

Trade and Precaution: Their Progressive Interlace

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Abstract: Problem statement: The principle of precaution has developed in International Law, as it has been present in either explicit or implicit forms in most of the celebrated international treaties dealing with the protection of the environment, over the past two decades. In spite of the huge recognition that this principle has got through incorporation, in the international order, this principle continues to be the greatest puzzle in International law for being vague, ambiguous and imprecise as well as its status in relation to being a principle of customary International Law. **Conclusion/Recommendation:** Elements of precaution have been incorporated into the WTO Agreements (SPS and TBT) and for the examination of the relationship between the two can only be analyzed by determining the basis upon which these measures are put in place in the agreements. WTO aims at progressive liberalization of trade and greater freedom to take risks, while precaution is an opposite attitude in decision making that reflects an aversion to risk in the face of uncertainty. The trade rules of the WTO permit countries to invoke precautionary measures especially on the basis of health or environment while justifying trade restrictions, but they face real challenges when defending a precautionary action before the WTO Dispute Settlement Body. The relationship between Multilateral Environmental Agreements (MEA) and the WTO is undergoing a change from being theoretical to a tenuous one due to the new trade trends and its upshot on the environment. This paper looks to find the middle path needed for further trade progression while minimizing the effects on the environment. And answer some questions like, when an invocation of the precautionary principle is trade protectionism in disguise, who should bear the burden of proof when there is disagreement between parties and the effect of new trade regulations on the developing countries.

Key words: Multilateral environmental, progressive interlace, trade protectionism

INTRODUCTION

This article provides an overview of the “trade and environment” interface in the World Trade Organization (WTO) with special reference to the precautionary principle and proposes a new paradigm for making progress. The article reviews the developments in WTO policy and recent adjudication and negotiations patterns. The article also points to several pro-environmental initiatives that could be taken by the WTO.

The article is divided into five parts. Part I provides a brief review of the history of environment linkage in trade policy. Part II offers a Tour d’Horizon of WTO rules and policies with implications for the environment, with a special reference to the relation between the WTO and various Multilateral Environmental Agreements (MEA’s). Part III provides an insight into the Precautionary Principle and its incorporation in various MEA’s. It also examines the status of the Precautionary Principle in International Law. Part IV of this article provides the gateways in

which the Precautionary Principle is recognized either explicitly or implicitly by the WTO. Part V focuses on a greener WTO and tries to lay out measures in which the Environment and Trade can harmoniously be handled by the WTO. Part VI of the Article concludes with the view that the precautionary principle should be taken in its step by the WTO while moving forward.

The trade-environment linkage in historical perspective: The linkage between Trade and Environment dates back a long time, the origins can be traced to the 1920s, the trading system sought to avoid interfering with national health and environmental policy measures proof of which is contained in the first multilateral treaty on trade, the Customs Simplification Convention of 1923^[1]. The next major multilateral trade treaty was the Trade Prohibitions Convention of 1927 which sought to discipline import and export prohibitions^[2].

After World War II, when leading governments negotiated both the General Agreement on Tariffs and Trade^[3] and the Charter of the International Trade

Organization, there were a sufficient number of multilateral environmental agreements in place with specific trade obligations such that the drafters of the Charter took care to include a general exception for measures “taken in pursuance of any inter-governmental agreement which relates solely to the conservation of fishery resources, migratory birds or wild animals ...”. Thus, the architects of the multilateral trading system were aware of certain environmental challenges and of the need to keep emerging trade policies compatible with the environmental norms (as the immediate post-war period had been an active time for international environmental policymaking^[4-7]). Unfortunately, the Charter of the International Trade Organization failed to go into force and the GATT (as amended) remained the organic law of the trading system until the WTO came into being in 1995. The GATT eventually assumed the role of an international organization. But the GATT lacked the duty of coordinating with the United Nations contemplated in the 1948 Charter^[8].

Environmental issues began to bump up against the GATT in the early 1970s. As an intellectual contribution to the 1972 U.N. Stockholm Conference on the Human Environment, the GATT Secretariat prepared a report on “Industrial Pollution Control and International Trade^[9,10]. In the same period, officials in the GATT Secretariat gave technical advice to the drafters of the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora^[11] on how to make its trade obligations GATT-consistent^[12]. In 1971, the GATT established a standby Group on Environmental Measures and International Trade. This GATT Group did not meet for 20 years--showing in retrospect how interest in trade and environment waned after the Stockholm Conference. By the early 1990s, pressure grew within the GATT to convene the Group and there was growing pressure from Nongovernmental Organizations (NGOs) for the trading system to be more accountable. Several events in the early 1990s contributed to a concern that the GATT might be acting in an environmentally-blind way. The GATT Group met intermittently over the next couple of years until it was replaced in 1995 by the WTO Committee on Trade and Environment. The Committee’s efforts have contributed to a better understanding of those intersecting policies and to better coordination of decision-making at the national level^[13]. The WTO in a single decade has established itself as the primary actor in International Law leaving apart International Trade Law.

Trade and environment is a topic that has been discussed ad nauseam and has cast a tangled web of

social, political and ecological relationships^[14] and supporting the tangled web are the three “interdependent and mutually reinforcing pillars: “economic development, social development and environmental protection^[15]. The complex geometry of these three pillars and the complexity of the natural systems on which human life and society depend and their myriad poorly-understood interactions, means that sustainability entails managing dynamic systems throughout their inflections of change.

In a nutshell, the tension between trade and environment can be summarized as follows:

First, treaties liberalizing trade can harm the environment. In this sense, trade and environment may conflict in at least four ways:

- More trade and economic activity may result in more environmental degradation
- The competition brought about by free trade may put pressure on governments to lower environmental standards (the so-called ‘race to the bottom’)
- Trade agreements may prevent governments from enacting certain environmental regulations and
- Trade law may prohibit the use of trade sanctions or preferences, be it as sticks or carrots to ensure the signing up to, or compliance with (international) environmental standards

Second, trade restrictions or distortions can harm the environment. In this sense, trade liberalization and environmental protection go hand in hand in at least three ways:

- Trade liberalization should lead to higher levels of development and make available resources for environmental protection (the Environmental Kuznets Curve)
- Trade-distorting subsidies and other support for over-production (activities generally disliked by trade law), be it in the fisheries or agricultural sectors, can deplete environmental resources
- Trade restrictions on the provision of cross-border services or technology to recycle or otherwise limit environmental harm can delay or prevent the efficient protection of the environment^[16]

The WTO which presently stands as the set of rules regulating trade, the next part analyses the effect that the environment has on the policy and law of the WTO.

The environment in WTO law and policy: WTO jurisprudence, in particular in the area of trade and

environment, continues to evolve. The WTO's attention to the environment starts at the beginning of the WTO treaty. In the Preamble to the Agreement Establishing the WTO^[17], the parties note that they act to establish the WTO:

... recognizing that their relations in the field of trade and economic Endeavour should be conducted with a view to raising standards of living ... while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development^[17]..."

This belief has been reaffirmed by the member states in the Doha Ministerial Declaration, where the governments stated:

We strongly reaffirm our commitment to the objective of sustainable development, as stated in the Preamble to the Marrakesh Agreement. We are convinced that the aims of upholding and safeguarding an open and non-discriminatory multilateral trading system and acting for the protection of the environment and the promotion of sustainable development can and must be mutually supportive^[18]

The potential trade impact due to environmental standards brings environmental law under the supervision of the WTO, as has also been noted by a WTO panel^[19]. Such disputes between the trade of goods and the environment are considered under the two exceptions provided under Article XX of the GATT^[3].

The second front of WTO law is trade in services. The General Agreement on Trade in Services^[17] can have significant environmental consequences. The GATS has only one environmental exception and that exception applies to measures necessary to protect human, animal or plant life or health. The GATT's environmental exception for conservation was purposefully omitted from the GATS^[10,20] enabling the governments to be more open to the importation of environmental services, proving to be a key environmental plus.

The TBT Agreement and the SPS Agreement provide the WTO with various rules on environmental and health regulations. The SPS Agreement covers

measures that Members introduce to protect human, animal and plant life from various risks posed by pests and diseases; as well as additives, contaminants and toxins^[21]. It requires Members to ensure that any SPS measure that sets a higher standard than that found in relevant international standards is based on scientific principles and is not maintained without sufficient scientific evidence^[22]. The SPS Agreement also contains detailed requirements relating to the assessment of risks including that SPS measures be 'based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health^[22]'. On the other hand, the TBT Agreement covers mandatory technical regulations, voluntary standards and conformity assessment procedures. It covers both agricultural and industrial goods but does not apply to those that are covered by the SPS Agreement^[22]. Technical regulations are defined as including a document which 'lays down product characteristics or their related processes and production methods^[22]'. Regulations may include environmentally motivated process and production requirements, for example, regarding energy conservation in the production of consumer goods.

While the Members of the World Trade Organization (WTO) have yet to adopt affirmative environmental obligations, the link between trade and the environment has been pressed in much academic and policy discourse^[23-25]. Particularly with respect to environmental issues, the judicial body of the WTO has been called on to identify some of the contours of appropriate linkage between such "nontrade" issues and WTO rules in a series of closely-watched disputes^[26]. The holdings of these cases have shifted since the WTO's establishment in 1995, away from a deep suspicion about the propriety of linking trade with nontrade issues and towards a nuanced view that accepts the validity of linkage as long as it meets certain formal parameters. The incorporation through judicial interpretation can be seen in the decisions of the various WTO dispute settlement panels and the appellate body from the early disputes in relation to cigarettes, dolphins and patent protection^[27-30], the birth of the two-tiered analysis for justifying a measure under Article XX of the GATT was brought about in the United States-Gasoline Case^[31], the weighing and balancing of a measure to determine necessity was brought forward in the Korea-Beef Case^[32], the evolutionary interpretative approach of the GATT to widen the scope of exhaustible natural resources was seen in the United States-Shrimp Case^[33], the Appellate Body has ruled that the phrase 'based on' is a substantive requirement that there be a rational

relationship between the measure and the risk assessment in the Hormones Case^[34] and in the most recent WTO appellate body gave a green decision in the Brazil-- Retreaded Tyres Case^[35] reversing the panel's decision^[35]. There has been a perceptible shift from the old GATT dispute settlement procedure, which was very pro-trade, to a more balanced approach under WTO panels^[36,37]. The GATT and GATS exceptions are no longer construed narrowly but, rather, are seen as competing interests that free trade rules must be "balanced" with^[38,39]. Gone are the days when the competing ideologies of trade liberalization and environmentalism simply crashed against each other like two tectonic plates^[37,40].

Although, the operation of the WTO Committee on Trade and Environment (CTE) has not reached any significant decisions, it may be having some positive impact, in serving as a continuing forum on international trade and the environment. Some other international institutions do exist, such as UNEP, the UN. Commission on Sustainable Development and the Roundtable on Sustainable Development sponsored by the Organization for Economic Co-operation and Development (OECD). But none of these entities has advanced the debate on "trade and environment" in recent years. The existence of such a forum (CTE) is significant for the environment regime because there is insufficient ongoing attention in global institutions for considering the tensions between economic and environmental goals^[10].

The Multilateral Environmental Agreements (MEAs) and the WTO: WTO members are negotiating on the relationship between WTO rules and specific trade obligations set out In Multilateral Environmental Agreements (MEAs). This issue is important because although MEAs have been using trade controls for over a century, there is a body of opinion inside the WTO that such controls are a violation of WTO rules and should no longer be permitted as environmental instruments. Many WTO member governments probably agree with Alan Oxley, the former GATT Council chairman, who has criticized leading MEAs for using "trade coercive measures" that disregard "national sovereignty"^[41]. The opposition to trade measures in MEAs seems to have chilled the inclusion of trade controls in new MEAs. Other than the Stockholm Convention on Persistent Organic Pollutants (2001)^[42], no MEA negotiated during the past seven years contains specific trade obligations.

Lack of enforcement has also characterized international environmental law. While the number and scope of multilateral environmental agreements

continue to grow, few institutional mechanisms have emerged for the effective enforcement of environmental obligations^[43,44]. Some of the MEA's under the UN Biodiversity regimes that include obligations in relation to trade measures is the Convention on Biological Diversity^[45] and the Cartagena Protocol^[46]. Several institutions that have been setup such as the United Nations Environment Programme (UNEP)^[47] and the (OECD) lack authority to require states to cooperate with its efforts to gather information or to further the progressive development of international environmental law^[26]. Although the WTO Agreement and MEA's have equivalent status in international law, there is sometimes a tendency among some governments to view the WTO as higher law because its obligations are enforceable through trade sanctions, while the obligations in environmental treaties are not enforceable in that manner, this pragmatic view is not easy to refute even though the equal hierarchical legal relationship between the WTO and MEAs is clear and the governments that are a member of the WTO and of an MEA are obligated to follow both sets of rules. Perhaps the best institutionalized international environmental agreement is the Montreal Protocol on Substances that Deplete the Ozone Layer^[48,49], because it administers a fund to assist countries in achieving compliance^[49]. The Montreal Non-Compliance Procedure (NCP)^[48] allows disputes between parties to be submitted to an Implementation Committee, which then recommends "appropriate action" to the parties^[50]. While the Implementation Committee conducts extensive reporting of no compliance, it has not pursued sanctions against noncompliant parties.

MEA's can apply specific trade obligations to non-parties in two ways. One is to apply the same measure to a non-party as the MEA applies to a party (e.g., CITES). The other is to apply a discriminatory measure against a non-party (e.g., the Montreal protocol on the ozone layer)^[48]. Both approaches are controversial within the WTO, but the second is more controversial because it involves discrimination. This stance seems to be hypocritical because the WTO member governments are given total freedom to discriminate against non-members and worse is that, the WTO can force the applicant country in an accession agreement to be discriminated against^[10].

The resources that exist for enforcement of international environmental law^[51] remain sparse. It is possible that the relative non-enforcement of these other regimes represents the desire of states that these realms be relatively less authoritative, but rather serve as communities in which norms evolve slowly over time. It is also possible that the weakness of

enforcement mechanisms in international environmental law is vestigial, representative of an earlier international arena in which the technologies of enforcement were simply less well-developed. The question of the legitimate scope of authoritativeness of international environmental rules has become more pressing as these regimes face a form of regulatory competition from trade law. Recently, a team of environmental analysts offered a good suggestion for shifting the hapless debate within the CTE (WTO Committee on Trade and Environment) around MEAs toward a useful purpose^[52]. They recommend that the WTO look at each MEA and consider what particular trade liberalization, in goods and services, would help to meet the objective of that MEA.

Multilateral environmental agreement and the precautionary principle: The precautionary principle is central to environmental policy making and is a key element of several Multilateral Environmental Agreements (MEAs) and declarations^[42,46,53-65] and the precautionary principle has received an extraordinary amount of attention from domestic and international jurists in the last decade or so, becoming one of the most well-known and talked-about international environmental rules. The principle has become entrenched in international environmental protection and resource management regimes, in light of scientific uncertainty regarding how to deal with a myriad of health, safety and environment-related concerns, governments are putting in place precautionary measures to address local and global issues^[66].

The origins of the formalized Precautionary Principle can be traced back to the German vorsorgeprinzip, which means literally 'forecaring principle' or simply 'care'^[67,68]. The precautionary principle stands for the "common sense idea that public and private interests should act to prevent harm"^[69]. That means that decision makers must not wait for unambiguous proof of a cause and effect relationship between a substance, process, or activity and an environmental harm before acting to reduce or eliminate the harm^[14]. As such, precaution is not so much a rule as a process--it serves as a guide for the process of interpretation and norm formation towards sustainability^[70]. It is perhaps best perceived as "a meta-judicial principle which provides a conduit between legal and non-legal forms of normativity"^[71]. "A precautionary approach implies that decisions concerning the possibly unacceptable but as-yet-unknown effects of regulatory choices cannot be made once and for all, but must always be viewed as somewhat preliminary, open to revisions based on social changes or new relevant information"^[72].

The precautionary principle is related to a range of broader policies and approaches to deal with situations of incomplete or inconclusive scientific information in an era of rapid technological advances. The precautionary principle attempts to fill the gap between scientific uncertainty and risk regulation. The application of precaution will vary according to the circumstances. Nevertheless, while for some it is an overreaching concept, for others the application of precaution is context specific and will vary accordingly. It is precisely these considerations that make it difficult to develop a generally applicable definition of the precautionary principle^[73]. A greater understanding of the precautionary principle is necessary in the multilateral trading system, while there is also a need to grapple with the economic harm that can be caused by the implementation of the principle^[66].

The debate on the precautionary principle is complex and often abstract. To a certain extent, the precautionary principle can be seen as a "culturally framed concept [...] muddled in policy advice and subject to the whims of international diplomacy and the unpredictable public mood over the true cost of sustainable living"^[74]. The controversial issue surrounding the use of a precautionary principle concerns how to determine when precautionary action is triggered and the burden of proof shifts towards ensuring health and safety or protecting the environment. This threshold can be higher, for example when the potential risks involve 'serious or irreversible harm' to the environment, or lower, for example when there is merely a threat that some 'harm' may be caused to the environment.

In spite of the huge recognition that this principle has got through incorporation, in the international order, this principle continues to be the greatest puzzle in International law for being vague, ambiguous and imprecise as well as its status in relation to being a principle of customary International Law. There are two features of precaution that tend to reduce the significance of the customary law issue: first of all, a number of features that it shares with most principles, namely its vagueness and generality and the absence of positive obligations; second, the immense influence that the principle already enjoys. Despite the resistance that it has encountered--resistance that may be explained, at least in part, by its success--the principle enjoys widespread support. It has generated a veritable flurry of law-and policy-making at both the domestic and international levels and has been applied by judges in a number of international tribunals. Many environmental lawyers believe that the precautionary principle is already a principle of customary international law^[75-77]

and I believe that there is enough state practice and *opino juris* to rate the precautionary principle as a principle of customary international law.

WTO and the precautionary principle: One of the persistent problems of the WTO is the need to find an appropriate balance between trade rules and environmental protection measures. The tension that arises from the constraints the WTO law places upon members who wish to take a precautionary approach to environmental protection. Commentators have been divided on the question of how far the WTO Agreement permits or accommodates the application of the precautionary principle^[78-81]. Even in the absence of an explicit provision, the precautionary principle is incorporated into the WTO agreements through gateway provisions^[82] and it can further be introduced through such provisions^[83-88]. In addition, Article 31(3) (c) of the Vienna Convention of the Law of Treaties^[89] provides that although treaty provisions usually override other rules of international law, general principles of international law will still apply unless specifically excluded by the treaty provision^[90]. The following discussion will focus on these provisions.

The agreement on sanitary and phytosanitary standards: Article 5.7 of the SPS Agreement provides that Members may introduce provisional measures where there is insufficient scientific evidence. In *EC--Hormones*^[34], the Appellate Body recognized that this provision reflected the precautionary principle and emphasized that it had not been written into the SPS as an exception and that it could not be used to avoid normal interpretation of the provisions of the SPS^[91]. As a result, the version of the precautionary principle contained in Article 5.7 must be applied in the context of the SPS and subject to its conditions and since the EC did not rely on Article 5.7 its implications in relation to the principle were not fully explored^[92].

Article 3.3 permits Members to impose measures leading to a higher standard of protection than granted by international standards, recommendations and guidelines. Members may introduce such measures if there is scientific justification for doing so, or if the higher level of protection can be justified according to the conditions contained in Article 5.1-8. Article 5.1 requires that national measures be based on a risk assessment, taking account of risk assessment techniques developed by relevant international organizations and Article 5.2 requires the risk assessment to take into account, *inter alia*, available scientific evidence. The Appellate Body in the *Hormones Case* acknowledged that the precautionary

principle was reflected in Article 3.3 and it recognized that panels considering the question of sufficiency of evidence should bear in mind that ‘responsible, representative governments commonly act from perspectives of prudence and precaution where risks of irreversible, e.g., life-terminating, damage to human health are concerned’. Here again the Appellate Body refrained from analyzing the application of the precautionary principle under this provision in detail as the EC failed in its attempt to rely on Article 3.3 because it had not carried out a proper risk assessment for the banned substances.

Although the Appellate Body has not yet had the opportunity to develop its analysis fully, it has recognized several key elements in the application of the SPS which have implications for the use of the precautionary principle. First, an SPS measure must be ‘based on’ a risk assessment, but this requires no more than a ‘certain objective relationship’ between them^[34]. Second, risk assessment is ‘a process characterized by systematic, disciplined and objective enquiry and analysis’ which must be specific to the facts of the case and examines risk as it applies to ‘the real world where people live and work and die’^[82]. Third, the risk must be more than theoretical, but an attempt by the Panel in *EC--Hormones* to suggest that there was a quantifiable threshold of risk was rejected by the Appellate Body^[34,93]. The risk that the Member wishes to avoid may be supported by minority opinions, provided that they are from ‘qualified and respected sources’^[34]. There is more likely to be a reasonable relationship between a measure and a minority view where the risk is ‘life-threatening in character and is perceived to constitute a clear and imminent threat to public health and safety’. Fourth, the right of Members to choose their own level of protection has been emphasized by the Appellate Body as a right under Article 3.3 and not an exception to be invoked by the defending party. However, Members must avoid arbitrary or unjustifiable distinctions when choosing their level of protection if the result is arbitrary or unjustifiable discrimination or disguised restrictions on trade^[34]. Fifth, the measure chosen to achieve that level of protection must be necessary and must not result in arbitrary or unjustifiable discrimination or disguised restriction on trade^[22]. Sixth, Article 5.7 provides an exception to the rule that measures may not be introduced without a risk assessment or maintained without sufficient scientific evidence; this is subject to the need to seek further information and review within a reasonable period and may only be used in situations where there is genuine scientific uncertainty.

Thus, the Members have discretion to apply the precautionary principle in two ways. First, Members may choose to introduce provisional measures under Article 5.7, subject to the accompanying conditions. The precautionary principle is here explicitly incorporated albeit in a *sui generis* form. Second, Members may exercise discretion when choosing their level of protection, provided that a risk assessment has been carried out which supports the claim that there is an identifiable risk and the measure has a reasonably objective relationship with the risk assessment. Within those limits, the use of the precautionary principle to identify a risk and respond to it is complete and protected^[93].

General agreement on trade and tariffs 1994: Article XX (b) has neither the detail nor the structure of the SPS. It merely provides that measures which otherwise violate the GATT may be valid if they are 'necessary to protect human, animal or plant life or health'^[82]. The language of paragraph (b) suggests a rather high burden of proof and therefore a difficult hurdle for any Member to overcome if it wishes to rely on the precautionary principle. The Appellate Body in the EC-Asbestos Case recognized that the right of Members to choose an appropriate level of protection was 'undisputed'^[26]. Provided the test assessing scientific evidence of the risks to human, animal or plant life or health is satisfied, the Members have the right to apply a precautionary approach.

Article XX (g) provides a defense for measures 'relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption'. It is unclear whether the term 'exhaustible natural resources' was intended only to refer to non-renewable resources such as minerals or whether it could include animal and other species. In practice, the phrase has always been interpreted liberally to include, for example, non-endangered dolphins^[82,94], clean air^[31] and renewable resources^[33]. Second aspect of Article XX (g) is the condition of 'relating to' conservation and it has been interpreted to provide that Members have discretion to introduce measures that have a general rather than a very specific conservation objective due to the lack of a strong causality test. Thus, measures intended to protect habitats or maintain high levels of population will be protected without having to prove that they are necessary to conserve a species from imminent extinction.

Once the design of a measure has satisfied one of the paragraphs of Article XX, the manner in which it is

applied must also satisfy the conditions contained in the chapeau^[31,33]. The most relevant condition to the use of the precautionary principle is that the measure must not be applied so as to constitute unjustifiable discrimination. The Appellate Body's reasoning in the US-Shrimp Case accommodates the precautionary principle by locating the meaning of justifiability in State practice outside the WTO and in the light of sustainable development and contemporary environmental concerns. However, the preference for multilateral consensus revealed in that case may not always work in favor of a precautionary approach^[82].

A final and very different provision which is relevant to the precautionary principle is Article III: 4. Article III: 4 provides that imported products must be given treatment 'no less favorable than that accorded to like products of national origin' with respect to laws and regulations that govern internal regulations such as sale, transport and distribution. The Appellate Body in the EC-Asbestos Case expanded its analysis of like products beyond the purely commercial aspects of a competitive relationship and provided that consumer fears that were supported by some scientific evidence, even a minority view in a situation of scientific uncertainty, might be accepted as reasonable grounds to differentiate between similar products^[27].

Agreement on technical barriers to trade: The TBT Agreement covers mandatory technical regulations, voluntary standards and conformity assessment procedures. This agreement, however, recognizes that state parties have the right to establish their own levels of protection^[95,96] and to enact measures that those levels are met. Technical regulations are defined as including a document which 'lays down product characteristics or their related processes and production methods'^[22]. The technical regulations shall not be more trade restrictive than necessary to fulfill a legitimate objective, taking account of the risks non-fulfillment would create^[21]. An innovation in this agreement is the inclusion of environment protection as a justification of imposing the TBT Agreement^[97] for example, regulations regarding energy conservation in the production of consumer goods. Although the TBT agreement makes no allusion to the precautionary principle, it can narrowly be construed as containing some of its elements, particularly in the exceptions provided in Article 2.2 of the TBT Agreement, in which states may impose TBT measures to protect 'legitimate objectives'.

It appears from the above analysis that the precautionary principle has far more potential impact on WTO law than is commonly realized and that the

mechanisms by which it may be introduced into WTO law (and by analogy other environmental principles) are varied, complex and not yet fully understood.

The Precautionary Principle emphasizes the limits of human knowledge and the frequency of unpleasant surprises from technology and industrial development, an *ex ante* stance of precaution is preferred whenever a proposed activity meets some threshold possibility of causing severe harm to human health or the environment^[98,99]. The three consistent elements of the Precautionary Principle that can be distinguished despite its numerous formulations are; first, threat of harm; second, lack of scientific evidence and third, necessity or duty to act. We live in a world of ever-increasing interactions on a global scale. The constantly accelerating rate of technological change means that the range and intensity of these interactions are rapidly expanding and so is the interaction between trade and the environment. The WTO aims at progressive liberalization of trade and greater freedom to take risks, while precaution is an opposite attitude in decision making that reflects an aversion to risk in the face of uncertainty. It is considered that for the harmonious continuation between the trade rules and environmental norms the precautionary principle should be perceived, not as a smokescreen for protectionism, but more so as a necessary practice, which by allowing a definition of risks that exceeds scientific considerations alone, it is able to reconcile new technology and public fears and that the principle should be considered what it has become-a norm. Such understanding has started to appear in other fora. For example, the World Conference of International Food Trade held in Melbourne, Australia in 1999 adopted a general recommendation for recognizing precaution as a “critical element in drawing up Codex standards” and highlighting the “discussion of legitimate factors other than science^[100,101]”.

Effects of the recognition of the precautionary principle in WTO: The questions of who can apply the precautionary principle and over what subject matter, the process by which the precautionary principle is deemed relevant must be considered. It is apparent that the Appellate Body’s approach to complex decisions breaks down into three stages^[102]. The first is the method by which the risk is identified and assessed, the second is the choice of level of protection against that risk and the third is the evaluation of the measure according to the conditions contained in the relevant provision.

The SPS explicitly requires a risk assessment to be carried out, but gives no threshold test of risk. The

Appellate Body has identified that threshold as more than theoretical, but it has rejected the application of any particular quantifiable requirement and has accepted the right of Members to accept minority scientific opinions provided that they are from qualified and respected sources. This threshold of risk is entirely compatible with the precautionary principle as expressed in the Rio Declaration, which also requires the existence of an identifiable threat before it is brought into play. The same threshold is therefore likely to apply to the introduction of provisional measures under Article 5.7 in situations of insufficient scientific evidence.

The position is less clear in other provisions where there is no explicit need for a risk assessment, such as Article XX (b) or (g). The Appellate Body’s approach to Article XX (b) has echoed its approach to the SPS, which is unsurprising given the close link between the two sets of provisions.

After a risk assessment has been carried out, Members must go on to evaluate the risk not just scientifically but also in the light of political, economic, social and other considerations. A Member might choose not to avoid a risk at all, or to take action that only partially responds to it. Risk-aversion, sensitivity to particular types of harm, opportunity costs and other considerations have a role to play in choosing an appropriate level of protection. Whatever the chosen level, it belongs to the prerogative of Members as part of their internal policy-making powers and will not be subject to review by a WTO panel or the Appellate Body^[27,93]. It is at this stage that the exercise of precaution as a matter of discretion is at its strongest. However, when the Member moves on to choosing a measure in order to achieve that level of protection, the measure will be subject to review in so far as it impinges on the rights of other Members.

Vision of a greener WTO:

Establishment of the WTO as an environmental agency: Perhaps the governments drafting the WTO Agreement originally intended to create a trade-specific agency, but by the time the negotiations were completed in 1994, the Preamble to the WTO Agreement embraced sustainable development and the environment as a common interest. Then in 1998, the Appellate Body breathed life into the Preamble language. In 2001, at the Doha Ministerial, the necessities of international life pointed to a need to launch new negotiations on “trade and environment”. Maintaining a trade-only identity for the WTO proved impossible because various non-trade issues, such as intellectual property, had already crept into the mission

of the trading system. Besides being a trade liberalization agency, the WTO has taken on additional identities. The WTO is an agriculture agency that addresses food aid^[103]. Through TRIPS, the WTO has certainly become an intellectual property agency^[104]. Since the Doha Ministerial Conference of 2001, the WTO has become a development agency^[105] and an agriculture agency that addresses food aid^[10, 103]. The WTO should now enter the arena of environmental governance in dealing with trade activities under it as a multi-functional agency.

Authoritative decision-making: Globalization and particularly the creation of the World Trade Organization (WTO)^[14,106] radically reconfigured decision-making for many important public decisions. International organizations and transnational corporations now play a role in decisions that had formerly been the purview of states. Fundamental decisions about the degree and kind of risk a society is willing to accept in anticipation of social and economic benefits are no longer made wholly by states and local communities. One effect of the move towards centralization is a shift in the locus of decision from the state and, at least in theory, a concomitant broadening of the “community” whose values must be considered as part of the decision process. The World Trade Organization has been a focal point for such contests. Since its establishment in 1995, the WTO has become the institution through which important international trade matters are discussed, including conflicts between national policies and global trade rules. In a series of disputes, member-states have attempted to use the WTO to reshape the domestic law of their rivals.

Resorting to the WTO dispute resolution mechanism^[14,107] effectively shifted the locus of decision from individual states to a centralized international bureaucracy. The expanding authority of the WTO is typically portrayed as a thickening of the legal-normative structures and a corresponding receding of politics. This formula envisages “more law, less politics”^[14,108-110].

Adaptive governance: The policymaking paradigm of “adaptive management” often is seen as a natural candidate to provide the kind of incremental, dynamic decision making procedure envisioned by Precautionary Principle^[111]. To the extent that international economic systems are characterized by similar complexity and uncertainty as that which characterizes ecological systems, adaptive governance is equally important in the field of international economic governance as it is in environmental management. The main characteristics

of adaptive governance are; firstly, learning; secondly, policy making as experimentation; thirdly, avoiding irreversible harm; fourthly, monitoring and feedback; and lastly, pluralism and process. The Panels and the Appellate Body must consider and adapt to the changes that take place in the international sphere and more aggressively participate to protect the environment. The ultimate aim of adaptive management, therefore, is the rather grandiose one of “integrating scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over the long term”^[83,112].

CONCLUSION

Instead of viewing trade and environment as substitutes, the WTO should view them as complements. The new consciousness should be that environment and sustainable development are part of the purpose of the WTO, not just a rhetorical adornment. WTO Director-General Pascal Lamy stated this well in a recent speech: “We must remember that sustainable development is itself the end-goal of this institution”^[113]. He went on to say that “accompanying” social and environmental policies “... can no longer be looked at by the WTO as the responsibility of other organizations. The WTO is responsible for them too”^[114]. It is, therefore, important for the WTO to accept the Precautionary Principle as a concept that favors acceptance of new technology and not deter from it. As such, it would not only foster the growth of technologies by lessening the perceived risk attached to them, but it would help the WTO diminish the tension that currently exists between trade and the environment.

REFERENCES

1. American Society of International Law, 1925. International convention relating to the simplification of customs formalities. *Am. J. Int. Law*, 19: 146-166. <http://www.jstor.org/pss/2213197>
2. American Society of International Law, 1931. Convention for the abolition of import and export prohibitions and restrictions. *Am. J. Int. Law*, 25: 121-145. <http://www.jstor.org/pss/2213116>
3. 55 UNTS 194, 1947. The current text of GATT 1994 can be found on the WTO website.
4. 161 UNTS 72, 1946. International convention for the regulation of whaling. <http://sedac.ciesin.org/entri/texts/intl.regulation.of.whaling.1946.html>

5. 231 UNTS 199, 1946. Convention for the regulation of the meshes of fishing nets and the size limits of fish.
6. 77 UNTS 143, 1947. The convention on the world meteorological organization.
http://www.paclii.org/pits/en/treaty_database/1947/4.html
7. BZTS 1975/21, 1948. Statutes of the international union for the conservation of nature and its resources.
8. 55 UNTS 187, 1948. Article 86 of the Havana charter for an international trade organization.
http://www.wto.org/english/docs_e/legal_e/prevto_legal_e.htm
9. UNIPub, 1979. Industrial Pollution Control and International Trade GATT Studies in International Trade No. 1. UNIPub, ISBN: 10: 0685127796.
10. Charnovitz, S., 2007. A new WTO paradigm for trade and the environment. Singapore Year Book Intl. Law, 11: 15-40.
<http://www.commonlii.org/sg/journals/SGYrBkIntLaw/2007/3.html>
11. 993 UNTS 243, 1973. Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
12. Boardman, R., 1981. International Organization and the Conservation of Nature Bloomington: Indiana University Press, ISBN: 10: 0253164745, pp: 89-92.
13. Shaffer, G., 2001. The world trade organization under challenge: democracy and the law and politics of the WTO's treatment of trade and environment matters. Harv. Environ. Law Rev., 25: 1-93.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=828644
14. Bratspies, R., 2007. Rethinking decision making in international environmental law: a process-oriented inquiry into sustainable development. Yale J. Int. Law, 32: 363.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=987029
15. United Nations, 2005. Resolution adopted by the General Assembly. 2005 World Summit Outcome.
<http://unpan1.un.org/intradoc/groups/public/documents/UN/UNPAN021752.pdf>
16. Pauwelyn, J., 2004. Recent books on trade and environment: Gatt phantoms still haunt the WTO. Eur. J. Int. Law, 15: 575-592.
<http://207.57.19.226/journal/Vol15/No3/chh305.pdf>
17. WTO, 1994. Marrakesh Agreement Establishing the World Trade Organization.
http://www.wto.org/english/docs_e/legal_e/04-wto_e.htm
18. WTO, 2001. Doha Ministerial Declaration.
http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm
19. WTO, 1996. Turkey-Restrictions on Imports of Textile and Clothing Products-Acceptance by Turkey of the Request to Join Consultations by the European Communities under Article 4.11 of the DSU. Panel Report.
<http://policy.mofcom.gov.cn/en/wto!fetch.html?lanmu=al&id=39bf6b2c-59b4-4470-b6b3-8db99fccfe8c>
20. Waskow, D., 2003. Environmental services liberalization: a win-win or something else entirely. Intl. Law, 37: 777-796.
<http://direct.bl.uk/bld/PlaceOrder.do?UIN=144173397&ETOC=RN&from=searchengine>
21. Kannan, P., 2007. The precautionary principle: More than a cameo appearance in United States environmental law. William Mary Environ. Law Policy Rev., 31: 409.
<http://www.coloradocollege.edu/Dept/EV/Kannan.asp>
22. WTO, 1994. Agreement on technical barriers to trade.
http://www.wto.org/english/res_e/booksp_e/analytic_index_e/tbt_01_e.htm
23. Bhagwati, J. and R.E. Hudec, 1996. Fair Trade and Harmonization: Prerequisites for Free Trade. MIT Press, Cambridge, Mass, London, ISBN: 0262024020, pp: 429-457.
24. IELG, 1998. Symposium, linkage as phenomenon: An interdisciplinary approach. U. Pa. J. Int. Econ. Law, 19: 201.
25. Leebron, D.W., 2002. Symposium: The boundaries of the WTO. Am. J. Int. Law, 96: 5-27.
26. Thomas, C., 2004. Should the world trade organization incorporate labor and environmental standards. Washington Lee Law Rev., 61: 347-406.
http://findarticles.com/p/articles/mi_qa3655/is_200401/ai_n9384622/
27. Wirth, D.A., 2002. European communities-measures affecting asbestos and asbestos-containing products. Am. J. Int. Law, 96: 435-439.
<http://www.jstor.org/pss/2693937>
28. DS10/R - 37S/200, 1990. Thailand-restrictions on importation of and internal taxes on cigarettes. Report of the Panel.
29. Koul, A.K., 2006. Guide to the WTO and GATT: Economics, Law and Politics. Hardcover, ISBN: 9041124896, pp: 630.
30. McInerney, C.P., 2009. From shrimps and dolphins to retreaded tyres: An overview of the world trade organization disputes. Discussing exceptions to trading rules. N. Y. Int. Law Rev., 22: 153.

31. Shenk, M.D., 1996. United States-standards for reformulated and conventional gasoline. *Am. J. Int. Law*, 90: 669-674. <http://www.jstor.org/pss/2203996>
32. Trachtman, J.P., 2000. Decisions of the appellate body of the world trade organization. Korea-measures affecting imports of fresh, chilled and frozen beef. AB Report. <http://207.57.19.226/journal/curdevs/sr17.html>
33. De la Fayette, L., 2002. United States-import prohibition of certain shrimp and shrimp products. *Am. J. Int. Law*, 96: 685-692. <http://www.jstor.org/pss/3062171>
34. WT/DS332/AB/R, 1998. EC measures concerning meat and meat products (hormones). Appellate Body Report. <http://www.sice.oas.org/dispute/wto/hormeca2.asp>
35. Gray, K.R., 2008. Brazil-measures affecting imports of retreaded tyres. *Am. J. Int. Law*, 102: 610-616. <http://www.jstor.org/pss/20456648>
36. Cho, S.J., 2005. Linkage of free trade and social regulation: Moving beyond the entropic dilemma. *Chicago J. Intl. Law*, 5: 625. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=886518
37. Ala'i, P., 1990. Free trade or sustainable development? An analysis of the two appellate body's shift to a more balanced approach to trade liberalization. *Am. Univ. Intl. Law Rev.*, 14: 1129. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1557920
38. McLaughlin, R.J., 1999. Sovereignty, utility and fairness: Using U.S. takings law to guide the evolving utilitarian balancing approach to global environmental disputes in the WTO. *Oregon Law Rev.*, 78: 855-940. <http://hdl.handle.net/1794/4459>
39. Paltrowitz, J.H., 2001. A greening of the world trade organization? A case comment on the asbestos report. *Brooklyn J. Intl. Law*, 26: 1789-1838. <http://direct.bl.uk/bld/PlaceOrder.do?UIN=100877521&ETOC=RN&from=searchengine>
40. Ghei, N., 2007. Evaluating the WTO's two step test for environmental measures under article xx. *Colorado J. Intl. Environ. Law Policy*, 18: 117-150. <http://direct.bl.uk/bld/PlaceOrder.do?UIN=207148660&ETOC=RN&from=searchengine>
41. Wirth, D.A., 2004. The relationship between MEAs and WTO rules. UNCTAD, Trade and Environment Review, Geneva. http://ecologic-events.eu/eu-trade-policy/en/documents/01_Wirth.pdf
42. 40 ILM 532, 2001. Stockholm convention on persistent organic pollutants.
43. Rinceanu, J., 2000. Enforcement mechanisms in international environmental law: Quo vadunt. *J. Environ. Law Litigation*, 15: 147. <http://heinonline.org/HOL/LandingPage?collection=journals&handle=hein.journals/jenvll15&div=16&id=&page=>
44. Beyerlin, U. and T. Marauhn, 1997. Law-making and law-enforcement in International Environmental Law after the 1992 Rio Conference, ISBN: 10: 3503040757, pp: 157-171.
45. 31 ILM 818, 1992. Convention on biological diversity. <http://www.unep.ch/regionalseas/legal/cbd.htm>
46. 39 ILM 1027, 2000. Cartagena protocol on biosafety to the convention on biological diversity. <http://www.cbd.int/doc/legal/cartagena-protocol-en.pdf>
47. Brown, H.L., 1997. United Nations Conference on Straddling Fish Stock and Highly Migratory Fish Stocks: An Analysis of International Environmental Law and the Conference's Final Agreement. <http://heinonline.org/HOL/LandingPage?collection=journals&handle=hein.journals/vlr21&div=23&id=&page=>
48. 26 ILM 1541, 1987. Montreal protocol on substances that deplete the ozone layer.
49. DeSombre, E.R., 2000. The experience of the Montreal protocol: Particularly remarkable and remarkably particular. *UCLA J. Environ. Law Policy*, 19: 49-82. <http://direct.bl.uk/bld/PlaceOrder.do?UIN=099917982&ETOC=RN&from=searchengine>
50. UNEP, 1999. Montreal Protocol to the WTO Committee on Trade and the Environment. WT/CTE/W/115.
51. Lal Panjabi, R.K., 1993. From Stockholm to Rio: A comparison of the declaratory principles of international environmental law. *Denver J. Intl. Law Policy*, 21: 215. <http://direct.bl.uk/bld/PlaceOrder.do?UIN=027688263&ETOC=EN&from=searchengine>
52. Carpentier, C.L., P.K. Gallagher and S. Vaughan, 2005. Environmental goods and services in the world trade organization. *J. Environ. Dev.*, 14: 225-251. DOI: 10.1177/1070496505277218
53. 1046 UNTS 120, 1972. Convention on the prevention of marine pollution by dumping of wastes and other matter. http://www.imo.org/Conventions/contents.asp?topic_id=258&doc_id=681

54. 27 ILM 835, 1987. Second international conference on the protection of the North Sea. Ministerial Declaration. <http://www.seas-at-risk.org/Images/1987%20London%20Declaration.pdf>
55. Bergen Declaration, 2002. Fifth International Conference on the Protection of the North Sea. <http://www.regjeringen.no/md/html/nsc/progressreport2002/hoved.html>
56. Helsinki Convention, 1992. Convention on the protection of the marine environment of the Baltic Sea Area. http://untreaty.un.org/unts/144078_158780/15/3/6512.pdf
57. 31 ILM 1312, 1992. Convention on the protection and use of transboundary watercourses and international lakes. [http://www.iwlearn.net/publications/misc/forums/Tansboundary-Convention-Eng/view](http://www.iwlearn.net/publications/misc/forums/Transboundary-Convention-Eng/view)
58. 34 ILM 1542, 1995. United Nations agreement for the implementation of the provisions of the United Nations convention on the law of the Sea of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks.
59. 28 ILM 649, 1994. The Basel convention ban amendment. <http://www.basel.int/pub/baselban.html>
60. 38 ILM 1734, 1998. Rotterdam convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade. http://www.fco.gov.uk/resources/en/pdf/pdf7/fco_cm6119_rotterdamhazardous
61. A/CONF.151/26, 1992. Rio declaration on environment and development principle. <http://habitat.igc.org/agenda21/rio-dec.htm>
62. 1760 UNTS 143, 1992. Convention on biological diversity preamble. <http://sedac.ciesin.org/entri/texts/biodiversity.1992.html>
63. 37 ILM 422, 1998. Kyoto protocol to the United Nations framework convention on climate change. <http://unfccc.int/resource/docs/convkp/kpeng.pdf>
64. GDRC, 1998. Wingspread statement on the precautionary principle. <http://www.gdrc.org/u-gov/precaution-3.html>
65. 31 ILM 849, 1992. United Nations Framework on Climate Change.
66. Shaw, S. and R. Schwartz, 2005. Trading precaution: The precautionary principle and the WTO. UNU-IAS Report, United Nations University UNU-IAS, Tokyo. <http://www.ias.unu.edu/binaries2/Precautionary%20Principle%20and%20WTO.pdf>
67. Kogan, L., 2004. The precautionary principle and WTO law: Divergent views toward the role of science in assessing and managing risk. *J. Dipl. Int. Rel.*, 77: 78. <http://diplomacy.shu.edu/journal/new/pdf/VolVNo1/6%20-%20Kogan.pdf> at 91
68. Recuerda, M.A., 2008. Dangerous interpretations of the precautionary principle and the foundational values of European union food law: Risk versus risk. *J. Food Law Policy*, 4: 1. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1305545
69. Martin, P., 1997. If you don't know how to fix it, please stop breaking it! The precautionary principle and climate change. *Foundations Sci.*, 2: 263-292. DOI: 10.1023/A:1009619720589
70. Cameron, J., 2001. The Precautionary Principle in International Law. In: *Reinterpreting the Precautionary Principle*, Tim O'Riordan *et al.* (Eds.). London, pp: 113-142.
71. Ellis, J., 2006. Overexploitation of a valuable resource? New literature on the precautionary principle. *Eur. J. Intl. Law*, 17: 445-462. <http://direct.bl.uk/bld/PlaceOrder.do?UIN=190131490&ETOC=RN&from=searchengine>
72. UN GA RES 37/7, 1982. World Charter for Nature. <http://eelink.net/~asilwildlife/wcn.html>
73. Christoforou, T., 2003. The Precautionary principle and democratizing expertise: A European legal perspective. *Sci. Public Policy*, 30: 205-212. <http://direct.bl.uk/bld/PlaceOrder.do?UIN=137060125&ETOC=RN&from=searchengine>
74. O'Riordan, T. and J. Cameron, 1994. The History and Contemporary Significance of the Precautionary Principle. In: *Interpreting the Precautionary Principle*. O'Riordan, T. and J. Cameron (Eds.). Earthscan, London, ISBN: 10: 1853832006, pp: 320.
75. Christoforou, T., 2003. The Precautionary Principle in EC Law and Science. In: *Environmental Science and Preventive Public Policy*, Tickner, J. (Ed.). Island Press.
76. Cameron, J. and J. Abouchar, 1996. The Status of the Precautionary Principle in International Law. In: *The Precautionary Principle in International Law*, Freestone, D. and E. Hey (Eds.). Kluwer, pp: 52.
77. Birnie, P. and A. Boyle, 2002. *International Law and the Environment*. Oxford University Press, Oxford, pp: 98.
78. Boutillon, S., 2002. The precautionary principle: Development of an international standard. *Michigan J. Int. Law*, 23: 429.

79. Abdel Motaal, D., 2005. Is the world trade organization anti-precaution? *J. World Trade*, 39: 483-501.
80. Ruessmann, L.A., 2002. Putting the precautionary principle in its place: Parameters for the proper application of a precautionary approach and the implications for developing countries in the light of the Doha WTO ministerial. *Am. Univ. Int. Law Rev.*, 17: 905.
81. Segger, M.C.C. and M.W. Gehring, 2003. The WTO and precaution: Sustainable development implications of the WTO asbestos dispute. *J. Environ. Law*, 15: 289-321. DOI: 10.1093/jel/15.3.289
82. Cheyne, I., 2007. Gateways to the precautionary principle in WTO law. *J. Environ. Law*, 19: 155-156. DOI: 10.1093/jel/eql036
83. French, D., 2006. Treaty interpretation and the incorporation of extraneous legal rules. *Int. Comparat. Law Q.*, 55: 281-314.
84. Pauwelyn, J., 2001. The role of public international law in the WTO: How far can we go? *Am. J. Int. Law*, 95: 535-578. <http://www.asil.org/ajil/pauwelyn.pdf>
85. Pauwelyn, J., 2003. How to win a world trade organization dispute based on non-world trade organization law? *J. World Trade*, 37: 997.
86. Bartels, L., 2001. Applicable law in WTO dispute settlement proceedings. *J. World Trade*, 35: 499.
87. Lindroos, A. and M. Mehling, 2005. Dispelling the chimera of 'self-contained regimes. *Environ. J. Int. Law*, 16: 857.
88. Pauwelyn, J., 2003. *Conflict of Norms in Public International Law, How WTO Law Relates to Other Rules of International Law*. Cambridge University Press, Cambridge.
89. 8 ILM 679, 1969. Vienna Convention on the Law of Treaties 1155 UNTS 331. http://www.oas.org/DIL/Vienna_Convention_on_the_Law_of_Treaties.pdf
90. McLachlan, C., 2005. The Principle of Systemic Integration and Art 31(3)(C) of the Vienna Convention. *Int. Comparat. Law Q.*, 54: 279.
91. WTO, 2006. European communities-measures affecting the approval and marketing of biotech products. WTO Panel Report, WT/DS291/R. http://www.worldtradelaw.net/articles/lesterbiotech_casenote.pdf
92. WTO, 2003. Japan-measures affecting the importation of apples. WTO Appellate Body Report, WT/DS245/AB/R. http://www.wto.org/english/tratop_e/dispu_e/245r_w-1_e.pdf
93. WTO, 1998. Australia-measures affecting importation of salmon (Australia-salmon). WTO Appellate Body Report, WT/DS18/AB/R. <http://docsonline.wto.org:80/DDFDdocuments/t/WT/DS/18ABR.DOC>
94. 33 ILM 839, 1994. United States-restrictions on the import of Tuna (Tuna Dolphin II). DS29/R. <http://www.law.georgetown.edu/iel/cases/US-Tuna.pdf>
95. WTO, 1994. Legal texts: The WTO agreements. http://www.wto.org/english/docs_e/legal_e/ursum_e.htm#dAgreement
96. Juan Antonio Herrera, I., 2007. International law and GMOS: Can the precautionary principle protect biological diversity? <http://www.ejournal.unam.mx/bmd/bolmex118/BMD000011804.pdf>
97. Macmillan, F., 2001. *WTO and the Environment*, Sweet and Maxwell, London, pp: 368.
98. Trouwborst, A., 2002. Evolution and Status of the Precautionary Principle in International Law and Policy 62. 1st Edn., Kluwer Law International, ISBN: 10: 9041117857, pp: 395.
99. Applegate, J.S., 2002. The taming of the precautionary principle. *William Mary Environ. Law Policy Rev.*, 27: 13-78.
100. Zylberman, P., 2004. Making food safety an issue: internationalized food politics and french public health from the 1870s to the present. *Med. Hist.*, 48: 1-28. PMID: 14968643
101. Clavier, S.M., 2008. Food fight at the WTO: Can the precautionary principle reconcile liberalization and public fear? *Curr. Int. Trade Law J.*, 16: 3. http://works.bepress.com/sophie_clavier/1/
102. Cheyne, I., 2006. Risk and precaution in world trade organization law. *J. World Trade*, 40: 837.
103. Zhang, R., 2004. Food security: Food trade regime and food aid regime. *J. Int. Econ. Law*, 7: 565-584. <http://www.ingentaconnect.com/content/oup/jielaw/2004/00000007/00000003/art00565>
104. Bhagwati, J.N., 2007. *In Defense of Globalization*. Oxford University Press, Oxford, pp: 330.
105. Ellison, M., 2005. *The Future of the WTO: Report by the Consultative Board to the Director-General WTO*, Geneva. http://www.hg.org/articles/article_677.html
106. NLCIFT, 1993. Final act embodying the results of the Uruguay round of multilateral trade negotiations. <http://www.natlaw.com/treaties/global/gatts/gatt1.htm>

107. 33 ILM1125, 1226, 1994. Understanding on rules and procedures governing the settlement of disputes. Marrakesh Agreement Establishing the World Trade Organization. http://www.eisil.org/index.php?sid=4ails&id=667&t=link_details&cat=807
108. Jackson, J.H., 1997. *The World Trading System: Law and Policy of International Economic Relations*. 2nd Edn., MIT Press, ISBN: 10: 0262600277, pp: 453.
109. Mora, M.M.I., 1993. A GATT with teeth: Law wins over politics in the resolution of international trade disputes. *Colum. J. Transnat. Law*, 31: 103.
110. Pauwelyn, J., 2005. The transformation of world trade. *Michigan Law Rev.*, 104: 1-70. <http://www.michiganlawreview.org/assets/pdfs/104/1/pauwelyn.pdf>
111. Tarlock, A.D., 2004. Is there a there there in environmental law? *J. Land Use*, 19: 213-254. http://www.law.fsu.edu/Journals/Landuse/vol19_2/tarlock.pdf
112. Grumbine, R.E., 1994. What is ecosystem management? *Conserv. Biol.*, 8: 27-38. [http://www.life.illinois.edu/ib/451/Grumbine%20\(1994\).pdf](http://www.life.illinois.edu/ib/451/Grumbine%20(1994).pdf)
113. Lamy, P., 2005. Trade can be a friend and not a foe, of conservation. http://www.wto.org/english/news_e/sppl_e/spp107_e.htm
114. Naim, M., 2007. The free trade paradox. http://www.foreignpolicy.com/articles/2007/08/16/the_free_trade_paradox