasised this understanding through my analysis of the Bt. brinjal controversy in which heterogeneous elements co-function, combine, connect, and relate with one another. This has prompted me to suggest that the controversy is an effect of machinic assemblage. Crucially, the assemblage is formed through the de/re-territorialising flow of desire because it is desire that assembles, establishes conjunctions, and programmes the assemblage (Deleuze and Parnet 1977/1987, p 79). The bioeconomy, from this perspective, is a material production of desire, or a desiring-machine. Alternatively, we can say that desire co-functions and works in symbiosis, it circulates in the assemblage and therefore, is a part of functioning assemblage (Deleuze 2001/2007, pp 125 and 130). Since an assemblage is a constellation of disparate elements, desire is 'coextensive with the whole line of the outside' (Deleuze 1986/1988, p 123). It follows that desire is to be found in different components of the assemblage, or in a 'whole series of semiotic components' (Guattari 2009, p 283) involved in the assemblage. Arguably, then, disparate elements emit desire in the bioeconomy to transform the subjects, augmenting or diminishing their power to act (Deleuze/Guattari 1980/2004, p 283). And this desire to transform remains folded in mechanisms and practices, which the subjects invoke. Consequently, the subjects move, or are moved by elements along the lines desire moves, assembles and relates.

Consider, for example, Mahyo/Monsanto's desire to produce and propertise a new life form in the Bt. brinjal controversy that moved through global/local intellectual property law. As discussed in chapter 3, Mahyco claimed that it had invented a new life form through bio-technical ingenuity – the Bt. brinjal and therefore, it has property rights over it. Significantly, the production of Bt. brinjal also involves Monsanto's Bt. gene. As a proprietary technology, the Bt. gene demands intellectual property protection of genetically modified living organisms, and at the same time, prohibits others from reproducing the new life form or any fragments of it in any manner in India. Accordingly, Mahyco not only reiterated the importance of protecting Monsanto's property rights, but also demanded intellectual property protection over the modified brinjal germplasm because it contains other technologies, such as the Bt. gene and MHSCL technology. Mahyco's property

rights claim thus extends to emergent life forms that the Bt. brinjal would produce. What this suggests is that Mahyco's desire to propertise not just remained limited to Bt. brinjal, but further moved towards propertising emergence. This desire to propertise emergence, I have shown, brought into existence an emergent space of property in India. And this desire was mediated by disparate elements and moved through heterogeneous spaces. The TRIPs Agreement, for instance, not only recognises the rights of legal subjects to protect intellectual properties, but also prescribes mechanisms to claim such rights irrespective of place and location, so that 'legitimate trade' in intellectual properties can be carried out throughout the globe. I have discussed how these practices are reterritorialised in India's intellectual property legislation. What is more important here is that these global/local legal mechanisms are emplaced to change the economic behaviours of the subjects. In the sense that in order to claim intellectual property rights, the subjects ought to transform and carry out their activities according to the practices recommended. In so doing, the proprietary subjects will not just take care of their own and others' desire, but will also transform others' behaviour, such as not to violate intellectual property rights. Global/local intellectual property practices are thus designed to produce transformed subject, and this transformation comes through the desire to propertise emergence, as it is evident in Mahyco/Monsanto's property rights claim over the Bt. brinjal. The point is that this desire to propertise emergence, not just moves through, but remains coded in intellectual property mechanisms and practices.

The desire to propertise operates in conjunction with the desire to normalise appropriation. As discussed in chapter 4, the expansion of the bioeconomy demands unparalleled access to and utilisation of bio-genetic resources. So governmental interventions are necessary to ensure the continuous movement of biological materials from one place to another. Simply stated, the viability of the bioeconomy hinges on creating a secure environment in which the appropriation and movement of bio-genetic resources can be authorised through a framework of law or legal mechanisms. The CBD and its counterpart, the Biological Diversity Act – two governance mechanisms, are designed to perform this task. The CBD, for instance, is a global legal instrument and my discussion shows how the idea of bioeconomy emerged and gained traction during the negotiation process. More importantly, how a

group of experts defined problems and adopted a particular way of thinking (unsustainable appropriation) and in doing so, devised mechanisms and practices to govern the access and utilisation of biological materials at a distance. Since bio-genetic resources are commercially viable assets, the CBD puts emphasis on their conservation and sustainable use. Thus, the core concern revolves around the issue of access and utilisation or commercial exploitation, which should be resolved through the use of genetic engineering and the recognition of ownership rights. As one commentator remarks, 'the drafters of the convention believed that the best strategy to protect biological and genetic resources was to give states explicit property rights' (Merson 2001, p 284). Accordingly, the CBD not only emphasises the role of modern biotechnology in evaluating the commercial value of germplasm, but also recognises the importance of property rights in protecting economic interests. This in turn suggests that the solution for unsustainable appropriation remains in modern bio-technical science and property rights. This is the solution OECD's Bioeconomy Project re-iterates. Hence, I have argued (in chapter 4) that the CBD has laid down the future path of the bioeconomy. But as emphasised above, the policy prescription of the OECD is directed towards transforming the economic behaviours and activities of the subjects. Or, one can say that to capture the economic value of biological materials and to expand the spaces of bio-economic production, a transformation in appropriative behaviours and activities is necessary – the subjects need to transform their conducts, activities, thoughts and desires. And this is clearly visible in the Bt. brinjal controversy, especially in Mahyco/Monsanto's desire to produce a new life as well as a new property form. In this respect, a framework of law and legal mechanisms are important because a secure environment is a necessary prerequisite for carrying out appropriation. Therefore, mechanisms and practices should be put in place to normalise appropriative activities, which are available in the CBD and the Biological Diversity Act. Viewing in this way, I have suggested that the CBD has normalised the desire to appropriate and capture, thereby expanded the spaces of bio-economic production. This observation is important, as it highlights that the CBD, like the TRIPs, has a transformative dimension – it is designed to transform the behaviours and activities of the subjects, and this transformation comes through mechanisms and practices in which the desire to capture, to appropriate, to normalise, and to expand remain folded.

The desire to expand the spaces of bio-economic production is equally visible in global/local intellectual property practices. In chapter 5, I have shown how the desire to expand the spaces of power/knowledge operates in the bioeconomy, especially through the TRIPs regime, and in particular how this expansion is mediated by institutions situated in a distant location. However, in the Bt. brinjal controversy and elsewhere, advocacy groups have contested these expansionist tendencies through the discourse of biopiracy, which reflects the real concern over increasing appropriation and propertisation of bio-genetic resources. An important aspect of this concern is the claim that wild plants and local germplasm containing commercially viable information and chemical properties are domesticated, conserved and protected by indigenous and local farming communities for generations. As such, these resources and knowledge associated with them are a part of communal life and collective mode of living. Hence, appropriation and propertisation of these resources by global/local bio-tech corporations without permission and compensation is unfair and inequitable. To fight injustice and remove imbalances, civil society actors, both in developed and developing countries, have demanded compensation, and a share of the benefits arising from appropriation for the providers of resources. Interestingly, these claims and demands are mobilised through the CBD and other local counterparts, such as the Biological Diversity Act. These global/local legal instruments not only recognise the rights of indigenous and local farming communities over their resources and knowledge, but also prescribe mechanisms through which such demands and claims should be mobilised. What this brings into view is that these mechanisms are designed to transform the thoughts, desires, and conducts of the subjects – to transform the contentious subjects into desiring subjects. The fight for justice, therefore, gradually and materially transformed into a desire to receive monetary and other benefits from exploitative activities. This transformation aligns very well with the desire to normalise appropriation and expansion because the mechanisms through which the desire to contest moves are component parts of the bioeconomy. Thus, by invoking the components through which desire moves and assembles, the contentious subject becomes more in command of herself as subject of enunciation in mental reality, for in the end the subject is only obeying to herself (Deleuze and Guattari 1980/2004, p 143). Subjectivation, then, is activated by a topological relationship between the inside and

the outside – the thoughts, behaviours, and actions of the subjects are affected by the outside. Or we might say that the prescribed mechanisms and practices create a condition in which the subjects internalise the outside – fold the outside into inside. As Deleuze writes, 'the relation to oneself is homologous to the relation with the outside' (Deleuze 2001/2007, p 259; Deleuze 1986/1988, p 119). The inside and the outside are always in contact with each other through the mediators – the components of the assemblage. Emergent subjectivity, therefore, is shaped by a continuous flow of desire because 'desire is the real agent merging each time with the variables of an assemblage' (Deleuze and Parnet 1977/1987, p 103). So the presence of desire – its operation, movement, distribution and manifestation through disparate elements, enables the subject to transform, thereby inaugurate the emergence of desiring-subject.

6.5: Becoming Subject

The bioeconomy is a space of mutation – it reveals how the desiring-subject slowly emerges through mechanisms and practices prescribed by various global/local institutions. This emergence is clearly visible in the strategies subjects adopt, especially in the discourse of biopiracy. In their fight for justice, civil society actors have mobilised contentious claims and demands through the language of rights, such as the right to receive a 'fair and equitable' share of benefits arising from commercial exploitation. In the Bt. brinjal controversy, this rights discourse becomes a strategy to fight unauthorised appropriation of bio-genetic resources. For instance, in its allegation of biopiracy, the ESG claimed that Mahyco/Monsanto and their collaborators have accessed local brinjal germplasm to develop Bt. brinjal. Since no authorisation was obtained from the NBA or other state bodies, the access is illegal and violated the provisions of the Biological Diversity Act. The ESG further stated that this violation 'denies the local communities who have cultivated and protected traditional varieties from time immemorial from their due right to benefit from commercial gain that would be made from the access and use of these biological

resources'.[157] This view was reiterated in a press release in 2011, which highlighted the rights of local communities to receive benefits as per the internationally applicable 'access and benefit sharing mechanisms'.[158] These mechanisms are obviously the CBD 1992, the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization 2002, and the Nagoya Protocol on Access and Benefit Sharing 2010. Even further, in a PIL suit at the Karnataka High Court, the ESG has drawn court's attention to injustice created through such a violation. For ESG, the alleged biopiracy is a gross miscarriage of 'justice' and violation of a number of 'fundamental rights' (enshrined in the Constitution of India) and other legally protected interests. Such unchecked and egregious cases of biopiracy, according to ESG, raise concerns about food security, the adequacy and accessibility of food, and the 'exclusion' of original providers of bio-resources and their indigenous modes of life. More importantly, the ESG contended that such a violation affects traditional farming practices in indigenous communities, compromises the sovereign control over nation's bio-resources, and erodes social, economic and ecological 'autonomy' of communities in growing their own food.[159]

What is significant here is that the ESG has invoked legal rights from the CBD, the Biological Diversity Act, and other international legal instruments to highlight injustice – the unauthorised appropriation of bio-genetic resources, which disregards autonomy, identity and indigenous mode of life, and violates the right to receive a 'fair and equitable' share of benefits. Of course, counter-strategic discourses aimed at fighting injustice and reclaiming autonomy are causes worth fighting for. And, to this effect, ESG has mobilised legal rights to translate demands and claims into justice and entitlements. So law matters in social struggles because 'it is often the law which provides the language and the locale for resistance' (Merry 1995, p 14). This is not surprising, however. In social movements, social actors always invent novel

[157] ESG (2010c) 'Violation of Biological Diversity Act, 2002 in matters relating to access and utilisation of local brinjal varieties for the development of Bt Brinjal by M/s Mahyco and ors. [sic], and related issues', ESG's Letter to KBB, 15th February 2010 (on file with the author).
[158] ESG (2011) 'National Biodiversity Authority to prosecute Mahyco/Monsanto and collaborators [for] promoting Bt brinjal in violation of Biodiversity Protection Law', Press Release 11th August 2011, (on file with the author).
[159] Environment Support Group and Others v. National Biodiversity Authority and Others, Writ Petition No. 41532/2012, (on file with the author).

expressions to articulate a sense of injustice and social power to fight against deprivation, for survival and identity (Frank and Fuentes 1990, p 127). As emphasised in chapter 5, in social movements or popular resistance law is understood as a resource, which activists and subaltern agencies utilise to advance their claims. Presuming that law articulates an idea of justice and a sense of power, subaltern actors invoke and rely on law as the most authoritative and definitive arbiter of rightness and a frame of reference (Turk 1976, p 281). Therefore, as a means of self-realisation, social activists mobilise law to translate their desire and demands into rights claim (Zemans 1983, p 700). Certainly, one can say that law as a communicative device sets the very terms of struggle and call into attention the violation of legal rights. Law thus becomes an end and means of action because it provides both normative principles and strategic resources for the conduct of social struggles (McCann 2004, p 508). In this sense, law is 'understood as a quiet plastic and malleable medium, routinely employed to reconfigure relations, redefine entitlements, and formulate aspirations' (McCann 2006, p 22). That is to say, law as a strategic resource plays a constitutive role in bringing rights consciousness – to understand claims and entitlements in terms of legal rights (ibid). Rights claim, from this point of view, becomes a strategic device to fight injustice. For instance, Alan Hunt argues for rights-based strategies in struggle for social change. He points out that 'rights-in-action involve an articulation and mobilization of forms of collective identities' (Hunt 1990, p 325). For him, counter-hegemonic rights strategy 'play[s] a part in constituting the social actors, whether individual or collective, whose identity is changed by and through the mobilisation of some particular rights discourse' (ibid., pp 325-326).

It is true that contentious subjects constitute themselves through rights discourse, in the sense that transformation comes through the articulation of claims and demands in terms of legal right. Thus, we may well be tempted think that in the Bt. brinjal controversy, the mobilisation of legal right is an articulation of collective identities formed through rights consciousness. But we need to be careful about such abstractions. As Isabelle Stengers cautions,

> ‘We cannot think without abstractions: they cause us to think, they lure our feelings and affects. But our duty is to take care of our abstractions, never to bow down in front of what they are doing to us – especially when they demand that we heroically accept the sacrifices they entail, the insuperable dilemmas and contradictions in which they trap us’ (Stengers 2008, p 50).

Hence, I do not see the mobilisation of legal rights as an articulation of collective identities, but rather, as a rupture in the discursive space of counter-power. In a sense, the articulation of claims and demands through legal rights inaugurates the emergence of desiring-subject because what remains folded in rights discourse is a desire to receive compensation and a ‘fair and equitable’ share of benefits. The point is that desire is central in the formation of transformed subject – both dominant and subjugated, and this desire remains folded in mechanisms through which the discourse of rights was articulated. Given that these mechanisms are framed to protect the interest of the subjects, there is a presupposition that the contentious subjects would invoke legal rights to mobilise their claims. Put otherwise, these prescribed mechanisms not only recognise the contention and desire of the subjects, but also encourage them to articulate their desire the way law defines and formulates – the language of rights. Law encourages the subjects to articulate their concerns, to assert their rights, and by doing so, puts the subjects into the position to demand autonomy and to obtain benefits that were previously denied to them (Collier et al. 1997). In the bioeconomy, however, the law does so in two complementary ways. It solicits expressions, interests, demands and claims of the subjects and to this end, prescribes mechanisms and practices that the subjects are free to invoke to further their desire. Hence, on the one hand, the desire to propertise, to appropriate, to normalise, to capture, and to expand the spaces of bio-economic production are moving and flowing through these mechanisms. On the other, the same mechanisms are prescribed to the subjects to mobilise their claims, especially through legal rights. This suggests that these mechanisms are designed and framed to transform the subjects, to produce desiring-subjects. Law thus plays an important role in constituting subjectivities – the invocation of law and legal rights in social struggle transforms the subjects and thereby yield new subjectivities (Coombe 1991, p 5; Hirsch and Lazarus-Black 1994, p 13). In the Bt. brinjal controversy, the ESG has invoked legal rights to articulate claims and demands, and this articulation reminds

us of Foucault's astute observation that 'anyone who attempts to oppose the law…will only encounter the silent and infinitely accommodating welcome of the law' (Foucault 1966/1987, p 38). This is very much evident in the discourse of biopiracy. In a sense, contentious claims, demands and rights are gradually transformed and accommodated in the law, which prescribes mechanisms to heal injustice through monetary compensation. The mobilisation of claims and demands through prescribed mechanisms, therefore, is an indication of the emergence of transformed subject. The point that needs to be stressed here is that what remains folded in law or legal mechanism is desire, shaped by co-functioning of and interactions between disparate entities. Not surprisingly, then, the law, along with desire, is constantly present in the assemblage. It is a part of functioning assemblage. Since law is a component part of the bioeconomy, desire moves around, flows through and traverses the assemblage in accordance with the law. What is more, law supports the movements of desire in all its hidden forms. Indeed, it can be argued that desire is inseparable from the law, neither from machinic complexes, nor from subjectivation. Accordingly, by conforming to law and embracing the legal mechanisms prescribed, the subject utters and reflects on her own desire and in doing so, becomes a part of the assemblage (Deleuze and Guattari 1980/2004, p 144).

6.6: Spaces of Becoming

As emphasised above, the discourse of biopiracy mobilised to resist the expansion of the bioeconomy gradually transformed into a rights discourse. And what remains folded in this rights discourse is a desire to include the custodians of bio-genetic resources in exploitative activities. This inclusion has been formalised through legal mechanism, such as the benefit-sharing arrangement. The benefit-sharing mechanism forms the central element of the CBD (Art. 15.7). Put simply, the benefit-sharing mechanism was put in place to protect economically valuable bio-genetic resources from unauthorised appropriation. As a precondition to access and commercial exploitation, the purpose of the mechanism is to ensure that the custodians of bio-genetic resources get a fair share of the benefits arising from the utilisation of resources protected by them for generations (Rosendal 2006, p 81). Thus, the aim of the CBD was to provide a legal framework through which indigenous and farming

communities can demand monetary compensation. Viewing in this way, one can say that the benefit-sharing mechanism is aimed towards achieving greater social justice. Significantly, the CBD not only endorses the epistemic value of indigenous or local peoples' knowledge and practices, but also recognises their right to receive monetary benefits that was previous denied. Or one might say that the benefit-sharing arrangement prescribed by the CBD is a step towards enhancing global redistributive justice, understood in terms of redistributing the economic wealth, which accrued as a result of unauthorised appropriation of southern plant genetic resources. The right to access thus comes with an obligation to share benefits. And those who disregards this obligation 'are unjust agents, committing unjust actions, insofar as they violate a legitimate social rule set up to prevent exploitation and injustice' (Schroeder and Pogge 2009, p 270). Echoing this understanding, the ESG brought to court's attention the Constitutional guarantees and effective sovereign laws that exist to protect India's bio-genetic resources and knowledge associated with them. In ESG's view, there is a blatant violation of the law because an egregious act of biopiracy was committed in the production of Bt. brinjal. This violation, the ESG contended, led to a situation in which precious bio-genetic resources have been taken away by unscrupulous scientists, botanists and businessmen without complying with the legal requirements of access and benefit-sharing. As a result, there is an irretrievable loss of revenue to the public exchequer because by and large a share of benefits from commercial exploitation has not been recovered.[160]

The right to receive a share of the benefits, according to ESG, operates as a compensatory mechanism which, as Peterson points out, emerged out of market-driven development paradigms (Peterson 2001, p 78). What this means is that while the benefit-sharing arrangement can offer material form of justice – at least in theory, its emphasis on monetary compensation implicitly converts appropriation into a commercial enterprise, subject to profit motives (Widenhorn 2014, p 382). As GRAIN puts it, the Convention was seen as a beacon to bring forth equality and justice. So the custodians of bio-genetic resources are supposed to get a fair deal, but what seems to be happening is that this purpose is increasingly being hijacked by an

[160] Environment Support Group and Others v. National Biodiversity Authority and Others, Writ Petition No. 41532/2012, (on file with the author).

exclusively commercial approach (Grain 2000). Indeed, the benefit-sharing mechanism speaks the language of inclusion, but the main emphasis is on the right to receive compensation and a 'fair and equitable' share of the benefits. For instance, Cori Hayden argues that the CBD 'has been particularly influential in reshaping the global topographies of rights and obligation' because it comes with a mandate that 'companies compensate or otherwise share benefits with source nations, as a condition for their continued access to "Southern" biological resources' (Hayden 2003a, pp 1-2). The CBD, from this point of view, 'has produced both an idiom of expectation and an institutional framework', backed up by an increasing number of national laws and watchful eyes of activists groups, 'to turn a one-way process of extraction into a multidirectional process of exchange' (ibid., p 2). This promise and its redistributive potential, she further notes, offers market-mediated inclusion or enfranchisement through which contemporary social struggles are being painted. Certainly, the idea of benefit-sharing 'is being used in many ways now to imagine how native and indigenous resource holders might become new kinds of participants or rights-holders' (ibid., p 37), as the discourse of biopiracy in the Bt. brinjal controversy demonstrates. Then, it is not surprising that the right to receive benefit itself becomes a tool of inclusion. However, the idiom of inclusion, as Hayden suggests, is mainly concerned with creating 'interests' (claims) in biodiversity by producing a shared ground: that each has something tangible to gain from commercial exploitation. The crucial lubricant here, according to her, is the idea of 'taking as giving' – a market-mediated redistribution mechanism. What remains implicit in this idea is the assumption that indigenous peoples and other benefit-sharers have a legitimate property rights in both knowledge and plants (Hayden 2003b and 2007). In fact, as Hayden points out, the production of interest in commercial exploitation 'depends heavily on the presumption of self-interested, maximizing actor…who will respond appropriately (rationally) to biodiversity's newly attributed and articulated value' (Hayden 2003a, p 61).

Notwithstanding Hayden's observation, it needs to be stressed that the CBD was aimed towards normalising appropriation and this normalisation is achieved by transforming contentious subjects into the subjects of legal rights. This is particularly evident in the discourse of biopiracy, since contentious claims and demands

gradually transformed into a right to receive benefit from exploitative activities. Thus, claims or what Hayden terms 'interests', are the contingent creation of legal mechanisms through which the desire to appropriate, to propertise, to normalise, and to expand the spaces of bio-economic production operate. As we have seen in the Bt. brinjal controversy, the promise and potential to receive a share of the benefits, which remain attached with commercial exploitation, emerged as a result of the continuous flow of desire between heterogeneous elements. Moreover, the rights claim was mobilised through the component parts of the bioeconomy. This in turn suggests that claims or interests depend on desire for their articulation and emergence because it is desire that connects, assembles, creates chains and produces intensities. The idiom of inclusion, that is, sharing burdens and benefits, therefore transforms the subjects, and this transformation not just coincides with the normalising strategies of appropriation, but remains folded in the expansive strategies of the bioeconomy. At any rate, the idiom of inclusion is a part of the overall strategy of expansion, so that bio-genetic resources can be transformed into tradable commodities in the rubric of redistributive justice. There is a calculated orchestration of techniques and practices aimed towards shaping, construing, arranging and normalising appropriative activities. In particular, these techniques and practices permit the subjects to shape their activities, thoughts and desires. The subjects, then, transform their actions, conducts and behaviours to pursue their own interests, which implicitly converge with the interests of global/local bio-tech industries. Or, perhaps, we can say following Deleuze that the subjects transform themselves in reference to their relations with others – a 'self-constitution' that derives from the code prescribed (Deleuze 1986/1988, p 100). Indeed, the conducts, arrangements and practices that global/location institutions prescribe operate beneath the code forming the hermeneutics on the basis of which the subjects transform themselves, claim their rights, and shape their actions in a recognised form, fixed once and for all (ibid., p 105). Certainly, one can argue that the self-interested subjects – the benefit-claimants, emerge through incentive structures shaped by profit driven bioprospectors (Hayden 2003a, p 61). The bioprospectors, however, frame the incentive structure on the basis of mechanisms and practices prescribed by the CBD. Ultimately, then, what remains folded in incentive structure is an 'infrastructure' – the desire to propertise, to appropriate, to capture, to normalise, and to expand that transform the subjects. And so, this transformation is a self-constitution because the

subjects ought to transform their actions and conducts to become benefit-recipients – to become *homo oeconomicus.*

In the Bt. brinjal controversy, the ESG not only invoked the benefit-sharing provision of the CBD, but also pointed out the ineffective implementation of the Biological Diversity Act. It further brought to attention the failure of the NBA to notify important regulations regarding access to biodiversity and intellectual property rights. These regulations, according to ESG, are essential mechanisms to check and balance access and utilisation. This failure, the ESG argued, has resulted in a gross miscarriage of justice and should be redressed through appropriate implementation of the provisions of the Biological Diversity Act. For ESG, this implementation is important, since it would not only redress injustice in the present care, but also extend protection to future generations.[161] In this vein, the ESG has emphasised the importance of 'prior informed consent' to protect bio-genetic resources from arbitrary and unreasonable appropriation. As ESG asserts,

> 'the law mandates that when biodiversity is to be accessed in any manner for commercial, research and other uses, local communities who have protected local varieties and cultivars for generations must be consulted and if they consent benefits must accrue to them [as] per the internationally applicable access and benefit sharing protocol'.[162]

The legal requirement of 'prior informed consent' is an important element of benefit-sharing mechanism prescribed by the CBD (Art. 15.5) and other complementary instruments, such as the Bonn Guideline (Art. 24) and the Nagoya Protocol (Art. 6). In terms of these instruments, access and utilisation of bio-genetic resources are subject to prior informed consent of the stakeholders providing such resources, such as indigenous and local communities. This legal requirement, as evident in ESG's claim, is intended to protect bio-genetic resources from unauthorised appropriation.

[161] Environment Support Group and Others v. National Biodiversity Authority and Others, Writ Petition No. 41532/2012, (on file with the author).

[162] ESG (2011) 'National Biodiversity Authority to prosecute Mahyco/Monsanto and collaborators [for] promoting Bt brinjal in violation of Biodiversity Protection Law', Press Release 11th August 2011, (on file with the author). The ESG has reiterated this view in its PIL suit at the Karnataka High Court.

The underlying rationale, however, is to create a mechanism through which the stakeholders can be made a party to exploitative activities because access should be based on mutually agreed terms, including the benefit-sharing arrangement. More importantly, this emphasis on stakeholders' consent is an implicit recognition that indigenous and local communities have some forms of proprietary or communal rights over their resources.

In fact, the CBD rests, as some commentators argue, on the notion of exploitation, the essential prerequisite of which is adequate property rights to bio-genetic resources and related knowledge (Boisvert and Caron 2002, p 151). Here, the emphasis on property right is aimed at creating a condition of negotiated and mutually profitable access and utilisation. In this sense, the legal framework presented by the Convention operates as a prelude to the introduction of bilateral market-like contracts between the holders and the users to ensure the fair and equitable sharing of benefits (ibid., p 152). Indeed, the Convention promotes transferrable rights to bio-genetic resources because the movement of resources is subject to the movement of rights. This movement, however, depends on prior informed consent. Simply stated, the requirement of prior informed consent has a distinctive character – it provides a guarantee to the users that resources and rights are moving with proper authorisation, and equally protects the rights of providers to receive a share of the benefits arising from commercial exploitation of their resources. As Fowler observes, genetic resources are not raw materials, but refined products or prior art developed through centuries of selection and breeding. So 'through the CBD, developing countries enunciated their desire for qualitatively different relationships between suppliers and recipients of genetic resources' (Fowler 2001, pp 478-479). In some way, it might appear that the providers of bio-genetic resources are assigned a privileged position in the bioeconomy – they are the steward in charge of protecting and conserving the rapidly disappearing stock of genetic resources – a position of empowerment that enables them to negotiate the economic value of their contribution. The Convention thus prescribes a very specific role for the providers: not just conserve and value their resources, but also negotiate a price for their consent, participate in exploitative activities, and profit from their rights. So, on the one hand, the Convention prescribes mechanisms to facilitate negotiation and

reciprocal exchange; and on the other, paves the way for the providers to invoke these mechanisms to transform themselves into rational, profit-maximising actors or *homo oeconomicus*. The claim for autonomy and the right to consent, recognised by the Convention and reiterated by ESG, are the means through which the providers are supposed to promote, valorise and maximise their entrepreneuring selves. Here, then, the Convention constructs a very specific kind of subjects – to achieve justice and to claim rights, the providers need to behave and conduct their activities in a certain way, that is, to transform and constitute themselves according to the techniques and mechanisms prescribed.

The understanding that justice should be achieved, as asserted by ESG repeatedly, by receiving a share of the benefits arising from commercial exploitation not only normalises appropriative activities, but also transforms the providers into subjects of property. At stake, is an assimilation, alliance or symbiosis of desire between the users and the providers of bio-genetic resources. This desire is clearly evident in ESG's reference to 'prior informed consent' and 'benefit-sharing arrangement' which, as my discussion shows, are intended to transform and constitute the subjects according to the aspiration of the bioeconomy. And it becomes ever more obvious from ESG's assertions because what remains folded in claims and demands is a desire is to include the providers in exploitative activities. Indeed, the indigenous and farming communities need to transform themselves – conduct their activities in a certain way to protect their resources and knowledge. I see this transformation as an assimilation with the dominant ideals of bioeconomy. That is, to ensure the production of desiring-subjects, so that the spaces of bio-economic production can be expanded.

The discussion above suggests that in the bioeconomy, and in the Bt. brinjal controversy in particular, heterogeneous elements combine or converge to constitute the process of becoming. It turns out that an association is the necessary condition in which relations emerge, ideas are mobilised, evoked and designated to the subject, and the subject who thinks, believes and speaks in the same language, constitutes her own becoming (Deleuze 1953/1991, pp 98-104). It follows that the emergent

subjectivity is formed by a collective (Guattari 1996, p 196). The term 'collective' should be understood here in the sense of a multiplicity that develops beyond the subject. Hence, the inseparability of emergent subjectivity from the technical and institutional mechanisms that support it (ibid., pp 196-197). To become, however, is not to attain a form because becoming is a process, it is always in the midst of being formed. Thus, to become, one needs to find the zone of proximity, indiscernibility, or indifferentiation where one can no longer be distinguished from others (Deleuze 1993/1997, p 1). Then, what I want to point out, rather disturbingly, is that to protect and conserve their resources and knowledge, the providers need to put themselves in the zone of proximity and adopt the language of indifferentiation. That is, to participate in commercial exploitation, to transform their resources into commodities, and even to transform themselves into subjects of property, into enterprising selves. In short, the providers need to assimilate themselves and become co-participants by forging exclusive alliance with the component parts of the bioeconomy. Strikingly, this becoming is not a part of their communal and intergenerational history. Rather, it entails leaving behind their culture, identity and autonomy. Put otherwise, to become co-participants, to become *homo oeconomicus*, the providers need to leave behind their history, howsoever recent (Deleuze 1990/1995, p 171), In what follows, there is a discursive shift in the constitution of subjectivity in the bioeconomy. This transformation, I would argue, is an emergent subjectivity – a becoming, shaped and produced by deploying a multiplicity of mechanisms and practices or 'polyphonic modes of subjectivation' (Guattari, 1996, p 199) through which desire moves and assembles. Crucially, then, the mobilisation of claims, demands and rights by ESG in the Bt. brinjal controversy is not surprising. It is rather folding once again of what remains folded, or overcoding of what remains coded in heterogeneous techniques and practices. It becomes apparent that the desiring-subjects are an ensemble of the bioeconomy, a part of the infrastructure. Thus, we can say, along with Deleuze/Guattari, the subjects always remain peripheral to the bioeconomy, 'garnering here, there, and everywhere a reward in the form of a becoming' (Deleuze and Guattari 1972/1977, p 16).

6.7: Conclusion

In this chapter, my aim was to provide an account of how subjectivity takes shape and emerges in the bioeconomy. Foucault's analytical framework illustrates that the transformed subjects emerge through subjection. An important aspect of his analysis is the emphasis that subjectivity is a process of becoming, which takes shape through techniques and mechanisms prescribed by various governmental institutions. This understanding becomes clear in my discussion of OECD and DBT's policy prescriptions. However, without leaving the Foucaultian analytic entirely, I have moved towards a Deleuze/Guattarian analysis of becoming. Because I was interested to see how does the continuous movement of desire between disparate elements shape becoming in the bioeconomy. In short, how subjectivity is shaped and produced by a multiplicity. Consequently, my analysis also moved in a slightly different direction. I have shown how desire moves through diverse mechanisms and practices, especially in the Bt. brinjal controversy, which are designed to shape and transform the behaviours, thoughts, conducts and activities of the subjects. So I have argued that it is the movement of desire that creates a condition for the emergence of desiring-subjects. And this desire remains folded in legal mechanisms and practices prescribed by various global/local institutions. To substantiate this argument, I have focused on strategies adopted by ESG to mobilise claims and demands, especially the rights discourse, and its insistence on 'benefit-sharing' arrangement and 'prior informed consent' to redress injustice. Significantly, these claims and demands moved through the component parts of the bioeconomy designed to transform the subjects, to produce *homo oeconomicus.* Indeed, the mechanisms and practices, which the ESG invoked to articulate rights claim, are aimed at transforming the subjects in a certain way, so that they can be aligned with the aspiration of the bioeconomy. ESG's invocation of the component parts of the bioeconomy, therefore, is an assimilation in the assemblage, becoming part of the infrastructure – an emergent subjectivity, shaped by disparate elements through which desire moves and flows.

Conclusion

This thesis was aimed towards examining how the bioeconomy operates; and how law mediates such operation in a global/postcolonial context. In exploring the main questions, the thesis emphasised the importance of ‘thinking through’ the philosophy of Deleuze/Guattari. Since Deleuze/Guattari were committed to bring movement in thought and to experiment with concepts, the thesis deployed the concept of ‘desiring-machine’ to explain the operation of the bioeconomy. Although comprised of dispersed elements, the bioeconomy operates in a connective fashion, through

conjunctions. The main focus, then, was to understand what establishes conjunctions between the elements. Put otherwise, how the elements connect and function in conjunction. The thesis has shown that disparate elements relate to each other through the continuous movement of desire. This movement, however, was mediated by law. In fact, the thesis revealed that this desire remains folded in heterogeneous legal mechanisms and practices through which the bioeconomy intends to expand the spaces of bio-economic production. A corollary to this observation is that the bioeconomy is an infrastructure in which disparate elements connect, relate, combine, co-function and work in symbiosis through the de/re-territorialising flows of desire. Accordingly, the thesis suggests that it is important to understand the bioeconomy as a 'desiring-machine'.

I have attempted to substantiate the above observations through my discussion of the Bt. brinjal controversy in India and, thus, Deleuze/Guattari's philosophical thinking remains the enduring thread throughout the thesis. The preceding chapters already detailed how the desire to propertise, to normalise appropriation, to contest, and to produce transformed subjects moved through disparate elements in the controversy. And how law mediated these movements and by doing so, spatialised materiality, normalisation, power and subjectivity. The conclusion thus brings together the ideas laid out throughout the thesis. However, given that the thesis combined dispersed lines, movements and flows, and deployed a range of complex concepts to construct the dimensions of the bioeconomy, it is difficult to simplify the arguments presented throughout. The conclusion, therefore, reiterates the main observation made in each chapter without going into details.

The Bt. brinjal controversy has been an important source of inquiry throughout the thesis. Specifically, I have looked into the controversy as an 'event' in which heterogeneous entities co-exist, interact, co-function and relate to each other. Thus, by unfolding the event, I have highlighted a number of competing modalities that run throughout the controversy. The first concerns the debate surrounding risk and uncertainty of bio-technical science. This debate arose in the wake of commercialisation and remains exclusively tied to techno-economic scepticism and

optimism. The focus of second modality was on uncertainty in the regulatory governance of biotechnology. To be more specific, a number of scholars have pointed out the uncertainty in legal mechanisms which regulate risk assessment and the environmental release of GMO's. Interestingly, these two competing but related modalities revolve around facts. Then, my argument is that these narratives of facts in scientific and legal discourses produce a 'factish epistemology' of law and science. The third modality, somewhat different from the preceding two, brought to attention the issue of biopiracy – unauthorised appropriation of local brinjal germplasm by a number of global/local entities in the production of Bt. brinjal. The discourse of biopiracy reveals the interaction between disparate elements, such as global/local bio-tech corporations, regulatory institutions, bio-genetic resources, civil society actors, biodiversity laws, and proprietary bio-technical artefact. In short, the biopiracy discourse shows that the production of Bt. brinjal is not just a simple affair of facts and certainty, but rather involves issues concerning unauthorised appropriation, right to receive a 'fair and equitable' share of the benefits arising from commercial exploitation, and legal requirement of 'prior informed consent'. The main concern, from this perspective, was with governance – governing the access and utilisation of bio-genetic resources through legal norms. This insistence on governing appropriation through law is an indication of how the desire to normalise appropriation operates in the bioeconomy. However, I have pointed out that a number of other issues remain folded in the event, especially how desire moves through disparate elements, such as Mahyco/Monsanto's desire to propertise emergence, the desire to contest or interaction between differentiated relations of power/desire, and the desire to produce transformed subjects. And so, I have argued that the Bt. brinjal controversy has multiple dimensions, it is a multiplicity.

But the question is: how do we provide an account of the co-existence of disparate elements, their inter-actions, inter-relations, co-functioning and dispersion? Put differently, how do we describe a multiplicity or what methodological approach does one need to adopt to construct the dimensions of the multiple? This is a methodological challenge that chapter 2 attempted to address. To this end, I have pointed out that in contemporary 'law and globalisation' scholarship, legal scholars theorise and understand the multiple or multiplicity in terms of many or plural legal

orders, fields, levels and spaces. In contrast, I have adopted a very specific methodological approach, which 'thinks through' the concept of 'multiplicity'. As a topological concept, it puts emphasis on constructing the multiple by adding elements successively through conjunctions. It follows that a multiplicity is a formation in which heterogeneous elements come together through lines and movements. Thus, what matters in a multiplicity are not the elements, but rather their movements or deterritorialisation, dispersion and interrelations. From this point of view, a multiplicity has many dimensions. However, one needs to construct these dimensions through 'rhizomatic thinking', which moves in all directions. As a style of thinking, it establishes paths of communication between dispersed elements and arranges them in semiotic chains through connections, combinations, and linkages. In what follows, by linking, connecting and combining one element with the other, rhizomatic thinking constructs an assemblage – a complex constellation of heterogeneous elements. In this direction, I have emphasised that a multiplicity is an assemblage – it is a piece by piece construction. Rhizomatic thinking, in this sense, is equally a style of composition because the relations between the many need to be actualised in extensive series. Therefore, mapping or cartography is an essential element of rhizomatic thinking. I reiterate these insights here because they foreground the approach through which I have constructed and described the dimensions of the controversy. And this construction was not just limited to adding elements successively; it was equally aimed towards linking and combining one concept with another through conjunctions. Rhizomatic thinking thus paved the way for experimentation with concepts and accordingly, I have added new concepts successively throughout the chapters to multiply and expand the dimension.

Since I have framed my investigation through the Bt. brinjal controversy in which multiplicities remain folded, the point of orientation is the movement of desire because it is desire that couples, connects, assembles and creates chains. So chapter 3 has demonstrated that Mahyco/Monsanto's desire to produce and propertise a new life form brought into existence an emergent space of property in a distant location. The point, however, is that this desire to propertise remains folded in the idea of materiality in Euro-American intellectual property law, which moved through dispersed spaces. Thus, while the focus of the chapter was on movement or

deterritorialisation of the idea of materiality, I have also emphasised its territorialisation and re-territorialisation. Significantly, this de/re-territorialisation was mediated by disparate elements, such as Monsanto, Bt. gene, the TRIPs Agreement and Indian patent law. The chapter, therefore, traced how an emergent space of property comes into existence through the movement of desire, which established machinic conjunctions between the elements. What this suggests is that de/re-territorialisation is not just mere 'extension and diffusion', rather it is a 'movement in process' because it brings into view continuity, consistency and dispersion. This understanding has recurred in chapter 4 but in a very different dimension. As emphasised, deterritorialisation is a 'movement in process' and thus, in deterritorialisation we only find expansion, a guiding thread of my discussion of normalisation in chapter 4. The chapter looked into the issue of governing access and utilisation of bio-genetic resources that we find in ESG's discourse of biopiracy. Since the viability of the bioeconomy depends on unparalleled access to bio-genetic resources, governance mechanisms are important to normalise appropriation. With this in mind, I have argued that instead of idealising the discourse of biopiracy, one needs to examine how normalisation occurs through the expansion of governance. To this end, I have linked up the concepts of 'governmentality' and 'normalisation' with 'de/re-territorialisation'. The purpose of governance, from Foucault's point of view, is to expand the spaces of the market by normalising the movement of persons and things. However, this normalisation depends on legal institutions or a framework of law, an understanding affirmed by Georges Canguilhem. The chapter observed that the CBD and its local counterpart, the Biological Diversity Act, are aimed towards normalising the appropriation of bio-genetic resources. In particular, the analysis revealed that the CBD not only legitimised appropriation, but also normalised the movement of desire, so that the spaces of bio-economic production can be expanded. Stated otherwise, global/local governance mechanisms have deterritorialised and spatialised the desire to normalise appropriation.

In chapter 5, I have looked more closely into ESG's contestation of unauthorised appropriation through the discourse of biopiracy. I have emphasised that it is necessary to understand this opposition or encounter as a differential power/desire. Foucault's analyses of power relations thus became relevant for my discussion.

Considering Foucault's emphasis on power in spatial and relational terms, the chapter scrutinised how power relations are analysed in contemporary intellectual property law scholarship. The chapter pointed out that these literatures view the TRIPs regime as a vehicle of power and domination and by doing so, situate power relations within a centre/periphery framework. Instead, the chapter demonstrated that the TRIPs regime is a space of power/knowledge that expands in all directions through interaction and mediation. Put otherwise, what remains folded in the TRIPs regime is the desire to expand a specific space of power/knowledge across the globe. And this desire is mediated by heterogeneous entities and therefore, moved through dispersed spaces. That being said, the desire to expand is contested by civil society actors, especially through the discourse of biopiracy. Thus, the chapter has argued that ESG's contestation is a counter-power or a differential desire. While my aim in this chapter was to provide an account of how differentiated relations of power/desire operate in the bioeconomy, I have ended the discussion on a different note, that is, to view the differential power/desire as a form of becoming giving rise to emergent subjectivities.

Ultimately, the main purpose of my discussion in chapter 5 was to show how desire moves, creates chains and establishes conjunctions. On this view, chapter 6 expanded the analyses carried out in chapter 5. Given that the discourse of biopiracy was mobilised to highlight injustice, the ESG made a number of claims and demands in the Bt. brinjal controversy. These claims and demands were articulated in terms of legal rights – the right to receive a 'fair and equitable' share of the benefits arising out of the commercial exploitation of local germplasm, and the legal requirement of 'prior informed consent'. Interestingly, the ESG has mobilised its rights claim through the CBD and the Biological Diversity Act – two component parts of the bioeconomy that have deterritorialised and spatialised the desire to normalise appropriation. The articulation of legal rights to heal injustice, I have argued, gives rise to emergent subjectivities because what remains folded in rights discourse is the desire to produce transformed subjects. The point, however, is that this desire to transform is shaped by heterogeneous elements through which the desire to propertise, to normalise appropriation, to contest, and to expand the spaces of bio-economic production move. Thus, while the chapter began with Foucaultian analytic

of subjectivity, it gradually moved towards a Deleuze/Guattarian analysis of 'becoming' to demonstrate how a multiplicity shapes and produces emergent subjectivity in the bioeconomy. In what follows, the chapter has shown that this emergent subjectivity is a becoming – becoming a part of the desiring-machine.

In this thesis, I have discussed how law mediates the operation of the bioeconomy in a global/postcolonial context. Keeping this in view, I would like to reflect briefly on law's operation in the bioeconomy, and in the global legal order in general. Certainly, the operation of the bioeconomy is global; it is expansive and deterritorial. It follows that law's operation has equally become global, expansive and deterritorialised. This is not surprising, however. Because law and globalisation scholars have already pointed out the globalisation of law, or the emergence of global law. To this end, they have also shown how law operates, regulates and governs at multiple levels or scales. Nevertheless, it remains the case that the bioeconomy is comprised of dispersed elements. Yet these elements relate to each other and function in conjunction. And it has already become clear how law mediates their functioning and establishes conjunctions between them. Simply stated, law co-functions, co-ordinates, creates chains and produces intensities. And, as emphasised briefly in chapter 2, this conjunctive synthesis has implication for how we theorise the operation of law in the global legal order. No doubt, one can pay attention to multiple, plural, fragmented, inter-connected legal orders or fields. Likewise, one can definitely describe the spatiality of law by focusing on geographic reach, diffusion and scale. But, as Philippopoulos-Mihalopoulos has observed recently, law's spatial turn is much larger and much more threatening that demands serious engagement and new conceptualisation (Philippopoulos-Mihalopoulos 2012, p 90). In this light, it is important to understand how law establishes conjunctions and produces functional synthesis between dispersed elements. In brief, can we describe the operation and spatialisation of law by looking into how it operates through conjunctions. A crucial supplement in this regard would be to think about the 'global legal order' (or perhaps 'global legal structure') as an 'infrastructure' in which the multiple, the plural, the disparate come together, hang together, co-function and relate to each other through conjunctions. Such a re-framing is essential to understand the operation of law in the

global legal order. However, to explore such a possibility, a movement in our thinking and theorisation is necessary.

Bibliography

Abdul Ahad, H et al. (2010) 'Bt Brinjal: The Controversial Genetically Modified Food', 3(5) *Journal of Pharmacy Research*, pp 912-915.

Abu-Lughod, L (1990) 'The Romance of Resistance: Tracing Transformations of Power through Bedouin Women', 17(1) *American Anthropologist*, pp 41-55.

Agrawal, A (2005a) *Environmentality: Technologies of Government and the Making of Subjects*, Durham: Duke University Press.

Agrawal, A (2005b) 'Environmentality: Community, Intimate Government, and the Making of Environmental Subjects in Kumaon, India', 46(2) *Current Anthropology*, pp 161-190.

Alberstein, M (2009) 'Measures of Legal Formalism', *Bar-Ilan University Public Law and Legal Theory Working Paper No. 04 – 09*.

Aleinikoff, T A (2008) 'Transnational Spaces: Norms and Legitimacy', 33 *Yale Journal of International Law*, pp 479-490.

Alessandrini, D (2010) *Developing Countries and the Multilateral Trade Regime: The Failure and Promise of the WTO's Development Mission*, Oxford and Oregon: Hart Publishing.

Allen, J (2004) 'The Whereabouts of Power: Politics, Government and Space', 86B(1) *Geografiska Annaler*, pp 19-32.

Allen, J (2009) 'Three spaces of power: territory, networks, plus a topological twist in the tale of domination and authority', 2(2) *Journal of Power*, pp 197-212.

Alliez, E (2011) 'Rhizome (With no return)', 167 *Radical Philosophy*, pp 36-42.

Amin, A (2002) Spatialities of globalisation', 34 *Environment and Planning A*, pp 385-399.

Anderson, Paul N (2001) 'The GE Debate: What is at Risk When Risk is Defined for Us?', 12(1) *Capitalism Nature Socialism*, pp 39-44.

Anghie, A (2004) *Imperialism, Sovereignty and the Making of International Law*, Cambridge, UK: Cambridge University Press.

Appadurai, A (1990) 'Disjuncture and Difference in the Global Cultural Economy', 2(2) *Public Culture*, pp 1-24.

Appadurai, A (1991) 'Global Ethnoscapes: Notes and Queries for a Transnational Anthropology' in Fox, Richard G (ed.) *Recapturing Anthropology: Working in the Present*, Snata Fe, New Mexico: School of American Research Press, pp 191-210.

Appadurai, A (1996) *Modernity at Large: Cultural Dimensions of Globalization*, Minneapolis: University of Minnesota Press.

Arup, C (2000) *The New World Trade Organization Agreements: Globalizing Law Through Services and Intellectual Property*, Cambridge, UK: Cambridge University Press.

Ashcroft, B (2009) 'Alternative Modernities: Globalization and the Post-Colonial', 40(1) *Ariel*, pp 81-105.

Bainbridge, D (1999) *Intellectual Property*, London: Financial Times Management.

Bandopadhyay, R, Sinha, P and Chaudhary, B (2012) 'Is *B*t-brinjal ready for future food? – A critical study', 11 *Indian Journal of Biotechnology*, pp 238-240.

Baxi, U (1992) 'The State's Emissary: The Place of Law in Subaltern Studies' in Chatterjee, P and Pandey, G (eds.) *Subaltern Studies, Vol. VII*, New Delhi: Oxford University Press, pp 247-264.

Baxi, U (2000) 'Postcolonial Legality' in Schwarz, H and Ray, S (eds.) *A Companion to Postcolonial Studies*, Oxford: Blackwell, pp 540-555.

Baxi, U (2002) *The Future of Human Rights* (3rd Ed.), New Delhi: Oxford University Press.

Baxi, U (2003) 'The colonialist heritage' in Legrand, P and Munday, R (eds.) *Comparative Legal Culture: Traditions and Transitions*, Cambridge, UK: Cambridge University Press, pp 46-75.

Baxi, U (2007) *Human Rights in a Posthuman World: Critical Essays*, New Delhi: Oxford University Press.

Barnett, Michael N and Finnemore, M (1999) 'The Politics, Power, and Pathologies of International Organizations', 53(4) *International Organization*, pp 699-732.

Barthes, R (1977) 'The Death of the Author' in Heath, S (ed. and trans.) *Image-Music-Text*, Glasgow: Fontana/Collins, pp 142-148.

Baudrillard, J (1977/2007) *Forget Foucault* (trans. Nicole Dufresne), Los Angeles, CA: Semiotext(e).

Baxter, H (1995-1996) 'Bringing Foucault into Law and Law into Foucault', 48 *Stanford Law Review*, pp 449-479.

Baxter, P and Jack, S (2008) 'Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers', 13(4) *The Qualitative Report*, pp 544-559.

Bell, David E (1993) 'The 1992 Convention on Biological Diversity: The Continuing Significance of U.S. Objections at the Earth Summit', 26 *George Washington Journal of International Law and Economics*, pp 497-537.

Benda-Beckman, Franz v, Benda-Beckmann, Keebet v and Griffiths, A (2005) 'Mobile People, Mobile Law: An Introduction' in Benda-Beckman, Franz v, Benda-Beckmann, Keebet v and Griffiths, A (eds.) *Mobile Law, Mobile People: Exploring Legal Relations in a Contracting World*, Aldershot: Ashgate, pp 1-25.

Benda-Beckmann, Franz v and Benda-Beckmann, Keebet v (2007) 'Transnationalisation of Law, Globalisation and Legal Pluralism: a Legal Anthropological Perspective' in Antons, C and Gessner, V (eds.) *Globalisation and Resistance: Law Reform in Asia since the Crisis*, Oxford: Hart, pp 53-80.

Benda-Beckman, Franz v, Benda-Beckmann, Keebet v and Griffiths, A (2009) 'Space and Legal Pluralism: An Introduction' in Benda-Beckman, Franz v, Benda-

Beckmann, Keebet v and Griffiths, A (eds.) *Spatialising Law: An Anthropological Geography of Law in Society*, Surrey: Ashgate, pp 1-29.

Benjamin, W (1996) 'Capitalism as Religion' in Bullock, M and Jennings, M W (eds.) *Walter Benjamin: Selected Writings, Vol. 1 1913-1926*, Cambridge, Massachusetts: The Belknap Press of Harvard University Press, pp 288-291.

Bentham, J (1871) *Theory of Legislation* (trans. R Hildreth), London: Trubner

Berman, Paul S (2012) *Global Legal Pluralism: A Jurisprudence of Law Beyond Borders*, Cambridge, UK: Cambridge University Press.

Bhargava, Pushpa M (2010) 'The story of Bt-brinjal in India: why it is not required', 37(3) *Microbiology Today*, pp 174-177.

Bhat, R V and Vasanthi, S (2008) 'Antiquity of the cultivation and use of brinjal in India', 12 *Asian Agri-History*, pp 169-178.

Biagioli, M (2006) 'Patent Republic: Representing Inventions, Constructing Rights and Authors', 73(4) *Social Research*, pp 1129-1172.

Bignall, S (2010) *Postcolonial Agency: Critique and Constructivism*, Edinburgh: Edinburgh University Press.

Bignall, S and Patton, P (2010) 'Deleuze and the Postcolonial: Conversations, Negotiations, Mediations' in Bignall, S and Patton, P (eds.) *Deleuze and the Postcolonial*, Edinburgh: Edinburgh University Press, pp 1-19.

Bix, B (2006) *Jurisprudence: Theory and Context* (4th ed.), Sweet and Maxwell.

Black, J (1998) 'Regulation as Facilitation: Negotiating the Genetic Revolution', 61 *Modern Law Review*, pp 621-660.

Blakeney, M (2004) 'International intellectual property jurisprudence after TRIPs' in Waver, D and Bently, L (eds.) *Intellectual Property in the New Millennium: Essays in Honour of William R. Cornish*, Cambridge, UK: Cambridge University Press, pp 3-19.

Blatter, J (2008) 'Case Study' in Given, L (ed.) *The Sage Encyclopedia of Qualitative Research Methods, Vols. 1 & 2*, London: Sage, pp 68-71.

Boisvert, V and Caron, A (2002) 'The Convention on Biological Diversity: An Institutionalist Perspective of the Debates', 36(1) *Journal of Economic Issues*, pp 151-166.

Bottomley, A and Moore, N (2008) 'Blind Stuttering: Diagrammatic City', 17(2) *Griffith Law Review*, pp 559-576.

Bottomley, A and Moore, N (2012) 'Law, Diagram, Films: Critique Exhausted', 23 *Law and Critique*, pp 163-182.

Boundas, Constantin V (2006) 'What Difference does Deleuze's Difference make?' in Boundas, Constantin V (ed.) *Deleuze and Philosophy*, Edinburgh: Edinburgh University Press, pp 3-26.

Bourdieu, P (1987) 'The Force of Law: Toward a Sociology of the Juridical Field', 38 *Hastings Law Journal*, 814-853.

Boyle, J (2004) 'A Manifesto on WIPO and the Future of Intellectual Property', 9 *Duke Law and Technology Review*, pp 1-12.

Brady, M (2014) 'Ethnographies of Neoliberal Governmentalities: from the neoliberal apparatus to neoliberalism and governmental assemblages', 18 *Foucault Studies*, pp 11-33.

Braithwaite, J and Drahos, P (2000) *Global Business Regulation*, Cambridge, UK: Cambridge University Press.

Braithwaite, J (2002) 'Rules and Principles: A Theory of Legal Certainty', 27 *Australian Journal of Legal Philosophy*, pp 47-82.

Bromley, D B (1990) 'Academic contributions to psychological counselling: 1. A philosophy of science for the study of individual cases', 3(3) *Counselling Psychology Quarterly*, pp 299-307.

Brush, Stephen B (1996) 'Whose Knowledge, Whose Genes, Whose Rights?' in Brush, Stephen B and Stabinsky, D (eds.) *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights*, Washington, D.C.: Island Press, pp 1-21.

Buchanan, I (1999) 'Introduction' in Buchanan, I (ed.) *A Deleuzian Century?*, London and Durham: Duke University Press, pp 1-11.

Burch, K (1995) 'Intellectual Property Rights and the Culture of Global Liberalism', 17(2) *Science Communication*, pp 214-232.

Burchell, G (1996) 'Liberal government and techniques of the self' in Barry, A, Osborne, T and Rose, N (eds.) *Foucault and Political Reason: Liberalism, neo-liberalism and rationalities of government*, London: UCL Press, pp 19-36.

Burns, L and Kaiser, Brigit M (2012) 'Introduction: Navigating Differential Futures, (Un)making Colonial Pasts' in Burns, L and Kaiser, Brigit M (eds.) *Postcolonial Literatures and Deleuze: Colonial Pasts, Differential Futures*, Basingstoke, Hampshire: Palgrave Macmillan, pp 1-20.

Butler, J (1997) *The Psychic Life of Power: Theories in Subjection*, Sanford, California: Stanford University Press.

Calliess, Gralf-Peter (2002) 'Reflexive Transnational Law: The Privatisation of Civil Law and the Civilisation of Private Law', 23(2) *Zeitschrift für Rechtssoziologie*, pp 185-216.

Callon, M, Lascoumes, P and Barthe, Y (2001/2009) *Acting in an Uncertain World: An Essay on Technical Democracy* (trans. Graham Burchell), Cambridge, Massachusetts: MIT Press.

Campbell, Brian L (1985) 'Uncertainty as Symbolic Action in Disputes Among Experts', 15 *Social Studies of Science*, pp 429-453.

Canguilhem, G (1966/1989) *The Normal and the Pathological* (trans. Carolyn R Fawcett), New York: Zone Books.

Canguilhem, G (1994) *A Vital Rationalist: Selected Writings from Georges Canguilhem* (trans. Arthur Goldhammer), New York: Zone Books.

Carolan, M (2007) 'Mapping Biotechnology: From Epistemic Artifacts to Geographies of Control', 2(2) *Nature and Culture*, pp 115-138.

Carolan, Michael S (2010) *Decentering Biotechnology: Assemblages Built and Assemblages Masked*, Surrey, England: Ashgate.

Chasek, P (1994) 'The Story of the UNCED Process' in Spector, Bertram I, Sjostedt, G and Zartman, I W (eds.) *Negotiating International Regimes: Lessons Learned from the United Nations Conference on Environment and Development (UNCED)*, Dordrecht: Martinus Nijhoff, pp 45-61.

Chaudhary, B and Gaur, K (2009) The Development and Regulation of Bt. Brinjal in India (Eggplant/Aubergine), *ISAAA Brief No. 38*, Ithaca, New York: ISAAA.

Chenail, Ronald J (2011) 'Ten Steps for Conceptualising and Conducting Qualitative Research Studies in a Pragmatically Curious Manner', 16(6) *The Qualitative Report*, pp 1713-1730.

Chomsky, N and Foucault, M (1974/2006) 'Human Nature: Justice vs. Power: A Debate Between Noam Chomsky and Michel Foucault' in Chomsky, N and Foucault, M, *The Chomsky-Foucault Debate: On Human Nature*, New York and London: New Press, pp 1-67.

Chowdhury, N and Srivastava, N (2010) 'Decision on Bt-Brinjal: Legal Issues', 45(15) *Economic and Political Weekly*, pp 18-22.

Cohen, Morris R (1931) 'Justice Holmes and the Nature of Law', 31 *Columbia Law Review*, pp 352-367.

Colebrook, C (2009) 'Legal Theory after Deleuze' in Braidotti, R, Colebrook, C and Hanafin, P (eds.) *Deleuze and Law: Forensic Futures*, New York: Palgrave Macmillan, pp 6-23.

Coleman, Felicity J (2010) 'Rhizome' in Parr, A (ed.) *The Deleuze Dictionary* (Rev. Ed.), Edinburgh: Edinburgh University Press, pp 232-235.

Collier, Jane F, Maurer, B and Suarez-Navaz, L (1997) 'Sanctioned Identities: Legal Constructions of Modern Personhood', 2(1-2) *Identities*, pp 1-27.

Collier, Stephen J and Ong, A (2005) 'Global Assemblages, Anthropological Problems' in Ong, A and Collier, Stephen J (eds.), *Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems*, Oxford: Blackwell, pp 3-21.

Collier, Stephen J (2009) 'Topologies of Power: Foucault's Analysis of Political Government beyond "Governmentality"', 26(6) *Theory, Culture & Society*, pp 78-108.

Collins, Harry M (1987) 'Certainty and the Public Understanding of Science: Science on Television', 17 *Social Studies of Science*, pp 689-713.

Colombat, Andre P (1991) 'A Thousand Trails to Work with Deleuze', 20(3) *SubStance*, pp 10-23.

Comaroff, John L (2001) 'Colonialism, culture and the law: A foreword', 26(2) *Law and Social Inquiry*, pp 305-314.

Commission on Global Governance (1995) *Our Global Neighbourhood: The Report of the Commission on Global Governance*, New York: Oxford University Press.

Cook, Kay E (2008) 'Discourse' in Given, L (ed.) *The Sage Encyclopedia of Qualitative Research Methods, Vols. 1 & 2*, London: Sage, pp 216-217.

Coombe, R (1991) 'Contesting The Self: Negotiating Subjectivities in Nineteenth-Century Ontario Defamation Trails' in Sarat, A and Silbey, Susan S (eds.) *Studies in Law, Politics, and Society, Vol. 11*, New York: JAI Press, pp 3-40.

Coombe, Rosemary J (1998) *The Cultural Life of Intellectual Properties: Authorship, Appropriation, and the Law*, Durham and London: Duke University Press.

Coombe, Rosemary J (2003) 'Works in Progress: Traditional Knowledge, Biological Diversity, and Intellectual Property in a Neoliberal Era' in Perry, R W and Maurer, B (eds.) *Globalization under Construction: Governmentality, Law, and Identity*, Minneapolis: University of Minnesota Press, pp 273-313.

Cooper, M (2008) *Life as Surplus: Biotechnology and Capitalism in the Neoliberal Era*, Seattle and London: University of Washington Press.

Corner, J (1999) 'The Agency of Mapping: Speculation, Critique and Invention' in Cosgrove, D (ed.) *Mappings*, London: Reaktion Books, pp 213-252.

Cornwall, A (2002a) 'Locating Citizen Participation', 33(2) *IDS Bulletin*, pp 49-58.

Cornwall, A (2002b) *Making spaces, changing places: situating participation in development, IDS Working Paper 170*, Sussex, England: Institute of Development Studies.

Cornwall, A (2004) 'Introduction: New Democratic Spaces? The Politics and Dynamics of Institutionalised Participation', 35(2) *IDS Bulletin*, pp 1-10.

Cossman, B (1997) 'Turning the Gaze back on Itself: Comparative Law, Feminist Legal Studies, and the Postcolonial Project', 2 *Utah Law Review*, pp 525-544.

Cotterrell, R (2008) 'Transnational Communities and the Concept of Law', 31(1) *Ratio Juris*, pp 1-18.

Cotterrell, R (2009) 'Spectres of Transnationalism: Changing Terrains of Sociology of Law', 36(4) *Journal of Law and Society*, pp 481-500.

Cotterrell, R (2012) 'What is Transnational Law', 37(2*) Law and Social Inquiry*, pp 500-524.

Croce, M and Goldoni, M (2015) 'A sense of self-suspicion: global legal pluralism and the claim to legal authority', 8(1) *Ethics and Global Politics*, pp 1-20.

Cunningham, H (1998) 'Colonial Encounters in Postcolonial Times: Patenting Indigenous DNA and the Human Genome Diversity Project', 18(2) *Critique of Anthropology*, pp 205-233.

Darian-Smith, E (1996) 'Postcolonialism: A Brief Introduction', 5(3) *Social and Legal Studies*, pp 291-299.

Darian-Smith, E (2004) 'Ethnographies of Law' in Sarat, A (ed.) *The Blackwell Companion to Law and Society*, Oxford, UK: Blackwell, pp 545-568.

Darian-Smith, E (2000) 'Structural Inequalities in the Global Legal System', 34(3) *Law and Society Review*, pp 809-828.

Darian-Smith, E (2013a) 'Postcolonial Theories of Law' in Banakar, R and Travers, M (eds.) *Law and Social Theory* (2nd Ed.), Oxford: Hart, pp 247-264.

Darian-Smith, E (2013b) *Laws and Societies in Global Contexts: Contemporary Approaches*, Cambridge: Cambridge University Press.

Darian-Smith, E (2013c) 'Locating a Global Perspective', 4(4) *Transnational Legal Theory*, pp 524-526.

Darian-Smith, E (2015) 'Postcolonial Law' in Wright, James D (ed.) *International Encyclopedia of the Social and Behavioral Sciences* (2nd Ed.), Oxford: Elsevier, pp 647-651.

Davidson, Arnold I (2005) 'Introduction' in Foucault, M (2001/2005) *The Hermeneutics of the Subject, Lectures at the College de France 1981-82* (trans. Graham Burchell), New York: Palgrave Macmillan, pp xix-xxx.

Dean, M (1999) *Governmentality: Power and Rule in Modern Society*, London: Sage.

Dam, Kenneth W (1994) 'The Economic Underpinnings of Patent Law', 23(1) *Journal of Legal Studies*, pp 247-271.

Davies, M and Nafine, N (2001) *Are Persons Property? Legal Debates About Property and Personality*, Aldershot: Ashgate Dartmouth.

Delaney, D (2001) 'Making Nature/Marking Humans: Law as a Site of (Cultural) Production', 91(3) *Annals of the Association of American Geographers*, pp 487-503.

Deleuze, G (1953/1991) *Empiricism and Subjectivity: An Essay on Hume's Theory of Human Nature* (trans. Constantin V. Boundas), New York: Columbia University Press.

Deleuze, G (1966/1988) *Bergsonism* (trans. Hugh Tomlinson and Barbara Habberjam), New York: Zone Books.

Deleuze, G (1968/1994) *Difference and Repetition* (trans. Paul Patton), New York: Columbia University Press.

Deleuze, G and Sacher-Masoch, Leopold V (1967/1989) *Masochism* (trans. Jean McNeil), New York: Zone Books.

Deleuze, G (1969/1990) *The Logic of Sense* (trans. Mark Lester and Charles Stivale), London: Athlone Press.

Deleuze, G and Guattari, F (1972/1977) *Anti-Oedipus* (trans. Robert Hurley, Mark Seem and Helen R Lane), London: Penguin.

Deleuze, G (1972/2004a) 'How Do We Recognise Structuralism' in Deleuze, G (2002/2004) *Desert Islands and Other Texts 1953-1974* (trans. Michael Taormina), New York: Semiotext(e), pp 170-192.

Deleuze, G (1973/2004b) 'On Capitalism and Desire' in Deleuze, G (2002/2004) *Desert Islands and Other Texts 1953-1974* (trans. Michael Taormina), New York: Semiotext(e), pp 262-273.

Deleuze, G (1973/2001) 'Dualism, Monism and Multiplicities (Desire-Pleasure-*Jouissance*)', 2 *Contretemps*, pp 92-108.

Deleuze, G and Guattari, F (1975/1986) *Kafka: Toward a Minor Literature* (trans. Dana Polan), Minneapolis: University of Minnesota Press.

Deleuze, G and Parnet, C (1977/1987) *Dialogues* (trans. Hugh Tomlinson and Barbara Habberjam), New York: Columbia University Press.

Deleuze, G and Guattari, F (1980/2004) *A Thousand Plateaus* (trans. Brian Massumi), London and New York: Continuum.

Deleuze, G (1983/1986) *Cinema 1: The Movement-Image* (trans. Hugh Tomlinson and Barbara Habberjam), Minneapolis: University of Minnesota Press.

Deleuze, G and Guattari, F (1983) *On the Line* (trans. John Johnston), New York: Semiotext(e).

Deleuze, G (1986/1988) *Foucault* (trans. Sean Hand), Minneapolis: University of Minnesota Press.

Deleuze, G (1988/1993) *The Fold: Leibniz and the Baroque* (trans. Tom Conley), London: Athlone Press.

Deleuze, G (1988-89/1996) *L'Abecedaire de Gilles Deleuze, avec Claire Parnet/Gilles Deleuze from A to Z* (trans. Charles J. Stivale) (DVD), New York: Semiotext(e).

Deleuze, G (1990/1995) *Negotiations: 1972 – 1990* (trans. Martin Joughin), New York: Columbia University Press.

Deleuze, G and Guattari, F (1991/1994) *What is Philosophy?* (trans. Hugh Tomlinson and Graham Burchell), New York: Columbia University Press.

Deleuze, G (1993/1997) *Essays: Critical and Clinical* (trans. Daniel W. Smith and Michael A. Greco), Minneapolis: University of Minnesota Press.

Deleuze, G (2001/2007) *Two Regimes of Madness: Texts and Interviews 1975 – 1995*, New York: Semiotext(e).

Deleuze, G (2002/2004) 'Instincts and Institutions' in Deleuze, G, *Desert Islands and Other Texts 1953-1974* (trans. Michael Taormina), New York: Semiotext(e), pp 19-21.

della Porta, D and Keating, M (2008) 'How many approaches in the social science? An epistemological introduction' in della Porta, D and Keating, M (eds.) *Approaches and Methodologies in the Social Sciences: A Pluralist Perspective*, Cambridge, UK: Cambridge University Press, pp 19-39.

Denzin, Norman K and Lincoln, Yvonna S (2011) 'Introduction: The Discipline and Practice of Qualitative Research' in Denzin, Norman K and Lincoln, Yvonna S (eds.) *The Sage Handbook of Qualitative Research* (4th Ed), London: Sage, pp 1-19.

de Sousa Santos, B (1985) 'On Modes of Production of Law and Social Power', 13 *International Journal of the Sociology of Law*, pp 299-336.

de Sousa Santos, B (1987) 'Law: A Map of Misreading. Toward a Postmodern Conception of Law', 14(3) *Journal of Law and Society*, pp 279-302.

de Sousa Santos, B (1995) 'Three Metaphors for a New Conception of Law: The Frontier, the Baroque, and the South', 29(4) *Law and Society Review*, pp 569-584.

de Sousa Santos, B (2002) *Toward a New Legal Common Sense* (2nd Ed), UK: Butterworths.

de Sutter, L and McGee, K (2012) 'Introduction' in de Sutter, L and McGee, K (eds.) *Deleuze and Law*, Edinburgh: Edinburgh University Press, pp 1-14.

de Ville, J (2011) 'Rethinking Power and Law: Foucault's *Society must be Defended*', 24 *International Journal for the Semiotics of Law*, pp 211-226.

Devy, G N (2009) 'Introduction' in Devy, G N, Davis, Geoffrey V and Chakravarty, K K (eds.) *Indigeneity: Culture and Representation*, New Delhi: Orient BlackSwan, pp xi-xvi.

Doel, Marcus A (1999) *Postructuralist Geographies: The Dialectical Art of Spatial Science*, Edinburgh: Edinburgh University Press.

Doel, Marcus A (2000) 'Un-Glunking Geography: Spatial science after Dr Seuss and Gilles Deleuze' in Crang, M and Thrift, N (eds.) *Thinking Space*, London: Routledge, pp 117-135.

Dosse, F (2007/2010) *Gilles Deleuze and Felix Guattari: Intersecting Lives* (trans. Deborah Glassman) New York: Columbia University Press.

Douzinas, C and Gearey, A (2005) *Critical Jurisprudence: The Political Philosophy of Justice*, Oxford: Hart.

Downes, David R (1993) 'New Diplomacy for the Biodiversity Trade: Biodiversity, Biotechnology, and Intellectual Property in the Convention on Biological Diversity', 4 *Touro Journal of Transnational Law*, pp 1-46.

Drahos, Peter (1996) *A Philosophy of Intellectual Property*, Aldershot: Dartmouth.

Drahos, P and Braithwaite, J (2001) 'The Globalisation of Regulation', 9(1) *Journal of Political Philosophy*, pp 103-128.

Drahos, P and Braithwaite, J (2002) *Information Feudalism: Who Owns the Knowledge Economy*, London: Earthscan.

Duanay, M C, Lester, R N and Ano, C (2001) 'Eggplant' in Charrier, A, Dacquot, M, Hamon, S and Nicolas, D (eds.) *Tropical Plant Breeding*, Montpellier: Science Publishers, pp 199-222.

Duffy, R (2014) 'What Does Collaborative Event Ethnography Tell Us About Global Environmental Governance?', 14(3) *Global Environmental Politics*, pp 125-131.

Duncanson, I (2003) 'Writing and Praxis: Law, History and the Postcolonial', 7 *Law Text Culture*, pp 9-42.

Dutfield, G (2003) *Intellectual Property Rights and the Life Science Industries: A Twentieth Century History*, Aldershot: Ashgate.

Dutfield, G (2004) *Intellectual Property, Biogenetic Resources and Traditional Knowledge*, London: Earthscan.

Dworkin, R (1978) *Taking Rights Seriously*, Cambridge, Massachusetts: Harvard University Press.

Dworkin, R (1967) 'The Model of Rules', 35 *University of Chicago Law Review*, pp 14-46.

Eisenberg, Rebecca S (2000) 'Re-examining the Role of Patents in Appropriating the Value of DNA Sequences', 49 *Emory Law Journal*, pp 783-800.

Escobar, A (1998) 'Whose Knowledge, Whose nature? Biodiversity, Conservation, and the Political Ecology of Social Movements', 5 *Journal of Political Ecology*, pp 53-81.

Esteva, G and Prakash, Madhu S (1998) *Grassroots Post-Modernism: Remaking the Soil of Cultures*, London and New York: Zed Books.

Etzkowitz, H and Webster, A (1995) 'Science as Intellectual Property' in Jasanoff, S, Markle, Gerald E, Petersen, James C and Pinch, T (eds.) *Handbook of Science and Technology Studies*, Thousand Oaks, California: Sage Publications, pp 480-505.

Ewald, F (1990) 'Norms, Discipline and the Law', 30 *Representation*, pp 138-161.

Fairclough, N (1992) *Discourse and Social Change*, Cambridge, UK: Polity Press.

Featherstone, M (1990) 'Global Culture: An Introduction' in Featherstone, M (ed.) *Global Culture: Nationalism, Globalization and Modernity*, Thousand Oaks: Sage, pp 1-14.

Fidel, R (1984) 'The Case Study Method: A Case Study', 6 *Library and Information Science Research*, pp 273-288.

Finnis, J (2000) 'The Priority of Persons' in Horder, J (ed.) *Oxford Essays in Jurisprudence* (4th Series), Oxford: Oxford University Press, pp 1-15.

Fischer-Lescano, A and Teubner, G (2004) 'Regime-Collisions: The Vein Search for Legal Unity in the Fragmentation of Global Law', 25 *Michigan Journal of International Law*, pp 999-1046.

Fischer, Michael M J (2007) 'Four Genealogies for a Recombinant Anthropology of Science and Technology', 22(4) *Cultural Anthropology*, pp 539-615.

Fiss, Owen M (1986) 'The Death of the Law?', 72 *Cornell Law Review*, pp 1-16.

Fitzpatrick, P (1990) 'The Desperate Vacuum: Imperialism and Law in the Experience of Enlightenment' in Carty, A (ed.) *Post-Modern Law: Enlightenment, Revolution and the Death of Man*, Edinburgh: Edinburgh University Press, pp 90-106.

Fitzpatrick, P (1992) *The Mythology of Modern Law*, London: Routledge.

Fitzpatrick, P and Darian-Smith, E (1999) 'Laws of the Postcolonial: An Insistent Introduction' in Darian-Smith, E and Fitzpatrick, P (eds.) *Laws of the Postcolonial*, Ann Arbor: University of Michigan Press, pp 1-15.

Fitzpatrick, P (2001) *Modernism and the Grounds of Law*, Cambridge, UK: Cambridge University Press.

Fitzpatrick, P (2003) '"Gods would be needed…": American Empire and the rule of (international) law', 16(3) *Leiden Journal of International Law*, pp 429-466.

Fitzpatrick, P (2014) 'The Revolutionary Past: Decolonizing Law and Human Rights', 2(1) *Metodo. International Studies in Phenomenology and Philosophy*, pp 117-133.

Fletcher, R (2010) 'Neoliberal Governmentality: Towards a Poststructuralist Political Ecology of the Conservation Debate', 8(3) *Conservation and Society*, pp 171-181.

Flood, J (2002) 'Globalisation and Law' in Banakar, R and Travers, M (eds.) *An Introduction to Law and Social Theory*, Oxford: Hart, pp 311-328.

Forbes, I (2006) 'States of uncertainty: governing the empire of biotechnology', 25(1) *New Genetics and Society*, pp 69-88.
Foucault, M (1961/1973) *Madness and Civilization: A History of Insanity in the Age of Reason* (trans. R Howard), New York: Vintage/Random House.

Foucault, M (1963/1973) *The Birth of the Clinic: An archaeology of Medical Perception* (trans. A M Sheridan), London and New York: Routledge.

Foucault, M (1966/1970) *The Order of Things: An Archaeology of the Human Sciences*, London: Tavistock Publications.

Foucault, M (1970/1981) 'The Order of Discourse' in Young, R (ed.) *Untying the Text: A Post-Structuralist Reader*, London: Routledge and Kegan Paul, pp 51-78.

Foucault, Michel (1975/1979) *Discipline and Punish: The Birth of the Prison* (trans. Alan Sheridan), New York: Vintage.

Foucault, M (1976/1998) *The Will to Knowledge: History of Sexuality, Vol. 1* (trans. Robert Hurley), London, England: Penguin.

Foucault, M (1977) *Language, Counter-Memory and Practice* (trans. Donald F. Bouchard and Sherry Simon), New York: Cornell University Press.

Foucault, M (1978/1991) ‘Governmentality’ in Burchell, G, Gordon, C and Miller, P (eds.) *The Foucault Effect: Studies in Governmentality*, Chicago: University of Chicago Press, pp 87-104.

Foucault, M (1979) ‘Power and Norm: Notes’ in Morris, M and Patton, P (eds.) *Power, Truth, Strategy*, Sydney: Feral Publications, pp 60-66.

Foucault, M (1979/1981) ‘Omnes et Singulatim: Towards a Criticism of “Political Reason”’ in McMurrin, Sterling M (ed.) *The Tanner Lectures on Human Values, Vol. II*, Cambridge, UK: Cambridge University Press, pp 223-254.

Foucault, M (1980) *Power/Knowledge: Selected Interviews and Other Writings 1972 – 1977*, New York: Pantheon Books.

Foucault, M (1980/1993) ‘About the Beginning of the Hermeneutics of the Self’, 21(2) *Political Theory*, pp 198-227.

Foucault, M (1981) ‘History of Systems of Thought, 1979’, 8(3) *Philosophy and Social Criticism*, pp 353-359.

Foucault, M (1981/1991) *Remarks on Marx: Conversation with Duccio Trombadori* (trans. R J Goldstein and J Cascaito), New York: Semiotext(e).

Foucault, M (1981-82/2007) ‘The Meshes of Power’ in Crampton, J W and Elden, S (eds.) *Space, Knowledge and Power: Foucault and Geography*, Aldershot: Ashgate, pp 153-162.

Foucault, M (1982) ‘The Subject and Power’ in Dreyfus, Hubert L and Rabinow, P (1983) *Michel Foucault: Beyond Structuralism and Hermeneutics* (2nd Ed.), Chicago: University of Chicago Press, pp 208-226.

Foucault, M (1984) ‘Preface to The History of Sexuality, Volume II’ in Rabinow, P (ed.) *The Foucault Reader: An Introduction to Foucault’s Thought*, New York: Pantheon Books, pp 333-339.

Foucault, M (1984/1992) *The Use of Pleasure: The History of Sexuality, Vol. 2* (trans. Robert Hurley), Middlesex, England: Penguin.

Foucault, M (1984/1986) *The Care of the Self, The History of Sexuality, Vol. 3* (trans. Robert Hurley), London: Penguin.

Foucault, M (1984/1987) ‘The Ethic of Care for the Self as a Practice of Freedom’, 12 *Philosophy and Social Criticism*, pp 112-131.

Foucault, M (1986/1987) ‘Maurice Blanchot: The Thought from Outside’ in *Foucault/Blanchot* (trans. Brian Massumi and Jeffrey Mehlman), New York: Zone Books, pp 9-58.

Foucault, M (1988a) ‘Power and Sex’ in Kritzman, Lawrence D (ed.) *Michel Foucault: Politics, Philosophy, Culture: Interviews and Other Writings 1977-1984* (trans. Alan Sheridan and Others), London: Routledge, pp 110-124.

Foucault, M (1988b) ‘Technologies of the Self’ in Martin, Luther M, Gutman, H and Hutton, Patrick H (eds.) *Technologies of the Self: A Seminar with Michel Foucault*, London: Tavistock Publications, pp 16-49.

Foucault, M (1988c) ‘On Power’ in Kritzman, Lawrence D (ed.) *Michel Foucault: Politics, Philosophy, Culture: Interviews and Other Writings 1977-1984* (trans. Alan Sheridan and Others), London: Routledge, pp 96-109.

Foucault, M (1994/1997) *Ethics: Subjectivity and Truth, The Essential Works of Michel Foucault 1954 – 1984, Vol. 1* (trans. Robert Hurley and Others), New York: The New Press.

Foucault, M (1994/2000) *Power, The Essential Works of Michel Foucault 1954 – 1984, Vol. 3* (trans. Robert Hurley and Others), London: Penguin Books.

Foucault, M (2001/2005) *The Hermeneutics of the Subject, Lectures at the College de France 1981-82* (trans. Graham Burchell), New York: Palgrave Macmillan.

Foucault, M (2004/2007) *Security, Territory, Population, Lectures at the College de France 1977 – 1978* (trans. Graham Burchell), Basingstoke, Hampshire: Palgrave Macmillan.

Foucault, M (2004/2008) *The Birth of Biopolitics, Lectures at the College de France 1978 – 1979* (trans. Graham Burchell), Basingstoke, Hampshire: Palgrave Macmillan.

Foucault, M (2008/2010) *The Government of Self and Others, Lectures at the College de France 1982-983* (trans. Graham Burchell), Basingstoke: Palgrave Macmillan.

Foucault, M (2008/2011) *The Courage of Truth, Lectures at the College de France 1983-1984* (trans. Graham Burchell), Basingstoke: Palgrave Macmillan.

Fowler, C (2001) ‘Protecting Farmer Innovation: The Convention on Biological Diversity and the Question of Origin’, 41 *Jurimetric*s, pp 477-488.

Frank, Andre G and Fuentes, M (1990) ‘Social Movements’ in *New Directions in the Study of Justice, Law and Social Control*, New York and London: Plenum Press, pp 127-141.

Frank, J (1930) *Law and the Modern Mind*, New York: Brentano’s.

Franklin, S (2005) ‘STEM CELLS R US: Emergent Life Forms and the Global Biological’ in Ong, A and Collier, Stephen J (eds.) *Global Assemblages: Technology, Politics and Ethics as Anthropological Problems*, Oxford, UK: Blackwell, pp 59-78.

Fraser, M (2006) ‘Event’, 23(2-3) *Theory, Culture and Society*, pp 129-132.

Fraser, N (2003) ‘From Discipline to Flexibilization? Rereading Foucault in the Shadow of Globalization’, 10(2*) Constellations*, pp 160-170.

Friedman, David D, Landes, William M and Posner, Richard A (1991) ‘Some Economics of Trade Secret Law’, 5(1) *Journal of Economic Perspectives*, pp 61-72.

Friedman, Lawrence M (2001) ‘Erewhon: The Coming Global Legal Order’, 37 *Stanford Journal of International Law*, pp 347-364.

Frow, E et al. (2009) ‘The politics of plants’, 1 *Food Science*, pp 17-23.

Fuller, Lon L (1963/1969) *The Morality of Law* (Rev. Ed.), New Haven and London: Yale University Press.

Garforth, K (2008) ‘Life as Chemistry or Life as Biology? An Ethic of Patents on Genetically Modified Organisms’ in Gibson, J (ed.) *Patenting Lives: Life Patents, Culture and Development*, Aldershot, Hampshire: Ashgate, pp 27-52.

Garth, B (2008) ‘The Globalization of Law’ in Candeira, Gregory A, Keleman, R D and Whittington, Keith E (eds.) *The Oxford Handbook of Law and Politics*, New York: Oxford, pp 245-263.

Gatens, M (1996) ‘Through a Spinozist Lens: Ethology, Difference, Power’ in Patton, P (ed.) *Deleuze: A Critical Reader*, Oxford: Blackwell, pp 162-187.

Gearey, A (2005) *Globalization and Law: Trade, Rights, War*, Lanham: Rowman and Littlefield.

Geertz, Clifford (1983) *Local Knowledge: Further Essays in Interpretive Anthropology* (3rd ed.), New York: Basic Books.

Gibson, J (2008) ‘Introduction: Patent Publics, Patent Cultures’ in Gibson, J (ed.) *Patenting Lives: Life Patents, Culture and Development*, Aldershot, Hampshire: Ashgate, pp 1-6.

Giddens, A (1990) *The Consequences of Modernity*, Stanford, CA: Stanford University Press.

Given, L (2008) ‘Introduction’ in Given, L (ed.) *The Sage Encyclopedia of Qualitative Research Methods, Vols. 1 & 2*, London: Sage, pp xxix – xxxii.

Gluckman, M (1965/1972) *The Ideas in Barotse Jurisprudence*, Manchester: Manchester University Press.

Goldman, M (2001) ‘Constructing an Environmental State: Eco-governmentality and other Transnational Practices of a “Green” World Bank’, 48(4) *Social Problems*, pp 499-523.

Goldman, M (2005/2006) *Imperial Nature: The World Bank and Struggles for Social Justice in the Age of Globalisation*, Hyderabad, India: Orient Longman.

Golder, B (2008) 'Foucault and the Incompletion of Law', 21(3) *Leiden Journal of International Law*, pp 747-763.

Golder, B and Fitzpatrick, P (2009) *Foucault's Law*, New York: Routledge.

Golder, B (2013) *Re-reading Foucault: On Law, Power and Rights* (ed.), New York: Routledge.

Gordon, C (1991) 'Governmental rationality: an introduction' in Burchell, G, Gordon, C and Miller, P (eds.) *The Foucault Effect: Studies in Governmentality*, Chicago: University of Chicago Press, pp 1-51.

Gray, K (1991) 'Property in Thin Air', 50 *Cambridge Law Journal*, pp 252-307.

Griffiths, J (1986) 'What is Legal Pluralism', 24 *Journal of Legal Pluralism*, pp 1-55.

Griffiths, A (2013) 'Reviewing Legal Pluralism' in Banakar, R and Travers, M (eds.) *Law and Social Theory* (2nd Ed.), Oxford: Hart, pp 269-286.

Griffiths, A (2002) 'Legal Pluralism' in Banakar, R and Travers, M (eds.) *An Introduction to Law and Social Theory*, Oxford: Hart, pp 289-310.

Guattari (1971) 'Machine and Structure' in Guattari, F (1984) *Molecular Revolution: Psychiatry and Politics* (trans. Rosemary Sheed) Middlesex, England: Penguin, pp 111-119.

Guattari, F (1972) 'The Plane of Consistency' in Guattari, F (1984) *Molecular Revolution: Psychiatry and Politics* (trans. Rosemary Sheed), Middlesex, England: Penguin, pp 120-129.

Guattari, F (1973) 'Molecular Revolution and Class Struggle' in Guattari, F (1984) *Molecular Revolution: Psychiatry and Politics* (trans. Rosemary Sheed), Middlesex, England: Penguin, pp 253-261.

Guattari, F (1974) 'Subjectless Action' in Guattari, F (1984) *Molecular Revolution: Psychiatry and Politics* (trans. Rosemary Sheed), Middlesex, England: Penguin, pp 135-143.

Guattari, F (1975) 'Towards a Micro-Politics of Desire' in Guattari, F (1984) *Molecular Revolution: Psychiatry and Politics* (trans. Rosemary Sheed) Middlesex, England: Penguin, pp 82-107.

Guattari, F (1979/2011) *The Machinic Unconscious: Essays in Schizoanalysis* (trans. Taylor Adkins), New York: Semiotext(e).

Guattari, F (1996) *The Guattari Reader* (ed. Gary Genosko), Oxford: Blackwell.

Guattari, F (2009) *Chaosophy: Texts and Interviews 1972 – 1977* (trans. David L Sweet, Jarred Becker, and Taylor Adkins), Los Angeles, CA: Semiotext(e).

Gunther, C (2008) 'Legal pluralism or uniform concept of law? Globalisation as a problem of legal theory', 5 *NoFo*, pp 5-21.

Gupta, A (1998) *Postcolonial Developments: Agriculture in the Making in Modern India*, Durham: Duke University Press.

Gupta, A (2011) 'An evolving science-society contract in India: The search for legitimacy in anticipatory risk governance', 36 *Food Policy*, pp 736-741.

Halliday, Terence C and Osinsky, P (2006) 'Globalization of Law', 32 *Annual Review of Sociology*, pp 447-470.

Halliday, Terence C (2009) 'Recursivity of Global Normmaking: A Sociolegal Agenda', 5 *Annual Review of Law and Social Science*, pp 63-89.

Hann, C (2005) 'Property' in Carrier, James G (ed.) *A Handbook of Economic Anthropology*, Cheltenham, UK: Edward Elgar, pp 110-124.

Hannerz, U (1996) *Transnational Connections: Culture, people, places*, London and New York: Routledge.

Harris, J W (1996) *Property and Justice*, Oxford: Oxford University Press.

Harris, J W (1997) *Property Problems: From Genes to Pension Funds* (ed.), London: Kluwer Law International.

Haraway, D (1976/2004) *Crystals, Fabrics and Fields: Metaphors That Shape Embryos*, Berkley, California: North Atlantic Books.

Haraway, D (1997*) Modest_Witness@ Second_Millennium.FemelaMan©_Meets_OncoMouse™: Feminism and Technoscience*, New York and London: Routledge.

Haraway, Donna J (2003) 'Cloning Mutts, Saving Tigers: Ethical Emergents in Technocultural Dog Worlds' in Franklin, S and Lock, M (eds.) *Remaking of Life and Death: Towards an Anthropology of the Biosciences*, Santa Fe and Oxford: James Curry and School of American Research Press, pp 293-327.

Hart, H L A (1961/1994) *The Concept of Law* (2nd ed.), Oxford: Clarendon Press.

Haunss, S and Shadlen, Kenneth C (2009) 'Introduction: rethinking the politics of intellectual property' in Haunss, S and Shadlen, Kenneth C (eds.) *Politics of Intellectual Property: Contestation Over the Ownership, Use, and Control of Knowledge and Information*, Cheltenham, UK: Edward Elgar, pp 1-12.

Hayden, C (2003a) *When Nature Goes Public: The Making and Unmaking of Bioprospecting in Mexico*, Princeton and Oxford: Princeton University Press.

Hayden, C (2003b) 'From market to market: Bioprospecting's idioms of inclusion', 30(3) *American Ethnologist*, pp 359-371.

Hayden, C (2007) 'Taking as Giving: Bioscience, Exchange, and the Politics of Benefit-Sharing', 37(5) *Social Studies of Science*, pp 729-758.

Held, D (1995) *Democracy and the Global Order*, Cambridge: Polity.

Held, D, McGrew, A, Goldblatt, D and Perraton, J (1999) *Global Transformations*, Cambridge: Polity.

Heller, C and Escobar, A (2003) 'From Pure Genes to GMOs: Transnationalized Gene Landscapes in the Biodiversity and Transgenic Food Networks' in Goodman, Alan H, Heath, D and Lindee, M Susan (eds.) *Genetic Nature/Culture: Anthropology and Science beyond the Two-Culture Divide*, California and London: University of California Press, pp 155-175.

Henne, G and Fakhir, S (1999) 'The Regime Building of the Convention on Biological Diversity on the Road to Nairobi', 3 *Max Plank Yearbook of United Nations Law*, pp 315-361.

Hesse, C (1990) 'Enlightenment Epistemology and the Laws of Authorship in Revolutionary France, 1777-1793', 30 *Representations*, pp 109-137.

Hettinger, E C (1989) 'Justifying Intellectual Property', 18 *Philosophy and Public Affairs*, pp 31-52.

Hilgartner, S (2007) 'Making the Bioeconomy Measurable: Politics of an Emerging Anticipatory Machinery', 2 *BioSocieties*, pp 382-386.

Hilgartner, S (2009) 'Intellectual Property and the Politics of Emerging Technology: Inventors, Citizens, and Powers to Shape the Future', 84 *Chicago-Kent Law Review*, pp 197-224.

Hirsch, Susan F and Lazarus-Black, M (1994) 'Introduction/Performance and Paradox: Exploring Law's Role in Hegemony and Resistance' in Lazarus-Black, M and Hirsch, Susan F (eds.) *Contested States: Law, Hegemony and Resistance*, London: Routledge, pp 1-26.

Hoebel, E A (1949/1958) *Man in the Primitive World* (2nd ed.), New York: McGraw-Hill Book Company.

Hoebel, E A (1941-1942) 'Fundamental Legal Concepts as Applied in the Study of Primitive Law', 51 *Yale Law Journal*, pp 951-966.

Hoebel, E A (1954) *The Law of Primitive Man: A Study in Comparative Legal Dynamics*, Cambridge, Massachusetts: Harvard University Press.

Hohfeld, Wesley N (1913) 'Some Fundamental Legal Conceptions as Applied in Judicial Reasoning', 23 *Yale Law Journal*, pp 16-59.

Hohfeld, W N (1917) 'Fundamental Legal Conceptions as Applied in Judicial Reasoning', 26 *Yale Law Journal*, pp 710-770.

Honore, A M (1961) 'Ownership' in Guest, A G (ed.) *Oxford Essays in Jurisprudence*, Clarendon: Oxford University Press.

Horwitz, Morton J (1975) 'The Rise of Legal Formalism', 19 *American Journal of Legal History*, pp 251-264.

Howarth, D (2000) *Discourse*, Buckingham: Open University Press.

Huggan, G (1989) 'Decolonizing the Map: Post-Colonialism, Post-Structuralism and the Cartographic Connection', 20(4) *Ariel*, pp 115-131.

Hughes, J (1988) 'The Philosophy of Intellectual Property', 77 *Georgetown Law Journal*, pp 287-366.

Hunt, A (1990) 'Rights and Social Movements: Counter-Hegemonic Strategies', 17(3) *Journal of Law and Society*, pp 309-328.

Hunt, A (1992) 'Foucault's Expulsion of Law: Toward a Retrieval', 17(1) *Law and Social Inquiry*, pp 1-38.

Hunt, A (1993) *Explorations in Law and Society: Toward a Constitutive Theory of Law*, London and New York: Routledge.

Hunt, A and Wickham, G (1994) *Foucault and Law: Towards a Sociology of Law as Governance*, London: Pluto Press.

Huxley, M (2007) 'Geographies of Governmentality' in Crampton, Jeremy W and Elden, S (eds.) *Space, Knowledge and Power: Foucault and Geography*, Hampshire, England: Ashgate, pp 185-204.

Huxley, M (2008) 'Space and Government: Governmentality and Geography', 2(5) *Geography Compass*, pp 1635-1658.

Inda, Jonathan X (2005) 'Analytics of the Modern: An Introduction' in Inda, Jonathan X (ed.) *Anthropologies of Modernity: Foucault, Governmentality and Life Politics*, Oxford, UK: Blackwell, pp 1-20.

Innovest (2005) *Monsanto and Genetic Engineering: Risks for Investors*, New York, NY: Innovest.

James, W (1909) *A Pluralistic Universe*, New York: Longman, Green and Co.

Jasanoff, S (2006) ‘Biotechnology and Empire: The Global Power of Seeds and Science’, 21 *Osiris*, pp 273-292.

Jasanoff, S (1987) ‘Contested Boundaries in Policy-Relevant Science’, 17 *Social Studies of Science*, pp 195-230.

Jasanoff, S (2000) ‘Between risk and precaution – reassessing the future of GM crops’, 3(3) *Journal of Risk Research*, pp 277-282.

Jasanoff, S (2008) ‘Making Order: Law and Science in Action’ in Hackett, Edward J et.al. (eds.) *The Handbook of Science and Technology Studies* (3rd ed.), Cambridge, Massachusetts: MIT Press, pp 761-786.

Jonas, H (1985) *The Imperative of Responsibility: In Search of an Ethics for the Technological Age*, Chicago: University of Chicago Press.

Kaplow, L and Shavell, S (2002) ‘Economic Analysis of Law’ in Auerbach, A J and Feldstein, M (eds.) *Handbook of Public Economics, Vol. 3*, London: Elsevier, pp 1661-1784.

Kearney, M (1995) ‘The Local and the Global: The Anthropology of Globalization and Transnationalism’, 24 *Annual Review of Anthropology*, pp 547-565.

Kennedy, D (1973) ‘Legal Formality’, 2 *Journal of Legal Studies*, pp 351-398.

Kennedy, D (2001) ‘Legal Formalism’ in Smelser, Neil J and Baltes, Paul B (eds.) *Encyclopedia of the Social and Behavioral Sciences, Vol. 13*, New York: Elsevier, pp 8634-8638.

Kennedy, D (2006) ‘Three Globalizations of Law and Legal Thought: 1850-2000’ in Trubek, David M and Santos, A (eds.) *The New Law and Economic Development: A Critical Appraisal*, New York: Cambridge University Press, pp 19-73.

Kierkegaard, S (1843/2006) *Fear and Trembling* (eds. Evans, C S and Walsh, S) (trans. Sylvia Walsh), Cambridge, UK: Cambridge University Press.

Kitchin, R and Dodge, M (2007) ‘Rethinking maps’, 31(3) *Progress in Human Geography*, pp 331-344.

Kitchin, R, Gleeson, J and Dodge, M (2013) ‘Unfolding mapping practices: a new epistemology for cartography’, 38(3) *Transactions of the Institute of British Geographers*, pp 480-496.

Kloppenburg, J (2000) ‘Biopiracy, Witchery, and the Fables of Ecoliberalism’, 12(4) *Peace Review*, pp 509-516.

Koester, V (1997) ‘The Biodiversity Convention Negotiating Process and Some Comments on the Outcome’, 27(3) *Environment Law and Policy*, pp 175-191.

Koh, H (1996) 'Transnational Legal Process', 75 *Nebraska Law Review*, pp 181-207.

Kolady, Deepthi E and Lesser, W (2006) 'Who Adopts What Kind of Technologies? The Case of Bt Eggplant in India', 9(2) *AgBioForum*, pp 94-103.

Kooiman, J and Van Vliet, M (1993) 'Governance and Public Management' in Eliassen, K and Kooiman, J (eds.) *Managing Public Organisations: Lessons from Contemporary European Experience* (2nd ed.), London: Sage, pp 58-72.

Koskenniemi, M (2007) 'Constitutionalism as Mindset: Reflections on Kantian Themes About International Law and Globalization', 8(1) *Theoretical Inquiries in Law*, pp 9-36.

Krishna, S (2009) *Globalization and Postcolonialism: Hegemony and Resistance in the Twenty-First Century*, Lanham: Rowman and Littlefield.

Kuchler, S (2004) 'Re-visualising Attachments: An Anthropological Perspective on Persons and Property Forms' in Pottage, A and Mundy, M (eds.) *Law, Anthropology, and the Constitution of the Social: Making Persons and Things*, New York: Cambridge University Press, pp 234-248.

Kumar, S et al. (2011) 'Bt brinjal in India: A long way to go', 2(2) *GM Crops*, pp 92-98.

Laddie, H (2004) 'Patents – what's invention got to do with it?' in Vaver, D and Bently, L (eds.) *Intellectual Property in the New Millennium: Essays in Honour of William R. Cornish*, Cambridge: Cambridge University Press, pp 91-95.

Lander, E (2006) 'Eurocentrism, Modern Knowledges, and the "Natural" Order of Global Capital' in Dube, S and Banerjee-Dube, I (eds.) *Unbecoming Modern: Colonialism, Modernity, Colonial Modernities*, New Delhi: Social Science Press, pp 189-210.

Landes, William M and Posner, Richard A (2003) *The Economic Structure of Intellectual Property Law*, Massachusetts: Harvard University.

Latour, B and Woolgar, S (1979/1986) *Laboratory Life: The Construction of Scientific Facts*, Princeton, New Jersey: Princeton University Press.

Latour, B (1998a) 'From the World of Science to the World of Research?', 280 *Science*, p 208.

Latour, B (1998b) 'A Few Steps towards the Anthropology of the Iconoclastic Gesture', 10(1) *Science in Context*, pp 63-83.

Latour, B (1998c) 'How to Be Iconophilic in Art, Science, and Religion?' in Galison, P and Jones, C A (eds.) *Picturing Science, Producing Art*, London: Routledge, pp 418-440.

Latour, B (2001) ‘Politics of Nature and Anthropological Analysis’, Paper Presented at Brown Bag Seminar, Science and Technology Studies Program, MIT.

Latour, B (2004a) ‘Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern’, 30 *Critical Inquiry*, pp 225-248.

Latour, B (2004b) *Politics of Nature: How to Bring the Sciences into Democracy* (trans. Catherine Porter), Cambridge, Massachusetts: Harvard University Press.

Latour, B (2005) *Reassembling the Social: An Introduction to Actor-Network-Theory*, Oxford, New York: Oxford University Press.

Latour, B (2011) ‘From Multiculturalism to Multinaturalism: What Rules of Method for the New Socio-Scientific Experiments?’, 6(1) *Nature and Culture*, pp 1-17.

Law, J and Hetherington, K (2000) ‘Materialities, Spatialities, Globalities’ in Bryson, John R, Daniels, Peter W, Henry, N and Pollard, J (eds.) *Knowledge, Space, Economy*, London: Routledge, pp 34-49.

Law, J (2004) ‘And if the global were small and noncoherent? Method, complexity, and the baroque’, 22 *Environment and Planning D: Society and Space*, pp 13-26.

Law, J and Urry, J (2004) ‘Enacting the social’, 33(3) *Economy and Society*, pp 390-410.

Lecercle, Jean-Jacques (2002) *Deleuze and Language*, Basingstoke: Palgrave Macmillan.

Lefebvre, A (2005) ‘A New Image of Law: Deleuze and Jurisprudence’, 130 *Telos*, pp 103-126.

Lefebvre, A (2006) ‘Habermas and Deleuze on Law and Adjudication’. *Law and Critique*, pp 389-414.

Lefebvre, A (2007) ‘Critique of teleology in Kant and Dworkin: The law without organs (LwO)’, 33(2) *Philosophy and Social Criticism*, pp 179-201.

Lefebvre, A (2008) *The Image of Law: Deleuze, Bergson, Spinoza*, Stanford, CA: Stanford University Press.

Lefebvre, A (2011) ‘Human Rights in Deleuze and Bergson’s Later Philosophy’, 14(3) *Theory and Event*, pp 1-9.

Leiter, B (2009) ‘The Radicalism of Legal Positivism’, 66 *Guild Practitioner*, pp 165-172.

Leiter, B (2010) ‘Legal Formalism and Legal Realism: What is the Issue?’, 16 *Legal Theory*, pp 111-133.

Lemke, T (2001) 'The Birth of bio-politics: Michel Foucault's lecture at the College de France on neo-liberal governmentality', 30(2) *Economy and Society*, pp 190-207.

Lemke, T (2002) 'Foucault, Governmentality, and Critique', 14(3) *Rethinking Marxism*, pp 49-64.

Lemke, T (2003) 'Comment on Nancy Fraser: Rereading Foucault in the Shadow of Globalization', 10(2*) Constellations*, pp 172-178.

Levidow, L (1995) 'Scientizing Security: Agricultural Biotechnology as Clean Surgical Strike', 13(3) *Social Text*, pp 161-180.

Levidow, L and Carr, S (1997) 'How biotechnology regulation sets a risk/ethics boundary', 14 *Agriculture and Human Values*, pp 29-43.

Levidow, L (1998) 'Democratizing technology – or technologizing democracy? Regulating biotechnology in Europe', 20 *Technology in Society*, pp 211-226.

Levidow, L (2001) 'Utilitarian bioethics? Market fetishism in the GM crops debate', 20(1) *New Genetics and Society*, pp 75-84.

Levi-Strauss, C (1973/1978) *Structural Anthropology, Vol. 2* (trans. Monique Layton), Middlesex, England: Penguin Books.

Lhuilier, G (2013) The Concept of 'Normative Space': A very short introduction, *French Research Institute on Japan, Occasional Papers No. 3*, pp 67-70.

Lipietz, A (1995) 'Enclosing the Global Common: Global Environmental Negotiations in a North-South Conflictual Approach' in Bhaskar, V and Glyn, A (eds.) *The North The South and The Environment: Ecological Constrains and the Global Economy*, New York: Earthscan, pp 118-142.

Little, Paul E (1995) 'Ritual, Power and Ethnography at the Rio Earth Summit', 15(3) *Critique of Anthropology*, pp 265-288.

Livesey, G (2010) 'Assemblage' in Parr, A (ed.) *The Deleuze Dictionary* (Rev. Ed.), Edinburgh: Edinburgh University Press, pp 18-19.

Lockyer, S (2008) 'History of Qualitative Research' in Given, L (ed.) *The Sage Encyclopedia of Qualitative Research Methods, Vols. 1 & 2,* London: Sage, pp 706-711.

Long, Pamela O (1991) 'Invention, Authorship, "Intellectual Property," and the Origin of Patents: Notes toward a Conceptual History', 32(4) *Technology and Culture*, pp 846-884.

Loomba, A et al. (2005) 'Beyond What? An Introduction' in Loomba, A, Kaul, S, Bunzl, M Burton, A and Esty, Z (eds.) *Postcolonial Studies and Beyond*, Durham and London: Duke University Press, pp 1-38.

Lowie, Robert H (1920/1929) *Primitive Society*, London: George Routledge & Sons.

Lowie, Robert H (1928) 'Incorporeal Property in Primitive Society', 37(5) *Yale Law Journal*, pp 551-563.

Lowie, Robert H (1934) *An Introduction to Cultural Anthropology*, New York: Farrar & Rinehart.

Luhmann, N (1988) 'The Third Question: The Creative Use of Paradoxes in Law and Legal History', 15(2) *Journal of Law and Society*, pp 153-165.

Luke, Timothy W (1995) 'On Environmentality: Geo-Power and Eco-Knowledge in the Discourses of Contemporary Environmentalism', 31 *Cultural Critique*, pp 57-81.

Luke, Timothy W (1999a) 'Environmentality as Green Governmentality' in Darier, E (ed.) *Discourses of the Environment*, Oxford, UK: Blackwell Publishers, pp 121-151.

Luke, Timothy W (1999b) 'Eco-manegerialism: Environmental Studies as a Power/Knowledge Formation' in Fisher, F and Hajer, M A (eds.) *Living with Nature: Environmental Politics as Cultural Discourse*, Oxford, UK: Oxford University Press, pp 101-120.

MacDonald, Kenneth I (2005) 'Global hunting grounds: power, scale and ecology in the negotiation of conservation', 12 *Cultural Geographies*, pp 259-291.

Macmillan, F (2011) 'The emergence of the World Trade Organization: Another triumph of corporate capitalism?' in Johns, F, Joyce, R and Pahuja, S (eds.) *Events: The Force of International Law*, Oxon and New York: Routledge, pp 191-206.

Macpherson, C B (1964) *The Political Theory of Possessive Individualism: Hobbes to Locke*, Oxford: Oxford University Press.

Macpherson, C B (1978) *Property: Mainstream and Critical Positions*, Oxford: Basil Blackwell.

Maine, H (1861/1920) *Ancient Law*, London: John Murray.

Maine, H (1883) *Dissertations on Early Law and Custom*, New York: Henry Holt and Company.

Malinowski, B (1926) *Crime and Custom in Savage Society*, London: Routledge and Kegan Paul.

Marx, K (1976) *Capital: A Critique of Political Economy, Vol. 1* (trans. Ben Fowkes), London: Penguin.

Maskus, K and Reichman, Jerome H (2005) 'The Globalization of Private Knowledge Goods and the Privatization of Global Public Goods' in Maskus, K and Reichman, J H (eds.) *International Public Goods and Transfer of Technology Under*

a Globalized Intellectual Property Regime, Cambridge, UK and New York: Cambridge University Press, pp 3-45.

Massey, D (2005) *For Space*, London: Sage.

Massumi, B (2002) *Parables For The Virtual: Movement, Affect, Sensation*, Durham and London: Duke University Press.

Mattai, U and Nader, L (2008) *Plunder: When the Rule of Law is Illegal*, Oxford, UK: Blackwell.

Mauss, M (1925/1954) *The Gift: Forms and Functions of Exchange in Archaic Societies* (trans. Ian Cunnison), London: Cohen and West.

May, C (2000) *A Global Political Economy of Intellectual Property Rights: New Enclosures?*, London and New York: Routledge.

May, C (2002) 'Unacceptable Costs: The Consequence of Making Knowledge Property in a Global Society', 16(2) *Global Society*, pp 123- 144.

May, C and Sell, Susan K (2006) *Intellectual Property Rights: A Critical History*, London: Lynne Rienner.

May, C (2007) *The World Intellectual Property Organization: Resurgence and the Development Agenda*, Oxon and New York: Routledge.

McAfee, K (1999) 'Selling Nature to Save It: Biodiversity and the Rise of Green Developmentalism', 17(2) *Environment and Planning D: Space and Society*, pp 133-154.

McAfee, K (2003) 'Neoliberalism on the molecular scale: Economic and genetic reductionism in biotechnology battles', 34 *Geoforum*, pp 203-219.

McCann, M (2004) 'Law and Social Movements' in Sarat, A (ed.) *The Blackwell Companion to Law and Society*, Oxford: Blackwell, pp 506-522.

McCann, M (2006) 'Law and Social Movements: Contemporary Perspectives', 2 *Annual Review of Law and Social Science*, pp 17-38.

McNeil, M (2005) 'Introduction: Postcolonial Technoscience', 14 *Science as Culture*, pp 105-112.

Merry, Sally E (1988) 'Legal Pluralism', *Law and Society Review*, pp 869-896.

Merry, Sally E (1991) 'Law and Colonialism', 25(4) *Law and Society Review*, pp 889-922.

Merry, Sally E (1992) 'Anthropology, Law, and Transnational Processes', 21 *Annual Review of Anthropology*, pp 357-379.

Merry, Sally E (1995) 'Resistance and the Cultural Power of Law', 29(1) *Law and Society Review*, pp 11-26.

Merry, S E (2001) 'Spatial Governmentality and the New Urban Social Order: Controlling Gender Violence through Law', 103(1) *American Anthropologist*, pp 16-29.

Merry, Sally E (2004) 'Colonial and Postcolonial Law' in Sarat, A (ed.) *The Blackwell Companion to Law and Society*, Oxford, UK: Blackwell, pp 569-588.

Merry, Sally E (2008) 'International Law and Sociolegal Scholarship: Toward a Spatial Global Legal Pluralism' in Sarat, A (ed.) *Law and Society Reconsidered, Studies in Law, Politics, and Society, Vol. 41*, Bingley, UK: Emerald Publishing, pp 149-168.

Merson. J (2001) 'Bio-prospecting or Bio-piracy: Intellectual Property Rights and Biodiversity in a Colonial and Postcolonial Context', 15 *Osiris*, pp 282-296.

Michaels, R (2013) 'Globalization and Law: Law Beyond the State' in Banakar, R and Travers, M (eds.) *Law and Social Theory* (2nd Ed.) Oxford: Hart, pp 289-303.

Miller, D (2005) 'Materiality: An Introduction' in Miller, D (ed.) *Materiality*, Durham and London: Duke University Press, pp 1-50.

Miller, P and Rose, N (1990) 'Governing Economic Life', 19(1) *Economy and Society*, pp 1-31.

Mills, S (2003) *Michel Foucault*, London and New York: Routledge.

Moore, N (2000) 'A Distant Hand Fell from His Shoulder', 11 *Law and Critique*, pp 185-200.

Moore, N (2004) 'So You Love Me', 15 *Law and Critique*, pp 45-64.

Moore, N (2007) 'Icons of Control: Deleuze, Signs, Law', 20 *International Journal for the Semiotics of Law*, pp 33-54.

Moore, N (2010) 'Get Stupid: Film and Law via Wim Wenders and Others', 31(4) *Cardozo Law Review*, pp 1195-1216.

Moore, N (2012) 'Image and Affect: Between Neo-Baroque Sadism and Masochism', 57 *New York Law School Law Review*, pp 97-113.

Moore, Sally F (1973) 'Law and Social Change: The Semi-Autonomous Social Field as an Appropriate subject of Study', 7 *Law and Society Review*, pp 719-746.

Moore, Sally F (1978) *Law as Process: An Anthropological Approach*, London: Routledge and Kegan Paul.

Munro, Vanessa E (2001) 'Legal Feminism and Foucault: A Critique of the Expulsion of Law', 28(4) *Journal of Law and Society,* pp 546-567.

Murray, J (2006) 'Nomo Law: Deleuze and Guattari on the Emergence of Law', 19 *International Journal for the Semiotics of Law,* pp 127-151.

Murray, J (2007) 'Deleuze & Guattari's Intensive and Pragmatic Semiotic of Emergent Law', 20 *International Journal for the Semiotics of Law,* pp 7-32.

Mussawir, E (2010) 'The Activity of Judgement: Deleuze, Jurisdiction and Procedural Genre of Jurisprudence', 7(2) *Law, Culture and the Humanities,* pp 463-483.

Mussawir, E (2011) *Jurisdiction in Deleuze: The Expression and Representation of Law,* New York: Routledge.

Nancy, Jean L (2001) 'The Two Secrets of the Fetish', 31(2) *Diacritics,* pp 3-8.

Newell, P (2002) 'Biotechnology and the politics of regulation', *IDS Working Paper 146,* Sussex, England: Institute of Development Studies.

Newell, P (2003) 'Biotech firms, biotech politics: negotiating GMOs in India', *IDS Working Paper 201,* Sussex, England: Institute of Development Studies.

Nietzsche, F (1968) *The Will to Power* (trans. Walter Kaufmann and R J Hollingdale), New York: Vintage Books.

Nietzsche, F (1967/1989) *On the Genealogy of Morals and Ecce Homo* (trans. Walter Kaufman and R J Hollingdale), New York: Vintage Books.

Nowotny, H (2000) 'Transgressive Competence: The Narrative of Expertise', 3 *European Journal of Social Theory,* pp 5-21.

Oldham, P (2007) 'Biopiracy and the bioeconomy' in Glasner, P, Atkinson, P and Greenslade, H (eds.) *New Genetics, New Social Formations,* London and New York: Routledge, pp 114- 137.

Orford, A (2003) *Reading Humanitarian Intervention: Human Rights and the Use of Force in International Law,* Cambridge, UK: Cambridge University Press.

Ormston, R, Spencer, L, Barnard, M and Snape, D (2014) 'The Foundations of Qualitative Research' in Ritchie, J, Lewis, J, Nicholls, Carol M and Ormston, R (eds.) *Qualitative Research Practice: A Guide for Social Science Students and Researchers* (2nd Ed.) London: Sage, pp 1-26.

Otto, D (1996) 'Subalternity and International Law: The Problems of Global Community and Incommensurability of Difference', 5(3) *Social and Legal Studies,* pp 337-364.

Otto, D (1999) 'Postcolonialism and Law?', 15 *Third World Legal Studies,* pp 7/18.

Pahuja, S (2003) ‘Globalization and International Economic Law’ in Dauvergne, C (ed.) *Jurisprudence for an Interconnected Globe*, London: Ashgate, pp 71-91.

Pahuja, S (2005) ‘The Postcoloniality of International Law’, 46(2) *Harvard International Law Journal*, pp 459-469.

Pahuja, S (2011) *Decolonising International Law: Development, Economic Growth and the Politics of Universality*, Cambridge, UK: Cambridge University Press.

Palsson, G (2009) ‘Biosocial Relations of Production’, 51(2) *Comparative Studies in Society and History*, pp 288-313.

Parry, B (2006) ‘New spaces of biological commodification: the dynamics of trade in genetic resources and “bioinformation”’, 31(1) *Interdisciplinary Science Review*, pp 19-31.

Parry, B (2007) ‘Concerning the Futures Market in Bio-epistemology’, 2 *BioSocieties*, pp 386-389.

Parry, B (2002) ‘Cultures of Knowledge: Investigating Intellectual Property Rights and Relations in the Pacific’, 34(4) *Antipode*, pp 679-706.

Patton, P (1994) ‘Translator’s Preface’ in Deleuze, G (1968/1996) *Difference and Repetition* (trans. Paul Patton), New York: Columbia University Press, pp xi-xiii.

Patton, P (2000) *Deleuze and the Political*, London and New York: Routledge.

Patton, P (2010) *Deleuzian Concepts: Philosophy, Colonization, Politics*, Stanford CA: Stanford University Press.

Patton, P (2012) ‘Immanence, Transcendence, and the Creation of Rights’ in de Sutter, L and McGee, K (eds.) *Deleuze and Law*, Edinburgh: Edinburgh University Press, pp 15-31.

Pennock, J R and Chapman, J W (1980) *Property*, NOMOS XXII, New York: New York University Press.

Penner, James E (1997) *The Idea of Property in Law*, Oxford: Oxford University Press.

Perkins, C (2009) ‘Performative and Embodied Mapping’ in Kitchin, R and Thrift, N (eds.) *International Encyclopedia of Human Geography*, London: Elsevier, pp 126-132.

Perry, R W (2000) ‘Governmentalities in City-scapes: Introduction to the Symposium’, 23(1) *PoLAR: Political and Legal Anthropology Review*, pp 65-72.

Perry, R W and Maurer, B (2003) ‘Globalization and Governmentality: An Introduction’ in Perry, R W and Maurer, B (eds.) *Globalization under Construction:*

Governmentality, Law, and Identity, Minneapolis: University of Minnesota Press, pp ix-xxi.

Peterson, K (2001) 'Benefit Sharing for All?: Bioprospecting NGOs, Intellectual Property Rights, New Governmentalities', 24(1) *PoLAR: Political and Legal Anthropology Review*, pp 78-91.

Philippopoulos-Mihalopoulos, A (2010) 'Spatial justice: law and the geography of withdrawal', 6(3) *International Journal of the Law in Context*, pp 201-216.

Philippopoulos-Mihalopoulos, A (2012) 'Law, Space, Bodies: The Emergence of Spatial Justice' in de Sutter, L and McGee, K (eds.) *Deleuze and Law*, Edinburgh: Edinburgh University Press, pp 90-110.

Philippopoulos-Mihalopoulos, A (2013a) 'Spatial Justice in the Lawscape' in Brighenti, A (ed.) *Urban Interstices: The Aesthetics and Politics of the In-Between*, Surrey: Ashgate, pp 87-102.

Philippopoulos-Mihalopoulos, A (2013b) 'The Autopoietic Fold: Critical Autopoiesis between Luhmann and Deleuze' in La Cour, A and Philippopoulos-Mihalopoulos, A (eds.) *Luhmann Observed: Radical Theoretical Encounters*, Basingstoke: Palgrave Macmillan, pp 60-81.

Philippopoulos-Mihalopoulos, A (2014) 'Critical Autopoiesis and the Materiality of Law', 27 *International Journal for the Semiotics of Law*, pp 389-418.

Philippopoulos-Mihalopoulos, A (2015) *Spatial Justice: Body, Lawscape, Atmosphere*, New York: Routledge.

Phillips, J (2006) 'Agencement/Assemblage', 23(2-3) *Theory, Culture & Society*, pp 108-109.

Phillips, N and Hardy, C (2002) *Discourse Analysis: Investigating Processes of Social Construction*, Thousand Oaks, CA: Sage.

Pieterse, Jan N (1995) 'Globalisation as Hybridisation' in Featherstone, M, Lash, S and Robertson, R (eds.) *Global Modernities*, London: Sage, pp 45-68.

Pinch, Trevor J (1981) 'The Sun-Set: The Presentation of Certainty in Scientific Life', 11 *Social Studies of Science*, pp 131-58.

Plotnitsky, A (2006) 'Manifolds: on the concept of space in Riemann and Deleuze' in Duffy, S (ed.) *Virtual Mathematics: The Logic of Difference*, Manchester: Clinamen Press, pp 187-208.

Plotnitsky, A (2009) 'Bernhard Riemann's Conceptual Mathematics and the Idea of Space', 17 *Configurations*, pp 105-130.

Polanyi, M (1962) 'The Republic of Science', 1 *Minerva*, pp 54-73.

Pollock, F (1894) 'What is a Thing?', 10 *Law Quarterly Review*, pp 318-322.

Pollock, F (1961) ‘Relation of Persons to Things: Possession and Ownership’ in Goodhart, A L (ed.) *Jurisprudence and Legal Essays*, London: Macmillan, pp 93-112.

Posner, R (2003) *Law, Pragmatism and Democracy*, Cambridge, Massachusetts: Harvard University Press.

Pospisil, L (1967) ‘Legal levels and multiplicity of legal systems in human societies’, 11(1) *Journal of Conflict Resolution*, pp 2-26.

Pottage, A (1998) ‘Instituting Property’, 18 *Oxford Journal of Legal Studies*, pp 331-344.

Pottage, A (2004) ‘Introduction: The Fabrication of Persons and Things’ in Pottage, A and Mundy, M (eds.) *Law, Anthropology, and the Constitution of the Social: Making Persons and Things*, New York: Cambridge University Press, pp 1-39.

Pottage, A (2006a) ‘Materialities in Law and Life: Informatic Technologies and Industrial Property’, 15(1) *Paragrana*, pp 81-99.

Pottage, A (2006b) ‘Too Much Ownership: Bio-prospecting in the Age of Synthetic Biology’, 1 *BioSocieties*, pp 137-158.

Pottage, A and Sherman, B (2010) *Figures of Invention: A History of Modern Patent Law*, Oxford, England: Oxford University Press.

Pottage, A (2011) ‘Law machines: Scale models, forensic materiality and the making of modern patent law’, 41(5) *Social Studies of Science*, pp 621-643.

Pottage, A (2012) ‘The Materiality of What?’, 39(1) *Journal of Law and Society*, pp 167-183.

Pound, R (1908) ‘Mechanical Jurisprudence’, 8 *Columbia Law Review*, pp 605-623.

Pound, R (1921) *The Spirit of the Common Law*, New Hampshire: Marshall Jones Company.

Rabinow, P (1996) *Making PCR: A Story of Biotechnology*, Chicago and London: University of Chicago Press.

Rabinow, P (2003) *Anthropos Today: Reflections on Modern Equipment*, Princeton and Oxford: Princeton University Press.

Ragin, Charles C (1992) *What is a Case? Exploring the Foundations of Social Inquiry*, Cambridge, UK: Cambridge University Press.

Rajagopal, B (2003) *International Law from Below: Development, Social Movements and Third World Resistance*, Cambridge, UK: Cambridge University Press.

Rajchman, J (2000) *The Deleuze Connections*, Massachusetts and England: MIT Press.

Ralston, Shane J (2012) 'Reconstructing the Legacy of Pragmatist Jurisprudence', 3(1) *Pragmatism Toady*, pp 58-66.

Rao, C K, Shantharam, S and Moses, V (2011) 'Bt-brinjal is an important tool for the control of fruit and shoot borer', 38(1) *Microbiology Today*, pp 60-61.

Rao, S R (2002) 'Indian Biotechnology Developments in Public and Private Sectors – Status and Opportunities', 5(1) *Asian Biotechnology and Development Monitor*, pp 1-14.

Ray, R and Katzenstein, Mary F (2005) 'Introduction: In the Beginning, There Was the Nehruvian State' in Ray, R and Katzenstein, Mary F (eds.) *Social Movements in India: Poverty, Power, and Politics*, Lanham and Oxford: Rowman & Littlefield, pp 1-31.

Raz, J (1972) 'Legal Principles and the Limits of Law', 81 *Yale Law Journal*, pp 823-854.

Raz, J (1978) *The Authority of Law*, Oxford: Clarendon Press.

Read, J (2009) 'A Genealogy of Homo-Economicus: Neoliberalism and the Production of Subjectivity', 6 *Foucault Studies*, pp 25-36.

Riles, A (2004) 'Property as Legal Knowledge: Means and Ends', 10 *Journal of the Royal Anthropological Institute*, pp 775-795.

Rhodes, R (1996) 'The New Governance: Governing without Government', 44 *Political Studies*, pp 652-667.

Robertson, R (1995) 'Glocalization: Time-Space and Homogeneity-Heterogeneity' in Featherstone, M, Lash, S and Robertson, R (eds.) *Global Modernities*, London: Sage, pp 25-44.

Robertson, R (2012) 'Globalisation or glocalisation?', 18(2) *Journal of International Communication*, pp 191-208.

Robin, M (2010) *The World According to Monsanto: Pollution, Politics and Power*, New York: The New Press.

Robinson, A and Tormey, S (2010) 'Living in Smooth Space: Deleuze, Postcolonial and the Subaltern' in Bignall, S and Patton, P (eds.) *Deleuze and the Postcolonial*, Edinburgh: Edinburgh University Press, pp 20-40.

Robinson, Daniel F (2010) 'Locating biopiracy: geographically and culturally situated knowledges', 42 *Environment and Planning A*, pp 38-56.

Rose, M (1988) ‘The Author as Proprietor: Donaldson v. Becket and the Genealogy of Modern Authorship’, 23 *Representations*, pp 51-85.

Rose, N and Miller, P (1992) ‘Political power beyond the State: problematics of government’, 43(2) *British Journal of Sociology*, pp 173-205.

Rose, N (1996a) ‘Governing “advanced” liberal democracies’ in Barry, A, Osborne, T and Rose, N (eds.) *Foucault and Political Reason: Liberalism, neo-liberalism and rationalities of government*, London: UCL Press, pp 37-64.

Rose, N (1996b) *Inventing Our Selves: Psychology, Power, and Personhood*, Cambridge: Cambridge University Press.

Rose, N and Valverde, M (1998) ‘Governed By Law’, 7(4) *Social and Legal Studies*, pp 541-551.

Rose, N (2000) ‘Government and Control’, 40 *British Journal of Criminology*, pp 321-339.

Rose, N, O’Malley, P and Valverde, M (2006) ‘Governmentality’, 2 *Annual Review of Law and Social Science*, pp 83-104.

Rosendal, G K (2006) ‘The Convention on Biological Diversity: Tensions with the WTO TRIPS Agreement over Access to Genetic Resources and the Sharing of Benefits’ in Oberthur, S and Gehring, T (eds.) *Institutional Interaction in Global Environmental Governance: Synergy and Conflict among International and EU Policies*, Massachusetts and London: MIT Press, pp 79-102.

Ruskola, T (2002) ‘Legal Orientalism’, 101 *Michigan Law Review*, pp 179-234.

Rutherford, S (2007) ‘Green governmentality: insights and opportunities in the study of nature’s rule’, 31(3) *Progress in Human Geography*, pp 291-307.

Ryan, A (1984) *Property and Political Theory*, Oxford: Basil Blackwell.

Ryan, Michael P (2002) ‘Knowledge-Economy Elites, the International Law of Intellectual Property and Trade, and Economic Development’, 10 *Cardozo Journal of International and Comparative Law*, pp 271-303.

Samuels, J (2011) ‘Centre of origin and the *Bt* brinjal controversy’, 101(4) *Current Science*, pp 469-469.

Samuels, J (2012) *Genetically engineered Bt brinjal and the implication for plant biodiversity – revisited*, Novel Solanaceae Crops Project, Cornwall: UK.

Sassen, S (1998) ‘De-Nationalization: Some Conceptual and Empirical Elements’, 22(2) *PoLAR: Political and Legal Anthropology Review*, pp 1-16.

Sassen, S (2000) ‘Spatialities and Temporalities of the Global: Elements for a Theorization’, 12(1) *Public Culture*, pp 215-232.

Sassen, S (2004) 'The State and Globalization: Denationalized: Participation', 25 *Michigan Journal of International Law*, pp 1141-1158.

Sassen, S (2008) 'Neither global nor national: novel assemblages of territory, authority and rights', 1(1-2) *Ethics and Global Politics*, pp 61-79.

Sell, Susan K (1999) 'Multinational Corporations as Agents of Change: The Globalization of Intellectual Property Rights' in Cutler, A C, Haufler, V and Porter, T (eds.) *Private Authority and International Affairs*, New York: State University of New York Press, pp 169-197.

Sell, Susan K (2002) Industry Strategies for Intellectual Property and Trade: The Quest for TRIPS and Post-TRIPS Strategies', 10 *Cardozo Journal of International and Comparative Law*, pp 79-108.

Sethi, H (1993) 'Survival and Democracy: Ecological Struggles in India' in Wignaraja, P (ed.) *New Social Movements in the South*, London and New Jersey: Zed Books, pp 122-148.

Schauer, F (1989) 'Formalism', 97 *Yale Law Journal*, pp 509-548.

Schroeder, D and Pogge, T (2009) 'Justice and the Convention on Biological Diversity', 23(3) *Ethics and International Affairs*, pp 267-280.

Scoones, I (2002) 'Science, policy and regulation: challenges for agricultural biotechnology in developing countries', *IDS Working Paper 147*, Sussex, England: Institute of Development Studies.

Scoones, I (2003) 'Regulatory manoeuvres: the Bt cotton controversy in India', *IDS Working Paper 197*, Sussex, England: Institute of Development Studies.

Scott, C (2009) 'Transnational Law as Proto-Concept: Three Conceptions', 10(7) *German Law Journal*, pp 859-876.

Shaffer, G (2012) 'Transnational Legal Process and State Change', 37(2) *Law and Social Inquiry*, pp 229-264.

Shah, E (2011) 'Science in the Risk Politics of Bt Brinjal', 44(31) *Economic and Political Weekly*, pp 31-38.

Shapiro, M (1993) 'The Globalization of Law', 1 *Indiana Journal of Global Legal Studies*, pp 37-64.

Sharma, S K, Pratibha, B and Rana, M K (2010) 'India's agri-horticultural diversity: conserving our biological heritage', 5 *Biotech News*, pp 78-82.

Sharp, Joanne P et al. (2000) 'Entanglements of Power: Geographies of domination/resistance' in Sharpe, Joanne P et al. (eds.) *Entanglements of Power: Geographies of Domination/Resistance*, London and New York: Routledge, pp 1-42.

Shelton, A M (2010) 'The long road to commercialization of Bt brinjal (eggplant) in India', 29 *Crop Protection*, pp 412-414.

Sherman, B and Bently, L (1999) *The Making of Modern Intellectual Property Law: The British Experience, 1760-1911*, Cambridge: Cambridge University Press.

Sheth, D L (2005) 'Micro-movements in India: Toward a New Politics of Participatory Democracy' in de Sousa Santos, B (ed.) *Democratizing Democracy: Beyond the Liberal Democratic Canon*, London and New York: Verso, pp 1-37.

Shiva, V (1993) *Monocultures of the Mind: Perspectives on Biodiversity and Biotechnology*, Dehra Dun, India: Natraj Publishers.

Shiva, V (1998) *Biopiracy: The Plunder of Nature and Knowledge*, Devon: Green Books.

Shiva, V (2000) 'North-South Conflicts in Intellectual Property', 12(4) *Peace Review*, pp 501-508.

Silbey, Susan S (1997) '"Let Them Eat Cake": Globalization, Postmodern Colonialism, and the Possibilities of Justice', 31(2) *Law and Society Review*, pp 207-235.

Slaughter, A (2000) 'Judicial Globalization', 40 *Virginia Journal of International Law*, pp 1103-1124.

Snyder, F (2004) 'Economic Globalization and the Law in the Twenty-first Century' in Sarat, A (ed.) *The Blackwell Companion to Law and Society*, Oxford, UK: Blackwell, pp 624-640.

Snyder, F (1999) 'Governing Economic Globalisation: Global Legal Pluralism and European Law', 5(4) *European Law Journal*, pp 334-374.

Spivak, Gayatri C (1988) 'Can the Subaltern Speak?' in Nelson, C and Grossberg, L (eds.) *Marxism and the Interpretation of Culture*, Basingstoke: Macmillan, pp 271-313.

Spector, H M (1989) 'An Outline of a Theory Justifying Intellectual and Industrial Property Rights', 8 *European Intellectual Property Review*, pp 270-273.

Stake, R (1978) 'The Case Study Method in Social Inquiry', 7(2) *Educational Researcher*, pp 5-8.

Stake, R (1995) *The Art of Case Study Research*, Thousand Oaks, CA: Sage.

Stake, R (2005) 'Qualitative Case Studies' in Denzin, Norman K and Lincoln, Yvonna S (eds.) *The Sage Handbook of Qualitative Research* (3rd Ed), London: Sage, pp 443-466.

Stengers, I (2008) ‘Experimenting with Refrains: Subjectivity and the Challenge of Escaping Modern Dualism’, 22 *Subjectivity*, pp 38-59.

Stivale, Charles J (1984) ‘The Literary Element in “Mille Plateaux”: The New Cartography of Deleuze and Guattari’, 13 *SubStance*, pp 20-34.

Stoker, G (1998) ‘Governance as theory: five propositions’, 155 *International Social Science Journal*, pp 17-28.

Strathern, M (1990) *The Gender of the Gift: Problems with Women and Problems with Society in Melanesia*, Berkeley and London: University of California Press.

Strathern, M (1996) ‘Potential property: Intellectual property rights and property in person’, 4(1) *Social Anthropology*, pp 17-32.

Strathern, M (1999) *Property, Substance and Effect: Anthropological Essays on Persons and Things*, London and New Brunswick, NJ: Athlone Press.

Strathern, M (2006) ‘Divided Origins and the Arithmetic of Ownership’ in Maurer, B and Schwab, G (eds.) *Accelerating Possession: Global Futures of Property and Personhood*, New York: Columbia University Press, pp 135-173.

Straus, J (2004) ‘Genomics and the food industry: outlook from an intellectual property perspective’ in Vaver, D and Bently, L (eds.) *Intellectual Property in the New Millennium: Essays in Honour of William R. Cornish*, Cambridge: Cambridge University Press, pp 124-136.

Sunder Rajan, K (2006) *Biocapital: The Constitution of Postgenomic Life*, Durham, NC: Duke University Press.

Tadros, V (1998) ‘Between Governance and Discipline: The Law and Michel Foucault’, 18 *Oxford Journal of Legal Studies*, pp 75-103.

Tamanaha, Brina Z (2009) *Beyond the Formalist-Realist Divide: The Role of Politics in Judging*, Princeton University Press.

Tarrow, S (1998) *Power in Movement: Social Movements and Contentious Politics* (2nd Ed.), Cambridge, UK: Cambridge University Press.

Teubner, G (1989) ‘How the Law Thinks: Toward a Constructivist Epistemology of Law’, 23 *Law and Society Review*, pp 727-757.

Teubner, G (1992) ‘The Two Faces of the Janus: Rethinking Legal Pluralism’, 13 *Cardozo Law Review*, pp 1443-1462.

Teubner, G (1997b) ‘The King’s Many Bodies: The Self-Deconstruction of Law’s Hierarchy’, 31(4*) Law and Society Review*, pp 763-787.

Teubner, G (1997a) ‘Global Bukowina: Legal Pluralism in the World Society’ in Teubner, G (ed.) *Global Law Without a State*, Brookfield: Dartmouth, pp 3-28.

Teubner, G (1998) ‘Legal Irritants: Good Faith in British Law or How Unifying Law Ends Up in New Divergences’, 61(1) *Modern Law Review*, pp 11-32.

Thacker, E (2001) ‘The Incorporate Bodies of Recombinant Capital’, 26 *Dialectical Anthropology*, pp 1-17.

Tolba, Mostafa K and Rummel-Bulska, I (1998) *Global Environmental Diplomacy: Negotiating Environment Agreements for the World, 1973-1992*, London and Massachusetts: MIT Press.

Touraine, A (2004) ‘On the Frontier of Social Movements’, 52(4) *Current Sociology*, pp 717-725.

Trentman, F (2009) ‘Materiality in the Future of History: Things, Practices, and Politics’, 48 *Journal of British Studies*, pp 283-307.

Trubek, David M, Dezalay, Y, Buchanon, R and Davis, John R (1994) ‘Global Restructuring and the Law: Studies of the Internationalization of Legal Fields and the Creation of Transnational Arenas’, 44 *Case Western Reserve Law Review*, pp 407-498.

Tsing, A (2000) ‘The Global Situation’, 15(3) *Cultural Anthropology*, pp 327-360.

Turk, Austin T (1976) ‘Law as a Weapon in Social Conflict’, 23(3) *Social Problems*, pp 276-291.

Turnbull, D (1997) ‘Reframing Science and Other Local Knowledge Traditions’, 29(6) *Futures*, pp 551-562.

Twining, W (1974) ‘Some Jobs for Jurisprudence’, 1 *British Journal of Law and Society*, pp 149-174.

Twining, W (2002) ‘Reviving General Jurisprudence’ in Likosky, M (ed.) *Transnational Legal Processes*, London: Butterworths, pp 3-22.

Twining, W (2005) ‘Have concepts, will travel: analytical jurisprudence in a global context’, 1(1) *International Journal of Law in Context*, pp 5-40.

Twining, W (2006) ‘Diffusion and Globalization Debate’, 47(2) *Harvard International Law Journal*, pp 507-515.

Twining, W (1996) ‘Globalization and Legal Theory: Some Local Implications’, 49(1) *Current Legal Problems*, pp 1-42.

Twining, W (2009a) *Globalisation and Legal Scholarship*, Tilburg Law Lecture Series, Montesquieu seminars vol. 4, Nijmegen: Wolf Legal Publishers.

Twining, W (2009b) *General Jurisprudence: Understanding Law from a Global Perspective*, Cambridge: Cambridge University Press.

Valverde, M (2010) ‘Spectres of Foucault in Law and Society Scholarship’, 6 *Annual Review of Law and Social Science*, pp 45-59.

Vennesson, P (2008) ‘Case studies and process tracing: theories and practices’ in della Porta, D and Keating, M (eds.) *Approaches and Methodologies in the Social Sciences: A Pluralist Perspective*, Cambridge, UK: Cambridge University Press, pp 19-39.

Visvanathan, S (2005) ‘Knowledge, justice and democracy’ in Leach, M, Scoones, I and Wynne, B (eds.) *Science and Citizens: Globalisation and the Challenge of Engagement*, New Delhi: Orient Longman, pp 83-94.

Wade, H W R (1940-41) ‘The Concept of Legal Certainty: A Preliminary Skirmish’, 4 *Modern Law Review*, pp 183-199.

Waldby, C (2002) ‘Stem cells, tissue cultures, and the production of biovalue’, 6(3) *Health: An interdisciplinary journal for the social study of health, illness and medicine*, pp 305-323.

Waldby, C and Mitchell, R (2006) *Tissue Economies: Blood, Organs, and Cell Lines in Late Capitalism*, Durham and London: Duke University Press.

Waldron, J (1988) *The Right to Private Property*, Oxford: Clarendon Press.

Watal, J (2001) *Intellectual Property Rights in the WTO and Developing Countries*, New Delhi: Oxford University Press.

Watson-Verran, H and Turnbull, D (1995) ‘Science and Other Indigenous Knowledge Systems’ in Jasanoff, S, Markle, Gerald E, Petersen, James C and Pinch, T (eds.) *Handbook of Science and Technology Studies*, Thousand Oaks: Sage, pp 115-139.

Weber, M and Rheinstein, M (1954) *Max Weber on Law in Economy and Society*, Cambridge, MA: Harvard University Press.

Weinrib, Ernest J (1988) ‘Legal Formalism: On the Immanent Rationality of Law’, 97 *Yale Law Journal*, pp 949-1016.

Westbrook, David A (2006) ‘Theorizing the Diffusion of Law: Conceptual Difficulties, Unstable Imaginations, and the Effort to Think Gracefully Nonetheless’, 47(2) *Harvard International Law Journal*, pp 489-505.

White, Hayden V (1973) ‘Foucault Decoded: Notes from Underground’, 12(1) *History and Theory*, pp 23-54.

Whitt, Laurie A (1998) ‘Biocolonialism and the Commodification of Knowledge’, 7(1) *Science as Culture*, pp 33-67.

Wickham, G (2006) 'Foucault, Law, and Power: A Reassessment', 33(4) *Journal of Law and Society*, pp 596-614.

Widenhorn, S (2014) 'Towards Epistemic Justice with Indigenous Peoples' Knowledge? Exploring the potentials of the convention on biological diversity and the philosophy of *Buen Vivir*', 56(3) *Development*, pp 378-386.

Wise, J M (2005) 'Assemblage' in Stivale, Charles J (ed.) *Gilles Deleuze: Key Concepts*, Montreal and Kingston: McGill-Queen's University Press, pp 77-87.

Wood, D and Krygier, J (2009) 'Maps' in Kitchin, R and Thrift, N (eds.) *International Encyclopedia of Human Geography*, Vol. 1, London: Elsevier, pp 421-430.

Woodmansee, M (1984) 'The Genius and the Copyright: Economic and Legal Conditions of the Emergence of the "Author"', 17(4) *Eighteenth-Century Studies*, pp 425-448.

Wright, S (2005) 'Knowing scale: intelle©tual property rights, knowledge spaces and the production of the global', 6(6) *Social and Cultural Geography*, pp 903-921.

Wynne, B (1988) 'Unruly Technology: Practical Rules, Impractical Discourses and Public Understanding', 18 *Social Studies of Science*, pp 147-167.

Wynne, B (1992a) 'Uncertainty and environmental learning: Reconceiving science and policy in the preventive paradigm', 2 *Global Environmental Change*, 111-127.

Wynne, B (1992b) 'Misunderstood misunderstanding: social identities and public uptake of science', 1 *Public Understanding of Science*, 281-304.

Wynne, B (2001) 'Creating Public Alienation: Expert Cultures of Risk and Ethics on GMOs', 10(4) *Science as Culture*, 445-480.

Wynne, B (2002) 'Risk and Environment as Legitimatory Discourses of Technology: Reflexivity Inside Out?', 50(3) *Current Sociology*, pp 459-477.

Wynne, B (2008) 'Elephants in the rooms where publics encounter "science"?: A response to Darrin Durant, "Accounting for expertise: Wynne and the autonomy of the lay public', 17 *Public Understanding of Science*, 21-33.

Yadugiri, V T (2011) 'What shall we do with Bt brinjal? A debate among scientists', 101(4) *Current Science*, 472-476.

Yin, Robert K (2009) *Case Study Method: Design and Methods* (4th Ed.), Thousand Oaks, CA: Sage.

Yin, Robert K (2012) *Applications of Case Study Research* (3rd Ed.), Washington, DC: Sage.

Young, Robert J C (1995) *Colonial Desire: Hybridity in Theory, Culture and Race*, London: Routledge.

Yu, Peter K (2002) 'World Trade, Intellectual Property and Global Elites: An Introduction', 10 *Cardozo Journal of International and Comparative Law*, pp 1-5.

Zemans, Frances K (1983) 'Legal Mobilization: The Neglected Role of the Law in the Political System', 77(3) *American Political Science Review*, pp 690-703.

Zumbansen, P (2006) 'Transnational Law' in Smits, J (ed.) *Encyclopedia of Comparative Law*, Cheltenham: Edward Elgar, pp 738-754.

Zumbansen, P (2009) '"New Governance" in European Corporate Law Regulation as Transnational Legal Pluralism', 15(2) *European Law Journal*, pp 246-276.

Zumbansen, P (2010) 'Transnational Legal Pluralism', *CLPE Research Paper No. 01/2010*.

Zumbansen, P (2011) 'Comparative, Global and Transnational Constitutionalism: The Emergence of a Transnational Legal-Pluralist Order', *CLPE Research Paper No. 24/2011*.

Zumbansen, P (2012) 'Defining the Spaces of Transnational Law: Legal Theory, Global Governance, and Legal Pluralism', 21 *Transnational Law and Contemporary Problems*, pp 305-335.

Zumbansen, P (2015) 'Theorizing as Activity: Transnational Legal Theory in Context' in Baxi, U, McCrudden, C and Paliwala, A (eds.) *Law's Ethical, Global and Theoretical Contexts: Essays in Honour of William Twining*, Cambridge, UK: Cambridge University Press, pp 280-302.

Legal Instruments

Biological Diversity Act 2002

European Patent Convention 1973

Indian Patent Act 1970

Paris Convention for the Protection of Industrial Property 1883

Patent Cooperation Treaty (PCT) 1970

Trade-Related Aspects of Intellectual Property Rights 1995

List of Cases

Amgen Inc. v. Chugai Pharmaceuticals Co. Ltd. And Genetics Institute927 F.2d 1200 (59 USLW 2575, 18 U.S.P.Q.2d 1016).

Diamond v. Chakrabarty100 S. Ct. 2204, 65 L. Ed. 2d.

UN Documents and Reports

Agenda 21, 1992.

Bonn Guideline on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization 2002

Convention on Biological Diversity 1992

International Union for the Conservation of Nature and Natural Resources (IUCN) Draft Convention 1988.

Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization 2010

Rio Declaration on Environment and Development 1992.

The Brundtland Report 1987 (Our Common Future).

United Nations Conference on the Human Environment 1972.

UNEP (1989) Report of the AD HOC Working Group on the Work of its First Session, Geneva, 16-18 November 1989 (UNEP/Bio.Div.1/3).

UNEP (1990) Report of the AD HOC Working Group on the Work of its Second Session in Preparation for a Legal Instrument on Biodiversity of the Planet, Second Session, Geneva, 19-23 February 1990 (UNEP/Bio.Div.2/3).

UNEP (1990) Biological Diversity: Needs and Costs, Third Session, Geneva, 9-13 July 1990 (UNEP.Bio.Div.3/3).

UNEP (1990) Biological Diversity: Global Conservation Needs and Costs, Third Session, Geneva, 9-13 July 1990 (UNEP/Bio.Div.3/Inf.1).

UNEP (1990) Report of the AD HOC Working Group on the Work of its Third Session in Preparation for a Legal Instrument on Biological Diversity of the Planet, Geneva, 9-13 July 1990 (UNEP/Bio.Div.3/12).

UNEP (1990) Relationship between Intellectual Property Rights and Access to Genetic Resources and Biotechnology, Third Session, Geneva, 9-13 July 1990 (UNEP/Bio.Div.3/Inf.4).

UNEP (1990) Ongoing Discussion on Intellectual Property Rights in Uruguay Round of GATT Negotiations, Third Session, Geneva, 9-13 July 1990 (UNEP/Bio.Div.3/8).

UNEP (1990) Relationship between Intellectual Property Rights and Access to Genetic Resources and Biotechnology, Third Session, Geneva, 9-13 July 1990 (UNEP/Bio.Div.3/6).

UNEP (1990) Current Multilateral, Bilateral and National Financial Support for Biological Diversity Conservation, Third Session, Geneva, 9-13 July 1990 (UNEP/Bio.Div.3/4).

UNEP (1990) Biotechnology: Concepts and Issue for Consideration in Preparation of a Framework Legal Instrument for the Conservation of Biological Diversity, Third Session, Geneva, 9-13 July 1990 (UNEP/Bio.Div.3/7).

UNEP (1990) Final Report of the Sub-Working Group on Biotechnology, Nairobi, 14-17 November 1990 (UNEP/Bio.Div/SWGB.1/5/Rev.1).

UNEP (1990) Report of the AD HOC Working Group of Legal and Technical Experts on Biological Diversity on the Work of its First Session, Nairobi, 19-23 November 1990 (UNEP/Bio.Div/WG.2/1/4).

UNEP (1990) Elements for Possible Inclusion in a Global Framework Legal Instrument on Biological Diversity, First Session, Nairobi, 19-23 November 1990 (UNEP/Bio.Div/WG.2/1/3).

UNEP (1990) Report of the AD HOC Working Group of Legal and Technical Experts on Biological Diversity on the Work of its First Session, Second Session, Nairobi, 19-23 November 1990 (UNEP/Bio.Div/WG.2/1/4/Add.1).

UNEP (1991) Draft Convention on Biological Diversity, Second Session, Nairobi, 25 February – 6 March 1991 (UNEP/Bio.Div/WG.2/2/2).

UNEP (1991) Revised Draft Convention on Biological Diversity, Third Session, Madrid, 24 June – 3 July 1991 (UNEP/Bio.Div/WG.2/3/3).

UNEP (1991) A Preliminary Note on the Concepts Outlined in some of the Key Terms and Phrases used in the Draft Articles, Third Session, Madrid, 24 June – 3 July 1991 (UNEP/Bio/Div/WG.2/3/6).

UNEP (1991) Note to Facilitate Understanding of Issues Contained in Articles under Consideration by Sub-Working Group II, Third Session, Madrid, 24 June – 3 July 1991 (UNEP/Bio.Div/WG.2/3/7).

UNEP (1991) Second Draft Convention on Biological Diversity, Fourth Session, Nairobi, 23 September – 3 October 1991 (UNEP/Bio.Div/INC.4/2).

UNEP (1991) Report of the Intergovernmental Negotiating Committee for a Convention of Biological Diversity on the Work of its Fourth Negotiating Session/Second Session, Nairobi, 23 September – 2 October 1991 (UNEP/Bio.Div/N4-INC.2/5).

UNEP (1991) Interpretation of the Words and Phrases 'Fair and Favourable', 'Fair and Most Favourable', 'Equitable', 'Preferential and Non-Commercial', 'Preferential', 'Non-Commercial' and 'Concessional', Fifth Negotiating Session/Third Session of INC, Geneva, 25 November – 4 December 1991 (UNEP/Bio.Div/N5-INC.3/3).

World Charter for Nature 1982.

Other Reports/Documents

DBT (2011) Report of the Working Group on Biotechnology, 12th Plan (2012 – 2017), New Delhi: Department of Biotechnology, Government of India.

DBT (2014) National Biotechnology Development Strategy 2014, New Delhi, India: Department of Biotechnology, Government of India.

DST (2003) Science and Technology Policy 2003, New Delhi, India: Ministry of Science and Technology, Government of India.

DST (2013) Science, Technology and Innovation Policy 2013, New Delhi: Ministry of Science and Technology, Government of India.
European Commission (1998) Directive of the European Parliament and of the Commission on the Legal Protection of Biotechnological Inventions (98/44/EC), Brussels, Belgium.

European Commission (2005) Development and Implications of Patent Law in the Field of Biotechnology and Genetic Engineering (COM 2005, 312 Final), Brussels, Belgium.

FICCI (2015) Biotechnology Landscape in India, New Delhi, India: Federation of Indian Council of Commerce and Industry.

Lenin, K, Udayasuriyan, V and Kannaiyan, S (2007) Diversity in *cry* genes of *Bacillus thuringiensis*, Tamil Nadu, India: National Biodiversity Authority.

MST (N.D.) Science, Technology and Innovation: Potential uses for the State Governments, New Delhi, India: Ministry of Science and Technology, Government of India.

OECD (2003) Harnessing Markets for Biodiversity: Towards Conservation and Sustainable Use, Paris, France: OECD.

OECD (N.D.) Proposal for a major project on The Bioeconomy in 2030: A Policy Agenda, Paris, France: OECD.

OECD (2006) The Bioeconomy to 2030: Designing a Policy Agenda (Scoping Paper), Paris, France: OECD.

OECD (2009) The Bioeconomy to 2030: Designing a Policy Agenda, Paris, France: OECD.

van Beuzekom, B and Arundel, A (2006) *OECD* Biotechnology Statistics – 2006, Paris, France: OECD.

Web Sites

http://dst.gov.in/about_us/intro_DST.htm

http://dst.gov.in/about_us/mandate_DST.htm

http://pfc.org/in/abt.htm

http://www.nipgr.res.in/about_us/institute.php

www.esgindia.org

Other Web Resources

BIO urges India to respect intellectual property, available at: http://www.biospectrumasia.com/biospectrum/news/22179/bio-urges-india-respect-intellectual-property

Bt Brinjal poses a risk to health, environment: Greenpeace report, available at: http://www.thehindu.com/sci-tech/energy-and-environment/bt-brinjal-poses-a-risk-to-health-environment-greenpeace-report/article3371450.ece

Controversial Bt brinjal cleared for entry as first GM food, available at: http://infochangeindia.org/environment/news/controversial-bt-brinjal-cleared-for-entry-as-first-gm-food.html

Debate over GM crops takes centre stage in India, top court says wait for a decision, available at: http://blog.indoasiancommodities.com/?p=600

Diplomatic Conference for the revision of the EPC, available at: https://www.epo.org/law-practice/legal-texts/archive/documentation/diplomatic-conference.html

Drahos, P (2003) 'Expanding Intellectual Property's Empire: the Role of FTAs', available at: http://www.grain.org/article/entries/3614-expanding-intellectual-property-s-empire-the-role-of-ftas

ETC (2002) Biopiracy + 10, 75 Communique, available at: http://www.etcgroup.org/content/biopiracy10

Food security on mind, Power plans push for GM crops, available at: http://www.hindustantimes.com/StoryPage/Print/929565.aspx

GRAIN (2000) Biodiversity for Sale: Dismantling the hype about benefit sharing, available at: https://www.grain.org/fr/article/entries/32-biodiversity-for-sale-dismantling-the-hype-about-benefit-sharing

GRAIN (2005) USAID: Making the world hungry for GM crops, available at: https://www.grain.org/article/entries/21-usaid-making-the-world-hungry-for-gm-crops

GRAIN (2010) Indian farmers organise to stop Bt brinjal, available at: https://www.grain.org/article/entries/4079-indian-farmers-organise-to-stop-bt-brinjal

Green, L (2003) 'Legal Positivism', http://plato.stanford.edu/entries/legal-positivism/

GMWatch (2013) Indefinite moratorium on GM field trials recommended in India, available at: http://www.gmwatch.org/news/archive/2013/14866-indefinite-moratorium-on-gm-field-trials-recommended-in-india

Indefinite moratorium on GM field trials recommended, available at: http://www.downtoearth.org.in/news/indefinite-moratorium-on-gm-field-trials-recommended-41730

India refused genetically modified crops, citing 'inadequate' science, available at: http://www.rawstory.com/2010/02/india-refuses-genetically-modified-crops-citing-inadequate-science/

India puts on hold first GM food crop on safety ground, available at: http://news.bbc.co.uk/2/hi/south_asia/8506047.stm

Koshy, J (2007) Supreme Court lifts 8-month ban on field trials of GM crops, available at: http://www.livemint.com/Politics/Ap26KTAwBhpAaqj6pXYnIK/Supreme-Court-lifts-8month-ban-on-field-trials-of-GM-crops.html

Proper tests not done before giving nod to Bt Brinjal: Parliamentary Panel, available at: http://articles.economictimes.indiatimes.com/2012-08-10/news/33137843_1_bio-technology-gm-crops-food-crops

RAFI (1993) BIO-PIRACY: The Story of Natural Coloured Cottons of the Americas, available at: http://www.etcgroup.org/content/bio-piracy-story-natural-coloured-cottons-americas

Rao, C K (2009a) 'Bt Brinjal: Technology and Biosecurity Regulation', available at: http://www.plantbiotechnology.org.in/issue39.html

Rao, C K (2009b) 'Bt Brinjal: An Activist Designed Imbroglio', available at: http://www.plantbiotechnology.org.in/issue40.html

Rao, C K (2010) 'Why Is India Shunning Safer Food?', available at: http://www.wsj.com/articles/SB10001424052748703862704575099042296849572

SC panel for 10-yr moratorium on all field trials of GM crops, available at: http://www.business-standard.com/article/pti-stories/sc-panel-for-10-yr-moratorium-on-all-field-trials-of-gm-crops-112101900590_1.html

TERI (2010) Strengthening Agricultural Biotechnology Regulation in India, Policy Brief, available at: http://www.teriin.org/policybrief/index.php?a=1

U.S. and Indian Biotech Industry Find Common Ground on Key Issues at BIO India, available at: https://www.bio.org/media/press-release/us-and-indian-biotech-industry-find-common-ground-key-issues-bio-india

Verma, S K and Muralidhar Rao, N V (N.D.) Impact of the Intellectual Property System on Economic Growth, Country Report – India, WIPO-UNU Joint Research Project, available at: www.wipo.int/about-ip/en/studies/pdf/wipo_unu_07_india.pdf

Annex

Aruna Rodrigues and Others v. Union of India and others, Writ Petition no. 260/2005

CEE/MoEF (N.D.) National Consultations on Bt. Brinjal: A primer on concerns, issues and prospects, Ahmedabad: Centre for Environment Education.

DBT's Letter to UAS-D, 19th May 2009.

DBT's Letter to UAS-D, 23rd July 2007.

Environment Support Group and Others v. National Biodiversity Authority and Others, Writ Petition No. 41532/2012.

ESG (2010a) 'An enquiry into certain legal issues relating to the approval of Bt Brinjal by the Genetic Engineering Approval Committee of the Union Ministry of Environment and Forests', ESG's submission to Minister Jairam Ramesh at Bangalore, 6th February 2010.

ESG (2010b) 'Environment Minister's Decision on Bt Brinjal Welcome, Scientifically Sound, but Sketchy and Legally Weak', Press Release, 10th February 2010.

ESG (2010c) 'Violation of Biological Diversity Act, 2002 in matters relating to access and utilisation of local brinjal varieties for the development of Bt Brinjal by M/s Mahyco and ors. [sic], and related issues', ESG's Letter to KBB, 15th February 2010.

ESG's Letter to NBA, 9th August 2011.

ESG (2011) 'National Biodiversity Authority to prosecute Mahyco/Monsanto and collaborators [for] promoting Bt brinjal in violation of Biodiversity Protection Law', Press Release 11th August 2011.

ESG's Letter to Chief Minister of Karnataka, 23rd May 2012.

ESG (2012a) 'Public Interest Litigation in Karnataka High Court challenging callous disregard for biodiversity protection', Press Release, 16th October 2012.

ESG (2012b) 'Karnataka High Court Issues Notice in PIL Highlighting Egregious Biopiracy and Governmental Apathy', Press Release, 21st November 2012.

Gene Campaign and Another v. Union of India and Others, Supreme Court Writ Petition (Civil) No. 115/2004 and 606/2007.

KBB's Letter to NBA, 29th March 2011

KBB's Letters to Mahyco and Sathguru Consultants, 6th April 2011.

KBB's Letter to NBA, 28th May 2011.

Mahyco's International Application (PCT) for Patent on Bt. Brinjal (WO 2007/091277 A2).

Mahyco's Letter to KBB, 25th June 2010.

Mahyco's Letter to the KBB, 29th April 2011.

Material Transfer Agreement between Mahyco and TNAU-C, 2005.

MoEF (2010a) Jairam Ramesh's Letter to Sharad Pawar, 21st January 2010.

MoEF (2010b) Decision on Commercialisation of Bt. Brinjal, New Delhi: Ministry of Environment and Forests, Government of India.

MoEF (2010c) National Consultations on Bt. Brinjal Report, New Delhi: Ministry of Environment and Forests, Government of India.

NBA's Letter to KBB, 28th March 2011.

NBA's Letter to KBB, 25th April 2011.

NBA's Letter to ESG, 21st May 2012.

Proceedings of the 13th Board Meeting of KBB, 26th February 2010.

Proceedings of the 18th Board Meeting of KBB, 14th September 2011.

Sathguru Consultants' Letter to the KBB, 21st April 2011.

Sub-Licence Agreement Between Mahyco, UAS-D and Sathguru Management Consultants Private Limited, 2005

UAS-D's Letter to the National Bureau of Plant Genetic Resources, 13th January 2006.

UAS-D's Letter to the KBB, 17th May 2011.