

ACERA Project 0908

1. **Project Title:** Biosecurity information sharing and data mining for building a biosecurity intelligence and decision making framework
2. **Theme:** Biosecurity framework and development; Risk analysis methods; Communication and decision making
3. **Rationale:**

World trade is growing at a rapid rate. This integrated globalization has increased the range of biosecurity threats. A big part of our economy depends on our primary produce, and the success of primary production depends on biosecurity. As our economy is growing so are the threats posed to the countries' biosecurity, as the opportunities for incursions of pests and diseases are also increasing.

Although there is much investment and research in biosecurity there is a crucial and urgent need to establish a well structured and integrated biosecurity research infrastructure. The data integration methods introduced in this project will assist in promoting integrated biosecurity research and the modeling techniques to identify correlations between variables coming from different data sources highlighting strategic investment directions. Thus the project will aim to develop a methodology to achieve optimum national biosecurity benefit and hence ultimate impact which cannot be achieved in isolation. The draft Investment Plan for NCRIS Capability 5.8, Networked Biosecurity Framework, submitted to the NCRIS Committee in October 2006 stated that "the development of an IT-based National Biosecurity Research Information Network (NBRIN) by linking research institutions and relevant databases had the potential to provide a strategic investment in national biosecurity research infrastructure" [1]. However the committee felt that the feasibility of the vision and scope of the NBRIN needed further clarification.

Clarification of the scope of this recommendation has become the obstacle in the way forward in establishing the NBRIN. Hence, the urgency of this project which will provide a prototype or framework to demonstrate the feasibility of such an integrated approach and its capacity to deliver.

The purpose of the NCRIS investment is to support research infrastructure, in benefiting the whole biosecurity continuum, comprising a range of biosecurity activities "from preparedness to disease outbreak management as well as crossing the public health, agriculture and environment sectors" [1]. In this study the demonstration of the general framework will be done by conducting a case study on predicting climate trends based on pollution data and exploring their effects on crop yield, crop disease for crops such as wheat, peanut and canola.

4. **Outputs**

The project will deliver:

- Methodological framework to integrate large volumes of data coming from different domains in different formats
- A prototype based on the case study integrating climate, agriculture and pollution data to illustrate the methodology and how it can be used in extracting useful

knowledge which is not possible using traditional statistical methods and carried out in isolation. List of relationship clusters highlighting interactions between macro and microclimatic data and their influence on disease occurrence

- A report describing the methodological framework, software and case study, and outlining the strengths of the methodology and a critical review of the Method and future developments
- Feedback from the industry and government agencies on the suitability of applications of the framework in the area of biosecurity for future developments

5. **Time frame:** Commencing: July 2008; finishing: June 2009

6. **Project leader(s)**

Title	First name	Surname	Location	Organisation	% Time of the project
Dr	Liwan	Liyanage	Sydney	UWS	20%

Manager (contact for budget, deliverables, timelines)

Ms	Tracey	Hanson	Sydney	UWS	5%
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7. **Resources**

A. Funds

Financial years of requested funding	July-Dec 2008	Jan-June 2009
Project Total	\$14,000	\$16,000

B. Funds obtained from other sources for this project

(Participant, Industry or Third Party support (cash or in-kind))

Financial years of requested funding	July-Dec 08	Jan-June 09
Total	\$36,064	\$36,064

8. **End Users**