

MID-TERM EVALUATION REPORT
ON
THE PROJECT FOR IMPROVEMENT OF
CATTLE ARTIFICIAL INSEMINATION TECHNOLOGY
IN VIETNAM

HANOI, MARCH 13th, 2003

JAPAN – VIETNAM

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Table of Contents

I . OUTLINE OF THE PROJECT

1. Background of the Project
2. Contents of the Project

II . OBJECTIVES OF THE EVALUATION

III. EVALUATION METHODS

IV. MEMBERS AND SCHEDULE OF THE JOINT EVALUATION TEAM

1. Japanese Evaluation Team
2. Vietnamese Evaluation Team
3. Schedule of the Evaluation

V. RESULTS OF THE EVALUATION

1. Relevance
2. Effectiveness
3. Efficiency
4. Impact
5. Sustainability

VI. CONCLUSIONS

VII. RECOMMENDATIONS



ANNEX

- (1) Results of Activities and Evaluation
- (2) Dispatch of Japanese Experts
- (3) Assignment of Counterparts
- (4) Equipment Inputs by Japanese Side
- (5) Budget Inputs by Japanese Side
- (6) Budget Inputs by Vietnamese Side

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ABBREVIATION

AI	Artificial Insemination
JICA	Japan International Cooperation Agency
MAIC	Moncada Artificial Insemination Center
MARD	Ministry of Agricultural and Rural Development
MPI	Ministry of Planning and Investment
NIAH	National Institute of Animal Husbandry
VDM	Vietnam Dairy Management
VINALICA	Vietnam National Livestock Company of Artificial Insemination Technology

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I . OUTLINE OF THE PROJECT

1. Background of the Project

The GNP of livestock industry had shown an average annual increase of 4.4% for the last ten years, and the growth rate was especially high at the second half of the 1990s. Livestock industry was thus considered to be an important industry in Vietnam.

According to the positive economic growth in Vietnam, the consumption of livestock products has been extremely increasing among Vietnamese nationals. As a result, the self-sufficiency ratio of milk products was lower than 10%. The increases of livestock production and their stable supply were urgent needs for the government, especially in dairy promotion.

Meanwhile, production and distribution of high-quality frozen semen had been the most important issue for improving productivity of cattle in Vietnam. Furthermore, AI technicians do not have sufficient knowledge and techniques, especially for the straw-typed frozen semen. Due to such background, the Vietnamese government requested technical cooperation for improving livestock artificial insemination related techniques, including shifting from pellet method to straw method in MAIC.

In response to the above request, JICA implemented several missions and developed a draft project plan focusing on improvement of straw-typed frozen semen production techniques, artificial insemination techniques as well as an AI recording network. The Project Design Team dispatched and signed the Record of Discussions(R/D) on the "Project for Improvement of Cattle Artificial Insemination Technology" (hereinafter referred to as "the Project") on March 15th, 2000, and a five-year cooperation started on October 2nd, 2000. In addition, the Project Consultation Team was dispatched in July 2001, and formulated the Project Design Matrix (PDM) and Plan of Operation (PO) in accordance with the R/D.

Since the mid-term of the project will soon have passed, the Mid-term Evaluation Team has been dispatched to evaluate the progress of the Project and hold consultation on the activities in the second half of the project period.

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2. Contents of the Project

The Project design is stipulated as follows:

(1) Overall Goal

The productivity of milk and beef will be increased by improving cattle artificial insemination techniques.

(2) Project Purpose

Artificial insemination techniques for cattle will be improved through the use of straw semen.

(3) Outputs of the Project

- 1) AI technicians are trained and their skills are improved.
- 2) Handling and quality control skills are improved in the frozen semen distribution network.
- 3) Production technique of straw-typed frozen semen is improved.
- 4) Feeding and management of sires are improved.

(4) Activities of the Project

- 1) Transfer of appropriate technical skills in artificial insemination.
 - a) Conduct surveys when necessity arises.
 - b) Produce the recording, collection and evaluation method of AI information in focused areas.
 - c) Counterparts acquire AI related techniques which is adaptable to field.
 - d) Retrain AI technicians for straw-typed frozen semen and recording.
 - e) Promote and strengthen the advantage of using AI.
- 2) Transfer of appropriate handling and quality control skills for the frozen semen distribution network.
 - a) Conduct surveys when necessity arises.
 - b) Train or consult about the handling method of straw-typed frozen semen.
- 3) Transfer of efficient techniques for production of straw-typed frozen semen.
 - a) Conduct surveys when necessity arises.
 - b) Improve general conditions of frozen semen processing facilities.

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- c) Provide training on semen processing method.
- d) Introduce a semen evaluation system based on insemination records.
- 4) Transfer of appropriate management techniques in feeding of sires.
 - a) Conduct surveys when necessity arises.
 - b) Renovate the existing facilities for large bulls.
 - c) Improve the quality of water.
 - d) Feed good quality feeds.
 - e) Improve individual bull management.
 - f) Improve the animal health program.

II . OBJECTIVES OF THE EVALUATION

Evaluation study was conducted with the purpose of:

- (1) Evaluating the level of achievement, overall effects and strategies based on R/D, PO, and PDM,
- (2) Evaluating the Project in terms of five criteria below, and
- (3) Reviewing the Project design and strategy through the joint study and meeting with experts and their counterparts for the improvement of the Project implementation.

III. EVALUATION METHODS

Evaluation activities were conducted by the Joint Evaluation Committee, which was composed of the Japanese Evaluation Team and the Vietnamese Evaluation Team in accordance with the R/D, PO, and the PDM. These activities included report analysis, field survey, and discussions with counterparts.

(1) Relevance

Relevance refers to the validity of the Project purpose and the overall goal in

connection with the development policy of the Vietnamese Government as well as the needs of beneficiaries.

(2) Effectiveness

Effectiveness refers to the extent to which the expected benefits of the Project have been achieved as planned, and examines if the benefit was brought about as a result of the Project (not as that of external factors).

(3) Efficiency

Efficiency refers to the productivity of the implementation process, and examines if the input of the Project was efficiently converted into the output.

(4) Impact

Impact refers to direct and indirect, positive and negative impact caused by implementing the Project, including the extent to which the overall goal has been attained.

(5) Sustainability

Sustainability refers to the extent to which the recipient country can further develop the Project, and the benefits generated by the Project can be sustained under the recipient country's policies, technologies, systems and financial state.

IV. MEMBERS AND THE SCHEDULE OF THE JOINT EVALUATION TEAM

1. Japanese Side

(1) Mr. Hidetaka FUNO: Leader

Deputy Director, Livestock and Horticulture Division,
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Japan International Cooperation Agency

(2) Mr. Kazuhiro KUDO: Techniques of Frozen Semen Production / Feeding Management

Investigation Chief, Breeding Stock Division
National Livestock Breeding Center Niikappu Station

(3) Mr. Shinichi YAMADA: Artificial Insemination Techniques

Investigation and Test Chief, Beef Cattle Improvement Division
National Livestock Breeding Center Tokachi Station

(4) Ms. Yoko KINASHI: Program Evaluation

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Staff, Livestock and Horticulture Division,
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Japan International Cooperation Agency

(5) Ms. Izumi TAKAHASHI

Interpreter

Japan International Cooperation Center

2. Vietnamese Side

(1) Dr. Hoang Kim Giao: Leader

Deputy Director, in charge of Large Livestock management

Department of Agricultural and Forestry Extension

Ministry of Agriculture and Rural Development

(2) Dr. Nguyen Xuan Trach: Cattle Production

Vice Dean

Faculty of Animal Science and Vet. Medicine,

Hanoi Agricultural University

(3) Dr. Nguyen Tan Anh: Artificial Insemination Techniques

Assoc. Prof.

Member of Animal Husbandry Association of Vietnam

(4) Dr. Nguyen Van Cat: Program Evaluation

Senior Officer

Agriculture and Rural Development Department,

Ministry of Planning and Investment

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3. Schedule of the Evaluation

Date & Time	Activities	Japanese Eva. Team	Vietnamese Eva. Team
March 4 (Tue)	Discussion with MPI Discussion on Evaluation with JICA Vietnam Office Discussion with Embassy of Japan Discussion on evaluation with NIAH	○	
5 (Wed) AM PM	1 st Joint evaluation committee meeting (Discussion of the method of evaluation with the Vietnamese team) Survey on NIAH	○	○
6(Thu) AM PM	Field Survey (MAIC) Observation and discussion on the Project Cattle Research Center, NIAH (BAVI) Visiting AI inseminator and farmers in Ha-Tay	○	○
7(Fri)	Report and discussion of the project activities with counterparts of NIAH and MAIC Report of the Project activities	○	○
8(Sat)	Team discussion and meetings	○	
9(Sun)	Preparation of draft evaluation report	○	
10(Mon) AM PM	Field survey (Tu-Son Center) Observation of Tu-Son Center and discussion on AI management system Visiting Bac Ninh Extension Center, AI inseminator and farmers	○	○
11(Tue) AM PM	Discussion about project activities with project members Individual interview with counterparts (9 C/P))	○	○
12(Wed)	2 nd Joint evaluation committee meeting	○	○
13(Thu) AM PM	3 rd Joint evaluation committee meeting (Sign the evaluation report) Discussion on Minutes	○	○
14(Fri)	Joint Coordinating committee meeting	○	○

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V. RESULTS OF THE EVALUATION

The Project and its activities were evaluated in terms of the five criteria: (1) relevance, (2) effectiveness, (3) efficiency, (4) impact, and (5) sustainability, based on the evaluation studies on the achievements of the Project.

1. Relevance

The Vietnamese government continues to implement policies and measures to develop dairy and beef sectors. The Vietnamese government issued the Decision No.167/2001/QD-TTg dated October 26th, 2001 to promote Dairy production including the National Dairy Project up to 2010. It is planned to increase sharply the local milk production up to 40% of the whole domestic demand by 2010 from 10% at present. Under this policy, dairy farmers are exempted from the land use tax if the land is used for grass cultivation. Dairy farmers are also provided with free artificial insemination services, except labor cost.

In order to improve productivity of cattle adapted to Vietnam's climate conditions, the first priority measure is artificial insemination by straw-typed semen. MAIC is planned to upgrade to be the national artificial insemination center to introduce straw-typed semen production technology.

Moreover, the focused areas of the Project are expected to be the models for the National Dairy Project, especially in the AI recording network. AI training methods and materials have been applied to other AI training courses conducted by the National Dairy Project and the Extension Department of MARD.

The Project is also relevant to the needs of the beneficiaries. According to positive economic growth of the country, milk consumption per capita has been increasing from 3.7kg in 1995 to nearly 6kg in 2000. And, the development of the dairy industry is expected to contribute to improve economic efficiency for small-scale farmers, which are raising more than 90% of dairy cattle.

Japan places a high priority in its cooperation in the field of rural development in Vietnam. Japan also has many achievements in the fields of artificial insemination technology and livestock improvement technology in the past technical cooperation.

Therefore, it can be said that the goal of the Project is highly relevant to the policy of Vietnamese government, Japan's expertise, as well as the needs of its beneficiaries.

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2. Effectiveness

2-1. Effectiveness in Terms of Project Purpose

All the activities were conducted satisfactorily and led to improved artificial insemination techniques for cattle through the use of straw-typed frozen semen. It is expected that the Project Purpose will be achieved as anticipated, through the achievements of Project's activities.

2-2. Major Achievements of Project Activities

The major achievements of the Project activities as of March 2003 are summarized below and their detailed explanations are in ANNEX 1.

2-2-1. Artificial Insemination

(1) Surveys in focused areas

A total of 9 focused areas were selected, and surveys on AI conditions were conducted through AI technicians in the focused areas. As a result, it was founded that the AI recording system wasn't unified and also that AI technicians hadn't recorded AI information. It seems to be difficult to grasp accurate reproductive records such as conception rate. In order to evaluate effectiveness of the Project, it is necessary to continue to have an accurate grasp of reproduction conditions in the focused areas.

(2) Establishment of the AI recording network

10 local offices in the 9 focused areas agreed to join the unified AI recording network. 1000 AI recording books and 3000 farmer's folders were produced and delivered to AI technicians and farmers. ID was also given to each cattle as ear tags. The Vietnamese side has developed software "VDM-AI" for data collection by AI technicians in provinces and their local offices.

AI recording is just starting at some places in the focused areas. AI data are collected through the local offices, and then NIAH and MAIC evaluate and utilize AI data for evaluation on AI activity and semen quality.

The focused areas are expected to be the models for the National Dairy Project. The National Dairy Project has decided to use the same recording system, and all local offices in the focused areas have agreed to join the AI recording network. The National Dairy Project has printed the same AI recording books of the Project for 28 provinces.

(3) Retraining of AI technicians

Five training courses have been conducted so far. A total of 124 AI technicians, who will become leading inseminators in each area of the

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focused areas, were retrained concerning handling of straw-typed frozen semen, AI recording and reproductive management. Most of the retrained AI technicians have continued artificial insemination.

In these training courses, lists with picture of participants were useful not only for good communication between instructors and trainees but also formulating a network among trainees after the training. The retrained AI technicians were provided AI equipment like liquid nitrogen tanks and AI guns.

The retrained AI technicians are necessary to be monitored about their results of AI. And training manuals adapted to Vietnamese actual condition are suggested to be made for retraining of AI technicians.

(4) Acquisition of AI related techniques of counterparts

The Vietnamese counterparts have acquired AI related techniques including reproductive disorders through Japanese experts and training in Japan. And acquisition of analysis of ovarian hormone assay helps to grasp reproductive conditions of cows, such as ovarian function, proper times of AI and early diagnosis of pregnancy. Embryo transfer technology has been also applied in the Project as an AI related technique due to the demand for effective multiplication of dairy cattle. It is expected to improve skills of AI technicians and reproductive performance of cows through the trained counterparts.

(5) Problems of reproductively disordered cows

There are many dairy cows which have reproductive disorders such as repeat breeder and silent heat in the focused areas. According to the survey in Phu Dong, 25% dairy cows had reproductive disorders. The survey has shown the necessity to improve feeding and management through trained AI technicians or technicians of provincial agricultural extension centers.

2-2-2. Handling and Quality Control Skills of Frozen Semen

In the AI technicians' training courses, one of the subjects was to master proper semen handling technique. The staff in Tu-Son Center and local offices forming the AI recording network are also trained on frozen semen handling technique.

The quality of semen distributed in four provinces has been checked and evaluated by the Project. As a result, it was found that sperm motility was improved from less than 20% in 2000 to more than 30% in 2002.

Monitoring semen quality is necessary to be continued in order to keep good

quality and get confidence of dairy farmers in the AI recording network. And collecting and evaluating conception rate from AI data through AI recording network is effective for the quality control of frozen semen in MAIC.

2-2-3. Production Technique of Straw-typed Frozen Semen

Improvement of semen processing facilities and guidance by the Japanese experts made it possible to improve the production technique of straw-typed frozen semen.

Semen collection facilities were renovated. Installation of a roof has enabled to collect semen on rainy days, and a dummy cow made semen collection easier. Treatment stalls and fences were also strengthened for the Holstein bulls.

Frozen semen processing laboratory was renovated to be more clean and sanitary. The rooms and equipment were arranged for efficient work. Equipment was provided for conducting appropriate straw-typed frozen semen processing and managing of proper temperature control.

The following points of processing methods were improved and contributed to reducing the damage of semen while processing.

- 1) It is possible to evaluate sperm motility exactly by using the diluted semen.
- 2) Temperature management can be performed carefully in all process.
- 3) Semen extender, which had been purchased overseas, can be prepared at MAIC by itself.

PDM shows that more than 95% of straw-typed frozen semen should pass the quality examination in the Objectively Verifiable Indicators. Actually, 93% of straw-typed frozen semen has already passed in 2002. The annual production of straw-typed frozen semen has been also increasing steadily (over 100,000 doses in 2002).

In the remaining period of the Project, it is necessary to improve production management to manage data on production and distribution by using computer and to make a manual book for straw-typed frozen semen production.

2-2-4. Feeding and Management of Bulls

(1) Bull management

MAIC introduced 7 young Holstein bulls from USA in 2001. It is necessary to establish a suitable management method for Holstein bulls, which are larger than other kinds of bulls in MAIC (expected maximum weight is over 1 ton). Japanese experts transferred hoof trimming and dehorning

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technique, which contributed to the feeding bulls in a good condition and safe treatment of bulls, respectively.

The water supplying facilities were renovated to improve the low quality of water, which caused bad influence on the health of bulls in the dry season.

It is necessary to renovate Holstein bulls' house for the purpose of installing facilities of reducing heat stress and reforming from hard floor to soft one for protection of bull's leg and feet.

The rate of bulls used for semen processing has been raised from 56% (before the Project) to 65% now by these activities and also by controlling the number of bulls for economical production. However, it is required to improve the health condition and nutrition of bulls for high quality semen production.

(2) Bull Feeding

No feeding standard of Holstein bulls in Vietnam has been established. Feeding management for bulls is performed by the conventional method in MAIC. However, bulls should be managed according to their individual body condition based on the feeding standard. If proper feeding is introduced based on feed analysis, the feeding cost will be also reduced. The Vietnamese counterparts acquired the method of processing hay and silage from Japanese experts. Supplying of high-quality forage will contribute to reducing the cost of feed as well as improving nutrition of bulls. If varieties of grass are introduced, it would be effective to cooperate with JICA's pasture seed development project in Thailand.

3. Efficiency

3-1 Achievement of Inputs

3-1-1 Inputs from Japanese Side

(1) Dispatch of Japanese Experts (See ANNEX 2)

Ideal and timely assignment of long-term experts in 4 fields, viz. Chief Advisor, Project Coordinator, Frozen Semen Processing, Artificial Insemination has facilitated the smooth implementation of the Project, complemented by the dispatch of 10 short-term experts in the above and other fields. If the dispatch of short-term experts is necessary in the same fields, the dispatch of the same short-term experts will be efficient.

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(2) Assignment of counterpart personnel for training in Japan (See ANNEX 3)

A total of 11 Vietnamese counterpart personnel have finished their trainings in Japan. The counterpart trainings in Japan were effectively organized in relation to the progress of the Project activities.

(3) Provision of equipment (See ANNEX 4)

Careful selection of equipment items for the Project were taking the Project's capability into consideration. Except for some of the equipment items, most of the equipments were locally purchased in Vietnam for the reason of efficient and early purchase. The equipment items provided have been properly working and maintained.

(4) Budget Inputs by Japanese Side (See ANNEX 5)

The semen collection area and frozen semen processing facilities in MAIC were almost repaired on the budget of Japan. The fence was strengthened to secure safety and the roof was established newly, and also a dummy cow was installed. Each processing room and equipment for frozen semen processing were arranged and, as a result, frozen semen can be prepared sanitarily.

3-1-2 Inputs from Vietnamese Side

(1) Assignment of the counterpart personnel (See ANNEX 3)

Assignment of counterparts in the Project has been sufficient. It is hoped that appropriate allocation of counterparts for the Project activities will continue for further development of the Project.

(2) Facilities for the Project operation

The Vietnamese side has covered expenses for improvement of the generator room, working room for Japanese experts, laboratories and counterpart's offices. Some of the facilities for frozen semen processing such as the water pipe of the distillation apparatus was repaired in MAIC by the Vietnamese side.

(3) Budget Allocation by Vietnamese side (See ANNEX 6)

The Vietnamese side allocated the budget for the local costs for telephone, electricity and other maintenance costs.

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3-2 Major Factors that Affected Efficiency of the Project Activities

- (1) Carefully selected experts and counterparts have promoted the efficiency of the Project activities. The improved facilities and equipment provided have been utilized effectively. The equipment was partly provided beyond the schedule in 2000 and 2001 fiscal years, and it contributed to smooth and effective implementation of the Project from the beginning of it.
- (2) In August 2001, MAIC was reorganized as one of the centers in VINALICA. It takes more time to decide using of budget than before because of need of getting permission from VINALICA. However, frozen semen produced by MAIC can be distributed efficiently to farmers in all over Vietnam through VINALICA. This reorganization is affecting the both positive and negative efficiency.
- (3) While there existed a harmonious working relationship between Vietnamese counterparts and Japanese experts, efficiency of working outputs were slightly affected because of differences in language.
- (4) Vietnam has a long experience in the field of artificial insemination with tablet-typed frozen semen. That has greatly contributed to the Project's achievements in institutional as well as technical aspects.
- (5) NIAH is cooperating with MAIC in the field of feed analysis and frozen semen inspection.
- (6) The policy of the Vietnamese government on dairy production has had positive influences on the Project implementation efficiency.

4. Impact

The impacts of the Project's activities are difficult to observe, while the Project is on going. However, the following impacts could be observed from the evaluation.

4-1. Policy Impacts

It has been decided by MARD that only straw-typed semen is available for dairy cows. It is considered that the Project affected to this policy.

4-2. Institutional Impacts

- (1) The Vietnamese side has newly established a unit in NIAH. One of the functions of this unit is supporting activities of AI recording network for the

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National Dairy Project as well as the Project.

- (2) Several contracts were prepared among NIAH, the 9 project provinces in the focused areas and AI technicians for establishing AI recording network in collaboration with National Dairy Project.

4-3. Technical Impacts

- (1) It is expected that through the National Dairy Project, the quality frozen semen will be distributed not only in the focused area, but also in other regions of the country.
- (2) AI recording books and farmer holders, which are outputs of the Project, will be used effectively as tools for AI extension in the National Dairy Project.
- (3) It was planned to conduct a breeding program in the National Dairy Project, which makes full use of the AI technique transferred by the Project.

4-4. Environmental Impacts

With the increasing number of heads of animals at dairy households, it is foreseen that the volume of manure will also increase. In this case, necessary countermeasures should be taken for preventing the deterioration of the environmental conditions.

4-5. Social and Economic Impacts

The Vietnamese government has been applying out free distribution of imported frozen semen until 2010. Since straw-typed frozen semen is extended by the Project, it is apprehensive that artificial insemination by using imported straw-typed frozen semen may also increase.

5. Sustainability

The following observation on the Project's sustainability can be made from the evaluation.

5-1. Policy Aspects

The Project's activities will be sustained by the governments as long as the National Dairy Project continues. However, the Project's sustainability would be

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prevented if free distribution of imported frozen semen continues to be applied after 2010.

5-2. Institutional Aspects

- (1) NIAH was established by Decision NO.2-CN-QT-ND dated 9/Feb/1952, for the purposes of livestock breeding promotion. Thus, NIAH will be sustained and strengthened as a permanent organization, with enhanced capability through the Project activities.
- (2) MAIC is the only cattle frozen semen production center in Vietnam for the time being, and is also responsible for training of AI technicians. To make the Project sustainable after the cooperation period, the Vietnamese side should support MAIC to function as a cattle frozen semen producing center and also should promote the distribution of frozen semen by MAIC to make sure that dairy farmers use them.

5-3. Financial Aspects

- (1) In comparison with when the Project started, the inputs from the Vietnamese side have been increasing year by year. In case that the Vietnamese side secures the necessary budget and operating fund to carry out the Project, the Project will be sustained and strengthened even after the end of the cooperation period.
- (2) Many farmers cannot afford to buy a cow if they do not get loan from banks. Expanding the dairy cow population would not be successful if the government does not have an appropriate loan program for the farmers.

5-4. Technical Aspects

- (1) All the Vietnamese counterparts have accepted positively the technologies introduced by Japanese experts. Those transferred technologies are supposed to be utilized and developed in NIAH and MAIC after the end of the cooperation period. The Committee is confident that the Project activities will be sustained as long as the trained counterparts remain in the posts they currently hold.
- (2) The Vietnamese counterparts are now giving training to local AI technicians as trainers. If the AI techniques are certainly and accurately extended to the AI technicians by these counterparts' leadership, the technical aspects will be sustainable.

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VI. CONCLUSIONS

The Project has been implemented for transfer of appropriate techniques in four (4) fields of artificial insemination, production of straw-typed frozen semen, bull management and AI recording network.

Based on the series of discussions with concerned officials and counterparts as well as a field study, the Committee has observed that the Project is now effectively going on and is expected to achieve the outputs in each activity. The Project has greatly contributed to the capacity building of MAIC and NIAH. The Project's purpose still has relevance to the Vietnamese government's policies like Decision No. 167/2001/QD-TTg.

The 9 focused provinces of the Project are expected to be the models for the National Dairy Project by the Vietnamese government. The AI training methods and materials have been applied to other AI training courses conducted by the Vietnamese government. The AI recording network will spread to other provinces as well as the focused provinces in the future.

On the other hand, a lot of imported straw-typed frozen semen is being supplied free of charge to farmers. It is necessary to encourage the wide distribution of frozen semen produced by MAIC to AI technicians and farmers in opposition to the imported frozen semen.

In conclusion, as there are still 2.5 years of the Project cooperation period, the Vietnamese counterparts and JICA experts should continue their best efforts to complete the Project's activities within the term of cooperation in consideration of the following recommendations.

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VII. RECOMMENDATIONS

The following issues and necessary measures are recommended by the Committee to further develop and sustain the Project.

- (1) The Vietnamese side should extend the major outputs of the Project to AI technicians and farmers all over Vietnam as well as the focused area. In this sense, it is necessary to continue and enhance the existing close relationship between the Project and the National Dairy Project, especially to establish the AI recording network.
- (2) Both sides should fully invest during the remaining period to accomplish the remaining tasks. The following necessary measures should be taken immediately for the achievement of the Project Purpose;
 - 1) To accurately complete AI information on pedigree, reproduction and productivity of registered cattle in the AI recording network.
 - 2) To improve the software for the AI recording network.
 - 3) To enrich the curriculum with reproductive disorders and feeding management in AI technician's training so that they can advise farmers accordingly.
 - 4) To improve the facilities for Holstein bulls, which are larger than other bulls in MAIC.
 - 5) To establish a feeding method for bulls according to their individual nutrient requirements.
 - 6) To improve quality of forage crops by introducing legumes for bull feeding in MAIC.
- (3) Even if MAIC can produce high-quality frozen semen, it will be difficult to sustain and further develop the achievement of the Project without distribution of the frozen semen to all over Vietnam. The Vietnamese side should take necessary measures to promote wide distribution of frozen semen produced by MAIC in opposition to imported frozen semen.
- (4) The Project should promote marketing of straw-typed frozen semen produced in MAIC so that farmers can acknowledge the real quality of it in collaboration with VINALICA.

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- (5) For the necessity of monitoring and demonstrating the Project's activities, the Project should choose model dairy farmers in collaboration with provinces of the focused area. These model farmers are expected to share the acquired techniques positively with other farmers.
- (6) In order to make the training activities more effectively, the retrained AI technicians should be selected carefully in consideration of their abilities and jobs as AI technicians.
- (7) For monitoring the progress of the Project's activities more properly, the revision of the Project Design Matrix (PDM) should be discussed in the Project and proposed at the next meeting of the Joint Coordinating Committee.
- (8) In order to coordinate the Project's activities more effectively, it is recommended to have a close communication between the Vietnamese counterparts and JICA experts in the Project. Steering and monitoring meetings, which are useful instruments to identify problems and solutions, should be held regularly.
- (9) The Project should hold international seminars to extend the outputs of the Projects to other Asian countries by the end of the Project in cooperation with JICA.
- (10) Both sides should inform not only the personnel of the organizations concerned but also the general public of this JICA's cooperation.

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1. Result of Activities and Evaluation

ANNEX 1

Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement
Output 1: AI technicians are trained and their skills are improved.	(Indicator on PDM) 1-1. 200 AI technicians in focused areas are retrained. 1-2. Trained AI technicians can record AI information and can report to NIAH/MAIC.				
1-1 Conduct surveys when necessity arise.					
1.1.1 Select the focused areas	Focused areas are decided	9 focused areas were selected	4	completed	
1.1.2 Conduct surveys in focused areas	Situation of focused areas		3		Continue to conduct a survey on focused areas and other parts of country so as to evaluate on the effect of the project activities.
1-2 Produce the recording, collection and evaluation method of AI information in focused area.					
1.2.1 Produce AI recording books	AI recording books	Format of AI recording book was completed and 1000 books were printed.	3	It took some time before having made an usable edition as it was necessary to meet real conditions of the filed now and future.	It needs to continue improving the contents and form of the recording book till achieving one of its best kinds.
1.2.2 Unify the AI recording system in focused area	Unified AI recording system in focused areas	10 Local office in 9 focused areas agreed to join the AI recording network.	3	To achieve making an unified AI recording system, the project tried to use the identical form of AI recording book and farmer's holder. Rather long time was spent due to the extensiveness of the focus areas and difficult conditions of communication with	Based on the activities tried regarding AI recording and reporting in the focused areas, the project will propose a method to be used in the AI recording system nation-wide.
1.2.3 Train local officers about AI recording	Local offices become able to understand AI recording and collection	Held seminars in Ha Tay, Hanoi Livestock Com., Bac Ninh, Vinh Phuc and south.	3	At the beginning of AI refresher courses, there was no AI recording method was prepared, thus the AI technicians participated the courses would not have been well instructed.	As AI recording book and farmer's holder were introduced after some experience and consideration, the project will continue to introduce the method during incoming AI training courses in near future.

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Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement
1.2.4 Put the farmer ID number and cattle ID number	List of registration				
1.2.4.1 Collect farmers information	List of registration	Information of Farmers were collected in all focused areas.	3	There were some confusions in the method of collecting farmer's information from the focused areas.	Farmer's information will be directly collected through the trained AI technicians to be of most efficiency from now on.
1.2.4.2 Put farmer ID number		Put farmer ID in Bac Ninh, Moc Chau, Vinh Phuc and one commune in Ha Tay,	2		Although Some ID numbers have been given to the trained AI technicians and farmers, there is a great need of unifying the ID number system with National Dairy Project.
1.2.4.3 Put cattle ID number		Put cattle ID in one commune in Ha Tay	2		same above
1.2.5 Establish the AI data collecting route	AI data collecting route	Collecting route was confirmed in Bac Ninh, Vinh Phuc and Ha Tay.	2		Further instructions and improvements are necessary regarding AI reporting method and its system.
1.2.6 Make AI data management system in NIAH/MAJC	Data management system				
1.2.6.1 Make AI data management system in NIAH	Data management system	1st modified version of VDM for local offices were made.	3	It took long time to understand VDM program and make it clear the some aspects of the program to be improved.	Through improvement of VDM such as rebuilding with ID numbers to manage AI activities, AI recording system will be established.
1.2.6.2 Make AI data management system in MAJC	Data management system		1	same as above	same as above
1.2.7 Collect insemination records	Collected AI information		1	It took long time to establish AI recording system with local offices and starting of recording was delayed.	Project also should promote AI recording activities to collect data.
1.2.8 Utilize AI recording information	Analyzed data		1	same as above	same as above
1.2.9 Conduct evaluation meeting with local officers	Evaluated AI recording network		1		

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Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement
1-3	Counterparts acquire AI related techniques which is adaptable to fields.				
1.3.1	Introduce reproduction management method	Counterparts acquired applied AI techniques	3		
1.3.1.1	Implement Regular reproduction Check in state dairy farm	Counterparts acquired applied AI techniques	3		
1.3.1.2	Implement regular reproduction examination for small scale dairy farms.		3		
1.3.1.3	C/Ps teach the reproduction examination method to AI	Counterparts acquired applied AI techniques	3		
1.3.2	Introduce semen evaluation techniques	Counterparts acquired applied AI techniques	3	No continuous collaboration activities between NIAH and MAIC.	
1.3.3	Introduce AI related techniques	Counterparts acquired applied AI techniques			
1.3.3.1	Introduce ovarian hormone assay technique		4		
1.3.3.2	Set up the laboratory	Laboratry was sat and operated.	3		
1.3.3.3	Apply hormone assay technique to field		3		
1.3.4	Operate Field Survey Point in BAVI center		3		
1.3.4.1	Set up Field Survey point	Survey point was sat.	4	Utilities such as electricity is not provided well and not been	
1.3.4.2	Conduct field survey and research		3		
1.3.4.2	Conduct reproduction and AI service for farmers		3		

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Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement	
1-4	Retrain AI technicians for straw type frozen semen and					
1.4.1	Determine training participants	Active AI technicians are selected	completed	3		
1.4.2	Reform the curriculum for adaptation of straw-typed semen	Reformed curriculum		3		
1.4.3	Prepare training materials	Training materials	Training material were prepared in various form such as video, flip chart	3	Making of unified text book is not completed.	
1.4.4	Conduct training courses	AI technicians are trained	4 training courses were conducted.	3		
1.4.5	Make training manuals for lecturers	Training manuals	Basic extension methodology course was held for counterparts.	1		
1.4.6	Evaluate the contents of training courses	Training course is improved	Evaluation meeting were held after each training course and made	3		
1.4.7	Monitor the trained AI technicians in the field	Trained techniques are established	Some AI technicians were monitored.	3	Should be done regularly and results should be sent to monitored AI technicians.	
1-5	Promote and strengthen the advantage of using AI.					
1.5.1	Produce more information on sire bull such as improved sire catalogues	Catalogues of sire bulls	Pictures of all sires bulls in MAIC were taken.	3	Taking pictures of sire bulls took long time.	Contents of sire information listed on catalogue should be decided. In order to do so, MAIC needs to trace the daughter cows of bulls.
1.5.2	Make the information for farmers to understand the importance of AI.	Leaflets, Poster Breeding calendar	Hand outs for AI recording was made.	3		
1.5.3	Set up or join seminars for AI technicians and farmers	Seminars	Seminars were held in one commune in Ha Tay and Bac Ninh, Vinh Phuc. Joined more than 10 other training courses or seminars.	3	Need more manpower engaging this activities in NIAH	
1.5.4	Provide information to media	TV programme	2 News paper and 1 TV news introduced Renovated MAIC. TV programme on AI technology was made. Seminars in Bac Ninh, Vinh Phuc, Ha Tay were introduced on TV	3		Contents should be checked carefully before on air on TV or newspaper

Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement
Output 2: Handling and quality control skills are improved in the frozen semen distribution network.	(Indicator on PDM) 2-1. The motility of straw type frozen semen is maintained in the distribution network.				
2-1	Conduct surveys when necessity arises.				
2.1.1	Select the focused areas	Focused areas are decided	9 focused areas were decided. (Local Office, AI technicians)	4	
2.1.2	Conduct survey in focused areas	Situation of focused areas	Tu Son AI center was found to be a possible area.	3	
2-2	Train or consult about the handling method of straw-typed				
2.2.1	Determine training participants	Participants are decided	Staff of Tu Son AI center was found to be a possible area.	4	
2.2.2	Conduct training courses	Participants acquire the handling of frozen semen	4 AI Training was conducted.	3	
2.2.2.1	Train AI technicians about the handling method of straw -typed frozen semen.		LN 2 Tanks were distributed and hold seminars.	3	
2.2.2.2	Train local officers about the handling method of straw -typed frozen semen.			1	
2.2.2.3	Train staff in Tu Son about the handling method of straw -typed frozen semen.			1	
2.2.3	Monitor trained participants in the field	Training techniques are established		1	

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Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement
Output 3: Production technique of straw-typed frozen semen is improved.	(Indicators on PDM) 3-1. 100% of frozen semen for dairy breed is produced in straw form in MAIC. 3-2. The rate of straw-typed frozen semen passed the quality examination increase from 75-80% to more than 95% in MAIC. 3-3. All the data on production and distribution of				
3-1 Conduct surveys when necessity arise.					
3.1.1 Conduct surveys on existing facilities	Weak point for improvement	Surveys on existing facilities were conducted and found that no father improvements on the facility were necessary except for semen processing facility and emergent supply system of electricity	4	completed	
3.1.2 Conduct a present condition survey as to make a starting point and decided methodology	Methodology is decided	Semen processing facility and semen collection area were renovated. Emergent electricity supply system was installed.	4	completed	
3-2 Improve General Conditions of Semen Processing.					
3.2.1 Make master plans for target facilities	Master plan	Existing semen processing facility, semen collection area and emergent electricity supply system were targeted for renovation and installation	4	completed	
3.2.2 Process professional designs and conduct bidding	Professional designs	Professional designs were made and bidding was conducted to chose local construction companies and suppliers.	4	completed	
3.2.3 Conduct renovation constructions	Renovated facilities	Semen processing facility and semen collection area were renovated. Emergent electricity supply system was installed.	4	completed	
3-3 Provide training on semen processing method.					

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Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement
3.3.1 Introduce an improved semen collection method	Improvement of quality of frozen semen	Timing and control of bull mounting were trained and improved. Hygienic handling of artificial vagina and bull semen were practiced. Prepuce douche washer has been introduced and used for each bull. Bull identification method during semen collection was introduced and practiced.	3		These technical aspects on frozen semen processing have been noticeably improved. From now on, continuous effort in further improvement on processing methods and semen quality based on its own observation and experience will become more important. In this regard, supplies of materials and maintenance of equipment will become important subjects.
3.3.2 Introduce a semen evaluation method	Improvement of quality of frozen semen	Sample semen diluted 10 times by an extender without glycerin was used for motility evaluation. A glass plate specially manufactured for semen examination is now used	3		
3.3.3 Introduce an extender formulation method	Improvement of quality of frozen semen	Semen extender is formulated freshly and manually, that changed from the one being purchased from overseas. Quality and quantity of semen extender is calculated and produced by the people in MAIC.	3		
3.3.4 Introduce a step-wise dilution method	Improvement of quality of frozen semen	Device to dilute semen at gradual speed by dropping method has been introduced. Semen dilution process was separated into steps as preliminary and secondary stage.	4	completed	
3.3.5 Introduce a freezing method	Improvement of quality of frozen semen	Standard freezing curve has been followed to best minimize the risk of crystallization in the tissue of sperm.	3		
3.3.6 Introduce production management method by computer	Production management data processed by computer	A database program for keeping production data has been utilized.	3	Most of counterparts were not knowledgeable about the use of computers. Because of this reason, computer training had been provided and as a result, certain C/P started inputting production data by computer.	

Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement
3.3.7 Produce an instruction manual for standard processing method in MAIC for future renovation	Instruction manual	Most of the technical aspects of semen processing have been in practice, but no written documents regarding semen processing.	3		There is a need of describing details on frozen semen processing method being practiced at present to be served as manual and as a base for further improvement in the future.
3.3.8 Conduct evaluation surveys for monitoring and applying activity results	Evaluation	Some new methods and trials have been tested in order to realize a best conditions under which high quality frozen semen can be produced.	3		
3-4 Introduce a semen evaluation method based on insemination records					
3.4.1 Introduce data processing method by computer	Data processed by computer	Some production data in MAIC started feeding into a computer, but there is no linkage made with insemination records from the filed	3		This is the linked area with AI recording activities. To achieve on this purpose, there is a need of achieving success on AI recording activities.
3.4.2 Analyze collected insemination records in the focused areas and evaluate the semen quality	Analyzed information	Some production data in MAIC started feeding into a computer though, there is no linkage made with insemination records from the filed of AI	3		

6/10
27

Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement
Output 4: Feeding and management of sires are improved.	4-1. The rate of sire bulls to be used for semen processing increases from the present 50 % to more than 85% in MAIC. 4-2. MAIC can manage the sire by using individual animal data. 4-3. The feeding programme is produced and practiced in MAIC.				
4-1 Conduct surveys when necessity arises.					
4.1.1 Conduct a water quality analysis	Water analysis	2 surveys were conducted and found the necessity to improve the quality of water.	3		Conduct water analysis in dry season each year
4.1.2 Analyze factors which deteriorate quality of semen and make countermeasures.	Countermeasures	Quality of semen has been improving and no other factors which deteriorate the quality were found	3		Feed analysis and
4-2 Renovate the existing facility for large bulls.					
4.2.1 Strengthen the fence of the bull pens.	Stronger bull fence	Survey was conducted and draft was made 2 times.	3*	Estimation of construction was too high and could not allocate budget.	Reasonable estimation and construction company was found. Plan will be completed if budget is allocated.
4.2.2 Make the sandbox to protect a leg, foot hoof.	Sandbox	Survey was conducted and draft was made 2 times.	3*	Estimation of construction was too high and could not allocate budget.	Reasonable estimation and construction company was found. Plan will be completed if budget is allocated.
4.2.3 Build treatment stall for large bulls.	Treatment stall	Treatment stall for large bulls were built.	4	completed	
4.2.4 Strengthen evacuation facilities to secure safety in the semen.	Safety for semen collector is improved	Strong fences in semen collection area were built.	4	completed	
4.2.5 Conduct heat stress management	Reduce the heat stress	Sprinklers and fans were built in a bull house. Showering by cool water on hot days was started.	3		Need improvement on sprinklers and fans.
4-3 Improve the quality of water.					
4.3.1 Renovate the water source and water purifier.	Clean water	Water facility was renovated.	4	completed	
4-4 Feed good quality feeds.					
4.4.1 Conduct a feed material analysis	Analyzed feed material	Sampling was done 6 times and being analyzed for food value	3	Communication between NIAH and MAIC was not well and results of analysis was not applied.	Sample should be taken and sent regularly. Communication between NIAH and MAIC should be improved.

Activities	Expected Results Target/Indicator	Progress	Index	Reasons of Delay on Activities	Future Plan and Counter measurement	
4.4.2	Find a suitable feeding standard	Suitable feeding standard for Dairy breed(HF, Jexxy)	Draft of feeding standard for bulls in Vietnam has being made.	3	No expert of nutrition in MAIC.	MAIC send responsible staff to be trained in NIAH.
4.4.3	Make feeding program	Feeding Programme		1	Experimen is not conducted yet.	MAIC send responsible staff to be trained in NIAH. Need aproval of MARD for officialy utilize it to MAIC.
4.4.4	Produce a management manual for standard feeds and feeding method in MAIC	Manuals		1	Experimen is not conducted yet.	MAIC send responsible staff to be trained in NIAH.
4.4.5	Produce good quality forage	Good quality forage (Enough quantity of forage for sire bulls are produced. Nutrition level of each forage is better than average. Hey is dried in green color	Short term exp. surveyed and introduced how to grow glass, timing of cutting, how to make dry forage and silage.	3		Make good dry forage effectively, some equipment are necessary. Leguminous is one possible feeds added.
4-5	Improve the individual bull management.					
4.5.1	Acquire management techniques of large bulls	Safety for human beeing is secured.	Management techniques of large bulls were introduced by short term	3		Should be able to manage when imported bulls become bigger (1t)
4.5.2	Introduce bull management techniques such as hoof trimming and dehorning	Counterparts acquirer techniques for bull management	Hoof trimming and dehorning were introduced.	3		Maintenance of equipment should be better. Hoofing should be done regularly
4.5.3	Consolidate individual bull records	Data processed by computer	Weight of each bull are checked regularly. Individual bull records were consolidated on paper.	3		
4.5.4	Analyze individual bull records	Feeding management based on individual records		1	Checking and arranging individual bull records took much time.	
4.5.5	Produce manuals for each technique.	Manuals	Manual for Hoofing, trimming, were made.	3		Manual for
4-6	Improve the animal health programme.					
4.6.1	Introduce disease control	Disease programme		1	Put priority on other activities.	
4.6.2	Introduce regular health check for each sire bull	Regular Health Check	Trichomonas and Campylobacter were examined with NIVR.	3	Put priority on other activities.	Should continue examination with NIVR.

5

*Acronyms and Abbreviations

JP FY: Japanese Fiscal Year (April -
March)

VN FY: Vietnamese Fiscal Year (January - December)

Qtr.: a quarter of the year

AI: artificial insemination

LN2: liquid nitrogen

Index

4. Completed

3. Will be Completed in Project Implementation Period

2. Difficult to be Completed

1. No Activity yet

6/10

58

2. Dispatch of Japanese Experts

ANNEX 2

List of Long Term Experts

	Name	Expertise	Duration	Organizations Belong to
1	Mr. Ichiro Suzuki	Chief Advisor/Feeding and Management of Sire	Dec 8, 2000 to Mar 31, 2003	Ministry of Agriculture, Forestry and Fisheries
2	Mr. Koji Shimokawa	Frozen Semen Processing	Oct 2, 2000 to Oct 1, 2003	Livestock Improvement Association of Japan
3	Dr. Kiyoshi Korematsu	Artificial Insemination	Mar 28, 2001 to Mar 27, 2003	
4	Ms. Shiho Akamatsu	Project Coordination	Oct 2, 2000 to Dec 28, 2002	Japan International Cooperation Center
5	Mr. Yoshihiro Shimizu	Project Coordination	Dec 11, 2002 to Dec 10, 2004	

- 59 -

MAFF = Ministry of Agriculture, Forestry and Fisheries
NLBC = Independent Administrative Institution National Livestock Breeding Center
LIAJ = Livestock Improvement Association of Japan

List of Short Term Experts

ANNEX 2

	Name	Expertise	Duration	Organizations Belong to
1	Dr. Yoshiaki Minato	Frozen Semen Processing Facility Improvement Plan	Mar 1, 2001 to Mar 31, 2001	LIAJ
2	Mr. Kazuyuki Inoue	Planning of Artificial Insemination Training	Aug 13, 2001 to Oct 12, 2001	Oita Prefectural Animal Industry Experimental Station
3	Mr. Takanori Yasumori	Frozen Semen Distribution Plan	Aug 20, 2001 to Sep 28, 2001	LIAJ
4	Ms. Kyoko Uchiyama	Frozen Semen Processing (Preparation of Extender)	Nov 7, 2001 to Nov 27, 2001	LIAJ
5	Mr. Takahiro Nobori	Feeding and Management of Sire	Mar 11, 2002 to Apr 23, 2002	NLBC
6	Mr. Kengo Hirakawa	Semen Collection Technique	May 13, 2002 to Jun 12, 2002	NLBC
7	Dr. Naoki Isobe	Reproduction Hormone Assay Technology	Sep 28, 2002 to Nov 28, 2002	University of Hiroshima
8	Mr. Shigeo Matsumoto	Evaluation on AI Recording Program and its Applied Activities	Oct 6, 2002 to Nov 9, 2002	LIAJ
9	Mr. Sonryo Morita	Forage Production and Feed Adjustment	Oct 8, 2002 to Nov 21, 2002	
10	Mr. Toshihiko Nakao	Reproduction Management	Dec 9, 2002 to Dec 27, 2002	University of Hiroshima

MAFF = Ministry of Agriculture, Forestry and Fisheries

NLBC = Independent Administrative Institution National Livestock Breeding Center

LIAJ = Livestock Improvement Association of Japan

3. Assignment of Counterparts

☆ : the leader ANNEX 3

No.	Name	Belong to	Position	Japanese Exp	Semen production	Bull feeding and management	AI recording network	Training programme	Promotion	Training in Japan		
1	Nguyen Dang Vang	NIAH	Director/ Project Director	Suzuki						Feb 2001	Oct 2000	~
2	Hoang Kim Giao		Vice Director/ Project Manager	Suzuki						Aug 2000	Oct 2000	~ Sep 2002 (Moved to MAF)
3	Vu Chi Cuong	NIAH	Deputy Head of Cattle Science Dept	Suzuki		☆		x			Oct 2000	~ Dec 2002 (Assumed)
4	Nguyen Manh Dung	NIAH	International Project Assistant	Akamatsu			x				Oct 2000	~
5	Luu Cong Khanh	NIAH	Deputy Head of Embryo Transfer Dept	Korematsu			x	x	x	Jun 2001	Oct 2000	~
6	Phan Le Son	NIAH	Embryo Transfer Dept	Korematsu/ Shimokawa			x	x			Oct 2000	~
7	Nguyen Thi Kim Anh	NIAH	Embryo Transfer Dept	Korematsu							Oct 2000	~ Sep 2002 -(Study in Neth)
8	Nguyen Thi Thoa	NIAH	Embryo Transfer Dept	Korematsu			x				Oct 2001	~
9	Dang Vu Hoa	NIAH	Embryo Transfer Dept	Shimokawa			x	x			Apr 2002	~
10	Nguyen Van Ly	NIAH	Embryo Transfer Dept	Korematsu						(Sep 2002)	Aug 2001	
11	Pham Tat Cuong	NIAH	Cattle Science Dept	Suzuki		x					Oct 2000	~
12	Nguyen Thanh Trung	NIAH	Cattle Science Dept	Suzuki		x					Oct 2000	~
13	Phan Van Kiem	NIAH	Head of Artificial Insemination Dept	Korematsu	x		x			Jun 2002	Oct 2000	~
14	Trinh Quang Phong	NIAH	Artificial Insemination Dept	Korematsu			x	x	☆		Oct 2000	~
15	Dao Duc Tha	NIAH	Artificial Insemination Dept	Shimokawa	x				x		Oct 2000	~
16	Nguyen Huu Luong	NIAH	Secretary of National Dairy Project	Shimokawa			x				Oct 2002	~
17	Vo Van Su	NIAH	Head Department of Biodiversity	Shimokawa			x				Oct 2002	~
18	Tang Xuan Luu	Bavi - NIAH	Deputy Head of Cattle Production Unit	Korematsu			x	x		Jun 2001	Oct 2000	~
19	Nguyen Van Thuan	Bavi - NIAH	Technical Dept	Korematsu			x				Oct 2000	~
20	Nguyen Tien Tung	Bavi - NIAH	Technical Dept	Korematsu			x				Oct 2000	~
21	Ha Van Chieu	VINALICA	Vice President of VINALICA	Suzuki/ Shimokawa	x		x	x			Oct 2000	~
22	Dao Duc Tien	MAIC	Vice-Director	Suzuki Shimokawa	☆	x		x	x	Feb 2001	Oct 2000	~
23	Doan Thi Canh	MAIC	Administration Department	Suzuki		x				Aug 2001	Oct 2000	~
24	Le Ba Que	MAIC	Deputy Head of Technical Dept	Suzuki		x			x	Aug 2002	Oct 2000	~
25	Tran Trung Chau	MAIC	Technical Dept	Shimokawa	x	x				Aug 2002	Oct 2000	~
26	Vo Thi Hoa	MAIC	Technical Dept	Shimokawa	x					Aug 2001	Oct 2000	~
27	Ha Van Dinh	MAIC	Semen Processing Unit	Shimokawa	x						Oct 2000	~
28	Hoang Van Khai	MAIC	Semen Processing Unit	Shimokawa	x						Oct 2000	~
29	La Xuan Vinh	MAIC	Semen Processing Unit	Suzuki		x					Jun 2002	~
30	Tran Cong Hoa	MAIC	Technical Department	Suzuki		x					Jun 2002	~

4. Equipment input of Japanese side

ANNEX 4

	Delivery Time	Name of Equipment	Model	Manufacturer	ID No	Q't	Unit Price (US\$)	Amount (US\$)	Place	Usage
	1/2001	Photo copy machine	FT7950	RICOH	PV-00-001	1	\$13,063.00	\$13,063.00	NIAH/Project office	A
	1/2001	Fax Machine	2900L	RICOH	PV-00-002	1	\$2,068.00	\$2,068.00	NIAH/Project office	A
	2/2001	Television set	XF25M80	Sony	PV-00-003	1	\$627.00	\$627.00	NIAH/Project office	A
	2/2001	Multi Video player	SLV-KF297MK2PS	Sony	PV-00-004	1	\$231.00	\$231.00	NIAH/Project office	A
	2/2001	Projector	Projector U3-880	Plus	PV-00-005	1	\$6,435.00	\$6,435.00	NIAH/Project office	A
	2/2001	Personal computer	DESKPRO SB PIII 800	Compaq	PV-00-006	1	\$1,102.50	\$1,102.50	AI/NIAH	A
	2/2001	Personal computer	DESKPRO SB PIII 800	Compaq	PV-00-007	1	\$1,102.50	\$1,102.50	ET/NIAH	A
	2/2001	Personal computer	DESKPRO SB PIII 800	Compaq	PV-00-008	1	\$1,102.50	\$1,102.50	MAIC	A
	2/2001	Personal computer	DESKPRO SB PIII 800	Compaq	PV-00-009	1	\$1,102.50	\$1,102.50	Project Management Board	A
	2/2001	Printer	HP 1100 Laser printer	Hewlett Packard	PV-00-010	1	\$399.00	\$399.00	AI/NIAH	A
	2/2001	Printer	HP 1100 Laser printer	Hewlett Packard	PV-00-011	1	\$399.00	\$399.00	ET/NIAH	A
	2/2001	Printer	HP 1100 Laser printer	Hewlett Packard	PV-00-012	1	\$399.00	\$399.00	MAIC	A
	2/2001	Printer	HP 1100 Laser printer	Hewlett Packard	PV-00-013	1	\$399.00	\$399.00	Project Management Board	A

	Delivery Time	Name of Equipment	Model	Manufacturer	ID No	Q't	Unit Price (US\$)	Amount (US\$)	Place	Usage
	2/2001	Notebook Computer	Model T21-2BA	IBM	PV-00-014	1	\$2,961.00	\$2,961.00	Project Management Board	A
	2/2001	Notebook Computer	Model T21-2BA	IBM	PV-00-015	1	\$2,961.00	\$2,961.00	Project Management Board	A
	3/2001	Station Wagon	Land Cruiser FZJ105I-GNMNK	Toyota	PV-00-016	1	\$30,580.00	\$30,580.00	NIAH	A
	3/2001	Pick Up Truck, Double Cabin	Hilux 4WD RZN169L-PRMDU	Toyota	PV-00-017	1	\$19,750.00	\$19,750.00	MAIC	A
	3/2001	Projector	Digital Multimedia Projector U3-880	Plus	PV-00-018	1	\$6,435.00	\$6,435.00	MAIC	A
	3/2001	Photocopy Machine	FT5832	RICOH	PV-00-019	1	\$5,807.90	\$5,807.90	MAIC	A
	3/2001	Balance	XB-620M	PRECISA	PV-00-020	1	\$1,059.00	\$1,059.00	MAIC	A
	3/2001	Balance	XB-620M	PRECISA	PV-00-021	1	\$1,059.00	\$1,059.00	AI/NIAH	A
	3/2001	Balance	XB-620M	PRECISA	PV-00-022	1	\$1,059.00	\$1,059.00	ET/NIAH	A
	3/2001	Balance	XB-620M	PRECISA	PV-00-023	1	\$1,059.00	\$1,059.00	CS/NIAH	B
	3/2001	Frozen Semen Preservation Bottle	XC47/11-6	MVE-USA	PV-00-024	1	\$2,277.00	\$2,277.00	MAIC	A
	3/2001	Frozen Semen Preservation Bottle	XC47/11-6	MVE-USA	PV-00-025	1	\$2,277.00	\$2,277.00	MAIC	A
	3/2001	Frozen Semen Preservation Bottle	XC47/11-6	MVE-USA	PV-00-026	1	\$2,277.00	\$2,277.00	MAIC	A

	Delivery Time	Name of Equipment	Model	Manufacturer	ID No	Q't	Unit Price (US\$)	Amount (US\$)	Place	Usage
	3/2001	Television set	XF25M80	Sony	PV-00-027	1	\$583.00	\$583.00	MAIC	A
	3/2001	Multi Video player	SLV-KF297MK2PS	Sony	PV-00-028	1	\$220.00	\$220.00	MAIC	A
	3/2001	personal computer	DESKPRO SB PIII 800	Compaq	PV-00-029	1	\$1,092.00	\$1,092.00	BAVI	A
	3/2001	personal computer	DESKPRO SB PIII 800	Compaq	PV-00-030	1	\$1,092.00	\$1,092.00	CS/NIAH	B
	3/2001	Notebook computer	Model T20-86A	IBM	PV-00-031	1	\$2,961.00	\$2,961.00	MAIC	A
	3/2001	Printer	HP 1100 Laser printer	Hewlett Packard	PV-00-032	1	\$414.75	\$414.75	BAVI	A
	3/2001	Printer	HP 1100 Laser printer	Hewlett Packard	PV-00-033	1	\$414.75	\$414.75	CS/NIAH	B
	3/2001	Scanner	HP Scanjet 6300C	Hewlett Packard	PV-00-034	1	\$504.00	\$504.00	MAIC	A
	3/2001	Balance	BP2100S	SATORIUS	PV-00-035	1	\$930.00	\$930.00	CS/NIAH	B
	3/2001	Centrifuges	UNIVERSAL 32	HETTICH	PV-00-036	1	\$3,545.00	\$3,545.00	ET/NIAH	A
	3/2001	Cold Handling Cabinet	14335/0400	MINITUB	PV-00-037	1	\$12,317.00	\$12,317.00	MAIC	A
	3/2001	Desiccators case	CM-3BS	SANPLATEC	PV-00-038	1	\$600.00	\$600.00	MAIC	A
	3/2001	Distillation apparatus	Cyclon Model WSC044	SANYO	PV-00-039	1	\$2,886.00	\$2,886.00	MAIC	A
	3/2001	Distillation apparatus	Cyclon Model WSC044	SANYO	PV-00-040	1	\$2,886.00	\$2,886.00	A1/NIAH	A
	3/2001	Freezer	MDF-U3086S	SANYO	PV-00-041	1	\$5,835.00	\$5,835.00	A1/NIAH	A

	Delivery Time	Name of Equipment	Model	Manufacturer	ID No	Q't	Unit Price (US\$)	Amount (US\$)	Place	Usage
	3/2001	Grinding Mil	Grindoxix MM100	RETSCH	PV-00-042	1	\$1,965.00	\$1,965.00	CS/NIAH	B
	3/2001	Incubator	MIR-162	SANYO	PV-00-043	1	\$1,401.00	\$1,401.00	ET/NIAH	A
	3/2001	Microscope apparatus	DMLS etc	MINITUB	PV-00-044	1	\$7,850.00	\$7,850.00	AI/NIAH	A
	3/2001	Microscope apparatus	MZ6 etc	MINITUB	PV-00-045	1	\$4,976.00	\$4,976.00	ET/NIAH	A
	3/2001	Oven	ULM500	MENMART	PV-00-046	1	\$1,366.00	\$1,366.00	AI/NIAH	A
	3/2001	Oven	ULM500	MENMART	PV-00-047	1	\$1,366.00	\$1,366.00	MAIC	A
	3/2001	PH meter	704	METROHM	PV-00-048	1	\$748.00	\$748.00	AI/NIAH	A
	3/2001	Potable Balance	BL600	SARTORIUS	PV-00-049	1	\$384.00	\$384.00	MAIC	A
	3/2001	Potable Counting Scale	EA30EDE-LOUR	SARTORIUS	PV-00-050	1	\$603.00	\$603.00	CS/NIAH	B
	3/2001	Refrigerator for Laboratory	MPR-161D (H)	SANYO	PV-00-051	1	\$1,343.00	\$1,343.00	AI/NIAH	A
	3/2001	Refrigerator for Laboratory	MPR-161D (H)	SANYO	PV-00-052	1	\$1,343.00	\$1,343.00	MAIC	A
	3/2001	Sterilizer Steriver	11050/0015	MINITUB	PV-00-053	1	\$3,208.00	\$3,208.00	MAIC	A
	3/2001	Ultra Sonic Washer with heater	RK1050CH	BANDELIN	PV-00-054	1	\$3,925.00	\$3,925.00	MAIC	A
	3/2001	Water Bath	WBU45	MENMART	PV-00-055	1	\$1,392.00	\$1,392.00	MAIC	A
	3/2001	Water Bath	WBU45	MENMART	PV-00-056	1	\$1,392.00	\$1,392.00	MAIC	A

	Delivery Time	Name of Equipment	Model	Manufacturer	ID No	Q't	Unit Price (US\$)	Amount (US\$)	Place	Usage
	3/2001	Sorter	ST29	Ricoh	PV-00-057	1	\$2,156.00	\$2,156.00	MAIC	A
	3/2001	Digital Video Camera	TRV 20	Sony	PV-00-058	1	\$1,452.00	\$1,452.00	NIAH/Project office	A
	5/2001	Frozen Semen Preservation Bottle	SC33/32	MVE-USA	PV-00-059	1	\$1,433.00	\$1,433.00	MAIC	A
	5/2001	Frozen Semen Preservation Bottle	SC33/32	MVE-USA	PV-00-060	1	\$1,433.00	\$1,433.00	MAIC	A
	5/2001	Frozen Semen Preservation Bottle	SC33/32	MVE-USA	PV-00-061	1	\$1,433.00	\$1,433.00	MAIC	A
	5/2001	Frozen Semen Preservation Bottle	SC33/32	MVE-USA	PV-00-062	1	\$1,433.00	\$1,433.00	MAIC	A
	5/2001	Frozen Semen Preservation Bottle	SC33/32	MVE-USA	PV-00-063	1	\$1,433.00	\$1,433.00	MAIC	A
	5/2001	Frozen Semen Preservation Bottle	XC47/11-6	MVE-USA	PV-00-064	1	\$2,277.00	\$2,277.00	MAIC	A
	5/2001	Frozen Semen Preservation Bottle	XC47/11-6	MVE-USA	PV-00-065	1	\$2,277.00	\$2,277.00	MAIC	A
	5/2001	Frozen Semen Preservation Bottle	XC47/11-6	MVE-USA	PV-00-066	1	\$2,277.00	\$2,277.00	MAIC	A
	5/2001	Stirrers	Model RCT Basic	IKA	PV-00-067	1	\$382.00	\$382.00	MAIC	A
	5/2001	Stirrers	Model RCT Basic	IKA	PV-00-068	1	\$382.00	\$382.00	MAIC	A

	Delivery Time	Name of Equipment	Model	Manufacturer	ID No	Q't	Unit Price (US\$)	Amount (US\$)	Place	Usage
	5/2001	Stirrers	Model RCT Basic	IKA	PV-00-069	1	\$382.00	\$382.00	NIAH	A
	5/2001	Multiposition Magnetic Stirrer	Model RO 5 Power	IKA	PV-00-070	1	\$591.00	\$591.00	MAIC	A
	5/2001	Multiposition Magnetic Stirrer	Model RO 15 Power	IKA	PV-00-071	1	\$1,058.00	\$1,058.00	MAIC	A
	3/2002	Computer	SB P4	Compaq	PV-01-001 ~ PV-01-002	2	\$1,207.10	\$2,414.20	MAIC	A
	3/2002	Computer	SB P4	Compaq	PV-01-003 ~ PV-01-010	8	\$1,207.10	\$9,656.80	Local Office	A
	3/2002	Printer	Laserjet 1200	HP	PV-01-011 ~ PV-01-018	8	\$412.50	\$3,300.00	Local Office	A
	3/2002	Printer	Laserjet 1200	HP	PV-01019 ~ PV-01-020	2	\$412.50	\$825.00	MAIC	A
	3/2002	Printer	Laserjet 1200	HP	PV-01019 ~ PV-01-020	2	\$412.50	\$825.00	MAIC	A
	3/2002	Shaker	Recipro shakerSR-2W	TAITEC	PV-01-021	1	\$3,437.00	\$3,437.00	AI	A
	3/2002	Minishaker	MS1	IKA	PV-01-022	1	\$300.00	\$300.00	AI	A
	3/2002	Generator	P60	FG Willson	PV-01-023	1	\$20,475.00	\$20,475.00	NIAH	A
	3/2002	Generator	P60	FG Willson	PV-01-024	1	\$20,475.00	\$20,475.00	MAIC	A
	3/2002	Plate Reader	Opsys MR	Jencons	PV-01-025	1	\$5,054.00	\$5,054.00	AI	A
	5/2002	Centrifuge	Universal 32R	Hettich	PV-01-026	1	\$4,151.00	\$4,151.00	ET	A
	5/2002	Incubator	1510E	Shellab	PV-01-027	1	\$790.00	\$790.00	AI	A

	Delivery Time	Name of Equipment	Model	Manufacturer	ID No	Q't	Unit Price (US\$)	Amount (US\$)	Place	Usage
	5/2002	Ultrasonic cleaner	RK514	Bandelin	PV-01-028	1	\$1,242.00	\$1,242.00	AI	A
	5/2002	Voltex Mixer	HGB55E	Waring	PV-01-029	1	\$1,865.00	\$1,865.00	CS	A
	5/2002	Ultrasonic bath	FS100B	Decon	PV-01-030	1	\$1,595.00	\$1,595.00	CS	A
	5/2002	Digital buret	Digitrate	Jencons	PV-01-031	1	\$518.00	\$518.00	CS	A
	5/2002	Colorimeter	Helinos Ganmma	Helinos	PV-01-032	1	\$4,029.00	\$4,029.00	CS	A
	5/2002	Clean Bench	VLF12	Labcaire	PV-01-033	1	\$6,321.00	\$6,321.00	ET	A
	5/2002	Dry Block Heater	DB-2D,	Jencons	PV-01-034	1	\$1,213.00	\$1,213.00	ET	A
	5/2002	Microscope	BME	Leica	PV-01-035	1	\$1,456.00	\$1,456.00	BAVI	A
	5/2002	LN2 Tank	XC47/11-6	MVE(USA)	PV-01-036~ PV-01-055	20	\$1,165.00	\$23,300.00	MAIC	Yet complete delivery
	5/2002	Ultrasonic generator	MPP133	Minitub	PV-01-056	1	\$4,862.00	\$4,862.00	MAIC	A
	5/2002	Straw printing machine	Easy Coder	Minitub	PV-01-057	1	\$20,045.00	\$20,045.00	MAIC	A
	6/2002	Multi channel pipette	30-300	Eppendorf	PV-01-058	1	\$789.00	\$789.00	AI	A
	6/2002	LN2 tank	GT2	Air Liquide	PV-01-059 ~ PV-01-148	90	\$390.00	\$35,100.00	Local office NIAH	Yet complete delivery
	6/2002	LN2 tank	GT3	Air Liquide	PV-01-149 ~ PV-01-248	100	\$400.00	\$40,000.00	Provinces NIAH	Yet complete delivery

5. Budget inputs by Japanese Side

ANNEX 5

Unit: Tousand yen)

Fiscal Year	2000(Oct-2001Mar)	2001(Apr-2002Mar)	2002(Apr-2003Mar)	Total	Remark
1 Local Cost					
1) General Expenditure	4,000	5,040	4,018	13,058	
Travel Expense for C/P	0	0	237	237	Air fare
Seminar Expense	0	0	351	351	
2) Research & Education Expenditure					
Training for Middle-level trainee Enlighthenment & Extension	0	5,916	2,755	8,671	AI Inseminator
Reparing & Renovation expense					
Semen processing facilities	0	7,725	0	7,725	
Water Treatment Facilities	0	1,675	0	1,675	
3) Study Trip	0	846	0	846	Thai
Sub-total	4,000	23,204	9,819	37,023	
2 Equipment & Machinery					
Procurement in Japan	0	20,100	0	20,100	
Procurement in Vietnam	22,527	29,183	0	51,710	
	incl. for 2001budget	incl. for 2002 budget			
Equipment brought by Experts	4523	1065	756		
Transport Charge	584	254	111		
Sub-total	27,634	50,602	867	79,103	
Total	31,634	73,806	10,686	116,126	

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6. Inputs by Vietnamese Side

ANNEX 6

Unit: VND)

Fiscal Year	2000(Oct-Dec)	2001(Jan-Dec)	2002(Jan-Dec)	2003(Jan-Feb)	Total
1 Working Expenditure					
Power and water Supply	6,000,000	36,000,000	36,000,000	6,000,000	84,000,000
Local telephone and fax	3,000,000	18,000,000	18,000,000	3,000,000	42,000,000
Benzyls, petrol & oil	6,000,000	36,000,000	36,000,000	6,000,000	84,000,000
2 Personnel Cost	56,000,000	336,000,000	336,000,000	56,000,000	784,000,000
3 Facility Expenditure					
Room Equipment	10,000,000				10,000,000
Reparing & Renovation expense	60,000,000				60,000,000
Reparing for storage & Lab etc.		50,000,000	50,000,000		100,000,000
Installation of tel and fax line	6,000,000				6,000,000
4 Research and Training					
Reaserch		51,000,000	71,000,000		122,000,000
Training		1,000,000	1,000,000		2,000,000
5 Others					
Custom prosedure					
Registure		40,000,000			40,000,000
Insurance		25,000,000			25,000,000
Total	147,000,000	593,000,000	548,000,000	71,000,000	1,359,000,000