Indian J. Soc. & Pol. 06 (02):37-46 : 2019 **ISSN: 2348-0084(P)**
ISSN: 2455-2127(O)

THE EXPORT CONTROL REGIME OF BIOLOGICAL WEAPONS

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ABSTRACT

Constituting the global biological weapons control regimes are various international instruments and a range of policies. These include policies like export controls, technology denial, biosafety and biosecurity, national and international prohibitions. This paper describes the existing international export controls of agents, materials, equipment, and technology related to biological weapons. The central conclusion is that export control of biological weapons, in place of being an appropriate response to the advances in biological sciences, has been a function of security perceptions of states.

KEYWORDS: *Arms, Armament, Disarmament, Biological Weapons*

In recent times, the role of international efforts to reduce the threat of biological weapons has gained significance mainly due to its proliferation and its linkages with terrorism. Constituting the global biological weapons control regime are various international instruments and a range of policies. These instruments are the Geneva Protocol, the Biological and Toxin Weapons Convention (BWC), the Australia Group, the Wassenaar Arrangement, United Nations Security Council Resolution 1540. Policies like export controls, technology denial, biosafety and biosecurity, national and international prohibitions support these international agreements.(Retrieved from http://www.armscontrol.org/factsheets/austrailagroup) However, the scope of these policies has widened in the changing nature of international security given the rise of non-military threats. This has made the role of export controls more important. The future salience of export controls is a question that needs to be probed.

Answering the research question this paper describes the existing international export controls of agents, materials, equipment, and technology related to biological weapons. The first section of the paper is the introduction that sets the background and provides a definition of various terms in the context of the paper. The second section provides a threat assessment of biological weapons based on recent literature. An overview of the existing international export control system is provided in the third section. The concluding section delineates the problems and prospects of international export controls of materials, equipment, and technology relevant to biological weapons.

INTRODUCTION

Biological weapons kill people by releasing pathogens (disease-causing biological agents) in the host's body. Biological agents include micro-organisms like viruses, bacteria, fungi, and rickettsia. An animate target of biological weapons will show symptoms of the disease. The entry points for biological agents in a host are through contaminated water, food air or any cut, wound or passage in the body. In general, the pathogens release toxins, affect immunity and disturb the normal functioning of the body. Worst, the victim's susceptibility to other diseases will increase. Once inside the body of the host, the pathogens will spread further, re-infect, mutate or lie dormant. Biological weapons affect both animate and inanimate targets. When used against inanimate targets, these weapons cause damage to agricultural, animal products and contaminate the enemy's food and water supply. Present-day technology and knowledge of biological sciences have the potential for both peaceful and hostile uses. While dual use means that the same agent, equipment, technology, and knowledge used in peaceful purposes like medicine, food, etc., can also be used to produce biological weapons. A more exacting definition of dual-use involves both tangible and intangible components. Tangible (hardware) and intangible (knowledge and knowledge creation) technological components can be considered dual-use if they have current and/or potential military and civilian applications. Export controls are controls designed to restrict the exports that might contribute to the development of biological weapons. Export controls "restrain trade, are tools to ensure that trade flows consistently with treaty obligations embodied in the relevant control regimes, which is to say, away from states with weapons programs and toward those with commercial, peaceful interests".(Roberts,1998) Exports include agents, equipment and expertise and intangible transfer of knowledge.(Littilewood, 2010) The Australia Group defines exports as "actual shipment or transmission of AG-controlled items out of the country, the transmission of technology by

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electronic media, fax or telephone"(Retrieved from www.austrailiagroup.net/en/dual_biological.html)

THE THREAT OF BIOLOGICAL WEAPONS

While the idea of the use of disease in war has a long history, the weaponization of the biological agent has been a recent phenomenon. The use of biological warfare is traced to the pre-Christian era. In 400 B.C. Scythian archers dipped arrowheads in the blood of decomposing bodies and used these arrows as missile directed towards the enemy.(Regis, 2002) There were allegations of German and the Japanese use of biological warfare agent in World War II. As regards their *delivery system*, depending on the motive behind a biological weapon attack, they can be delivered through military and non-military ways. The military ways of delivering biological weapons include launching aerosolized biological agents through missiles, aerial sprays, and artillery(Spiers, 2000). The most potent variable of biological weapon utility is at the psychological level of warfare. Unlike other categories of weapons that have military utility at three levels, biological weapons have a 3 + 1 level. This includes operational, theater, strategic plus psychological levels of warfare.(Koblentz 2003-2004) In addition, the delayed effects, uncertainties surrounding the attack and the disproportionate fear that these dreaded weapons evoke could amplify the psychological impact of even a small-scale biological attack.(Stern, 2003) These after-effects could be more destructive for a country than the actual attack, as it has been stated that one can fight a known enemy but what about the unknown ones.

According to World Health Organisation (WHO) sources, dating to 1970, hypothetical dissemination by airplane of 50 kg of anthrax under optimal weather conditions over a developed urban area of 5 million could infect as many as 250,000 people and 100,000 could be expected to die. In this report, attention is focused on the effects that could be produced by weapons dropped from one or a very few aircraft and generating an aerosol cloud extending across the direction of the wind along a continuous line 2 km in length.(WHO, 1970)

The twin decades of the Seventies and Eighties witnessed the rapid development of process and techniques in biological sciences. The potential of these advances in weaponry has been well established. Laboratory production of weapons-grade biological agents drastically differs from the life-cycle of micro-organisms in nature. The facilities for the production of biological agents are the same as those used in legitimate vaccine or pharmaceutical plants(Isenberg, 2002) The remarkable turnabout was the use of microbial animal or plant cells or enzymes to synthesize; breakdown or transform materials.(Smith, 1996) Present-day biotechnology (any technological application that uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use) traces its origin in the ancient and traditional fermentation process like brewing of beer, manufacturing of bread, etc. "Other fields not traditionally viewed as biotechnologies—such as materials science, information technology, and nanotechnology—are becoming integrated and synergistic with traditional biotechnologies in extraordinary ways enabling the development of previously unimaginable technological applications".

Two schools have framed the discussion on biological weapons. The first school "is not, cannot be" dismisses the threat of biological weapons and highlights the hype surrounding biological weapons. The second school might be called "is not, could be" school. This points to the destructive capacity of biological weapons, given the advances in biological sciences and paints a grim future. The proponents of the first school can be traced to Schelling. Biological weapons are "ridiculous weapons that nobody is interested in having even if the other side is foolish enough to procure them"(Schelling, 1984) Reasons like the lack of attribution of use, long incubation periods, and dependence on environmental conditions make biological weapons excellent killing machines but poor weapons.(Regis,2002) Scholars now view biological weapons as weapons of last resort, a strategic deterrent at the most.(Martyn, 2001) A section of medical doctors are also critical and rate biological weapon attack as highly improbable though not zero.(Sidel et al, 2001)

The second school, though relatively new has overwhelmed the first school. Among the second school, Bailey points out that factors like the lack of signature of use, slow development of effects, easy delivery and small quantities of the agent required make biological weapons the most suitable for *covert attacks*.(Bailley, 1991) Malcolm Dando highlights the theoretical possibilities of the malign uses the advances in biotechnology can be put to (Dando,2001) . The classical methods, quantities of specific DNA molecules, proteins and other products can be produced through the use of r-DNA to impart altered characteristics to host organisms. (Wheelis, 2002) It is argued by a group of scholars that not only new agents can now be manufactured; an agent that produces novel effects on their hosts can also be engineered (Petro et al, 2003) Technological findings like these, when applied to arms control theories, have led to the emergence of the "assimilation theory".(Robinson, 2008) This theory argues that the push from advances in biological sciences would create a pull process, the assimilation of biological weapons in state arsenals. "Push from life sciences: new technologies and new

capabilities, pull from "new wars" in the 21st Century that is radically different from those envisaged in the cold war era", generates the potential for assimilation of a new category of weapons in state arsenals"(Ibid) There is something disease that is inherently terrifying. Somehow the evolution is developed in such a way that there are fear and dread against something to which the organism has no obvious form of protection.

Evidence suggests that the number of countries interested in the biotechnology sector is rapidly rising. From 2004 to 2006, the US witnessed a 29 per cent increase in biotechnology drug development.(Report 2006 Retrieved from http://stanleyfoundation .org/publication/pab/TurpenPAB609.pdf) As of 2005, China had approximately 20,000 personnel in the biotechnology sector working in more than 200 facilities.(National Research Council, 2005) The World Federation for Culture Collections (WFCC) has registered 585 culture collections in 68 countries out of which 233 are supported by respective governments.(WDCM Statics,2010) Even smaller countries like Morocco, Senegal, Uganda, Uzbekistan, and Papua New Guinea are included in the WFCC list. WFCC statistics also show that more than 2,800 people work in these institutions.(Ibid) By 2007, 30 Biosafety Level 4 (BSL-4) laboratories were working worldwide with the most dangerous pathogens in the highest containment environment in Belarus, Gabon, and India.(Gronvall et al, 2006)

Non state actors like extremists, terrorist groups or groups sponsored by a state sympathizer to their cause, face fewer challenges while using biological weapons. However, terrorists working outside a state-run laboratory infrastructure would have to overcome extraordinary technical and operational challenges to effectively and successfully weaponize a biological agent to cause mass casualties. There are difficulties in acquiring, producing, handling or storing these agents. There can be four primary acquisition routes that terrorists could pursue in acquiring biological agents (Cordesman,2002). They are, purchasing an agent from one of the world's 1500 germ banks, by theft, from natural sources, from a rogue state, a disgruntled government scientist or a state sponsor. Terrorist actions are not bound by traditional moral standards. Their goal is to disrupt, destabilize society by generating fear. Precisely because they are silent, stealthily, invisible and slow-acting, germs are capable of inducing levels of anxiety approaching hysteria. The first bioterrorist attack in the US was carried by a religious cult led by Bhagwan Shree Rajneesh. The cult members, hoping to disrupt an upcoming county election, contaminated local salad bars with salmonella, causing 751 cases of diarrhea.(Garret ,2001) From 1990-1993, a Japanese religious cult of Aum Shinrikyo carried out several unsuccessful attempts of using biological agents like anthrax and botulinum. In 2000, the unknown perpetrator(s) sent a series of the agent (weaponized anthrax) laden letters, via postal service, to several locations in the US.(Retrived from at http://www.biosecurity.sandia.gov/documents/historic-precedence2002.pdf, 20 January 2005)

Terrorism coupled with the advances in biological sciences poses the biggest security challenge of our times. States hold the responsibility to prevent the malign use of technology through improved international coordination and effective implementation of controls. The tremendous growth in expertise and enterprise in biotechnology and related technologies, the global spread of this knowledge coupled with the threat of bioterrorism has created a daunting challenge for international security. There are a huge number of biotechnology companies worldwide. This international expansion was driven by a host of factors, such as the growing use of international subcontracting and technological cooperation agreements, including biodefense-related research and vaccine development. (Christopher and Greninger ,2009) Non-state actors are now seen as both sources of threat and as sources of technological capabilities. "Governments are now enrolling actors not normally associated with security by introducing new controls on people, experiments and the flow of information, technology, and materials". (Caitriona and Nightingale , 2011) National controls have become the main tools that regulate the scientific activity.

PROCEDURES AND SYSTEM OF EXPORT CONTROLS

The earliest effort of non-proliferation norms for biological weapons has its origin in the League of Nations Treaty Series. In the post First World War era, Geneva Protocol was the major agreement banning the entire category of biological and chemical weapons. At times, the Geneva Protocol is also referred to as "no first use" protocol. The state parties could retaliate if biological or chemical weapons were used against them. This protocol prohibits the use of germs or chemical weapons. The state parties were "bound as between themselves according to the terms".([1] Protocol for the Proliferation of the use in war of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare ["Geneva Protocol"] signed in Geneva, Switzerland, June 17, 1925)

The protocol contains no verification or compliance mechanism and does not restrict research and development of biological weapons. Several scholars doubt whether Geneva Protocol really dissuaded state parties from using biological weapons in World War II. The belief is that belligerents

refrained from using chemical and biological weapons, largely because they feared retaliation and perception of limited likely military gains from use. (Farley ,1988) The advent of nuclear weapons deepened the existing ideological divisions of the former Soviet Union and the US. The Soviet Union wanted to acquire the nuclear weapon to get an edge over the US. The US desired nuclear weapons to further its influence in global politics. (Blacker and Duffy , 1984) Resultantly, various efforts towards arms control after 1945 were driven by propaganda. (Russet ,1983) It is only after 1950, with the launch of the Soviet satellite Sputnik, the vulnerability of the US to technology threats drove the agenda of arms control efforts towards more realistic results. (Larsen and Rattaray ,1990) The Cold War dynamics led to the formation of the Coordinating Committee on Export Controls (COCOM) in 1949. The network of COCOM was an Anglo-American effort to control the export of strategic items (including dual-use items related to biological weapons) to communist countries. (Yasuhara ,1991) COCOM got a fitting end with the end of the Cold War.

The matter of building norms to ban chemical and biological weapons (CBW) received particular attention in the heightened arms control atmosphere of the 1960s and 1970s. Post-World War II, the allegations of the use of chemical weapons sparked off voices to urgently address the issue of possible health hazards through the release of chemical and biological agents. The causes of these intense reactions were two incidents. The first was the news of the US use of defoliants and tear gas in the war against Vietnam. The second was the killing of six thousand sheep in Utah because of the accidental release of nerve gas from a US army ground. There were both international and domestic reactions to the use of chemical weapons. (Blacker and Duffy, op. cit.) The Conference of the Committee on Disarmament (CCD), an international group of experts was commissioned by the UN General Assembly to study chemical weapons and biological weapons. In the US, President Nixon declared to abide by the terms of the Geneva Protocol and unilaterally renounced biological weapons. At that time lack of field testing & unproven military potency of biological weapons as compared to chemical weapons, gave thrust to biological weapons control. Moscow and Washington viewed the convention as a means to maintain momentum on arms control to find yet another area in which the US and former USSR shared a common interest and advocated restraint. (Sims ,1995) After years of negotiations, a convention prohibiting the production and storage of biological toxins and calling for the destruction of biological weapons stocks was signed in 1972.

The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, more commonly known as the Biological and Toxin Weapons Convention (BWC) was simultaneously opened for signature in Moscow, Washington and London on 10 April 1972 and entered into force on 26 March 1975. The number of states party to the convention has risen from 46 in 1975 to 163 in 2010; there are also 13 signatory-only states.

Article I prohibits development, production, stockpiling or retention of microbial, biological agents or toxins "of types and in quantities" without justification for peaceful purposes. Under the terms of Article II, the state parties are obligated to destroy all such weapons in a period of nine months. The BWC does not prohibit research on biological weapons. The convention bans biological weapons but does not include any legally binding mechanisms to monitor and enforce compliance by states parties. In addition, the incorporation of the term "hostile purpose or in armed conflict" in Article I to restrict the non-peaceful use of biological weapons is expansive. The hostile purpose is broader than armed conflict, which, in turn, is broader than war. (Wheelis ,2002) There is no distinction between permitted and prohibited activities or an objective criterion for deciding the quantities of agents.

In Article III of the treaty, all states parties undertake “not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist, encourage, or induce any State, group of States or international organizations to manufacture or otherwise acquire any of the agents, toxins, weapons, equipment, or means of delivery” required for biological weapons. Primarily, effective export controls would be a product of the domestic laws and regulations of a state party in accordance with the international treaty obligations.

The issue of verification is not dealt with in detail by the convention. In order to resolve mutual problems and disputes, Article V has provisions for consultation between the states. Article VI provides obligations for compliance by the state parties. There is no provision for on-site inspection keeping in mind the clandestine nature of biological weapons. This convention endorses the role of the UN as an international organization unlike any other agreement since the procedures for investigation is to be carried out by the UN Security Council. The BWC lacks verification and compliance mechanisms. Many issues regarding verification, including the very word verification, should or can be applied to BWC continue to divide the countries. (Feakes ,2002) The fact that biological weapons can be clandestinely manufactured in small quantities guides the US stand on non-verifiability of BWC. It stems from the belief that the convention understands this concept for other arms control agreement and no verification

regime can be devised to make it so. (Chevrier and Smithson ,1996) Important issues related to verification are on-site inspections, the specification of the type of visit; duration, work, and selection of inspectors' have not been agreed upon. The close association of legitimate pharmaceutical activities and public health measures with a possible biological weapon program is a difficult issue to resolve. Any, verification and compliance measure which sets out to establish prohibited and permitted activities will invariably affect security information and commercial proprietary information (CPI).(Ibid., p.220) The verification protocol published after every negotiating session contains a statement for the selection of agents and the list of agents being considered. (Dando ,2001) Countries are divided on the issue of whether to include a comprehensive list according to current developments or a simple list of agents to simplify compliance matters.

Article X of BWC stipulates international cooperation and exchange for the development and application of scientific knowledge for peaceful purposes and protects the economic or technological development of states parties. This article has been an issue of contention amongst states parties. Most developing countries are interested in its implementation. Experts argue that "developing countries that do not face an immediate threat from biological weapons tend to view the benefits of the compliance protocol primarily in economic rather than security terms." (Tucker, 1998) Developing countries would, however, like to weaken the scope of Article III, which restricts the transfer of biological pathogens from a state party to any other. Non-transfer of such materials hampers the long-term economic, scientific interests of developing countries. But western countries view this contention with scepticism. For them, Article III is in direct obligation to the provisions of the Australia Group and therefore contributes to the disarmament regime. The polarisation amongst states parties on the issue of transfer of agents and technology is adversely affecting the success of BWC. "North-South disputes have become increasingly prominent in multilateral arms control negotiations since the end of the Cold War, and centred around differences of national interest between developed and developing countries with respect to trade in sensitive dual-use technologies".(Ibid)

The convention also provides for a Review Conference to be held every five years. These conferences take account of advancements in science and technology, make an article by article review of the BWC and help evolve consensual means and measures for an effective biological and toxin disarmament regime. Six Review Conferences have been held so far. The First Review Conference was held in 1980. The inclination to strengthen the BWC in this Review Conference was "virtually taboo".(Sims , 1990) This Review Conference made progress by classifying terms and specifying a consultative procedure.(Kessler, op. cit., p. 56) The Declaration of the Conference notes the confidence-building value of voluntary declaration by parties concerning past biological weapons and steps to eliminate such programs. (Kessler, op. cit., p. 56) At the Second Review Conference in 1986, the scope of "consultative meeting" was expanded to suggest ways and means with the assistance of technical experts for resolving problems and initiate international procedure within the UN framework.(Final Declaration of the Second Review Conference, BWC/CONF. 11/13) At the Third Review Conference in September 1991, compliance-related elements of the regime were also extended. Apart from the earlier four, five new measures to be implemented "on the basis of mutual co-operation of states parties" were introduced. (Final Declaration of the Third Review Conference, BWC/CONF. 23, Article I) The new measures included active promotion of contacts, declaration of legislation, regulation and other measures, declaration of past activities in offensive and/or defensive biological research and development programs, export controls, declaration of vaccine production facilities, annual declaration of nothing or nothing new. (Ibid) At the Fourth Review Conference, in 1996 it was emphasized that States Parties should consider ways and means to ensure that individuals or subnational groups are effectively prevented from acquiring, through transfers, biological agents and toxins. (Fourth Review Conference 1996, Final Declaration, http://www.opbw.org)

The deliberations and efforts to prepare a verification protocol for the Fifth Review Conference (November 2001) received a serious blow when the US rejected the draft protocol text and terminated the mandate of the working Ad-Hoc Group (AHG). The final meeting of the Fifth Review Conference was suspended to avoid a total failure of the Review Conference. The final declaration of the Sixth BWC review Conference, in 2006 called for appropriate measures by all States Parties to ensure that biological agents and toxins relevant to the Convention are protected and safeguarded, including through measures to control access to and handling of such agents and toxins. (Sixth Review Conference 2006, Final Document, http://www.opbw.org/) As part of the Confidence-Building Measures at BWC, the first CBMs in the form of data exchange were part of the Second Review Conference. These measures were enhanced in the Third Review Conference. Exchange of data can be filed on a yearly basis in seven different categories of (Form A to Form G). Form E deals with the Declaration of legislation, regulations and other measures and includes export controls as a sub-head.

(http://www.opbw.org/) However, data exchanges as a CBM have been of limited use. States have not been willing to improve the level of participation and quality of the CBMs. (Hunger and Isla ,2006) According to the limited information available about the CBMs; more than 40% of BWC member states have never submitted any information (up to 2005). (Ibid,p29)

A more comprehensive, voluntary and not legally binding international agreement is the Australia Group. The Group was established in 1985. During the Iran-Iraq War in 1980, there were Iranian allegations of use of chemical weapons by Iraq. Following this, the UN Secretary-General dispatched an international team of specialists to Iran. This team verified the use of chemical weapons against Iranians in 1984. Robinson and Jozef Goldblat ,2010) It was also found out that the Iraqi chemical weapons programme had received substantial aid from abroad through legitimate trade channels. http://www.australiagroup.net/en/origins.html)

Under the aegis of the Australia Group, uniform export controls for chemicals that could be used to manufacture weapons were codified. In the early 1990s, the US intelligence agencies had substantial information on Iraq's biological weapons programme. (Retrived from http://www.nytimes.com/2003/06/04/world/after-the-war-intelligence-iraq-arms-report-now-the-subject-of-a-cia-review.html?src=pm , 12 January 2011) The Australia Group in the 1990s adopted export controls of specific biological agents. Subsequently, materials, equipment, and technology that have the potential for the manufacture and dispersal of biological weapon agents were included in the export controls. The biotechnology industries were regarded not only as a target for proliferators as also as a source of materials required for biological programmes. The Australia group aims to harmonize the national export licensing measures of participating countries to restrain the spread of biological weapons. The Australia Group holds its meetings in Paris annually. This Group has forty-one participants, including the European Union.[1] The control list of sensitive items can be implemented as a matter of choice by states; the Group has no legal mechanism. (http://www.armscontrol.org/factsheets/australiagroup)
Sensitive items on these control lists can be divided into five categories. Relevant for biological weapons are-

- Biological agents-disease-causing microorganisms, whether natural or genetically modified, such as smallpox, Marburg, foot-and-mouth disease, and anthrax.

- Dual-use biological equipment-items that can be used for both peaceful research and biological weapons production, such as fermenters (capable of cultivation of pathogenic micro-organisms, viruses or for toxin production, without the propagation of aerosols, having a capacity of 20 litres or greater), containment facilities (that meet the criteria for P3 or P4 (BL3, BL4, L3, L4), freeze-drying equipment, and aerosol testing chambers, Spraying or fogging systems and components. (Ibid)

According to the Australia Group, Technology, including licenses, directly associated with AG-controlled biological agents; or AG-controlled dual-use biological equipment items to the extent permitted by national legislation. This includes a) transfer of technology (technical data) by any means, including electronic media, fax or telephone b) transfer of technology in the form of technical assistance. (Ibid) Controls on 'technology' do not apply to information 'in the public domain' or to 'basic scientific research' or the minimum necessary information for patent application. (Ibid) The approval for export of any AG-controlled item of dual-use equipment also authorizes the export to the same end-user of the minimum 'technology' required for the installation, operation, maintenance, or repair of that item.(Ibid)

Concerns about chemical and biological terrorism led the member states to adopt three important measures in June 2002. The first provision was "no undercut" agreement. “Members pledged not to approve a particular export to a specific country that another member had previously denied without first consulting with that member”.(Ibid) The second called the "catch-all" provision “requires member countries to be able to halt the transfer of any export, regardless of whether it appears on the group's control lists if an importer might use it in a chemical or biological weapons programme”.(Ibid) Third, the provision prohibiting the transmission of CBW technologies by "intangible means," e-mail, phone, or fax.

Membership of the Australia Group is dependent on the country’s legislation and policy of export controls. The candidate country must meet all the criteria of the Australia Group. Guidelines for Transfers of Sensitive Chemical or Biological Items (January 2009) specify that participating nations adhere to set guidelines. (Ibid) These guidelines list a number of factors that should be accounted for while framing the export control policies of countries. Important amongst those factors are:

a. Information about proliferation and terrorism involving CBW, including any proliferation or terrorism-related activity, or about involvement in clandestine or illegal procurement activities, of the parties to the transaction;

b. The capabilities and objectives of the chemical and biological activities of the recipient state;

c. The significance of the transfer in terms of (1) the appropriateness of the stated end-use, including any relevant assurances submitted by the recipient state or end-user, and (2) the potential development of CBW;

d. The role of distributors, brokers or other intermediaries in the transfer, including, where appropriate, their ability to provide an authenticated end-user certificate specifying both the importer and ultimate end-user of the item to be transferred, as well as the credibility of assurances that the item will reach the stated end-user;

e. The assessment of the end-use of the transfer, including whether a transfer has been previously denied to the end-user, whether the end-user has diverted for unauthorized purposes any transfer previously authorized, and, to the extent possible, whether the end-user is capable of securely handling and storing the item transferred;

f. The extent and effectiveness of the export control system in the recipient state as well as any intermediary states;

g. The applicability of relevant multilateral agreements, including the BTWC and CWC. (Ibid)

Members of the former COCOM export control regime under the Wassenaar Arrangement of 1994 are committed to promoting transparency and greater responsibility in transfers of conventional arms and dual-use goods and technologies, thus preventing destabilizing accumulations.[2] This arrangement is kept up to date with periodic meetings of participating states. Developing an effective export control system is one of the main agendas of these meetings. "Participating States will seek, through their national policies, to ensure that transfers of these items do not contribute to the development or enhancement of military capabilities which undermine these goals, and are not diverted to support such capabilities." (http://www.wassenaar.org/guidelines/docs/Initial%20Elements%20-%202009.pdf) According to the agreement, all items set forth in the Lists of Dual-Use Goods and Technologies (2 annexes: Sensitive List and Very Sensitive List) and the Munitions List 2 will be subject to national controls, with the objective of preventing unauthorized transfers or re-transfers of those items. The following is a list of possible principal elements of the general information exchange on non-participating states, pursuant to the purposes of the agreement- Export control policy, Trade-in critical goods and technology. (Ibid) In a Statement of Understanding on Control of Non-Listed Dual-Use Items Agreed at the 2003 Plenary of the Wassenaar Arrangement, it was agreed that the Participating States will take "appropriate measures to ensure that their regulations require authorization for the transfer of non-listed dual-use items to destinations subject to a binding United Nations Security Council arms embargo, any relevant regional arms embargo either binding on a Participating State or to which a Participating State has voluntarily consented to adhere, when the authorities of the exporting country inform the exporter that the items in question are or may be intended, entirely or in part, for a military end-use".

The UN Security Council passed resolution 1540 on 28 April 2004 to prevent the proliferation of weapons of mass destruction. Andrew Semmel, Principal Deputy Assistant Secretary of State for Nuclear Nonproliferation, noted that "the crux of UNSCR 1540 requires states to ensure that they have the infrastructure in place to address the threat posed by the involvement of non-state actor in any aspect of WMD proliferation. It decides that states shall not support non-state actors involved in such activities and that states shall enact and enforce the necessary laws to prevent these activities on their territories."(Semmel,,2011) Thus Resolution 1540 requires all UN member states to monitor and control the security and export of sensitive technologies, materials, and equipment, with the goal of closing gaps associated with the multilateral treaty and export control regimes. On 17 April 2006, the Security Council passed resolution 1673, which extends the mandate of the 1540 Committee for two years and calls for the intensification of efforts to promote the full implementation of resolution 1540. The implementation of UNSCR 1540 has its challenges. There are sixty states which have not submitted their implementation reports as per the UNSCR 1540, a majority of these are from Africa.

CONCLUSION

The central conclusion is that export control of agents, types of equipment, materials, and technology related to biological weapons, in place of being an appropriate response to the advances in biological sciences, has been a function of security perceptions of states. It is important that any policy decision regarding export controls must take inputs from the relevant stakeholders, most importantly the biological scientific enterprise. Although still weak at the implementation level, export controls remain the most essential element in an overall strategy to limit the spread of biological weapons.

NOTES

[1]Australia Group Member States- Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, the Netherlands,

New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and the United States, the European Commission

[2]The Participating States of the Wassenaar Arrangement are: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom and United States

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