No.

Ex-post Evaluation Report on the Pasture Seed Production Development Project in Northeast Thailand

February 2007

JAPAN INTERNATIONAL COOPERATION AGENCY

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JR
07-001

Field Survey Photos of the Ex-post Evaluation Study

Interview survey to Khon Kaen Animal Nutrition Division (AND) 1/2

Interview survey to Khon Kaen Animal Nutrition Division (AND) 2/2

Pasture seed production survey (Seed drying and cleaning) 1/2

Pasture seed production survey (Seed drying and cleaning) 2/2

Pasture seed production survey (Pasture seed harvesting)

Equipment supplied from the Project at KKANRDC (Low temp incubator)

Equipment supplied from the Project at KKANRDC (Gravity separator)

Equipment supplied from the Project at KKANRDC (Cylinder separator)

Abbreviation

JICA	Animal Nutrition Division
DLD	Department of Livestock Development
AND	Animal Nutrition Division
ANRDC	Animal Nutrition Research and Development Center
ANS	Animal Nutrition Station
KKANRDC	Khon Kaen Animal Nutrition Research and Development Center
MANDS	Mahasalakham Animal Nutrition Development Station
MOAC	Ministry of Agriculture and Cooperatives
NRANRDC	Nakorn Ratchasima Animal Nutrition Research and Development Center
OECD	Organization for Economic Cooperation and Development

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牧草種子生産開発計画事後評価　　要　約

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国名：タイ王国		案件名： 東北タイ牧草種子生産開発計画
分野：農業分野		
所轄部署：農業開発協力部畜産園芸課		援助形態：技術協力プロジェクト
協力期間	（R/D）： 1999 年 8 月 14 日～2004 年 8 月 13 日	協力金額：3 億 97 百万円
		先方関係機関：農業・協同組合省畜産振興局
		日本側協力機関：農林水産省
		他の関連協力：

１－１　協力の背景と概要

タイ国では、主要農産物（米、キャッサバ）の国際価格低迷に伴い、牛乳・乳製品・牛肉など、国内消費の伸びの著しい畜産物の生産拡大及び生産コスト引き下げが計画されている。同国政府は家畜の飼育頭数増加に見合った飼料生産の増強と畜産物生産に要するコスト低減の重要性を認識しており、この活動の一環として東北タイのコンケン地域は、1975 年から農業・協同組合省畜産振興局（DLD）による農家の牧草種子生産が実施されている。タイの牧草種子は 97%が同地域で生産されており、牧草種子生産は従来の稲作より収益性が高いため、農家でも牧草種子の生産拡大が望まれている。

しかしながら、現在の牧草種子生産は、①栽培されている牧草の種類・品質が限られている、②牧草の栽培・管理及び種子の収穫・調整技術の水準が低い、③牧草種子の品質保証が無く、品質の改善が遅れている、④牧草種子のマーケットが限定されている、等の問題を抱えている。

このため、タイ国政府は東北タイ農民の所得向上と雇用機会の拡大を目指し、牧草種子生産及び利用技術の改善を目的とした技術協力を日本政府に要請してきた。

１－２　協力内容

（１）　上位目標

タイの畜産振興に必要な飼料が確保される。

（２）　プロジェクト目標

タイ東北部の小規模畜産農家及び種子生産農家が利用可能な牧草種子及び適切な飼料の生産・利用・調整技術が開発される。

（３）　成果

1)　優良牧草品種の評価選抜技術が開発される。
2)　原種及び流通種子の生産・収穫調整技術が開発される。
3)　牧草種子の検査及び品質管理技術が開発される。
4)　良質粗飼料生産、調整及び利用技術が開発される。

（4） 投入

日本側

長期専門家派遣	7 名	機材供与	8,407 万円
短期専門家派遣	16 名	ローカルコスト負担	3,435 万円
研修員受け入れ	13 名	その他	1,300 万円

タイ側

カウンターパート配置	20 名
ローカルコスト負担	現地通貨 1,495 万タイバーツ
その他（秘書/ガソリン代等）	315 万タイバーツ

2. 評価調査団の概要

調査者	評価・分析	藤井　稔
		株式会社　レックス・インターナショナル
	アシスタント調査員	タニャトーン・シングルアン
		国際航業（タイランド）株式会社
	技術サポート	スチーワン・ヨイルロッブ
		国際航業（タイランド）株式会社

調査期間	評価種類
2006 年 10 月 1 日～2007 年 1 月 25 日	事後評価

3. 評価結果の概要

3-1 評価結果の要約

(1) インパクト

(a) 上位目標の達成

プロジェクトで選別した優良品種開発・育成の成果は、開発後、少なくとも 3 年の時間の経過が要求されるため、現時点では確認できなかった。しかしながら、2004 年～2007 年の 4 年間でこれらの新種の牧草種子栽培面積及び牧草生産量が拡大してきていることが確認できたことから、新種はタイの地域性に順調に適応して根付いてきていると判断することが可能である。更に、2004 年～2006 年の統計によると、タイ国内の畜産飼料の生産実績量は生産計画量を超えている。そのため、畜産飼料の供給は需要量を十分に満足していると判断できる。このことから、プロジェクト上位目標を順調に実現しつつあると言える。

新種牧草種子面積の変化

品種	栽培面積（ﾗｲ）			
	2004	2005	2006	2007(見通し)
Panicum maximum	1,719	3,008	5,826	12,164
Brachiaria ruziziensis	1,353	4,804	6,941	7,614
Stylosanthes guianensis	447	122	57	200
Stylosanthes hamata : cv. Verano	507	366	589	942
Centrosema pascuorum: cavalcade	249	170	341	367
合　計	4,275	8,470	13,754	21,287

＊ﾗｲはﾀｲの土地面積単位：1 ﾗｲ＝0.16ha

牧草種子生産量計画と実績

種類	生産計画 (t)			生産実績 (t)		
	2004	2005	2006	2004	2005	2006
干草	5,300	4,475	4,750	5,387	5,022	5,879
ｻｲﾚｰｼﾞ	550	885	697	1,204	1,053	1,275
飼料	3,090	3,090	3,003	4,855	4,995	5,563
合　計	8,940	8,450	8,450	11,446	11,070	12,717

(b) 技術的インパクト

プロジェクトにより移転された技術及び知識はプロジェクトカウンターパート（以下、C/P）及びその所属機関だけではなく、プロジェクトで作成した技術マニュアルが、実際にプロジェクトへ参加しなかった人にも使用される事により広く普及されている。この見地より、プロジェクト期間中に発現した技術的なインパクトは現在も顕著であり、プロジェクトの上位目標達成に貢献している。

なお、プロジェクト終了時に予想できなかった技術的インパクトとして、現在 AND 主導で実施中の「休稲作地を活用した牧草種子開発・生産プロジェクト」（休稲作地牧草種子プロジェクト）に参加している殆どの AND 職員は、今回調査したプロジェクトの C/P であり、プロジェクトから移転された技術・知識が AND 職員によって活用されている。また、種子の品質管理に必要なガイドラインやその管理記録を客観的且つ体系的に行うことが出来る統一的なインスペクションシートなどの記録帳が、プロジェクトにおいて英語とタイ語で作成された結果、プロジェクトに参加した AND 職員のうち、英語を理解する人だけではなく、その他の AND 職員及び種子農家にも広く普及して活用されてきている。

更に、多くの供与機材もこの休稲作地牧草種子プロジェクトに活用されており、プロジェクトインパクトが拡大する現在の起点となっている。

(c) 制度的インパクト

プロジェクト終了後、プロジェクト期間中から活動を開始し、プロジェクトもその運営のサポートしていた種子生産農家クラブ（以下、種子クラブ）の活動が充実化し、同時に農業・協同組合省畜産振興局（以下、DLD）と同省同局家畜栄養部（以下、AND）が種子生産・開発に関する政策及び活動計画を更に効果的に実施することができるようになっていることは特筆に値する。この種子クラブを通じて、農家の意見や種子生産活動の現場状況を DLD と AND が政策及び活動計画策定に効果的に反映することができている。その結果、種子品質の向上が効果的に行われるようになった。

*なお、この種子クラブは、タイの種子生産の大半を占める東北部の農家を中心に 2003 年に設立された。同クラブ設立後は、種子生産量と価格は市場状況に応じて同クラブの会合で決定されるようになり、種子農家の自立発展に貢献してきた。また、同クラブは、AND と連携して牧草種子生産及び開発活動の普及を農家に対して行ってきている。

(d) 経済・財政的インパクト

AND が主導的に行っている牧草種子生産量が近年、タイ国内の需要を上回っている。余剰分の牧草種子は、種子クラブの農家から AND を通じて他国に輸出してされており、その収益は地域の経済・財政面を強化してきている。

(e) 環境・社会的インパクト

プロジェクト終了時評価調査では、プロジェクトから供与された農作機械が従来のものと比べて、労働負荷の軽減及び粉塵の削減といった正のインパクトを評価している。今回の調査においても、牧草種子及び飼料生産活動の現場において、これらのインパクトの継続が確認できた。

(2) 自立発展性

(a) 組織面

組織面における自立発展性に関しては、プロジェクト終了以降、今日までプロジェクトで研修を受けたカウンターパートの異動・離職等による流出が無く、自立発展性を確保する上での組織面の維持・安定が確保されている。

(b) 政策・制度面

農業が全国の生産人口の 54%を占めるタイでは、国家政策の最上位に位置付けられている第 10 次国家経済社会開発計画でも農業分野は重要視されている。この計画では、農業生産活動を通じてバランスの取れた持続性のある経済活動の再構築に重点を置いている。それに応えるために牧草種子生産の相対的な位置付けも農産物の品質や量を確保する観点から高くなっている。

また、OECD 種子スキームを始めとした国際的な品質基準への適合が農産物の輸出国であるタイに求められており、プロジェクトの成果である「牧草種子の検査及び品質管理技術開発」が果たす効果は益々重要となることが予想される。こうした状況下で AND の役割は相対意的に向上しており、政策・制度面でも AND の活動を阻害する要因は無い。

(c) 技術面

プロジェクト供与資機材が AND の運営維持管理の下、良好な状態で維持されている。また、その取扱マニュアル等を含めた技術資料が英語だけではなく、タイ語でも作成された。その結果、種子検査ガイドラインや種子検査シート等が地元の農家にも広く理解され利用されるようになり、プロジェクトの自立発展性拡大の重要な要素となっている。

また、AND 主導で実施中の休稲作地牧草種子プロジェクトにおいても、今回調査したプロジェクトの技術的知識が十分活用されていることも、自立発展性の顕著な表れといえよう。

(d) 財務面

AND の牧草育種開発のための年間予算は、農業・協同省予算総額の 0.4%以下である。しかし、近年の AND 予算は同省の予算増加に従って増加してきている。また、AND は前年度の育種開発支出額を上回る予算を毎年獲得している。このように、予算が毎年配分され、予算の範囲内で予算計画に基づいて支出されている点は自立発展性の観点から評価できる。しかしながら、予算動向を示す具体的な将来計画は発表されておらず、その先行きについて留意が必要である。

3-2 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

(a) 種子クラブ

プロジェクトに参加した AND 職員が種子クラブを通じて農家への技術移転を行っており、種子クラブの加盟農家数が増加している事実より技術的なインパクトは予想されていたものと比べて拡大していると考えられる。また、種子クラブの設立以来、農家にとって同クラブは種子生産及び開発に係る技術的な交流場所となってきた。この観点から、種子クラブの存在は、インパクトの拡大の重要な要素と評価することができる。

(b) 畜産牛の頭数増加

2003 年の狂牛病再発は牛肉業界に大きな打撃を与え、タイ国内の牛肉生産量は 2003 年から　2004 年にかけて約 4 割下落することとなった。一方、畜産牛の頭数は年々増加している。これは健康促進のための児童への牛乳配給や、西洋的食文化の浸透からチーズ・ヨーグルトなどを始めとした乳製品の消費量の増加により畜産牛の全体頭数が増加していることに起因する。この畜産牛の頭数増加は、プロジェクト上位目標達成度の指標の一つである、「牧草の生産拡大」の妥当性を引き続き高めている。

(2) 自立発展性を促進した要因

(a) 海外に輸出されるタイ産畜産製品

間接的な要素になるが、タイ政府によって進められている「世界の台所」プロジェクトも重要な要素である。このプロジェクトは、海外においてタイ料理レストランの発展とともにタイ産食品の輸出拡大を図っていく国家プロジェクトであり、安全品質が保証されたタイ産畜産製品の輸出量拡大を推し進める力にもなっている。このプロジェクトを推し進めていくために、輸出用畜産品に必要な牧草種子の国際品質の確保及びその基準管理を AND が担うことになった。その結果、本プロジェクトで移転した種子検査及び品質管理技術能力が更に活用されるようになった。

(b) 現地語での資料作成

効果的な牧草種子生産活動を実施していくために技術マニュアル及びガイドラインが英語だけではなく、タイ語でも作成された。その結果、プロジェクトの技術移転・普及を英語が理解できる一部の人だけではなく、農家まで含んだ現場レベルまで幅広く利用されることになった。これはインパクト発現に加え、自立発展性双方に寄与する要因となっている。

3-3 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

該当なし。

(2) 自立発展性強化を阻害した要因

該当なし。

3-4　結論

プロジェクトから移転された技術及び知識は C/P だけでなく、種子クラブ等をとおしてプロジェクトに参加しなかった人にも波及して広く活用されている。更にプロジェクトで準備した様々なマニュアル・ガイドラインを使っての技術トレーニングはプロジェクト終了時点と比較しても更に拡大しており、プロジェクトのインパクトは更に拡散しつつある。例えば、現在 AND が主導して実施している休稲作地牧草種子プロジェクトにおいてはプロジェクトの C/P の殆どが参加しており、プロジェクトで導入したインスペクションシートを使って良質な種子生産を行っている。供与された農業機械も十分活用されており、効率的で効果的に種子栽培面積の拡大及び種子生産量の増大に繋がっている。

自立発展性に関しては、技術面及び組織面が高く評価された。技術面では、プロジェクトで準備した技術マニュアル・ガイドラインが英語だけでなく、タイ語でも作成されたため種子生産者である種子農家まで浸透しており、自立発展性を促進する要因となった。そのため、草の根レベルの農家まで種子品質管理技術及びその重要性を効果的且つ効率的に理解してもらうことが可能になった。また組織面においては、プロジェクト終了以降今日まで、C/P の異動・離職等による人的流出が無く、移転された技術・知識を活用した種子生産活動が AND で維持されている。これらを勘案し、プロジェクト事後の評価は総じて高いと判断できる。

3-5 提言（当該プロジェクトに関する具体的な措置、提案、助言）

- プロジェクトで作成されたマニュアル・ガイドラインや、AND と種子クラブが共同で開催している技術研修プログラムは、自立発展性の確保に重要な役割を果たしてきた。将来、この自立発展性を更に維持していくためには、これらの内容及びプログラムが種子生産農家や種子市場のニーズに合せて必要に応じて改訂していくことも望まれる。
- 持続性のある牧草種子生産･開発活動の観点から、変動する畜産製品の消費需要に合せた中長期的な牧草種子の将来計画を検討し、将来の効果的な牧草種子生産・開発活動に不可欠な予算を確保することが望まれる。
- 牧草種子の品質と生産性の更なる向上のために、AND と種子クラブは引き続き強い連携を保つ必要がある。その結果、実態を踏まえ、良質飼料を引き続き十分に供給できる体制が維持されると思われる。

3-6　教訓（当該プロジェクトから導き出された他の類似プロジェクトの発掘・形成、実施、運営管理に参考となる事柄）

- 農業開発などを含めた動植物開発プロジェクトの場合、その技術的成果の評価が可能になるまで数年かかる場合がある。そのため、これらの開発プロジェクトの事後評価調査は、プロジェクト終了時から一定の時間を経過した後に実施することが望ましい。
- 現在の JICA 専門家派遣制度では通常 2 年間の派遣期間であり、プロジェクト成果を現場で一貫して確認できないことがある。そのため、現場で一貫して確認できるような工程を事前に計画したり、当該専門家の後任が確実にフォローできる体制を含めたプロジェクトの専門家配置計画に十分留意する必要がある。
- マニュアル、ガイドラインを現地語で作成することによって初めて現場レベルで活用される。そのため、農家等の現場での技術移転及び普及を行う協力案件では現地語の資料作成は大変有用である。

3-7 フォローアップ状況

なし。

1. Outline of the Project

Country： Kingdom of Thailand		Project Title： The Study on Pasture Seed Production Development Project in Northeast Thailand
Issue/ Sector： Agriculture		
Division in Charge： Livestock and Horticulture Division, Agricultural Development Cooperation Department		Cooperation Scheme： Technical Cooperation
Period of Cooperation	（R/D）： 14th August, 1999 – 13th August, 2004	Total Cost： 397,334 thousand JP yen
		Partner Country's Implementing Organization： Department of Livestock Development (DLD), Ministry of Agriculture and Cooperatives (MOAC)
		Supporting Organization in Japan： Ministry of Agriculture, Forestry and Fisheries
		Related Cooperation：

1-1 Background of the Project

In the 9th National Socio-economic Development Plan (2002-2006), the Thai government set up the Livestock Promotion Plan, in order to promote the livestock products to meet the domestic and international demand for agricultural products.

In the livestock Promotion Plan, the Thai government identified the importance of increasing high quality forage production in order to respond to the cattle population increase as well as to reduce production costs of livestock products.

The Thai government built a basic system for the purpose of supporting forage seed production for developing livestock industry. This system allocated a quota to seed production farmers for purchasing seeds and provision of seeds at free of charge to dairy farmers who newly started cattle rearing and cooperate with the government's project. Especially in Khon Kaen area of Northeast Thailand, the seed production farmers produced the 97 % of the total forage seed production in Thailand, supported by the government. The seed production farmers were eager to produce forage seeds because of its high profitability compared with rice production.

However, there were several problems faced in forage seeds production: 1) appropriate seed varieties are not developed in Thailand; 2) cultivation management, 3) inspection and the system for maintaining the quality of seed technique were not well developed; and seeds market in limited.

In order to resolve such problems, the Thai government requested the Japanese government for a technical cooperation to promote the livestock development through improvement of the forage production and utilization techniques.

1-2 Cooperation Overview

（1） Overall Goal

Appropriate forage is secured for the development of cattle rising in Thailand.

（2） Project Purpose

The techniques on production, processing, and utilization of pasture seed and appropriate forage are developed for small-scale livestock and pasture seed farmers in Northeast Thailand.

（3） Project Outputs

1) Techniques on evaluation and selection of appropriate varieties of pasture are developed.
2) Techniques on pasture seed production and post-harvest processing for registered and commercial seeds are developed.
3) Techniques on pasture seed inspection and quality control are developed.
4) Techniques on production, processing and utilization of appropriate forage are developed.

（4） Project Inputs

Japanese side：

Long term expert	7 persons	Equipment supply	8,407 thousand JP yen
Short term expert	16 persons	Local cost	3,435 thousand JP yen
No. of trainees Received in Japan	13 persons	Others	1,300 thousand JPyen

Thai side

Counterparts	20 persons
Local cost	14,950 thousand baht
Others	3,150 thousand baht

2. Evaluation Team and Period

Members	Evaluation/ Analysis	Minoru Fujii RECS International Inc.
	Assistant Researcher	Thanyatorn Singrueng Kokusai Kogyo (Thailand) Co., Ltd.
	Technical Support	Sucheewan Yoyrurob Kokusai Kogyo (Thailand) Co., Ltd

Period of Evaluation 1st/October/2006～30th/January/2007	Type of Evaluation Ex-post Evaluation

3. Results of Evaluation

3-1 Summary of Evaluation Results

(1) Impact

(a) Achievement of the Project overall goal

Because new pasture seed varieties takes at least three years to be evaluated, the Study could not confirm their results. It is essentially desirable to evaluate these varieties from the viewpoints of local adaptability and specific characters, after three years from their breeding development.

However, The pasture seeds newly introduced by the Project took a firm hold on the local situation in Thailand from 2004 to 2007. Besides, according to a statistical data from 2004 to 2006, the crop of animal food production as Thailand's supply sufficiently exceeded expectations of Thailand's demand planned by the AND program. Therefore, the achievement of the overall goal has continuously been realized since the Project termination because the supply obviously fulfilled the demand in Thailand, based on the comparison between the production plan and actual crop.

From this analysis, the achievement of overall goal since the Project termination has continuously been realized.

Cultivated Area of New Varieties 2004-2007

Species	Cultivated Acreage (Rai)			
	2004	2005	2006	2007(forecast)
Panicum maximum	1,719	3,008	5,826	12,164
Brachiaria ruziziensis	1,353	4,804	6,941	7,614
Stylosanthes guianensis	447	122	57	200
Stylosanthes hamata : cv. Verano	507	366	589	942
Centrosema pascuorum: cavalcade	249	170	341	367
Total	4,275	8,470	13,754	21,287

＊1 Rai = 0.16 ha

Planed and Actual Crop of Pasture Seeds

Item	Planned Production (t)			Actual Production (t)		
	2004	2005	2006	2004	2005	2006
Hay	5,300	4,475	4,750	5,387	5,022	5,879
Silage	550	885	697	1,204	1,053	1,275
Forage	3,090	3,090	3,003	4,855	4,995	5,563
Total	8,940	8,450	8,450	11,446	11,070	12,717

(b) Technical Impact

The techniques and knowledge of the Project are widely utilized by C/P personnel and their organizations. In addition, technical manuals produced by the Project have been widely spread through their use by persons who did not join the Project. From this point of view, the technical impact realized in the Project period is kept alive and influences the achievement of the Project overall goal.

A notable Project impact not anticipated at the time of the Project termination is the Paddy pasture project (Paddy project) being implemented under the AND initiative. For the Paddy project, most of the AND personnel who joined the Project have been working for the Paddy project. As a result, techniques/knowledge and manuals/guidelines transferred from the Project have been utilized by the AND personnel for the Paddy project. Moreover, resulting from the fact that the manuals/guidelines were produced not only in English but also in Thai, they have widely been utilized not only by AND personnel with a command of English but also by other AND personnel and seed production farmers

Moreover, much of the equipment supplied by the Project has been used for the Paddy project as well. These events have also contributed the expansion of the Project impact.

(c) Institutional Impact

There has been no particular change in institutional improvement and efforts to ensure an increase in forage production since the Project termination. It, however, should be remarked that the expansion of the number of members of the Seed Production Farmers' Club (Seed Club), which was operationally supported by the Project during its implementation period, could influence its relative position among the pasture seed production organization. This is because the Department of Livestock Development (DLD) and Animal Nutrition Department (AND) have been able to reflect seed farmers' opinions and the existing conditions of seed production activities in the field effectively through the Seed Club. As a result, the improvement of the seed quality has effectively been enhanced in Thailand.

*The Seed Club was established in 2003 mainly by seed farmers in the Northeast, the Thai major seed production area. Since its establishment, the seed production crops and prices have got to be determined through the club's meetings according to the market situation. Then, it has contributed to the independence and sustainability of the farmers. Besides, the Seed Club has promoted pasture seed production and development activities to the farmers, while cooperating with AND.

(d) Economic and Financial Impact

As a whole, the supply of AND's crop product exceeds demand. Under this circumstance, AND regulated the crop production through the Seed Club, which reserved pasture seed as stock, and eventually sold these reserves to other countries.

(e) Environmental and Social Impact:

As for the terminal evaluation on the Project, the terminal study concluded the positive impact on the local environment such as the reduction of hard labor required for traditional methods and the reduction of dust pollution associated with operation of old-model machines. The Study could also confirm these impacts were still kept alive in the practical fields of pasture seed and forage production.

(2) Sustainability

(a) Organizational Aspects

In terms of the organization, the present sustainability can be secured thanks to the lack of outflows, such as personnel changes and job separations of the Project trained C/P, since the Project termination.

(b) Political Aspects

In Thailand, the agricultural industry occupies 54% of the overall industrial population, and so the 10th National Economic and Social Development, ranked as the highest national policy in Thailand, puts a special emphasis on the agricultural industry. This plan put a special emphasis on "economic restructuring for balanced and sustainable development". To deal with the reconstruction, the relative position of pasture seed production has recently risen from the viewpoint of securing the quality and quantity of agricultural products.

Besides, since the international standard of OECD Seed Scheme required of Thailand as an agricultural exporting country, greater importance and effectiveness of the Project output "Techniques on pasture seed inspection and quality control are developed" is anticipated. Under this circumstance, AND's functions have relatively risen, and there are no factors inhibiting AND's activities in terms of political aspects.

(c) Technical Aspects

The availability of the equipment can be sustained by the control and maintenance of AND in good condition. Besides, various technical materials including equipment operational manuals were produced not only in English but also in Thai by the Project. As a result, the materials, such as seed inspection guidelines and seed inspection sheets, have been understood and widely used by local farmers. This point has also been an important factor for the expansion of the Project sustainability.

The technical knowledge and skills have also been applied sufficiently for the AND-led Paddy project. As a result, further maintenance of the technical sustainability has been possible through the Paddy project.

(d) Financial Aspects

Although the budget rate for the forage breeding development is still less than 0.4% of the Ministry of Agriculture and Cooperatives (MOAC) total budget, the recent AND budget has steadily increased depending on its upper level budgets. Moreover, AND has received certain budgets over the expenditures of the previous years for its forage breeding development activities. Moreover, the budgets have been distributed every year, and they have been expended within limits according to their plans. These facts can also be evaluated well from the viewpoint of sustainability.

However, a future plan to increase the budget trend is still unannounced for the development and so it is unclear. This is a point of concern.

3-2 Factors that have promoted the Project

(1) Impact

(a) Seed Club

Since the technical transfer by participating AND personnel took place, the impact of the Project has spilled over to seed farmers via the Seed Club beyond expectations of the organizers. Besides, the establishment of the Seed Club has acted as a community body for the farmers in technical terms and, as a result, the existence of the Seed Club can be defined as one of the significant factors in the expansion of the Project impact.

(b) Increase in the number of livestock cattle

A return of the mad cow disease in 2003 dealt a serious blow to the beef industry. As a result, a decrease in Thailand's domestic production of beef of approximately 40% was seen from 2003 to 2004. On the other hand, the number of livestock cows has annually risen. This is because the number of youths enjoying dairy products has dramatically increased recently through a milk supply program to pupils at primary schools, and the recent popularization of western-style dietary life and culture among young people. This increase in livestock cattle has contributed to an objective verifiable indicator of the achievement of the Project overall goal.

(2) Sustainability

(a) Thai made products exporting to the world

Although indirect in nature, "Kitchen of the World" promoted by the Thai government is also a notable factor. This is a national project which aims at promoting the export of safety-guaranteed Thai food products, together with the development of overseas Thai restaurants. So, this project has also been a promotional force in the expansion of exporting Thai livestock

products. For the progression of the project, AND has recently been required to secure pasture seeds at an international quality level and to control the quality standard for export livestock products. As a result, the technical capacity of seed inspection and quality control transferred from the Project has been more fully utilized.

(b) Material production in the local language

For the effective implementation of pasture seed production activities, technical manuals and guidelines were produced not only in English but also in Thai by the Project. As a result, these materials have been widely accepted not only by those with a command of English but also others, including farmers at the field level. This is also a factor of the Project sustainability in addition to the technical impact.

3-3 Factors that have inhibited the Project

(1) Impact

Nothing in particular.

(2) Sustainability

Nothing in particular.

3-4 Conclusion

The technical skills and knowledge transferred from the Project have widely been used not only by the Project C/P but also by persons who did not join the Project. Furthermore, technical training with various manuals and guidelines arranged by the Project have been increased in comparison with the time of the Project termination, and so, the Project impact has been further expanded. In the Project, a recording system was introduced for objective and systematic seed quality testing and controlling. Today, most of the Project C/Ps participate in the AND-led Paddy project, and this system is fully applied for the production of good quality seeds. Moreover, the existence of the Seed Club has contributed to the expansion of the Project impact. As a result, the efficient and effective production of good quality seeds has been possible, and it has strengthened the realization of the Project overall achievement.

As for the Project sustainability, technical and organizational aspects were highly evaluated. In terms of the technical aspects, technical references and materials were arranged not only in English but also in Thai by the Project. So, they have widely penetrated grass-roots farmer levels, and it has efficiently and effectively been possible for the framers to understand seed quality control techniques and their importance. This event has been a factor to further accelerate the Project sustainability.

As for organizational aspects, there have been no personnel outflows from the C/P side since the Project termination. So AND still maintains seed production activities using techniques and knowledge transferred from the Project. As a result, these techniques and importance have continuously been transferred from the C/P to farmers, and this has highly contributed to maintain the Project sustainability.

This Study could not confirm the output of news seed breeding varieties defined as one of the indicators to achieve the overall goal, but it could confirm the expansion of cultivated acreage and the growth of seed production crop. So, the Study concluded with high evaluation results of the Project as a whole. To sustain these high results, it is required to continue the technical transfer to persons concerned with the activities of pasture seed production and development. For that, strengthened

future cooperation between AND and the Seed Club is essential. On the other hand, there is no detailed future plan dealing with an effective pasture seed development. Therefore, AND needs to produce its detailed future strategy under its role as a practical implementing organization with the political assistance of DLD as AND's supervising organization.

3-5 Recommendation

- Technical manuals and guidelines produced by the Project and technical training workshops jointly held by AND and the Seed Club have taken an important role to secure the Project sustainability. In order to maintain this sustainability in the future, it is desirable that these contents and programs are revised according to the needs of seed farmers and the seed market whenever necessary.
- The planning of mid and long term strategies for pasture seed supply are necessary, while considering variable consumptive demand for livestock products from the viewpoint of sustainable pasture seed production and development activities. As a result, it will be possible to secure budgets essential for effective seed production and development activities in the future.
- For the enhancement of pasture seed quality and productivity, AND needs to sustain a strong partnership with the Seed Club. As a result, the sufficient supply of good quality forage necessary for the Thai livestock promotion can stably be continued.

3-6 Lesson Learned

- In terms of flora and fauna development projects including the agricultural field, the exact evaluation of their technical outputs can take several years. Therefore, it is desirable to carry out ex-post evaluation studies for such as development project after a certain period from their project terminations.
- At present, the dispatch term of JICA experts is generally two years at most, so they often cannot consistently confirm the outputs themselves. Therefore, a plan in which the experts can confirm needs to be considered in advance, or more attention paid to follow-up schedules carried out by their successors.
- Technical manuals and guidelines can eventually be utilized at the field level by producing them in the local language. Therefore, such as material production in the local language is very useful for technical cooperation projects with the activities of technical transfer and promotion to farmers in the field.

3-7 Follow-up Situation

No follow-up programs have yet been carried out by the Japanese side since the Project termination in 2004.

1 The Outline of the Ex-post Evaluation

1.1 Background and the Purpose of the Project

The Japan International Cooperation Agency (hereinafter referred to as "JICA") Thailand Office has decided to conduct an ex-post evaluation study (hereinafter referred to as the "Study") on the "Pasture Seed Production Development Project in Northeast Thailand" (hereinafter referred to the "Project") which was terminated over two years ago in August, 2006. The results of the Study will contribute to better-informed decision-making and will be shared with the Department of Livestock Development of the Ministry of Agriculture and Cooperatives of Thailand. The Main purposes of the Study are as follows;

1. To evaluate and confirm the impact and sustainability of the projects after a certain period has passed since the completion of the projects.

2. To derive lessons and recommendations for the improvement of JICA country Programs and for the planning and implementation of more effective and efficient projects.

3. To ensure accountability to tax payers through producing reports in both electronic and printed forms.

1.2 Evaluation Team and the Study Period

1.2.1 Evaluation Team

The Study was surveyed by the following members.

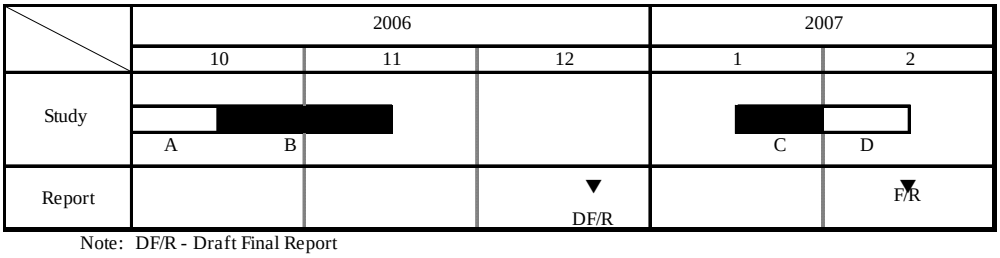
Table 1-1: Member List of Study Team

No.	Name	Duty	Nationality
1	Mr. Minoru FUJII	Evaluation Analysis	Japanese
2	Ms. Thanyatorn SINGRUENG	Assistant Researcher	Thai
3	Ms. Sucheewan YOYRUROB	Technical Support	Thai

1.2.2 Study Period

The Study was carried out according to the following schedule.

Table 1-2: Study Period



Note: DF/R - Draft Final Report
F/R - Final Report

The outline of the study work is below.

Table 1-3: Outline of the Study

A	Preparation of evaluation grid and questionnaire	1 – 14 October, 2006
B1	First study period including distribution of questionnaire, interview and field trip	15 October – 15 November, 2006
B2	Compiling of draft evaluation and draft final report	
C1	Second study including supplementary survey	15 – 30 January, 2007
D	Compiling of Final Report	1 – 15 February, 2007

1.3 Outline of the Project

The outline of the Project is summarized in the table shown below.

Table 1-4: Outline of the Project

Country	The Kingdom of Thailand
Project Title	Pasture Seed Production Development Project in Northeast Thailand
Project Overall Goal	Appropriate forage is secured for the development of cattle raising in Thailand
Project Purpose	The techniques on production, processing, and utilization of pasture seed and appropriate forage are developed for small-scale livestock and pasture seed farmers in Northeast Thailand
Project Outputs	1) Techniques are developed for evaluation and selection of appropriate varieties of pasture. 2) Techniques are developed for pasture seed production and post-harvest processing for registered and commercial seeds. 3) Techniques are developed for pasture seed inspection and quality control. 4) Techniques are developed for production, processing and utilization of appropriate forage.
Issue/ Sector	Agricultural development
Cooperation Scheme	Technical Cooperation
JICA Division in Charge	Livestock and Horticulture Division, Agricultural Development Cooperation Department
Implementing Organization in Thailand	Department of Livestock Development (DLD) , Ministry of Agriculture and Cooperatives (MAOC)
Supporting Organization in Japan	Ministry of Agriculture, Forestry and Fisheries
Period of Cooperation	14 August, 1999 ~ 13 August, 2004

2 Study Methods

2.1 Stakeholders and Information/ Data Collected

Table 2-1: Target Counterpart Organization and Information

Target	Information / data collected
Department of Livestock Development (DLD) - Animal Nutrition Division (AND) - Animal Nutrition Research and Development Center (ANRDC) - Animal Nutrition Station (ANS)	• Related material reviews, • Questionnaire • Interview

2.2 Study Methods

The following methods were mainly used for the purposes of the study.

1) Related material reviews

2) Questionnaires

3) Interviews

The Study team initially started its survey from the collection of materials related to the Project. The collection for the Project's overall goal and purpose was based upon a material review related to the Project. After confirming those through the collected materials, the Study team went on to the works for the preparation of questionnaires to be distributed to DLD personnel as listed in the table in Chapter 3.2.1 "Current status of counterpart personnel", while focusing especially on the impact and sustainability of the five evaluation criteria described below.

The five evaluation criteria are part of a basic evaluation method set by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) to evaluating project achievements. All of the JICA projects are presently evaluated by means of this evaluation method.

In terms of the Study, it focuses mainly on two of the five evaluation criteria: which are "*impact*" – which is expected to appear a certain period of time after the end of the project, and "*sustainability*"- where evaluators look at whether the effect is continually produced after the end of the project. Up to the Project terminal evaluation, these criteria were always examined on the basis of their prospects, but in the ex-post evaluation, they are examined on the basis of performance.

Table 2-2: Main Checkpoints of Ex-post Evaluation

Impact	The impact of the Project is assessed by measuring either positive or negative influences made by the Project, which are not originally expected in the Project plan.
Sustainability	The sustainability of the Project is assessed by organizational, technical and financial aspects by the extent to which the achievements of the Project are sustained or expanded after the Project is completed.

The Study team eventually produced the Study results through the methods above, and released recommendations and lessons learned to contribute to JICA's efforts on technical cooperation projects in the future.

3 Study Results

3.1 Impact of the Project

3.1.1 Achievement of the Overall Goal

The Project overall goal "Appropriate forage is secured for the development of cattle raising in Thailand" will be evaluated based on the facts and findings identified through the Study. Each section, as follows, describes important indicators for the degree of achievement of the overall goal.

a. Variety of Production Crop

The availability of pasture varieties suitable for local conditions is indispensable for the continuous realization of impacts, which have been originally generated from the project and essential to achieve the overall goal of the Project.

During the Study, the Study team faced difficulties to evaluate the completion of the crop development, which was due to the duration after the termination of the Project, from the viewpoints of local adaptabilities and specific characters. Normally, the new pasture seed varieties can be precisely evaluated after at least three years, or five years in general.

Therefore, the completion of newly developed crop varieties is evaluated based on the current status of crop utilization cited from AND statistical data by the Study team.

Table 3-1: Current Status of Production Crops

Species (Place)	Possible impact	Findings
Panicum maximum (KKANRDC)	Can not be confirmed exactly	Breeding was stopped by the Project. No breeding was done following Project termination. Production crop was controlled by AND decreased from 326,651 kg in 2004 to 283,398 kg in 2005, but it is estimated to rise over 639,000 kg in 2006. Although the possibility that it occurred due to uneven weather conditions in Thailand cannot be denied for this production fluctuation, this contains unstable factors which may hinder a sustainable increase in the seed production crop. Considering this matter, it may rightly be evaluated that the JICA experts of the project decided to stop this breeding program.
Brachiaria ruziziensis (NRANRDC)	Positive	Continuous breeding work was suggested by the Project following Project termination. The continuation of the breeding work was also seen in the Study. Moreover, AND's statistical data also showed an increase in this seed production crop, and therefore, the technical sustainability of this grass could be confirmed in the Study.
Stylosanthes guianensis (KKANRDC)	Positive	Continuous breeding work was suggested by the Project following Project termination. The continuation of the breeding work was also seen in the Study. Moreover, AND's statistical data also showed an increase in this seed production crop, and therefore, the technical sustainability of this grass could be confirmed in the Study.
Stylosanthes hamata :	Positive	Continuous breeding work was suggested by the Project following Project termination.

Species (Place)	Possible impact	Findings
cv. Verano (MANDS)		The continuation of the breeding work was also seen in the Study. Moreover, AND's statistical data also showed an increase in this seed production crop, and therefore, the technical sustainability of this grass could be confirmed in the Study.

KKANRDC: Khon Kaen Animal Nutrition Research and Development Center
MANDS: Mahasalakham Animal Nutrition Development Station
NRANRDC: Nakorn Ratchasima Animal Nutrition Research and development Center

b. Cultivated Area of New Varieties

According to AND statistical data presented in Table 3-2, the cultivated area of new varieties has the tendency of increase during 2004 to 2006.

Table 3-2: Cultivated Area of New varieties 2004 – 2007

Species	Cultivated Acreage (Rai)			
	2004	2005	2006	2007
Panicum maximum	1,719	3,008	5,826	12,164
Brachiaria ruziziensis	1,353	4,804	6,941	7,614
Stylosanthes guianensis	447	122	57	200
Stylosanthes hamata : cv. Verano	507	366	589	942
Centrosema pascuorum: cavalcade	249	170	341	367
Total	4,275	8,470	13,754	21,287

Note: 1 Rai = 0.16 ha
Sources: AND Annual Report 2006 and AND Production Plan 2007

c. Planned and Actual Yield of Pasture Seed Product

AND, as a responsible implementer to control pasture seed and animal food production in Thailand, has been conducting their pasture seed production activities. As shown in Table 3-3, the crop of animal food production as Thailand's supply quantitatively exceeded planned production set forth by AND as Thailand's demand.

Therefore, the supply obviously fulfilled the demand in Thailand, based on the comparison between the production plan and actual crop.

Table 3-3: Planed and Actual Crop

Item	Production (t) Plan			Production (t) Actual		
	2004	2005	2006	2004	2005	2006
Hay	5,300	4,475	4,750	5,387	5,022	5,879

Item	Production (t) Plan			Production (t) Actual		
	2004	2005	2006	2004	2005	2006
Silage	550	885	697	1,204	1,053	1,275
Forage	3,090	3,090	3,003	4,855	4,995	5,563
Total	8,940	8,450	8,450	11,446	11,070	12,717

Source: AND Statistical data 2006

d. Conclusion

Because new pasture seed varieties takes at least three years to be evaluated, the Study could not confirm their results. However, The pasture seeds newly introduced by the Project took a firm hold on the local situation in Thailand from 2004 to 2007. Moreover, from 2004 to 2006, the crop of animal food production as Thailand's supply sufficiently exceeded its planned production set forth by AND as Thailand's demand.

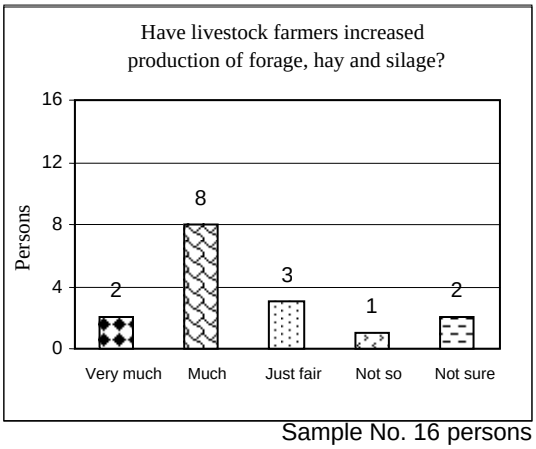
Therefore, the achievement of the overall goal has been continuously realized since the Project termination because the supply obviously fulfilled the demand in Thailand, based on the comparison between the production plan and actual crop.

From this analysis, it can be said that the achievement of the overall goal since the Project termination has continuously been realized.

3.1.2 Technical impact

a. Production of Animal Food

As described in the previous section, the amount of forage, hay and silage production has been increasing statistically. Proving this fact, most of the respondents of a questionnaire survey to 16 counterparts of AND, as detailed according to name and position in Table 3-5, rated the increase of their production as "much" or "very much", as shown in Figure 3-1.

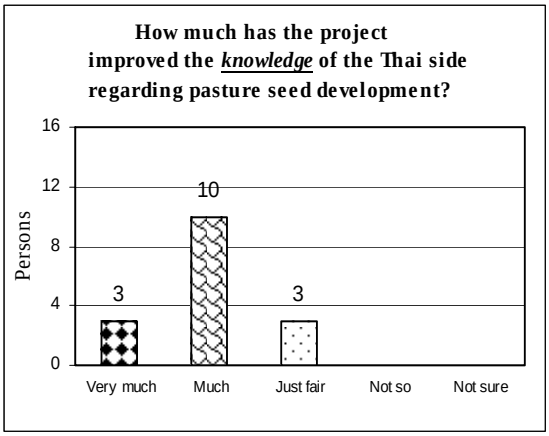


Sample No. 16 persons

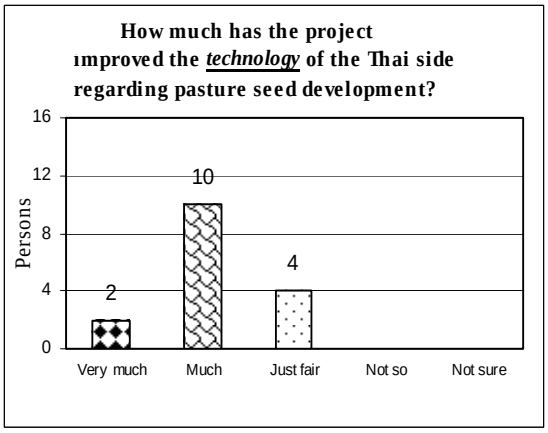
Figure 3-1: Questionnaire Survey Result 1

b. Relevance in Pasture Seed Development

The Study team acknowledged through their field visit that the questionnaire survey result might be supported by the great deal of relevance in pasture seed development such as seed quality evaluation and inspection tests, including regional adaptability and specific characters test. Moreover, the following two figures support the relevance of knowledge and technology transferred from the project, which are duly utilized in their respective areas of seed development.



Sample No. 16 persons



Sample No. 16 persons

Figure 3-2: Questionnaire Survey Results 2

c. Availability of Various Manuals

During the Project, several manuals for various activities, such as for field testing, breeding, evaluation, etc., were prepared in both English and Thai, in collaboration with Japanese experts and Thai C/Ps. Examples of the manuals are as follows: “Manual on Pasture Seed Field Inspection for Registered Seeds”, “Testing Manuals of Pasture Seed Quality in Controlled Plot Test” and “Field Inspection Sheets on Appropriate Seed Quality”. These manuals are utilized even now, not only by those having command of English within AND, but also other AND staff and local farmers.

This contributes technology and knowledge transferred to C/Ps, which is shared widely amongst them. These contributions are currently realized through regular technical training, specifically 10 times in the year of 2006, organized by AND regional stations of the northeast area of Thailand.

d. Conclusion

The techniques and knowledge of the Project are widely utilized by C/P personnel and their organization. In addition, technical manuals produced by the Project are dispersed further through their extensive use by persons who did not join the Project. From this point of view, the technical impact realized in the Project period is kept alive, and this has influenced the achievement of the Project’s overall goal.

3.1.3 Institutional impact

a. Pasture Seed Club

Individual effort and development by seed production farmers themselves was recognized significantly during the field visit and helped establish the Seed Producer Farmers Club (hereinafter, the "Seed Club") in order to raise the value of their seed products competitively in a market.

The number of farmers participating in the Seed Club has been increasing year by year as shown in Table 3-4.

Table 3-4: No. of seed production farmers participating in the Thailand Pasture Seed Producers Club and Total Area 2004-2007

Year	2004	2005	2006	2007(estimated)
No. of farmers	2,793	2,777	3,015	4,185
Total area (ha)	1,441	1,960	2,663	3,788

Source: AND Statistical data 2006

The Seed Club was initiated by the Thai side with the support of the project and originally managed among three parties of AND, farmers and the project. During the Project period, budget allocations were insufficient for the activities. Therefore, the Project supported them by providing an in kind rental service of equipment.

The Project has also transferred technical skills and knowledge such as evaluation and inspection techniques to the Seed Club as described in 3.1.2c. Moreover, the Seed Club has provided the opportunity for farmers to share seed market information concerned with seed production and development activities necessary for livestock promotion through workshops.

The annual holding number of the workshops has been increased. Today, the workshop is held five times a year in cooperation with AND. In the workshops, policies and regulations concerned with seed quality standards are shared with farmers through lectures from AND personnel. Furthermore, AND releases the latest seed market information, such as unit prices, which is shared among farmers.

With these cooperative events above, the Seed Club today acts as a seed production information center for farmers. As a result, DLD and AND can effectively concentrate on creating political and field action plans for further seed production and development.

What is the Thailand Pasture Seed Producers Club?

In the past, the Thai government adopted a quota system that the government purchased seeds from farmers in a pre-determined crop at a pre-determined price. However, this system discouraged the independency and sustainability of seed production farmers' activities. So, the Thailand Pasture Seed Producers Club (Seed Club) was set up in 2003 under the government's direction. Under this new system, the roles of the government became only limited functions such as supplying registered seeds, inspecting and certifying seeds produced by farmers. Meanwhile, the seed production crops and prices got to be determined through the club's meetings according to the market situation. In other words, the farmers have been able to have the right of independent determination through the Seed Club, and the independency and sustainability of the farmers has accelerated since the establishment of the Seed Club in 2004. The Project pointed out such as problems associated with the quota system and suggested its reform since the Project commencement.

b. Conclusion

There has been no particular change in institutional improvement and efforts to ensure an increase in forage production since the Project termination. However, it should be remarked that the member expansion of the Seed Club, which was operationally supported by the Project during its implementation period, could influence its relative position among the pasture seed production organization. This is because DLD and AND have been able to reflect seed farmers' opinions and the existing conditions of seed production activities in the field immediately through the Seed Club. As a result, the improvement of the seed quality has effectively been enhanced in Thailand.

3.1.4 Economic and financial impact

As a whole, the supply of AND's crop product exceeds demand, as described in 3.1.1.c. Under this circumstance, AND has regulated crop production through the Seed Club, which was able to reserve pasture seed as stock, and eventually sold these reserves to other countries. For the exporting trade, AND has been required for further development and continuous production of good quality seeds. Then, such activities by AND have sparked continuous export trades.

As a result, this cycle has expanded economic and financial impacts in their local areas. These impacts have relatively been enlarged when compared to conditions during the Project period.

3.1.5 Environmental and social impact

As for the terminal evaluation on the Project, the terminal study team identified the positive impact on the local environment based on two indicators shown below.

- Saving of hard labor required for traditional methods, and,
- Reduction of dust pollution associated with operation of old-model machines

The favorable condition of procured equipment was physically confirmed during the field visit by the Study team and the members of the Seed Club have made good use of this equipment in cooperation for their production works. This circumstance is unchanged as identified in the terminal evaluation. Therefore, the two impacts specified above are still kept alive in the practical fields of pasture seed and forage production.

3.1.6 Impact not Anticipated at Project Completion

The impact from most of the Project inputs has spread to other individuals or organizations largely as expected. In particular, the knowledge and technologies transferred from the Project seem to be passed over quite rapidly through daily operations and other occasions, such as self-organized workshops and training sessions, according to the result of the questionnaire and interview surveys.

Another event to report in this section is a pasture project AND has been organizing called the Paddy Pasture Project (hereinafter, "Paddy project") with the same Project C/P members through its preparatory period from 2002 until 2004. Under the livestock theory that a higher quality forage can produce a higher income thorough efficient livestock productivities, the Paddy project aims to increase dairy and beef productivity, while decreasing their production costs, for additional income sources of farmers by producing forage such as hay and silage, known as "paddy pasture", instead of my means of rice and regular cash crops .

The Paddy project has several notable characteristics. For example, the Paddy project has adopted all the seed varieties selected by the Project, and approximately 30% of the seeds have been supplied from the Seed Club. Furthermore, the Paddy project has adopted technical manuals, such as seed inspection sheets, training manuals for farmers on production, operation and utilization of pasture seed varieties, and instructing manuals on pasture seed management techniques prepared by the Project for field activities.

By means of the technical materials and human resources of the Project, the Paddy project was able to produce a total gross benefit from 2002 until 2005 of 250 million baht, and farmers earned agreeable income from their growing pastures.

This impact was not anticipated at the Project termination, but it is a reportable as a derivation from the Project activities.

3.2 Sustainability

3.2.1 Organizational Aspect

a. Current Situation of Counterpart Personnel

During the study, 16 C/P personnel (of 22 as total number of C/P) were contacted for the questionnaire and interview surveys. As the result of the questionnaire survey, it was confirmed that all of them worked under the same responsibility as shown in the table below.

This condition, in which many C/P personnel still work under the same responsibility, could ensure the availability of knowledge and technology transferred by the Project, and contribute to the sustainability of the project effect.

There is no particular change in the organizational structure (Annex 1) of AND and DLD.

Table 3-5: List of Counterpart Personnel

(In no particular order)

Name		Position during the Project period
1	Mr. Chirawat Kemsawat	Director of AND
2	Mr. Somjit Intaramanee	Director of Khon Kaen ANRDC (also as the Project Manager during the Project period)
3	Mr. Jaroonroj Chantarasiri	Director of Lampang ANRDC
4	Mr. Suppachai Udchachon	Director of Nakhon Ratchasima ANRDC
5	Mrs. Chaisang Pailaew	Senior Expert on Animal Nutrition

	Name	Position during the Project period
6	Mr. Sarayut Thaikua	Scientist
7	Mrs. Pimpaporn Pholsen	Scientist
8	Mrs. Sasithon Thinnakorn	Scientist
9	Mrs. Walaikan Jeamjedijarun	Scientist
10	Miss Jantrakan Orananan	Scientist
11	Mr. Thamrongsakd Phonbumrung	Animal Husbandry Researcher
12	Mr. Samran Wijitraphan	Animal Husbandry Researcher
13	Mrs. Ganda Nakamanee	Animal Husbandry Researcher
14	Mr. Thaweesak Chuenprecha	Animal Husbandry Researcher
15	Mr. Wittaya Sumamal	Animal Husbandry Researcher
16	Mr. Weerasak Chinosaeng	Animal Husbandry Researcher

AND – Animal Nutrition Division
ANRDC – Animal Nutrition Research and Development Center
ANS – Animal Nutrition Station

b. Conclusion

In terms of the organizational aspects, the present sustainability can be secured by no outflows such as personnel changes and job separations of the Project trained C/P since the Project termination.

3.2.2 Political Aspects

a. 10th National Socioeconomic Plan

The Thai government recently released its 10th National Economic and Social Development Plan (2007 – 2011) this past October. This plan is ranked as the highest national policy in Thailand, and it includes the strategy emphasizing "economic restructuring for balanced and sustainable development". The restructuring programs for agricultural activities are prepared under this structure. One of the main objectives focuses on the promotion of the Thai agricultural products over the world known as the "Kitchen of the World" project. Livestock products of beef and pork will be further strengthened, while currently the export of poultry products from Thailand leads the world market.

Under this circumstance, the effective food production for livestock becomes a more important factor in order to increase exports from Thailand.

b. Policies for Quality Control (OECD Seed Scheme)

Presently, there are various international standards for different products. Unless producers respect these standards, they can not sell their product in markets where a particular quality standard has been adopted. Therefore, DLD and AND as policy makers have installed several policies, as described below.

AND has been selling pasture seeds produced under OECD Seed Schemes since 2004, not

only in Thailand but also in foreign countries. In order to meet the quality standard required in other countries, AND had to employ this international standard of seed quality. Therefore, finally, AND has installed the internationally qualified standard as Seed Scheme of OECD. This requires an applicant to adapt and fulfill various conditions of their products.

c. Conclusion

In Thailand, the agricultural industry occupies 54% of the overall industrial population, and so the 10th National Economic and Social Development puts a special emphasis on the agricultural industry. Moreover, the relative position of pasture seed production has recently risen from the viewpoint of securing of the quality and quantity of agricultural products.

Moreover, since the international standard of OECD Seed Scheme is required to Thailand as an agricultural exporting country, it is anticipated that the effectiveness of a Project output "Techniques on pasture seed inspection and quality control are developed" should be more important. Under this circumstance, AND's functions have relatively risen, and there are no factors inhibiting AND's activities in terms of political aspects.

3.2.3 Technical Aspects

a. Effective Use of Equipment

The list of equipment and their present condition is attached in Annex 4. Most of the equipment supplied by the Project is still used in good condition today.

These machines and materials have been controlled and maintained by AND since the Project termination by following their operational and maintenance manuals. Some consumption articles such as chemical solutions and pH liquid materials for pasture seed testing were already consumed, but Thai counterparts intends to promptly refill them when necessary.

b. Technical Materials

The Project produced various technical materials such as technical manuals, guidelines and inspection sheets, not only in English but also in Thai. For example, the Project produced the useful techniques for the forage production manual, the hay-making and silage-making techniques manual, the instructions on pasture management techniques and silage-making techniques, the manuals on forage production, processing and utilization, and field inspection sheets.

Since the Project produced these manuals in both English and Thai, the technical ideas of the manuals and guidelines have been spread among seed farmers. As a result, AND could widely utilize the materials among farmers at the grassroots level for sustainable technical expansion.

In terms of the inspection sheet systems, the systems have been introduced into another AND project, the Paddy pasture project operated since 2002, and the systems have worked for the effective and efficient activities of the project. In the Paddy project, other manuals such as the pasture plant regional adaptability test, field inspection standards, seed field and post-harvesting management, and seed quality standard guidelines have also been utilized by farmers with AND instructions. The details of the Paddy pasture project are explained in 3.1.6.

The following sheets are English samples from the pasture plant regional adaptability test which has been adopted for the Paddy project.

Reporting Form (NO.1) for Pasture Plant Regional Adaptability Test

1. Experimental Field

Center/Station : ______________________

Address : ______________________

Altitude : ________ m - Average temperature : _____ °C Annual precipitation : ______ mm

Paddy or Upland : ________ (Soil moisture : Wet, Medium, Dry) Soil property : ________

Remarks : ______________________

2. Experimental Methods

Seeding : date __________ month : __________ year : __________

Plot and Replications : __________ m^2 (______ m x ______ m ; width ______ cm)

Harvest __________ m^2 Replications __________

Strains and seeding density

1) ______________________ ______ g/m^2

2) ______________________ ______ g/m^2

3) ______________________ ______ g/m^2

4) ______________________ ______ g/m^2

5) ______________________ ______ g/m^2

6) ______________________ ______ g/m^2

Fertilizer (kg/rai)

	Basal	Top dressing 1	Top dressing 2	Top dressing 3	Top dressing 4	Total
Date						
N						
P_2O_5						
K_2O						

Lime : __________ Manure : __________

Cutting stage : 1st cutting when __________ grow to plant height __________ cm

and the head emergence stage for the aftermass cutting

Cutting tool : __________ Cutting height : __________ cm

Researcher 's name : ______________________

Reporting Form (NO.2) for Pasture Plant Regional Adaptability Test

Name of strain		Germinating date	Seed germination (score1 – 5)	Early growth (score1 – 5)	Regrowth (score 1:poor – 5:very good)					
					1st Cut	2nd Cut	3rd Cut	4th Cut	5th Cut	Ave
Investigating date										
	1									
	2									
	3									
	4									
	5									
	6									
	Ave									
	1									
	2									
	3									
	4									
	5									
	6									
	Ave									
	1									
	2									
	3									
	4									
	5									
	6									
	Ave									
	1									
	2									
	3									
	4									
	5									
	6									
	Ave									

Figure 3-3 Reporting Forms for Pasture Plant Regional Adaptability Test

The Paddy project has been introducing systematic reporting systems during its operation activities since its commencement. For example, the Paddy project has been copying how to report what kinds of fertilizers and how many kilograms of them have been used, when the first cutting silage was done with tool names for the cutting and germination information, such as date and growth scores, following generally filed information such as testing area, date and weather condition.

Through the systematic systems, AND has been able to implement the Paddy project efficiently without the conventional random inspections carried out by different persons.

c. Conclusion

The availability of the equipment in good condition can be sustained by the control and maintenance of AND. Moreover, various technical materials, including equipment operational manuals, were produced not only in English but also in Thai by the Project. As a result, the materials, such as seed inspection guidelines and seed inspection sheets, have been understood and widely used by local farmers. This point has also been an important factor for the deepening of Project sustainability.

3.2.4 Financial Aspects

a. Recent % of AND forage breeding development budget to other upper levels

The following table presents the Thai national, Ministry of Agriculture and Cooperatives (MOAC), DLD and AND budgets from 2004 until 2007.

(million Thai baht)

Year	2004	2005	2006	2007
National	1,163,500	1,250,000	1,360,000	1,566,200
MOAC	53,226.4	52,409.9	55,639.9	65,425.4
DLD	3,058.8	3,017.6	4,015.3	6,476.0
AND[1)]	173.4	178.5	209.0	N/A[2)]

Note: 1) AND budget is almost for forage breeding development.
2) AND budget in 2007 is not yet released.
Sources: Data of the Bureau of the Budget and AND Annual Report 2006

From the table above, it can be seen that although the budget rate for the forage breeding development is still less than 0.4% of the MOAC total budget, the recent AND budget has steadily risen depending on its upper level budgets.

b. Recent budget and expenditure for forage breeding development

In addition, according to AND's financial data, AND's financial budget and expenditure for the activities of forage breeding development from 2004 until 2006 are as follows.

Table 3-6: Annual Budget for AND forage breeding development

(Thai baht)

2004		2005		2006	
Budget	Expenditure	Budget	Expenditure	Budget	Expenditure
173,400,000	173,413,480	178,457,200	170,116,283	209,045,900	Not calculated yet

Source: AND Annual Report 2006

From the table above, it can be said that the expenditure has changed little from 2004 to 2005; while on the other hand, the budget in 2005 was higher than the expenditures in 2004. In addition, the 2006 budget increased to over 200,000,000 Baht. Furthermore, the budget schedule has been modified depending on the situation, and activity plans and schedules have also been modified within their permissible ranges depending on the situation.

c. Conclusion

Although the budget rate for the forage breeding development is still less than 0.4% of the Ministry of Agriculture and Cooperatives (MOAC) total budget, the recent AND budget has steadily increased depending on its upper level budgets. Moreover, AND has received certain budgets over the expenditures of the previous years for its forage breeding development activities.

Furthermore, the budgets have been distributed every year, and they have been expended within limits according to their plans. These facts can also be evaluated well from the viewpoint of sustainability.

However, a future plan to increase the budget is still not announced for the development and so it is unclear. This is an important point to consider.

3.2.5 Sustainability of Project Effects

Sustainability of the Project effects can be evaluated with the following indicators, judgments and results.

a. Techniques on evaluation and selection of appropriate varieties of pasture are developed

Indicator	Rating	Findings of ex-post evaluation
4 kinds of manuals will be published for evaluation and selection	Good	All manuals produced both in English and Thai by the Project are still useful as referential materials for person concerned.
The number of strains which	Good	The development of 3 strain types has

Indicator	Rating	Findings of ex-post evaluation
will be selected for new cultivar in the legal species of pasture		continued since the Project termination.
A future plan of the breeding activity (where the breeding activities are conducted, who will manage these activities, how to operate the breeding system and when new varieties are to be produced) is worked out.	Fair	Since the Project mainly focused on the selection activities of variety more than breeding development, and because this activity is a new technique for AND to implement by itself, it takes times to achieve the target. At this stage, however, they have succeeded to develop some standard strains. In order to develop further varieties and breeds, they need further assistance from forage breeding experts.

b. Techniques on pasture seed production and post harvest processing for registered and commercial seeds are developed

Indicator	Rating	Findings of ex-post evaluation
The number of techniques and equipment which will be improved for pasture seed production and post harvest processing in the Project.	Good	Some techniques, for example pasture seed production, post harvest processing, pasture seed inspection and quality control, are maintained and expanded to others. Most of the equipment have been utilized well and some have been transferred and developed by local technologies which are helpful to reduce the production costs.
Methods of multiplication, post-harvest processing and storage of pasture seed will be determined by AND	Fair	The methods of multiplication, processing and storage have not been confirmed completely because they take more than three years. However, their progress is appropriate according to monitoring data.
A future plan of the pasture seed marketing control system which cover forage seed production at AND are worked out.	Fair	By the establishment of the Seed Club, AND can act as a technical supervisor to provide full support to the Seed Club for the seed market expansion.

c. Techniques on pasture seed inspection and quality control are developed

Indicator	Rating	Findings of ex-post evaluation
3 kinds of manuals will be published for inspection and quality control.	Good	All manuals produced both in English and Thai by the Project are still useful as referential materials for persons concerned.
More than ten officers who will conduct seed testing completely in accordance with the rule of the ISTA	Good	ISTA under OECD Seed Schemes can be conducted by 19 scientific staff of AND.
DLD will be able to certify quality of pasture seed by its own standard	Good	Techniques on pasture seed inspection and quality control transferred by the Project have been developed to be adequate for DLD works.

d. Techniques on production, processing and utilization of appropriate forage are developed.

Indicator	Rating	Findings of ex-post evaluation
The number of useful techniques and equipment which will be improved for forage production, processing and utilization in the Project	Good	The use of equipment technically transferred by the Project has been improved. Following some winnowers called “TOMI”, they have been improved for field use by AND with the assistance of AND.
2 types of manuals will be published for forage production, processing and utilization.	Good	All manuals produced both in English and Thai by the Project are still useful as referential materials for persons concerned.
The number of model farmers which participate in verification and demonstration for useful techniques of forage production, processing and utilization.	Good	AND regularly organizes training activities related to seed and forage production in order to transfer appropriate techniques for the farmers and to increase the number of model farmers.
Importance and effectiveness of forage are recognized by participants in verification and demonstration programs.	Good	AND regional personnel conduct regular visits to seed farms belong to those who attend the training in order to assist and supervise them.

e. Conclusion

Technical manuals produced by the Project are still beneficial for the activities of pasture seed development. They were produced for the purpose of actual field use, and for this reason, they were created both in English and Thai. Accordingly, the manuals can be improved adequately by the Thai side without confusion.

In addition, technical assistance including the improvement of equipment use obtained by the Project has regularly been carried out from AND to seed farmers through the Seed Club. The Seed Club has acted as a technical supporter to assist AND technical activities for the promotion of technical transfers to the farmers.

Based on the analyses above, the Project effects have been highly sustained since the Project termination.

3.3 Analysis of Impact and Sustainability Factors

3.3.1 Analysis of impact factors

As the Project impact promotion, the following factors can be noted. At present, no remarkable inhibitions are visible.

a. Seed Club

Since the technical transfer by AND personnel participating in the Project, know-how has spilled over to seed farmers via the Seed Club. This impact has been expanded among the farmers beyond expectations. Moreover, the establishment of the Seed Club has acted as a community body for the farmers in technical terms. So, the establishment of the Seed Club can be defined as one of the significant factors in the expansion of farmers' activities for Project sustainability.

b. Increase in the number of livestock cattle

A return of the mad cow disease in 2003 dealt a serious blow to the beef industry. As a result, domestic beef production in Thailand fell by approximately 40% from 2003 to 2004. On the other hand, the number of livestock cows has risen annually as described in the table below. This is because the number of youths enjoying dairy products has dramatically increased recently through a milk supply program to pupils at primary schools, in addition to the recent popularization of western-style dietary life and culture among young people. This increase in livestock cattle has contributed to an objective verifiable indicator of the achievement of the Project overall goal. This factor is promoting and expanding the Project impact for the achievement of the overall goal.

Recent statistical data on the number of livestock cattle, dairy production and beef production in Thailand 2001 - 2005

	2001	2002	2003	2004	2005
No. of livestock cattle (million heads)	4.6	4.8	5.1	5.3	5.5
Dairy production (thousand tons)	587.7	660.3	731.9	842.6	900.0
Beef production (thousand tons)	176.3	182.9	190.4	114.7	115.0

Source: FAO data 2006

3.3.2 Analysis of sustainability factors

Factors promoting the Project sustainability can be mentioned as follows. In comparison, significant inhibitions are not visible.

a. Thai made products exporting to the world

Although it is an indirect factor, "Kitchen of the World" promoted by the Thai government is also notable. This is a national project which aims at promoting the export of safety-guaranteed Thai food products, together with the development of overseas Thai restaurants. So, this project has also been a power to promote the expansion of the export of Thai livestock products. For the progress of the project, AND has recently been required to secure pasture seeds at an international quality level and to control its quality standard to export livestock products. As a result, the technical capacity of seed inspection and quality

control transferred from the Project has been utilized more fully.

b. Material production in the local language

For the effective implementation of pasture seed production activities, technical manuals and guidelines were produced by the Project not only in English but also in Thai. As a result, these materials have widely been accepted not only by those who have command of English but also others, including farmers at the field level.

3.4 Issues, Problems

AND's overall budget for seed development and promotion has steadily been sustained as a whole. However, there are no future plans to increase the budget for further forage breeding development.

Furthermore, the expansion of dairy production is essential for the expansion of pasture seed production with its mid and long term strategic plans, but the Thai side does not yet have such strategic plans. AND has mid and long term plans for pasture seed development and promotion, but the plans do not have any detailed plans with specific target figures.

For the future plan of seed development and promotion, mid and long term future plans of livestock consumption with specific target figures is required simultaneously. However, AND's supervising department, DLD, does not have the future detailed plan with specific target figures concerned with livestock production. This issue translates into a challenge for DLD and AND to promote strategic seed development.

3.5 Follow-up Situation

No follow-up programs have yet been carried out by the Japanese side since the Project termination in 2004.

3.6 Conclusion

The technical skills and knowledge transferred from the Project have widely been used not only by the Project C/P but also by persons who did not join the Project. Furthermore, technical training with various manuals and guidelines arranged by the Project have been increased in comparison with the time of the Project termination, and so, the Project impact has been further expanded. In the Project, a recording system was introduced for objective and systematic seed quality testing and controlling. Today, most of the Project C/Ps participate in the AND-led Paddy project, and this system is fully applied for the production of good quality seeds. Moreover, the existence of the Seed Club has contributed to the expansion of the Project impact. As a result, the efficient and effective production of good

quality seeds has been possible, and it has strengthened the realization of the Project overall achievement.

As for the Project sustainability, technical and organizational aspects were highly evaluated. In terms of the technical aspects, technical references and materials were arranged not only in English but also in Thai by the Project. So, they have widely penetrated grass-roots farmer levels, and it has efficiently and effectively been possible for the framers to understand seed quality control techniques and their importance. This event has been a factor to further accelerate the Project sustainability.

As for organizational aspects, there have been no personnel outflows from the C/P side since the Project termination. So AND still maintains seed production activities using techniques and knowledge transferred from the Project. As a result, these techniques and importance have continuously been transferred from the C/P to farmers, and this has highly contributed to maintain the Project sustainability.

This Study could not confirm the output of news seed breeding varieties defined as one of the indicators to achieve the overall goal, but it could confirm the expansion of cultivated acreage and the growth of seed production crop. So, the Study concluded with high evaluation results of the Project as a whole. To sustain these high results, it is required to continue the technical transfer to persons concerned with the activities of pasture seed production and development. For that, strengthened future cooperation between AND and the Seed Club is essential. On the other hand, there is no detailed future plan dealing with an effective pasture seed development. Therefore, AND needs to produce its detailed future strategy under its role as a practical implementing organization with the political assistance of DLD as AND’s supervising organization.

4 Recommendation and Lesson Learned

4.1 Recommendation

- Technical manuals and guidelines produced by the Project and technical training workshops jointly held by AND and the Seed Club have taken an important role to secure the Project sustainability. In order to maintain this sustainability in the future, these contents and programs need to be revised according to the needs of seed farmers and the seed market whenever necessary.

- The planning of mid and long term strategies for pasture seed supply are necessary, while considering variable consumptive demand for livestock products from the viewpoint of sustainable pasture seed production and development activities. As a result, it will be possible to secure budgets essential for effective seed production and development activities in the future.

- For the enhancement of pasture seed quality and productivity, AND needs to sustain a strong partnership with the Seed Club. As a result, the sufficient supply of good quality forage necessary for the Thai livestock promotion. can be continued.

4.2 Lessons Learned

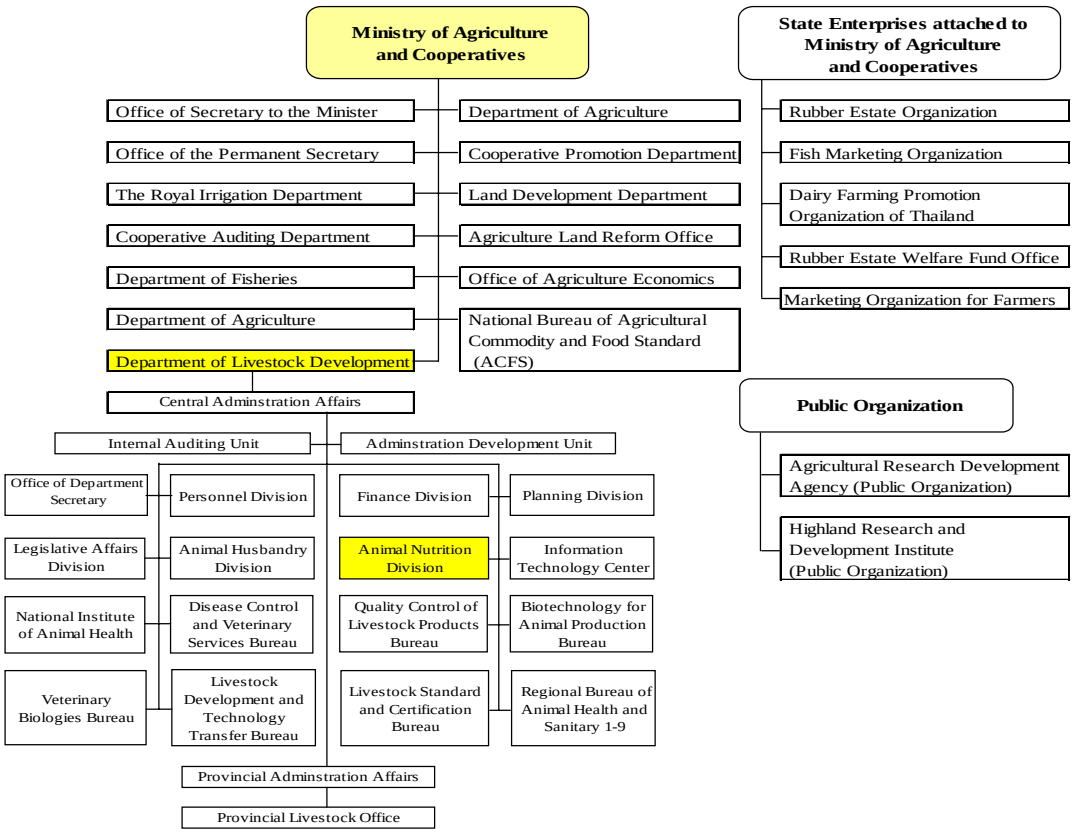
- In terms of flora and fauna development projects, including the agricultural field, the exact evaluation of their technical outputs can take several years. Therefore, it is desirable to carry out ex-post evaluation studies for such as development projects after a certain period from their project terminations.

- At present, the dispatch term of JICA experts is generally two years at most, so they often cannot consistently confirm the outputs themselves. Therefore, a plan in which the experts can confirm needs to be considered in advance, or more attention paid to the dispatching schedules to have continued follow-up schedules carried out by their successors.

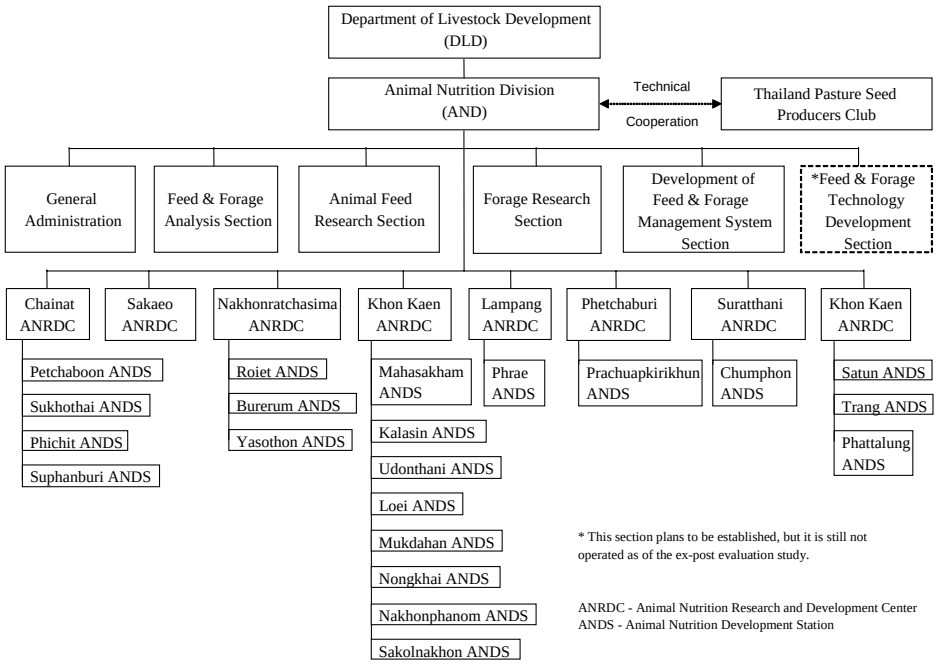
- Technical manuals and guidelines can eventually be utilized at the field level by producing them in the local language. Therefore, material production in the local language is very useful for technical cooperation projects with the activities of technical transfer and promotion to farmers in the field.

Annex 1: Present organizational chart of DLD/AND

Annex 1



Present Organizational Chart of DLD/AND 1/2



Present Organizational Chart of DLD/AND 2/2

Annex 2: Equipment List

Equipment List

J.F.Y	NO.	EQUIPMENT	QTY.	USING PLACE (AS OF PROJECT TERMINATION)	CONDITION (GOOD OR NOT SO GOOD)
VEHICLE					
1999	27,28	TOYOTA SPORT RIDER PRERUNNER	2	Khon Kaen	G
	29	TOYOTA HILUX TIGER CAB	1	Khon Kaen	G
	30,31	TOYOTA HILUX DOUBLE CAB	2	Khon Kaen	G
	37	TOYOTA COMMUTER HI ROOF	1	Khon Kaen	G
PROVISION EQUIPMENT					
1999	1	PHOTOCOPY MACHINE CANNON	1	Khon Kaen	G
	2	FAX MACHINE CANNON	1	Khon Kaen	G
	3,4,5,6,7	AIR CONDITIONER	5	Khon Kaen	G
	8,9	DESKTOP COMPUTER OMNI	2	Khon Kaen	G
	10	NOTE BOOK PC COMPUTER	1	Khon Kaen	G
	11	LASER PRINTER WITH SCANNER HP	1	Khon Kaen	G
	12	COLOR PRINTER HP	1	Khon Kaen	G
	13	DIGITAL CAMERA (SONY)	1	Khon Kaen	G
	14	SCANNER HP	1	Khon Kaen	G
	15	MICROSCOPE (OLYMPUS)	1	Khon Kaen	G
	16	ACCESSORIES FOR ABOVE MICROSCOPE	1	Khon Kaen	G
	17,18	DIGITAL CAMERA WITH PRINTER FOR ABOVE MICROSCOPE	2	Khon Kaen	G
	19	CULTIVATOR FOR THE TRACTOR	1	Khon Kaen	G
	20	ELECTRIC BALANCE (0.001-219g.) (A&D)	1	Khon Kaen	G
	21	ELECTRIC BALANCE (0.01 2100g.) (A&D)	1	Khon Kaen	G
	22	HAND CULTIVATOR (KUBOTA)	1	Khon Kaen	G
	23-26	OVEN (YAMATO)	4	Khon Kaen	G
	32	4 WHEEL TRACTOR	1	Khon Kaen	G
	33	PLOW FOR THE ABOVE TRACTOR (K.K)	1	Khon Kaen	G
	34	HARROW FOR THE ABOVE TRACTOR (EMP)	1	Khon Kaen	G
	35	ROTARY TILLER FOR THE ABOVE TRACTOR	1	Khon Kaen	G
	36	FRONT BLADE FOR THE ABOVE TRACTOR	1	Khon Kaen	G
2000	38	ELECTRONIC BALANCE 1 (YAMATO SCIENTIFIC) (0.01g)	1	Khon Kaen	G
	39	ELECTRONIC BALANCE 2 (YAMATO SCIENTIFIC) (0.01g)	1	Khon Kaen	G
	40	INCUBATOR FOR GERMINATION TEST (LEGUME) (SANYO)	1	Khon Kaen	G
	41	INCUBATOR FOR GERMINATION TEST (GRASS) (SANYO)	1	Khon Kaen	G
	42	SAMPLE SPLITTER (FUJIWARA SEISAKUSHO) (JIS 20)	1	Khon Kaen	G
	43	SAMPLE SPLITTER (FUJIWARA SEISAKUSHO) (JIS 10)	1	Khon Kaen	G
	44	SAMPLE SPLITTER (FUJIWARA SEISAKUSHO) (JIS 6)	1	Khon Kaen	G
	45-46	DISPENSER (TOYO GLASS) (RANG 1-10 ml. With cap)	2	Khon Kaen	G
	47-48	DISPENSER (TOYO GLASS) (RANG 2-20 ml. With cap)	2	Khon Kaen	G
	49-50	DRYING RACK	2	Khon Kaen	G
	51	LUMINANCE METER	1	Khon Kaen	G
	52	SEED SAMPLE PAN (10 X 10 X1 cm.)	100 pcs	Khon Kaen	G
	53	SEED SAMPLE PAN (16 X 2 cm.)	100 pcs	Khon Kaen	G
	54	ALUMINUM PETRI DISH	10	Khon Kaen	G
	55	DESICCATORS (YAMATO)	1	Khon Kaen	G
	56	SEED PROCESSING PLANT	1	Mahasarakham	G
	57	CABINET X-RAY APPARATUS	1	Khon Kaen	G

Equipment List

(Continued)

J.F.Y	NO.	EQUIPMENT	QTY.	USING PLACE (AS OF PROJECT TERMINATION)	CONDITION (GOOD OR NOT SO GOOD)
2001	58	PASTURE SEES DRILL	1	Khon Kaen	G
	59	BOOM SPRAYER	1	Khon Kaen	G
	60	K-TYPE ROLLER	1	Khon Kaen	G
	61	ULTRASONIC CLEANER	2	Khon Kaen	G
	62-63-	INCUBATOR (YAMATO)	1	Khon Kaen	N
	64	VACUUM PACKING MACHINE	1	Khon Kaen	G
	65	LEAF ACREAGE METER	1	Khon Kaen	G
	66	CLEAN BENCH	1	Khon Kaen	G
	67	COLD ROOM	2	Khon Kaen	G
	68-69	AIR-CONDITIONER	1	Khon Kaen	G
	70	AUTOCLAVE	1	Khon Kaen	G
	71	COMPUTER NOTEBOOK (TOSHIBA SEATTLEITE)	1	AND. Bangkok	G
	72	PRINTER (HP)	1	AND. Bangkok	G
	73	LCD OVERHEAD PROJECTOR	1	Khon Kaen	G
	74	ROTARY CULTIVATOR	1	Khon Kaen	G
	75	GRASS SEED CLEANING PLANT WITH CONVEYER	1	Mahasarakham	G
2002	76	NEAR INFRARED REFLECTANCE SPECTROSCOPE (FEED &	1	Khon Kaen	G
	77	FORAGE HARVESTER	1	Mahasarakham	G
	78	SHAKERATOR (SUB-SOLIER)	2	Khon Kaen &	G
2003	78	REVESERSIBLE BOTTLE SOIL PLOW	1	Khon Kaen	G
	79	PLANT CULTURE SHELF	1	Khon Kaen	G
	80	DESICATOR AUTO DRY	1	Khon Kaen	G
	81	DESICATOR AUTO DRY	3	KK. CY.PC	G
	82	SURRY TANK	1	Khon Kaen	G
EQUIPMENT CARRIED BY EXPERTS					
1999	1	PERSONAL COMPUTER MAC G3 WITH SOFT WARE AND	1	AND. Bangkok	G
	2	PERSONAL COMPUTER TOSHIBA DYNABOOK WITH SOFT WARE	1	AND. Bangkok	G
	3	DIGITAL CAMERA KONIKA Q-M2000	1	Nakhon Rajchasima	G
	4	PERSONAL COMPUTER TOSHIBA DYNABOOK WITH SOFT WARE	1	Khon Kaen	G
	5	DIGITAL CAMERA SONY DSC-F55K	1	Mahasarakham	G
	6	PERSONAL COMPUTER POWER BOOK G3233 (NOTEBOOK)	1	AND. Bangkok	G
	7	CARRYING BAG	1	Mahasarakham	G
	8,9,10	DIAL CALIPER	3	Khon Kaen &	G
	11,12	FORCE GAUGE (2kg/2g)	2	Khon Kaen	G
	13,14	FORCE GAUGE (10kg/10g)	2	Khon Kaen	G
	15	ALTIMETER	1	Khon Kaen	G
	16-21	SLIDE FILE	6	Khon Kaen	G
	22-46	SPARE INDEX (FOR SLIDE FILE)	24	Mahasarakham	G
	47,48	TESTING RICE HUSKER	2	Khon Kaen	G
2000	49	WINNOWER (TOMI)	1	Village	G
	50-55	WINNOWER (TOMI)	6	Village	G
	56-59	TWEEZER (INOX 5F)	4	Khon Kaen	G
	60-63	TWEEZER (TAXAL 7F)	20	Khon Kaen	G
	64-84	SLID GLASS	5	Khon Kaen	G
	85-90	MICRO COVER GLASE	2	Khon Kaen	G
	91-92	MEMORY STICK (SONY)	6	Khon Kaen	G
	93-99	MINI DY CASSETTE DVM-60RM (SONY)	1	Khon Kaen	G
	100	MICRO DRIVE (MELCO)	2	Khon Kaen	G
	101,102	PC CARD ADAPTER	1	Khon Kaen	G
	103	CO-R/RW DRIVE	1	Khon Kaen	G
	104	CD- RW DISC	1	Khon Kaen	G
	105	MOBILE SCANNER (PANASONIC)	2	Khon Kaen	G

Equipment List

(Continued)

J.F.Y	NO.	EQUIPMENT	QTY.	USING PLACE (AS OF PROJECT TERMINATION)	CONDITION (GOOD OR NOT SO GOOD)
2001	106,107	ELECTRIC DRILL SET WITH CASE. SPARE DRILL & TRANSFORMER	1	Khon Kaen	G
	108	LACTIC BACILLUS AKUREMO POWER FOR SILAGE	1	Mahasarakham	G
	109	COMPUTER PH METER	1	Khon Kaen	G
	110	PROPIONIC ACID	1	Mahasarakham	Run out
	111	FORMIC ACID	1	Mahasarakham	Run out
	112	STEREOMICROSCOPE. SCZ-40PFw / TRANSFORMER	1	Khon Kaen	G
	113-116	SMART MEDIA	4	Khon Kaen	Run out
		HEAD LOUPE R7500	2	Khon Kaen	G
	117,118	THERMO-HYGROMETER	2	Khon Kaen	G
	119	BASIC FUCHSIN WITH CERTIFIED	1	Khon Kaen	G
	120	CARMIN WITH CERTIFIED	1	Khon Kaen	G
	121,122	MEMO STICK	2	Khon Kaen	G
	123	CONNECTION CABLE	1	Khon Kaen	G
	124	SOFTWARE	1	Khon Kaen	G
	125,126	ADAPTOR FOR MICRO DRIVE	1	Khon Kaen	G
	127	MICRO PIPET NPX-20	1	Khon Kaen	G
	128	MICRO PIPET NPX-200	1	Khon Kaen	G
	129	MICRO PIPET NPX-1000	1	Khon Kaen	G
	130	RACK TIP	1	Khon Kaen	G
	131	RACK TIP	1	Khon Kaen	G
	132	ROTARY STAND	1	Khon Kaen	G
	133	MICRO TEST TUBE	1	Khon Kaen	G
	134-138	RACK FOR TEST TUBE	5	Khon Kaen	G
	139	SHAKER W/DOWN TRANSFORMER	1	Khon Kaen	G
	140	BASE AND SHEET SET FOR SHAKER	1	Khon Kaen	G
	141	TUBE MIXER	1	Khon Kaen	G
	142	PERSONAL CENTRIFUGE	1	Khon Kaen	G
	143	POLYSTYRENE CASE	1	Khon Kaen	G
	144	POLYETHYLENE BAG	1	Khon Kaen	G
	145,146	TWEEZER	2	Khon Kaen	G
	147-156	CERAMIC MOTOR	10	Khon Kaen	G
	157,158	SILICA GEL	2	Khon Kaen	G
	159	SUPPORT NICROOLLULOSE MEMBRANCE	1	Khon Kaen	G
	160	SICKLE FOR GRASS BLADE 60cm	10	Khon Kaen	G
	161-171	SICKLE FOR GRASS BLADE30cm	1	Khon Kaen	G
	172	COMPUTER NOTEBOOK FUJITSU	1	Khon Kaen	G
	173	DIGITAL STILL CAMERA CANNON	1	Khon Kaen	G
	174	SOFTWARE ITITARO	1	Khon Kaen	G
	175	SOFTWARE POWERPOINT	1	Khon Kaen	G
	176	CD-R MEDIA	1	Khon Kaen	G
	177	COMPACT FLASH MEMORY	1	Khon Kaen	G
	172	PH METER HORIBA	1	Khon Kaen	G
	173	PH ELECTRODE HORIBA	1	Khon Kaen	N
	174	ELECTRONIC BALANCE 30 kg	1	Khon Kaen	G
	175	ELECTRONIC BALANCE 10 kg	1	Khon Kaen	G
	176	GRAIN DIAL CALIPERS	1	Khon Kaen	G
	177-377	HAND MIDGET DUSTER	200	Khon Kaen	G
	378	STANDARD LEAF COLOR CHART	1	Khon Kaen	G
	379-579	SEEDLING CASES	200	Khon Kaen	G
	580	STORAGE CABINET	1	Khon Kaen	G
	581	COMPUTER NOTEBOOK SONY VAIO WITH SOFT WARE AND	1	Khon Kaen	G
	582	SINGLE LENS REFLEX CAMERA WITH LENS. VINV FILM CANNON	1	Khon Kaen	G
	583	SWEEPER	1	Mahasarakham	G
	584-588	BOOKS	4	Khon Kaen	G

Equipment List

(Continued)

J.F.Y	NO.	EQUIPMENT	QTY.	USING PLACE (AS OF PROJECT TERMINATION)	CONDITION (GOOD OR NOT SO GOOD)
2002	585	PERSONAL COMPUTER POWERBOOK G4 M8591J/A APPLE	1	Khon Kaen	G
	586	PRINTER HP DESKJET 551 HP	1	Khon Kaen	G
	587	RISING PLATE METER	1	Mahasarakham	G
	588	KETO METER	1	Mahasarakham	G
	589-590	KETO FILM	2	Mahasarakham	G
	591	HAND REFRACT METER SERUM PROTEIN	1	Mahasarakham	G
	592-593	DIGITAL CALIPER TYPE	2	Khon Kaen	G
	594	CHLOROPHYLL METER	1	Khon Kaen	G
	959	HAND REFRACT METER	2	Khon Kaen	G
	596-606	VIDEO TAPE	10	Khon Kaen	G
	607-617	STICKLE	10	Khon Kaen	G
	618-623	STICKLE	5	Khon Kaen	G
	624-634	SHARPENING STONE	10	Khon Kaen	G
	635-640	WATERING POT	1	Khon Kaen	G
	641	FIELD SYSCOM	4	Khon Kaen	G
	642-645	HANDY COUNTER	2	Khon Kaen	G
	646-647	COUNTER WITH BASE	2	Khon Kaen	G
	648-649	QUARTZ THERMO-HYGROGRAPH	1	Khon Kaen	G
	650	DISPENSER NPX-10	1	Khon Kaen	G
	651	DISPENSER NPX5000	1	Khon Kaen	G
	652	TIP 96	1	Khon Kaen	G
	653-654	TIP 50	2	Khon Kaen	G
	655	TIP 1000 EMT-SG	1	Khon Kaen	G
	656	TIP 1000 EMT-L	1	Khon Kaen	G
	657-658	STAINLESS NET	2	Mahasarakham	G
	659	STAINLESS NET	1	Mahasarakham	G
	660	STAINLESS NET	1	Mahasarakham	G
	661	STAINLESS NET	1	Mahasarakham	G
	662	STAINLESS NET	1	Mahasarakham	G
	663	STAINLESS NET	1	Mahasarakham	G
	664	NYLON BRUSH	1	Mahasarakham	G
	665	NYLON BRUSH	1	Mahasarakham	G
	666-667	NYLON BRUSH	2	Mahasarakham	G
	668	QUADRAT SAMPLING RICE SEPARATOR	1	Khon Kaen	G
	669	ALL PURPOSE SCISSORS	1	Khon Kaen	G
	670	THERMO RECORD	1	Khon Kaen	G
	671	DIGITAL CAMERA SONY DSCF-717	1	Khon Kaen	G
	672-673	BATTERY	2	Khon Kaen	G
	674	HAD CASE FOR DSF-717	1	Khon Kaen	G
	675	HP OFFICE JET SCANNER	1	Khon Kaen	G
	676	EPPENDORF MICROPIPETTE RESEARCH	1	Nakhon	G
	677	HABU TYPE STABLE GAUGE FOR WAGYU	1	Khon Kaen	G
	678	RISING PLATE METER, STANDARD TYPE	1	Nakhon	G
	679	KETO METER N	1	Nakhon	G
	680	SERUM REFERACTOMETER	1	Khon Kaen	G

Equipment List

(Continued)

J.F.Y	NO.	EQUIPMENT	QTY.	USING PLACE (AS OF PROJECT TERMINATION)	CONDITION (GOOD OR NOT SO GOOD)
2002	681	GLUETEST ACE R	1	Nakhon	G
	682-694	GLUETEST SENSOR	12	Nakhon	G
	695-698	THERMO-HYGRO CARD (BODY)	4	Khon Kaen	G
	699-707	THERMO HYGRO SENSOR	8	Khon Kaen	G
	708-711	CABLE	4	Khon Kaen	G
	712	HANDY THERMO HYGROMETER	1	Khon Kaen	G
	713	SENSOR PROBE P FOR VH-10 P	1	Khon Kaen	G
	714-715	WEEDING MACHINE	2	Khon Kaen	G
	716	MANURE SPRAYER	1	Khon Kaen	G
	717	PH METER	1	Khon Kaen	G
	718	KETO FILM BOX	6	Mahasarakham &	G
2004	719	INFRARED MOISTURE BALANCE FD-600	1	Khon Kaen	G
	720	GRAIN MOISTURE TESTER PM-830	1	Khon Kaen	G
	721-722	BAMBOO RULER lm	2	Khon Kaen	G
	723-724	BAMBOO RULER 50cm.	2	Khon Kaen	G
	725	DAISISTON	1	Khon Kaen	G
	726-746	RULER 30cm	20	Khon Kaen	G
	747-757	RULER 50cm	10	Khon Kaen	G
	758-768	RULER 100cm	10	Khon Kaen	G
	769-775	RULER 200CM	6	Khon Kaen	G
	776-786	TEETH FOR TS - 500	10	Khon Kaen	G
	787--797	TEETH FOR TS-500	10	Khon Kaen	G
	798-804	SPRING BALANCE 1 kg	6	Khon Kaen	G
	805-811	SPRING BALANCE 2 kg	6	Khon Kaen	G
	811-817	SPRING BALANCE 5 kg	2	Khon Kaen	G

Annex 3: Evaluation Grid

Evaluation Grid
(The Pasture Seed Production Development Project in Northeast Thailand)

Impact

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
How far has the overall goal been achieved since the terminal evaluation the project?	1. How many number of varieties are bred and appropriateness of each variety? 2. Have livestock farmers increased production of forage, hay and silage? 3. Have stakeholder been enlightened in breeding techniques of new pasture varieties? 4. Have seed markets (such as ANRDC) been maintained or expanded to other areas?	・ Comparison of before and after the project	1) Statistical data on cultivated acreage of new varieties. 2) Annual report of the AND 3) Comments from the personnel and counterparts of Department of Livestock Development (DLD)	1) Related material reviews 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey to farmers
Are there any unintended positive or negative changes resulted from the project intervention?	5. Are there new problems, troubles and/or confusions occurred by new technologies transferred by the project?	・ Comparison of before and after the project	1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey
	6. What are positive and/or negative changes by the project?		1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
	7. Have there been any changes in the government policy of Thailand as a result of the project		1) Comments from the personnel and counterparts of DLD 2) Thai central policy analysis	1) DLD's personnel and counterparts 2) Related materials analysis	1) Questionnaire and/or interview survey 2) Related materials
	8. What are gains from the project?		1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey
What factors have contributed to positive and negative impacts?	9. Have there been any boosters and/or obstacles contributing to positive and negative impacts since the project termination? If yes, what factors have contributed to positive and negative impacts?	・ Comparison of before and after the project	1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey
Has the project contributed to improve institutional capacity of the implementing agency?	10. How much has the project improved the knowledge and technologies of the Thai side regarding pasture seed development?	・ Comparison of before and after the project ・ Comparison of personnel of the Thai side trained by the project and those not trained.	1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey

Sustainability

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
Sustainability of project effects Have there been any external factors affected the project sustainability since the project termination?	11. What events have influenced the project sustainability since the project termination?	・ Comparison of the present situation and the terminal period of the project	1) Comments from the personnel and counterparts of DLD 2) Thai central policy analysis	1) DLD's personnel and counterparts 2) Related materials analysis	1) Questionnaire and/or interview survey 2) Related materials
What factors contribute to or inhibit the project effects or sustainability?	12. Does the project organization cooperate with other organizations concerned with pasture seed production development and livestock for the wide spread of the project outputs?	・ Comparison of the present situation and the terminal period of the project	1) Annual and/or monthly technical activity reports from DLD 2) Comments from the personnel and counterparts of DLD	1) Related materials analysis 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey
	13. Are there any boosters and/or obstacles contributing to positive and negative impacts since the project termination? If yes, what factors contribute to the sustainability of the project since the project termination?		1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
Technical sustainability Is there adequate techniques to maintain works of the project since the project termination?	14. Have all developed techniques still been effective/conducted/ progressed since the project termination?	・ Comparison of the present situation and the terminal period of the project	1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey
	15. Have the skills of counterpart in conducting researches been increasing since the project termination?		1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey
	16. Are procured equipments still utilized well since the project termination?		1) Maintenance records 2) Comments from the personnel and counterparts of DLD	1) Related materials analysis 2) DLD's personnel and counterparts	1) Related materials
	17. Do the counterparts have adequate skills in maintaining procured equipments since the project termination?		1) Maintenance records 2) Comments from the personnel and counterparts of DLD	1) Related materials analysis 2) DLD's personnel and counterparts	1) Related materials

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
Organizational sustainability Has the project organization been maintaining the benefits accrued as a result of achieving the project overall goal and purposes?	18. Have there been any limitations and/or constrains to inhibit the further development of the project derived from the structure of organization?	・ Comparison of the present situation and the terminal period of the project	1) Annual and/or monthly technical activity reports from DLD 2) Comments from the personnel and counterparts of DLD	1) Related materials analysis 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey
	19. Do all organization concerned have sufficient/efficient human resources even after the project termination?		1) Annual and/or monthly technical activity reports from DLD 2) Comments from the personnel and counterparts of DLD	1) Related materials analysis 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey
	20. Has the project organization been continuing to provide training on new knowledge and/or technologies to local farmers in the project areas?		1) Annual and/or monthly technical activity reports from DLD 2) Comments from the personnel and counterparts of DLD	1) Related materials analysis 2) DLD's personnel and counterpart	1) Related materials 2) Questionnaire and/or interview survey

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
	21. Has the government policy supported the activities of the project organization since the project termination?		1) Annual and/or monthly technical activity reports from DLD 2) Comments from the personnel and counterparts of DLD 3) Thai central policy analysis	1) Related materials analysis 2) DLD's personnel and counterpart	1) Related materials 2) Questionnaire and/or interview survey
<u>Financial sustainability</u> Is there adequate budget from the central and/or local government(s) of Thailand to maintain works of the project?	22. Is there adequate budget from the central and/or local government(s) of Thailand to maintain works of the project? - If yes, what department(s) and/or organization(s) is/are the main budget provider? - If yes, is the budget sufficient for the sustainability?	・ Comparison of the budget of the project and that of other projects in the pasture seed field.	1) Annual financial report of DLD 2) Comments from the personnel and counterparts of DLD	1) Related materials analysis 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey

Specifications

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
What have the trends been in the per capita consumption of beef/dairy production in Thailand since the project termination?	23. Have the trends increased or decreased?	・ Comparison of the present situation and the terminal period of the project	1) Related statistical 2) DLD technical report	1) Related material reviews	1) Related materials
	24. Have the Thai people consumed beef/dairy products by choice?		1) Related statistical 2) DLD technical report	1) Related material reviews	1) Related materials
	25. Have there been any boosters and/or obstacles for the consumption of beef/dairy products since the project termination? If yes, what have been boosters and/or obstacles?		1) Thai central policy analysis 2) DLD technical report 3) Comments from the personnel and counterparts of DLD	1) Related material reviews 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey
What are the frequency of usage and/or revision of manuals and guidelines been made by the project?	26. Are the manuals and/or guidelines produced by the project adequate, easy and widely applicable to other programs related to the project?	・ Comparison of the present situation and the terminal period of the project	1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey
	27. Are there any inadequate, difficult and inflexible contents in the manual and/or guidelines?		1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
As mentioned in the recommendations of the terminal evaluation study of the project, has the forage unit in AND already been established?	28. If the unit has not yet been established, have there been any difficulties and/or obstacles for the establishment? If so, what have been them?	・ Comparison of the present situation and the terminal period of the project	1) Comments from the personnel and counterparts of DLD	1) DLD's personnel and counterparts	1) Questionnaire and/or interview survey
Has there a cooperation network been among organizations of concerned pasture seed breeding?	29. Have departments/ organizations relating to the project cooperated for the establishment? If no, why have they been uncooperative?	・ Comparison of this project case and other ones.	1) DLD's activity reports 2) Comments from the personnel and counterparts of DLD	1) Related material reviews 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey
Are there any activities (such as country wide seminar, workshops or others) conducted by the project staff to diffuse knowledge on pasture seed breeding or forage quality management?	30. Are there any activities (such as country wide seminars, workshops, events, exhibitions or others) conducted by the project staff to diffuse knowledge on pasture seed breeding or forage quality management? If yes, how often these activities have been conducted?	・ Comparison of this project case and other ones.	1) DLD's activity reports 2) Comments from the personnel and counterparts of DLD	1) Related material reviews 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey

Evaluation Questions		Criteria and Method for Judgment	Required Data	Information Source	Data Collection
Main Questions	Sub-Questions				
	31. Are there any publication (such as newsletter, leaflet, poster or others) published by the project organization to diffuse knowledge on pasture seed breeding or forage quality management to the public?		1) DLD's activity reports 2) Comments from the personnel and counterparts of DLD	1) Related material reviews 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey
	32. Has the project organization been continuing to monitor and evaluate how far the local farmers develop their knowledge on pasture seed breeding or forage quality management? If yes, how often monitoring and evaluation have been conducted?		1) DLD's activity reports 2) Comments from the personnel and counterparts of DLD	1) Related material reviews 2) DLD's personnel and counterparts	1) Related materials 2) Questionnaire and/or interview survey

Annex 4: Questionnaire and its data

Annex 4

Questionnaire which the Study distributed to the Thai side

Japan International Cooperation Agency

Ex-post Evaluation Study on
the Pasture Seed Production Development Project in Northern Thailand

Questionnaire

Name of correspondent: _____

Division/Section: _____ **Position.:** _____

Position: _____ **Contact Tel No.:** _____

Period involved in the Project: _____

Share of working hours for the Project activities: (Approx.) _____ **%**

This questionnaire is prepared for the Ex-post Evaluation Study on the project mentioned above. Your answers would help analyse whether or not the Project has been keeping its direct/indirect impacts and also sustainability since the termination of the project.

Please feel free to write your answers and/or comments in either **English** or **Thai**. If you need some more space for your answers and/or comments, please prepare additional papers and write down onto them.

Finally, after fulfilling this questionnaire, please send back to 'Mr. Tomohiro Kato of the JICA Ex-post Evaluation Study Team not later than 03:00PM, 27th, October, 2006 with the following way;

By fax: 02-937-0704

By e-mail: tomohiro_kato@kkc.co.jp

We should be glad if you would share your time for this work. Thank you for your cooperation in advance.

I. Impact

1. How many number of varieties are bred and appropriateness of each variety?

1.1 Name of variety……Appropriateness…….
1.2 Name of variety……Appropriateness…….
1.3 Name of variety……Appropriateness…….
1.4 Name of variety……Appropriateness…….
1.5 Name of variety……Appropriateness…….
1.6 Name of variety……Appropriateness…….

Comment:……
……..

2. Have livestock farmers increased production of forage, hay and silage?

❍ Very much ❍ Much ❍ Just fair ❍ Not so ❍ Not sure

Comment:……
……..

3. Have stakeholder been enlightened in breeding techniques of new pasture varieties?

❍ Very much ❍ Much ❍ Just fair ❍ Not so ❍ Not sure

Comment:……
……..

4. Have seed markets (such as ANRDC) been maintained or expanded to other areas?

❍ Yes, expand to…….……. ❍ Same as before ❍ Decrease

Comment:……
……..

5. Are there new problems, troubles and/or confusions occurred by new technologies transferred by the project?

❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of them there are:…...……
……..

6. What are positive and/or negative changes by the project?

Positive changes:…...……
……..

Negative changes:....……
……..

7. Have there been any changes in the government policy of Thailand as a result of the project?

❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of them there are:…...……
……..

8. What are gains from the project?

Answer:……
……..

9. Have there been any boosters and/or obstacles contributing to positive and negative impacts since the project termination?

In terms of Boosters:
❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of factors there are & what kinds of impacts happened:…..……
……..
……..

In terms of obstacles:
❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of factors there are & what kinds of impacts happened:…..……
……..
……..

10. How much has the project improved the knowledge and technologies of the Thai side regarding pasture seed development?

In terms of knowledge:
❍ Very much ❍ Much ❍ Just fair ❍ Not so ❍ Not sure

In terms of technologies:
❍ Very much ❍ Much ❍ Just fair ❍ Not so ❍ Not sure

Comment:……
……..
……..

II. Sustainability

Sustainability of project effects

11. What events have influenced the project sustainability since the project termination?
❍ Yes ❍ No ❍ Not sure

Answer:……
……..

12. Does the project organization cooperate with other organizations concerned with pasture seed production development and livestock for the wide spread of the project outputs?
❍ Yes ❍ No ❍ Not sure

If yes, please describe which organizations and what kinds of cooperations there are:…..……
……..
……..

13. Are there any boosters and/or obstacles contributing to the sustainability of the project since the project termination?

In terms of Boosters:
❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of factors there are & what kinds of sustainability:……...……
……..
……..

In terms of obstacles:

❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of factors there are & what kinds of sustainability:……...……
……..
……..

Technical Sustainability

14. Have all developed techniques still been effective/conducted/progressed since the project termination?

Answer:……..……
……..
……..

15. Have the skills of counterpart in conducting researches been increasing since the project termination?

❍ Yes ❍ No ❍ Not sure

If no, please describe what happened:…….....……
……..

16. Are procured equipments still utilized well since the project termination?

❍ Yes ❍ No ❍ Not sure

If no, please describe what happened:…….....……
……..

17. Do the counterparts have adequate skills in maintaining procured equipments since the project termination?

❍ Yes ❍ No ❍ Not sure

If no, please describe what happened:…….....……
……..

Organizational Sustainability

18. Have there been any limitations and/or constrains to inhibit the further development of the project derived from the structure of organization?

❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of them there are:….....……
……..

19. Do all organization concerned have sufficient/efficient human resources even after the project termination?

In terms of sufficient:

❍ Very much ❍ Much ❍ Just fair ❍ Not so ❍ Not sure

In terms of efficient:

❍ Very much ❍ Much ❍ Just fair ❍ Not so ❍ Not sure

Comment:……
……..
……..

20. Has the project organization been continuing to provide training on new knowledge and/or technologies to local farmers in the project areas?

❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of them there are:…..……
……..

21. Has the government policy supported the activities of the project organization since the project termination?

❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of them there are:…..……
……..

Financial Sustainability

22. Is there adequate budget from the central and/or local government(s) of Thailand to maintain works of the project?

❍ Yes ❍ No ❍ Not sure

If yes, please describe whick organizations there are:…..……
……..

Which one is the main budget provider?.....

Is the budget sufficient for the sustainability of the project? ❍ Yes ❍ No

Comment:……
……..

III. Specification

23. Have the trends in the per capita consumption of beef/dairy production in Thailand been increased or decreased since the project termination?

❍ Increase ❍ Decrease ❍ Same as before

Comment:……
……..

24. Have the Thai people consumed beef/dairy products by choice?

In terms of beef products:

❍ Very much ❍ Much ❍ Just fair ❍ Not so ❍ Not sure

In terms of dairy products:

❍ Very much ❍ Much ❍ Just fair ❍ Not so ❍ Not sure

Comment:……
……..

25. Have there been any boosters and/or obstacles for the consumption of beef/dairy products since the project termination?

In terms of Boosters:
❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of them there are:…
……..

In terms of Obstabless:
❍ Yes ❍ No ❍ Not sure

If yes, please describe what kinds of them there are:…
……..

26. Are the manuals and/or guidelines produced by the project adequate, easy and widely applicable to other programs related to the project?
❍ Yes ❍ No ❍ Not sure

If yes, please describe what points are adequate, easy and widely applicable.....
……..
……..

27. Are there any inadequate, difficult and inflexible contents in the manual and/or guidelines?
❍ Yes ❍ No ❍ Not sure

If yes, please describe what points are inadequate, difficult and inflexible.....
……..
……..

28. If the unit has not yet been established, have there been any difficulties and/or obstacles for the establishment?
❍ Yes ❍ No ❍ Not sure

If yes, please describe what have been them…….....
……..

29. Have departments/organizations relating to the project cooperated for the establishment?
❍ Yes ❍ No ❍ Not sure

If no, please describe what have they been uncooperative ..…….....
……..

30. Are there any activities (such as country wide seminar, workshops, events, exhibitions or others) conducted by the project staff to diffuse knowledge on pasture seed breeding or forage quality management? If yes, how often these activities have been conducted?
❍ Yes ❍ No ❍ Not sure

If yes, please describe them in detail…….. ..……..….....
……..
……..
……..
……..
……..

31. Are there any publication (such as newsletter, leaflet, poster or others) published by the organization to diffuse knowledge on pasture seed breeding or forage quality management to the public?

❍ Yes ❍ No ❍ Not sure

If yes, please describe them in detail…….. ..…….…..…….

32. Has the project organization been continuing to monitor and evaluate how far the local farmers can develop their knowledge on pasture seed breeding or forage quality management? If yes, how often these activities have been conducted?

❍ Yes ❍ No ❍ Not sure

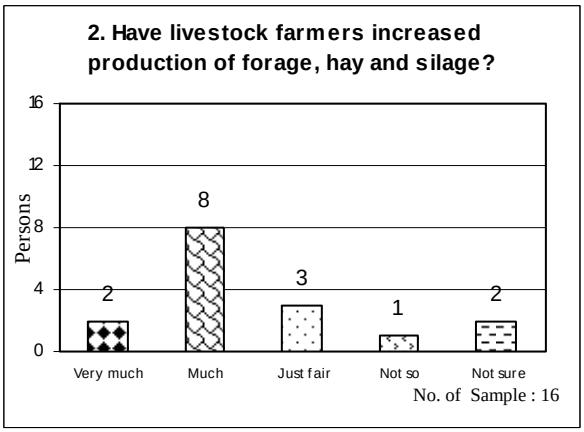
If yes, please describe them in detail…….. ..…….…..…….

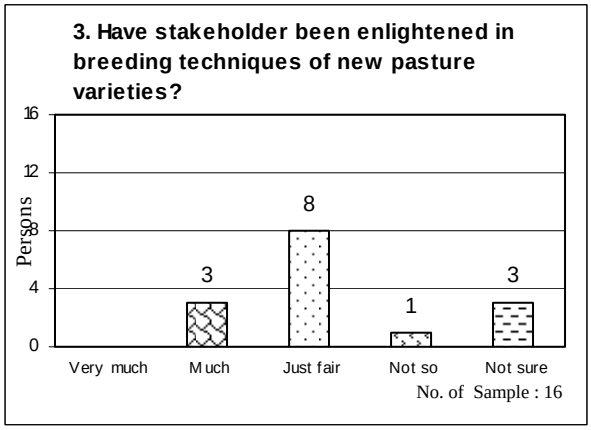
Thank you indeed again for your cooperation. If you have other suggestions and/or comments useful for the ex-post evaluation on the Project, please feel free to state below. Any comments (especially, comments on how the JICA technical cooperation projects should be operated in the future) should be welcome.

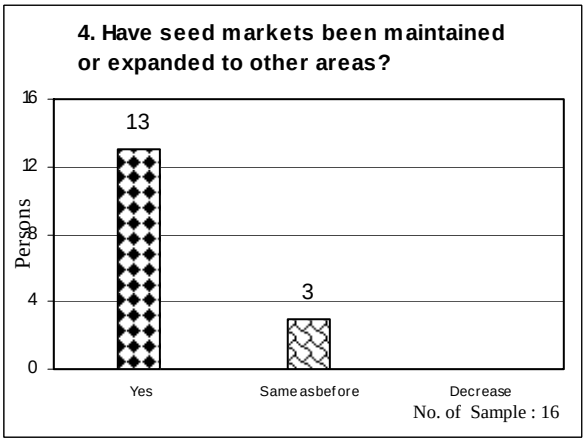
Suggestions and/or Comments:

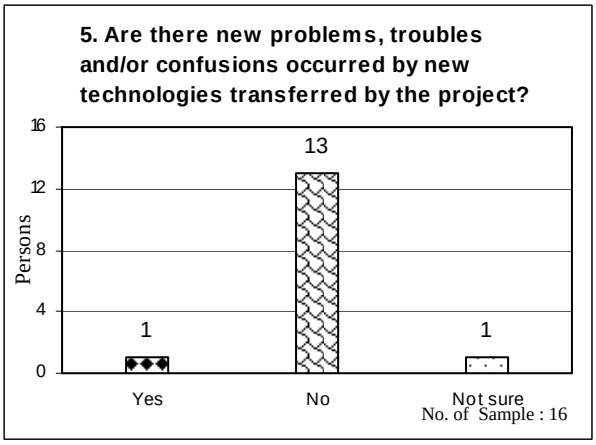
--- End ---

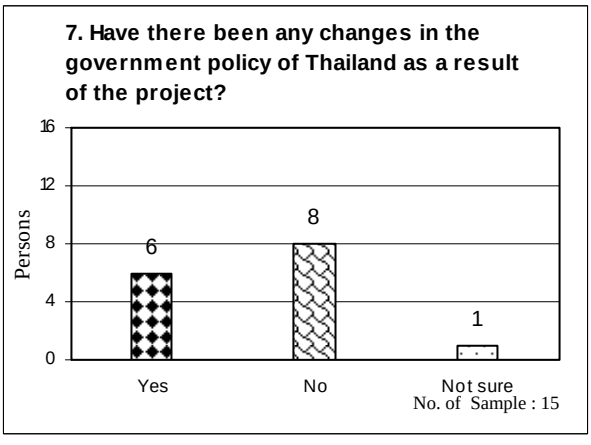
Questionnaire's Data



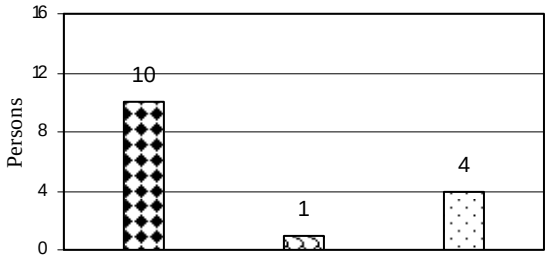






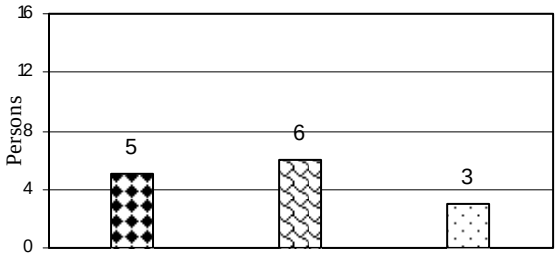


9a) Have there been any *boosters* contributing to positive and negative impacts since the project termination?



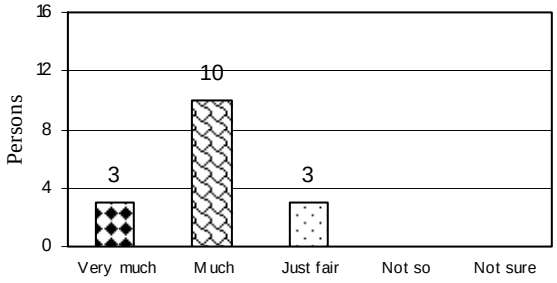
No. of Sample : 15

9b) Have there been any *obstacles* contributing to positive and negative impacts since the project termination?



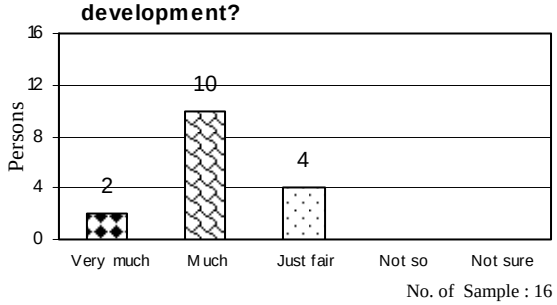
No. of Sample : 14

10a) How much has the project improved the *knowledge* of the Thai side regarding pasture seed development?



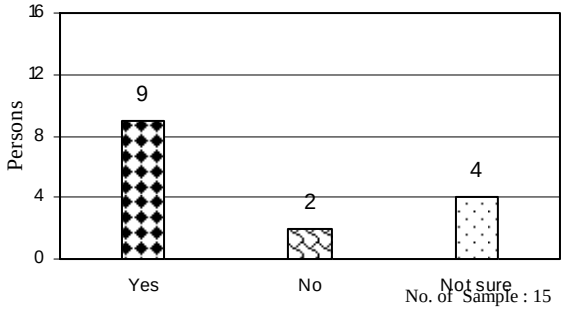
No. of Sample : 16

10b) How much has the project improved the *technology* of the Thai side regarding pasture seed development?



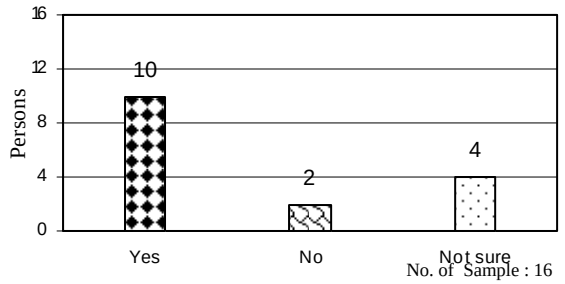
No. of Sample : 16

11. Have there events been influenced the project sustainability since the project termination?



No. of Sample : 15

12. Does the project organization cooperate with other organizations concerned with pasture seed production development and livestock for the wide spread of the project outputs?



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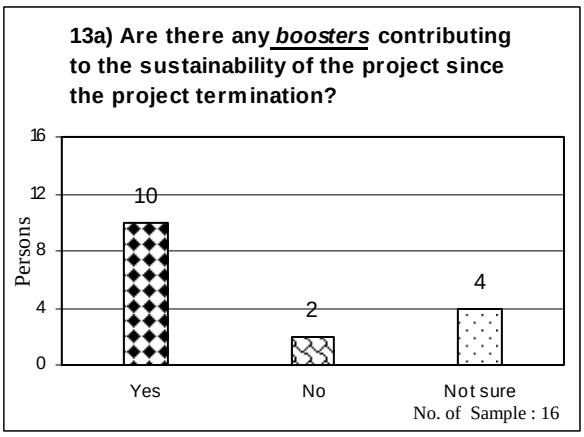
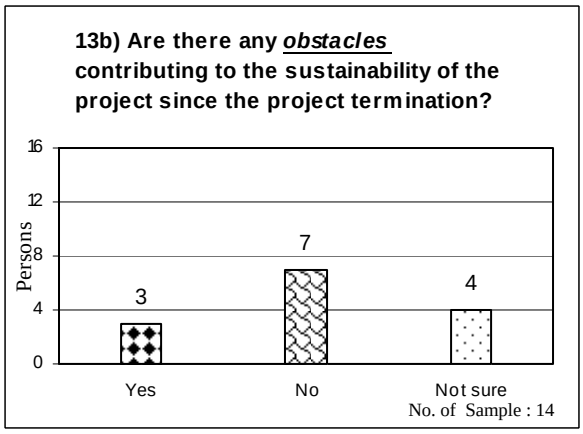
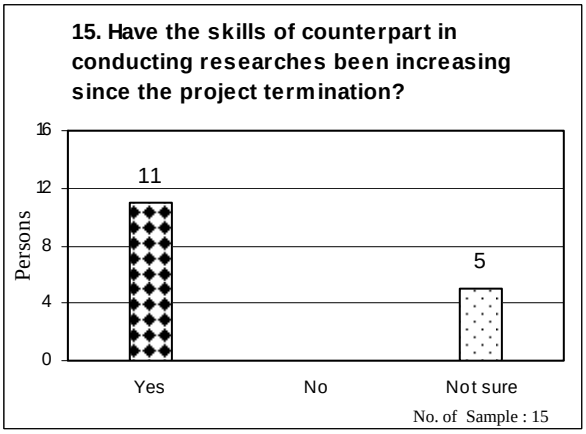
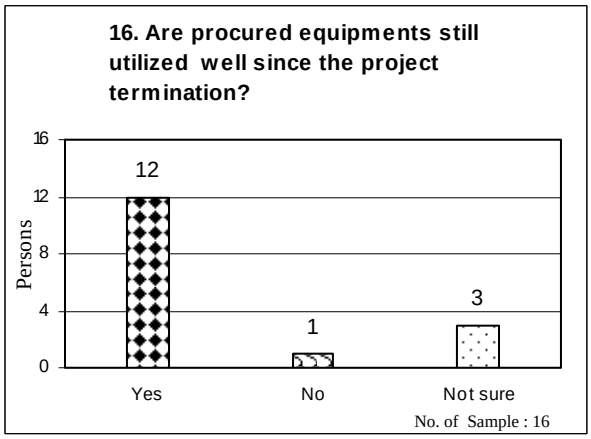
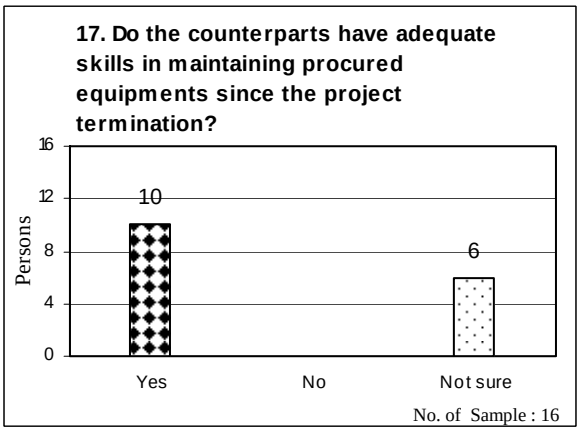
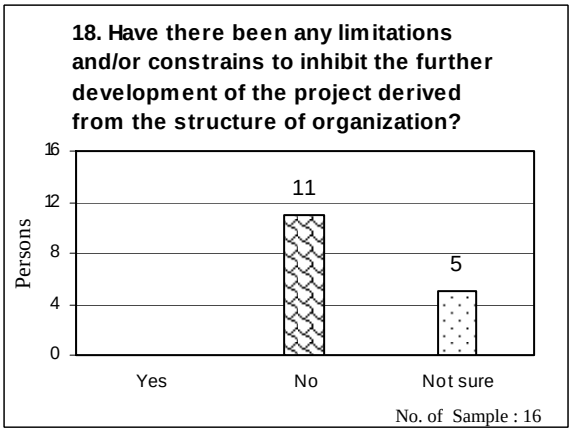

13a) Are there any boosters contributing to the sustainability of the project since the project termination?
Persons
16
12
8
4
0
10
2
4
Yes
No
Not sure
No. of Sample : 16


13b) Are there any obstacles contributing to the sustainability of the project since the project termination?
Persons
16
12
8
4
0
3
7
4
Yes
No
Not sure
No. of Sample : 14

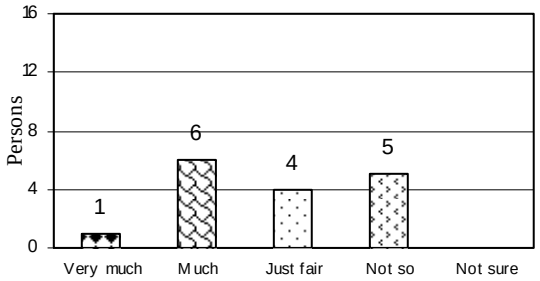

15. Have the skills of counterpart in conducting researches been increasing since the project termination?
Persons
16
12
8
4
0
11
5
Yes
No
Not sure
No. of Sample : 15


16. Are procured equipments still utilized well since the project termination?
Persons
16
12
8
4
0
12
1
3
Yes
No
Not sure
No. of Sample : 16


17. Do the counterparts have adequate skills in maintaining procured equipments since the project termination?
Persons
16
12
8
4
0
10
6
Yes
No
Not sure
No. of Sample : 16

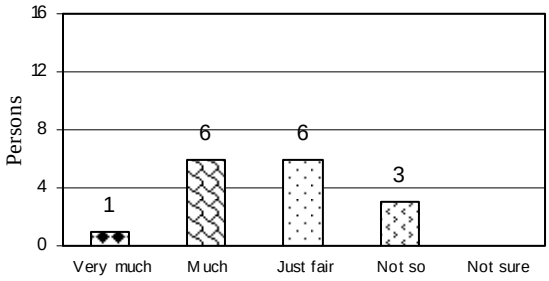

18. Have there been any limitations and/or constrains to inhibit the further development of the project derived from the structure of organization?
Persons
16
12
8
4
0
11
5
Yes
No
Not sure
No. of Sample : 16

19a) Do all organization concerned have sufficient human resources even after the project termination?



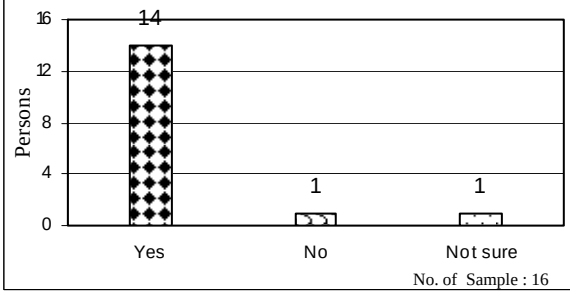
No. of Sample : 16

19b) Do all organization concerned have efficient human resources even after the project termination?



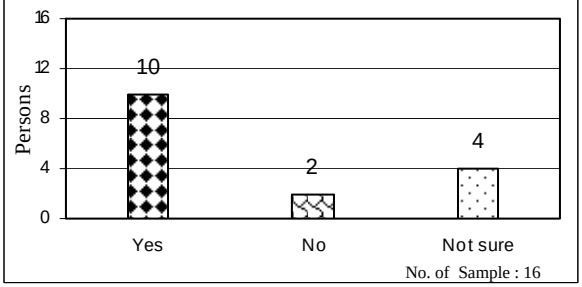
No. of Sample : 16

20. Has the project organization been continuing to provide training on new knowledge and/or technologies to local farmers in the project areas?



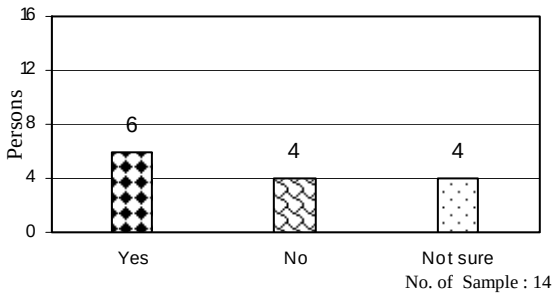
No. of Sample : 16

21. Has the government policy supported the activities of the project organization since the project termination?



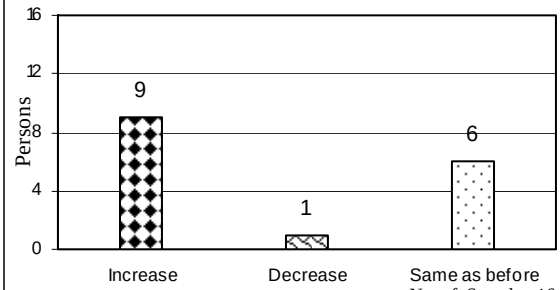
No. of Sample : 16

22. Is there adequate budget from the central and/or local government(s) of Thailand to maintain works of the project?



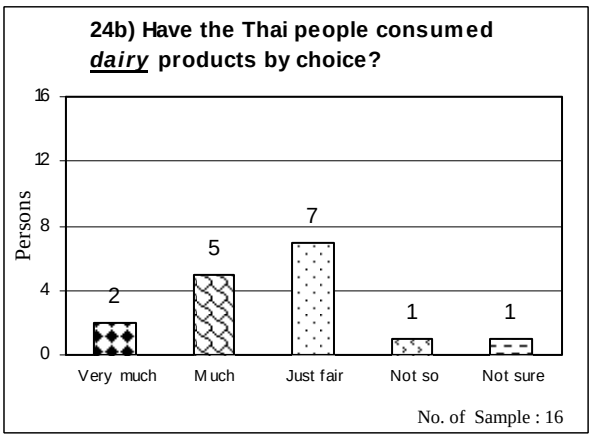
No. of Sample : 14

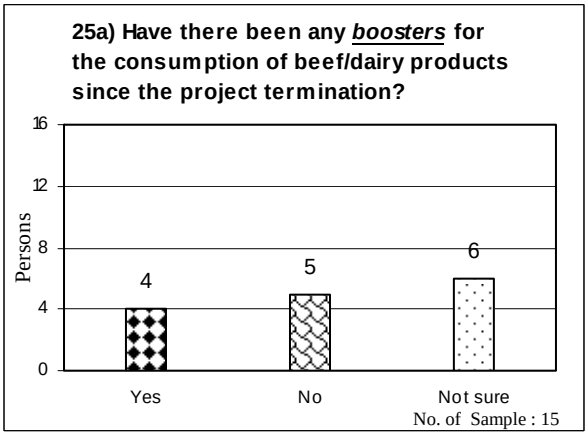
23. Have the trends in the per capita consumption of beef/dairy production in Thailand been increased or decreased ?

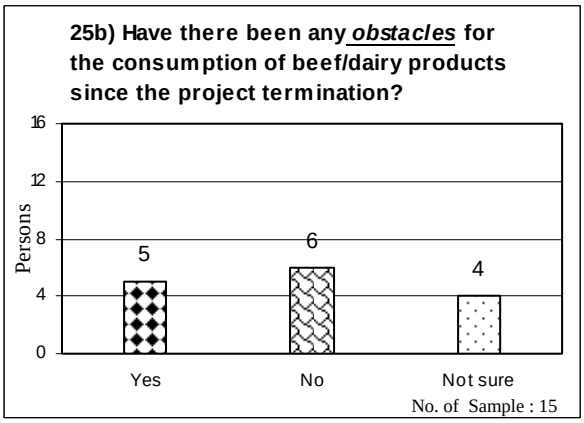


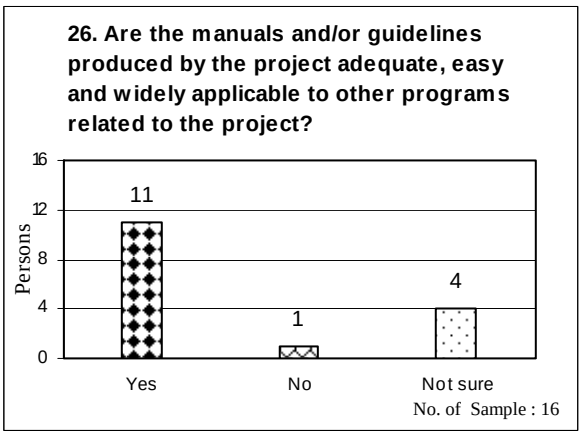
No. of Sample : 16

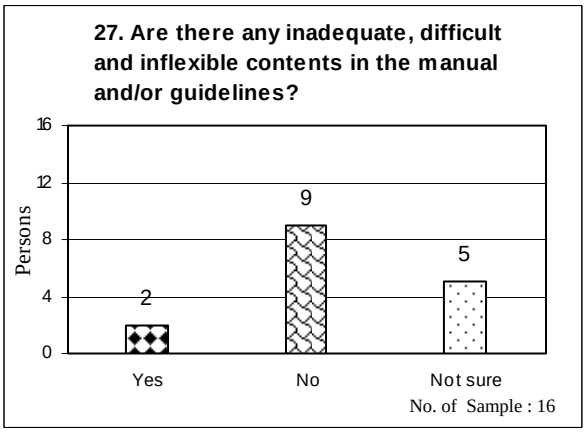

24a) Have the Thai people consumed beef products by choice?
Persons
16
12
8
4
0
5
7
1
3
Very much
Much
Just fair
Not so
Not sure
No. of Sample : 16


24b) Have the Thai people consumed dairy products by choice?
Persons
16
12
8
4
0
2
5
7
1
1
Very much
Much
Just fair
Not so
Not sure
No. of Sample : 16

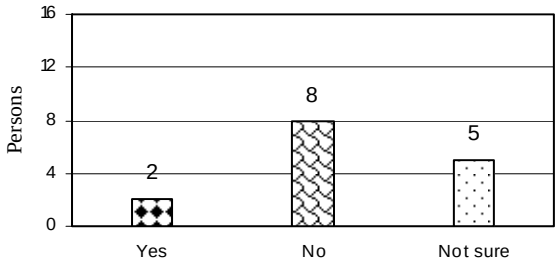

25a) Have there been any boosters for the consumption of beef/dairy products since the project termination?
Persons
16
12
8
4
0
4
5
6
Yes
No
Not sure
No. of Sample : 15


25b) Have there been any obstacles for the consumption of beef/dairy products since the project termination?
Persons
16
12
8
4
0
5
6
4
Yes
No
Not sure
No. of Sample : 15


26. Are the manuals and/or guidelines produced by the project adequate, easy and widely applicable to other programs related to the project?
Persons
16
12
8
4
0
11
1
4
Yes
No
Not sure
No. of Sample : 16

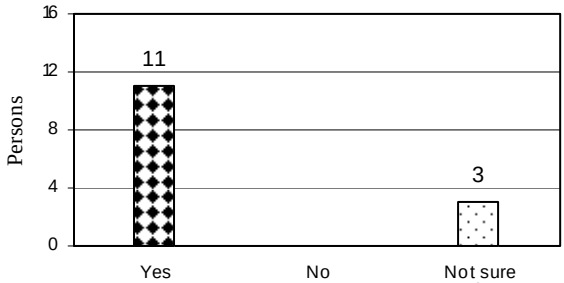

27. Are there any inadequate, difficult and inflexible contents in the manual and/or guidelines?
Persons
16
12
8
4
0
2
9
5
Yes
No
Not sure
No. of Sample : 16

28. If the unit has not yet been established, have there been any difficulties or obstacles for the establishment?



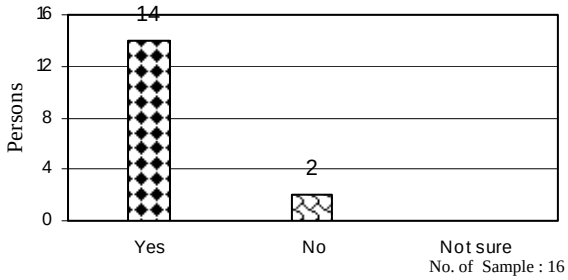
No. of Sample : 15

29. Have departments/organizations relating to the project cooperated for the establishment?



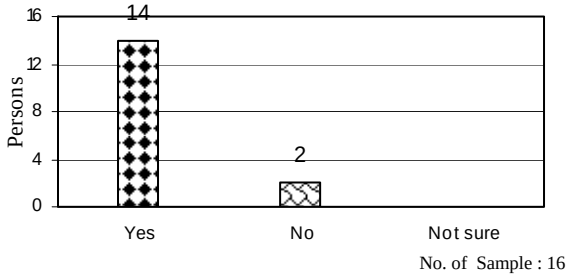
No. of Sample : 14

30. Are there any activities conducted by the project staffs to diffuse to knowledge on pasture seed breeding or forage quality management?



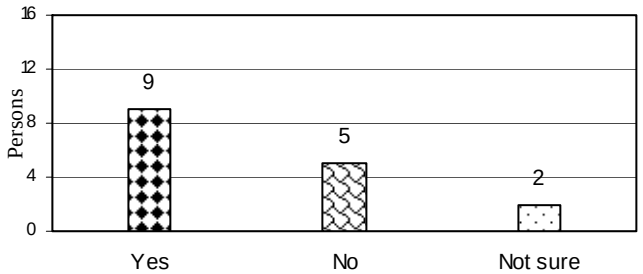
No. of Sample : 16

31. Are there any publication published by the organization to diffuse knowledge on pasture seed breeding or forage quality management to the public?



No. of Sample : 16

32. Has the project organization been continuing to monitor and evaluate how far the local farmers develop their knowledge on pasture seed breeding or forage quality management?



No. of Sample : 16

Annex 5: Third Party Review by external Experts

Third Party Review by External Experts

Ex-Post Evaluation on ... *Project Title*

The Study on Pasture Seed Production Development Project in Northeast Thailand

** This Third Party Review by External Experts is to examine the end-product (an evaluation report and a summary sheet) of ex-post evaluation of the above-mentioned project in light of its structure, verification procedure and overall consistency. It is to be noted that the review is not to question the validity of the evaluation results per se.*

** On the leftmost column of each item, choose the rating from A as 'excellent', B as 'good', C as 'acceptable' and D as 'unacceptable'.*

** When you choose D for an item, specify the reason in comment fields.*

** For more details of viewpoints for each item, refer to the corresponding page of 'JICA Project Evaluation Guideline' which is indicated on the rightmost column of each item.*

1 Evaluation Framework

Reference page No. of 'JICA Project Evaluation Guideline'

	(1) Time Frame of Evaluation Study	97
Viewpoint A	Necessary field survey activities such as data collection and discussion with counterparts are appropriately set within the time frame of the evaluation study. Time frame also contains preparations such as distribution of questionnaires, and are appropriate in terms of timing, length and schedule of the evaluation study.	
	(2) Study Team	107
Viewpoint B	Team members are assigned on a impartial basis, and are with balanced specialty.	
Comment	Specialized field of evaluation team member is not informative.	

2 Data Collection and Analysis

	(1) Evaluation Questions	51
Viewpoint B	Evaluation questions are in line with evaluation purposes and set properly in the evaluation grid. General questions as to the five evaluation criteria are narrowed down to more specific sub questions to identify necessary information/data to be collected.	
	(2) Data Collection	72
Viewpoint B	Data collection is conducted based on the evaluation grid, and is sufficient for obtaining answers for evaluation questions. Additional information are collected for unexpected and newly confronted questions during the process.	
	(3) Measurement of Results	61
Viewpoint A	Achievement level of overall goal is examined on the basis of appropriate indicators, being compared with targets.	
	(4) Examination of Causal Relationship	62
Viewpoint B	The causal relationships whether the effects for the beneficiaries resulted from the project is examined either in a qualitative or quantitative manner (i.e. Are the effects at the overall goal level caused by the project intervention?)	
Comment	Detail of questionnaire and to what extend people responded to it are not given, but the result is conclusive, it is probably good.	

3 Evaluation Results

	(1) Impact	57, 85-86
Viewpoint B	Perspectives for evaluation of 'Impact' (e.g. achievement level of the overall goal, causal relationships between the outcome of the project and overall goal, ripple effects) are substantially covered. Grounds for judgment are clearly stated in a convincing manner.	
	(2) Sustainability	58, 85-86
Viewpoint B	Perspective for evaluation of 'Sustainability' (e.g. probability of activities to be continued and outcomes to be produced in terms of 1)policies and systems, 2) organizational and financial aspects, 3) technical aspects, 4) Society, Culture and environment and) are substantially covered. Grounds for judgment are clearly stated in a convincing manner.	
	(3) Factors Promoting Sustainability and Impact	85-86
Viewpoint B	Promoting factors on 'Impact' and 'Sustainability' are analyzed properly based on the information obtained through evaluation process.	

	(4) Factors Inhibiting Sustainability and Impact	85-86
Viewpoint B	Inhibiting factors on 'Impact' and 'Sustainability' are analyzed properly based on the information obtained through evaluation process.	
	(5) Recommendations	87-88
Viewpoint C	Recommendations are made thoroughly based on the information obtained through the process of data analysis and interpretation. Recommendations are specific and useful for feedbacks and follow-ups, preferably being prioritized with a time frame.	
	(6) Lessons Learned	87-88
Viewpoint C	Lessons learned are derived thoroughly based on the information obtained through the process of data analysis and interpretation. Lessons learned are convincing and useful for feedbacks, being generalized for wider applicability.	
Comment	I believe that impact evaluation is possible at household level beyond labor advantage at the time of evaluation. Empowerment of the Group Seed Club and it network should have been examined for long term sustainability. If evaluation covered process of implement there should be more good lessons learnt. Thus recommendation. .	

4 Structure of Report

	(1) Writing Manner	89,103
Viewpoint A	Logical structure and major points are clearly described in an easily understandable manner.	
	(2) Presentation of Primary Data and Utilization of Figures	89,103
Viewpoint B	Sufficient primary data such as on the target, contents and results of interviews and questionnaires are presented properly in the report. Figures and tables are utilized effectively to present statistics and analysis results.	
Comment	More data or information on demand and supply of seed and forage crop should be given for broader analysis. This evaluation focused mainly on technical side.	

5 Overall Review based on 'Criteria for Good Evaluation'

	(1) Usefulness	13-14
Viewpoint A	In light of the effective feedback to the decision-making of the organization, clear and useful evaluation results are obtained.	
	(2) Impartiality and Independence	13-14
Viewpoint A	Evaluation is impartially conducted in a neutral setting	
	(3) Credibility	13-14
Viewpoint B	In light of the specialties of evaluators, transparency of the evaluation process and appropriateness of the criterion of judgment, evaluation information are credible.	
	(4) Participation of Partner Countries	13-14
Viewpoint B	Partner countries' stakeholders participate actively in the process of evaluation, not just provide information.	
Comment	Can not check transparency and participation of local stakeholders. But indirect result indicates so.	

6 Overall Comment

Other viewpoint should be that not increasing seed and pasture production is driver for increased cattle population. But resiliency of it's population is due to high price of cattle as well as chemical fertilizer. Some farmers have to raise cattle because they need manure as fertilizer. It should be made clear that whether the project supported seed exportation or for internal use. At present forage is in great demand locally due to cattle population increase and area for natural grazing land is greatly replaced by crops. Seasonal shortage of forage is still an important. Problem. There are some points that could not be firmly concluded. How ever the overall result matches present livestock and forage circumstances in the Northeast Thailand.

Date

24/01/07

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