3．国際原子力機関（IAEA）が提案しているプロジェクト

PROJECT TITLE: CONTROL OF FOOT AND MOUTH DISEASE IN ASIA PACIFIC

BACKGROUND

The intended project focuses on the foot-and-mouth disease (FMD) in S.E. Asia. The importance of FMD is illustrated by the recent outbreak in the UK, with losses of approximately 8 billion dollars. The losses annually in the S.E Asian region are probably not truly appreciated, but stand around 200 million dollars each year, where there is no epidemics and a great deal higher, e.g., in Taiwan (6 billion dollars) where epidemics have been witnessed recently. Japan too suffered an incursion of the disease in 2000, which although contained, threatened trade and human security through creating poverty by direct economic losses and indirect losses in trading. There is also revulsion by the public to the wholesale slaughter of animals to control the disease, where vaccination policies are not followed.

OBJECTIVE

The overall aim of this multi-year project will be to improve the livelihood of families dependent on animals that are susceptible to foot and mouth disease. The focus will be the population in the developing countries in the Asia Pacific Region, which are affected by FMD cases, e.g. Myanmar, Vietnam, Thailand, and others.

For the first 2 years, the specific objective will be to develop capability in participating countries for the production of diagnostic kits including quality assurance, testing of kits, and harmonization of protocols among the countries in the region

SUMMARY

The constraints on control of the disease include reliance for reagents and kits for the diagnosis of the disease and measurement of antibodies in cattle, sheep, goats and pigs, on developed country laboratories. It is interesting to note that in the recent outbreak in Japan, kits had to be purchased from UK. The costs are high and often too high to allow purchase. The sustainability of such kits is also threatened due to alteration in the internal scientific requirements and perceived threats. The support for countries, for example by Europe (threatened continuously by FMD from the East), is mainly verbal and there is little activity on the ground. Molecular techniques also greatly add value to serological tests in laboratories and although methods are available to laboratories the training, management and implementation of such methods are not so easy. The IAEA has a good experience in this area managing PCR* technology transfer in Africa, S. America and Asia.

The project for the first 2 years will:

1. Set up sustainable kit production in an agreed Reference laboratory in S.E. Asia, to produce and distribute quality-controlled kits for the typing and antibody assessment (C-ELISA**) for total antibodies and NS-ELISA*** to detect antibodies only in infected animals).
2. Improve the information available from the whole area, leading to far better strategies for disease control. EQA**** exercises will be run from the reference centre.
3. Train laboratory staff in serological and molecular techniques and management veterinarians to greatly assist in lifting the expertise of individuals and foster the networking of laboratories and understanding between countries, which is vital in the region. This in turn would lead to protection of countries, without the disease and allow a much greater confidence in results stemming from all countries in the region.
4. Organise regular meetings of epidemiologists and laboratory staff to ascertain the disease situation in S.E. Asia.

The project will foster good laboratory practice, expertise, technical training, production and distribution of cheap reagents and the potential to develop and supply other kits base on the facilities and expertise gained. The setting up of this sustained programme to allow reagent and kit production in a developing country and the distribution of such quality-controlled kits would be a tremendous landmark. The program would also provide the means to vastly improve the information available from the whole area, leading to far better strategies for disease control. The training and management role through the project would greatly assist in lifting the expertise of individuals and foster the networking of laboratories and understanding between countries, which is vital in the region.

For future years additional activities will involve field applications involving participating laboratories and farms in the countries.

1. Summary	As above. The importance of FMD internally in the region as well as in affecting trade within and outside the region is a paramount issue.
2. Human Security Context	Reduction in poverty at all levels. Reduction in health risks due to lack of need to slaughter and burn/bury infected animals. Increase in productivity through better control at baseline level protected. FMD probably affects a large proportion of families in the whole region dependent on Agriculture (70% of population at a rate of 30% FMD affected = 20% families in region per year). This includes lost production and power, e.g., draft animals which affect rice and cereal production. Benefits from reduction in FMD by even 20% would be enormous. Eventual programmes should aim at eradication.
3. Objectives	For the first 2 years: Sustainable kit production. Cheap kits on demand. Cost recovery at end of second year. Trained staff. Introduction and use of PCR for aiding rapid diagnosis and molecular epidemiology. Certification mechanisms for trade in livestock as being free from FMD. Methods of sero-monitoring to ensure vaccines work!
4. Activities	Kit production for antigen detection (typing) antibody assessment (total antibodies to monitor vaccines etc) and antibodies against non structural proteins (to differentiate vaccinated and infected livestock), training, reference centre accreditation and mandate proved, pathway to accredit labs in region under OIE guidelines'
5. Outputs	Kits. Trained staff. Data. Processed data leading to understanding of epidemiology of disease in S.E. Asia, greater confidence in data from all laboratories, better disease control, certification of livestock in trading terms as FMD free. Greater and safer trade within and export to non-S.E Asian countries.
6. Implementing modalities	Management from IAEA (technical officer expertise), previously trained counterpart staff through IAEA coordination research projects (CRP) and IAEA TC projects. OIE representation in area. Australian wishes to place staff in a S.E. Asian reference centre (AHHL, Geelong).
7. Project Budget[4]	Over a 2 year cycle. Equipment/reagents US$300,000 Training US$100,000 Expertise US$100,000
8. Schedule of activities	A full detailed plan of activities is available.
9. Miscellaneous	Countries envisaged as beneficiaries would be Japan, China, *Laos, Cambodia,* Viet Nam, Philippines, Thailand, Myanmar, Malaysia, Bangladesh, Australia, Indonesia. Non-IAEA member states (in italics) cannot be supported by the IAEA, so these would particularly receive tremendous needed support through project. The vital component is that co-operation is required by all the countries if FMD is to be contained and eventually eradicated. This project FOR THE FIRST TIME addresses key issues in cooperation on a wide scale. Other bodies interested in funding could then use this as a dynamic focus for particular national funding ,e.g. The EU. FAO.

* PCR= Polymerase Chain Reaction technology. A method of increasing the amount of nucleic acid (in a sample to amplify and identify and provide the unequivocal proof of presence or absence of a disease agent.

** ELISA = Enzyme Linked Immunosorbent Assay. A simple method whereby a colour reaction is used to make diagnosis in a variety of systems. C-ELISA is a competitive method.

***The NS-ELISA is a recently developed test to differentiate vaccinated and infected animals. Important in FMD control programmes, and to certify animals as being disease free.

**** EQA = External Quality Assurance A system whereby the performance of laboratories and tests is monitored through exercises to assure that tests are accurate for desired use.