BIOSECURITY

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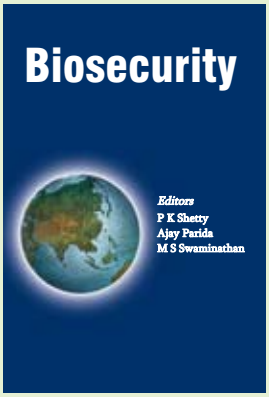

The book, featuring 17 chapters, had evolved after a discussion on Biosecurity in November, 2006. This discussion was jointly organized by National Institute of Advanced Studies (NIAS), Bangalore and M.S. Swaminathan Research Foundation, Chennai (MSSRF). India being one of the most vulnerable countries to the threat of bioterrorism, the discussion was organized for setting up a National Agenda Towards Biosecurity. The main focus of this meeting was on issues related to bio-security, bio-safety, biohazards and bioterrorism and its significance for India. The book covers bio-security in natural resources – land, water and environment, integrated pest management, aquaculture, animal and human health and contains lead papers from distinguished bio-security specialists.

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In the foreword K. Kasturirangan emphasizes that 'India's preparedness and capability in the area of bio-security is a serious concern, particularly after the introduction of the H5N1 strain of avian influenza virus in many parts of the country'. While introducing the book to the readers he further asserts that the book covers various aspects of bio-security including international comparisons and framework in which India's efforts must be set.

The authors have efficaciously made it very clear that 'in today's global trade, even an infestation that is limited in area or in direct damage to crops can devastate the bio-economics of the entire country (via defensive import bans imposed by trade partners) unless a convincingly effective scheme of quarantine, assessment, control and eradication is in place'. The papers included in this volume contains overviews, current systems and procedures of defence, international comparisons and

the international framework in which India's efforts must be set.

The book under review can be organized into four thematic sections. Part I of the book can be broadly classified as *Plant and Animal Biosecurity*. The work of M.S.Swaminathan, R.K.Khetrapal, Kavita Gupta, S.Ayyappan, Renu Swarup and Gopi Ghosh can be included under this section. The first paper discusses and elaborates the recommendations of the Farmers' Commission. The key concerns of the Food and Agriculture Organisation of the United Nations (FAO) has been successfully highlighted in this section. Most of the developed countries such as United States, Norway, New Zealand and Australia have already set up institutions and made necessary legislations to deal with bio-security. On the other hand, India needs a comprehensive bio-security policy to safeguard the income and livelihood of the farm sector and to monitor, warn and build infrastructure to certain possible pandemics. Plant bio-security in India and bio-security in aquaculture have also been covered in this section.

Part II of the book mainly deals with the food and nutrition security of the plants and animals at the backdrop of bio-security and therefore can be named as *Biosecurity for Human and Animal Health*. The works of H.K.Pradhan, V.Prakash and B. Sesikeran can be clubbed under this broad heading. The different risk groups (RG) I–V and bio-safety levels 1–4 have been discussed in this section. RG-I is low individual and community risk; RG-II moderate individual risk and limited community risk; RG-III high individual risk and low community risk; RG-IV high individual risk and high community risk and RG-V is a special category which includes animal and human pathogens not present in the country. Plant and animal viruses have high mutation rates that often alter their host range. Historical perspective of emerging viruses as the greatest challenge to bio-security has been addressed in this section. In order to prevent the entry of exotic insects and new pests, countries and states (e.g. California, USA) have adopted quarantine restrictions on agricultural commodities. Till recently, it was not possible to export Indian mangoes to USA. Even the mangoes produced in Hawaii could not be sent to the US mainland due to the presence of fruit flies endemic in Hawaii. In another thought provoking article the nutrition security dimension has been discussed. In the present scenario, we find a large looming threat in the bio-security of food, public health and nutrition. The greatest challenge that we face today in terms of prevention of food losses, capacity building and contribution of science to society, as well as bringing an evergreen revolution at the village level in the area of nutrition and agri-business security, ultimately to give the consumer a cost-effective product with a focus on employment empowerment has been successfully addressed in this section.

Part III of the book mainly deals with the challenges that India is countenancing in terms of bio-security and the role that it can play in nipping the threat in the bud. Thus it can be broadly termed as *Role and Challenges of Biosecurity*. The works of Panjab Singh, Mohan Kanda, Pavan Kumar Singh, S.M. Virmani, M. Mahadevappa, Arun Sharma, J.S. Samra, P.D. Sharma and T.P. Trivedi has been clubbed under this section. This section mainly deals with 'protection of animals, plants and human health against alien species including pests, pathogens and diseases, and protection of native species, including lower taxa and 'microorganisms, against contamination, hybridization, local eradication or extinction'. S. M. Virmani in crunchy, argot-free language states that the FAO bio-security is aimed to protect: (1) agricultural systems, (2) human health and consumer confidence in agricultural production, and (3) the environment, and promote sustainable production of agricultural commodities. Biosecurity in terms of saving land, water and environmental resources has been dealt by highlighting that in the last few years due to deterioration in the natural resources there has been a rapid slowdown of agriculture growth and stagnation in the crop productivity. All these major changes have been noticed primarily in the Indo-Gangetic Plain. The authors state that 120 mha land in the country is degraded due to increased soil erosion, water-logging, salinity/alkalinity, soil acidity, etc. It has been declared that India would be facing three main challenges in terms of bio-security: a) how to sustain 4% growth

rate in agriculture so that an 8-10% GDP growth is achieved over the foreseeable future; b) how to reverse the process of land (and soil) and water resource degradation; and c) how to stall and minimize the negative impacts of global warming and how to improve environmental quality in the future. An extensive adoption of resource conserving technologies has been recommended.

The last section of the book deals mainly with agro terrorism and biological warfare and can be therefore classified as *Threat of Bioterrorism*. Lt Gen D. Raghunath's paper Biological Warfare and Terrorism and P.K. Shetty's paper Agro-terrorism: Biosecurity Threats and Preparedness fall under this sub heading. WMD includes nuclear, biological and chemical weapons. Biological Weapons require relatively simple technologies and equipment like viruses, bacteria, fungi and insects to damage crops and animals as compared to the chemical and nuclear weapons. Therefore, they are especially attractive to the terrorists. Ricin obtained from castor beans, widely grown in India for its oil, has been used in terror activities. What appears is that bioterrorism can become quite favourite with the existing terrorists outfits keeping in mind its easy access and usage. But the later is used because the impact and the disaster have a show value which is not the case with biological agents. Bombs and explosions give immediate attention to the actions of the terrorists. However, there is a time gap between the action and the damage in the case of bio agents Both papers list several examples of Bioterrorism using different types of disease-causing organisms. For instance – there have been reports stating that an Indian religious group in the US attempted to contaminate the salad bar of a local restaurant with Salmonella in 1984. The motive was to incapacitate the voters in a local election. It is believed that in the early eighties, a Tamil militant group threatened to spread diseases in tea and rubber plantations in Sri Lanka while a disgruntled employee in Texas attempted to contaminate muffins and donuts with Shigella dysentriae cultures.

The book is factually crisp but seems to lose its analytical vehemence. It has highlighted a number of aspects of bio-security, though its main focus is on agricultural bio-security. Albeit the book covers a wide range of issues related to bio-security, the primary glitch for an international audience would be that the book is more Indian specific and caters to the interest of one small section and also there is only one paper which deals with biological weapons. This has limited the understanding of the subject. Overall, the book brings out valuable bio-security perspectives and is a useful addition to the literature on the subject as not much research from Indian perspective has been done on the issue. The book provides us with loads of information and suggestions on the subject which makes it a necessary reference for the scholars as well as the policy makers. The papers are well researched and analyzed. The editors have come up with this informative and comprehensive book at a time when the risk of bioterrorism is paramount.