

CBW

Magazine

Journal on Chemical and Biological Weapons

Volume 3

Number 1

Oct.-Dec. 2009

ISSN: 0974-0619

EDITORIAL

INVITED ARTICLES

Agent Orange: Resonance on Vietnam-US Relations

Dr. Pankaj Jha

OPINION

Assessing the impact of a Bio-terrorist Attack using Mathematical Model

Dr. Sarita Azad

COVER STORY

Taking Strength from the Past in Securing India's Future

Ms. Binalakshmi Nepram

COUNTRY PROFILE

Mr. Shamshad Khan

KALEIDOSCOPE

CHEMICAL AND BIOLOGICAL NEWS

BOOK REVIEW

Dr. Prashant K. Singh



Institute for Defence Studies and Analyses

CBW Magazine

Journal on Chemical and Biological Weapons

Volume 3

Number 1

Oct.-Dec. 2009

ISSN: 0974-0619

EDITORIAL 2

INVITED ARTICLES 3

Agent Orange: Resonance on Vietnam-US Relations
Dr. Pankaj Jha

OPINION 9

Assessing the impact of a Bio-terrorist Attack using Mathematical Model
Dr. Sarita Azad

COVER STORY 12

Taking Strength from the Past in Securing India's Future
Ms. Binalakshmi Nepram

COUNTRY PROFILE 16

Mr. Shamshad khan

KALEIDOSCOPE 20

CHEMICAL AND BIOLOGICAL NEWS 21

BOOK REVIEW 29

Dr. Prashant K. Singh



**Editor &
Director General
IDSA**

N S Sisodia

Executive Editor

Ajey Lele

Assistant Editor

Monalisa Joshi

Editorial Assistance

Gunjan Singh

Four decades after the Vietnam War the veteran American soldiers are still fighting for their rights. In October this year Veterans Affairs officials added three new illnesses to the list of diagnoses which are connected to Agent Orange. Agent Orange was the pseudonym for a host of herbicides used by the United States military in Vietnam to destroy the thick jungle canopy which concealed the guerilla fighters. In this issue Pankaj Jha highlights the effects of the usage of Agent Orange.

This issue also looks at India's earlier leadership in Biological and Chemical Weapons Convention and the need to play a proactive role in the ongoing UN Process for an Arms Trade Treaty (ATT). Ms Binalakshmi Nepram covers this issue while Sarita Azad has attempted to assess the impact of a Bio-terrorist Attack using the Mathematical Model.

This issue also features other regular sections like Country Profile, Kaleidoscope, Chemical and Biological News and Book Review.

With our reader's feedback, we wish to publish issues in the future that focus on a subject of particular concern.

Contributions and feedbacks are welcome and can be addresses to: **editorcbw@gmail.com**

Agent Orange: Resonance on Vietnam-US Relations

Dr. Pankaj Jha

*The author is an Associate
Fellow at the IDSA,
New Delhi.*

Summary

United States which is an avowed advocate of curbing Chemical and Biological weapons has successfully publicized the issue of Iraq possessing Weapons of Mass Destruction (WMD) including deadly chemical weapons in order to justify its operations. But it has itself used it for its ulterior objectives in the past. The burning and lingering example is that of Vietnam when US troops used chemical dioxin, Agent Orange, to get rid of the green forest cover and other foliage, so as to cut the supply lines of North Vietnamese guerillas.

“Agent Orange has long been a sensitive issue for both countries and we have differed over the lasting impact of the defoliant on Vietnam. I am pleased to say that we are now engaged in practical, constructive cooperation. Both the United States and Vietnam agree that the health of the Vietnamese people and the safety of its environment will be vital for Vietnam’s future. With the support of additional funds approved by Congress in FY 2007 and FY 2009, we are moving ahead with collaborative efforts to help Vietnam address environmental contamination and related health concerns.”

US Deputy Assistant Secretary Scot Marciel

United States which is an avowed advocate of curbing Chemical and Biological weapons has successfully publicized the issue of Iraq possessing Weapons of Mass Destruction (WMD) including deadly chemical weapons in order to justify its operations. But it has itself used it for its ulterior objectives in the past. The burning and lingering example is that of Vietnam when US troops used chemical dioxin, Agent Orange, to get rid of the green forest cover and other foliage, so as to cut the supply lines of North Vietnamese guerillas (freedom fighters). When US troops became directly involved in Vietnam in the year 1964, the Pentagon signed contracts amounting to \$57m (£36m) with exclusive eight US chemical companies to produce defoliants, which also included Agent Orange. It was named so after the coloured band painted around the barrels in which it was shipped. The after effects of the chemical are still reported far and wide in Vietnam and even among war veterans in US. There is a chain of events and cases bitterly denied by the US government. US government scientists had claimed that these chemicals were completely harmless to humans and had a short life in the environment. US strategists argued that Agent Orange was a prototype smart weapon, a benign tactical herbicide that saved many hundreds of thousands of American lives by denying the North Vietnamese army the jungle cover that allowed it ruthlessly to strike and feint. New scientific research, however, confirms what the Vietnamese people have been claiming for past so many years. It also shows that the US government is also one that has illicitly used weapons of mass destruction, stymied all independent efforts to assess the impact of

their deployment, failed to acknowledge cold, hard evidence of maiming and slaughter, and pursued a policy of evasion and deception¹. The same Frank stein has been haunting United States for the last three decades but it is using the selective amnesia and discriminatory judgment to avoid catering to the victims of Agent Orange, both in US and Vietnam. The steps that have been taken recently are satisfactory but not adequate.

Agent Orange- Ignominious Past and Lingering Effects

The war in Vietnam was the first to see a full-scale use of herbicides in warfare. This was highly inspired by the tactics of the British in Malaya. The United States military developed an expansive spray-system which comprised of aircraft, handsprayers, trucks, helicopters, and boats and was aimed at the defoliation of mangroves and forests, and destruction of crops and their distribution. This was done to remove aerial cover and food supplies to the North Vietnamese and allied forces. While its effectiveness as a weapon of warfare has been questioned, its effects have been far reaching. In this specific case approximately two-thirds of the herbicides sprayed contained a highly toxic, irremovable chemical which is commonly known as dioxin. This has a tendency to concentrate in the body of animals and humans and it has been recognized as among the most toxic substances ever produced, archives recently released from the US Department of Defense inform the extent of exposure and concentration of dioxin to be far greater than previously thought. It is now contended that an additional seven million litres of herbicides were sprayed, in particular with heavy dioxin concentration: more than doubling the total dioxin deposited to 366 kilograms or the world's largest dioxin contamination. Agent Orange, the main herbicide used and primarily for defoliation, it is now thought to have contained closer to 13 parts per million dioxin than an earlier estimate of 3 parts per million. Due to recording error and lost inventory, as well as questions as to what extent did vaporization occur in the atmosphere or after the spray had landed on vegetation, and the extent to which spraying continued after the Americans left, the exact amount of dioxin deposited can never be determined. Over a ten-year period 1961-

71 it is estimated that 15 to 16 per cent of land cover of the former South Vietnam, and at least 2.1 million and as many as 4.8 million people were directly sprayed. Missions, discontinued officially in 1971, it is alleged continued by allied South Vietnamese forces until the end of the war in 1975. Select areas of Laos and less directly, Cambodia that flanked the major supply and reinforcement route known as the "Ho Chi Minh Trail" were also targeted. Extraneous in the whole, the extent of territory exposed and the number of flight missions remains contested.²

There are various estimated which indicate that the American military sprayed approximately 11 to 12 million gallons of Agent Orange over an area of approximately 10% of the then-South Vietnam. This happened between the period of 1961 and 1971. There is one scientific study which estimated that between 2.1 million and 4.8 million Vietnamese were directly exposed to this. Various Vietnamese advocacy groups claim that there are over three million Vietnamese who suffer from numerous serious health problems caused by exposure to the Agent Orange. In the last few years, the people of Vietnam have become increasingly concerned about this issue. Various non-government organizations are placing more pressure on the Vietnamese government to remove the dioxin from the environment and also to provide better care to the people already exposed. Some government ministries are comparatively sympathetic to the public concern. But there are other ministries which are apprehensive as they believe that highlighting the dangers of dioxin could have undesired consequences for bilateral relations with the United States. And this in turn will affect the Vietnamese economy³.The Vietnamese government has long sought American assistance. Although the US has provided much scientific and technical support in the past, it has continued to deny any legal liability to provide assistance. It has also regularly questioned Vietnam's assertions regarding the extent of the environmental and health problems attributed to Agent Orange and dioxin. This results in a growing possibility of friction between the two governments over this issue.⁴Even during the visit of Vietnamese President Nguyen Minh Triet to US in 2007, the issue was raised in certain quarters.

Even within the United States there has been a lot of issues regarding to the legislation and legal aspects for claims with regard to health problems for the US war personnel who were a part of the Vietnam War. Due to the non committal approach towards addressing the grievances of its personnel exposed to Agent Orange, the victims have lost patience and have sued the defoliant manufacturers in an action that was finally settled out of court in 1984 for about \$180m (£115m). Subsequently, it took the intervention of the former commander of the US Navy in Vietnam, Admiral Elmo Zumwalt, for the government to finally to admit that it had been aware of the potential dangers of the chemicals used in Vietnam from the start of Ranch Hand⁵. In 1991, Congress passed legislation requiring the VA to cover all sicknesses which were linked to exposure of Agent Orange. But in the year 2002, the VA changed its policy to cover only those veterans who had “boots on the ground,” excluding sailors and pilots (who have never been on ground).⁶ Sen. Kirsten Gillibrand introduced a legislation in First Week of November 2009 which requires coverage for the estimated 800,000 nationwide “blue-water vets,” who have illnesses which could be linked to exposure of Agent Orange but they have never set foot in Vietnam⁷. Though compensation will be a major issue, health and medical assistance would become a starting point.

Remedial Measures-Need for Concerted Approach

The persistence of dioxin in the soil has been measured in decades. A combination of tropical rain, erosion, and chemical degradation over time is thought to reduce the general threat of contamination in aerially sprayed areas. But for those in which herbicides were stored, loaded and or sprayed more directly very high dioxin levels continue to be recorded in soil, blood, and breast milk samples. Lower yet elevated soil concentrations have also been taken from aerially sprayed areas, with abnormally high readings coming from sites typically from places where contaminated earth has been excavated, that is, where a pond is dug to raise carp, for example. Yet in general, the bulk of recent scientific research and fears focus on areas immediately surrounding former storage and loading bases where protracted

perimeter spraying occurred. By the same measure are locations of known flight missions shot down and abandoned. At least five C-123 loaded aircraft each carrying 1,000 gallons of herbicides crashed, and another 42 were forced to dump their sortie in emergency. As far as can be judged there has been only modest remediation of contaminated areas. In total it is estimated that approximately 2.6 million hectares were sprayed by herbicides at least once, of which 1.7 million hectares were sprayed by herbicides containing dioxin compound TCDD. Some upland forest areas were sprayed up to ten or more times. The actual environmental impact is difficult to decipher though it is consistently reported that mangrove forests were most sensitive to the dioxin with irreversible consequences for up to 40 per cent of the population. The Vietnamese government, in cooperation with other governments and international organizations, has begun the process of inland and mangrove afforestation, though in 1993, it was estimated that it would take many more decades of industrious labour and a steady supply of international funding to recover the total area destroyed by herbicides. The extent to which this process has continued is not documented⁸.

Of greater concern are the sites of former US bases and adjoining areas, abandoned after the war and resettled as villages where local inhabitants raised food, washed and ingested water from surrounding sources. As a result of a joint study by Hatfield Consultants (British Columbia) and the Vietnamese Ministry of Health in the Aluoi Valley, 15 families residing near former Special Services base also were relocated. Aquaculture ponds were deactivated with no further excavation of the soil permitted and provincial authorities provided educational advice to valley inhabitants on how to avoid or reduce their exposure to dioxin. The study served as a mirror for all military installations and potential dioxin reservoirs in southern Vietnam. Grave regard is held for the former Bien Hoa base where a known major spill of 7,500 gallons of Agent Orange and three smaller spills each of several hundred gallons occurred in early 1970. The former base is located in close proximity to Bien Hung lake that connects to the Dong Nai river. It is reported that the Vietnamese Department of Defence carried out detoxification of several “hotspots” including Bien Hoa, Da Nang, and Phu Cat in late 2006.

At an estimated cost of US\$10 million per site, the Vietnamese government is currently calling for international assistance. It is unclear what financial contribution the United States will make, if any, towards these efforts, yet according to most recent press reports it is prepared to offer technical advice and make available scientific and historical archival information but has ruled out compensation for individual victims of Agent Orange in Vietnam.⁹

Since the end of the cold war, there has been a gradual warming of bilateral relations between the United States and Vietnam. During this process of “normalization” Vietnamese leaders continued to press on the issue of reparation but the focus was now on Agent Orange. The Vietnamese at this time also pushed for US assistance in the location of its own 300,000 unaccounted servicemen. Later in 2000, during President Clinton’s visit to Vietnam, the United States agreed to a joint research study on the effects of dioxin/Agent Orange as well as the provision of data and materials to assist in the location of missing Vietnamese servicemen. The extent to which either has been met is doubtful. Funding for the study as outlined in a 2002 memorandum of understanding between the two countries was discontinued by the Bush administration in March of 2005, reportedly due to want of Vietnamese Ministry of Health approval. According to Vietnamese sources, however, the joint research programme was unilaterally ended. The remains of 300,000 North Vietnamese and 1,500 US servicemen are unaccounted, to say nothing of the South Vietnamese which neither has taken issue.¹⁰ The granting of Permanent Normal Trade Relations (PNTR) to Vietnam in 2007 and increasing strategic importance of Vietnam both in terms of trade and defence would ease discussions between the two countries.

To gain a fuller appreciation of the situation of Vietnamese victims of Agent Orange, it is necessary to return to Paris, 1973¹¹. Fading prospects of military victory and rising internal pressures from both sides led to more frequent private and public talks that culminated in the final signing of the Paris Peace Agreement in January 1973. For reasons of expediency as well as political pliability the final agreement was left vague in a number of key provisions. While reports of private discussions and

interpretations of these provisions differ and are complex, it is clear that the greatest American concern lay with securing the release of its prisoners and exiting the war on terms that did not damage its international credibility, viz. “peace with honour”. For Hanoi, with respect to the Americans, it was to remove them anon from the war (personnel, bases, and equipment included) and secure an agreement for post-war reconstruction assistance. For all its failings, chiefly the violation of the ceasefire by all parties, the agreement was successful as a vehicle for the release of prisoners and withdrawal of US forces from Vietnam. In a climate of distrust, concern would linger over whether all US prisoners had been released and whether full cooperation had been given to the search for the missing and dead. No post-war aid would ever be paid¹².

Even among the western thinkers and academicians, there is anguish over US non committal approach to provide succor to both Vietnamese and US war veterans which have been affected by the deadly chemical agent. One of the Professors Prof. Marjorie Cohn states

“Several treaties the United States has ratified require an effective remedy for violations of human rights. It is time to make good on Nixon’s promise and remedy the terrible wrong the U.S. government perpetrated on the people of Vietnam. Congress must pass legislation to compensate the Vietnamese victims of Agent Orange as it did for the U.S. Vietnam veteran victims.” Our government must know that it cannot continue to use weapons that target and harm civilians. Indeed, the U.S. military is using depleted uranium in Iraq and Afghanistan, which will poison those countries for incalculable decades”¹³.

On the other hand Vietnamese academics like Professor Nguyen Trong Nhan have lamented the fact that the efforts are too late and too little. He states

“Vietnam can’t solve the problem on its own. Hanoi helped the US military to track down remains of MIAs (US servicemen missing in action), and we asked them to reciprocate with humanitarian

aid for victims of Agent Orange.... American victims of Agent Orange will get up to \$1500 a month. However most Vietnamese families affected receive around 80,000 Dong a month (just over \$5 dollars) in government support for each disabled child.”¹⁴

The issue does not only have ramifications on the bilateral relations but it also poses important question about how to rectify the mistakes that have been committed in the past and how the erring parties should comply with the international norms. Even the International Tribunal which arbitrated the matter in his judgment stated that:

This Tribunal finds

1. that the United States Government is guilty of the offenses listed above and determines that the damage to the environment of Vietnam can be defined as “ecocide”;
2. that the Chemical companies who were charged in the summons and complaint are guilty of complicity in the offenses listed above; and
3. that the United States Government and the Chemical companies which manufactured and supplied Agent Orange must fully compensate the victims of Agent Orange and their families. The US Government and the Chemical companies must also repair the environment to remove the contamination of Dioxin from the soil and the waters, and especially from the “hot spots” around former US military bases¹⁵.

To complete the above task of compensation and repair, the Tribunal recommended that the Agent Orange Commission be established to assess the amount of compensation to be allocated to each victim, family group, and community. The Agent Orange Commission will also determine the amount necessary to provide specialized medical facilities and rehabilitation and other therapeutic services to the victims and their families. The Agent Orange Commission will also estimate the costs of the necessary studies of contaminated areas and the cost of environmental repair in the future. The Agent Orange Commission will

also determine the amount to be paid to the State of Vietnam to indemnify it for monies it has expended to support the victims and repair the environment. The Tribunal urges the Government of the Socialist Republic of Vietnam to forthwith constitute such Agent Orange Commission of people of eminence in the fields of medicine, science, engineering, law, epidemiology, agriculture, toxicology, ecology, public administration, and representatives of civil society. The Agent Orange Commission shall make its recommendations within one year of its constitution. Once the Agent Orange Commission has established the requisite amounts, those monies shall be paid by the United States Government and the Chemical companies jointly and severally to a trust fund specially created for present and future victims and their families, and repair of the environment. The amount of \$1.52 billion a year being paid by the United States Government to the US Vietnam veteran victims of Agent Orange can be employed as a guide for the calculations performed by the Agent Orange Commission¹⁶.

Though to a limited extent, more than 35 years later, US allocated an additional \$3 million in FY2009 funding for Agent Orange/dioxin activities in Vietnam. The proposal is to use approximately \$1 million of this funding for further support of environmental health activities and the remaining \$2 million for environmental remediation efforts¹⁷. This shows the costs of using a chemical warfare and its effects not only on the humans but also on the inter-state relations. Vietnam has been seeking medical and detoxification cooperation from US on Agent Orange while in return it offered to help USA in the search for US soldiers Missing in Action (MIA). The initiatives taken from both sides is conciliatory and the warming of relations would provide help to the victims of the Agent Orange but there is more to be done from both sides¹⁸. The efforts for rehabilitation and providing medical assistance are necessary but the compelling action is that the culprit companies and the government should be internationally castigated and the international obligations should be enforced. The treaties and conventions have provided the platform for discussion but it is necessary that these gruesome acts of ‘biocide’ should not be repeated in human history.

Endnotes:

1. Testimony of US Deputy Assistant Secretary Scot Marciel before the Subcommittee on Asia, the Pacific, and the Global Environment Committee on Foreign Affairs, June 4, 2009
2. Cathy Scott-Clark and Adrian Levy, Spectre Orange, The Guardian, Saturday 29 March 2003 <http://www.guardian.co.uk/world/2003/mar/29/usa.adrianlevy>(Accessed 23.10.2009)
3. Michael G. Palmer, The Case of Agent Orange, Contemporary Southeast Asia, April 2007
4. Michael F. Martin, Vietnamese Victims of Agent Orange and U.S.-Vietnam Relations, Congressional Research Service, May 28, 2009 at <http://www.fas.org/sgp/crs/row/RL34761.pdf>(Accessed 20.10.2009)
5. Michael F. Martin, Vietnamese Victims of Agent Orange and U.S.-Vietnam Relations, Congressional Research Service, May 28, 2009 at <http://www.fas.org/sgp/crs/row/RL34761.pdf>(Accessed 20.10.2009)
6. Cathy Scott-Clark and Adrian Levy, Spectre Orange, The Guardian, Saturday 29 March 2003 <http://www.guardian.co.uk/world/2003/mar/29/usa.adrianlevy>(Accessed 3.10.2009)
7. Jake Pearson, New bill to aid vets hurt by Agent Orange - by land & sea at http://www.nydailynews.com/ny_local/brooklyn/2009/10/28/2009-10-28_new_bill_to_aid_vets_hurt_by_agent_orange__by_land__sea.html#ixzz0Vlrjb1ZG (Accessed 2.10.2009)
8. Jake Pearson, New bill to aid vets hurt by Agent Orange - by land & sea at http://www.nydailynews.com/ny_local/brooklyn/2009/10/28/2009-10-28_new_bill_to_aid_vets_hurt_by_agent_orange__by_land__sea.html#ixzz0Vlrjb1ZG (Accessed 2.10.2009)
9. Michael G. Palmer, The case of Agent Orange, Contemporary Southeast Asia, Vol.29(1) April 2007, pp.172-195
10. Michael G. Palmer, The Case of Agent Orange, Contemporary Southeast Asia, Vol.29(1) April 2007, pp.172-195
11. Michael G. Palmer, The Case of Agent Orange, Contemporary Southeast Asia, Vol.29(1) April 2007, pp.172-195
12. Article 21 of the 1973 Paris Agreement states, "In pursuance of its traditional policy, the United States will contribute to healing the wounds of war and to postwar reconstruction of the Democratic Republic of Viet-Nam and throughout Indochina" Michael G. Palmer, The Case of Agent Orange, Contemporary Southeast Asia, Vol.29(1) April 2007, pp.172-195
13. Michael G. Palmer, The Case of Agent Orange, Contemporary Southeast Asia, Vol.29(1) April 2007, pp.172-195
14. Prof. Marjorie Cohn, Agent Orange Continues to Poison Vietnam, Global Research, June 14, 2009
15. Professor Nguyen Trong Nhan, the vice-president of the Vietnam Victims of Agent Orange Association (VAVA). Quoted in Tom Fawthrop, Vietnam's war against Agent Orange, at <http://news.bbc.co.uk/go/pr/fr/-/2/hi/asia-pacific/3798581.stm>, Published: 2004/06/14 (Accessed 12.10.2009)
16. International Peoples' Tribunal Of Conscience In Support Of The Vietnamese Victims Of Agent Orange, Executive Summary Of The Decision, Paris, May 18, 2009 at http://www.vn-agentorange.org/paris_2009_tribunal_exec_summary.html(Accessed 22.10.2009)
17. International Peoples' Tribunal Of Conscience In Support Of The Vietnamese Victims Of Agent Orange, Executive Summary Of The Decision, Paris, May 18, 2009 at http://www.vn-agentorange.org/paris_2009_tribunal_exec_summary.html (Accessed 22.10.2009)

Assessing the impact of a Bio-terrorist Attack using Mathematical Model

Dr. Sarita Azad

The author is a Project Associate at the IDSA, New Delhi.

Summary

In recent years there has been greater stress on conflict prevention all over the world. A key role in this effort has been played by science and technology. However, the challenges of international relations and national security are growing more complex. Hence, special measures would be needed for dealing with security issues. In this regard, mathematical model can prove to be a benefit. One such model known as Gaussian plume model, where airborne release of bio-agent anthrax can be explained with mathematical method, is discussed here.

I. Introduction

Bioterrorism is terrorism by intentional release of biological agents like bacteria, viruses, or toxins. In last few decades various pathogenic organisms have been identified as possible weapons in bio-terrorist attack. These agents have seldom been dispersed in aerosol form where tiny particles of liquid or solid are released in air. One such example where airborne release of bio-agent results from inhaling an aerosol of anthrax spores into the respiratory tract is invariably fatal. Anthrax, caused by the bacterium *Bacillus anthracis*, is found in nature and can be easily cultured, which makes it a relatively easy agent for terrorist to acquire and prepare. In 2001, envelopes containing anthrax spores were mailed to various government and media leaders in United States, causing some casualties and immense panic in the country. In 1982, there were 24 cases of oral-pharyngeal anthrax in a rural northern Thailand outbreak following the consumption of contaminated buffalo meat.¹ Also in 1979, a city of 1.2 million in Russia was attacked, where 79 persons were reported to have developed inhalation anthrax, and 68 of these died².

As is evident from the foregoing paragraph, an intentional release of bio agent in form of aerosol could prove disastrous to human health. To counter the deadly effects of the anthrax pathogen, various mathematical and probabilistic techniques like Markov chain model³, Bayesian approach⁴, Plume model⁵, have been proposed in the development of life saving measures. These models enable us to predict how the outbreaks will evolve and to quantify the effectiveness of public health responses. One such study concluded that there was no significant threat to personnel in areas contaminated by 1 million spores per square meter either from traffic on asphalt-paved roads or from a runway used by helicopters or jet aircraft⁶. A separate study showed that in areas of ground contaminated with 20 million *Bacillus* spores per square meter, a soldier exercising actively for a 3-hour period would inhale between 1000 and 15,000 spores⁷.

It is to be noted that the above mentioned models have been developed based on parameters best suited for western countries. However in Indian context, weather conditions differ drastically as Indian topography and terrain features are greatly influenced by the prevailing climatic conditions.

This paper describes the basic Gaussian plume model, which can help to predict distribution of anthrax particles depending on weather conditions. Hence it is an attempt to envisage the anthrax outbreak in Indian scenario.

II. Gaussian Plume Model

Gaussian plume model (GPM) is a mathematical technique, which is commonly used to describe dispersion of air pollutants in the atmosphere as shown in Fig. 1. The technical literature on atmospheric dispersion modeling is quite wide and dates back to the early 1930s. Sir Graham Sutton derived one of the early air pollutant plume dispersion equation in 1932.

The GPM describes dispersal over distance up to 10 km from a source. It predicts concentration of gases or particles downwind from a point source. Spore concentration at a given point depend on the distance from the source, the wind direction, the number of released spores, the wind speed and the amount of mixing in the atmosphere as affected by weather conditions. The spore concentration C at location (x, y, z) downwind from a source is calculated as ⁸:

$$C = \frac{Q}{1} \frac{\exp(-y^2 / 2\sigma_y^2)}{2} \frac{1}{\sigma_z} \left\{ \exp\left[-\frac{(H-z)^2}{2\sigma_z^2}\right] + \exp\left[-\frac{(H+z)^2}{2\sigma_z^2}\right] \right\} \quad (1)$$

where:

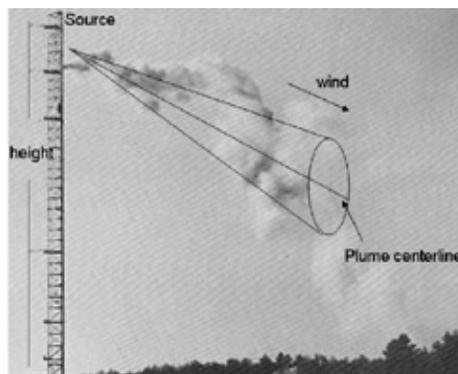
1. $C(x,y,z)$ is the concentration of the emission (kg/m³).
2. Q is the quantity or mass of the emission (kg/s).
3. u is the wind speed (m/s) .
4. H is the height of the source above ground level (m).

In this algorithm, we are concerned with dispersion in all three dimensions (x, y, and z):

- longitudinally (in the x direction), also called the plume axis, lies in the direction of the mean wind.
- laterally (in the y direction) in the crosswind direction.
- vertically (in the z direction) which is the height above the surface.

The number of released spores and the wind speed are described in factor 1 of Eq. (1). Factors 2 and 3 describe the height and width of the plume. Factor 2 describes the crosswind shape of the plume as a Gaussian curve with standard deviation with its peak on the x-axis. The factors 3a and 3b describe the shape of the plume in the vertical direction. Factor 3a describes a Gaussian curve with standard deviation and a peak at height H . The standard deviations and determine the height and width of the plume. For a given x , the maximum concentration is at the plume centerline and decreases exponentially away from the centerline at a rate dependent upon the sigma values, and .

Now, if we assume anthrax spores are released from certain height over a large city, the concentration of the release can be estimated from Eq. 1, if the wind patterns are known. Based on that the most effected geographical area can be located and hence medical response strategies can be estimated.



Source: Slade et al. *Meteorology and Atomic Energy*, 1968.

Fig. 1 Gaussian plume concentration.

III. Conclusion

As is evident from the above, Gaussian plume model can be used to gauge the impact of a bio-terrorist attack. This method is effective in the determination of spread of aerosolized biological weapon like anthrax.

In terms of security threats it is imperative that government authorities must be prepared to face such bio-terrorist attack. The most crucial task is to be ready with effective models so that correct location of dispersion of such attacks can be estimated and hence causalities can be minimized. Hence from a policy viewpoint, these models focus on addressing a key issue of decision-making and can be a tool for a broader political agenda.

The scope of these methods can be extended to calculate the effect on population density which could give more realistic assessment.

Endnotes:

1. Sirisanthana T, Nelson KE, Ezzell JW, Abshire TG (1988). Serological studies of patients with cutaneous and oralpharyngeal anthrax from northern Thailand, .Am J Trop Med Hyg., Vol 39, 575-581.
2. Meselson M, Guillemin J, Hugh-Jones M, Langmuir A, Popova I, Shelokov A, and Yampolskaya O(1994).The Sverdlovsk anthrax outbreak of 1979, Science, Vol 266, Issue 5188, 1202-1208.
3. Legrand J, Egan J R, Hall I M, Cauchemez S, Leach S, Ferguson N M (2009). Estimating the location and spatial extent of a covert anthrax release, PLoS Computational Biology, Vol 5, Issue 1, e1000356.
4. Hogan WR, Cooper GC, Wallstrom GL, Wagner MM, Depinay JM (2007). The Bayesian aerosol release detector. Stat Med., Vol 26, Issue 29, 5225-52
5. Wein L M, Craft D L, Kaplan E H (2003). Emergency response to an anthrax attack,

Proceedings of National Academic Science, Vol. 100, No. 7, 4346-4351.

6. Chinn KS. Reaerosolization Hazard Assessment for Biological Agent-Contaminated Hardstand Areas. Life Sciences Division, Dugway Proving Ground, Utah: US Dept of the Army; 1996:1-40. Publication DPG/JCP-96/012.
7. Resnick IG, Martin DD, Larsen LD. Evaluation of Need for Detection of Surface Biological Agent Contamination. Dugway Proving Ground, Life Sciences Division, US Dept of the Army; 1990:1-35. Publication DPG-FR-90-711.
8. Turner, D.B. Workbook of atmospheric dispersion estimates: an introduction to dispersion modeling (2nd Ed.), CRC Press.

Taking Strength from the Past in Securing India's Future: India's earlier leadership in Biological and Chemical Weapons Convention and the need to take a pro-active role in ongoing UN Process for an Arms Trade Treaty (ATT).

Ms. Binalakshmi Nepram

The author is Founder-Secretary-General of the Control Arms Foundation of India.

Summary

A new ongoing process for an international arms trade treaty has been testing India's foreign and domestic policy for greater peace and security. When the UN committee on disarmament and peace voted on a resolution for a global Arms Trade Treaty on October 30, 2009 India abstained. The final tally was 153 for, 1 against, 19 abstaining with India in the minority alongside the company of countries like Pakistan and China.

To promote the establishment and maintenance of international peace and security with the least diversion for armaments of the world's human and economic resources

-Article 26 of the UN Charter

Peace, disarmament and development were the pillars of India's foreign policy since independence in 1947. As early as 1959, India called attention of the United Nations to the existence of large armaments and their unchecked growth which, besides being a threat to international peace and security. In 1964, India placed the item, "Non-proliferation of Nuclear Weapons" on the agenda of the United Nations. In 1965, India with 7 other nations called for an international treaty based, among others, on the principles which was to be a step towards the achievement of general and complete disarmament. Prime Minister Jawaharlal Nehru Speech at the Anti-Nuclear Arms Convention, New Delhi, June 16, 1962 had stated, "I am absolutely convinced that if any country adopted unilateral disarmament through strength, nobody would be able to injure it and it will win in the end".

In the year 1973, India signed Biological Weapons Convention and ratified of the Biological and Toxin Weapons Convention (BWC) on July 15, 1974. The Biological Weapons Convention was the first disarmament treaty that eliminated an entire category of weapons of mass destruction. And then in 1981, India signed the Convention on Certain Conventional Weapons and ratified in 1984. The last disarmament treaty that India signed the Chemical Weapons Convention treaty in the year 1993. It was ratified in 1995. Under that Convention, India has destroyed over half of its declared 1,055 metric tons of chemical weapon stockpiles. 100% of India's chemical weapons stockpile was destroyed by the end of April 2009, an example to the world of India's continued commitment to peace and disarmament efforts.

However of late, a new ongoing process for an international arms trade treaty has been testing India's foreign and domestic policy for greater peace and security. When the UN

committee on disarmament and peace voted on a resolution for a global Arms Trade Treaty on October 30, 2009 India abstained. The final tally was 153 for, 1 against, 19 abstaining with India in the minority alongside the company of countries like Pakistan and China. Some of the world's biggest arms traders, including the United States, Britain, France and Germany, supported the resolution, which garnered 153 out of 192 votes.

Background to United Nations's Arms Trade Treaty Process

Armed violence kills more than 350,000 people a year, and severely injures more than a million. Yet the global trade that fuels the epidemic of armed violence is not subject to international regulation. The 55 billion dollar weapons industry is unlike any other. It operates without regulation.

The movement of arms across the world is a huge threat to human security including that of India. Recently the Union Home Secretary, Shri G K Pillai has stated Indian concerns about Maoists being supplied arms from China. The realisation has come late since China has been supplying arms to Northeast India armed groups since 1960s.

Around 8 million new small arms are manufactured every year, but far more significant is the movement of second-hand guns from one user to another. They last - and remain lethal - for decades. At present, it is impossible to monitor or interrupt this deadly flow of weapons. This is because there are no agreed global standards for governments when authorising exports or transfers.

On December 6, 2006, work on an international Arms Trade Treaty began immediately following a historic vote in the UN General Assembly¹, which saw 153 governments supporting the proposed Arms Trade Treaty. The UN General Assembly vote comes just three years after the launch of the Control Arms campaign, which has seen over a million people in 170 countries calling for a Treaty. Pursuant to General Assembly Resolution 61/89, on September 28,

2007 the Secretary General appointed a Group of Governmental Experts (GGE) from the 28 countries². The GGE have already met for three sessions in New York³ in 2008 and they met twice in 2009.

India's Response to Arms Trade Treaty Process

India abstained repeatedly from voting repeatedly for an Arms Trade Treaty in October 2006 and also in October 2009 voting. In its submission to the United Nations Secretary General's request for views in 2007, India had written:

Although India's security interests have also been affected by illicit and irresponsible transfers, Government of India is not convinced that it is the absence of common international standards on trade in conventional arms alone that results in irresponsible or illicit trade... Only by eliminating the illicit trade we can address the basic malaise. It is the lack of full and effective implementation of existing obligation of states and not the lack of common international standards for the import, export and transfer of conventional arms that is to be blamed for illicit transfers or diversion for licit transfers to illicit trade... In conclusion, India believes that it is premature to begin work on a comprehensive, legally binding instrument establishing common international standards for the import, export and transfer of conventional arms.

However, it is important to note that there is no such treaty as Arms Trade Treaty and it is in India's interest to take leadership role in securing its interest in the ongoing negotiations. India was one among of the few select countries to be included in the Group of Governmental Experts selected by UN Secretary General Ban Ki Moon in 2008 to work towards the feasibility, scope and parameters of an Arms Trade Treaty. India could have taken this role to advance and strengthen our foreign policy for peace, disarmament and development policies which had earlier formed pillars of our foreign policy.

The Need for India to Take a More Pro-active Role for an ATT

Work at Control Arms Foundation of India confers three reasons as to why India need to take a more pro-active role and support the call for an international Arms Trade Treaty:

1. Lack of regulation of the ongoing international arms trade is hurting India's citizens
2. The Global Principles of the Arms Trade Treaty reflect India's values and Constitution.
3. An Arms Trade Treaty would not end India's arms production or trade in arms but only require good practice by all countries

India is a victim of unregulated arms trade. Insurgencies, armed insurrections, criminal activities and armed violence have become a part of life in many states of the country. India possesses 40 million firearms many illegal according to United Nations sources. These weapons impact the polity, social life and the economy and they are linked to illegal trafficking and money laundering that manages political clout and sustains conflicts. An international arms trade treaty is a way out of this spiral.

A national incentive alone cannot tackle the problem of arms proliferation in the country. Our Arms Act cannot tackle this problem alone. The Arms Trade Treaty proposes rules to regulate the transfer of conventional arms based on the principle that arms exporters and importers have a responsibility to ensure that they do not provide weapons that would be used in serious violations of international law. If this happens, we can hold China or Pakistan accountable for many of their arms which are flooding India.

The Arms Trade Treaty would also reinforce states' existing responsibilities under international law and provide a mechanism for their application to the trade in weapons.

The Treaty proposes that countries importing arms must meet criterion like promotion of democracy; do not violate human rights; do not engage in civil war and armed conflict; commit genocide, etc. It opposes the sale of arms to states that support terrorism; and advocates marking of weapons so as to its source and end use; it looks into the issue of brokers and their registration.

The proposed Treaty is thus in keeping with India's historic role for non-violence, civil order and universal disarmament. India's Constitution and national laws support arms control. This is also what can help India in the long run

The ATT in no way targets the legitimate security needs of countries or the legal transfer of arms. India has the largest defence industry on the subcontinent. This makes the country's state-owned munitions factories a significant source of arms exports to smaller neighbouring nations, such as Nepal, Burma, and the Maldives. The Government is now seeking a more global scope for arms exports. India is also the largest arms importer in the developing world, purchasing some \$15 billion in weapons every year, a figure expected to rise to \$50 billion by 2015, and is now developing closer ties with other international arms suppliers. And many of the countries which India is dealing with namely USA, UK, France etc are now strongly supporting the ATT.

An Arms Trade Treaty would not end arms production or trade for India but only require good practice by all countries. And global "restrictions" on irresponsible arms transfers, applied to all countries, would be in India's enlightened self-interest. It is time therefore that India takes a pro-active role in the ongoing Arms Trade Treaty process, just the way India had taken leadership role in other disarmament treaties such as Biological and Chemical Weapons Convention. The changing needs of the time such as terrorism and armed insurrections which confront India can be tackled strongly if "tools of terror" based ATT is in place.

Endnotes:

1. UN Resolution 61/89 of 6 December 2006, entitled “Towards an arms trade treaty: establishing common international standards for the import, export and transfer of conventional arms”.
2. Algeria, Argentina, Australia, Brazil, China, Colombia, Costa Rica, Cuba, Egypt, Finland, France, Germany, India, Indonesia, Italy, Japan, Kenya, Mexico, Nigeria, Pakistan, Romania, Russian Federation, South Africa, Spain, Switzerland, Ukraine, United Kingdom of Great Britain and Northern Ireland, and United States.
3. First session: 11 - 15 February 2008, Second session: 12 -16 May 2008

Japan: CBW

Mr. Shamshad Khan

The author is a Research Assistant at the IDSA, New Delhi.

Summary

Observing the success of new agents such as mustard gas in World War I, Imperial Japan undertook its own research to add chemical and biological weapons in its arsenal. By the end World War II, it had gathered enough expertise in this field and tested their chemical and biological weapons on live prisoners in its covert laboratories in its occupied territories in China, the details of which started unfolding during 1949 Khabrovsk trial. However, Japan was probably the first country which renounced possession of war potential including the WMDs and enshrined these provisions in its Constitution.

Japan claims that it does not possess Weapon of Mass Destructions including the Chemical and Biological Weapons. Determined never to revisit war following its disastrous defeat in World War II, it has enshrined renunciation of war, non-possession of war potential and denial of belligerency of state¹ in its Constitution promulgated in 1947 as its stated policy in this regard. Various policy documents including Japan's defense white paper interpret the non-possession of war potential as "possession of those (war potentials) that are characterized as offensive weapons that by the nature of their performance are intended to be used only for the mass destruction for another country,...under no circumstances are these weapons permissible"².

However, its own history of Chemical and Biological weapon is tainted as it pursued covert Chemical Warfare programmes during its colonial expansion and set up various laboratories in mainland China including the infamous "Unit 731" and experimented on prisoners to test its effect in battlefield. Japan had been in the state of denial over its covert programmes and it had not allowed the issue to be included in the Japanese text books arguing that "no credible scholarly research, articles or book, have yet been published on this issue, it is premature to discuss it in a textbook"³

The issue of Japanese Chemical Warfare remained uncovered till some of the records of Khabarovsk war trial held in USSR in 1949 were made public. The records of interrogation of 10 Japanese Prisoner of Wars (POWs) captured during the World War II revealed that the Japanese Chemical and Biological Warfare was largely the responsibility of two detachments of Japanese Kwantung Army established in 1930s in Northeast China. Colonel Shiro Ishii, a Japanese medical officer who established a biological warfare research centre in 1935 in Japanese occupied Manchuria is considered the main architect of Unit 731.⁴

Another detachment, Unit 100, was under the commandment of Jiro Wakamatsu and the task of the unit was limited to devising and producing bacteriological weapons of sabotage

in the form of exterminating animals and contaminating crops.⁵

The Japanese used flea as a main vector and the main agents as was revealed by Japanese POWs at Khabrovsk trial were plague, cholera, typhoid and anthrax and the methods of dissemination they discussed were spraying from aircraft, bombing and direct contamination of water and land. Various out breaks of plague and typhoid were attributed to Biological Warfare attacks.⁶

The issue of Japanese colonial chemical and biological warfare could not become a matter of academic as well as public discourse until an investigative documentary “Unit 731: Did Emperor Hirohito Know?” was released in 1985, which depicted the story of Colonel Shiro Ishii’s code named Unit 731. The documentary by British journalists portrayed that Unit 731, in Harbin, Manchuria had grown into an enormous installation with laboratory and germ production facilities, testing grounds, an airport and especially equipped germ dropping planes.⁷ The issue remained hidden from the public debate for over four decades also because the American investigators who conducted their own trial during occupation of Japan “were prevented by some of their own compatriots from uncovering the full story”⁸, as General Douglas MacArthur, Supreme Commander of Allied Powers, has struck a deal with Ishii in exchange for information.⁹ While British journalists who made documentary termed Ishii’s programme “the secrets of secrets”, historian Sheldon Harris demonstrated in his book, *Factories of death: Japanese Biological warfare 1932-1945* and the American cover up, that it was known to, and collaborated in by, various elements of Japanese society. Sheldon offered circumstantial evidence of the Showa emperor having sanctioned biological warfare developments.¹⁰

It is difficult to ascertain the after affects of usage of Japanese chemical and biological warfare in China, however as per a Chinese account, “during Japan’s invasion of China Biological Warfare activities were carried out in more than twenty provinces and cities, causing more than 200,000 casualties among the Chinese people”.¹¹

Since the accounts of journalists and historians were not corroborated with enough facts and records, the story they revealed remained shrouded with the mysteries. The cloud over the mystery of Japanese chemical and biological warfare started clearing when some of those involved in the Chemical and Biological Warfare confessed to their inhuman acts before media. One of the Japanese vivisectionists, Ken Yuasa, involved in Chemical Warfare in Changzhi (then Luan) in China’s Shanxi Province told the Japan Times that at least 1,000 people, including surgeons, nurses and servicemen were part of similar atrocities all over mainland China. About his experience on performing vivisection on live Chinese prisoners he told “I was afraid during my first vivisection, but the second time around it was much easier and the third time I was willing to do it.” Asked why he concealed this fact for so long, he revealed that “I was in denial of the things I did in Luan until the war was over. It was because I had no sense of remorse while I was doing it. It is difficult for anyone, including myself to admit having done something evil.”¹²

Japan also has the unfortunate distinction of being the target for chemical terrorism involving nerve agent Sarine. In 1994-95 Aum Shinrikyo, a new age cult, used improvised Chemical Warfare agents in Tokyo Metro trains killing about 14 people and affecting more than 5000.

It was the Tokyo subway incident that led Japan to think that “the development and use of chemical weapon by non-State actors are palpable threats to international peace and security.” Its ratification of Chemical Weapon Convention (CWC), a convention that supplants 1925 Geneva Protocol, coincides with incident of Sarine gas attack in Tokyo subway. The CWC bans the acquisition, development, production, stockpiling, transfer and use of chemical weapons.

After ratifying the Convention of Biological Weapons in 1982 and Chemical Weapon Convention (CWC) in 1997, Japan has been aggressive campaigner to eliminate weapon of mass destruction including nuclear, biological and chemical weapons. It has utilized its

diplomatic tools for the universalization of the two conventions which supplant 1925 Geneva Convention.

In compliance to its obligation under the CWC and Organization for the Prohibition of Chemical Weapons (OPCW) it has declared its 588 industry plant site where it undertakes Chemical and biological research for purposes other than Chemical weapons and has allowed inspection of these industrial sites. It is pushing the OPCW to improve the industry verification regime and has been pursuing the State Parties and technical Secretariat to make the CWC's multilateral disarmament convention a success¹³.

However, it is still struggling at the international level to correct its historical past in China. In accordance to the CWC it has signed Memorandum of Understanding with China to excavate abandoned Chemical Weapons and destroy them. So far Japan and China have conducted more than 120 bilateral investigation and excavation and have recovered more than 40,000 abandoned Chemical weapons¹⁴. But it is yet to begin substantive destruction of these abandoned Chemical Weapons.

Endnotes:

1. Article 9 of the Japanese Constitution states: Aspiring sincerely to an international peace based on justice and order, the Japanese people forever renounce war as a sovereign right of the nation, or the threat or use of force, as a means of settling disputes with other nations. In order to achieve the purpose of the preceding paragraph, the land, sea and air forces, as well as other war potential, will never be maintained. The right of belligerency of the state would never be recognized.
2. Defense of Japan 2004, (Japan's Defense Whitepaper) p.113
3. For details read Saburo Ienaga, "The Glorification of War in Japanese Education", International Security, Vol.18, No.3, (winter 1993/94) pp.113-133. The author writes that he had to delete the references to Unit 731, from the manuscript of school text

book following the objections from Japan's Ministry of Education which screens the text books before approving it for publication.

4. Cookson, John and Nottingham, Judith, (1969) "A Survey of Chemical and Biological Warfare", Sheed and Ward Ltd, (London). pp 56
5. Ibid, pp 56
6. Ibid, pp 56 and 296
7. Unit 731: Did Emperor Hirohito Know?, A TVS Production, London 1985, review by John W. Powell, in The Journal of Asian Studies, Vol. 51, No.1 (February 1992), pp. 225-227.
8. Williams, Peter and Wallace, David (1989), Unit 731: Japan's Secret Biological Warfare in World War II, Free Press, New York. pp. 229.
9. Historian Stephen C Mercado supporting the fact writes: Many Japanese biological warfare specialists were granted immunity from prosecution in exchange for their Biological Warfare data and equipment removed from the death factories on the Asian continent to Japan in August 1945. For detail read ,Stephen C Mercado (2002), The Shadow Warriors of Nakano: A History of the Imperial Japanese Army's Elite's Intelligence School, Dulles, Virginia , : Brassey's Inc pp 165-199.
10. Sheldon H. Harris (1994), Factories of Death : Japanese Biological Warfare 1932-45 and the American Cover-up. London and New York: Routledge, p 144.
11. Liu Huaqui, (2000) ed., Arms Control and Disarmament Book, National Defense Industry Press, Beijing. p. 368.
12. Witness to War : Vivisectionist recalls his day of reckoning, The Japan Times, October 24, 2007.
13. <http://www.mfa.gov.cn/eng/wjb/zzjg/jks/kjlc/shwq/t532424.htm> (accessed on November 13, 2009)

The Federation of American Scientists

Amongst the various organizations devoted to spreading awareness regarding biological and chemical weapons issues, the Federation of American Scientists (FAS) occupies a unique position. It was founded in 1945 by scientist who had worked on the Manhattan Project to develop the first atomic bombs.¹ The guiding philosophy of FAS has been to “warn the public policy leaders of potential dangers from scientific and technical advances and to show how good policy could increase the benefits of new scientific knowledge”.²

The Board of Sponsors of FAS comprises of 84 Nobel Laureates. The organization often addresses critical policy topics that are not well covered by other organizations.³ The FAS is funded by contributions from its members and public and private sector.

The three main programme areas under the FAS projects are organized as under:

- Energy and the Environment
- Learning Technologies
- Strategic Security

The strategic Security Programme pursues projects that can reduce the threat to the United States and the world from biological, chemical, conventional and nuclear weapons.⁴

The FAS Biological and Chemical Weapons Control Project falls under the Strategic Security Programme. The project “defines biosecurity challenges that face the nation, provides sound information and policy guidance and advocates for overall preparedness for public health emergencies and pandemics, disasters and terrorism event”. It covers all aspects of chemical and biological weapons and their control, but concentrates on researching and advocating policies that balance science and security without compromising national security or scientific progress.

The BWPP released the First Edition of its BioWeapons Report on December 9, 2004

Meeting of States Parties to the Biological and Toxin Weapons Convention (BTWC) in Geneva, Switzerland. The report highlights the dangers posed by both traditional and potentially new biological weapons, and delineates some of the measures governments can and should take to reduce the impending threat.

The Bioweapons Monitor is one of the leading publications of the BWPP. It is an online searchable database with open-source information on topics related to international accords controlling biological weapons and relevant developments in specific regions and countries. The BioWeapons Report is the more analytical component of the BWPP publications. It is an annual printed book containing contributions from various authors. The current Strategic Programme 2004-06 is a concerted effort to generate an agenda to monitor and strengthen the norms against the use of disease as a weapon for and beyond the 2006 Review Conference of the Biological and Toxin Weapon Convention. BWPP aims to fill this gap by monitoring implementation of the legal and political obligations never to develop, produce or use biological weapons. Since April 2006 the BWPP has been involved in the technical implementation of the Joint Action in support of the BTWC, which was adopted by the Council of the European Union in February 2006. The activities involve the organisation of 5 regional seminars to promote the universalization of the convention and assist with national implementation legislation of States Parties to the Convention.⁴

BWPP has contributed significantly in spreading awareness regarding the threat of BW and is incessantly working in the same direction to curb the impending threat of the same.

Endnotes:

1. <http://www.bwpp.org/about.html>
2. www.armscontrolcenter.org/policy/biochem/articles/bio_weapons_project_report/
3. www.bwpp.org/documents/2004-06BWPPstrategicprogramme.pdf
4. <http://www.bwpp.org/>

Chemical and Biological News

ARMS CONTROL

OPCW Director-General Visits Mexico

The Director-General highlighted the recent accession of the Bahamas and the Dominican Republic to the CWC.

On September 1, 2009 the OPCW Director-General, Ambassador Rogelio Pfirter, paid an official visit to Mexico City where he addressed the opening session of the Tenth Regional Meeting of OPCW National Authorities in Latin America and the Caribbean.

During his visit Director-General Pfirter met with the Deputy Foreign Minister for Multilateral Affairs and Human Rights, Ambassador Juan Manuel Gómez-Robledo. He commended Mexico for its unwavering commitment to the Chemical Weapons Convention (CWC) and work of the OPCW, and provided the Deputy Foreign Minister an overview on the implementation of the Convention.

Ambassador Gomez-Robledo reaffirmed Mexico's strong commitment to the objectives of the CWC and expressed his Government's firm support for the work of the OPCW in implementing the global chemical weapons ban.

In his address to the Tenth Regional Meeting, the Director-General highlighted the recent accession of the Bahamas and the Dominican Republic to the CWC, which he noted achieved universality of the Convention in Latin America and the Caribbean. He stressed that the next challenge will be to ensure that all OPCW Member States in the region appoint a National Authority, submit their initial declarations to the Technical Secretariat, and put into place the legislative and administrative measures to implement the CWC at national level.

<http://www.opcw.org/news/news/article/opcw-director-general-visits-mexico-1/>

DISARMAMENT

U.S. Reaches Chemical Disarmament Milestone

The U.S. Army Chemical Materials Agency announced today that it has eliminated 2 million chemical agent-filled munitions since the international Chemical Weapons Convention entered into force in 1997.

“The professional, dedicated government and contract workers at all of our locations are making great strides to safely eliminate our chemical weapons stockpile, making our nation and the world safer,” said CMA Director Conrad Whyne said in a press release.

The United States is among the 188 nations that have signed the pact that prohibits the development, production, stockpiling, use or proliferation of warfare materials such as mustard blister agent and the nerve agents sarin and VX.

Chemical warfare material stockpiles at Aberdeen, Md., Newport, Ind., and the Johnston Atoll have all been safely destroyed. The Army is continuing disarmament operations at depots in Alabama, Arkansas, Oregon and Utah, while another Pentagon agency is set to manage disposal of weapons stored in Colorado and Kentucky.

The Army eliminated roughly 226,000 chemical-filled munitions before the pact's entry into force, according to CMA spokesman Greg Mahall. Another 1.2 million weapons remain to be destroyed, he said.

The service expects to meet the April 2012 disposal deadline established by the convention. Work by the Assembled Chemical Weapons Alternatives program could continue through 2021, according to current estimates.

http://www.globalsecuritynewswire.org/gsn/nw_20091006_1787.php

Russian Site Finishes Disposal of Sarin Nerve Agent

A Russian chemical weapons disposal site has finished elimination of 232.6 metric tons of the nerve agent sarin, Interfax reported.

The Maradykovsky facility in the Kirov Region destroyed 4,866 munitions filled with the chemical warfare material.

Progress has also been made in preparations to begin disarmament operations for a cache of munitions filled with a mixture of mustard and lewisite blister agents. There are 150 metric tons of the material waiting for disposal.

“The facility has completed the construction of a line for the destruction of mustard-lewisite mixture,” said the Kirov Region government in a statement. “In late November, hook-up and commissioning work will start at the line, testing the technology for destroying this toxic substance.”

Full chemical weapons destruction at Maradykovsky is expected to be finished by 2012.

http://gsn.nti.org/gsn/nw_20091119_8050.php

NATIONAL AND INTERNATIONAL DEVELOPMENT

Export of bioweapon technology to India to remain restricted

The United States has maintained restrictions on the export of as many as 11 of its 16 dual use technology regimes to India, including on dual use technology in chemical and biological weapons.

Dual use technologies are those that can be used for both peaceful and military purposes, including those that can aid in the proliferation of nuclear weapons and the creation of bioweapons.

India currently faces that maximum number of dual use technology denial regimes, which are adhered by the United States’ Department of Commerce, State Department and the Munitions Controller.

In addition to its restrictions in chemical and biological weapons, India faces restriction in one of the two categories in nuclear non-proliferation and missile technology and in both categories in the National Security and Regional Stability dual use technology regimes.

Researchers and regulators fear that lax security at laboratories, though not in India, have allowed potential select agents to fall into the hands of those who would use them for nefarious purposes. For this reason, the dual use technology regimes are often tightly constrained.

The 2001 anthrax attacks in the United States are believed to have stemmed from just such a situation as are the July 2007 terrorist attacks in central London and at Glasgow airport. In the latter, it is believed that NHS medical professionals were potentially involved.

As well as the restrictions, the recent attacks have also served as a wake-up call that screening of those who handle pathogens needs to be heightened.

<http://www.bioprepwatch.com/news/211044-export-of-bioweapon-technology-to-india-to-remain-restricted>

Group Warns Biosecurity Bill Could Burden Scientific Research

Mandates included in new federal legislation could impair the ability of U.S. laboratories to conduct important biodefense research, according to a leading U.S. science organisation.

The American Association for the Advancement of Science earlier this month submitted a letter to the bill’s authors, Senate Homeland Security

and Governmental Affairs Committee Chairman Joseph Lieberman (I-Conn.) and ranking member Susan Collins (R-Maine). It includes a series of comments and recommendations on the Weapons of Mass Destruction Prevention and Preparedness Act of 2009.

The association is primarily concerned that the bill calls for the establishment of a new system of oversight and security procedures under the Homeland Security Department for certain select agents, pathogens and biological toxins declared to pose a severe threat to human or animal health.

“We feel that having a whole separate system of oversight — even if it is for 12 or 13 agents — can very well complicate things about implementation,” according to Kavita Berger, project director at the AAAS Center for Science, Technology and Security Policy. “And while you may have the best of intentions while writing the bill, it does not mean that upon implementation it will turn out the way that one intends.”

Many in the biological research community have raised concerns that laboratories already must use time and resources that could be employed for research to deal with government security rules.

The Senate measure was approved November 4 in an 8-1 vote of the homeland security panel. Senator Carl Levin (D-Mich.) was the sole vote of dissent. It could not be determined when a Senate floor vote on the bill is slated.

If approved, the legislation would require the Homeland Security Department to prepare security regulations for laboratories and divide the government’s list of select agents and toxins into three tiers. Facilities that handle the eight to 10 most dangerous materials would receive the highest security and be regulated by Homeland Security while the Health and Human Services Department would oversee sites in the remaining two tiers.

The bill could affect as many as 400 facilities and 15,000 individuals authorized to work with deadly pathogens, according to Collins.

The measure would also mandate the establishment of a national strategy for dispensing medical countermeasures to the public before and after a disease outbreak or act of bioterrorism.

Representatives from the scientific association met with staff members from the homeland security panel before the bill was introduced in September, Berger said in a telephone interview.

After the committee’s first attempted vote on the legislation October 28 “we thought it was appropriate to make these comments a little more official,” Berger told Global Security Newswire. She added that while the association offered its input to lawmakers, the group has no formal position on the measure.

A spokeswoman for the homeland security committee did not return repeated phone calls or an e-mail message request for comment.

The four-page letter begins by applauding lawmakers for consulting with academic and scientific experts to guide the development of new security standards and regulatory oversight of select agent research programs. It also compliments them for calling for common standards on which all institutions working with “tier one” pathogens can base their security measures.

However, the association believes oversight for the select agent program should remain within the Centers for Disease Control and Prevention and the Agriculture Department’s Animal and Plant Health Inspection Service.

Berger said that rather than having Homeland Security establish and oversee laboratory security standards the department could simply provide input to CDC officials.

“Trying to keep it simple, trying to affect change within the existing system to improve some of the problems that currently exist, would be good,” Berger said. “A lot of the problems are not with the select agent program per se but rather more with the other agencies wanting to have their own oversight over the research that they fund.”

Laboratories already deal with inconsistent requirements and multiple, uncoordinated government inspections, according to the AAAS letter. Some facilities can spend about \$50,000 per inspection and today might undergo more than eight per year, the group said.

The letter also notes that few federal funds are directly allocated for operations, security or training at high-containment laboratories — those that handle the most lethal pathogens — meaning they must use general finances that could otherwise go to research.

Increasing the security mandates could heighten the burden, further hampering scientific effort.

Berg noted that lawmakers “tried to consciously minimize” the number of inspections by suggesting in the bill that government agencies conduct joint assessments.

The letter also expresses concern about policy discussions in both the executive and legislative branches about the design and implementation of personnel reliability programs at research facilities to evaluate whether an individual is trustworthy enough to work with sensitive material.

“In the absence of evidence that such programs can identify individuals likely to misuse biology, the overall costs to science, health and other national goals from implementing such a system appear to outweigh the assumed security benefits,” the letter states.

The programs — already employed by the Defense and Energy departments, among other agencies — can include psychological screening, polygraph testing and credit checks.

The association recommended that Congress look to the National Institutes of Health, which recently developed a “biological surety” program that relies on fostering a network and culture of responsible conduct of research.

The group also suggested lawmakers consult with administrators and laboratory managers

from a variety of research facilities on how a personnel reliability program and appeals process should be developed.

http://www.globalsecuritynewswire.org/gsn/nw_20091119_7367.php

Biological Weapons Convention Must be Fixed, Experts Say

The Biological Weapons Convention must become stronger or risk falling into irrelevancy, experts said this week.

While the treaty embodies the “necessary” norm against the use of disease as a weapon of warfare “it’s not sufficient” and suffers from shortcomings that need to be tackled by member nations, according to Jonathan Tucker, a senior fellow with the James Martin Center for Nonproliferation Studies.

Among the inadequacies that hinder implementation are the “relatively limited” number of states that adhere to the compact and the nonbinding results that stem from the annual meetings of member nations, Tucker said.

The treaty also has no provisions for verification of its rules, which led to the document being “blatantly disregarded” in the past by countries such as Iraq and South Africa, said Gigi Kwik Gronvall, a senior associate at the University of Pittsburgh’s Center for Biosecurity.

Both offered their comments Tuesday during a panel discussion at a biodefense conference organized here by the center.

The Biological Weapons Convention entered into force in 1975 and today has 163 member nations. It prohibits the development, production and stockpiling of weaponized disease agents such as anthrax, smallpox or plague.

The pact has not been as widely accepted as other nonproliferation agreements, Tucker said. He compared it to the Chemical Weapons

Convention, which entered into force in 1997 — more than 20 years after its biological weapons counterpart — and boasts 188 states parties.

A key reason for the divergence in the number of member states the existence of an implementing body, the Organization for the Prohibition of Chemical Weapons, that has “actively recruited or pressured countries to join” the Chemical Weapons Convention, Tucker said. The biological convention, meanwhile, has an “institutional deficit,” he told the audience.

Today, the treaty’s Implementation Support Unit, which helps coordinate activities related to the agreement, is composed of three people at the U.N. Office at Geneva, according to Tucker. He said that a congressionally mandated panel on weapons of mass destruction recently urged the United States to support an “appropriate increase” in the “size and stature” of that office.

The U.S. Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism also recommended that Washington propose a new “action plan” for achieving universal adherence to the treaty for adoption at the 2011 BWC review conference. The sessions are held every five years to review the workings of the treaty.

Another problem dates back to the 2001 collapse of negotiations that would have stood up a BWC verification regime, leaving the compact “without a clear direction for future efforts,” Tucker said. That year the Bush administration moved to abandon six and a half years of negotiations toward an inspections protocol.

The “political vacuum” left over about how to strengthen the compact has only been partially filled by the intercessional conferences, separate annual meetings of experts and states parties that have focused on implementation of the treaty, Tucker said.

Those conferences have been useful in focusing the international community’s attention on biosecurity issues, but they are reaching a point of “diminishing returns” because they do not have a direct impact on implementation of the convention, he told the audience.

Those sessions address a different each issue year. This year’s topic was disease surveillance and next year participants will address investigations of the alleged use of biological weapons.

The convention is also in danger of being overtaken by technology, Kenneth Luongo, president of the Partnership for Global Security, said during the panel discussion.

“We have to figure out how to deal with that because the BWC in a sense was dealing with governments that were producing biological materials for warfare,” he said. Today “we’re dealing with a primarily private sector owned industry that’s producing biological agents for profit and not for warfare.”

He added that most private sector biological research is devoted to pharmaceuticals and medical countermeasures.

The arms control model that was applied to the nuclear sector, focused on state production of fissile material, might not be applicable to biological agents, where a far greater number of private institutions are producing materials that might be of concern, Luongo told the audience. “I think we have a lot of different stakeholders here. That’s going to be a challenge.”

He referred to a report that examined the global biotechnology sector in 2008. More than 4,700 companies were found to have spent about \$30 billion on research that year, while the U.S. National Institute of Health spent slightly more than \$5 billion.

While U.S. President Barack Obama’s statements on nuclear proliferation have been “well-informed” and backed by years of consensus within the scientific community, there is not the same kind of agreement on biological dangers, according to Luongo. He did not elaborate.

The White House in August convened a summit with roughly 40 biological scientists and research analysts to inform the administration’s strategy on bioterrorism, including how it

should approach the treaty and its 2011 review conference .

Possible Solutions

Luongo said that in the future BWC member states should work on confidence-building measures instead of standing up a verification regime, which would be a “difficult concept” for some states and focused on a “small percentage of the research that we’re worried about.”

“The idea is to have a framework where we agree on the dangers and a range of solutions, but not mandate behavior,” he said.

Another option to strengthen the treaty would be for the United States to prepare a U.N. Security Council resolution similar to one passed last month, according to Luongo. That document, numbered 1887, was aimed at promoting nuclear nonproliferation and disarmament.

“I’m wondering whether or not we need an 1887-B on the bio side,” Luongo said during the panel discussion.

He did not say what specifically such a resolution would involve, only that it should outline a range of activities countries could take to adhere to the compact and allow for future negotiations about implementation.

Tucker said that existing confidence-building declarations — annual reports issued by countries to detail their biodefense activities or disease outbreaks on their soil — could be made mandatory to enhance transparency.

Fewer than half of the state parties issue the report today and the documents often are printed in a nation’s native language and not translated, he said. In addition, the reports are not made public or given to nongovernment organizations that could play a useful “watchdog” role.

Thought is being given now as to how to make confidence-building statements “more

relevant,” according to Tucker. He added that the 2011 review conference could take up the matter.

http://gsn.nti.org/gsn/nw_20091008_3610.php

Two Cult Members to Stay on Death Row for Tokyo Sarin Attack

Japan’s Supreme Court affirmed today the death sentences for two men who helped carry out the 1995 sarin nerve agent attack on the Tokyo subway system that left 12 dead, Kyodo News reported.

Toru Toyoda, 41, and Kenichi Hirose, 45, had filed an appeal of the death sentences handed down in 2000 by the Tokyo District Court and upheld four years later by the Tokyo High Court. They are allowed to object to today’s decision on technical grounds, but that is unlikely to prevent their execution, Kyodo reported.

Should the decision hold, a total of eight former members of the Aum Shinrikyo cult would be awaiting execution for the sarin attack and other crimes. Among them are cult founder Shoko Asahara.

Death penalties have been unsuccessfully appealed by four of the five former Aum members who were found guilty of physically releasing the sarin gas that left thousands sickened. Toyoda and Hirose appear to be among that group.

Toyoda has also been convicted of conspiring with the cult to use a bomb against then-Tokyo Governor Yukio Aoshima in 1995. A metropolitan government official suffered serious injuries when the parcel bomb detonated.

http://www.globalsecuritynewswire.org/gsn/nw_20091106_7506.php

Cornell University professor says bioweapons threat is increasing

The critical questions that frame the understanding of biological weapons include what biological weapons threaten the U.S.; how the threats have changed after the Cold War, the Sept. 11 terror attacks and the development of biotechnology; and how to better assess such threats for biodefense policy, a Cornell University professor said during a lecture Nov. 9.

Professor Kathleen Vogel, science and technology studies and faculty member of the Peace Studies Program, spoke about the issue of biothreats and policy logistics, according to The Cornell Daily Sun.

According to Vogel, throughout history and across the world there have been analytical failures in detecting and assessing the scope of bioweapons programs, be they in the Soviet Union, Iraq, Japan, Afghanistan or the United States.

“There’s this growing, elusive, more technologically advanced set of bioweapons threats due to the increasing pace and infusion of biotechnology,” Vogel said.

Vogel approaches U.S. bioweapons assessments as the result of a “sociotechnical assemblage” made up of narratives and accounts. The early 1990s brought about geopolitical changes with the collapse of the Soviet Union. Rogue states, such as Iraq, arose, creating concern in the U.S. over the difficulty of detecting covert weapons programs.

The 1995 Tokyo subway attack raised concerns in the U.S. because it demonstrated the capacity of a non-state actor to perform a chemical activity on a large scale.

The 2001 anthrax attacks underscored the need for more information, especially as weapons technology becomes increasingly accessible. Until U.S. military forces found an al-Qaida makeshift lab in Afghanistan, the U.S. was unsure who had performed the attack.

“We didn’t know that al-Qaida was trying to do this in Afghanistan and this, once again, indicated that the US intelligence committee has underestimated another bioweapons threat,” Vogel said.

Scientific literature on pathogen research raises concerns about the accessibility of scientific knowledge to dangerous sources. She emphasized the growing threat of non-state actors and how difficult enacting preventative measures and policy becomes because of the stealth-like nature of the attacks.

New technical analytic units have arisen because of this increasing concern, such as directorates in the CIA and the Weapons, Intelligence, Nonproliferation and Arms Control Center in 2001. Even earlier, the Nonproliferation Center was founded in 1992, creating new science advisory groups to increase biological expertise at the same time that the U.S. Defense Intelligence Agency increased their focus on biochemistry.

In the early 2000s, there was increased support for “science-based” threat assessments in intelligence in the policy arena. The focus was on biological and genetically engineered agents, and technical assessments were separated from the notion of an adversarial attack.

<http://bioprepwatch.com/news/210908-cornell-university-professor-says-bioweapons-threat-is-increasing>

European States Press to Make Chem, Bio Weapons Usage War Crimes

The Netherlands is expected to request that the International Criminal Court expand its definition of what actions constitute war crimes to include the use of chemical and biological weapons, Deutsche Presse-Agentur reported.

Dutch Foreign Minister Maxime Verhagen and Dutch Justice Minister Ernst Ballin told lawmakers by letter that they back a Belgian measure that would change the Rome Statute

to address biological and chemical weapons. The Rome Statute is the undergirding document on which rests the court established in 1998 to prosecute war crimes and crimes against humanity.

The Rome Statute is due to be revisited later this month by its 110 signatory states during a meeting in The Hague.

The ministers told the Dutch parliament that they did not intend to back a Mexican proposal that would classify the use of nuclear weapons as a war crime. Designating the use of such weapons as a war crime might dissuade nonsignatory nations from recognizing the authority of the court in the future, the ministers advised.

http://www.globalsecuritynewswire.org/gsn/nw_20091109_7039.php

Compiled by: Wg. Cdr. Ajey Lele, Dr. Monalisa Joshi and Gunjan Singh

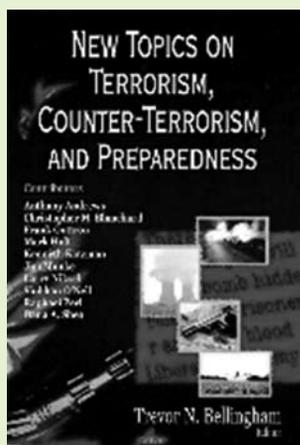
New Topics on Terrorism, Counter- Terrorism, & Preparedness, Edited By Trevor N Bellingham, Nova Science Publishers - May 2008, 74.5 Pounds Sterling

Dr. Prashant K. Singh

*The author is a Research
Assistant at the IDSA,
New Delhi.*

Summary

In the period when cutting-edge science and technology have hardly remained a preserve of states and state-sanctioned institutions or actors, terrorists are posing a great challenge to human security by misusing them. Their unchecked access to science and technology is helping them project every time newer and graver security threat to governments and civilians. Under these circumstances, governments and their allied institutions are compelled to envisage imaginatively about newer forms of possible terrorist threats and put an effective mechanism to forestall them.



New Topics on Terrorism, Counter-Terrorism, And Preparedness is an edited volume by Trevor N. Bellingham. As is evident from the title itself, the contributors to this book have contributed new subjects which could be divided on thematic and geographical basis as well. The book has been finalized in a way which not only presents 'leading-edge' analyses on terrorism but also throws light on the measures being adopted by the US government to fight it. It covers traditional terrorism of some already well-known terrorist organisations like Al Qaeda, and Abu Sayyaf in Philippines, and at the same time the book also introduces new subjects of bio and agro terrorism. Of course, nuclear vulnerability in the face of a terrorist attack also gets due space in this book.

The first chapter The National Bio – and Agro – Defense Facility: Issues for Congress has highlighted the fact that agricultural and food infrastructure could be a potential target of terrorist attack. The novelty about this chapter is that the author of the chapter brings the fear of terrorist spreading zoonotic diseases in the focus of the discussion on terrorism. This potentially vulnerable aspect of security has been duly taken note of by the US establishment. The Plum Island Animal Disease Center (PIADC) under the US Department of Agriculture (USDA) was set up to conduct 'foreign animal disease research'. The seriousness of this potential risk was recognized and PIADC was transferred Department of Homeland Security (DHS), established in 2003. In fact, "Homeland Security Presidential Directive 9 tasks the Secretaries of Agriculture and Homeland Security to develop a plan to provide safe, secure, and state-of-the-art agriculture biocontainment laboratories for research and development of diagnostic capabilities and medical countermeasures for foreign animal and zoonotic diseases."

As far as nuclear power plants worldwide are concerned, they have been unthreatened by terrorist attacks so far. Precisely this is the reason why international community fighting against terrorism should be alarmed. The next terroristic surprise could come in form of an attack on any nuclear facility.

The way terrorists gave surprise by attacking 'twin-towers' in the US in 2001 makes it amply clear that their dexterity in giving surprises should not be underestimated. The tragedy caused by any nuclear damage inflicted upon by terrorists would be colossal. The chapter *Nuclear Power Plants: Vulnerability to Terrorist Attacks* dwells upon precisely this frightening proposition. The US Nuclear Regulatory Commission (NRC) is mandated to make regulations on nuclear reactor security. Now, it is busy with strengthening them. However, critics charge that nuclear industry is not showing desired alacrity to implement these rules and regulations; and in fact, it is too slow to implant them.

The subject of Agro-terrorism as a sub-set of the much broader bioterrorism has been discussed in the chapter *Agroterrorism: threats and Preparedness*. The chapter informs that agro-terrorism has been increasingly recognized as national security threat in the US. It also informs that the US Congress has held several hearings on this potential threat. The Government Accountability Office (GAO) has carried out various studies on this issue. It should be clear that the ultimate purpose of agroterrorism remains to kill only human beings either by contaminating agro products or creating shortage of their supply.

The Chapter Project Bioshield: Purposes and Authorities delineates purpose and authority of the Project Bioshield Act which came into force in the US in 2004. This act was brought into force to expedite procedures for chemical, biological, radiological and nuclear related procurement, hiring and award of research grants. Besides, this act further strengthens Department of Health and Human Services (HHS) to "temporarily allow the emergency use of countermeasures that lack Food and drug Administration (FDA) approval." Another related chapter *Project Bioshield: Appropriations, Acquisitions, and Policy Implementation Issues* for Congress critically examines the execution of this law. As this chapter informs the US Congress has also expressed concern about the implementation of project Bioshield. Financial irregularities have been reported in the functioning of HHS.

Iraq and Al Qaeda tries to scrutinize the issue of linkages between erstwhile Ba'athist Saddam Hussein regime in Iraq and Al Qaeda. The author of the chapter investigates this issue because the same has been very contended since the commencement of the second Gulf war. This has been controversial because this alleged nexus between the Saddam regime and Al Qaeda was presented as a *casus belli* against Iraq by Bush administration, and the administration could never establish this beyond doubt. Critics have argued that there might be sporadic communication between top leadership; however, no consistent, systematic or institutionalized linkages could be established to substantiate the US argument. It is difficult to prove that Saddam government and Al-Qaeda carried out any terrorist attack jointly. This chapter seems to be incongruent in the overall scheme of the book. However, the purpose of this chapter appears to be exploring whether Al Qaeda in Iraq (Al Qaeda-I) can attack US homeland security, howsoever weak linkages might be there between Al Qaeda (or Al Qaeda-I) and Saddam regime.

Al Qaeda: Statements and Evolving Ideology argues that top leadership of Al-Qaeda may have been neutralized and it may have been cornered by the coalition forces, yet it is relentless in its ideological pursuit. It has successfully been manipulating international media in spreading its message. By carefully studying its statements, one would find that it has hardened its ideological commitments. The expulsion of foreign forces and influences from Islamic societies and, ultimately the creation of an Islamic state ruled by Sharia Law remain its unflinching commitments.

In the chapter titled *Abu Sayyaf: target of Philippine-U.S. Anti-Terrorism Cooperation*, the author basically details the Philippine-U.S. cooperation against local Islamic terrorism in Philippines.

Terrorist precursor Crimes: Issues and options for Congress discusses as to how to nip terrorist activities in the bud. It argues that whatever ideological motives terrorists may have and howsoever committed they could be, their terrorist activities need basic material support.

That is where governments should strike well before time. The chapter Combating Terrorism: The Challenge of Measuring Effectiveness is basically a report, designed to support 110th Congress to “understand and apply broad based objective criteria when evaluating progress in the nation’s efforts to combat terrorism.”

Finally, this book is a policy-oriented book which has been written for American audience. The organization of the chapters in this book could have been better. Ideally, this book should have been divided into three sections. The first section could have consisted of bio, agro and nuclear terrorism related themes. The second could have Al Qaeda and Abu Sayyaf related material. Then third one could have prescriptive chapters of Terrorist precursor Crimes: Issues and options for Congress and Combating Terrorism: The Challenge of Measuring Effectiveness. Instead, chapters keep coming to and fro unsystematically.

CBW Magazine

ORDER FORM

INDIA	SINGLE ISSUE Rs. 125 <input type="checkbox"/>	ANNUAL Rs. 400 <input type="checkbox"/>
OTHER COUNTRIES	US\$ 15 <input type="checkbox"/>	US\$ 50 <input type="checkbox"/>

Name: _____

Institution: _____

Address: _____

City: _____

Zip/Postal Code: _____

Country: _____

E mail: _____

Subscription Total:

Method of Payment:

Payments can be made only in the form of Cheque addressed to the 'Director General, Institute for Defence Studies and Analyses,' New Delhi.

Send your Order to:

CBW Magazine
Room No. 219,
Institute for Defence Studies and Analyses,
No.1, Development Enclave,
Rao Tula Ram Marg,
New Delhi – 110010
India

Instructions for Authors

CBW Magazine is the publication of the Institute for Defence Studies and Analyses (IDSA). The magazine was launched in the year 2007. It is a quarterly magazine.

Submissions: IDSA invites contributors to submit researched papers, articles and view points. Contributions may deal with matters of contemporary debate or historical analysis related to Chemical and Biological Weapons/Terrorism/Disasters. The magazine carries three categories of contributions: full-length analytical papers of 2000-3000 words; articles of 1500-2000 words and view points of 800-100 words. The magazine also welcomes book reviews of 700-1000 words.

Contributors are requested to follow the guidelines and style given below.

Guidelines

- The paper should be composed using MS Word 6.0 and above.
- The paper should be sent by email to the editor. It should be typed in Times New Roman, Font size 12 and 1.5 line spacing.
- All diagrams, charts and graphs should be referred to as Figures and consecutively numbered (Fig.1, Fig.2, and so on). Tables should carry only essential data and should complement the text rather than repeat what has already been said. They should carry a short title, be numbered (Table 1) and carry the source at the bottom. Each table must be referenced in the text.
- If actual statements or phrases are taken from another paper, the name of the author should be mentioned in the text and the chosen material should be placed within quotation marks with an appropriate reference. Alternatively, if another author's views are to be summarised, use the formulation: 'The views of xyz are summarised'; give a crisp summary. It is a good practice to reference sources of information extensively and effectively.
- Details of sources referenced should be included with notes listed at the end of the article.
- The paper should preferably have sub-headings to make it more reader-friendly.

References and notes

Notes should be sequentially numbered and listed at the end of the article. Details of references to sources should be included in the notes. Authors are responsible for the accuracy of the references.

All submissions should be addressed to The Editor, CBW Magazine, Institute for Defence Studies and Analyses, 1, Development Enclave, New Delhi - 110010, India; idsa@vsnl.com and editorcbw@gmail.com

CBW Magazine

Journal on Chemical and Biological Weapons

Volume 3

Number 1

Oct.-Dec. 2009



Institute for Defence Studies and Analyses
No. 1, Development Enclave, Rao Tula Ram Marg
Delhi Cantt., New Delhi-110 010
<http://www.idsa.in>