

**EX-POST EVALUATION STUDY ON
THE COLLABORATIVE STUDY PROJECT
ON EPIDEMIOLOGY, PATHOGENESIS AND
MOLECULAR CHARACTERIZATION OF
NIPAH VIRUS IN ANIMALS IN MALAYSIA**

Evaluation Report

March 2008

JICA MALAYSIA OFFICE

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評価調査結果要約表

1. 案件の概要	
国名：マレーシア	案 件 名：研究協力ニパウイルス
分野：農業一般	協力形態：技術協力プロジェクト
所轄部署：農村開発部第一グループ 水田地帯第二チーム	協力金額：約 1.1 億円
協 力 期 間	2001 年 10 月 1 日 ~ 2004 年 9 月 30 日
	先方関係機関：農業省国立獣医学研究所 日本側協力機関：農林水産省、(独)農業・ 食品産業技術総合研究機構動物衛生研究所
他の関連協力：特になし	
1-1 協力の背景と概要	
<p>1998 年 11 月以降、マレー半島北西部のイポーで発生したヒト型日本脳炎様疾病は、その後マレーシア各地に拡がって多数の死者を出した。米・豪等の協力を得た調査の結果、原因となった新種のウイルスはニパウイルスと命名され、同ウイルスが人に感染した結果であることが判明した。その後感染が疑われた豚 100 万頭以上が殺処分されたことで一時的に流行が終息したが、疫学的研究の結果、豚以外の家畜や野生動物も同ウイルスに感染していることが明らかとなり、再流行を防ぐには広範な研究が必要であることが指摘された。マレーシア政府は国立獣医学研究所 (Veterinary Research Institute: VRI) のウイルス研究施設を拡充し、ニパウイルス等の研究を深めるとともに、今回の流行を契機として、養豚の近代化をすすめており、その基本構想策定のためにも同ウイルス感染症の研究を深めることが急務であるとのことから、本研究協力の要請に至った。</p>	
1-2 協力内容	
(1) 上位目標	
ニパウイルス感染症のリスクが減少する	
(2) プロジェクト目標	
ニパウイルス感染症の診断技術の改良、開発及び疫学調査の実施	
(3) アウトプット (成果)	
1) ニパウイルス抗原検出技術の改良及びウイルスの性状解明	
2) ニパウイルス抗体検出技術の改良・開発	
3) ニパウイルス感染症診断技術の野外応用	
(4) 投入 (プロジェクト終了時)	
日本側：	
長期専門家派遣 2 名	
短期専門家派遣 4 名	

研修員受入 4名 機材供与 25,810千円 ローカルコスト負担 28,967千円 相手国側： カウンターパート配置 6名 機材購入 Sequencing Machine、PCR machine、Protein analysis set、 Incubators 野外調査用車両 土地・施設提供 ローカルコスト負担 RM 300,000 (約 9,000千円)
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2. 評価調査団の概要

調査者	(担当分野：氏名、所属先、職位) 評価計画 河添靖宏 JICA マレーシア事務所 評価分析 PE Research Sdn.Bhd.	
調査期間	2008年2月4日～2008年3月4日	評価種類：事後評価

3. 実績の確認

3-1 プロジェクト目標の状況

2000年5月にニパウイルスが流行したのを最後に、同ウイルス感染症の流行は認められていない。この要因としては、獣医学研究所における診断手法の改良、疫学的研究成果の貢献が大きく寄与していると言える。このプロジェクトを通して、獣医学研究所は東南アジアの中でも高度な獣医学研究が可能な機関として、その地位を確立したといえる。

3-2 上位目標の達成状況

本プロジェクトの成果は感染症に対する生物学的、疫学的アプローチであったが、その成果はマレーシアの行政施策にも反映され、ウイルス流行の抑止につながっている。具体的には、ウイルスの宿主であるコウモリを養豚場から隔離すること、ウイルス流行地における養豚の禁止等、行政指導が徹底されたことが、上位目標の達成につながっている。

3-3 終了時評価での提言の活用状況

終了時評価報告書の主な提言として、「獣医学研究所はプロジェクトで開発された方法を使用することによって、特に自然宿主を明らかにするために、ニパウイルスと野生動物への感染に対する継続的な研究を実施するべきである」という点が挙げられていた。この提言に対して、ニパウイルス研究はプロジェクトの元カウンターパートにより継続的に研究開発が進められており、この重責を果たすために、更なるスタッフの充実が検討されているところである。

終了時評価報告書はまた「ニパウイルスの感染の危険性に対する意識向上のため、

出版物やセミナーを通して、ニパウイルス研究の確立した知識や技術を近隣諸国へ普及することが大切である」ことを提言している。これに関連し、関係スタッフは研究結果を共有するためのセミナーやワークショップに出席、講演しており、広報・啓発活動にも取り組んでいると言える。

「獣医学研究所は、地域における日本とその他の機関とのニパウイルス／新型の疾病の共同研究を通して、情報・研究資料・訪問研究者の交換をする必要がある」という提言についても、獣医学研究所は大学と医学研究所とともにニパウイルスに関する共同研究を実施している。

プロジェクト初期段階において検討されていた、プロジェクトの研究活動の結果から生じた商品等の知的財産権の問題に関しては、現在に至り、研究成果が商品化につながった事案がなく、知的財産権の申請を行った事例がないため、知的財産権の権利関係に関する問題が生じたケースは特に認められない。

4．評価結果の概要

4-1 評価結果の要約

(1) インパクト

1) 上位目標の達成

プロジェクト終了後、獣医学研究所はプロジェクトを通して開発された技術を用いて、ニパウイルスに係る疫学研究、野生動物への感染の研究を続けてきた。これら研究は継続されており、その成果は養豚場での検査や監視に応用されている。これらの努力により、現在に至り、ニパウイルスの流行は認められていない。

2) 当初予定外の効果

人間と動物に対する抗体診断検査キットの開発に伴う成果として、養豚業者が豚の体内のニパウイルス抗体を検査しチェックする取り組みが促進され、結果として、ウィルス流行の未然防止に貢献している。

(2) 自立発展性

1) 制度面

プロジェクトのカウンターパートの半数は獣医学研究所に所属していない点は課題である。獣医学研究所を離れた3人のうちの1人は転勤、他の2人は定年退職している。一方で、当時のカウンターパートのコメントに依ると、新たなスタッフに対して技術移転が図られ、プロジェクトの期間中に学んだ技術を他のスタッフと共有する努力も継続されている。

2) 技術面

ウイルス研究を行うために整備されたプロジェクト設備や機材は適切に維持されており、これを利・活用する人材も配置されている。また、「1) 制度面」にある通り、組織的に研究技術の共有が図られており、技術面において自立発展性における問題点はないと評価できる。一部機材に機能低下が認められるが、

研究活動における支障はないため、継続的に利用されている。

3) 経済・財務面

獣医学研究所は農業省の家畜医療サービス課の管轄のため、機関の運営開発費用は政府によって適切に支弁されている。獣医学研究所は人材育成にかかる経費の要求を行っており、そのための予算は適切に確保されている。

4-2 プロジェクトの促進要因

(1) インパクト発現を促進した要因

ニパウイルスの宿主であるコウモリと養豚場を隔離するために取られた措置として、養豚場近辺における果樹の栽培を認めないという行政指導、及びニパウイルスがかつて流行した地区における養豚業の禁止、養豚業を新規開業する場合の地理的制限(かつて流行した地区への開業は認めない)に係る行政指導を実施し、これらは上位目標の達成に対して貢献したと思われる。

また、ニパウイルスを簡易に検出できる検査キットの開発及びその普及によりニパウイルスの早期発見・流行抑止に貢献したことも挙げられる。

(2) 自立発展性強化を促進した要因

ニパウイルス流行の阻止に向けたマレーシア農獣医局の積極的かつ具体的な取組みにおいて、獣医学研究所は生物学的、疫学的対応を担う拠点として位置づけられ、明確な研究目的及び必要な資源(予算、設備、人材)を与えられた事が自立発展に寄与していると言える。

4-3 プロジェクトの阻害要因

(1) インパクト発現を阻害した要因

特に見当たらない

(2) 自立発展性強化を阻害した要因

特に見当たらない

4-4 結論

本プロジェクト実施以降、ニパウイルスの流行が抑止されている事実から、上位目標まで到達していると評価できる。また、この事後評価を通して、プロジェクト終了後も獣医学研究所は自立発展的にニパウイルスの診断技術と疫学研究について継続的に取り組んでいることが確認された。動物疾病に係る研究診断センターとしての獣医学研究所の地位は学会発表や共同研究を通して向上しており、組織としても、運営面、技術面、経済・財務面の全てにおいて自立発展性をもって運営されているものと判断できる。

4-5 提言

(1) マレーシア政府に対する提言

1) 制度面

プロジェクトの成果(研究開発機能、研究者の人材育成)を持続発展させるために、獣医学研究所におけるプロジェクトのカウンターパートを数年は所内に留め置く必要がある。

2) 継続的なトレーニング

農業省農獣医サービス局及び獣医学研究所は技術的变化に対応できるよう、スタッフを定期的に教育・訓練する機会を設ける必要がある。

3) メンテナンス

機材と設備の予防メンテナンスを行うに十分な予算が配分される必要がある。また、メンテナンスは計画的に行われる必要があるため、係る管理も行われる必要があると思われる。

(2) JICA に対する提言

1) 組織

プロジェクトの成果を持続発展させるためにも、少なくとも5年間はカウンターパートが獣医学研究所に定着するように、農獣医サービス局に対して申し入れすることが望まれる。

2) 第三国のトレーニング

アセアン等の各国において、ニパウイルスの監視と診断の能力向上を図る上で、獣医学研究所は地域の発展に貢献することが出来る機関である。従って、状況や必要に応じて、獣医学研究所を実施機関とした研修やセミナーの開催を支援することも検討しても良いと思われる。

3) 更なるトレーニングの機会

獣医学研究所の研究者が技術的革新についてゆくためにも、JICA は更なる研修・教育機会を与えられるよう考慮する必要がある。

4-6 教訓

(1) 財務面

ニパウイルス研究に対する予算措置は適切に行われているが、人材育成面も含めた予算措置が検討される必要がある。

(2) 組織的側面

人事異動について、技術指導を受けたカウンターパートの離職は可能な限り避けることが望ましい。プロジェクト成果の継続及び組織内における技術移転、技術移転を受けたカウンターパートの研究者としての活躍の場を確保する必要があると思われる。

(3) 技術的側面

ニパウイルス研究において、他大学や他研究機関との共同研究の機会を通して研

研究者の能力が向上していることが伺える。最新の技術や研究成果を獲得するために、この様な機会を有効に利・活用することが望ましい。

4-7 フォローアップ状況

フォローアップは特になし。

Summary Sheet

Ex-Post Evaluation Conducted by JICA Malaysia Office

1. Outline of the Project		
Country: Malaysia		Project title: Ex-Post Evaluation Study on the Collaborative Study Project on Epidemiology, Pathogenesis and Molecular Characterization of Nipah Virus in Animals in Malaysia
Field: Nipah Virus Research		Cooperation scheme: Project-type Technical Cooperation
Section in charge: Department of Veterinary Services (DVS) , Ministry of Agriculture and Agro-based Industries, Malaysia; Japan International Cooperation Agency (JICA)		
Period of Cooperation	October 2001 ~ September 2004	Partner Country's Related Organization: Veterinary Research Institute (VRI)
		Supporting Organization in Japan: 1) Ministry of Agriculture, Forestry and Fisheries 2) National Institute of Animal Health
Related Cooperation: Grant Aid (1986-1987) Technical Cooperation Project: Asean Poultry Disease Research and Training Center (1986-1993, after care 1996-1998) Third Country Training Program (1987-2008) Senior Volunteer (1999-2002)		
1-1 Background of the Project		
<p>The outbreak of Nipah Virus caused tremendous economic and social losses to the nation in terms of loss of human lives and a reduction of more than 50% of swine population in the country. Despite the disease caused by the Nipah Virus being brought under control, there remained a possibility that the virus had established itself in other mammalian hosts to further maintain its existence, which may pose a threat to the future of mankind and animal industry in Malaysia. A lot of work had been done to understand to adaptive behaviour of the virus through conventional scientific research approached and implementation. A better understanding of the virus for formulation of control programme and ultimate eradication of the disease is necessary. However, despite these efforts, there were little information on the epidemiology and pathogenesis of Nipah Virus.</p> <p>Under these circumstances the Government of Malaysia requested the Government of Japan for technical assistance and cooperation in Nipah Virus research. JICA dispatched a study team to examine the possibility and feasibility of the cooperation project. As a result of discussions between the study team and Malaysian authorities concerned, both sides agreed to launch the three-year project starting in October 2001.</p> <p>This ex-post evaluation is conducted three years after the completion of the Project to gain an</p>		

understanding of the impact and sustainability of the Project.		
1-2 Project Overview		
The primary objective of this project is to ensure that a healthy environment for swine industry is created and the swine industry in Malaysia is modernized.		
(1)Overall Goal	The risk of Nipah Virus infection is decreased	
(2) Project Purpose	To improve diagnostic technology and epidemiological research for Nipah Virus	
(3)Outputs	1) To improve antigen detection methods and characterization of Nipah Virus. 2) To improve and develop antibody detection methods for Nipah Virus. 3) To evaluate effectiveness of Output 1) and 2) on field samples.	
(4) Inputs	Japanese side:	
	Long-term Expert	2 persons
	Short-term Expert	4 persons
	Provision of Equipment	25.8million Yen
	Local budget	28.9million Yen
	Malaysia's side:	
	Counterparts	6 persons
	Facilities and Equipment	Project office, transports, sequencing machines, PCR machine, Protein analysis set and incubators
2. Evaluation Team		
Members of Evaluation Team	Mr. Yasuhiro Kawazoe (Principal Assistant Resident Representative, JICA Malaysia Office, team leader) PE Research, consultant	
Period of evaluation	February 4 – March 4, 2008	Type of Evaluation: Ex-Post Evaluation
3. Project Performance		
3-1 Performance of the Project Purpose		
There has been no pandemic of Nipah virus ever since last pandemic occurred in May 2000. One of the reasons is VRI conducts epidemiological research and study on the Nipah virus and its infection in wild animals for prevention of pandemic. It is concluded VRI became one of the centres of excellence that conducts high level of researches in Southeast Asia through this project.		
3-2 Achievement related to Overall Goal		
The Project focused on biological and epidemiological approach to Nipah virus. While DVS conducted significant role by putting outputs of the project into practice as well. DVS regulated farmers not to plant fruits near by pig farms for preventing fruits bats into the farms. Also DVS		

prohibited continuing pig farming at the location experienced pandemic of Nipah virus. These efforts resulted in successful achievement of overall goal.

3-3 Follow up the Recommendation by Terminal Evaluation Study

The key recommendation of the Joint Final Evaluation Report is that “VRI should perform continuous epidemiological study of Nipah virus and its infection in wild animals, especially to determine natural host reservoir by using the developed methods in the Project”. This recommendation has been implemented and currently the Nipah virus research section is led by one of the counterparts of the project. The director of VRI has plans to involve more staff in this section in the near future.

The Joint Final Evaluation Report also recommended “to increase public awareness on the risk of Nipah Virus infection, it is essential to disseminate the established knowledge and techniques for Nipah Virus study to the neighbouring countries through publications and seminars”. Relevant staffs often attend seminar and workshop to share the research findings.

On the recommendation that “VRI should exchange information, research materials and visiting researchers through a collaborative study on Nipah virus/emerging diseases with Japanese and other institutions in the region”, the Evaluation Team noted that VRI has been conducting collaborative studies on the Nipah virus with universities and the Consortium for Conservation Medicine (CCM).

Regarding the issue of intellectual property of the products resulting from the research activities of the project during the initial stage of project formulation, the subject has not yet been sorted out. However, it has not affected the sustainability of the project.

4. Results of Evaluation

4-1 Summary of Evaluation Results

(1) Impact

1) Achievement of the Overall Goal:

Due to the government policy on pig farming and VRI efforts in screening, there has been no reports of outbreaks of the Nipah Virus disease. Therefore, it is concluded that the overall goal has been achieved.

2) Unexpected outputs

Pig farmers utilize test kit of Nipah virus that is developed by the Project for prevention measures of pandemic.

(2) Sustainability

1) Institutional and Management Aspect:

It is of concern that half of the counterparts of the Project are no longer with VRI. Out of the three who are no longer with VRI, one has been transferred, while two have retired. Despite the loss of trained staff, the counterpart survey reported that the skills learned during the Project have been shared with other staff through on the job basis.

2) Technological Aspect:

Overall, the management survey reported that the Project facilities and equipment are adequately maintained and that they do not face any issue in sustaining the Project outcomes. However some of the equipments are spoilt and not usable need to be replaced.

The VRI staff are has continued with their epidemiological research and study on the Nipah virus and its infection in wild animals using the techniques transferred and developed in the Project. The research on the Nipah Virus is continuing and the output has been used for screening and monitoring of the pig farms.

3) Economic and Financial Aspects:

As VRI comes under the Department of Veterinary Services, Ministry of Agriculture, the operational and development expenditures of the institute are provided by the government. While the government budget allocation has made VRI sustainable for operational expenses, the management need additional funds to enable the staff of VRI to participate in more seminars and training courses to enhance their knowledge and to ensure that they are abreast with technological changes.

4-2, 4-3 Promoting and Inhibiting Factors

Government policy on pig farming of disallowing fruit trees to grow near to the pig farms have contributed to the achievement of the overall goal. This is to avoid the fruit bats transmitting the virus to the pig farms. Furthermore, pig farming has been completely prohibited in the previously infected areas. The Ministry of Agriculture only allows pig farming to be sited in identified Pig Farming Areas (PFAs). As an alternative, farmers are being encouraged to undertake other agriculture and livestock activities. The government policy has contributed to the zero outbreak of Nipah virus.

Another factor that contributed to the impact of the Project is screening and monitoring. Although the screening in pig farms has been ceased, the screening on the fruit bats is continuing.

The development of a C-ELISA diagnosis test kit for humans and animals was an unintended and promoting factor. This kit which uses the specific monoclonal antibody produced and can be used by the farmers to test and check for Nipah virus antibodies in the pigs.

4-4 Conclusion

Through this ex-post evaluation exercise, the Evaluation Team has found that three years after Project completion, the Project goal of to improve diagnostic technology and epidemiological research for Nipah virus continues to be met. As a result of the Project, the status of VRI as a centre for research and diagnosis of animal diseases has been enhanced. Overall VRI has managed to be sustainable from the institutional and management, technological, as well as the economic and financial aspects. The Project has enabled the VRI to expand its capability in Nipah Virus diagnosis.

4-5 Recommendations

(1) Recommendations for Malaysian Government

1) Institutional: In order to maximise the gains from the training and capacity development of the

scientists, DVS should ensure that the trained counterparts are not transferred, at least for a few years. If possible, contracts could be offered to the trained counterparts that have retired so as to take advantage of the skills and knowledge.

2) Continuous Training: The DVS and VRI should continue to send the staff for periodic training to ensure that they are abreast with technological changes. If necessary, the future training could be on a cost-shared basis.

3) Maintenance: Sufficient funds must be made available for VRI to conduct preventive maintenance of the equipment and facilities. This may entail ensuring that the staff are sufficiently equipped and trained to be able to carry out the maintenance. A maintenance schedule should also be drawn up and adhered to.

4) Intellectual Property of Products: Although this issue has not affected the sustainability of the project, it is recommended that the matter be addressed. This is to ensure that any future commercialisation of the products can be handled appropriately.

(2) Recommendations for JICA

1) Organisation: For future joint technical cooperation accords, it is recommended that JICA insists that the implementing institutions do not transfer out trained counterpart staff for at least five years to ensure that the Project benefits from the capacity building provided to the counterpart staff.

2) Third Country Training: JICA could consider sending veterinary officials from developing countries in the region to learn from VRI on how to conduct surveillance and diagnosis of the Nipah virus and other zoonotic diseases in their respective countries.

3) Further Training Opportunities: To ensure that the counterparts are keeping up with the technological developments, JICA could continue to identify opportunities for further training or seminars (in Japan) on a cost-shared basis.

4-6 Lesson Learned

(1) Financial: The operational expenses of the Nipah Virus research section of the VRI are sustainable through the government budget allocation. However there is a need to ensure adequate funding to enable the staff to be continuously trained to keep abreast with technological changes.

(2) Institutional: While recognising that the staff of VRI are transferable (and can retire) ,the transfer (and retirement) of the trained counterparts, after being trained under the Project, means that they do not have the opportunity to put into practice what they have been trained and to share their new skills with their colleagues.

(3) Technological: The Nipah virus section of the VRI has been sharing and collaborating with universities and other institutions to keep abreast of research work on the virus and other emerging diseases. Furthermore the research work is also shared with countries in the region especially those that are affected by the virus.

(4) Others: Preventive maintenance of equipment and facilities to ensure that they are in good working condition needs to be carried out on a regular basis.

4-7 Follow-up Situation

None

ABBREVIATIONS

3NAP	3 rd National Agricultural Policy
CCM	Consortium for Conservation Medicine
DVS	Department of Veterinary Services
JICA	Japan International Cooperation Agency
OIE	World Organisation for Animal Health
PFAs	Pig Farming Areas
RM	Ringgit Malaysia
VRI	Veterinary Research Institute

1.INTRODUCTION

1.1 Project Background

This Ex-Post Evaluation Report of the Collaborative Study Project on Epidemiology, Pathogenesis and Molecular Characterization of Nipah Virus in Animals in Malaysia (hereinafter referred to as “the Project”) was carried out in February 2008. The Terms of Reference of the project is attached in Annex 1.

The Study on the Nipah Virus Characterization project was for a three-year period from October 2001 to September 2004. A Joint Final Evaluation Report was produced on 19th August 2004, one month before the project termination. The report outlined the achievements and progress of the activities of the Project, and the results achieved, although they were some activities yet to be achieved for the remaining project period.

Institutional, organisational, political, market and economic factors are likely to influence the outcomes and directions of the project goals and purpose, as well as the capacity of the institution. Thus, the extent of the project’s impact on and sustainability within the organisation and the counterparts is a function of its design and implementation, and its ability to demonstrate its relevance to the organisation’s needs in connection with the development policy of the Malaysian government. In this regard, an Ex-Post Evaluation helps in learning how to improve on the design and implementation of future projects. Such an exercise will help both donor and recipient evaluate the facts on whether project elements are still relevant to the needs of the recipient, particularly the size of the impacts, and whether the outcomes could be sustained.

1.2 Study Objectives

In an Ex-Post evaluation, the most important objective is **to gain an understanding of the impact and sustainability of the project**. In this case, the evaluation is done three and a half years after termination of the Project. In undertaking this exercise, JICA has determined that the evaluation should comprise mainly interviews with key stakeholders, i.e. VRI Management, and Project counterparts. Other inputs, such as condition of equipments, observations during site visits were compiled to supplement this exercise.

1.3 Key Evaluation Objectives

The objective of the evaluation is to verify important issues relating to the impact and sustainability of the Project. The main evaluation questions are listed as follows:

Impact: Achievement of Project Goal since completion

1. How far has the Overall Goal of the Project been achieved since the final evaluation?
2. What kinds of factors have contributed to positive and negative impacts?
3. Besides the Overall Goal of the Project, have the unexpected positive/ negative impacts

observed?

4. Are there any external factors that affected the achievement of the Overall Goal?

Sustainability: Continuation of Project activities and services

1. How has the counterpart agency continued the Project activities and service?
2. Have the Project outcomes been maintained since the termination of JICA's assistance?
3. What kinds of the factors contribute to or inhibit the sustainability?

Specific Questions

In addition, the evaluation wanted to know how the recommendations made in the joint final evaluation report on the Project dated August 19, 2004 been implemented and to assess the economic and financial sustainability of the Project taking into consideration the trend of world economy.

1.4 Evaluation Team

The Evaluation Team for this study is put together by PE Research Sdn Bhd and comprises Lim Pao Li as Consultant and Chong Siew Kook as Researcher. The team leader is Mr. Yasuhiro Kawazoe, the Principal Assistant Resident Representative of JICA Malaysia Office.

1.5 Structure of Report

The structure of this report is as follows. **Section 2** discusses the methodologies, particularly the tasks and approaches used in this evaluation. **Section 3** discusses the results of the evaluation, focussing on the two main issues of impact and sustainability. **Section 4** provides a conclusion of the key lessons learned with regards to impact and sustainability, and makes recommendations to resolve the issues that have surfaced during the discussions and interviews.

2. EVALUATION STUDY APPROACH

2.1 Methodology

The principal technique used is the logical framework (Logframe) approach. Specifically, the ex-post evaluation method uses the final evaluation reports as the starting basis. The project goal and purpose are defined as follows:

Project Goal: The risk of Nipah Virus infection is decreased.

Project Purpose: To improve diagnostic technology and epidemiological research for Nipah Virus.

2.2 Implementation

The following methodologies were used in this ex-post evaluation:

Methodology	Implementation
Preparation of an evaluation grid (Annex 2)	An evaluation grid establishes the main questions of the evaluation. Sub-questions were developed alongside the key questions. Indicators were identified (e.g. skills and knowledge of antigen and antibody detection method), and their measures were defined (e.g. low to high). Another key aspect was data requirements, sources of data and method of its collection. Hence, the evaluation grid provided the scope of work that was envisaged at the start of the Evaluation, and thus guided the evaluators in terms of answering the main and sub-questions. The grid was defined without detailed knowledge of the record keeping or documentary procedures or what will be accessible to the study team. The study team also had the benefit of information in the Joint Final Evaluation Report and this was also used to prepare the final evaluation grid.
Surveys and interviews with VRI and counterparts/ ex-counterparts (Annex 3A and 3B)	Using the evaluation grid, the survey instruments were then developed based on the main and sub-questions. In this evaluation, two different questionnaires were designed, i.e. to the two levels of impacts – management and counterparts/ex-counterparts. In this study, VRI management and all available counterparts were interviewed. Some of the counterparts are no longer with VRI but attempts were made to survey them too. The Evaluation Team managed to interview/survey all the 3 counterpart staff members that are still with the institute as well as 2 out of the 3 ex-counterpart staff members that are no longer with the institute. The list of counterparts/ex-counterparts surveyed is shown in Annex 6 while the detailed findings are in Annex 7.
Checklist of status of equipments and facilities left behind (Annex 4)	In any technical cooperation project, the status of use of the equipment and facilities post-project form an important indication of the relevance of the technology that was delivered, especially after project resources are no longer sustaining their maintenance and upkeep. A checklist of equipment that was handed over to VRI at the time of the Joint Final Evaluation Report and their latest status is shown in Annex 4.

2.3 Overview of Work Plan

An overview of the Work Plan for the evaluation is shown in **Figure 2-1**.

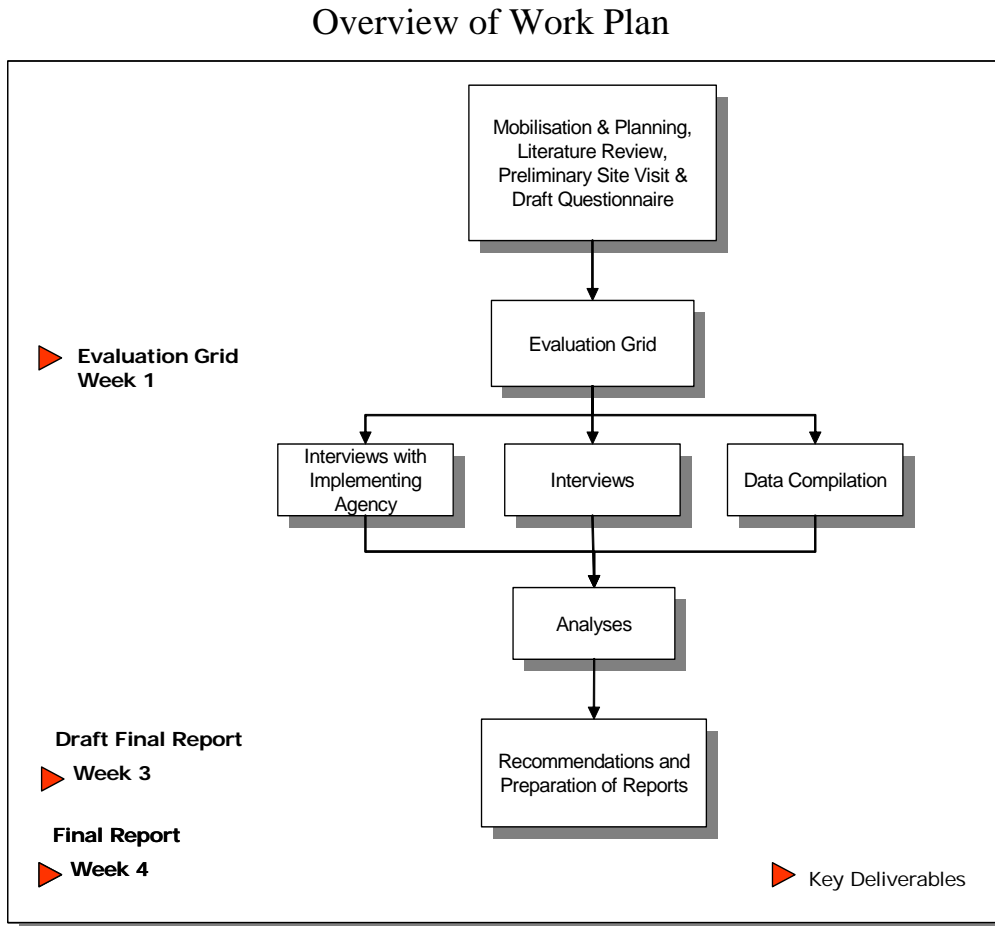


Figure 2-1: Overview of Work Plan

3. RESULTS

3.1 Introduction

The Nipah Virus project is in line with Malaysia's 3rd National Agricultural Policy (3NAP) which emphasises on the development of better diagnostic techniques to detect newly emerging infectious animal diseases which can badly affect the animal husbandry industry in Malaysia.

The first Nipah virus outbreak in Malaysia occurred in 1998. The virus which was identified in caused 105 human deaths¹ and resulted in the culling of a million pigs during that year. Today, the disease caused by the Nipah virus has been brought under control and Malaysia is recognised by The World Organisation for Animal Health (OIE) as being free of the Nipah virus infection, with the last positive serological case in May 2000. However due to zoonotic nature of the virus and its apparent potential to infect a range of animals, it is vital that the sensitivity and rapid diagnostic techniques for detection of the virus be made available for the control and surveillance programme in the country.

3.2 Evaluation Results

3.2.1 Impact of the Project

This project is in response to Malaysia's need to reduce the risk of the Nipah virus posing a threat to humans as well as to the animal industry in Malaysia. Since the last outbreak in May 2000, there has been no outbreak of the Nipah virus. This has been largely due to the improved diagnostic and epidemiological research capability of the VRI to meet the increasing needs of industry.

The Project counterparts at VRI have also acquired new skills and knowledge from the Project and these have enabled them to upgrade the diagnostic test of animals for the virus thus helping the industry to reduce the risk of socio-economic damage by the outbreak. Furthermore the Project has enhanced the standing of VRI as a regional diagnostic centre for animal diseases. Detailed discussions of the impact of the Project follow.

3.2.1.1 Achievement of the Overall Goal

The remaining activities that were identified during the Joint Final Evaluation were completed before the Project termination in September 2004. Since the final evaluation and the Project completion, VRI has continued with their epidemiological research and study on the Nipah virus and its infection in wild animals using the techniques developed in the Project. The research on the Nipah Virus is continuing and the output has been used for screening and monitoring of the pig farms. Due to the government policy on pig farming and VRI efforts in screening, no outbreaks has been reported since.

¹ Source: <http://agrolink.moa.my/jph/dvs/nipah.html>

From the counterpart/ex-counterpart survey, all the respondents agreed that the project has raised the overall level of VRI's capability in Nipah Virus diagnostic technology and epidemiological research has been upgraded and expanded, especially the antigen detection methods.

In addition to the survey findings, the impact is also reflected in the swine population statistics. During the Nipah Virus outbreaks in 1998, the swine population dropped tremendously by 42.7% in 1999. The swine population in 2001 (at the start of the project) was 1,432,613. In 2006, the swine population stood at 1,514,170 (after the project). This shows that the swine population has stabilised and was no longer threatened by the virus. The output of the study has played an important role in the control of disease.

Table 3.1: Swine Population in Peninsular Malaysia

Year	Swine Population	Growth rate
1996	2,452,241	-
1997	2,490,667	1.6%
1998	2,364,601	-5.1%
1999	1,355,240	-42.7%
2000	1,391,351	2.7%
2001	1,432,613	3.0%
2002	1,486,708	3.8%
2003	1,421,657	-4.4%
2004	1,483,515	4.4%
2005	n.a.	-
2006	1,514,170	2.1%

Source: <http://agrolink.moa.my>

3.2.1.2 Factors Contributing to the Impacts

One of the key issues that have affected the achievement of the overall goal is the **government policy** on pig farming. No fruit trees are allowed to grow near to the pig farms. This is to avoid the fruit bats transmitting the virus to the pig farms. Furthermore, pig farming has been completely prohibited in the previously infected areas. The Ministry of Agriculture only allows pig farming to be sited in identified Pig Farming Areas (PFAs). As an alternative, farmers are being encouraged to undertake other agriculture and livestock activities. The government policy has contributed to the zero outbreak of Nipah virus.

Another factor that contributed to the impact of the Project is **screening and monitoring**. Although the screening in pig farms has been ceased, the screening on the fruit bats is still continuing.

These factors have contributed positive impacts to the overall project goal.

3.2.1.3 Unanticipated Impacts Observed

Development of a Diagnostic Test Kit: On the positive side, there was an unanticipated technological innovation with the development of a C-ELISA diagnosis test kit for humans and animals. This kit which uses the specific monoclonal antibody produced, can be used by the farmers to test and check for Nipah virus antibodies in the pigs.

Career improvement: A counterpart who has left the VRI is now an associate professor of a university indicated that the project experience has enabled her to act as the supervisor to a student who is studying the Nipah Virus. Another counterpart was promoted after the project.

No unintended **negative impacts** were observed.

3.2.2 Sustainability of the Project

How is the sustainability of the Project? How has VRI continued the Project activities? What kinds of the factors contribute to or inhibit the sustainability?

The Management and Counterpart/Ex-counterpart survey and interview findings shed some light on the sustainability of the Project since the completion. These findings are analysed from the institutional and management aspect, the technological aspect as well as the economic and financial aspect.

3.2.2.1 Institutional and Management

Loss of trained counterpart staff, due to transfer or retirement: It is of concern that half of the counterparts of the Project are no longer with VRI. Out of the three who are no longer with VRI, one has been transferred, while two have retired. However, the former director who has retired is now teaching in a private university and is supervising a student who is doing research on the Nipah virus.

Skills and knowledge: Despite the loss of trained staff, the counterpart survey reported that the skills learned during the Project have been shared with other staff at VRI through on the job basis.

Feedback from the counterpart staff show that their skills and knowledge was upgraded and they are using the skills that were acquired during the Project (Table 3-2). This demonstrates that there is some degree of sustainability of the Project even after Project completion. Furthermore, 40 per cent of the respondents indicate that they spend more than half of their working ours using the Project equipment or skill acquired from the Project (Table 3-3)

Table 3.2: Counterpart Skill and Knowledge Upgrading since Project Completion

	Percent	n
Yes	60.0	3
No	40.0	2
		5

Source: Counterpart Survey

Table 3.3: Best Estimate of Time Spent Using Project Equipment / Skills Acquired as a Proportion of Total Working Hours

Time Spent	Percent	n
Less than 10%	20.0	1
Between 10% to 50%	40.0	2
Above 50%	40.0	2
	100.0	5

Source: Counterpart Survey

3.3.2.2 Technological Aspects

Overall, the management survey reported that the Project facilities and equipment are adequately maintained and that they do not face any issue in sustaining the Project outcomes. The Evaluation Team was informed that some of the equipments are spoilt and not usable need to be replaced.

Table 3-4 summarises the status of Project equipment. While 79 per cent of the equipments are still in use, some of the equipments require repairs. In the case of the equipments are broken beyond repair those are not in use. The Equipment in Use and Maintenance List is shown in Annex 4.

Table 3.4: Project Equipment Status

Equipment	Percent	No. of items
Still in use	79.4	27
Require repair	11.8	4
Not used, spoilt and disposed	8.8	3

Note: Disposable items such as pipetman and easypet are not included.

To some extent, the life span of the equipments can be enhanced with regular preventive maintenance of the equipment.

On the other hand, the reports produced by JICA's experts or other literature reference provided by JICA during the project are utilised.

3.2.2.3 Economic and Financial Aspects

As VRI comes under the Department of Veterinary Services, Ministry of Agriculture, the operational and development expenditures of the institute are provided by the government. While the government budget allocation has made VRI sustainable for operational expenses, the management need additional funds for training purposes. The additional training allocation will enable the staff of VRI to participate in more seminars and training courses to enhance their knowledge and to keep abreast with technological changes.

3.3 Status of Implementation of Recommendations of Joint Final Evaluation Report

The key recommendation of the Joint Final Evaluation Report is that “VRI should perform **continuous epidemiological study of Nipah virus** and its infection in wild animals, especially to determine natural host reservoir by using the developed methods in the Project”. This recommendation has been implemented and currently the Nipah virus research section is led by one of the counterparts of the project. The director of VRI has plans to involve more staff in this section in the near future.

The Joint Final Evaluation Report also recommended “to **increase public awareness** on the risk of Nipah Virus infection, it is essential to disseminate the established knowledge and techniques for Nipah Virus study to the neighbouring countries through publications and seminars”. Relevant staffs often attend seminar and workshop to share the research findings.

On the recommendation that “VRI should exchange information, research materials and visiting researchers through a **collaborative study on Nipah virus/emerging diseases** with Japanese and other institutions in the region”, the Evaluation Team noted that VRI has been conducting collaborative studies on the Nipah virus with universities and the Consortium for Conservation Medicine (CCM). In addition, they have routine teleconferencing with CCM to keep communication channels going.

Regarding the issue of **intellectual property of the products** resulting from the research activities of the project during the initial stage of project formulation, the subject has not yet been sorted out. However this has not affected the sustainability of the project.

4.CONCLUSIONS

4.1 Observations and Lessons Learned

Through this ex-post evaluation exercise, the Evaluation Team has found that three years after Project completion, the Project goal of to improve diagnostic technology and epidemiological research for Nipah virus continues to be met. As a result of the Project, the status of VRI as a centre for research and diagnosis of animal diseases has been enhanced. Overall VRI has managed to be sustainable from the institutional and management, technological, as well as the economic and financial aspects. The Project has enabled the VRI to expand its capability in Nipah Virus diagnosis.

The VRI management has demonstrated that they have ownership of the Project as they continue to strive to make VRI a centre of excellence in the field of research and diagnosis of zoonotic diseases in the region. They are however facing some challenges, and these provide lessons to be shared and learned.

Likewise, the counterparts and ex-counterparts acknowledged the usefulness of the Project training and that it has enhanced their overall capability with respect to research skills, Furthermore, they have been sharing the knowledge not only with the other

The Evaluation Team found that over the last three years, some of the counterparts have been transferred or retired, and this has affected VRI especially from the point of view of sustainability, although 50% of the counterparts are still in service.

To augment the overall observations on the impacts and sustainability of the Project, the Evaluation Team has grouped the lessons learned under four areas:

- (1) Financial: The operational expenses of the Nipah Virus research section of the VRI are sustainable through the government budget allocation. However there is a need to ensure adequate funding to enable the staff to be continuously trained in order to keep abreast with technological changes.
- (2) Institutional: While recognising that the staff of VRI are transferable (and can retire), the transfer (and retirement) of the trained counterparts, after being trained under the Project, means that they do not have the opportunity to put into practice what they have been trained and to share their new skills with their colleagues.
- (3) Technological: The Nipah virus section of the VRI has been sharing and collaborating with universities and other institutions to keep abreast of research work on the virus and other emerging diseases. Furthermore the research work is also shared with countries in the region especially those that are affected by the virus and other zoonotic diseases.
- (4) Others: Preventive maintenance of equipment and facilities to ensure that they are in good working condition needs to be carried out on a regular basis.

4.2 Recommendations

In coming up with recommendations for the Project, the Evaluation Team takes into consideration the impact and sustainability of the Project as well as the lessons learned from the ex-post evaluation exercise. The recommendations also take into consideration that JICA's role and activities in Malaysia. Nonetheless it is hoped that the recommendations will be useful for the formulation of future projects in a similar context.

4.2.1 Recommendations for DVS and VRI

Institutional: In order to maximise the gains from the training and capacity development of the scientists, DVS should ensure that the trained counterparts are not transferred, at least for a few years. If possible, contracts could be offered to the trained counterparts that have retired so as to take advantage of the skills and knowledge.

Continuous Training: The DVS and VRI should continue to send the staff for periodic training to ensure that they are abreast with technological changes. If necessary, the future training could be on a cost-shared basis.

Maintenance: Sufficient funds must be made available for VRI to conduct preventive maintenance of the equipment and facilities. This may entail ensuring that the staff are sufficiently equipped and trained to be able to carry out the maintenance. A maintenance schedule should also be drawn up and adhered to.

Intellectual Property of Products: Although this issue has not affected the sustainability of the project, it is recommended that the matter be addressed. This is to ensure that any future commercialisation of the products can be handled appropriately.

4.2.2 Recommendations for JICA

Organisation: Under the joint technical cooperation accord, it is recommended that JICA insists that the implementing institutions do not transfer out trained counterpart staff for at least five years to ensure that the Project benefits from the capacity building provided to the counterpart staff.

Third Country Training: JICA could consider sending veterinary officials from developing countries in the region to learn from VRI on how to conduct surveillance and diagnosis of the Nipah virus and other zoonotic diseases in their respective countries.

Further Training Opportunities: To ensure that the counterparts are keeping up with the technological developments, JICA could continue to identify opportunities for further training or seminars (in Japan) on a cost-shared basis.

Intellectual Property of Products: Although this issue has not affected the sustainability of the project, it is recommended that the matter be addressed. This is to ensure that any future commercialisation of the products can be handled appropriately.

ANNEX

1. Terms of Reference

2. Evaluation Grid

3A. Management Survey

3B. Counterpart Survey

4. Equipment checklist

5. Equipment Checklist

6. Persons Surveyed/Interviewed

7. Survey Findings-Counterpart Survey

8. Organisation Chart of VRI

9. VRI's Development Budget 2003-2007

Annex 1: Terms of Reference

Terms of Reference for the Ex-Post Evaluation Study on

The collaborative study project on epidemiology, pathogenesis and molecular characterization of nipah virus in animals in Malaysia

1. Outline of the Targeted Project

As stated in the annex1

2. Purpose of the Study

(1) Title of the Study

The Ex-Post Evaluation Study on The collaborative study project on epidemiology, pathogenesis and molecular characterization of nipah virus in animals in Malaysia (hereinafter referred to as "the Study")

(2) Purpose

The Study is expected to verify the important issues relating to the project impact and sustainability observed after three (3) years from the completion of the Project. The results of the Study contribute to the better-informed decision-making based on the lessons learned, and the promotion of the greater accountability. The results will also be shared by Department of Veterinary Services, Ministry of Agriculture and Agro-based Industries, Malaysia.

3. Implementation of the Study

The Study will be carried out considering the following items:

(1) Main Evaluation Questions

The Study will seek answers to the following main evaluation questions:

a. Impact

- How far has the Overall Goal of the Project been achieved since the final evaluation?
- What kinds of factors have contributed to positive and negative impacts?
- Besides the Overall Goal of the Project, have the unexpected positive/ negative impacts observed?
- Are there any external factors that affected the achievement of the Overall Goal?

b. Sustainability

- How has the counterpart agency continued the Project activities and service?
- Have the Project outcomes been maintained since the termination of JICA's assistance?
- What kinds of the factors contribute to or inhibit the sustainability?

c. Specific questions

- How recommendations made in the joint final evaluation report on the Project dated on August 19, 2004 has been implemented?
- Assessment of economic and financial sustainability of this project taking into consideration trend of world economy.

(2) Suggested/Required Evaluation methods

The Consultant is responsible for identifying specific evaluation methods of data collection. It is suggested that actual inquiries use the methods, which can assess both quantitative and qualitative measurements of the changes. The Consultant is requested to come up with the objectively variable indicators to measure up these changes. In addition to that, it is important to investigate the factors that positively and negatively contributed to the changes. Data and information will be collected through the surveys including the followings,

- a. Site visit to Veterinary Research Institute (hereinafter referred to as "VRI") and/or other authorities concerned.
- b. Questionnaire surveys and Interviews with VRI counterpart/ex-counterpart who worked together with the JICA Experts, and also who were trained in Japan.
- c. Qualitative investigations to measure the Project impacts, such as;
 - numbers of trained counterparts in each field
 - numbers of reports prepared by VRI
 - budget allocation for the Project activities

JICA requires that all evaluation studies present the recommendations and the lessons learned in the Evaluation Report based on the qualitative and quantitative analysis. The recommendations should document practical and specific suggestions to improve the Project that is subject to evaluation. On the other hand, the lessons learned present specific suggestions for the formulation of future projects in a similar context.

4. Implementation Schedule

The Study is scheduled to commence from 21 January 2008, and complete by 19 February

2008.

JICA estimates the total amount of man-month (M/M) required for the Study approximately as follows;

- Leader: 0.50M/M
- Researcher/ Evaluation Analysis: 1.00M/M

5. Deliverables

The Consultants shall submit the following deliverables to JICA.

(1) Evaluation Grid

The evaluation Grid is to be prepared within 5 days of the first meeting with JICA and to be presented by 25 January 2008. The Consultants will be requested to modify their evaluation planning if JICA finds it inappropriate.

(2) Draft Evaluation Report

The Consultants shall submit the 5 copies of the Draft Evaluation Report to JICA Malaysia Office. The comments on the report will be given by JICA, VRI and the authorities concerned, and will be sent back to the Consultants for the revision of the report.

(3) Evaluation Report

The Consultants shall submit the Evaluation Report to JICA Malaysia Office by 19 February 2008.

- 5 copies in printed format
- 2 copies in CD-ROM (PDF format)

It should be concise and be no longer than 15 pages in A4 size form. The evaluation results and conclusions should be supported by the data gathered through the interviews and questionnaires and/or the additional information and data. The graphic presentation of data is recommended wherever applicable. The report should include the following issues;

- Scope of evaluation study
- Project overview
- Evaluation methods used
- Results of evaluation

- Conclusions
- Recommendations
- Lessons learned
- Annex (Logical Framework, Evaluation Grid and supporting data)

(4) Evaluation Summary Sheet

The Consultants shall submit the Evaluation Summary Sheet to JICA Malaysia Office by 19 February 2008. It should be prepared in accordance with the format which will be provided by JICA.

Annex 2: Evaluation Grid

	Evaluation Questions		Achievement Criteria/Measures	Data Needed	Data Sources	Data Collection Method
	Main Questions	Sub-Questions				
IMPACT	How far has the Overall Goal of the Project been achieved since the final evaluation?	How many Nipah Virus infections were found since the last evaluation?	Compare the number of Nipah Virus infections from the year 2001.	Number of Nipah Virus infections	Statistics	Literature & Document Search Interviews with VRI
	What kind of factors have contributed to positive and negative impacts?	What are the factors that have contributed to positive impacts?	Examine conditions of equipment.	- List of equipment	Counterparts VRI	Literature & Document Search Discussion, interviews with VRI Counterparts / ex-counterpart officers & who were trained in Japan
		What are the factors that have contributed to negative impacts?				
	Besides the Overall Goal of the project, are there unexpected positive/negative impacts observed?	What are the positive unintended effects of the Project? Particularly benefits	Examine institutional and management, personal, technology, environment, economic and policy areas	To be specified	Counterparts VRI	Literature & Document Search Discussion, interviews with VRI Counterparts / ex-counterpart officers & who were trained in Japan
What are the negative unintended effects of the Project? Particularly issues and problems						
Are there any external factors that affected the achievement of the Overall Goal?	Are there changes in government policy that might affect/impact on Project goals?	Description and analysis of discussion	Government policies	VRI	Literature review Interview with VRI	

Evaluation Questions		Achievement Criteria/Measures	Data Needed	Data Sources	Data Collection Method
Main Questions	Sub-Questions				
SUSTAINABILITY					
How has the counterpart agency continued the Project activities and services?	<p>Have you upgraded or expanded your technical skills and knowledge acquired through the project?</p> <p>Is Project facility/equipment still in use?</p> <p>Is Project facility/equipment adequately maintained?</p> <p>Does VRI face any issue in sustaining Project outcomes?</p>	<p>Compare the newly obtained information with the final evaluation; and</p> <p>Determine whether VRI can carry out programme without JICA's support</p>	<p>Utilisation rate of Project skills</p> <p>Utilisation rate of Project equipments</p>	<p>VRI records</p> <p>Counterparts</p>	<p>Literature review</p> <p>Interview with Counterparts</p> <p>Interviews with VRI</p>
Have the Project outcomes been maintained since the termination of JICA's assistance?	<p>How does VRI keep up to date on technology changes in this area?</p> <p>What are the impediments faced by VRI to maintain the project outcomes?</p>	<p>Compare this information with final evaluation</p>	<p>Operating and development budget allocation</p>	<p>VRII records</p> <p>Counterparts</p>	<p>Literature review</p> <p>Interview with Counterparts</p> <p>Interview with VRI</p>
What kinds of the factors contribute to or inhibit the sustainability?	<p>Are there any budgetary constraints?</p>	<p>Describe the significant changes and analyse findings</p>	<p>Budget requests approved and rejected (separately for development and operating)</p>	<p>VRI</p>	<p>Interview with Counterparts</p> <p>Interviews with VRI</p>

	Evaluation Questions		Achievement Criteria/Measures	Data Needed	Data Sources	Data Collection Method
	Main Questions	Sub-Questions				
Specific Questions		Are there any technology transfer or skills issues?			VRI	Interview with Counterparts Interviews with VRI
		Are there any institutional challenges?		Institutional changes	VRI	Interview with VRI
	How recommendations made in the joint final evaluation report on the Follow-up Project dated on August 19, 2004 has been implemented? Pros and cons, if any.	Does VRI perform continuous epidemiological study of Nipah Virus? Did the knowledge and techniques obtained from Nipah Virus study disseminated to the neighbouring countries through publications / seminars / collaborative study?	Describe situation and changes	Utilisation rate of equipment	VRI	Interview with Counterparts Interviews with VRI
	Assessment of economic and financial sustainability of this project taking into consideration the trend of world economy		Describe current status of swine industry		VRI	Interview with VRI

Annex 3A: Management Survey Questionnaire

QUESTIONNAIRE FOR IMPLEMENTING AGENCY (VRI)

Name of Respondent : Mr./Ms/Mrs./Dr. _____

Designation : _____

Address & Contact : _____

Interviewer : _____

Date : _____ 2008

SECTION 1: IMPACT

1.1 How many Nipah Virus infections/outbreaks were found since the last evaluation?

1.2 What are the factors that have contributed to positive impacts?

1.3 What are the factors that have contributed to negative impacts?

1.4 What are the unintended consequences of the Project?

Issues	Unanticipated impacts (positive or negative)
Technological innovation	
Social Aspects	
Economic/Financial benefits	
Institutional management	
Others	

1.5 Has there been any change in government policy that has affected/impacted VRI's technical capability in diagnostic technology and epidemiological research on the Nipah Virus?

Yes No

If Yes, describe the changes: _____

SECTION 2: SUSTAINABILITY

5.1 Has VRI's capability in diagnostic technology and epidemiological research for Nipah Virus obtained through the project been upgraded/ expanded?

	Yes	No	Explain
Antigen detection methods	<input type="checkbox"/>	<input type="checkbox"/>	_____
Antibody detection methods	<input type="checkbox"/>	<input type="checkbox"/>	_____

5.2 Are Project facilities and equipments provided still in use and adequately maintained?

	Still in use?		Adequately maintained?		If not adequately maintained, why?
	Yes	No	Yes	No	
PCR Thermal Circular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Refrigerated micro centrifuge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Laminar air flow cabinet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Freezer (-30c)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Immunofluorescent microscope	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Transilluminator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Pipetman	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Easypet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Minicell PRIMO Submarine Gel Electrophoresis System + power pack	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
DNA Vacuum Dryer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
ELISA reader + washer + hardware + software for data analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Inverted microscope	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Shaking incubator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Digital camera	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Bio Photometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Hot Staler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Rocking Platform	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Personal computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

5.3 How does VRI keep up to date on technology changes in this area?

5.4 What are the impediments faced by VRI to maintain the Project outcomes?

Areas	Impediments
Staff	
Facility/Equipment	
Financing	
Others	

5.5 Are there any additional facility/equipment procured since project final evaluation?

	Additional asset value of Equipment/Facility (RM)	Additional annual operating and maintenance expenditure (RM)	Additional Staff
2004			
2005			
2006			
2007			

5.6 Are there any other donors/agencies involved in this Nipah Virus project since Project completion?

[] Yes [] No

If Yes, indicate the name of the donor/agencies, areas of cooperation, period of involvement and finance allocations.

Name of Donors/Agencies	Areas of Cooperation	Period of Involvement	Financial Allocation

5.7 Has the above mentioned co-operation projects and services contributed to VRI financial status?

[] Yes [] No

Reason: _____

5.8 Are there any issues with regards to the following areas that inhibit the sustainability of Project outcomes?

	Yes	No	Reasons
Budget constraint	[]	[]	_____
Technology transfer	[]	[]	_____
Skills requirement	[]	[]	_____
Institutional Challenges	[]	[]	_____
Others	[]	[]	_____

5.9 Are there any non-economic services that need to be maintained as a result of commitment made in the Project?

[] Yes [] No

Reason: _____

SECTION 3: SPECIFIC QUESTIONS

3.1 Have the recommendations made in the Joint Final Evaluation report been implemented?

	Yes	No	Explain
a. Accomplish the remaining task and prepared the termination of the project?	[]	[]	
b. Continue epidemiological study of Nipah Virus and its infection in wild animals?	[]	[]	
c. Increase public awareness on the risk of Nipah Virus infection to the neighbouring countries through publications and seminars?	[]	[]	
d. Exchange information, research materials and visiting researchers through a collaborative study on Nipah Virus/emerging diseases with Japanese and other institutions in the region?	[]	[]	
e. Clarified the issue of intellectual property of the products resulting from the research activities during the initial stage of project formulation?	[]	[]	

3.2 Basic information about VRI staff trained under JICA Project.

	No. Staff trained by Project	No. staff remaining 2008	No. staff no longer in service
	6		

Note: No. of Staff trained can overlap across different Project activities (except total)

Annex 3B: Counterpart Survey Questionnaire

SURVEY OF COUNTERPARTS

Information about yourself and your institution (attach name card if any)

Name : Mr./Ms/Mrs./Dr. _____
Current Designation : _____

SECTION 1: IMPACT

1.1 To what extent did the Project raise the overall level of VRI's capability in Nipah Virus diagnosis?

No comment	Low					High
[]	1	2	3	4		5

1.2 To what extent has the Project succeeded in enhancing your technological capability in providing such services?

	Not relevant	Low				High
Antigen detection methods	[]	1	2	3	4	5
Antibody detection methods	[]	1	2	3	4	5

Please elaborate: _____

1.3 What in your view was particularly distinctive about the JICA Project and the training that you received?

1.4 How would you compare the JICA project training with other training that you had undertaken in VRI? [better/same/worse]

Explain: _____

1.5 In your view, were there any areas that would have enhanced the impact of the Project even more than it has?

Explain: _____

1.6 How many projects are you working on? And how many of these would use skills acquired during the JICA Project?

Total no of projects you're working on No. of projects using Project skills

Total value of projects

Value of projects using Project skills

RM _____

RM _____

1.7 Your best estimate of how much time you spend using Project equipment or skills acquired as a proportion of your total working hours? (say average for second half of 2007)

_____ % of time

1.8 Have you trained other VRI staff using skills that were acquired during the Project?

[] Yes [] No

Explain: (if yes, provide details, best estimate for training between 2005 and 2007)

Total No. of training sessions:

Total No. of VRI staff trained:

1.9 Any unintended benefit from the Project for you? (e.g. training accepted as waiver for a professional qualification, career improvement, awards, etc.)

1.10 Any unintended problems and issues of the Project that arose for you? (e.g. missed promotion, career stagnated, etc.)

SECTION 2: SUSTAINABILITY

- 2.1 Have you upgraded or expanded your technical skills and knowledge which you have acquired through the Project, through formal training since 2004?
 Yes No

If Yes, provide details, e.g. type of course attended, place and year, duration.

- 2.2 Do these types of skill learning situations exist at VRI? Most prevalent.

- knowledge sharing between colleagues
 on-the-job training
 learning from clients or subcontractors
 collaboration across disciplines

Others: _____

- 2.3 Do you face any issues/problems in sustaining the technology and skills learned in the Project?
 Yes No

If Yes, describe the issues: _____

- 2.4 Do you think that the technology transfer and skills acquired by you through the Project meets current needs and demand?
 Yes No

Explain: _____

- 2.5 Has your work been interrupted or stopped because Project facilities and equipment were not adequately maintained or repairs were lacking?
 Yes No

Explain: (specify particular services, period of time, reason, impact on clients)

2.6 Are the Project facilities and equipments fully utilised?
 Yes No

Explain: _____

2.7 In your view, is VRI investing sufficiently in skill development in your area of expertise?
 Yes No

Explain: _____

2.8 Have you utilised the reports produced by JICA's experts or other literature reference provided by JICA after the project completion?
 Yes No

Reason(s): _____

Annex 4: Equipment Checklist

Updated at as 4 February 2008

	Quantity	Still in use	Not used	Require repair	Spoilt and Disposed	Remark
Ultracentrifuge and accessories	1	✓				
PCR cabinet	3	✓				
Biohazard class II cabinet	1	✓				
Carbon dioxide incubator	2	✓			✓	One still in used and the other one was disposed because too expensive to repair
Nitrogen freezer tanks and accessories	2	✓				
Refrigerated centrifuge	1			✓		
Autoclave	1	✓				
High speed centrifuge	1	✓				
Deep freezer (-80c)	1	✓		✓		Still in used but the lowest temperature is at -50c (require repair)
Fax machine	1					Not sure
Printer	1	✓				
Personal computer	1	✓				
Generator	2	✓				
PCR Thermal Circular	1	✓				
Refrigerated micro centrifuge	1	✓				
Laminar air flow cabinet	1	✓				
Freezer (-30c)	1	✓				
Immunofluorecent microscope	1	✓				
Transilluminator	1	✓				
Pipetman						Not sure (disposable item)
Easypet						Not sure (disposable item)
Minicell PRIMO Submarine Gel Electrophoresis System + power pack	1	✓				
DNA Vacuum Dryer	1	✓				
ELISA reader + washer + hardware + software for date	1			✓		

	Quantity	Still in use	Not used	Require repair	Spoilt and Disposed	Remark
analysis						
Inverted microscope	1	✓				
Shaking incubator	1	✓				
Digital camera	1	✓				
Bio Photometer	1				✓	
Hot Staler	1			✓		
Rocking Platform	1		✓			
Personal computer	1	✓				

Annex 5: Interview Reports

MEETING NOTES

Time : 2.30 pm to 4 pm

Venue : Veterinary Research Institute (VRI)
59, Jalan Sultan Azlan Shah, 31400 Ipoh
Tel: 605-5457166 / Fax: 605-5463368
Website: www.jphvri.gov.my

Participants : Dr. Ramlan (Director, VRI)
Dr Sharifah (former director, VRI; counterpart)
Mr. Mohd Ali Abdul Rahman (counterpart)
Mr Kawazoe (JICA)
Ms. Chong Siew Kook (Researcher, PE Research)

Discussion brief

Dr Ramlan, the Director of VRI chaired the meeting and welcomed the Ex-Post Evaluation Study. Mr Kawazoe started the meeting by giving a brief overview on the project's terms of reference, i.e., the Ex-Post Evaluation Study and highlighted the reasons for the study.

A management interview was conducted during the meeting. Dr Sharifah, Dr Ramlan and Mr Mohd Ali have provided useful feedback.

Since the project completion, Dr Ramlan pointed out that some of the counterpart officers have been left VRI. However, he assisted the Evaluation Team to distribute the questionnaire to the relevant counterparts.

It was highlighted that the assessment would also look into whether the recommendations made in the joint final evaluation report on the Follow-up Project have been implemented.

At the end of the meeting, Mr Mohd Ali gave the Evaluation team a short tour to observe and picturing the equipment in use.

Table A2: Current Status of Malaysian Ex-Counterparts trained in this project

No.	Name	Current Status
1	Dr. Sharifah Syed Hassan	Retired (now work at Monash University, Sunway campus)
2	Dr Sohayati Adbudl	Veterinary Officer, VRI
3	Mrs Suriani Mohd Noor	Research Officer, VRI
4	Mr Mohd Ali Abdul Rahman	Lab technician, VRI
5	Mr Jamal Abd. Nasir bin Mohd Hassan	Transferred (now work at Pusat Pembiakan Unggas (PPU) Bukit Tengah)
6	Mr Shahiruddin bin Shamsuddin	Retired

Annex 6: Persons Surveyed/Interviewed

Counterparts at VRI

Organisation	Name/Position	Contact
Veterinary Research Institute 59, Jalan Sultan Azlan Shah, 31400 Ipoh Perak, Malaysia	Dr Sohayati Abdul Rahman (Veterinary Officer)	Tel.:05-5457166 Fax.:05-5463368
	Mrs Suriani Binti Mohd Noor (Research Officer)	Tel.:05-5457166 Fax.:05-5463368
	Mr Mohd Ali Abdul Rahman (lab technician)	Tel.:05-5457166 Fax.:05-5463368

Ex-Counterparts

Organisation	Name/Position	Contact
Monash University, Sunway Campus	Dr Sharifah Syed Hassan (Associate Professor)	Tel.:019-5588991 Email: sharifahmy@yahoo.com
Bukit Tengah	Mr Jamal Abd. Nasir bin Mohd. Hassan (Research officer, Immunology lab)	

Annex 7: Survey Findings- Counterpart Survey

Table 1 What in your view was particularly distinctive about JICA Project and the training that you received?

	Percent	n
Dedicated Japanese Experts, advance technology and facility	40.0	2
Learned from the advanced country, Japanese culture	20.0	1
No difference	40.0	2
Total	100.0	8

Source: Counterpart Survey

Table 2: How would you compare the JICA training with other training that you had undertaken in VRI?

	Percent	n
Better	60.0	3
Same	40.0	2
Total	100	41

Source: Counterpart Survey

In your view, were there any areas that would have enhanced the impact of the project even more than it has?

- On the Malaysian side, more counterparts who should give 100% commitment in working with the experts
- To transfer the technology effectively

Table 3: How many projects are you working on?

No. of Project	Percent	n
1	40.0	2
2	20.0	1
3	40.0	2
	100.0	5

Source: Counterpart Survey .

Table 4: Give your best estimate of how much time you spend using Project equipment or skills acquired as a proportion of your total working hours?

% of Times	Percent	n
1 to 10%	20.0	1
10 to 50%	40.0	2
More than 50%	40.0	2
Total		5

Source: Counterpart Survey.

Table 5: Skill Learning Methods?

skill learning method	Percent	n
Knowledge sharing between colleagues	60.0	3
On-the-job training	80.0	4
Learning from clients or subcontractors	40.0	2
Collaboration across disciplines	100.0	5

Source: Counterpart Survey.

Note: Multiple choice answers

Table 6: Have you upgraded or expanded your skills and knowledge which you have acquired through the Project, through formal training since Project completion?

	Percent	n
Yes	60.0	3
No	40.0	2
Total	100.0	5

Source: Counterpart Survey

Table 7: Has your work been interrupted or stopped because Project facilities and equipment were not adequately maintained or repairs were lacking?

	Total	
	Percent	n
Yes	20.0	1*
No	80.0	4
Total	100.0	5

Source: Counterpart Survey

Note: * One counterpart reported the work has been interrupted or stopped due to lack of a BSL-3/4 animal experimentation facility for ¾ bio-hazardous micro-organisms.

Table 8: Are the Project facilities and equipments relevant to your area of expertise fully utilised?

	Percent	n
Yes	80.0	4
No	20.0	1*
Total	100.0	41

Source: Counterpart Survey Q4.3

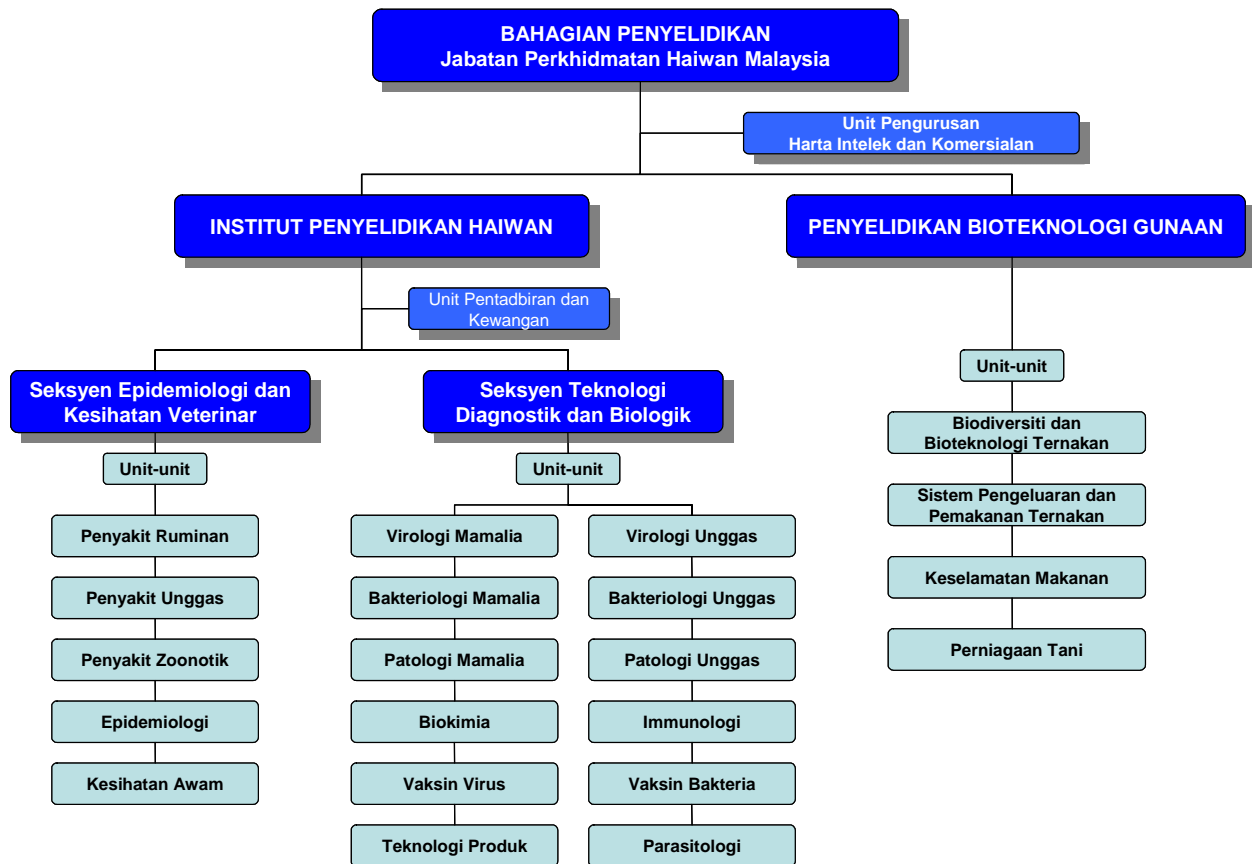
Note: * One reported some of the equipments bought during the project were supplied by the company with poor after-sales service, it was difficult to repair and getting replacement spare part.

Table 9: In your view, is VRI investing sufficiently in skill development in you area of expertise?

	Percent	n
Yes	75.0	3
No	25.0	1
Total	100.0	41

Source: Counterpart Survey (one missing value)

Annex 8: Organisation Chart of VRI



Source: VRI, 2008

Annex 9: VRI's Development Budget 2003-2007

Butiran & Tajuk	Peruntukan Asal	Tambahan / Kurangan Peruntukan	Jumlah Peruntukan Dipinda	Jumlah Perbelanjaan Sebenar	Jumlah Tanggungan	Baki Selepas Perbelanjaan Sebenar & Tanggungan	
						f=c-(d+e)	g=f/c %
a	b	c=a+b	d	e			
Jan-Dec 2003							
Pembelian Peralatan bahan Ujian utk Survilan Penyakit Nipah							
10820403							
20000	22,141.00		22,141.00	22,141.00	0.00	0.00	
30000	49,859.00		49,859.00	49,230.00	0.00		
Jumlah	72,000.00		72,000.00	71,371.00	0.00	629.00	0.87
Perolehan Fermentor							
10910002							
20000	4,331.55		4,331.55	4,331.55	0.00	0.00	
30000	1,073,668.45		1,073,668.45	1,073,667.99	0.00	0.46	
Jumlah	1,078,000.00		1,078,000.00	1,077,999.54	0.00	0.46	0.00
Pem. Teknologi Diagnostik &Pengkukuhan Penyelidikan Pem.							
10920003							
20000	166,123.46		166,123.46	166,123.46	0.00	0.70	
30000	549,876.54		549,876.54	549,804.00	0.00	72.54	
Jumlah	716,000.00		716,000.00	715,927.46	0.00	73.24	0.01

Butiran & Tajuk	Peruntukan Asal a	Tambahhan / Kurangan Peruntukan b	Jumlah Peruntukan Dipinda c=a+b	Jumlah Perbelanjaan Sebenar d	Jumlah Tanggungan e	Baki Selepas Perbelanjaan Sebenar & Tanggungan	
						f=c-(d+e)	g=f/c %
Jan-Dec 2004							
Kawalan dan Pembasmian Penyakit Unggas Spesifik							
10830404							
20000	20,000.00		20,000.00	19,996.20	0.00	3.80	
30000							
Jumlah	20,000.00		20,000.00	19,996.20	0.00	3.80	0.02
Menaik Taraf Kemudahan Penyelidikan							
10910002							
20000	18,912.80		18,912.80	18,912.80	0.00	0.00	
30000	1,181,087.20		1,181,087.20	1,180,415.06	0.00	672.14	
Jumlah	1,200,000.00		1,200,000.00	1,199,327.86	0.00	672.14	0.06
Pembangunan Teknologi Diagnostik							
10920003							
20000	369,062.00		369,062.00	368,907.80	0.00	154.20	
30000	485,928.00		485,928.00	485,938.00	0.00	0.00	
Jumlah	855,000.00		855,000.00	854,845.80	0.00	154.20	0.02

Butiran & Tajuk	Peruntukan Asal	Tambahhan / Kurangan Peruntukan	Jumlah Peruntukan Dipinda	Jumlah Perbelanjaan Sebenar	Jumlah Tanggungan	Baki Selepas Perbelanjaan Sebenar & Tanggungan	
						f=c-(d+e)	g=f/c %
Jan-Dec, 2005							
Pembangunan Makmal-makmal Veterinar Kawasan							
10820403							
20000	898,262.00		898,262.00	833,386.40	39,330.00	25,545.60	
30000	342,738.00		342,738.00	309,678.65	20,611.00	12,448.35	
Jumlah	1,241,000.00		1,241,000.00	1,143,065.05	59,941.00	37,993.95	3.06
Pembangunan Infrastruktur & Kemudahan Penyelidikan							
10910002							
20000	244,602.00		244,602.00	202,615.80	18,483.10	23,503.10	
30000	1,166,468.00		1,166,468.00	1,166,467.62	0.00	0.38	
Jumlah	1,411,070.00		1,411,070.00	1,369,083.42	18,483.10	23,503.48	1.67
Pengukuhan Penyelidikan dan Pembangunan R & D							
10920003							
20000	183,090.00		183,090.00	175,733.55	3,873.00	3,483.45	
30000	80,000.00		80,000.00	72,485.00	0.00	7,515.00	
Jumlah	263,090.00		263,090.00	248,218.55	3,873.00	10,998.45	4.18

Butiran & Tajuk	Peruntukan Asal	Tambahhan / Kurangan Peruntukan	Jumlah Peruntukan Dipinda	Jumlah Perbelanjaan Sebenar	Jumlah Tanggungan	Baki Selepas Perbelanjaan Sebenar & Tanggungan	
						f=c-(d+e)	g=f/c %
	a	b	c=a+b	d	e		

Jan-Dec, 2006							
Pembangunan Makmal-makmal Veterinar Kawasan							
10820403							
20000	100,000.00	19,000.00	119,000.00	118,828.00	500.00	-328.00	
30000	70,000.00	11,000.00	81,000.00	80,459.00	0.00	541.00	
Jumlah	170,000.00	30,000.00	200,000.00	199,287.00	1,064.00	213.00	0.11
Pembangunan Infrastruktur & Kemudahan Penyelidikan							
10910002							
20000	605,000.00	-550,661.00	54,339.00	54,338.20	0.00	0.80	
30000	1,395,000.00	1,750,661.00	3,145,661.00	3,094,932.70	49,800.00	928.30	
Jumlah	2,000,000.00	1,200,000.00	3,200,000.00	3,149,270.90	49,800.00	929.10	0.03
Pengukuhan Penyelidikan dan Pembangunan R & D							
10920003							
20000	305,000.00	941,477.00	1,246,477.00	1,173,160.16	66,283.72	7,033.12	
30000	695,000.00	3,358,523.00	4,053,523.00	4,044,630.70	4,695.10	4,197.20	
Jumlah	1,000,000.00	4,300,000.00	5,300,000.00	5,217,790.86	70,978.82	11,230.32	0.21

Butiran & Tajuk	Peruntukan Asal	Tambahhan / Kurangan Peruntukan	Jumlah Peruntukan Dipinda	Jumlah Perbelanjaan Sebenar	Jumlah Tanggungan	Baki Selepas Perbelanjaan Sebenar & Tanggungan		
						f=c-(d+e)	g=f/c %	
a	b	c=a+b	d	e	f=c-(d+e)	g=f/c %		
Jan-Dec, 2007								
Pembangunan Makmal-makmal Veterinar Kawasan								
10820403								
20000	100,000.00	208,000.00	380,000.00	335,954.00	32,051.20	11,994.80		
30000								
Jumlah	100,000.00	208,000.00	380,000.00	335,954.00	1,064.00	11,994.80		3.16
Pembangunan Infrastruktur & Kemudahan Penyelidikan								
10910002								
20000	155,000.00		119,650.00	106,786.50	2,290.00	10,573.50		
30000	2,643,600.00		2,578,950.00	2,584,003.45	0.00	-5,053.45		
Jumlah	2,798,600.00		2,698,600.00	2,690,789.95	7,810.05	5,520.05		0.20
Pengukuhan Penyelidikan dan Pembangunan R & D								
10920003								
20000	800,000.00		954,430.00	912,969.40	40,281.60	1,179.10		
30000	3,900,000.00		2,545,570.00	2,487,251.64	58,288.68	29.68		
Jumlah	4,700,000.00		3,500,000.00	3,400,221.04	98,570.18	1,208.78		0.03