

**ラオス人民民主共和国  
養殖改善・普及計画フェーズ2  
(AQIP 2)  
終了時評価報告書**

平成 22 年 1 月  
( 2010 年 )

独立行政法人国際協力機構  
ラオス事務所

ラオ事
JR
10-043

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## 序 文

独立行政法人国際協力機構は、ラオス人民民主共和国（以下、「ラオス」）政府との討議議事録（R/D）に基づき、技術協力プロジェクト「ラオス養殖改善・普及計画フェーズ2（AQIP2）」を2005年4月から5年間の計画で実施しています。

本プロジェクトの活動終了に先立ち、日本及びラオス側での合同評価を通じて、プロジェクトの成果を確認し、今後のプロジェクトに関する提言と教訓を得るべく、2009年10月7日から10月27日までの間、当機構国際協力専門員 千頭 聡を団長とする終了時評価調査団を現地に派遣しました。

本報告書は、同終了時評価調査団による現地調査や協議の内容・結果をまとめたものであり、今後の協力事業の更なる発展の指針として広く活用されることを願うものです。

最後に、調査の実施にあたりご協力を頂いた内外の関係各位に対し、心より感謝の意を表します。

平成22年1月

独立行政法人国際協力機構  
ラオス事務所長 高島 宏明

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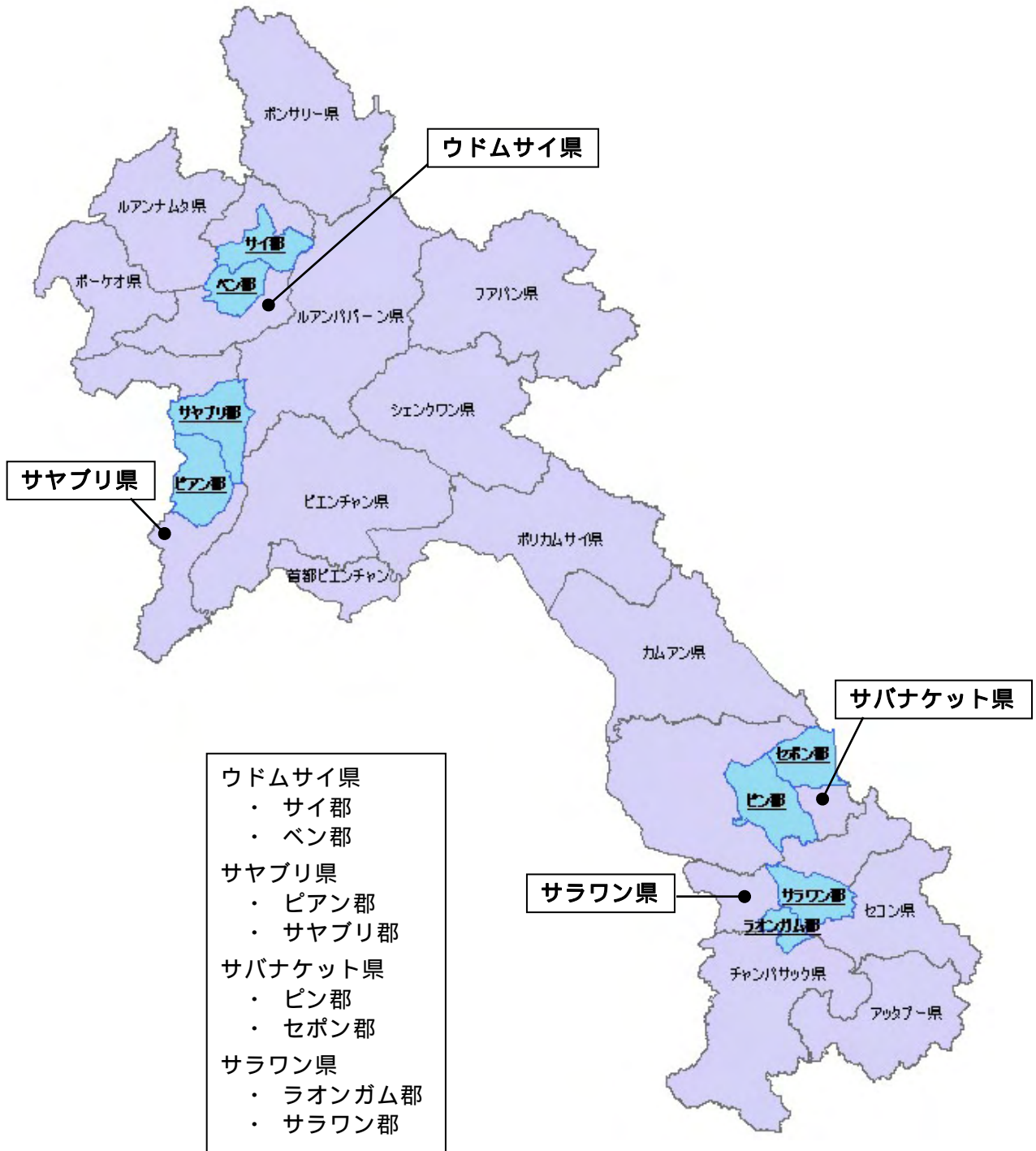
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# プロジェクト対象地域地図



写 真



第1回合同評価委員会(10月16日)



4県から集まった村落養殖開発ワーカー(VADW)



VADW認証式(10月16日)



サバナケット県ピン村の養殖池



サバナケット県サイサムパン村の養殖池



サイサムパン村でのナマズ養殖



サラワン県ラオンガム郡での打合せ(10月20日)



ワンジェン養殖ステーションでのインタビュー



サラワン県ノンスーン村の複合養殖



サラワン県ノンスーン村でのインタビュー



ミニッツ署名式(10月26日)



ミニッツ署名式(10月26日)



## 略 語 表

AIT	Asian Institute of Technology	アジア工科大学
AQIP	Aquaculture Improvement and Extension Project	養殖改善・普及計画
DAFO	District Agriculture and Forestry Office	郡農林事務所
DLF	Department of Livestock and Fisheries, MAF	(農林省) 畜水産局
FORCOM	Project for Forest Management and Community Support	森林管理・住民支援プロジェクト
FTF	Farmer to farmer	「農民から農民へ」
JICA	Japan International Cooperation Agency	独立行政法人 国際協力機構
JIRCAS	Japan International Research Center for Agricultural Sciences	国際農林水産業研究センター
Lao PDR	The Lao People's Democratic Republic	ラオス人民民主共和国
LARReC	Living Aquatic Resources Research Center	水生生物研究センター
MAF	Ministry of Agriculture and Forestry	農林省
M/M	Minutes of Meeting	協議議事録
NADC	Namxouang Aquaculture Development Center	ナムスワン養殖開発センター
NAFES	National Agriculture and Forestry Extension Service	農林業普及局
NAFRI	National Agriculture and Forestry Research Institute	農林研究所
NPEP	National Poverty Eradication Program	国家成長・貧困撲滅戦略
PADS	Provincial Aquaculture Development Strategy	県養殖開発戦略
PAFO	Provincial Agriculture and Forestry Office	県農林事務所
PAS	Provincial Aquaculture Station	県養殖ステーション
PDM	Project Design Matrix	プロジェクト・デザイン・マトリックス
PLFS	Provincial Livestock and Fisheries Section	県畜水産課
PO	Plan of Operation	(プロジェクト) 活動計画
RAPP	Rural Aquaculture Promotion Package	農村養殖振興パッケージ
R/D	Record of Discussion	討議議事録
SEAFDEC	Southeast Asian Fisheries Development Center	東南アジア漁業開発センター
TSC	Technical Service Center	技術サービスセンター
VADW	Village Aquaculture Development Worker	村落養殖開発ワーカー
VAPC	Village Aquaculture Promotion Committee	村落養殖振興委員会
WU	Women's Union	女性同盟

## 評価調査結果要約表

1. 案件の概要	
国 名：ラオス人民民主共和国	案件名：養殖改善・普及計画フェーズ2
分 野：水産（増養殖）	援助形態：技術協力プロジェクト
所轄部署：ラオス事務所	協力金額（評価時点）：5億5,000万円
協力期間	(R/D)：2005年4月～2010年4月 (5年間)
	先方関係機関：農林省 畜水産局（MAF DLF）
	日本側協力機関：農林水産省
他の関連協力：	
<p>1 - 1 協力の背景と概要</p> <p>魚をはじめとする水産物はラオス人民民主共和国（以下、「ラオス」）の人々にとって最も重要な動物性たんぱく源であり、ラオス政府は国家食糧安全保障の立場からその増産を図っている。天然及び人工水域からの漁業生産は既に頭打ちの状態なので、水産物の増産には養殖の開発・普及が不可欠である。わが国は、養殖開発・普及を進めるために適した方法（養殖技術、養殖経営方法、養殖普及方法）の確立と養殖普及能力の向上に資するために技術協力プロジェクト〔養殖改善・普及計画フェーズ1（AQIP1）及びフェーズ2（AQIP2）〕を実施している。AQIP1は2001年から2003年にかけて実施され、養殖改善・普及を推進する国立センターとして、畜水産局（DLF）に属するナムスワン養殖開発センター（NADC）の施設がプロジェクトの枠内で建設された。さらに、NADC職員の能力向上、ラオス全国の養殖情報の収集等が行われ、養殖普及に着手する基盤が築かれた。一方、国連食糧農業機関（FAO）やアジア工科大学（AIT）など他ドナーが地方部において養殖振興に係るプロジェクトを実施してきた結果として、一般にラオス農民は魚を計画的に生産するという認識が希薄であるため、県・郡レベルで養殖普及を一層強化する必要があることが分かった。以上のような背景から、フェーズ2の協力では、フェーズ1の協力成果を最大限に活用し、養殖普及の地方展開に着手している。</p>	
<p>1 - 2 協力内容</p> <p>(1) 上位目標</p> <p style="padding-left: 20px;">協力対象4県（ウドムサイ県、サヤブリ県、サバナケット県、サラワン県）において、立地条件に適合した養殖普及を通じて、小規模養殖農家の生活が向上される。</p> <p>(2) プロジェクト目標</p> <p style="padding-left: 20px;">協力対象4県において、立地条件に適合した養殖手法が普及する。</p> <p>(3) 成 果</p> <p style="padding-left: 20px;">成果1 パイロットサイトの立地条件に適合した養殖手法が実証される。</p> <p style="padding-left: 20px;">成果2 関係者（養殖農家、県・郡普及員及び県技術員）の養殖技術とその普及に関する能力が改善される。</p> <p style="padding-left: 20px;">成果3 協力重点郡の養殖農家が改良された養殖手法を導入する。</p> <p style="padding-left: 20px;">成果4 立地条件に適合した養殖手法の普及に際し、関係機関の機能と連携が強化される。</p>	

<p>(4) 投入 (評価時点)</p> <p>日本側：</p> <p>    専門家：10名 (150MM：プロジェクト終了時までの計画を含む)</p> <p>    本邦への研修員受入れ：18名</p> <p>    機材供与：約1,450万円 (15万7,190ドル)</p> <p>    施設整備：約1,800万円 (19万5,000ドル)</p> <p>    ローカルコスト負担：約6,460万円</p> <p>相手国側</p> <p>    土地・施設提供、資機材提供、人員配置 (カウンターパート36名配置)</p>		
<p>2. 評価調査団の概要</p>		
調査者	<p>(担当分野・氏名・職位)</p> <p>団長・総括 千頭 聡 JICA 国際協力専門員</p> <p>養 殖 白勢 隼人 JICA 農村開発部 参事役</p> <p>村落開発 龍澤 直樹 ラオス農林省 計画局 農業政策アドバイザー</p> <p>評価分析 土居 正典 インテムコンサルティング(株) 専務取締役</p> <p>調査企画 渡辺 盛晃 JICAラオス事務所 企画調査員</p> <p>* 加えてラオス側も合同評価者として参加</p>	
調査期間	2009年10月7日～10月27日 (現地調査期間)	評価種類：終了時評価
<p>3. 評価結果の概要</p>		
<p>3 - 1 実績の確認</p> <p>(1) 活 動</p> <p>    成果1の「パイロットサイトの立地条件に適合した養殖手法が実証される」を達成するために必要な活動について、当初3年次までにすべて終了する予定であったが、対象となるパイロット村の機能をより強化するために、パイロット事業の期間を1年間延長した。それ以外の活動はおおむね計画どおりに実施された。</p> <p>(2) 成 果</p> <p>    成果1：パイロットサイトの立地条件に適合した養殖手法が実証される。</p> <ul style="list-style-type: none"> <li>- 終了時評価時点で6種類のマニュアルが作成され、プロジェクト終了時までにあと2種類のマニュアルが作成される予定。</li> <li>- 2005年から2008年にかけてパイロットサイト対象農家の魚生産が平均122%増加した。</li> <li>- パイロットサイトの大部分の対象農家がプロジェクト終了後も養殖を継続する高い意欲を有している。</li> </ul> <p>    成果2：関係者 (養殖農家、県・郡普及員及び県技術員) の養殖技術とその普及に関する能力が改善される。</p> <ul style="list-style-type: none"> <li>- すべての対象県の県養殖ステーション (PAS) において、2名以上の職員が独自に研修を実施できる。</li> </ul>		

- すべての対象県の県畜水産課（PLFS）において、2名以上の職員が県養殖計画を作成することができ、PASと郡農林事務所（DAFO）職員に対して、養殖普及に必要な説明・指導を行うことができる。
- すべての対象郡のDAFOにおいて、2名以上の職員が農民に説明・指導を行うことができる。
- すべてのパイロットサイトにおいて、2名が他の農家に普及を行うための村落養殖開発ワーカー（VADW）として認証されている。

成果3：協力重点郡の養殖農家が改良された養殖手法を導入する。

- 8つの協力重点郡において、1,000農家以上が改良された養殖手法を導入している。

成果4：立地条件に適合した養殖手法の普及に関して関係機関の機能と連携が強化される。

- プロジェクトは、ラオスにおける持続可能な養殖開発手法として農村養殖振興パッケージ（RAPP）を提案し、DLFによって公式に承認されている。
- プロジェクトによる養殖普及活動を通じて関係機関の機能と連携は強化されたが、各機関の役割を明確にした協力協定を結ぶまでには至っていない。

### （3）プロジェクト目標の達成度

プロジェクト目標：協力対象4県で立地条件に適合した養殖手法が普及する。

- 4県のパイロット村と普及村の合計約1,000名の養殖農家が魚の生産量を40%以上増加させていると推定される。
- RAPPの考えに基づき、対象県で県養殖開発戦略が策定され、県・郡レベルの養殖普及の方向性が議論され、原則的な合意形成が図られている。

### （4）上位目標の達成度

上位目標：協力対象4県で、立地条件に適合した改良養殖手法の普及を通じて、小規模養殖農家の生活が向上する。

- パイロット村での養殖生産量の伸び率は年平均30%であり、今後養殖を継続的に振興することにより、上位目標の指標である対象4県での1人当たり魚の消費量を22kg/人/年とする可能性は示されている。

## 3 - 2 評価結果の要約

### （1）妥当性

本プロジェクトの妥当性は高いと判断される。

- ラオスの1人当たり年間魚消費量は、インドシナ諸国のなかで最も低い水準にとどまっている。近年、消費量は徐々に増加する傾向はあるが、天然水域からの漁獲、供給量について今後大きく増大することは見込めない。したがって、現金収入だけでなく、自家消費も目的とした低コストの養殖について基本的なニーズがある。
- 本プロジェクトの内容はその開始時において「食糧安全保障」及び「貧困削減」とい

ラオス政府の方針に合致しており、かつ現行の第6次計画（2006～2010年）の目標とも合致している。

- DLFでは養殖振興、資源管理、水域環境保全及びポストハーベストを水産セクターの重点分野と位置づけている。なかでも、淡水養殖の振興は最も優先順位が高い。
- 対ラオス国別援助計画において、「3つの援助目標」「6つの重点分野」があり、本プロジェクトは援助目標「『人間の安全保障』の視点から貧困削減を実現すべく、ミレニアム開発目標（MDGs）の達成に向けた着実な歩みを支援する。」、重点問題「農村地域開発及び持続的森林資源の活用」に位置づけられる。
- 本プロジェクトの対象4県には、ラオス政府が重点開発地域として指定する貧困72郡のうちの20郡を含む。気候や生活条件の異なる北部と南部を対象とし、それぞれの地域にあった養殖手法をパイロット事業にて開発し、その手法を普及対象村に普及する本プロジェクトのアプローチは、効率的・効果的な養殖手法をラオス全土に普及させるために適切なアプローチであると考えられる。

## （2）有効性

本プロジェクトの有効性は高いと判断される。

- 本プロジェクトでは2段階の普及アプローチが取られた。すなわち、当初はパイロット村（12村）に集中した活動を行い（成果1）、その後その経験を用いて普及村（54村）に活動を展開した（成果3）。そのなかで関連する機関の政府職員及び養殖農民の研修が行われ、また日本人専門家及びNADCのカウンターパートらとのさまざまな共同プロジェクト活動により彼らの能力強化が図られた（成果2）。パイロット村での活動は当初計画の3年間で4年間に延長して行われたが、この対応により種苗生産農家の能力向上が図られ、「農民から農民へ（FTF）」の普及が機能した。これらの活動実績を基にRAPPが作成され、将来の養殖開発ツールとしてDLFで公式に承認された。また、プロジェクト終了後の養殖普及について、RAPPの考え方に沿って対象4県の県養殖開発戦略（PADS）が作成され、関連機関の合意形成が図られた（成果4）。これら一連のプロジェクトアプローチはプロジェクト目標を達成するために効果的かつ効率的であった。
- RAPP実効性の要は村落クラスターごとに認定されるVADWが行う自発的な養殖普及である。パイロット村では既に種苗生産農家や女性同盟（WU）による養殖グループが育成されており、他村での種苗販売とそれに伴う技術ガイダンスなど、VADWとしての自発的な活動が一部で開始されている。
- プロジェクトでは当初から計画されていた農家個人での養殖に加え、WU、コミュニティ、学校などによるグループ養殖について実証試験を行い、個人養殖、グループ養殖双方を振興していることから、プロジェクト目標を達成した。

## （3）効率性

本プロジェクトの効率性はおおむね高いと判断される。

- フェーズ1で整備強化されたNADCやカウンターパートを活用して投入の効率性を高めた。
- 日本側、ラオス側の投入及びタイミングは質、量ともにおおむね計画どおり実施された。プロジェクトの前半ではNADCへのカウンターパートの配置や運営予算について不十分な点があったが、その後のラオス側の努力によりNADCセンター長及び3名の新スタッフの公式な配置が図られ、改善された。
- 日本側では関連機材の投入とともに、NADCやPASの施設整備を行った。これらの機材、施設はプロジェクト活動、とりわけ農民研修や種苗生産において有効に活用された。

#### (4) インパクト

本プロジェクトの正のインパクトが確認される。

- 農村部の養殖は現金収入だけでなく、自家消費用の魚供給源として重要である。プロジェクトによる調査では、パイロット村の養殖農家の大半（71%）を占める小規模農家（年間生産量100kg以下）では生産量の約60%が自家消費用に充てられている。また、中規模/大規模の養殖農家では自家消費に加えて村内への魚供給に貢献している。プロジェクトによる養殖普及は1人当たり魚消費量を増加させ、生活水準の向上に資するという上位目標に向けて、正のインパクトを引き出している。
- 本プロジェクトではあらゆる活動において農村女性の参加を積極的に促した。特に、プロジェクトが力をいれたWU 9グループによる養殖は良好な成果を上げた。WUによるグループ養殖の便益は多くの場合、メンバー間で分配するのではなく、WUの活動や村の社会保障の原資とされている。プロジェクトの養殖普及活動は対象地域農村女性のエンパワーメントに大きく貢献した。
- プロジェクトはまた個人養殖農家の自発的なネットワーク形成というインパクトを醸成した。サヤブリ県の一つ苗生産農家は他村の先進農家7軒を集めた農家ネットワークを形成し、種苗や親魚の融通、共同での機材調達、情報の共有などの活動を開始している。
- プロジェクト活動をきっかけとした社会的なインパクトもみられる。例えば、これまで交流が少なかった民族間の交流促進、村人全員が参加する作業による相互扶助意識の高揚などである。

#### (5) 自立発展性

本プロジェクトの自立発展性は、おおむね高いと判断されるが、自立発展性を確保するための方策について更なる検討が必要である。

- RAPPはプロジェクトの成果に基づき、ラオス政府が表明しているクラスターアプローチという新しい地方開発方針にのっとり作成された養殖振興の技術パッケージであり、DLFが承認している。すなわち、VADWの認定制度を含むRAPPはプロジェクト終了後のロードマップと位置づけられ、ラオス政府は県レベル及び郡レベルでそ

れを具体化するために継続して努力を行うということを確認した。

- パイロット村12村では養殖普及の中心となる種苗生産農家あるいは中核農家が育成され、一般養殖農家に対する情報発信を行っている。先進的な養殖農家のなかからDLFにより認定されたVADWは種苗販売など経済的なインセンティブだけでなく、社会的なインセンティブをもって自発的な養殖普及を行うことが期待される。養殖技術「農民から農民へ(FTF)」普及アプローチの有効性については他の国でも実証されており、公的な普及サービスを補完するものとして高い自立発展性をもつ、と思われる。
- 県や郡では、慢性的な人材・資金不足により、普及員による安定的な普及活動に、若干の懸念は残る。しかしながら上記のVADWによるFTF普及アプローチは、地方政府の普及活動を補完すると思われる。
- 本プロジェクトで初めて取り組んだWUによるグループ養殖は、個人ではなくWUあるいは村の収益源として受け入れられている。村社会の利益のために労働するというはラオスで伝統的な活動であり、WU養殖グループのメンバーは養殖活動を継続する意思を有している。また、WUの活動を養殖普及に取り込むことはRAPPで位置づけられており、持続性は高いと判断される。

### 3 - 3 効果発現に貢献した要因

#### (1) 計画内容に関すること

該当なし

#### (2) 実施プロセスに関すること

貢献要因としてはプロジェクト専門家の個人的ネットワークを通じ、数多くの関係機関と連携した活動を行った点を指摘できる。プロジェクトが調整した主な活動は次のとおりである。

- ウドムサイ県で村の集会所の3カ所の建設（日本のNGO、2団体との連携）
  - 共同研究の推進〔水生生物研究センター（LARReC）、ラオス大学、国際農林水産業研究センター（JIRCAS）、東海大学、東京大学など〕
  - 資金源とのパイプ（長尾財団による魚類調査と環境教育）
  - 現場での連携と研修〔東南アジア漁業開発センター（SEAFDEC）及びAIT〕
  - 他の類似プロジェクトとの連携〔森林管理・住民支援プロジェクト（FORCOM）〕
- これらの活動は村人及びカウンターパートの能力強化に寄与した。

### 3 - 4 問題点及び問題を惹起した要因

#### (1) 計画内容に関すること

該当なし

#### (2) 実施プロセスに関すること

阻害要因としては自然災害があった。特に2008年はプロジェクト対象県のうちウドムサイ県、サヤブリ県、サラワン県の一部養殖場が洪水による被害を受けた。一方、サバナケット県では雨量不足で養殖池の水量が不十分であった。このような自然災害はパイロット

村、展開村の養殖活動が安定しない要因のひとつであった。

### 3 - 5 結 論

本プロジェクトでは2005年のプロジェクト開始時から現在まで、農村地域の魚養殖に関する技術マニュアルの作成、機材供与、NADCやPASの拠点施設整備、政府職員及び養殖農民に対する理論的及び実務的な技術研修の実施など一連の養殖普及活動を実施した。その結果、対象地域の養殖生産量は増加し、養殖普及手法パッケージとしてRAPPが作成され、DLFに承認された。プロジェクトは高い有効性、効率性をもってプロジェクト目標をほぼ達成しており、残りの期間ですべて達成することが見込まれる。

また、本プロジェクトは農村コミュニティに対して多くの正のインパクトを与えている。すなわち上位目標に掲げられている養殖を通じた生活水準の向上だけでなく、ジェンダー主流化、先進的な養殖農民のネットワーク化及び異なる民族間の友好関係の構築などである。DLF及び関連する中央及び地方組織は、プロジェクトで導入され、検証された養殖普及活動の継続性を確保するための努力を続けるという強い意志を持っている。そして、RAPPに示された「農民から農民へ（FTF）」の普及アプローチはVADWのイニシアティブにより機能すると判断される。

これらにより本プロジェクトは討議議事録（R/D）及びプロジェクト・デザイン・マトリックス（PDM）の計画どおりに終了することができる。プロジェクト側では以下の提言を踏まえ、残されたプロジェクト活動を円滑に遂行することが期待される。

### 3 - 6 提言（当該プロジェクトに関する具体的な措置、提案、助言）

#### （1）種苗生産農家への支援強化（プロジェクトへの提言）

対象地域では種苗の需要が増大しており、種苗生産に興味を示す養殖農家の数が増加している。実際、いくつかの個別養殖農家、WU及び村落養殖振興委員会（VAPC）では既に種苗生産を開始している。プロジェクトの残り期間においては、これらの種苗生産農家あるいはグループに対して集中的な技術支援の実施を要望する。また、可能なところからVADWのネットワーク化を図っていくことを提言する。このようなネットワークは種苗生産において経験のある農民から初心者へ技術移転を行うなど、相互協力的な活動の活性化につながる。さらに、種苗場の施設、機材の建設や改善を行ううえで、種苗生産農家が農業振興銀行あるいは他ドナーなどの資金ソースを利用できるよう指導していくことを併せて提言する。

#### （2）VADWの活動モニタリングとその報告（プロジェクトへの提言）

2009年10月、パイロット村から選ばれた24名がVADWとして認定された。これらVADWからはそれぞれの村落クラスターにおいて養殖普及活動を行うことが期待されている。プロジェクトは、RAPPの効果を実証することを目的に、彼らの普及活動を綿密にモニタリング並びに指導し、受動的及び能動的な養殖普及についての成功例を報告願いたい。

#### （3）県養殖普及アクションプランの作成（対象県農林局への提言）

PADSはプロジェクト及び対象となる県農林事務所（PAFO）、PAS及びDAFOの共同作業で策定された。PADSに基づき、各県では詳細な行動計画が作成される必要がある。計画内



容には予算、期間、具体的な担当機関などが含まれ、それぞれの地域の関係機関により承認されなければならない。この計画の策定を進めるため、プロジェクトは可能な範囲で地域の関係機関を支援していただきたい。

(4) クラスタアプローチの枠組みでのRAPPの実施（DLFへの提言）

農村部における養殖振興手法の標準パッケージとしてプロジェクトが開発したRAPPは、農民の行政サービスへのアクセス改善を図るためラオス政府が採用しているクラスタ開発方針と一致している。政府の村落クラスタアプローチはいまだ全国的に大きく展開されているわけではないが、DLFはプロジェクト終了後、関係機関と協力して本プロジェクトの展開サイトにおけるRAPPの実施促進を図ってほしい。

(5) 複合養殖、学校養殖の振興（DLFへの提言）

FORCOMと連携したプロジェクト活動の経験から、養豚を組み込んだ施肥養殖、稲田養殖など魚と畜産や農業を組み合わせた複合養殖のポテンシャルが確認された。また、学校養殖は将来の養殖振興の一手法と思われた。将来の養殖プロジェクトにおいてはこれらの養殖活動を取り込んでいくことを提言する。

3 - 7 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）

(1) WUの活動強化

本プロジェクトを通じてWUによるグループ養殖が適切に実施されたこと、そして参加した女性の社会的な力が向上したことは注目すべきである。彼女らは養殖あるいは種苗生産から共通の資金を捻出し、その資金をメンバーの出産や病気時など必要時の相互扶助の原資に充てている。このように、WUの養殖活動はプロジェクト終了後も継続して行われる可能性が高いと思われる。また、ラオスでは全国ほとんどの村でWUが組織化されており、グループ養殖を円滑に実施するための強い結束力を有していると思料される。WUのようなポテンシャルの高い既存組織への支援は、一から組織をつくり支援するよりも、少ない支援で持続的・効果的に活動が展開する。WU活動の振興についてのプロジェクトの経験は、他の村落開発活動における良い参考事例になり得る。

(2) 「農民から農民へ（FTF）」の普及アプローチの有効性

本プロジェクトを通じて、養殖農民数を増やし、さらに行政による普及効率を高める、という観点から「農民から農民へ」の普及アプローチの有効性が示された。このような農民間の普及アプローチは、中心となる裨益者に経済的なインセンティブ（種苗販売による現金収入）や社会的な地位（VADWといった公式に任命された地位）が適切に付与されるという仕組みを構築することで、養殖だけでなく、他の村落開発プロジェクトに応用できるとと思われる。

(3) 貧困削減におけるグループ養殖の意義

プロジェクトが実施したモニタリング調査によると、一般的な傾向として養殖農民は非

養殖農民より裕福であることが示されている。養殖開発はそのような2つのグループの経済的なギャップを更に拡大する可能性があるかもしれない。このため、プロジェクトではVAPCの調整機能及び低所得非養殖農家や女性が参加するグループ養殖の振興を通じてこのような社会的な観点に注意を払ってきた。特に、村落構造を考えた場合、市場経済ではなく、コミュニティの結束と調和を重視して行動する傾向が強い対象者の社会的文化的な価値観を理解することが重要である。しかしながら、WUによるグループ養殖は成功した一方、低所得層にある農民グループはおそらくはその脆弱性によりグループ活動を持続することができなかった。農村部におけるかかる貧困層への対策については養殖振興も含め、それ以外の多くの村落開発プロジェクトにおいて今後の課題として残されている。

### 3 - 8 フォローアップ状況

該当なし

## Summary of Terminal Evaluation Survey

<b>I. Outline of the Project</b>	
<b>Country :</b> Laos	<b>Project title :</b> Aquaculture Improvement and Extension Project Phase II (AQIP2)
<b>Issue/Sector :</b> Fishery	<b>Cooperation scheme :</b> Technical Cooperation
<b>Division in charge :</b> JICA Laos Office	<b>Total cost :</b> 5.5 (thousand)_yen
<b>Period of Cooperation</b>	Apr 2005 – Apr 2010 (5 years)
	<p><b>Partner Country's Implementing Organization :</b> Department of Livestock and Fishery(DLF), Ministry of Agriculture and Forestry(MAF)</p> <p><b>Supporting Organization in Japan :</b> Ministry of Agriculture, Forestry, and Fisheries (Fisheries Agency)</p>
<p><b>1 Background of the Project</b></p> <p>Fish and other aquatic organisms are the most important animal protein source for the people in Lao PDR. The government of Lao PDR is trying to increase production of fisheries products in the national food security policy. Production increase by catching fisheries in natural and man-made waters is limited as fishing pressure has already reached to the maximum sustainable yield level or over it. Therefore, promotion of aquaculture is a matter of emergency for the production increase of aquatic organisms.</p> <p>The government of Japan has been conducting technical cooperation projects (AQIP 1 and AQIP 2) to assist development of appropriate techniques (including culture technique, culture farm management technique, as well as extension technique), and capacity building (both human capacity and institutional capacity) in order to contribute to aquaculture promotion in Lao PDR.</p> <p>AQIP 1 was implemented from 2001 to 2003. the project established NADC as a national aquaculture research and development, and training center under DLF, trained staff of NADC and collected information on aquaculture situation throughout the country. Thus, a firm basis has been established by AQIP 1 for implementation of the project aiming at aquaculture development and extension in rural areas. Past other donor's projects such as Food and Agriculture Organization (FAO) and Asian Institute of Technology (AIT) revealed that enhancing aquaculture extension is needed in Provincial / District level because rural people tend to have less consciousness to produce fish by making clear plan. AQIP2 has utilized achievement of AQIP1 and has effort to expansion of the aquaculture in rural area of the country.</p>	
<p><b>2 Project Overview</b></p> <p><b>( 1 ) Overall Goal</b></p> <p>Standard of living of rural fish farmer is improved through the dissemination of aquaculture suitable for local conditions in the 4 target provinces.</p> <p><b>( 2 ) Project Purpose</b></p> <p>Aquaculture suitable for local condition is established in the 4 target provinces.</p> <p><b>( 3 ) Outputs</b></p> <ol style="list-style-type: none"> <li>1. Adequate aquaculture methods are verified according to the local conditions of pilot sites.</li> <li>2. The capacity of relevant persons such as target farmers, province/district extension staff and staff of PASs regarding aquaculture technology and extension is improved.</li> <li>3. Fish farmers of the focal districts introduce improved aquaculture methods.</li> </ol>	

4. The roles of relevant organizations are clarified and their collaboration mechanism is developed regarding the aquaculture extension matched with the local conditions.

## ( 4 ) Inputs

### Japanese side :

- Dispatch of Experts : 10 experts (150 MM: including plan in 2009)
- Training of C/Ps in Japan : 18 C/Ps
- Provision of machineries and equipment: About 14.5 million yen (159,190 US\$)
- Provision of facilities: About 18.0 million yen (195,000 US\$)
- Local cost : About 64.6 million yen

### Lao Side:

- Provision of land, building, and facilities
- Allocation of C/Ps: 36 C/Ps

## II. Evaluation Team

<b>Members of Evaluation Team</b>	<ol style="list-style-type: none"> <li>1. <u>Team Leader:</u> Mr. Satoshi CHIKAMI (Senior Adviser on Fishery Development and Rural Development, JICA HDQ)</li> <li>2. <u>Aquaculture:</u> Mr. Hyato SHIRASE (Senior Adviser to the Director General of the Rural Development Department, JICA HDQ)</li> <li>3. <u>Rural Development:</u> Mr. Naoki TATSUZAWA (JICA Expert, Department of Planning, MAF in Lao PDR)</li> <li>4. <u>Evaluation Analysis:</u> Dr. Masanori DOI (Managing Director, INTEM consulting Inc.)</li> <li>5. <u>Evaluation Planning:</u> Mr. Moriaki WATANABE (Project Formulation Advisor, JICA Laos Office)</li> </ol>	
	<p>Besides, 9 members from Laos side participated in the process of joint evaluation</p>	
<b>Period of Evaluation</b>	7/Oct/2009~27/Oct/2009	<b>Type of Evaluation :</b> Terminal

## III. Results of Evaluation

### 1 Project Performance

#### (1) Activities

The activities for Output 1 “adequate aquaculture methods are verified according to the local conditions of pilot site” had a plan to complete in the 3<sup>rd</sup> year. However, the duration of the activities was extended in one more year because enhancing function of the pilot sites was needed. Most of other activities have been implemented well as scheduled according to PO.

#### (2) Outputs

Output 1: Adequate aquaculture methods are verified according to the local conditions of pilot sites.

- A total of 6 technical manuals has been prepared and additional 2 manuals are in preparation.
- From 2005 to 2008 production of fish culture by target farmers in Pilot villages increased by 122 % on average.
- Most of the farmers in pilot villages have intention to continue aquaculture after the termination of the Project.

Output 2: The capacity of relevant persons such as target farmers, province / district extension staff and staff of PASs regarding aquaculture technology and extension is improved.

- More than 2 staff members of each PAS in the target provinces can train district staff and farmers.

- More than 2 staff members of each PLFS in the target provinces can make provincial aquaculture plan and give necessary guidance to the PAS and DAFO.
- More than 2 staff member of each DAFO in the target districts can give guidance to farmers.
- 2 progressive farmers of each pilot villages were certified officially as VADW who conduct extension activities to other farmers.

Output 3: Fish farmers of the local districts introduce improved aquaculture methods.

- More than 1,000 farmers have applied improved aquaculture methods in 8 focal districts.

Output 4 The roles of relevant organizations are clarified and their collaboration mechanism is developed regarding the aquaculture extension method with the local conditions.

- The Project proposed “Rural Aquaculture Promotion Package (RAPP)” as method for sustainable development of aquaculture in Lao PDR and the RAPP was officially authorized by DLF.
- Although the functions and collaboration mechanism of relevant organizations have been developed through the Project implementation, collaboration agreement defining duties of each organization has not been agreed.

### **(3) Project Purpose**

Project Purpose: Aquaculture suitable for local conditions is expanded in the 4 target provinces

- Approximately 1,000 fish farmers in pilot villages and extension villages were considered to increase fish production more than 40 % in 4 target provinces.
- Based on the principle of RAPP, Provincial Aquaculture Development Strategy was prepared in each target province. Aquaculture extension direction at province and district level has been discussed and agreed in principle by all of relevant organizations.

### **(4) Overall Goal**

Overall Goal: Standard of living of small-scale fish farmers is improved through the dissemination of aquaculture suitable for local conditions in the 4 target provinces.

- The average annual increasing rate of fish production in the pilot villages was 30 %. There is possibility to accomplish the indicator, fish consumption of 22 kg / person / year by the rural people in 4 target provinces, in future by encouraging the aquaculture continuously.

## **2 Summary of Evaluation Results**

### **( 1 ) Relevance**

The relevance of the Project is very high.

- Per capita fish consumption of Lao PDR remained at the lowest level in the Indochina region. Although it tends to increase slightly in recent years, the domestic fish production and supply from capture fishery may not increased largely in rural areas. Therefore basic needs exist for aquaculture with low cost aiming at home consumption as well as income generation.
- The Project contributes for achievement of “stable food supply” and “reduction of poverty” which were stressed in “Fifth Social Economic Five Years Development Plan (2001-2005)” as focused issues and are continuously given priority in the current “Sixth Social Economic Five Years Development Plan (2006-2010)”. In addition, agriculture and forestry development addressed to poverty reduction is one of the most important issues in “National Growth and Poverty Eradication Strategy (NGPES)”.
- DLF has set forth the four priority issues for the development of fishery sector of Lao PDR. Those are aquaculture, fishery resource management, assessment of water environment and post harvest. Sustainable development of freshwater aquaculture is the most important target in the fishery sector of the country where natural fish resources tend to decrease markedly.
- In the Country Assistance Program for Lao PDR, Three goals of assistance to Laos and six priority areas are described. This project is corresponded to one of three goals “with a view to promoting the reduction of poverty from the standpoint of ”human security”, Japan will support Laos in its steady steps towards the achievement of the Millenium Development Goals(MDGs)” and one of six priority areas “Developing rural regions and sustainable use of forest resources” .

- In National Growth and Poverty Eradication Strategy, 72 districts of 142 districts in the whole country are designated as prior area for poverty reduction countermeasure. The target provinces in the project includes 20 districts, and it could contribute for achievement of Lao National Development Plan.

## **( 2 ) Effectiveness**

The effectiveness of the Project is evaluated high

- The Project undertook the 2-step extension approach, initially focused on the 12 pilot villages (Output 1) and then expanded to the 54 extension villages by using the experiences in the pilot villages (Output 3). Technical training of relevant government officials as well as fish farmers has been conducted and their capacity has been strengthened by various joint project activities with Japanese experts and counterpart of NADC (Output 2). By extending the period of intervention to the pilot villages for one year from initially planned 3 years to 4 years, capacity development of seed producing farmers could be secured and the “FTF extension” became functionalised. Based on those experiences and results, RAPP was drafted by the Project and authorized by DLF as a future aquaculture development tool. As for the aquaculture extension activities after termination of the Project, PADS was prepared according to the framework of RAPP and agreed by relevant parties. (Output 4). Those series of project approaches were appropriate and effective to accomplish the project purpose.
- The principles of RAPP are official appointment of VADW and spontaneous aquaculture extension by VADW at cluster level. Generally 1-2 progressive farmers or aquaculture groups have started seed production at each pilot village. Some of those progressive fish farmers have already motivated to extend the knowledge and skill for other villages as well as his/her village.
- Based on the results of the pilot project, effectiveness of the group aquaculture by WU, community and school has been verified feasible in addition to individual aquaculture that had been planned from the initial stage of the Project. The Project achieves the project purpose by encouraging positively both types of aquaculture activities.

## **( 3 ) Efficiency**

The efficiency of the project is almost high.

- The Project could utilize the result of its phase 1 such as improved facility of NADC and staff trained in the phase 1, which improved efficiency of technical cooperation in the phase 2.
- Most of inputs by Japanese and Lao side have been done based on the plan both in quality and timing. Although number of Lao personnel allocated at NADC and provision of operation cost was insufficient during the early project period, Lao side made effort to allocate necessary number of counterpart staff such as official appointment of the director of NADC and 3 new staff.
- The Project supported improvement of facilities and equipment at NADC, PAS of the 4 target provinces and one district level aquaculture station in Laongan District. They have been used appropriately for the project activities, particularly for training of farmers and seed production.

## **( 4 ) Impact**

Positive impact of the Project is recognized.

- It is well-known that the small-scale aquaculture plays an important role for providing fish for self-consumption. According to the survey of the Project for the pilot villages, small-scale fish farmers with annual production less than 100kg were dominant occupying 71% in number of farmers and 60.9% of their production was consumed by themselves. Considering the production scale, medium- and large-scale farmers are also important to supply fishes in the village. It can be concluded that extension of aquaculture by the Project inspired significant positive impact towards the Overall goal that has been pursued to increase per capita fish consumption in target provinces, which is considered as an indicator for improving standard of living in rural area.

- The Project has tried to involve women aggressively in various aquaculture-related activities. In particular group aquaculture of a total of nine WU was supported by the Project and achieved preferable results. In many cases, profits obtained from aquaculture are not shared by the members but kept for the activity of WU and for social safety of the villagers. It was confirmed in this study such group aquaculture contributes largely for socio-economic empowerment of women in rural areas. From these aspects, it is concluded the Project has generated significant impact to gender mainstreaming.
- The Project derived an impact to formulate a spontaneous organization of progressive fish farmers. A progressive fish farmer in Xaignabouli province has organized a fish farmer's network to be functioned for mutual benefits such as exchange of seeds or broodstock, joint procurement of equipment and feed and information sharing.
- The project activities generated various intangible positive impacts to villagers that were considered as multi-dimensional function of aquaculture. For example, two ethnic groups that did not closely collaborate before AQIP2 have been encouraged to collaborate each other through the Project activities. Some activities enhanced mind of mutual help among villagers.

### **( 5 ) Sustainability**

Sustainability of the Project is considered mostly high, however, further consideration for securing the sustainability is necessary.

- Based on the achievements of the Project and also taking into consideration the new local development policy, namely the village cluster approach, the Project has prepared the RAPP including VADW appointment system, which are considered a sort of road map after the termination of the Project since they have been approved and authorized officially by DLF. It is confirmed that Lao PDR makes continuous efforts to materialize them particularly in provincial and district levels.
- Seed producing farmers or core farmers who can act as the hub of aquaculture extension in rural area have been fostered in the 12 pilot villages of the Project and they are now providing technical information for ordinary farmers who come to buy seeds. The VADWs selected among such progressive farmers and certified by DLF will work for spontaneous aquaculture extension with social incentive as well as economic incentive. Effectiveness of the FTF technical extension has also been verified in some other countries. It is suggested that the FTF approach implies high sustainability for extension of aquaculture in private basis and supplements the government extension services.
- It is not clear whether aquaculture extension activities by extension workers continue to be implemented, because local government in Provincial / District level has always faced insufficient human resources and budget. However, FTF extension approach by VADW as mention above can make for extension activities by local government.
- Group aquaculture of WU that was initiated by the Project seemed to be accepted by the WU members as a new income generating activity for the union/village not for individual. Work for the common benefit is traditionally undertaken in rural area of Lao PDR. The members show their interest and will to continue group aquaculture. Based on the results of project activities, their involvement for aquaculture extension has described clearly in RAPP. From those aspects, aquaculture of WU is evaluated to keep sustainability after the Project.

## **3 . Factors promoting better sustainability and impact**

### **( 1 ) Factors concerning to Planning**

None

### **( 2 ) Factors concerning to the Implementation Process**

As for contributory factors, various collaboration activities with NGOs as well as national and international institutions can be pointed out. Main collaboration activities show as below.

- construction of the village halls of three pilot villages in Oudomxai province (Collaboration with two Japanese NGOs)

- Promotion of joint research and technical studies on aquaculture (LARRec, National University of Laos, JIRCAS, Tokai University, University of Tokyo, etc.)
- Pipeline with foundation (Environmental study and education regarding the fishes in paddy fields by the Nagao Foundation)
- Collaboration on the field activities (SEAFDEC and AIT)
- Collaboration with similar project (FORCOM)

A series of those collaborative activities contributed for strengthening of capacity of both villagers and counterparts.

#### **4 . Factors inhibiting better sustainability and impact**

##### **( 1 ) Factors concerning to Planning**

None

##### **( 2 ) Factors concerning to the Implementation Process**

As for obstructive factors, natural disaster can be pointed out. Flooding occurred in a part of target areas in Oudomxay, Xaiyabouli and Salavan provinces in 2008, on the other hand insufficiency of rainfall in Savannakhet province in the same year. Those natural disasters obstructed stability of aquaculture operation of fish farmers in both pilot and extension villages.

#### **5 . Conclusion**

The Team confirmed that the Project has prepared sufficient numbers of technical manuals to be adopted for rural fish farming, provided necessary equipment, supported improvement of facilities of NADC and PAS, and implemented a lot of theoretical and practical training not only for Lao government personnel but also for villagers during the project period of 5 years from 2005 up to now. As the results the aquaculture production of the target area has been increased and a technical package for aquaculture extension, namely the Rural Aquaculture Promotion Package (RAPP) was prepared and authorized by DLF. Overall, the Team concludes that so far this Project has almost achieved the Project Purpose with high effectiveness and efficiency, and confirms that the remaining part concerning the provincial aquaculture development plan will be completed by the end of the Project.

It was also confirmed by the Team that the Project has elaborated many positive impacts to rural communities not only on improvement of standard living but also on gender mainstreaming, formulation of a network of progressive farmers and enhancement of amicability of different ethnic groups. DLF and relevant central and local organizations show their strong will to keep continuous efforts for securing sustainability of aquaculture extension activities that have been introduced and verified by the Project. It is deemed that the farmer to farmer approach shown in RAPP works by initiative of VADW.

Accordingly, the Team suggests for both Lao and Japanese authorities that the Project can be terminated as scheduled in R/D and PDM. It is expected that the Project accomplish the remaining activities taking into consideration the recommendations.

#### **6 . Recommendations**

##### **(1) Intensive Support for Seed Producing Farmers (To the Project)**

It is found that seed demand is increasing in the target areas and the increasing number of fish farmers show their interest to produce seed by themselves. Actually, some individual farmers, women's unions and VAPC groups have already stated seed production. During the remaining period, the Project should intensify its technical support to such seed producing farmers. It is also recommended, where applicable, to build a network of VADWs for the promotion of their reciprocal cooperation such as technology transfer from advanced farmers to beginner farmers in the seed production. In addition, facilitating the seed production farmers to avail of financial sources such as Agriculture Promotion Bank and other donors is recommended for constructing/upgrading hatchery facilities and equipment.



(2) Monitoring and Documentation of VADW Activities (To the Project)

24 farmers were selected from pilot villages and certified as VADWs in October 2009. They are now expected to conduct aquaculture extension activities in the respective clusters. The Project should closely monitor and guide their extension activities and document successful cases of both passive and active aquaculture extension in order to scrutinize the effectiveness of the RAPP.

(3) Formulation of Provincial Action Plan (To the PAFO)

Provincial Aquaculture Development Strategy (PADS) has been formulated jointly by the Project, PAFO, PAS, and DAFO of target provinces / districts. Based on the PADS, a detailed action plan should be prepared by each target province. The plan includes budget, time, and responsible organizations, etc. The plan should be authorized by local authorities. To the extent possible, the Project should provide assistance to local authorities in its formulation.

(4) Implementation of RAPP in the Cluster Approach (To the DLF)

The RAPP developed by the Project as a standard package of rural aquaculture promotion is conformed to the cluster development policy of Lao government that is to improve the access of rural people to government services. Although the village cluster approach has not yet been adapted in full-swing in the whole country, it is recommended that the DLF promotes implementation of the RAPP in the Project extension sites in coordination with concerned offices after the termination of the Project.

(5) Promotion of Integrated Farming and School Aquaculture (To the DLF)

Based on the experience of the Project in collaborative activities with FORCOM, potential of integrated farming of fish with animal husbandry and agriculture such as pig-cum-fish culture and rice-cum-fish culture was confirmed. Also school aquaculture is considered as a means of future aquaculture promotion. The Team recommends for future similar aquaculture projects to incorporate those alternative aquaculture activities.

## **7 . Lessons Learned**

(1) Promotion of Women's Union (WU) activities

It is noteworthy that the group aquaculture by WU has been successfully implemented and the woman participants have been empowered. They raise a common fund from the proceeds of fish culture and/or seeds production, which is used in turn for the purpose of mutual support in case of necessity such as delivery or sickness of members. Thus, it seems that the continuation of their aquaculture activities is highly likely even after the project termination. There are WUs already organized in most of the villages nationwide with solid organizational structure including leadership and regulations that may lead to smooth implementation of group aquaculture operations. The experience of the Project in the promotion of WU activities can be a good reference for other rural development activities.

(2) Effectiveness of Farmer to Farmer (FTF) Approach

In the course of the Project implementation, the FTF extension approach has shown its effectiveness to multiply the number of beneficiary fish farmers and efficiency of government intervention in the extension work. The FTF approach is considered applicable not only to aquaculture but also to other rural development if economic incentives and social status are properly provided to key beneficiaries.

(3) Implications of Group Aquaculture in Poverty Reduction

The monitoring survey conducted by the Project shows that fish farmers are generally richer than no-fish farmers. The development interventions may widen such as an economic gap between the two groups. The Project has given due consideration to this social aspect through the coordination function of the VAPC and the promotion of group aquaculture which low-income non-fish farmers and women participated in. In the rural setting especially, it is important to understand social and cultural values of the target people who might opt to behave on the basis of not market economy but solidarity and harmony of the community. In this context, the group aquaculture of WUs has succeed but the groups of low-income farmers are not able to sustain the group activities probably due to their high vulnerability. Thus, this aspect remains as challenge that face the rural aquaculture promotion in particular and many

other rural development projects in general.

**8. Follow-up Situation**

None

# 第1章 終了時評価の概要

## 1-1 背景

魚をはじめとする水産物はラオス人民民主共和国（以下、「ラオス」）の人々にとって最も重要な動物性たんぱく源であり、ラオス政府は国家食糧安全保障の立場からその増産を図っている。天然及び人工水域からの漁業生産は既に頭打ちの状態なので、水産物の増産には養殖の開発・普及が不可欠である。わが国は、養殖開発・普及を進めるために適した方法（養殖技術、養殖経営方法、養殖普及方法）の確立と養殖普及能力の向上に資するために技術協力プロジェクト〔養殖改善・普及計画フェーズ1（AQIP1）及びフェーズ2（AQIP2））を実施している。AQIP1は2001年から2003年にかけて実施され、養殖改善・普及を推進する国立センターとして、畜水産局（DLF）に属するナムスワン養殖開発センター（NADC）の施設がプロジェクトの枠内で建設された。さらに、NADC職員の能力向上、ラオス全国の養殖情報の収集等が行われ、養殖普及に着手する基盤が築かれた。一方、国連食糧農業機関（FAO）やアジア工科大学（AIT）など他のドナーが地方部においてプロジェクトを実施してきた結果として、一般にラオス農民は魚を計画的に生産するという認識が希薄であるため、県・郡レベルで養殖普及を一層強化する必要があることが分かった。以上のような背景からAQIP2は、AQIP1の成果を十分に活用しつつ、養殖普及の地方展開に着手している。

## 1-2 調査の目的

今回の調査では、プロジェクト活動の進捗、プロジェクト自己評価の結果を踏まえ、2010年4月のプロジェクト終了を前に、今までの協力実績及び実施のプロセスを確認し、プロジェクトの派遣中専門家及びラオス側関係者とともプロジェクトの評価を行う。本調査の目的は、以下のようまとめられる。

- (1) プロジェクト終了間際での成果、活動実績、投入実績、計画達成度をプロジェクト・デザイン・マトリックス（PDM）や活動計画（PO）に基づき確認する。
- (2) 評価5項目の観点からプロジェクトを評価し（特に有効性・効率性・自立発展性の観点から）、プロジェクト終了に向けた課題・懸念事項を明確化し、解決方法を検討する。
- (3) 相手国側が事業を継続する場合の留意点、あるいは類似プロジェクトへの教訓を導き出す。

## 1-3 合同評価チームの構成

評価は、日本側及びラオス側により、日本・ラオス合同調査委員会が構成され、合同評価形式で行われた。評価メンバーは、以下のとおりである。

### (1) 日本側調査団員

氏名	担当分野	職位
1) 千頭 聡	団長・総括	JICA 国際協力専門員
2) 白勢 隼人	養殖	JICA 農村開発部 参事役
3) 龍澤 直樹	村落開発	ラオス農林省 計画局 農業政策アドバイザー
4) 土居 正典	評価分析	インテムコンサルティング(株) 専務取締役
5) 渡辺 盛晃	調査企画	JICAラオス事務所 企画調査員

(2) ラオス側評価メンバー

氏名	評価チームでの担当	職位
1) Dr. Bounkhouang KHAMBOUNHEUNG	リーダー	農林省 畜水産局長
2) Mr. Chanthaboun SIRIMANOTHAM	副リーダー	畜水産局 計画課長
3) Mr. Bounthong SAPHAKDY	メンバー	畜水産局 水産管理課長
4) Ms. Panida PHOMMALISACK	メンバー	農林省 計画局技官
5) Ms. Nouhak LIEBVIXAY	メンバー	ナムスワン養殖開発センター所長
6) Mr. Bounkham SIACKHASONE	メンバー	農林省 監査局 総務課長
7) Mr. Khamphet ROGER	メンバー	農林省 農林研究所 水生生物研究センター次長
8) Mr. Phousit PHOUNMMAVONG	メンバー	農林省 農林普及局技官
9) Mr. Somekhith KAOYAHOUANG	メンバー	計画投資省 国際協力局技官

1 - 4 評価調査日程

2009年10月7日(水)～27日(火)(21日間)

詳細行程は以下のとおり。

日順	日付	曜日	行程	宿泊先
1	10月7日	水	【評価分析団員】成田 バンコク ビエンチャン移動	ビエンチャン
2	10月8日	木	・ JICAラオス事務所及びDLFとの打合せ ・ AQIP2専門家との打合せ	ビエンチャン
3	10月9日	金	・ AQIP2カウンターパートとの打合せ	ビエンチャン
4	10月10日	土	・ ビエンチャン ウドムサイ移動(飛行機)	ウドムサイ
5	10月11日	日	・ ウドムサイ県サイ郡パイロット村視察	ウドムサイ
6	10月12日	月	・ ウドムサイ県農林事務所(PAFO)との打合せ ・ ウドムサイ県 サヤブリ県移動(車両)	サヤブリ
7	10月13日	火	・ サヤブリPAFOとの打合せ ・ サヤブリ県サヤブリ郡普及展開村視察	サヤブリ
8	10月14日	水	・ サヤブリ県 ルアンパバーン県 ビエンチャン移動(車両 飛行機) 【団長・養殖団員】成田 バンコク ビエンチャン移動	ビエンチャン
9	10月15日	木	・ 計画局(DOP) \ DLF、JICAラオス事務所表敬	ビエンチャン
10	10月16日	金	・ 第1回合同評価委員会(NADC)	ビエンチャン
11	10月17日	土	・ データ整理	ビエンチャン
12	10月18日	日	・ ビエンチャン サバナケット県ピン郡移動(車両)	ピン

13	10月19日	月	・サバナケットPAFO・ピン郡農林事務所（DAFO）職員との打合せ ・サバナケット県ピン郡パイロット村・普及展開村視察 ・ピン郡 チャンパサック県パークセー移動（車両）	パークセー
14	10月20日	火	・パークセー サラワン県ラオンガム郡移動 ・サラワン県PAFO・ラオンガム郡DAFO職員との打合せ ・サラワン県ラオンガム郡パイロット村視察 ・ラオンガム郡 サバナケット県移動（車両）	サバナケット
15	10月21日	水	・サバナケット県養殖ステーション視察 ・サバナケット県 ビエンチャン移動（車両） ・チーム会議	ビエンチャン
16	10月22日	木	・第2回合同評価委員会〔協議議事録（M/M）案協議〕	ビエンチャン
17	10月23日	金	・第3回合同評価委員会（M/M案協議）	ビエンチャン
18	10月24日	土	・M/M作成&資料整理	ビエンチャン
19	10月25日	日	・M/M作成&資料整理	ビエンチャン
20	10月26日	月	・M/M署名 ・JICAラオス事務所・在ラオス日本大使館報告 【評価分析団員】ビエンチャン バンコク移動	ビエンチャン/ バンコク（評価 分析団員）
21	10月27日	火	・国際協力局（DIC）報告 【団長・養殖団員】ビエンチャン バンコク移動	

1 - 5 主要面談者  
（敬称略・順不同）

<ラオス養殖改善・普及計画フェーズ2 専門家>

池ノ上 宏	チーフアドバイザー
枝 浩樹	専門家（訓練/親魚育成/種苗生産）
茶木 博之	同（養殖技術1/普及）
佐野 幸輔	同（養殖技術2/村落開発/流通調査）

<農林省 畜水産局>

Dr. Bounkhuang Khambounheung	畜水産局長
Ms. Phinkham LASASIMMA	同 次長
Mr. Chanthaboun Sirimanotham	同 計画課長
Mr. Bounthong Saphakdy	同 水産管理課長
Ms. Nouhak Liepvisay	同 ナムスワン養殖開発センター 所長
Mr. Bouasavanh VIENGSOMBATH	同 ナムスワン養殖開発センター 技官
Ms. Vonsamay DALASAEN	同 ナムスワン養殖開発センター 技官
Mr. Bouakeo VONG-AMMAT	同 ナムスワン養殖開発センター 技官

< 農林省 計画局 >

Mr. Khame PHALAKHONE 計画局 次長  
Ms. Panida PHOMALISAK 同 技官  
Mr. Lamngeun SAIPADITH 同 技官

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< 農林省 監査局 >

Mr. Bounkham SYAKSONE 監査局 総務課長

< 農林省 農林業普及局 >

Mr. Phousit PHOMMAVONG 農林業普及局 技官

< サバナケット農林局 >

Mr. Bounthak BOUTHILAT 県養殖ステーション長  
Mr. Phansy 県農林局畜産課 技官  
Mr. Somnit SOUWANLAT ピン郡農林事務所 次長  
Mr. Somvandy ピン郡農林事務所 技官

< サラワン農林局 >

Mr. Somkhith SENTHAVI 局次長  
Mr. Soukan SENTHAVISOUK ラオンガム郡農林事務所 次長  
Mr. Ath ラオンガム郡農林事務所 技官  
Mr. Saly サラワン郡農林事務所 技官

< 計画投資省 >

Mr. Somkhith KAOYAHEUANG 国際協力局 技官

< 在ラオス日本大使館 >

宮下 正明 特命全権大使  
中村 健 一等書記官

< JICAラオス事務所 >

高島 宏明 所長  
武井 耕一 次長  
小谷 匡 所員

## 1 - 6 対象プロジェクトの概要

### 【プロジェクト目標】

協力対象4県（ウドムサイ県、サヤブリ県、サバナケット県、サラワン県）で立地条件に適合した養殖手法が普及する。

### 【上位目標】

協力対象4県で、立地条件に適合した養殖普及を通じて、小規模養殖農家の生活が向上する。

### 【成果】

成果1：パイロットサイトの立地条件に適合した養殖手法が実証される。

成果2：関係者（養殖農家、県・郡普及員及び県技術員）の養殖技術とその普及に関する能力が改善される。

成果3：協力重点郡の養殖農家が改良された養殖手法を導入する。

成果4：立地条件に適合した養殖手法の普及に際し、関係機関の機能と連携が強化される。

### 【活動】

活動1-1：パイロットサイトとなる農村を確定する。

活動1-2：パイロット事業の活動運営計画を策定する。

活動1-3：パイロット事業を実施する。

活動1-4：NADCが中心となって、農家レベルの養殖技術と普及に関する研修プログラム及び教材を作成する。

活動2-1：各県の立地条件に適合した養殖技術と普及に関する研修プログラム及び教材を作成する。

活動2-2：NADC、県養殖ステーション（PAS）及びタイ国において、県技術員、県・郡普及員及び中核養殖農家の研修を行う。

活動2-3：PASの養殖普及活動のための機能を強化する。

活動3-1：パイロット事業の成果を導入する農村と養殖農家を選定する。

活動3-2：養殖農家を対象とした、養殖手法の視聴覚教材を作成し、研修を行う。

活動3-3：選定した養殖農家に対し、普及活動とモニタリングを行う（養殖普及展開事業）。

活動4-1：対象県の養殖活動に関する情報の収集及び整理を行う。

活動4-2：対象県の養殖普及戦略の策定を支援する。

活動4-3：協力期間終了後の養殖普及に係る行動計画を策定する。

活動4-4：養殖普及の促進のため、関係機関を対象とする行動計画に関するセミナーを開催する。

## 1 - 7 終了時評価の手順と方法

終了時評価は次の3ステップで実施した。

### (1) ステップ1 プロジェクトによる自己評価

プロジェクトの進捗と達成状況について、日本人専門家とラオス側カウンターパートなどプロジェクト関係スタッフにより評価する。

(2) ステップ2 JICA側の評価分析担当メンバーによる予備調査

上記の自己評価の結果に基づき、日本人専門家及びラオス側カウンターパートに対し質問表によるインタビュー調査を実施し、また北部の対象サイトの調査を行ってプロジェクトの予備的な評価を行う。この調査はJICA側評価分析担当団員がJICAラオス事務所と協力して行われた。

(3) ステップ3 合同評価調査

ステップ1及び2の結果を踏まえ、合同評価チームは南部の対象サイトの現地調査を行い、プロジェクトの適切な評価についての一連の協議を行う。評価の結果は合同評価レポートとして取りまとめ、相互理解を図る。

【評価の基準】

終了時評価はJICAのプロジェクト評価ガイドライン及び5項目評価基準に沿って実施した。5項目評価基準とは次のとおりである。

(1) 妥当性

ラオス政府の開発方針及び受益者のニーズとプロジェクト目標、上位目標が整合性をもって  
いるかどうかを問う視点。

(2) 有効性

プロジェクトに期待された便益が計画どおり達成されたかどうか。また、それらの便益はプ  
ロジェクトの結果としてもたらされたものかどうかを問う視点。

(3) 効率性

実施過程における生産性を検証する。すなわち、プロジェクトの投入が効率的に成果に転換  
されたかどうかを問う視点。

(4) インパクト

プロジェクトの実施により生じる直接的あるいは間接的、正あるいは負のインパクトを問う  
視点。上位目標への寄与についてのインパクトも含まれる。

(5) 自立発展性

プロジェクトがラオス政府により継続して実施されるかどうか、またプロジェクトによって  
惹起された便益が国家政策、技術、制度、財務的な状況の下で持続できるかどうかを問う視点。



## 第2章 プロジェクトの実績

### 2 - 1 投入実績

プロジェクトの投入実績は、以下のとおりである。

#### (1) 日本側投入

##### 1) 専門家派遣

2005年4月のプロジェクト開始以来、POに示された活動を達成するため、次のような10分野の専門家が派遣された。その投入規模はプロジェクト終了時までの計画を含め150MMである。

- 研修/親魚育成/種苗生産
- 養殖技術 1/普及
- 養殖技術 2/村落開発/流通調査
- チーフアドバイザー
- ジェンダー主流化/生活改善
- 参加型開発
- 初期開発
- 施設設計
- 営農改善
- 域内ネットワーク強化

これら日本人専門家に加え、プロジェクトでは水産普及/餌料開発の分野でタイ国から第三国専門家が短期派遣された。

##### 2) 研 修

研修は次のような3つの形態で行われた。

カウンターパートの本邦研修

カウンターパートの第三国研修

地方政府スタッフ及び農民の国内研修

これらの研修により合計18名が本邦研修を、21名がタイ国にて第三国研修を受講した。国内研修はNADCやPAS及び村で行われ、合計58名の地方政府職員、260名のパイロット村農家、718名の展開村農家が参加した。今後更に112名の農民がプロジェクト終了時までに研修を受講することが計画されている。

##### 3) 供与機材及び施設整備

プロジェクト活動に必要な機材として、ミニバス、モーターバイク、コンピュータなど合計15万7,190ドル相当の機材が供与された。また、NADCやPASなどで養殖関連の施設整備が行われた。投入された施設整備費の合計は約19万ドルであった。

##### 4) 現地業務費

研修・セミナー実施経費、巡回指導経費、普及教材作成経費などを目的に、現地業務費と

して合計約6,460万円の支出が行われた。

## (2) ラオス側投入

### 1) 土地・施設

プロジェクト活動に必要な土地（12ha）建物がラオス政府から提供された。

### 2) カウンターパートの配置

農林省DLF局長、NADC所長及びスタッフ、DLF水産管理課長、DLF計画課長、県・郡レベルのプロジェクト担当職員など、これまで合計36名のカウンターパートが配置された。

### 3) その他機材など

トラック1台、四輪駆動車3台、ミニバス1台、バイク2台、PC3台、プリンター1台などの機材が提供された。

### 4) 業務費

プロジェクトの業務費として現時点まで合計6億4,500万キップ（約7万7,000ドル）が拠出された（2005年：8,000万キップ、2006年：1億5,000万キップ、2007年：1億キップ、2008年：1億キップ、2009年：2億1,500万キップ）。また、NADCの電気代及び水道代が負担された。しかしながら、ラオス側の拠出金額はNADCの運営管理において十分とはいえず、また予算執行はときどき遅れた。

## 2 - 2 活動実績

成果1のパイロット事業については、当初3年次で終了する予定であったが、対象となるパイロット村の機能をより強化するために、パイロット事業の期間を1年間延長した。それ以外の活動はおおむね計画どおりに実施された。

## 2 - 3 成果達成状況

< 成果1 パイロットサイトの立地条件に適合した養殖手法が実証される。 >

指標1-1．現地の状況に合ったマニュアルが整備される。

ティラピア養殖、コイ養殖など現在まで6種類の技術マニュアルが作成され、プロジェクト終了時までにあと2種類のマニュアルが作成される予定である（すべてラオス語）。これらに加えて計14刷のプロジェクトニュースレターが作成され、関係機関に配布された。

指標1-2．パイロット村において対象農家の魚生産が平均40%増加する。

プロジェクト開始1年目から3年目にかけて、プロジェクト活動は養殖技術の改善とパイロット村12村への普及に集中した。農民の技術訓練はプロジェクトによって開発された教材を用いてNADC、PAS及びオンサイト（各村）で行われた。これらの活動は、「農民から農民へ（FTF）」の

普及アプローチを強化するために第4年次も継続された。結果として、村落養殖振興委員会(VAPC)がすべてのパイロット村に設立され、村レベルの種苗生産が開始された。

指標1-2の達成度は表1に示すとおり、モニタリング調査により確認されている。パイロット村の総魚生産量は、2005年の46.25tから2008年には102.6tに増加したと推定される。この間3年間の増加率では全村平均で122%と計算される。個別にみると、12パイロット村のうち9村で40%以上の魚生産の増加が認められた。2008年に生産量を減少させた村があるが、それは雨量不足〔ピン(Phin)村〕あるいは洪水により種苗生産農家の池が浸水し、生産が中断されたこと〔ノンスン(Nonsoung)村〕による。ナタン(Natane)村では生産量がほぼ横ばいであるが、ここでも洪水被害が報告されている。

表1 パイロット村における養殖農家数及び生産量の増加

Province/District	Village	Number of aquaculture households (HH)		Aquaculture production (kg/HH/year)		Aquaculture production (ton/village)		Increased rate for aquaculture production (%)	Remarks
		2005	2008	2005	2008	2005	2008		
Oudomxai province (Xai district)	Houaysang	18	58	28.5	54	0.51	3.13	511	
	Houaythong	31	39	37.5	54	1.16	2.09	80	
	Houaykhoun	33	77	70	231	2.31	17.82	671	
Xaignabouli province (Phiang district)	Natane	84	91	139	130	11.68	11.83	1	
	Somsavanh	70	97	173	238	12.11	23.09	91	
	Nasomnyai	60	70	119	406	7.14	28.42	298	
Sub-total (North)		296	432	117.9	199.9	34.91	86.38	147	
Savannakhet province (Phin district)	Phin	32	32	175	55	5.60	1.77	-68	*1)
	Xaisamphan	15	37	113.5	216	1.70	8.00	370	
	Oudomxai	25	30	22.1	88	0.55	2.65	380	
Salavan province (Laongam district)	Houakouaset	15	15	68	100	1.02	1.49	46	
	Dondou	12	11	42.5	172	0.51	1.89	270	
	Nonsoung	16	9+	122	47	1.95	0.42	-78	*2)
Sub-total (South)		115	134	98.6	121.1	11.34	16.23	43	
Total		411	566	112.5	181.3	46.25	102.60	122	

Remarks \*1) Shortage of rainfall in rainy season, \*2) An active fish farmer suspended production in 2008

Source: Monitoring survey of the Project in 2006 and 2009

指標1-3 .パイロット村の対象農家のうち60%以上が、パイロットプロジェクト終了時に養殖を継続する高い意欲を有す。

2009年8月に実施されたサンプル調査によると、12パイロット村のうち10村においてすべての養殖農家が養殖を継続するという意向を示した(調査標本数:9~20農家/村)。2つの村(すなわち、ピン郡ウドムサイ(Oudomxai)村とラオンガム(Laongam)郡ノンスン(Nonsoung)村では、天災被害を受けた一部の農家で継続意欲が低かったものの、大部分の農民(76~89%)は他村と同様に養殖継続の意欲を有していた。この調査結果は養殖農家がプロジェクト終了後も養殖を継続する高い意欲を有していることを示すものであり、本指標が達成されていることを確認した。

<成果2 関係者(養殖農家、県・郡普及員及び県技術員)の養殖技術とその普及に関する能力が改善される。>

指標2-1．各PASにおいて2名以上の職員が郡県職員及び農民に研修を行うことができる。

研修に関するPAS職員の能力向上は郡職員や農民を対象とする技術研修実施時の観察で確認されている。能力を向上させ、独自に研修を実施できるPAS職員は対象県それぞれで2名以上である。

指標2-2．各県畜水産課（PLFS）においてそれぞれ2名以上の職員が県養殖計画の作成を行うことができ、PASやDAFOに対して養殖普及において必要となる説明指導を行うことができる。

上記と同様、PLFS職員の能力向上はさまざまなプロジェクト活動における計画作成とその実行過程において高められた。少なくともPLFS職員は、県レベルの養殖計画を作成することができ、PASとDAFOに養殖普及のために必要となる説明指導を行う能力がある。

指標2-3．各DAFOにおいて2名以上の職員が農民に説明指導できる。

DAFOの職員は、PLFSを通してプロジェクトから発信される指示により、農民と最も近い現場で業務を行った。彼らの研修能力は各村におけるオンザジョブ訓練だけでなく、NADCやPASで実施された技術訓練により改善された。プロジェクト担当のDAFO職員は昇進や外国での長期研修などのため、ときどき変更されたが、少なくともすべての対象郡で2名は農民に適切な説明指導を行うことができる。

指標2-4．各パイロット村において少なくとも1名以上が他の農家に普及を行うための意欲の高い村落養殖開発ワーカー（VADW）となる。

まず、VAPCとDAFOを通じてVADWとして活動できる資質を有している先進的な農民2名をそれぞれのパイロット村から推薦してもらった。そして、農村養殖振興パッケージ（RAPP）（後述する成果4を参照）に示された手順に沿って、農民への教え方やプレゼンテーションの方法、VADWの役割と義務、更なる養殖技術などに関してNADCで研修を行った。その結果、彼らは2009年10月16日、DLFからVADWとして公式に認証された。

< 成果3 協力重点郡の養殖農家が改良された養殖手法を導入する（養殖普及展開事業） >

指標3-1．8つの協力重点郡において、少なくとも600農家以上（普及村）が改良された手法を導入する。

対象4県8郡から計54の普及村を選定して、近隣のパイロット村へのスタディツアーを企画、実施した（2007年9月）。この研修には計191名の農民が参加している。

それを受け、2007年10月～11月及び2008年11月～12月の2回に分けて、オンサイトでの研修をすべての普及村で実施した。研修は村の集会場、DAFOの事務所などで行われ、計415名の農民が参加した。この研修では、パイロット村の先進的な農民がプロジェクトに協力して研修講師として参加した。

普及村においてVAPCが設立された後は、そのメンバーに対する更なる研修をPASで実施した（2009年2月）。この研修には計108名の農民（2名/村×54の村）が参加した。同様の研修は2010年2月にもう一度計画されている。

普及村における養殖普及は以上のような方法にてパイロット村で培われた経験と人的資源を活用して推進された。パイロット村の先進的な農民は現在VADWとして認証されているが、彼らがオンサイトの研修において重要な役割を果たした点は「農民から農民へ」の研修アプローチとして注目される。

指標要件となっているプロジェクトで導入した改良された養殖手法を適用した養殖農家数は、下記表2のとおりすべての普及村合計で1,000件以上となったことが確認された。

表2 普及村において改良された技術を導入した養殖農家数（2009年）

District	Number of extension villages	Monitoring results		Total number of fish farmers	Estimated number of farmers who applied improved methods
		Number of sample farmers	% of farmers who applied improved methods		
Xai	7	101	86.1	131	113
Beng	6	92	87.0	130	113
Xaignabouli	7	84	84.5	229	194
Phiang	6	114	54.4	187	102
Phin	7	62	80.6	192+	155+
Sepon	7	90	93.3	84+	78+
Laongam	7	66	74.2	113+	84+
Salavan	7	119	94.1	175	165
Total	54	728	81.7	1,241+	1,004+

< 成果4 立地条件に適合した養殖手法の普及に際して関係機関の機能と連携が強化される。 >

指標4-1．関係機関が各機関の役割を明確にした協力協定を受け入れる。

プロジェクトの養殖普及は、国レベルではDLFとNADC、県レベルではPAFOとPAS、郡レベルではDAFOそして村レベルはVAPCとの連携により実施されている。この普及ネットワークは適切で実務的であると思われ、プロジェクトとの協業により強化された。

他方、ラオス政府は2007年に出された首相令に基づき、10村前後の村を1つのクラスターとして考えるクラスターアプローチの導入を進めている。この政府の方針に沿って、農林省では2008年大臣令を出して、普及活動を推進し、農民に対する技術サービスを提供することを目的とする県レベル、郡レベル（特定のクラスターあるいはいくつかのクラスター単位）の技術サービスセンター（TSC）づくりを進めている。ただ、このTSC体制は政府の新しい枠組みであり、少なくとも水産セクターについてはよく認識されているとはいえない。

そのような現在の状況の下で、プロジェクトのリーダーシップにより書面での協力協定を結ぶことは難しいと思われる。

指標4-2．プロジェクトはラオスにおける持続可能な養殖開発に関する提言を行う。

農村地域における養殖普及のパッケージとして、2009年4月、プロジェクトは農村養殖振興パッケージ（RAPP）を作成した。RAPPは新しい漁業法との整合性を勘案し、必要な修正を加えてDLFによって公式に承認されている。RAPPは図1に示すように「1クラスター、1パイロット村」、「1パイロット村、2VADW」という考え方でクラスターアプローチを取り入れている。

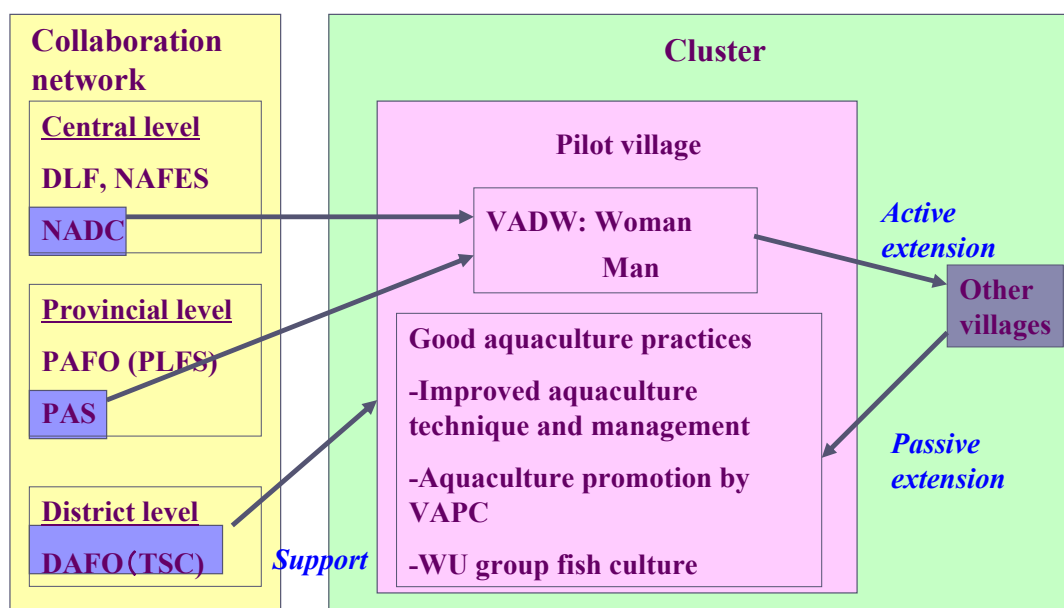


図1 RAPPにおける「1クラスター、1パイロット村」普及システム

#### 2 - 4 プロジェクト目標の達成度

プロジェクト目標：協力対象4県（ウドムサイ県、サヤブリ県、サバナケット県、サラワン県）で、立地条件に適合した養殖手法が普及する。

指標1：4県720養殖農家（パイロット村120、普及村600）で魚の生産量が平均40%以上増加する

プロジェクトのモニタリングデータによると、プロジェクト期間中に40%以上養殖生産を増やした農民数は表3に示すように推定されている。パイロット村では、566名のうち511名の養殖農家が改善された養殖方法のいずれかを適用し、うち425名が40%以上養殖生産を伸ばしたと推定される。普及村では、成果3でも述べたとおり1,241名のうち1,004名が改善された養殖方法を適用し、うち616名が40%以上魚生産を増加させた。パイロット村と普及村の合計では約1,000名の養殖農家が養殖生産量を40%以上増加させていると推定され、プロジェクト目標の指標1は達成されているといえる。

表3 改良された方式を導入した農家数及び生産量を増加させた農家数

Category	District	Number of fish farmers	Number of farmers who applied improved methods	Number of fish farmers who increased fish production by more than 40% ( * )
Pilot villages	Xai	174	165	165
	Phiang	258	231	167
	Phin	99	86	67
	Laongam	35+	29+	26+
Pilot village total		566+	511+	425+
Extension villages	Xai	131	113	19
	Beng	130	113	82
	Phiang	229	194	168
	Xaignabouli	187	102	25
	Phin	192+	155+	155+
	Sepon	84+	78+	76+
	Laongam	113+	84+	41+
	Salavan	175	165	50+
Extension village total		1,241+	1,004+	616+
Total of pilot and extension villages		2,373+	1,515+	1,041+

\* : for pilot villages from 2005-2008, for extension villages from 2007-2008.

Source : Monitoring survey of the Project in August 2009

指標2：県及び郡レベルで養殖開発計画が策定される

RAPPの考え方に基づき、プロジェクトでは県養殖開発戦略(PADS)を作成したが、これはプロジェクト終了後、ラオス側で実施されるべきものである。PADSにおいて示される基本アプローチは4対象県8郡においてはほぼ同様であり、普及村のなかからクラスター単位でパイロット村を1つ選定すること、そして、地方政府機関はNADCやDLFと連携しつつRAPPに示された手順でVADWの育成などを実施することが示されている。

県レベル、郡レベルの養殖普及の方向性、すなわちPADSはAQIP2、PLFS、PAS及びDAFOで議論され、原則的な合意形成が図られている。

## 2 - 5 上位目標の達成度

上位目標：協力対象4県で、立地条件に適合した改良養殖手法の普及を通じて、小規模養殖農家の生活が向上する。

指標：対象4県において、村落部の住民の魚の消費量が22kg/人/年となる

指標に示されている22kg/人/年の魚消費量は、農村部の2020年の国家目標として掲げられているもので、このなかには水生動物の消費も含まれている。

対象4県の魚消費に関してプロジェクトはパイロット村の養殖農家を対象とするサンプル調査を実行した。結果は表4に示すとおりであり、1人当たりの魚消費量は全調査村でほぼ同じ水準であり、全体平均ではおおむね13.3kg/人/年（他の水生動物は含まない）であった。

表4 パイロット村における養殖農家の1人当たり魚消費量

Province/District	Village	Sample size	Fish consumption ( kg/person/yr )
Oudomxai province ( Xai district )	Houaysang	12	10.2
	Houaythong	3	4.2
	Houaykhoun	14	14.3
Xaignabouli province ( Phiang district )	Natane	14	13.9
	Somsavanh	20	12.4
	Nasomnyai	18	17.6
Sub-total ( North )		81	13.5
Savannakhet province ( Phin district )	Phin	13	11.6
	Xaisamphan	15	16.4
	Oudomxai	14	10.9
Salavan province ( Laongam district )	Houakouaset	13	12.0
	Dondou	3	11.6
	Nonsoung	8	15.0
Sub-total ( South )		66	13.0
Total		147	13.3

Source : Monitoring survey of the Project in August 2009

一方、今日養殖は最も重要な魚たんぱくの供給源であり、プロジェクト期間中、パイロット村では大きく生産量を増やしたと推定される。パイロット村のモニタリングデータによると、全12村合わせた養殖生産量は2005年の46.25kgから2008年102.6kgへと増加し（表1）その年平均伸び率は30%と計算される。この伸び率は明らかに、人口増加率のそれ（1995～2005年における年平均増加率は約2.5%）より高い。このように考えると、今後養殖を持続的に振興することにより将来的にこの指標が達成できる可能性が示唆される。ただし、魚消費量に関してはより正確で信頼できるデータが求められる。



## 第3章 評価結果

### 3 - 1 妥当性

本プロジェクトの妥当性は次の観点から高いと判断される。

(1) ラオスのニーズと一致している。

ラオスの1人当たり年間魚消費量は、インドシナ諸国のなかで最も低い水準にとどまっている。近年、消費量は徐々に増加する傾向はあるが、天然水域からの漁獲、供給量について今後大きく増大することは見込めない。したがって、現金収入だけでなく、自家消費も目的とした低コストの養殖について基本的なニーズがある。

(2) ラオスの国策と一致している。

本プロジェクトの内容はその開始時において「食糧安全保障」及び「貧困削減」というラオス政府の方針に合致しており、かつ現行の第6次計画（2006～2010年）の目標とも合致している。また、貧困削減をめざす農林セクターの振興は国家成長貧困撲滅戦略（NGPES）において最重要課題と位置づけられている。

(3) 水産セクターの開発方針と一致している。

DLFでは養殖振興、資源管理、水域環境保全及びポストハーベストの4つを水産セクターの優先課題と位置づけている。なかでも、天然水域の魚資源が大きく減少している現在、淡水養殖の振興は最も重要度が高い。

(4) わが国の対ラオス国別援助計画と整合性がある。

対ラオス国別援助実施方針において、「3つの援助目標」「6つの重点分野」があり、本プロジェクトは援助目標の「『人間の安全保障』の視点から貧困削減を実現すべく、ミレニアム開発目標（MDGs）の達成に向けた着実な歩みを支援する。」、重点問題「農村地域開発及び持続的森林資源の活用」に位置づけられる。

(5) 対象地域選定は妥当な選択であった。

本プロジェクトの対象4県には、ラオス政府が重点開発地域として指定する貧困72郡のうち20郡を含む。気候や生活条件の異なる北部と南部を対象とし、それぞれの地域にあった養殖手法をパイロット事業にて開発し、その手法を普及対象村に普及する本プロジェクトのアプローチは、効率的・効果的な養殖手法をラオス本土に普及させるために適切なアプローチであった。

### 3 - 2 有効性

本プロジェクトの有効性は次の観点から高いと判断される。

(1) プロジェクトアプローチの的確性

本プロジェクトでは2段階の普及アプローチが取られた。すなわち、当初はパイロット村(12

村)に集中した活動を行い(成果1)、その後その経験を用いて普及村(54村)に活動を展開した(成果3)。そのなかで関連する機関の政府職員及び養殖農民の研修が行われ、また日本人専門家及びNADCのカウンターパートらとのさまざまな共同プロジェクト活動により彼らの能力強化が図られた(成果2)。パイロット村での活動は当初計画の3年間で4年間に延長して行われたが、この対応により種苗生産農家の能力向上が図られ、「農民から農民へ」の普及が機能した。これらの活動実績を基にRAPPが作成され、将来の養殖開発ツールとしてDLFで公式に承認された。また、プロジェクト終了後の養殖普及について、RAPPの考え方に沿って対象4県のPADSが作成され、関連機関の合意形成が図られた(成果4)。これら一連のプロジェクトアプローチはプロジェクト目標を達成するために効果的かつ効率的であった。

## (2) RAPPシステムの実効性

RAPP実効性の要は村落クラスターごとに認定されるVADWが行う自発的な養殖普及である。それぞれのパイロット村では既に1~2カ所の先進的な養殖農家あるいは女性同盟(Women's Union: WU)による養殖グループが種苗生産を開始している。これらのうち何人かは自分の村だけでなく、近隣の村に対して知識や技術を普及するよう動機づけがなされている。プロジェクトでは次のような事例を把握しており、本終了時評価でもそのいくつかを確認できた。

### 北部

ウドムサイ(Oudomxai)県サイ(Xai)郡ホワイサン(Houaysang)村のクノイ氏(Mr. Keunoy、現 VADW)は、2009年6月に生産した種苗を販売する目的でサイ郡ボヒエン(Bouhieang)村とロンニャ(Longnya)村に行った。そのとき、彼はこれら2村の農民に対し、養殖方法に関する技術ガイダンスを行った。彼は自分の村だけでなく、近隣の5つの村から来る顧客にも種苗を販売している。

同県同郡ホワイクム(Houaykhoum)村のケオライ氏(Ms. Keolai、現 VADW)は2007年及び2008年、WUのメンバーとともに近隣の村まで自分たちで生産した稚魚の販売に行き、集まった村人に養殖方法の説明を行った。

サヤブリ(Xaignabouli)県ピアン(Phiang)郡ソムサワン(Somsavanh)村のサンブンサン氏(Mr. Xiengkounthan、現在 VADW)は、2007年より郡内他村の7人の種苗生産農家とともに種苗生産グループを組織した。このグループは種苗を販売するとともに、ピアン郡内の多くの村人に技術的なアドバイスを行っている。

### 南部

サバナケット(Savannakhet)県ピン(Phin)郡ピン(Phin)村及びウドムサイ(Oudomxai)村のWU養殖グループはナマズ養殖のための小規模網生簀の組み立て手法を習得し、自分たちのメンバーに教えるとともに、2008年からは他の村向けの販売活動も開始した。

同県同郡サイサムパン(Xaisamphan)村のラムトン氏(Mr. Lamthoun、現 VADW)は本プロジェクトの普及村のためにティラピア種苗の配布を始めた。同様の活動は同郡のウドムサイ村及びサラワン(Salavan)県ラオンガム(Laongam)郡ホアクワセット(Houakhouset)村のVAPCメンバーも行っている。

VADW としての政府からの公式な認定はこれら先進的な養殖農民を勇気づけ、養殖普及における彼らの社会的な責任感を醸成することが見込まれる。以上のような分析、検討結果から、公共部門の激励や技術サポートも重要ではあるものの、RAPP システムはプロジェクトが終了された後も実効性を保つと思われる。

### (3) グループ養殖の振興

当初から計画されていた農家個人での養殖に加え、プロジェクトではパイロットプロジェクトを通じてWU、コミュニティ、学校などによるグループ養殖についての可能性を実証した。これを踏まえ、個人養殖、グループ養殖双方を振興していることから、プロジェクト目標を達成した。

## 3 - 3 効率性

本プロジェクトの効率性はおおむね高いと判断される。

### (1) AQIPフェーズ1の経験の活用

本プロジェクト(フェーズ2)はフェーズ1で整備強化されたNADCの施設やカウンターパートを活用して投入の効率性を高めた。

### (2) 日本側、ラオス側の投入

日本側、ラオス側の投入及びタイミングは質、量ともにおおむね計画どおりであった。プロジェクトの前半ではNADCへのカウンターパートの配置や運営予算について不十分な点があったが、その後のラオス側の努力によりNADCセンター長及び3名の新スタッフの公式な配置が図られ、改善された。JICAの契約制度上、種苗生産期に相当する年度初め(4月)に日本人専門家を派遣できなかった。しかしながら、プロジェクトではカウンターパートが専門家と意思疎通を図って活動を継続することで特段の問題は発生しなかった。

### (3) 日本からの供与資機材の活用

日本側では関連機材の投入とともに、NADC及び対象4県のPAS、郡レベルの種苗生産場1カ所(ラオンガム郡)の整備を行った。これらの機材、施設はプロジェクト活動、とりわけ農民研修や種苗生産において有効に活用された。また、コンクリート水槽、引き網、酸素ポンプなど農民支援のための小規模な機材がVAPCを通じて供与され、養殖活動効率を大きく向上させた。

## 3 - 4 インパクト

本プロジェクトのインパクトは大きいと判断される。

### (1) 魚たんぱく供給源としての小規模養殖

本プロジェクトでは、農村部における生活水準向上の指標のひとつとして位置づけた対象県における1人当たり魚消費量を増加させることをめざしている。小規模養殖が農村部地域において自家消費用の魚供給源になることはよく知られている。プロジェクトによる調査では、

パイロット村の養殖農家の大半（71%）を占める小規模農家（年間生産量100kg以下）では生産量の60.9%が自家消費に充てられている（表5）。また、生産の規模を考えると中規模/大規模の養殖農家も村での魚供給において重要である。プロジェクトによる養殖普及は1人当たり魚消費量を増加させ、生活水準の向上に資するという上位目標に向けて、正のインパクトを引き出している。

表5 パイロット村における養殖魚の自家消費割合

Production scale of fish farm	% in number of fish farmers	Self-consumption rate of fish produced
Small ( Less than 100 kg/year )	71%	60.9%
Medium ( 100 – 500 kg/year )	26%	35.5%
Large ( More than 500 kg/year )	3%	16.2%

Source : Survey of AQIP2 in 2008

## (2) ジェンダー主流化

本プロジェクトでは研修、フィールド指導、モニタリングなど養殖に関連するさまざまな活動において農村女性の参加を積極的に促した。特に、プロジェクトが力をいれたWU9グループによる養殖は良好な成果を上げている。WUによるグループ養殖の便益は多くの場合、メンバー間で分配するのではなく、WUの活動や村の社会保障の原資とされている。すなわち、プロジェクトによる養殖普及活動は農村女性の社会経済的なエンパワーメントを強く推進した。これらの観点からプロジェクトはジェンダー主流化について大きなインパクトをもたらしたと結論できる。

## (3) 先進養殖農家のネットワーク化

プロジェクトはまた先進養殖農家の自発的なネットワーク形成というインパクトを醸成した。先に述べたとおり、サヤプリ県ピアン郡ナタン（Natane）クラスター、ソムサワン村の一種苗生産農家は養殖農家ネットワークを組織し、種苗や親魚の融通、共同での機材調達、情報の共有などの活動を開始している。PAFOやDAFOによる類似したネットワーク組織化と持続的な養殖活動の強化が期待される。

## (4) 村民間の友好と相互扶助

プロジェクト活動は養殖の多面的な機能として注目されるさまざまな可視化できないインパクトも引き出した。ここでは2つ事例を挙げる。

その1：ウドムサイ県サイ郡ホアイトン村にはカム（Kham）族とモン（Hmon）族という2つの少数民族が居住している。プロジェクトが開始される以前はこれら少数民族の間で生計向上について緊密に連携することはなかった。プロジェクト活動、すなわちVAPCの立ち上げやWUによるグループ養殖を通じて、2つの少数民族の連携が促進され、両グループ間の心理的な溝が埋まった。

その2：サヤプリ県ピアン郡ナソムニヤイ（Nasomyai）村では村人全員が参加してWUグループ養殖池のコンクリート製水門造りを行った。この作業は村民の相互扶助意識を高揚

させた。

### 3 - 5 自立発展性

本プロジェクトの自立発展性は、おおむね高いと判断されるが、自立発展性を確保するための方策について更なる検討が必要である。

#### (1) 養殖普及活動の継続性

プロジェクトではその成果と、クラスターアプローチという新しい地方開発方針に考慮しながらVADWの認定制度を含むRAPPを作成した。RAPPはDLFから公式に承認されており、プロジェクト終了後のひとつのロードマップになると思われる。本調査を通じてラオス政府は県レベル及び郡レベルでそれを具体化するために継続して努力を行う意思があることが確認された。

#### (2) 「農民から農民へ」の普及活動の自立発展性

パイロット村12村では養殖普及の中心となる種苗生産農家あるいは中核農家が育成され、一般養殖農家に対する情報発信を行っている。先進的な養殖農家のなかからDLFに認定されたVADWは種苗販売など経済的なインセンティブだけでなく、社会的なインセンティブをもって自発的な養殖普及を行うことが期待される。養殖技術の「農民から農民へ (FTF)」の普及アプローチの有効性については他の国でも実証されており、公的な普及サービスを補完するものとして高い自立発展性をもつ、と思われる。

#### (3) 財政面での自立発展性

県や郡では、慢性的な人材・資金不足により、普及員による安定的な普及活動に、若干の懸念が残る。しかし、上記のVADWによるFTF普及アプローチが、地方政府の普及活動を補完することが期待される。

#### (4) WUによる養殖の自立発展性

本プロジェクトで初めて取り組んだWUによるグループ養殖は、個人ではなくWUあるいは村の収益源として受け入れられている。村社会の利益のために労働するというのはラオスで伝統的な活動であり、WU養殖グループの多くでは養殖による利益の確保と次の飼育回への再投資を行っている。メンバーは養殖に興味をもち、活動を継続する意思を有している。WUの活動を養殖普及に取り込むことはRAPPで位置づけられている。これらの観点からWUによる養殖はプロジェクト終了後も自立発展性を確保していると判断される。

## 第4章 効果発現に貢献した要因及び阻害要因

### 4 - 1 貢献要因

貢献要因としては数多くの関係機関と連携した活動を行った点を指摘できる。プロジェクトが調整した主な活動は次のとおりである。

- ウドムサイ県で村の集会所3カ所の建設（日本のNGO、2団体との連携）
- 共同研究の推進〔水生生物研究センター（LARReC）、ラオス大学、国際農林水産業研究センター（JIRCAS）、東海大学、東京大学など〕
- 資金源とのパイプ（長尾財団による魚類調査と環境教育）
- 現場での連携と研修〔東南アジア漁業開発センター（SEAFDEC）及びAIT〕
- 他の類似プロジェクトとの連携〔森林管理・住民支援プロジェクト（FORCOM）〕

これらの活動は村人及びカウンターパートの能力強化に寄与した。

### 4 - 2 阻害要因

阻害要因としては自然災害があった。特に2008年はプロジェクト対象県のうちウドムサイ県、サヤブリ県、サラワン県の一部養殖場が洪水による被害を受けた。一方、サバナケット県では雨量不足で養殖池の水量が不十分であった。このような自然災害はパイロット村、普及村の養殖活動が安定しない要因のひとつであった。

## 第5章 中間評価時に指摘のあった課題への対応

中間評価時において指摘されていた5項目の課題についての対応は、以下のとおり確認した。

### (1) グループ養殖手法の確立

プロジェクトではラオス農村部において、3つの形態で行われるグループ養殖、すなわちWUグループ養殖、コミュニティ養殖、学校養殖が高い可能性を有することを実証した。一方、低収入の農民によるグループ養殖を促進することは、土地の確保が困難などの理由から難しいことが示唆された。

### (2) 魚の消費量の測定方法の確立

魚消費量データの精度を向上することを目的に、プロジェクトでは家庭内で調理される魚の重量を農民が記帳する、という方法で直接的な計量を開始している。この方法はインタビュー調査データのクロスチェックとともに、実務的な魚消費量測定の方法の検討において参考になると思われる。

### (3) VADWの認証制度の検討

これについてはRAPPの中で記載されているとおりである。

### (4) FORCOMとの連携

2008年サヤブリ県のナムン（Namone）村（FORCOM対象村）及びホアイサニェム（Houaysa Ngem）村（AQIP2対象村）の2村でFORCOMと共同したフィールド活動が行われた。FORCOM対象村ではAQIP2がティラピアの種苗生産方法を紹介するとともに、何人かの農民にはNADCの技術研修に参加してもらった。一方、FORCOMはAQIP2の対象村で養豚についての研修を企画実施した。結果として、魚養殖、養豚ともに効率的な普及が行われた。特に、ホアイサニェム村では養豚と魚養殖を組み合わせた複合養殖が試みられている。

### (5) クラスタ制度に合わせた養殖普及システムの確立

これについてはRAPP及びPADSに示されているとおりである。

## 第6章 結 論

日本・ラオス合同評価チームでは本プロジェクトの達成度や活動内容を適切にかつ客観的に評価することを目的に、プロジェクト側が作成した自己評価表に基づく協議、対象地域の現地調査などを通じて詳細な検討を行い、以下のような結論に達した。

本プロジェクトでは2005年のプロジェクト開始時から現在まで、農村地域の魚養殖に関する技術マニュアルの作成、機材供与、NADCやPASの拠点施設整備、政府職員だけでなく12カ所のパイロット村、54カ所の普及村の農民に対する理論的及び実務的な養殖技術研修など一連の養殖普及活動を実施した。その結果、対象地域の養殖生産量は増加し、養殖普及手法パッケージとしてRAPPが作成され、DLFに承認された。プロジェクトは高い有効性、効率性をもってプロジェクト目標をほぼ達成しており、残りの期間ですべて達成することが見込まれる。

また、本プロジェクトは農村コミュニティに対して多くの正のインパクトを与えている。すなわち上位目標に掲げられている養殖を通じた生活水準の向上だけでなく、ジェンダー主流化、先進的な養殖農民のネットワーク化及び異なる民族間の友好関係の構築などである。DLF及び関連する中央及び地方組織は、プロジェクトで導入され検証された養殖普及活動の継続性を確保するための努力を続けるという強い意志をもっている。そして、RAPPに示された「農民から農民へ(FTF)」の普及アプローチはVADWのイニシアティブにより機能すると判断される。

これらにより本プロジェクトは討議議事録(R/D)及びPDMの計画どおりに終了することができる。プロジェクト側では以下に示すような提言を踏まえ、残されたプロジェクト活動を円滑に遂行することが期待される。



## 第7章 提言と教訓

### 7 - 1 提言

#### (1) 種苗生産農家への支援強化

対象地域では種苗の需要が増大しており、種苗生産に興味を示す養殖農家の数が増加している。実際、いくつかの個別養殖農家、WU及びVAPCでは既に種苗生産を開始している。プロジェクトの残り期間においては、これらの種苗生産農家あるいはグループに対して集中的な技術支援の実施を要望する。また、可能なところからVADWのネットワーク化を図っていくことを提言する。このようなネットワークは種苗生産において経験のある農民から初心者へ技術移転を行うなど、相互協力的な活動の活性化につながる。さらに、種苗場の施設、機材の建設や改善を行ううえで、種苗生産農家が農業振興銀行あるいは他ドナーなどの資金ソースを利用できるよう指導していくことを併せて提言する。

#### (2) VADWの活動モニタリングとその報告

2009年10月、パイロット村から選ばれた24名がVADWとして認定された。これらVADWらはそれぞれの村落クラスターにおいて養殖普及活動を行うことが期待されている。プロジェクトはRAPPの効果を実証することを目的に、彼らの普及活動を綿密にモニタリング並びに指導し、受動的及び能動的な養殖普及についての成功例を報告願いたい。

#### (3) 県養殖普及アクションプランの作成

PADSはプロジェクト及び対象となるPAFO、PAS及びDAFOの共同作業で策定された。PADSに基づき、各県では詳細な行動計画が作成される必要がある。計画内容には予算、期間、具体的な担当機関などが含まれ、それぞれの地域の関係機関により承認されなければならない。この計画の策定を進めるため、プロジェクトは可能な範囲で地域の関係機関を支援していただきたい。

#### (4) クラスタアプローチの枠組みでのRAPPの実施

農村部における養殖振興手法の標準パッケージとしてプロジェクトが開発したRAPPは、農民の行政サービスへのアクセス改善を図るためラオス政府が採用しているクラスター開発方針と一致している。政府の村落クラスターアプローチはいまだ全国的に大きく展開されていないわけではないが、DLFはプロジェクト終了後、関係機関と協力して本プロジェクトの展開サイトにおけるRAPPの実施促進を図ってほしい。

#### (5) 複合養殖、学校養殖の振興

FORCOMと連携したプロジェクト活動の経験から、養豚を組み込んだ施肥養殖、稲田養殖などの魚と畜産や農業を組み合わせた複合養殖のポテンシャルが確認された。また、学校養殖は将来の養殖振興の一手法と思われた。将来の養殖プロジェクトにおいてはこれらの養殖活動を取り込んでいくことを提言する。

## 7 - 2 教 訓

### (1) WUの活動強化

本プロジェクトを通じてWUによるグループ養殖が適切に実施されたこと、そして参加した女性の社会的な力が向上したことは注目すべきである。彼女らは養殖あるいは種苗生産から共通の資金を捻出し、その資金をメンバーの出産や病気時など必要時の相互扶助の原資に充てている。このように、WUの養殖活動はプロジェクト終了後も継続して行われる可能性が高いと思われる。また、ラオスでは全国ほとんどの村でWUが組織化されており、グループ養殖を円滑に実施するための強い結束力を有していると思料される。WUのようなポテンシャルの高い既存組織への支援は、一から組織をつくり支援するよりも、少ない支援で持続的・効果的に活動が展開する。WU活動の振興についてのプロジェクトの経験は、他の村落開発活動における良い参考事例になり得る。

### (2) 「農民から農民へ (FTF)」の普及アプローチの有効性

本プロジェクトを通じて、養殖農民数を増やし、さらに行政による普及効率を高める、という観点から「農民から農民へ」の普及アプローチの有効性が示された。このような農民間の普及アプローチは、中心となる裨益者に経済的なインセンティブ（種苗販売による現金収入）や社会的な地位（VADWのように公式に任命された地位）が適切に付与されるという仕組みを構築することで、養殖だけでなく、他の村落開発プロジェクトに応用できると思われる。

### (3) 貧困削減におけるグループ養殖の意義

プロジェクトが実施したモニタリング調査によると、一般的な傾向として養殖農民は非養殖農民より裕福であることが示されている。養殖開発はそのような2つのグループの経済的なギャップを更に拡大する可能性があるかもしれない。このため、プロジェクトではVAPCの調整機能及び低所得非養殖農家や女性が参加するグループ養殖の振興を通じてこのような社会的な観点に注意を払ってきた。特に、村落構造を考えた場合、市場経済ではなく、コミュニティの結束と調和を重視して行動する傾向が強い対象者の社会的文化的な価値観を理解することが重要である。しかしながら、WUによるグループ養殖は成功した一方、低所得層にある農民グループはおそらくはその脆弱性によりグループ活動を持続することができなかった。農村部におけるかかる貧困層への対策については養殖振興を含め、それ以外の多くの村落開発プロジェクトにおいて今後の課題として残されている。

## 付 属 資 料

- 1 . 協議議事録 ( Minutes of Meeting )
- 2 . 自己評価報告書  
( Self Evaluation for The Joint Terminal Evaluation )


**MINUTES OF MEETINGS  
BETWEEN  
THE JAPAN INTERNATIONAL COOPERATION AGENCY  
AND THE AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF THE LAO PEOPLE'S DEMOCRATIC REPUBLIC  
ON JAPANESE TECHNICAL COOPERATION  
ON AQUACULTURE IMPROVEMENT AND EXTENSION PROJECT PHASE II**


The Japanese terminal evaluation team (hereafter referred to as "Japanese team"), organized by the Japan International Cooperation Agency, headed by Mr. Satoshi CHIKAMI, visited the Lao People's Democratic Republic (hereafter referred to as "Lao PDR") from October 7<sup>th</sup> to 27<sup>th</sup>, 2009 for the purpose of conducting a Lao-Japan Joint terminal Evaluation Study for the Aquaculture Improvement and Extension Project Phase II.


For this purpose, the Japanese team and the Lao authorities concerned formed the joint evaluation team (hereinafter referred to as "the Team"). The Team evaluated performance and achievements of the project through field visits, interviews and a series of discussions.


As a result of a series of surveys and discussions, both sides, the Ministry of Agriculture and Forestry and the Japanese team came to the understanding concerning the matters referred to in the report of the Lao-Japan joint terminal evaluation, which is attached hereto.

Vientiane, October 26<sup>th</sup>, 2009

  
Mr. Satoshi CHIKAMI  
Team Leader of Japanese Side  
Lao-Japan Joint Evaluation Study Team  
Senior Adviser on Fishery Development and  
Rural Development  
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Director General  
Department of Livestock and Fishery  
Ministry of Agriculture and Forestry



Joint Evaluation Report on the Aquaculture Improvement  
and Extension Project Phase II (AQIP2)  
in the Lao PDR

Vientiane, October 26<sup>th</sup>, 2009



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List of abbreviations

AIT	Asian Institute of Technology
AQIP	Aquaculture Improvement and Extension Project
DAFO	District Agriculture and Forestry Office
DLF	Department of Livestock and Fisheries, MAF
FORCOM	Project for Forest Management and Community Support
FTF	Farmer to farmer
JICA	Japan International Cooperation Agency
JIRCAS	Japan International Research Center for Agricultural Sciences
Lao PDR	The Lao People's Democratic Republic
LARReC	Living Aquatic Resources Research Center
MAF	Ministry of Agriculture and Forestry
M/M	Minute of Meeting
NADC	Namxouang Aquaculture Development Center
NAFES	National Agriculture and Forestry Extension Service
NAFRI	National Agriculture and Forestry Research Institute
NPEP	National Poverty Eradication Program
PADS	Provincial Aquaculture Development Strategy
PAFES	Provincial Agriculture and Forestry Extension Service
PAFO	Provincial Agriculture and Forestry Office
PDM	Project Design Matrix
PFS	Provincial Fishery Station
PLFS	Provincial Livestock and Fisheries Section
RAPP	Rural Aquaculture Promotion Package
PO	Plan of Operation
R/D	Record of Discussion
SEAFDEC	Southeast Asian Fisheries Development Center
TSC	Technical Service Center
VADW	Village Aquaculture Development Worker
VAPC	Village Aquaculture Promotion Committee
WU	Women's Union

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## 1. Outline of the Terminal Evaluation

The Aquaculture Improvement and Extension Project Phase II (AQIP2) is a JICA's five year technical cooperation project, the term of which is from April 2005 to April 2010. This fiscal year 2009 is the time for terminal evaluation to review the Project.

An effective and successful joint Lao-Japan evaluation exercise is subject to an appropriate design and schedule, which is due soonest, as well as to the close discussions among stakeholders on the scope and key issues in the evaluation which takes the current situation and the characteristics of the AQIP2 project into account.

### 1.1. Purpose of the Evaluation

- (1) To confirm achievement of output, accomplishment of activities and input just before termination of the Project, based on the Project Design Matrix (PDM) and the plan of operation (P/O).
- (2) To evaluate the Project from the 5 evaluation criteria to clarify issues / concerns for the latter period of the Project and to verify solutions. (especially from the view of effectiveness, efficiency and sustainability)
- (3) To clarify issues for continuing activities by Lao Government after termination of the Project and lead to lessons learned for similar rural development projects.

### 1.2. Members of the Joint Evaluation Team

The terminal evaluation was carried out by the Joint Evaluation Study Team (herein after called as "the Team") composed of both Lao and JICA sides. The members of the Team is shown below.

#### (1) Lao Government side

Name	Title	Position in the team
1) Dr. Bounkhouang KHAMBOUNHEUNG	Director General, DLF, MAF	Team leader
2) Mr. Chanthaboun SIRIMANOTHAM	Director of Planning Division, DLF, MAF	Sub team leader
3) Mr. Bounthong SAPHAKDY	Director of Fishery Division, DLF, MAF	Member
4) Ms. Panida PHOMMALISACK	Senior Technical Staff, Department of Planning, MAF	Member
5) Ms. Nouhak LIEBVIXAY	Director of NADC, MAF	Member
6) Mr. Bounkham SIACKHASONE	Director of Administration Division, Department of Inspection, MAF	Member
7) Mr. Khamphet ROGER	Deputy Director, LARReC, NAFRI, MAF	Member
8) Mr. Phousit PHOUNMMAVONG	Senior Technical Staff, NAFES, MAF	Member
9) Mr. Somekhit KAOYAHOUANG	Senior Technical Staff, Department of International Cooperation, Ministry of Planning and Investment	Member



(2) JICA Side

Name	Title	Position in the team
1) Mr. Sathoshi CHIKAMI	Senior Adviser on Fishery Development and Rural Development, JICA HDQ	Team leader
2) Mr. Hayato SHIRASE	Senior Advisor to the Director General of the Rural Development Department, JICA HDQ	Member (Aquaculture)
3) Mr. Naoki TATSUZAWA	JICA Expert, Department of Planning, MAF	Member (Rural Development)
4) Dr. Masanori DOI	Managing Director, INTEM Consulting Inc.	Member (Evaluation Analysis)
5) Mr. Moriaki WATANABE	Project Formulation Advisor, JICA Laos Office	Member (Evaluation Planning)

1.3. Process and Methods of Terminal Evaluation

(1) Process of the terminal evaluation

The terminal evaluation was implemented in the 3 steps as follows.

1) Step 1 Self-evaluation of the Project

Progress and achievements of the Project were evaluated by the staff of the Project including both Japanese experts and Lao counterparts.

2) Step 2 Preliminary survey by a member of JICA side

Based on the results of the above self-evaluation, the Project was evaluated preliminary through interview survey for the Japanese experts and Lao counterparts using questionnaires and field investigation of the northern project sites. This survey was implemented by a member of JICA side who was responsible for Evaluation Analysis in cooperation with the JICA Laos Office.

3) Step 3 Joint evaluation study

Taking into account the outcomes of the above 2 steps, the Team carried out further field investigation in the southern project sites and a series of discussion for adequate evaluation of the Project. The Team concluded the whole results into the Joint Evaluation Report (this report) for mutual understandings.

The Steps 2 and 3 were conducted from 7-27 October 2009, which schedule is shown in Annex 1.

(2) Evaluation criteria

The terminal evaluation was carried out following the JICA's Project Evaluation Guideline and the 5 evaluation criteria, which are explained below.

1) Relevance

Relevance refers to the validity of the Project Purpose and the Overall Goal in connection with the development policy of Lao PDR as well as the needs of beneficiaries.

2) Effectiveness

Effectiveness refers to the extent to which the expected benefits of the Project have been achieved as planned. It also examines whether these benefits have been brought about as a result

of the Project

3) Efficiency

Efficiency refers to the productivity of the implementation process. It examines whether the Inputs of the Project have been efficiently converted into Outputs.

4) Impact

Impact refers to direct and indirect, positive and negative impacts caused by the implementation of the Project, including the extent to which the Overall Goal has been attained.

5) Sustainability

Sustainability refers to the extent to which the Project can be further developed by Lao PDR, and the extent to which the benefits generated by the Project can be sustained under the national policies, technology, systems and financial state.

## 2. Outline of the Project

### 2.1. Background

Fish and aquatic animals are the most important animal protein source to the rural people in Lao PDR. Increase of fisheries product supply is an urgent need in rural area in order to achieve national food security, to raise nutritional level and to improve livelihood of the people.

Capture fishery production from natural and man-made water bodies seems already to exceed the level of sustainable production in recent years due to strong fishing pressure on the fisheries resources. Therefore, promotion of aquaculture is the most promising way to increase supply of fisheries products.

Aquaculture in rural area in Lao PDR is characterized by the fact that it is conducted as a part of the integrated agricultural production system composed of rice and vegetable cultivation, collection of wild products, cottage industry, livestock farming and so on.

The purpose of the present project is to establish an appropriate model of "farmer to farmer (FTF) aquaculture extension system" to increase production of such rural aquaculture in order to contribute to improvement of livelihood of rural people.

The Project is implemented under four slogans, namely, "poverty alleviation", "food security", "environmental friendliness", and "gender mainstreaming".

### 2.2. Project Design Matrix (PDM)

AQIP2 has been implemented following the PDM which was agreed by both Lao and JICA side at the Joint Coordination Committees. The current version of PDM which was confirmed at the mid-term evaluation stage in January 2008 is shown in Annex 2.

### 2.3. Plan of Operation (PO)

The Plan of Operation of the Project is shown in Annex 3.



## 2.4. Implementing organizations

The Project was implemented by the multiple organizations collaboratively at central, provincial and district levels as shown in Annex 4.

## 3. Accomplishment of the Project

Accomplishment of the project was measured in terms of inputs, activities, outputs and project purpose, as specified in the record of discussion of the project, PDM and PO.

### 3.1. Inputs

#### (1) Japanese side

##### 1) Experts

Since the commencement of the Project in April 2005, the Japanese experts have been allocated adequately to accomplish the activities shown in PO. The fields of the experts and assignment period are summarized in Annex 5.

In addition to the Japanese experts, the Project invited a short-term expert from Thailand in the fields of aquaculture extension system and feed development with a total assignment period of 68 days.

##### 2) Training

Technical training was carried out in the following 3 ways.

- a) Training of Lao counterpart personnel in Japan
- b) Training of Lao counterpart personnel in the third country
- c) Training of local government staff and farmers

A total of 18 counterparts has participated in the training in Japan, and 21 counterparts were sent to Thailand for observation and discussion on progressive aquaculture. Training of local government staff and farmers are conducted at NADC, PAS and villages. A total of 58 local government staff, 260 farmers in pilot villages and 718 farmers in extension villages has been trained. In addition, 112 farmers are scheduled to be trained by the end of the Project. Annex 6 gives more details about training organized and provided by the Project.

##### 3) Provision of machineries, equipments and facilities,

A total of 157,190 USD was provided for purchasing necessary equipment including desktop PCs, motor bikes, minibus, etc, and 195, 000 USD for improvement of aquaculture-related facilities of NADC and PAS as shown in Annex 7.

##### 4) Local cost borne by Japanese side

A total of 64.6 million Japanese Yen was distributed as local operation cost as shown in Annex 7.

(2) Lao side

The summary of input by Lao side is shown below. Inputs by Lao side have been made appropriately in general.

1) Land, building and facilities

Land (12ha), building and facilities for the Project have been provided by Lao government.

2) Assignment of counterpart personnel

Lao side have provided 36 personnel so far as follows,

- Project Director (Director General of the Department of Livestock and Fisheries)
- Project Manager (Director of NADC)
- Project Manager (Head of Technical Division, DLF)
- Project Coordinator (Head of Planning and Cooperation Division, DLF)
- Technical /Training/ Extension Staff (NADC, PLFS and DAFO)

3) Provision of tools and other materials

1 truck, 3 four-wheel drive cars, 1 minibus, 2 motorbike, 3 computers and one printer has been provided by Lao government.

4) Operation cost

As for the operation cost of the Project, a total of 645 million kip has been provided by Lao government from 2005 up to the present (80 million kip in 2005, 150 million kip in 2006, 100 million kip in 2007, 100 million kip in 2008, and 215 million kip in 2009) in addition to the cost for electricity and water supply of NADC. However, the amount of budget was not sufficient to fulfill all the operation costs required for NADC, and their disbursement was sometimes delayed.

3.2. Activities

Most of the activities have been implemented well as scheduled according to the PO.

3.3. Outputs

Outputs is evaluated by each indicators as follows,

- (1) Output 1: Adequate aquaculture methods are verified according to the local conditions of pilot sites.

**Indicator 1-1: Manuals on aquaculture techniques suitable to local conditions are prepared.**

A total of 6 technical manuals has been prepared and additional 2 manuals are in preparation. The

list of those manuals, extension materials such as CD and guidelines prepared or in preparation is shown in Annex 8.

In addition, a total of 14 volumes of project news letters have been produced and distributed among relevant parties.

Indicator 1-2: Production of fish culture by target farmers in pilot villages increases by more than 40% on average.

During the 1<sup>st</sup> to 3<sup>rd</sup> years of the Project, the project activities had been focused on improvement of aquaculture techniques and their extension for the 12 pilot villages. Technical training for farmers was conducted at NADC and PAS as well as at the sites using the text book materials developed by the Project. Those activities were continued in the 4<sup>th</sup> year of the Project for strengthening FTF extension approach. As the results, the Village Aquaculture Promotion Committee (VAPC) was established for all the pilot villages and seed production has been started at village level. Current status of seed production and aquaculture in the pilot villages is summarized in Annex 9.

The achievement of the indicator is confirmed by the monitoring surveys as shown in Table 1. Total fish production of the pilot villages in 2005 was estimated to be 46.25ton and thereafter increased to be 102.6tons with an average increasing rate of 122% for 3 years. In the 9 villages out of 12 pilot villages, more than 40% increase of fish production has been achieved. On the other hand, there were some villages that decreased production in 2008 due to the shortage of rainfall (Phin village) and suspension of production due to inundation of seed producer's pond (Nonsoung village). Aquaculture production was almost unchanged in Natane village which was suffered from flooding in 2008.

Table 1. Increase of aquaculture households and production in the pilot villages.

Province/District	Village	Number of aquaculture households (HH)		Aquaculture production (kg/HH/year)		Aquaculture production (ton/village)		Increased rate for aquaculture production (%)	Remarks
		2005	2008	2005	2008	2005	2008		
Oudomxai province (Xai district)	Houaysang	18	58	28.5	54	0.51	3.13	511	
	Houaythong	31	39	37.5	54	1.16	2.09	80	
	Houaykhoum	33	77	70	231	2.31	17.82	671	
Xaignabouli province (Phiang district)	Natane	84	91	139	130	11.68	11.83	1	
	Somsayanh	70	97	173	238	12.11	23.09	91	
	Nasomnyai	60	70	119	406	7.14	28.42	298	
	Sub-total (North)	296	432	117.9	199.9	34.91	86.38	147	
Savannakhet province (Phin district)	Phin	32	32	175	55	5.60	1.77	-68	*1)
	Xaisamphan	15	37	113.5	216	1.70	8.00	370	
	Oudomxai	25	30	22.1	88	0.55	2.65	380	
Salavan province (Laongam district)	Houakouaset	15	15	68	100	1.02	1.49	46	
	Dondou	12	11	42.5	172	0.51	1.89	270	
	Nonsoung	16	9+	122	47	1.95	0.42	-78	*2)
	Sub-total (South)	115	134	98.6	121.1	11.34	16.23	43	
	Total	411	566	112.5	181.3	46.25	102.60	122	

Remarks \*1) Shortage of rainfall in rainy season, \*2) An active fish farmer suspended production in 2008

Source: Monitoring survey of the Project in 2006 and 2009.

Indicator 1-3: More than 60% of target farmers in pilot villages are well motivated to continue aquaculture at the time of termination of the pilot operation.

Based on the sample survey conducted by the Project in August 2009, 100% of fish farmers answered their intension to continue aquaculture in the 10 of 12 pilot villages (sample size: 9-20 farmers/village). In the 2 villages, namely Oudonxai of Phin district and Nonsoung of Laongam district, most of the farmers (76-89%) showed the same intension, although there were some households which were discouraged by natural disasters. Those findings indicated that fish farmers are well motivated to continue aquaculture, so that the indicator is confirmed achieved.

(2) Output 2: The capacity of relevant persons such as target farmers, province/district extension staff and staff of PASs regarding aquaculture technology and extension is improved.

Indicator 2-1: More than two staff members of each PAS can train district staff and farmers.

Improvement of the capacity of PAS staff for training was confirmed in on-the-job bases in the course of training for district staff and farmers. The number of PAS staff who accomplished the ability of training as stipulated in the indicator is more than two each in the 4 PAS in target provinces. Their names are given in Annex 10.

Indicator 2-2: More than two staff members of each PLFS can make provincial aquaculture plan and give necessary guidance for aquaculture extension to the PAS and DAFO.

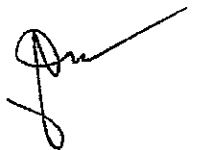
As in the above, the capacity development of PLFS staff was encouraged in the course of planning work and implementation of various project activities. At least the PLFS staff shown in Annex 10 can make provincial aquaculture plan and give necessary guidance for aquaculture extension to PAS and DAFO.

Indicator 2-3. More than two staff members of each DAFO can give guidance to farmers.

Staff members of DAFO have worked most closely with farmers based on the instruction from the Project through PLFS. Their teaching capacity was improved through the training at NADC and PAS as well as on-the-job training at the villages. Although the staff of DAFO in-charge of the Project was replaced sometimes because of promotion or long-term training in overseas, at least two each in all focal districts can give adequate guidance to farmers (Annex 10).

Indicator 2-4. At least one target farmer at each target village becomes the Village Aquaculture Development Worker (VADW) well motivated to extend aquaculture to other farmers.

Basically 2 progressive farmers at each pilot village were recommended for VADW by VAPC and



DAFO. They were trained at NADC on teaching and presentation methods, roles and duties of VADW, further aquaculture techniques, etc. following the RAPP (refer to the Output 4). Finally they were certified officially as VADW by DLF on 16 October 2009. Their names are given in Annex 11.

(3) Output 3: Fish farmers of the focal districts introduce improved aquaculture methods.

Indicator 3. At least 600 target farmers (extension villages) apply improved methods in 8 focal districts.

The Project selected a total of 54 extension villages from the 8 focal districts in the 4 target provinces, and organized study tours for fish farmers there to nearby pilot villages of the Project in September 2007. A total of 191 farmers participated in the tour.

Then on-site training was conducted for all the extension villages in October-November 2007 and November-December 2008. A total of 415 farmers participated in this form of training that was held at village hall, office of DAFO, etc. in which progressive farmers of the pilot villages attended as trainers in cooperation with the AQIP 2 project staff.

After establishment of VAPC of the extension villages, members of VAPC were further trained at PAS in February 2009, the number of participants being 108 farmers (2 farmers/village x 54 villages). The same number of farmers will be trained at PAS in February 2010.

Like the way explained above, aquaculture extension was conducted for the extension villages using experiences and resource persons developed in the pilot villages. It is noted that the progressive farmers of the pilot villages, who are now certified as VADW, play a key role in on-site training. In other words, FTF extension approach is employed.

Current situation of seed production and aquaculture in the extension villages are summarized in Annex 12, and it was confirmed that number of fish farmers applying various improved culture methods which were introduced by the Project (refer to Annex 13) has reached to be more than 1,000 in whole extension villages (Table 2).

Table 2 Number of fish farmers who applied improved techniques at extension villages (2009)

District	Number of expansion villages	Monitoring results		Total number of fish farmers	Estimated number of farmers who applied improved methods
		Number of sample farmers	% of farmers who applied improved methods		
Xai	7	101	86.1	131	113
Beng	6	92	87.0	130	113
Xaignabouli	7	84	84.5	229	194
Phiang	6	114	54.4	187	102
Phin	7	62	80.6	192+	155+
Sepon	7	90	93.3	84+	78+
Laongam	7	66	74.2	113+	84+
Salavan	7	119	94.1	175	165
Total	54	728	81.7	1,241+	1,014+

(4) Output 4: The roles of relevant organizations are clarified and their collaboration mechanism is developed regarding the aquaculture extension matched with the local conditions.

Indicator 4-1: Related organizations approve a collaboration agreement defining duties of each organization.

Aquaculture extension of the Project has been carried out in collaboration with DLF and NADC at national level, PAFO and PAS at provincial level, DAFO at district level, and VAPC at village level. This extension network is considered adequate and practical, and has been further strengthened through the joint activities of the Project.

On the other hand, the Government of Lao PDR is promoting to introduce the cluster approach in which about 10 villages are integrated into a village cluster based on the Prime Minister's Decree in 2007. In line with the policy of the government, the Ministry of Agriculture and Forestry is implementing to establish the Agricultural and Forestry Technical Service Center (TSC) at provincial level and district level (certain cluster and/or various clusters) in order to promote the extension work and provide technical services to local farmers based on the Agriculture and Forestry Minister's Order in 2008. Since the TSC system is a new regime of the government, it has not been recognized well as far as fishery sector is concerned.

Under such current situations, it would be difficult to exchange a sort of written collaboration agreement under the leadership of the Project. However, the duties and roles of relevant organizations towards aquaculture extension after termination of the Project are delineated in principle as shown in Annex 14.

Indicator 4-2. The project makes recommendations for sustainable development of aquaculture in Lao PDR.

As a technical package for aquaculture extension in rural area, the Project drafted the Rural Aquaculture Promotion Package (RAPP) in April 2009, and RAPP was officially authorized by DLF after necessary amendments in conformity with newly ratified Fishery Act. RAPP pursues the cluster approach indicating "One cluster, one pilot village" and "Two VADW in one pilot village" as shown in Figure 1.

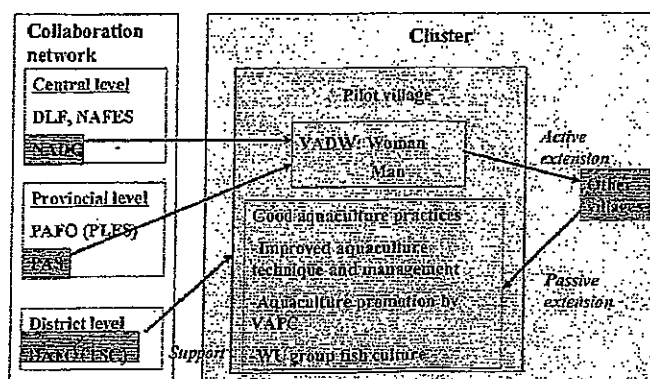


Figure 1. "One pilot village in one cluster" system in RAPP



### 3.4. Project Purpose

Project purpose: Aquaculture suitable for local conditions is established in the 4 target provinces

Indicator 1. 720 fish farmers (120: pilot villages, 600: extension villages) increase their fish production by more than 40% on average by applying improved aquaculture methods in 4 target provinces.

Based on the monitoring data of the Project, number of fish farmers who have increased fish production during the project period more than 40% were estimated as shown in Table 3. In pilot villages, 511 out of 566 fish farmers have applied any of improved aquaculture methods and 425 of them were estimated to improve fish production more than 40%. In extension villages, 1004 out of 1241 fish farmers have applied any of improved aquaculture methods and 616 of them were estimated to improve fish production more than 40%, which had been discussed in Output 3. In the total of pilot villages and extension villages, approximately 1000 fish farmers were considered to increase fish production more than 40%, meaning that this indicator was accomplished.

Table 3. Number of fish farmers who applied improved methods and those who increased fish production.

Category	District	Number of fish farmers	Number of farmers who applied improved methods	Number of fish farmers who increased fish production by more than 40% (*)
Pilot villages	Xai	174	165	165
	Phiang	258	231	167
	Phin	99	86	67
	Laongam	35+	29+	26+
Pilot village total		566+	511+	425+
Extension villages	Xai	131	113	19
	Beng	130	113	82
	Phiang	229	194	168
	Xaignabouli	187	102	25
	Phin	192+	155+	155+
	Sepon	84+	78+	76+
	Laongam	113+	84+	41+
Salavan	175	165	50+	
Extension village total		1,241+	1,004+	616+
Total of pilot and extension villages		2,373+	1,515+	1041+

\*: for pilot villages from 2005-2008, for extension villages from 2007-2008.

Source: Monitoring survey of the Project in August 2009

Indicator 2. Aquaculture development plans are prepared at province and district levels.

Based on the principle of RAPP, the Project prepared Provincial Aquaculture Development Strategy (PADS), which shall be implemented by Lao side after termination of the Project. Basic approach shown in PADS is nearly the same for the 4 target provinces having 8 focal districts, in which identification of one pilot village for one cluster among extension village is stressed and thereafter development procedures described in RAPP, like fostering of VADW, shall be undertaken by relevant local government organizations in collaboration with NADC and DLF.

Aquaculture extension direction at province and district levels, namely PADS, has been discussed among AQIP2, PLFS, PAS and DAFO and agreed in principle by all of them.

### 3.5. Overall goal

Standard of living of rural fish farmer is improved through the dissemination of aquaculture suitable for local conditions in the 4 target provinces.

Indicator Fish consumption of 22 kg/person/year by the rural people in 4 target provinces.

The indicative fish consumption of 22kg/person/year in which consumption of other aquatic animals is included was set corresponding to the national target in 2020 for rural area.

Regarding the fish consumption in the 4 target provinces, the Project carried out a sample survey for fish farmer's households in the pilot villages as shown in Table 4. Based on the result, per capita fish consumption is more or less at the same level in all the villages with an average of 13.3kg/person/year not including other aquatic animals.

Table 4. Per capita fish consumption of the fish farmer's households in the 12 pilot villages.

Province/District	Village	Sample size	Fish consumption (kg/person/yr)
Oudomxai province (Xai district)	Houaysang	12	10.2
	Houaythong	3	4.2
	Houaykhoun	14	14.3
Xaignabouli province (Phiang district)	Natane	14	13.9
	Somsavanh	20	12.4
	Nasommyai	18	17.6
Sub-total (North)		81	13.5
Savannakhet province (Phin district)	Phin	13	11.6
	Xaisamphan	15	16.4
	Oudomxai	14	10.9
Salavan province (Laongam district)	Houakouaset	13	12.0
	Dondon	3	11.6
	Nonsoung	8	15.0
Sub-total (South)		66	13.0
Total		147	13.3

Source: Monitoring survey of the Project in August 2009.

On the other hand, the fish production from aquaculture that is the major source of fish protein at present was estimated to increase markedly in the pilot villages during the Project period. Based on the data of fish production monitoring in the pilot villages, namely from 46.25kg in 2005 to 102.6kg in 2008 (Table 1), the average annual increasing rate was calculated to be 30%. This rate is apparently higher than that of population, which is about 2.5% annually during 1995-2005. These examinations suggest the possibility to accomplish the indicator in future by encouraging the aquaculture continuously. However, more accurate and reliable data on fish consumption are highly required.

#### **4. Results of Evaluation**

##### **4.1. Relevance**

The relevance of the Project is very high.

**Consistency with the needs of Lao PDR:** Per capita fish consumption of Lao PDR remained at the lowest level in the Indochina region. Although it tends to increase slightly in recent years, the domestic fish production and supply from capture fishery may not increased largely in rural areas. Therefore basic needs exist for aquaculture with low cost aiming at home consumption as well as income generation.

**Consistency with national policies of Lao PDR:** The Project contributes for achievement of “stable food supply” and “reduction of poverty” which were stressed in “Fifth Social Economic Five Years Development Plan (2001-2005)” as focused issues and are continuously given priority in the current “Sixth Social Economic Five Years Development Plan (2006-2010)”. In addition, agriculture and forestry development addressed to poverty reduction is one of the most important issues in “National Growth and Poverty Eradication Strategy (NGPES)”.

**Consistency with the development policy in fishery sector:** DLF has set forth the four priority issues for the development of fishery sector of Lao PDR. Those are aquaculture, fishery resource management, assessment of water environment and post harvest. Sustainable development of freshwater aquaculture is the most important target in the fishery sector of the country where natural fish resources tend to decrease markedly.

##### **4.2. Effectiveness**

The effectiveness of the Project is evaluated high

**Appropriateness of the project approaches:** The Project undertook the 2-step extension approach, initially focused on the 12 pilot villages and then expanded to the 54 extension villages by using the experiences in the pilot villages. Technical training of relevant government officials as well as fish

farmers has been conducted and their capacity has been strengthened by various joint project activities with Japanese experts and counterpart of NADC. By extending the period of intervention to the pilot villages for one year from initially planned 3 years to 4 years, capacity development of seed producing farmers could be secured and the "FTF extension" became functionalised. Based on those experiences and results, RAPP was drafted by the Project and authorized by DLF as a future aquaculture development tool. As for the aquaculture extension activities after termination of the Project, PADS was prepared according to the framework of RAPP and agreed by relevant parties. Those series of project approaches were appropriate and effective to accomplish the project purpose.

**Workability of RAPP system:** The principles of RAPP are official appointment of VADW and spontaneous aquaculture extension by VADW at cluster level. As seen in Annex 9, generally 1-2 progressive farmers or aquaculture groups have started seed production at each pilot village. Some of those progressive fish farmers have already motivated to extend the knowledge and skill for other villages as well as his/her village. The Project has observed the following cases, some of which were confirmed in this terminal evaluation study.

#### Northern provinces

- 1) In June 2009, Mr. Keunoy (now VADW at Houaysang village, Xai district, Oudomxay province) went to Bouhieang village and Longnya village in Xai district to sell fish seeds produced by him. At that time, he gave technical guidance to villagers of those two villages about how to grow-out fingerlings. He is receiving customers of fingerlings not only from his village but also from neighboring 5 villages.
- 2) In 2007 and 2008, Ms. Keolai (now VADW at Houaykhoum village, Xai district, Oudomxay) and some women's union (WU) members went to nearby villages to sell fish seeds produced by them, at which they gave technical advises about growing-out method to villagers of those villages.
- 3) Mr. Xiengbounthan (now VADW, at Somsavanh village, Phiang district, Xaignabouli province) have organized a fish seed producers group together with seven seed producers in other villages of the district since 2007. The group is selling fish seeds and giving technical advises to villagers at many villages in Phiang district.

#### Southern provinces

- 1) WU fish culture groups at Phin village and Oudomxai village, Phin district, Savannekhet province have acquired technique to assemble small-scale net cages for catfish culture, and started sales promotion of net cage in addition to free instruction to group members since 2008.
- 2) Mr. Lamthoun (now VADW, at Xaisamphan village, Phin district, Savananakhet province) has started delivery of tilapia seeds for extension villages of the Project. Similar activities were seen for VAPC members at Oudomxai village of the same district, and at Houakhouset village, Laongam district, Salavan province.

It is plausible that official appointment as VADW empowers those progressive fish farmers and elaborates more their social responsibility for aquaculture extension. Based on those observations, the RAPP system would be workable after the termination of the Project, although continuous encouragement and technical support by public sector is also of importance.

**Encouragement of group aquaculture:** Based on the results of the pilot project, effectiveness of the group aquaculture by WU, community and school has been verified feasible in addition to individual aquaculture that had been planned from the initial stage of the Project. The Project achieves the project purpose by encouraging positively both types of aquaculture activities.

#### 4.3. Efficiency

The efficiency of the project is almost high.

**Use of the results and experiences of the AQIP phase1:** The Project (AQIP phase 2) could utilize the result of its phase 1 such as improved facility of NADC and staff trained in the phase 1, which improved efficiency of technical cooperation in the phase 2.

**Input by Japanese and Lao sides:** Most of inputs by Japanese and Lao side have been appropriate both in quality and timing. Although number of Lao personnel allocated at NADC and provision of operation cost was insufficient during the early project period, Lao side made effort to allocate necessary number of counterpart staff such as official appointment of the director of NADC and 3 new staff. Due to the contract system of JICA, Japanese experts could not be allocated in the early fiscal year, namely April, which meets the seed production season. However, no serious problem occurred in the Project since the counterparts continued activities with close communication with the Japanese experts.

**Use of facilities and equipment provided by Japan:** The Project supported improvement of facilities and equipment at NADC, PAS of the 4 target provinces and one district level aquaculture station in Laongan District. They have been used appropriately for the project activities, particularly for training of farmers and seed production. Small-scale equipment provided for farmers through VAPC such as concrete tanks, seine net, O<sub>2</sub> bomb, etc. improved their work efficiency largely.

#### 4.4. Impact

The impact of the Project is high.

**Small-scale aquaculture as a source of fish protein in rural areas:** The Project has been pursued to increase per capita fish consumption in target provinces, which is considered as an indicator for

improving standard of living in rural area. It is well-known that the small-scale aquaculture plays an important role for providing fish for self-consumption. According to the survey of the Project for the pilot villages, small-scale fish farmers with annual production less than 100kg were dominant occupying 71% in number of farmers and 60.9% of their production was consumed by themselves (Table 5). Considering the production scale, medium- and large-scale farmers are also important to supply fishes in the village. It can be concluded that extension of aquaculture by the Project inspired significant positive impact towards the Overall goal.

Table 5. Self-consumption rate of fish produced in the pilot villages

Production scale of fish farm	% in number of fish farmers	Self-consumption rate of fish produced
Small (Less than 100 kg/year)	71%	60.9 %
Medium (100 – 500 kg/year)	26%	35.5 %
Large (More than 500 kg/year)	3%	16.2 %

Source: Survey of AQIP2 in 2008

**Gender mainstreaming:** The Project has tried to involve women aggressively in various aquaculture-related activities through training, field guidance and monitoring. In particular group aquaculture of a total of nine WU was supported by the Project and achieved preferable results. In many cases, profits obtained from aquaculture are not shared by the members but kept for the activity of WU and for social safety of the villagers. It was confirmed in this study such group aquaculture contributes largely for socio-economic empowerment of women in rural areas. From these aspects, it is concluded the Project has generated significant impact to gender mainstreaming.

**Formulation of a network of progressive farmers:** The Project derived an impact to formulate a spontaneous organization of progressive fish farmers. As mentioned above, a progressive fish farmer in Somsavanh village of Natane cluster, Phiang district, Xaignabouli has organized a fish farmer's network to be functioned for mutual benefits such as exchange of seeds or broodstock, joint procurement of equipment and feed and information sharing. It is expected by PAFO and DAFO that a similar network be formulated in other areas and strengthen for sustainable aquaculture.

**Enhancement of amicability and mutual help among villagers:** The project activities generated various intangible positive impacts to villagers that were considered as multi-dimensional function of aquaculture. Two examples are shown here: (1) There are two ethnic groups, "Khamu" and "Himong", inhabiting at Houaythong village, Xai district, Oudomxai province. Those two ethnic groups did not closely collaborate for livelihood improvement at the village before AQIP2. Through the Project activities, such as formation of VAPC and group fish culture by WU, two ethnic groups were encouraged to collaborate each other. As a result, psychological gap between the two groups has been much narrowed. (2) All villagers at Nasomnyai village, Phiang district, Xaygnabouli

province, worked together to construct a big concrete water gate for a large fish pond to be used by WU group. This activity enhanced mind of mutual help among villagers.

#### 4.5. Sustainability

Sustainability of the Project is considered mostly high, however, further consideration for securing the sustainability is necessary.

**Continuity of the aquaculture extension activities:** Based on the achievements of the Project and also taking into consideration the new local development policy, namely the village cluster approach, the Project has prepared the RAPP including VADW appointment system, which are considered a sort of road map after the termination of the Project since they have been approved and authorized officially by DLF. It is confirmed that Lao PDR makes continuous efforts to materialize them particularly in provincial and district levels.

**Sustainability of FTF approach:** Seed producing farmers or core farmers who can act as the hub of aquaculture extension in rural area have been fostered in the 12 pilot villages of the Project and they are now providing technical information for ordinary farmers who come to buy seeds. The VADWs selected among such progressive farmers and certified by DLF will work for spontaneous aquaculture extension with social incentive as well as economic incentive. Effectiveness of the FTF technical extension has also been verified in some other countries. It is suggested that the FTF approach implies high sustainability for extension of aquaculture in private basis and supplements the government extension services.

**Sustainability of aquaculture by WU:** Group aquaculture of WU that was initiated by the Project seemed to be accepted by the WU members as a new income generating activity for the union/village not for individual. Work for the common benefit is traditionally undertaken in rural area of Lao PDR. Most of WU aquaculture group kept the profit for common use and re-invested for the next operation. The members show their interest and will to continue group aquaculture. Based on the results of project activities, their involvement for aquaculture extension has described clearly in RAPP. From those aspects, aquaculture of WU is evaluated to keep sustainability after the Project.

### 5. Contributory and obstructive factors

The Project has envisaged by its own effort various collaboration activities with NGOs as well as national and international institutions. The village halls of three pilot villages in Oudomxai province were established by two Japanese NGOs, namely the Japan International Cooperation Foundation and Network of Asian Rural Communities in cooperation with the Project. The Project conducts joint

research and technical studies on aquaculture with various research institutions including LARReC under NAFRI, National University of Laos, JIRCAS, Tokai University and the University of Tokyo. Under the coordination of the Project, the Nagao Foundation (Japan) is now carrying out environmental study and education regarding the fishes in paddy fields. It also collaborated with SEAFDEC and AIT on the field activities and training of counterparts. A series of those collaborative activities contributed for strengthening of capacity of both villagers and counterparts.

As for obstructive factors, natural disaster can be pointed out. Flooding occurred in a part of target areas in Oudomxay, Xaiyabouli and Salavan provinces in 2008, on the other hand insufficiency of rainfall in Savannakhet province in the same year. Those natural disasters obstructed stability of aquaculture operation of fish farmers in both pilot and extension villages.

## **6. Responses to the issues suggested in the mid-term evaluation**

### **(1) Potential of group aquaculture**

The Project verified that the three types of group aquaculture, namely WU group fish culture, community fish culture and school fish culture have high potential in rural areas of Lao PDR. However, it was suggested difficult to encourage group aquaculture by low-income farmers because of the difficulty in securing land.

### **(2) Method for measuring fish consumption**

In order to improve accuracy on fish consumption data, the Project has started direct measurement of fish weight to be cooked at home by means of daily record keeping by selected villagers. This attempt would be effective for development of practical methodology to measure fish consumption as well as cross checking the data with those obtained from interview survey.

### **(3) Certification system of VADW**

The certification system of VADW has been authorized within framework of RAPP.

### **(4) Collaboration with FORCOM**

In 2008 joint field activities with FORCOM were carried out in the two villages, Namone village (FORCOM target village) and Houaysa Ngem village (AQIP2 target village). AQIP2 introduced seed production technique of tilapia for the target village of FORCOM, and invited some villagers for technical training at NADC, while FORCOM organized training on pig farming for the target village of AQIP2. As the result, both fish culture and pig farming could be extended efficiently. In particular in the Houaysa Ngem village, pig-cum-fish culture, which is a form of integrated agriculture, was attempted and continued.

### **(5) Aquaculture expansion system in consideration of village cluster approach**



It has been described in RAPP and PADS.

## 7. Conclusion

The Joint Evaluation Study Team has carried out intensive examination on the self-evaluation report submitted by the Project, a series of discussions and field investigation of the target provinces in order to evaluate adequately and objectively the achievements and performance of the Project.

The Team confirmed that the Project has prepared sufficient numbers of technical manuals to be adopted for rural fish farming, provided necessary equipment, supported improvement of facilities of NADC and PAS, and implemented a lot of theoretical and practical training not only for Lao government personnel but also for villagers in the 12 pilot villages and 54 extension villages during the project period of 5 years from 2005 up to now. As the results the aquaculture production of the target areas has been increased and a technical package for aquaculture extension, namely the Rural Aquaculture Promotion Package (RAPP) was prepared and authorized by DLF. Overall, The Team concludes that so far the Project has almost achieved the Project Purpose with high effectiveness and efficiency, and confirms that the remaining part concerning the provincial aquaculture development plan will be completed by the end of the Project.

It was also confirmed by the Team that the Project has elaborated many positive impacts to rural communities not only on improvement of standard living but also on gender mainstreaming, formulation of a network of progressive farmers and enhancement of amicability of different ethnic groups. DLF and relevant central and local organizations show their strong will to keep continuous efforts for securing sustainability of aquaculture extension activities that have been introduced and verified by the Project. It is deemed that the farmer to farmer approach shown in RAPP works by initiative of VADW.

Accordingly, the Team suggests for both Lao and Japanese authorities that the Project can be terminated as scheduled in R/D and PDM. The Team highly appreciates the efforts of all Japanese experts and Lao counterpart staff who lead the Project successful, and also expects them to accomplish the remaining activities taking into consideration the recommendations shown in this report.

## 8. Recommendations and Lessons

### 8.1. Recommendations

#### (1) Intensive Support for Seed Producing Farmers

It is found that seed demand is increasing in the target areas and the increasing number of fish farmers show their interest to produce seed by themselves. Actually, some individual farmers, women's unions and VAPC groups have already started seed production. During the remaining period, the Project should intensify its technical support to such seed producing farmers. It is also recommended,



where applicable, to build a network of VADWs for the promotion of their reciprocal cooperation such as technology transfer from advanced farmers to beginner farmers in the seed production. In addition, facilitating the seed production farmers to avail of financial sources such as Agriculture Promotion Bank and other donors is recommended for constructing/upgrading hatchery facilities and equipment.

(2) Monitoring and Documentation of VADW Activities

24 farmers were selected from pilot villages and certified as VADWs in October 2009. They are now expected to conduct aquaculture extension activities in the respective clusters. The Project should closely monitor and guide their extension activities and document successful cases of both passive and active aquaculture extension in order to scrutinize the effectiveness of the RAPP.

(3) Formulation of Provincial Action Plan

Provincial Aquaculture Development Strategy (PADS) has been formulated jointly by the Project, PAFO, PAS, and DAFO of target provinces / districts. Based on the PADS, a detailed action plan should be prepared by each target province. The plan includes budget, time, and responsible organizations, etc. The plan should be authorized by local authorities. To the extent possible, the Project should provide assistance to local authorities in its formulation.

(4) Implementation of RAPP in the Cluster Approach

The RAPP developed by the Project as a standard package of rural aquaculture promotion is conformed to the cluster development policy of Lao government that is to improve the access of rural people to government services. Although the village cluster approach has not yet been adapted in full-swing in the whole country, it is recommended that the DLF promote implementation of the RAPP in the Project extension sites in coordination with concerned offices after the termination of the Project.

(5) Promotion of Integrated Farming and School Aquaculture

Based on the experience of the Project in collaborative activities with FORCOM, potential of integrated farming of fish with animal husbandry and agriculture such as pig-cum-fish culture and rice-cum-fish culture was confirmed. Also school aquaculture is considered as a means of future aquaculture promotion. The Team recommends for future similar aquaculture projects to incorporate those alternative aquaculture activities.

8.2. Lessons learned

(1) Promotion of Women's Union (WU) activities

It is noteworthy that the group aquaculture by WU has been successfully implemented and the woman participants have been empowered. They raise a common fund from the proceeds of fish culture and/or seeds production, which is used in turn for the purpose of mutual support in case of



necessity such as delivery or sickness of members. Thus, it seems that the continuation of their aquaculture activities is highly likely even after the project termination. There are WUs already organized in most of the villages nationwide with solid organizational structure including leadership and regulations that may lead to smooth implementation of group aquaculture operations. The experience of the Project in the promotion of WU activities can be a good reference for other rural development activities.

(2) Effectiveness of Farmer to Farmer (FTF) Approach

In the course of the Project implementation, the FTF extension approach has shown its effectiveness to multiply the number of beneficiary fish farmers and efficiency of government intervention in the extension work. The FTF approach is considered applicable not only to aquaculture but also to other rural development if economic incentives and social status are properly provided to key beneficiaries.

(3) Implications of Group Aquaculture in Poverty Reduction

The monitoring survey conducted by the Project shows that fish farmers are generally richer than non-fish farmers. The development interventions may widen such an economic gap between the two groups. The Project has given due consideration to this social aspect through the coordinating function of the VAPC and the promotion of group aquaculture which low-income non-fish farmers and women participated in. In the rural setting especially, it is important to understand social and cultural values of the target people who might opt to behave on the basis of not market economy but solidarity and harmony of the community. In this context, the group aquaculture of WUs has succeeded but the groups of low-income farmers are not able to sustain the group activities probably due to their high vulnerability. Thus, this aspect remains as challenge that face the rural aquaculture promotion in particular and many other rural development projects in general.

## Annexes

- Annex 1. Schedule of Lao-Japan Joint Evaluation Study
- Annex 2. Current Project Design Matrix (PDM)
- Annex 3. Plan of Operation (PO)
- Annex 4. Organization chart of AQIP2
- Annex 5. List of Japanese experts dispatched to AQIP2.
- Annex 6. Summary of technical training provided by the Project
- Annex 7. Summary of Japanese input for equipment, facility and local cost
- Annex 8. List of manual, extension material and guideline prepared by AQIP 2
- Annex 9. Current situation of seed production and aquaculture in the pilot villages
- Annex 10. List of local government staff who improved the capacity.
- Annex 11. List of the 1st VADW officially certified by DLF in 2009.
- Annex 12. Current situation of seed production and aquaculture in the extension villages
- Annex 13. Improved culture methods and their application
- Annex 14. Duties and roles of relevant organizations towards aquaculture extension after termination of the Project

## Annex 1 Schedule of Joint Terminal Evaluation

Date		Schedule	Stay
Oct 7	Wed	【Member of Evaluation Analysis】 Narita→Bangkok→Vientiane	Vientiane
Oct 8	Thu	<ul style="list-style-type: none"> <li>• Meeting with JICA Office and DLF</li> <li>• Meeting with Japanese experts of AQIP2</li> </ul>	Vientiane
Oct 9	Fri	<ul style="list-style-type: none"> <li>• Meeting with Counterparts of AQIP2</li> </ul>	Vientiane
Oct 10	Sat	Move to Oudomxai by air	Oudomxai
Oct 11	Sun	<ul style="list-style-type: none"> <li>• Site survey of the pilot villages in Xai District</li> </ul>	Oudomxai
Oct 12	Mon	<ul style="list-style-type: none"> <li>• Meeting at PAFO</li> <li>• Move to Xaignabouly by road</li> </ul>	Xaignabouly
Oct 13	Tue	<ul style="list-style-type: none"> <li>• Meeting at PAFO</li> <li>• Site survey of the extension villages in Xaignabouli District</li> </ul>	Xaignabouli
Oct 14	Wed	<ul style="list-style-type: none"> <li>• Move to Luangprabang by road, and to Vientiane by air</li> </ul> 【Team leader and aquaculture member】 Narita→Bangkok→Vientiane	Vientiane
Oct 15	Thu	<ul style="list-style-type: none"> <li>• Courtesy call to DOP, DLF and JICA Laos office</li> </ul>	Vientiane
Oct 16	Fri	<ul style="list-style-type: none"> <li>• 1st meeting of the joint evaluation committee at NADC</li> </ul>	Vientiane
Oct 17	Sat	<ul style="list-style-type: none"> <li>• Data analysis</li> </ul>	Vientiane
Oct 18	Sun	<ul style="list-style-type: none"> <li>• Move to the southern target provinces</li> </ul>	Phin
Oct 19	Mon	<ul style="list-style-type: none"> <li>• Meeting with Savanakhet PAFO staff</li> <li>• Visit to pilot villages and extension villages in Phin district</li> <li>• Move to Pakse</li> </ul>	Pakse
Oct 20	Tue	<ul style="list-style-type: none"> <li>• Move to Saravan from Pakse</li> <li>• Meeting with Saravan PAFO/DAFO</li> <li>• Visit to pilot villages in Laoungam district</li> <li>• Move to Savanakhet</li> </ul>	Savanakhet
Oct 21	Wed	<ul style="list-style-type: none"> <li>• Move to Vientiane</li> <li>• Team meeting</li> </ul>	Vientiane
Oct 22	Thu	<ul style="list-style-type: none"> <li>• 2nd meeting of the joint evaluation committee at DLF on the M/M draft</li> </ul>	Vientiane
Oct 23	Fri	<ul style="list-style-type: none"> <li>• 3rd meeting of the joint evaluation committee at DLF on the M/M draft</li> </ul>	Vientiane
Oct 24	Sat	<ul style="list-style-type: none"> <li>• Finalization of M/M</li> </ul>	Vientiane
Oct 25	Sun	<ul style="list-style-type: none"> <li>• Data analysis</li> </ul>	Vientiane
Oct 26	Mon	<ul style="list-style-type: none"> <li>• Signing of M/M</li> <li>• Report to JICA and EOJ</li> </ul> 【Member of Evaluation Analysis】 <ul style="list-style-type: none"> <li>• Leave for Bangkok/Tokyo</li> </ul>	Bangkok/ Vientiane
Oct 27	Tue	<ul style="list-style-type: none"> <li>• Report to DIC</li> </ul> 【Team leader and aquaculture member】 <ul style="list-style-type: none"> <li>• Leave for Bangkok</li> </ul>	

Annex 2 Project Design Matrix (PDM-3)

(7 March 2008)

**Project title:** Aquaculture Improvement and Extension Project, Phase II (AQIP II)  
**Duration:** from 23 April 2005 to 22 April 2010 (5 years)  
**Target group:** Rural fish farmers who have experience of aquaculture, and relevant government personnel  
**Implementing Agency:** The Department of Livestock and Fisheries (DLF)  
**Target areas:** 4 provinces of Oudomxai, Xaignyabouli, Savannakhet and Salavan  
**Approved:** at 2nd Joint Coordination Committee Meeting held on 28 February 2006  
**Super goal:** Fish production meets the demand of the people of Lao PDR through sustainable development of aquaculture.

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumptions
<p><b>Overall goal:</b></p> <p>Standard of living of rural fish farmers is improved through the dissemination of aquaculture suitable for local conditions in the 4 target provinces.</p>	<p>Fish consumption of 22 kg/person/year by the rural people in 4 target provinces.</p>	<p>Project impact survey report.</p>	<p>-The policy of agriculture and rural development is not changed drastically.</p> <p>-The price of cultured fish has not been detrimentally affected.</p>
<p><b>Project purpose:</b></p> <p>Aquaculture suitable for local conditions is established in the 4 target provinces</p>	<p>1. 720 fish farmers (120: pilot villages, 600: extension villages) increase their fish production by more than 40% on average by applying improved aquaculture methods in 4 target provinces.</p> <p>2. Aquaculture development plans are prepared at provinces and district levels.</p>	<p>1. Project monitoring report</p> <p>2. Aquaculture development plan of target provinces</p>	<p>-Necessary budget is secured.</p> <p>-Socio-economic situation of rural areas is not changed largely.</p>
<p><b>Outputs:</b></p> <p>1. Adequate aquaculture methods are verified according to the local conditions of pilot sites.</p>	<p>1-1. Manuals on aquaculture techniques suitable to local conditions are prepared.</p> <p>1-2. Production of fish culture by target farmers in</p>	<p>1-1. Project monitoring report</p> <p>1-2. Village monitoring report</p>	<p>-Serious epidemic fish diseases do not occur.</p> <p>-Extreme natural disasters such as drought and flood do not occur.</p>

<p>2. The capacity of relevant persons such as target farmers, province/district extension staff and staff of PASs regarding aquaculture technology and extension is improved.</p>	<p>pilot villages increases by more than 40% on average.</p> <p>1-3. More than 60% of target farmers in pilot villages are well motivated to continue aquaculture at the time of termination of the pilot operation.</p> <p>2-1. More than two staff members of each PAS can train district staff and farmers.</p> <p>2-2. <u>More than two staff members of each FLES can make provincial aquaculture plan and give necessary guidance for aquaculture extension to PAS and DAFO.</u></p> <p>2-3. <u>More than two staff members of each DAFO can give guidance to farmers.</u></p> <p>2-4. At least one target farmer at each target village becomes the Village Aquaculture Development Worker (VADW) well motivated to extend aquaculture to other farmers.</p> <p>3. At least 600 target farmers (extension villages) apply improved methods in 8 focal districts.</p> <p>4-1. Related organizations approve a collaboration agreement defining duties of each organization.</p> <p><del>4-2. Responsible organizations allocate sufficient budget to the national aquaculture extension plan).</del></p> <p>4-2. The project makes recommendations for sustainable development of aquaculture in Leo PDR.</p>	<p>1-3. Village monitoring report</p> <p>2-1. Project monitoring report</p> <p>2-2. Project monitoring report</p> <p>2-3. Project monitoring report</p> <p>2-4. Village monitoring report</p> <p>3. Village monitoring report</p> <p>4-1. The national aquaculture development plan defining collaboration system</p> <p>4-2. Action plan for national aquaculture development</p>
<p>3. Fish farmers of the focal districts introduce improved aquaculture methods.</p>	<p>3. Fish farmers of the focal districts introduce improved aquaculture methods.</p>	<p>3. Village monitoring report</p>
<p>4. The roles of relevant organizations are clarified and their collaboration mechanism is developed regarding the aquaculture extension matched with the local conditions.</p>	<p>4-1. Related organizations approve a collaboration agreement defining duties of each organization.</p> <p><del>4-2. Responsible organizations allocate sufficient budget to the national aquaculture extension plan).</del></p>	<p>4-1. The national aquaculture development plan defining collaboration system</p> <p>4-2. Action plan for national aquaculture development</p>

Activities:	Inputs:	Situation that hinder project												
<p>1-1. Identify pilot villages and target farmers (4 focal districts, 12 villages, 120 target farmers in pilot villages)</p> <p>1-1-1. Collect and analyse data on focal districts</p> <p>1-1-2. Determine pilot villages</p> <p>1-2. Prepare operation and management plan of pilot sites</p> <p>1-2-1. Determine indicators in PDM</p> <p>1-2-2. Prepare pilot operation plan by district</p> <p>1-2-3. Determine target farmers and organize a Village Aquaculture Promotion Committee (VAPC) in each pilot village</p> <p>1-3. Carry out pilot operation</p> <p>1-4. Improve methods on seed production and grow-out culture mainly at NADC</p> <p>2-1. Prepare training programs and materials considering conditions of localities</p> <p>2-1-1. Prepare training programs</p> <p>2-1-2. Prepare textbooks</p> <p>2-2. Conduct training for extension staff and target farmers at NADC, PASs and in Thailand</p> <p>2-3. Strengthen function of PASs</p> <p>3-1. Select villages (extension villages) and farmer groups for which outputs of pilot operations are to be introduced (3 focal districts, 50-60 villages, 200 farmers</p>	<p>[Japanese side]</p> <p>1. Experts</p> <p>1) Chief advisor</p> <p>2) Aquaculture technique, extension</p> <p>3) Training, broodstock management, seed production</p> <p>4) Aquaculture technique, rural development, marketing survey</p> <p>5) Other relevant experts (as per required)</p> <p>2. Training of C/P in Japan or third countries</p> <p>3. Provision of equipment</p> <p>1) Vehicles for training and monitoring</p> <p>2) Equipment for seed production, facility improvement, etc.</p> <p>4. Allocation of other project costs</p> <p>Lao government estimation and development plan on fish supply (kg/person/year)</p> <table border="1" data-bbox="638 347 718 548"> <thead> <tr> <th>Year</th> <th>2005</th> <th>2010</th> <th>2020</th> </tr> </thead> <tbody> <tr> <td>Rural area</td> <td>8-10</td> <td>13</td> <td>22</td> </tr> <tr> <td>Urban area</td> <td>14</td> <td>16</td> <td>27</td> </tr> </tbody> </table>	Year	2005	2010	2020	Rural area	8-10	13	22	Urban area	14	16	27	<p>[Lao side]</p> <p>1. Allocation of C/Ps</p> <p>1) Project director</p> <p>2) Project managers</p> <p>3) Project coordinator</p> <p>4) Other counterparts</p> <p>2. Allocation of extension staff at provincial/district level</p> <p>3. Budget allocation</p> <p>4. Provision of office space</p>
Year	2005	2010	2020											
Rural area	8-10	13	22											
Urban area	14	16	27											
		<p>-Situation that hinder project participation of villagers have not occurred.</p> <p>-C/Ps, province/district extension staff and PAS staff are not transferred to other organizations.</p> <p>Preconditions:</p> <p>-Security of pilot sites is confirmed.</p>												

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<p>in the northern provinces and 400 farmers in the southern provinces, 600 target farmers in total in extension villages)</p> <p>3-2. Prepare visual extension materials on practical aquaculture and train selected farmers</p> <p>3-3. Carry out aquaculture expansion operation for selected farmers</p> <p>4-1. Collect and compile information on the aquaculture activities of target provinces</p> <p>4-2. Assist preparation of aquaculture development strategies of the target provinces</p> <p>4-3. Make an action plan of the project after its cooperation period.</p> <p>4-4. Hold a seminar on the action plan of the relevant organizations for further aquaculture extension.</p>	<p>Average (D.L.F. 2005)</p>	<p>14</p>	<p>24</p>
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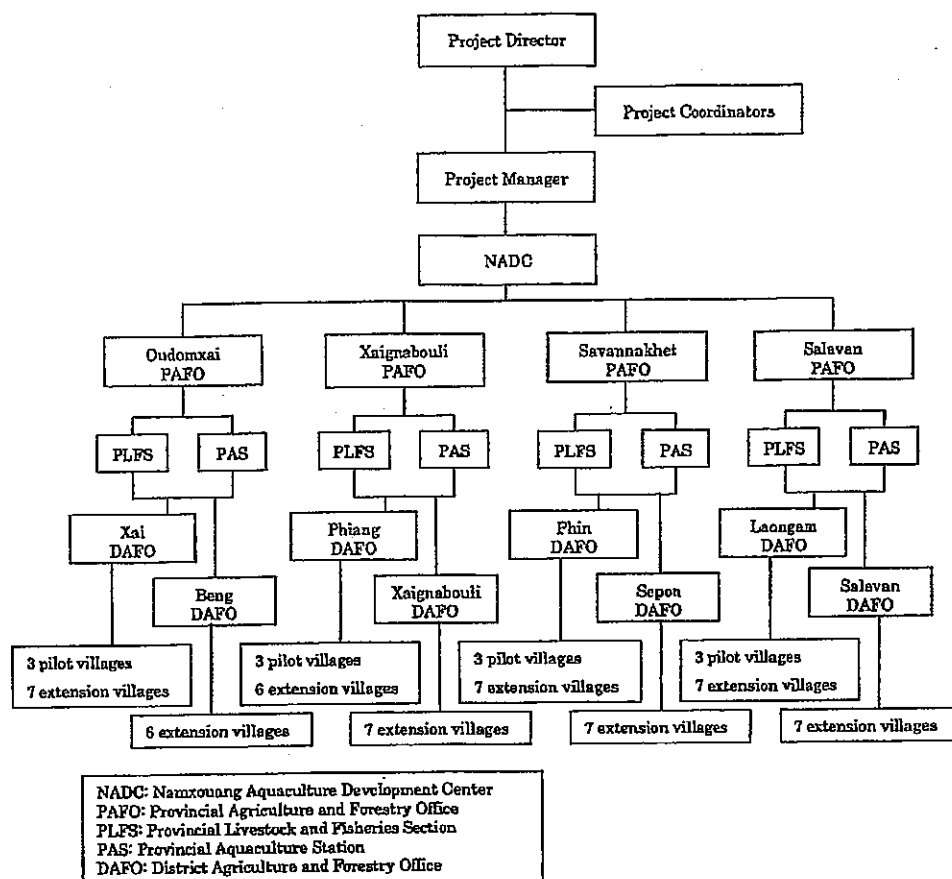
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Annex 3 Plan of operation

Activity	1 <sup>st</sup> year (JFY2005)		2 <sup>nd</sup> year (JFY2006)		3 <sup>rd</sup> year (JFY2007)		4 <sup>th</sup> year (JFY2008)		5 <sup>th</sup> year (JFY2009)	
Joint Coordination Committee meeting	△									
Monitoring of project progress										
Activity 1-1. Identify villages as pilot sites	△									
Activity 1-2. Prepare operation and management plan of pilot sites	△									
Activity 1-3. Carry out pilot operation										
Activity 1-4. Improve methods of seed production and grow-out culture mainly at NADC										
Activity 2-1. Prepare training programs and materials considering conditions of localities										
Activity 2-2. Conduct training for extension staff and core farmers at NADC, PAsS and Thailand										
Activity 2-3. Strengthen extension abilities of PAsS.										
Activity 3-1. Select villages and farmer groups										
Activity 3-2. Prepare visual extension materials and train farmers										
Activity 3-4. Carry out aquaculture expansion operation for selected farmers										
Activity 4-1. Collect and compile information on aquaculture activities										
Activity 4-2. Assist preparation of aquaculture development strategies										
Activity 4-3. Make an action plan after the cooperation period										
Activity 4-4. Hold an seminar on the action plan										

#### Annex 4. Organization chart of AQIP2



#### Annex 5. List of Japanese experts dispatched to AQIP2.

Fields of assignment	2005	2006	2007	2008	2009 (plan)
Chief advisor	3.00	3.00	3.00	2.00	3.00
Training, Broodstock management, seed production	9.50	9.00	9.00	8.67	5.00
Aquaculture technique, extension	9.50	9.00	9.00	8.67	5.00
Aquaculture technique, rural development, market survey	9.50	9.00	9.00	8.67	5.00
Gender mainstreaming, life improvement	2.00	1.50	1.00		
Participatory development	1.00	1.00			
Early larval development	1.00				
Planning of aquaculture facility	2.00				
Improvement of agriculture system	1.00	1.00			
Strengthening regional network	1.00				
Total M/M	39.5	33.5	31.0	28.0	18.0
	150.0				

Annex 6 Summary of technical training provided by the Project

Subjects	Trainees		Year and Duration
	Level	Number	
1) Training of Lao counter parts in Japan			
Training in Japan (freshwater fish breeding)	Central	4	2006 (26 days) 2006 (15 days)
Training in Japan (freshwater aquaculture)	Central, Province, District	6	2006 (39 days)
Group Training Course in Japan (sustainable aquaculture development)	Central	1	2006 (132 days)
Group Training Course in Japan (gender mainstreaming in fishing community development)	Central, Province, District	5	2006 (45 days) 2007 (45 days) 2008 (45 days) 2009 (45 days)
Japanese language program for public officials	Central	1	2007 (261 days)
Group Training Course in Japan (fish disease prevention and hygienic handling of cultured fish)	Central	1	2009 (73 days)
Sub-total		18	
2) Training of Lao counterparts in the third country			
Training in Thailand (observation and discussion on freshwater aquaculture)	Province, District	21	2005 (8 days) 2006 (5 days)
3) Training of local government staff and farmers			
Aquaculture Training at NADC	Province, District	24	2005 (21 days) 2006 (21 days)
Aquaculture Training at NADC	Pilot village	72	2006 (15 days) 2007 (10 days) 2007 (14 days)
VADW Training at NADC	Pilot village	24	2008 (7 days)
Aquaculture Training at PAS	Pilot village	128	2006 (30 days) 2007 (10 days) 2008 (10 days)
Aquaculture Training at PAS	Extension village	112 [112]	2009 (5 days) [2010 (5 days)]
Aquaculture Training at PAS	District	24	2008 (3 days)
Study trip inside Lao	Pilot village	36	2006 (11 days) 2007 (4 days)
Study trip to pilot villages	Extension village	191	2007 (5 days)
On-site training at extension villages	Extension village	415	2007 (1 day) 2008 (1 day)
Sub-total:	Province, District	58	
	Pilot village	260	
	Extension village	718 [112]	

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Annex 7. Summary of Japanese input for equipment, facility and local cost

Subject		US\$	million Yen
1) Equipment provided			
JFY 2005	Office equipment, microscope, motobike, generator	68,460	
JFY 2006	4WD vehicle, color photocopier machine	42,850	
JFY 2007	Desktop PC, pH meter, DO meter	23,880	
JFY 2008	Mini-bus	22,000	
JFY 2009			
	Sub-total	157,190	
2) Facility improvement			
JFY 2005	Donekeo Aquaculture Station (Oudomxai) Pakbo Aquaculture Station (Savannakhet) Nongdeng Aquaculture Station (Salavan) Vangyen Aquaculture Station (Laongam District)	77,100	
JFY 2006	Namxouang Aquaculture Development Center (NADC, Vientiane)	56,700	
JFY 2007	Vangyen Aquaculture Station (Laongam District) NADC (Vientiane)	37,300	
JFY 2008	Nam-Tien Aquaculture Station (Xaignabouli)	23,900	
JFY 2009			
	Sub-total	195,000	
3) Local cost			
JFY 2005	Training, travel, text making, facility maintenance, etc.		12.7
JFY 2006	Ditto		14.3
JFY 2007	Ditto		14.7
JFY 2008	Ditto		11.4
JFY 2009	ditto (Provisional)		11.5
	Sub-total		64.6
	Total	352,190	64.6

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Annex 8. List of manual, extension material and guideline prepared by AQIP 2

Title	Language	Volume	Remarks
<b>1) Manuals</b>			
Common carp culture method	Lao	29 pages	
Tilapia culture method	Lao	28 pages	
Aquaculture extension method	Lao	25 pages	
Frog culture method	Lao	20 pages	
Cricket culture method	Lao	10 pages	
Aquaculture extension method based on the results of AQIP 2	Lao	24 pages	
Puntius culture method	Lao	-	In preparation
Catfish culture method	Lao	-	In preparation
<b>2) Extension materials</b>			
Video CD "Aquaculture method in rural area"	Lao	30 minute	
Hanging paper panel "How to increase fish production"	Lao	16 pages	
Paper theater "Let's do aquaculture"	Lao	10 pages	
<b>3) Guideline</b>			
Selection of target cluster for RAPP	Lao	-	In preparation
Selection of pilot village for RAPP	Lao	-	In preparation
Organizing VAPC for RAPP	Lao	-	In preparation
Organizing by Women's Union aquaculture group	Lao	-	In preparation
Selection of progressive farmers and VADW	Lao	-	In preparation

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Annex 9. Current situation of seed production and aquaculture in the pilot villages

Province/District	Village	Seed production	Number of aquaculture households (HH)	Estimated fish production	
				Sample size	Average (kg/HH/yr)
Oudomxai province (Xai district)	Houaysang	2 individual farmers produce 50,000 - 60,000 fingerlings/year	58	12	54
	Houaythong	VAPC and WU members are trying common carp seed production..	39	3	54
	Houaykhoun	VAPC members produce 2,000 - 4,000 fingerlings/year	77	14	231
Xaignabouli province (Phiang district)	Natane	A group of 3 farmers produces 30,000 - 50,000 fingerlings/year	91	14	130
	Somsavanh	1 individual farmer produces 20,000 - 30,000 fingerlings/year	97	20	238
	Nasomnyai	2 individual farmers produce 200,000 - 250,000 fingerlings/year	70	18	406
Sub-total (North)			432	81	221
Savannakhet province (Phin district)	Phin	VAPC intends to try seed production.	32	13	55
	Xaisamphan	1 individual farmer produces 4,800 tilapia seeds. Some of them are sold for them for extension villages	37	15	216
	Oudomxai	VAPC members produce 3,760 common carp Some of them are sold for them for extension villages.	30	14	88
Salavan province (Laongam district)	Houakouaset	1) VAPC produced 300 tilapia seeds. 2) WU produced 1,000 common carp seeds and 2,000 Puntius seeds.	15	13	100
	Dondou	No seed production activity	11	3	172
	Nonsoung	1 individual farmer produces 130,000 tilapia seeds, and another individual farmer produces 12,000 common carp seeds.	9+	8	47
Sub-total (South)			134	66	112
Total			566	147	172

Annex 10. List of local government staff who improved the capacity.

1) Staff at province level

Province	PAS staff	PLFS staff
Oudomxai	Mr. Somphet, Mr. Khonsavanh	Mr. Lanthaphone, Mr. Kongthasith
Xaignabouli	Mr. Vilavong, Mr. Feng	Mr. Vilaphong, Mr. Pasouth
Savannakhet	Mr. Khamphay, Mr. Latsamy	Mr. Phansy, Mr. Khanthavong
Salavan	Mr. Phouangkeo, Mr. Daoby	Mr. Tongon, Mr. Bounliang

2) Staff at district level

District	DAFO staff
Xai	Ms. Amphai, Ms. Chalouny
Beng	Mr. Keiwmoaya, Mr. Thongnan
Phiang	Mr. Sio, Mr. Phonmany
Xaignabouli	Mr. Thongsalop, Mr. Chanleune
Phin	Mr. Khamsamong, Ms. Somvandy
Sepon	Mr. Keoudon, Mr. Bounna
Laongam	Mr. Ath, Ms. Outama
Salavan	Mr. Saly, Mr. Thongdee

Annex 11 List of the 1<sup>st</sup> VADW officially certified by DLF in 2009.

District	Village	VADW
Xai	Houaysang	Mr. Keunoy, Mr. Khamsao
	Houaythong	Mr. Ounset, Ms. Bouaphan
	Houaykhoun	Mr. Bounvai, Ms. Keolai
Phiang	Natane	Mr. Phanseun, Mr. Mouth
	Saosavanh	Mr. Xiengbounthanh, Ms. Pan
	Nasommyai	Mr. Deng, Ms. Vieng
Phin	Phin	Mr. Lingthong, Ms. Mo
	Saisamphan	Mr. Lamthoun, Mr. Khamtan
	Oudomxai	Mr. Bounraym, Ms. Phoungmaly, Ms. Panchar
Laongam	Houakhouset	Mr. Thongdeuan, Ms. Vone
	Dondou	Mr. Khamsay
	Nonsoung	Mr. Thongdan, Mr. Khamray



Annex 12. Current situation of seed production and aquaculture in the extension villages

Province	District	Village	Seed production	Number of aquaculture households (HH)	Estimated fish production	
					Sample size	Average (kg/HH/yr)
Oudomxai province	Xai district	KM 10	-	8	3	33.3
		Homxai	-	9	8	44.4
		Donxai	2 farmers	15	10	234
		Donkeo	6 farmers	19	17	378.4
		Nale	-	11	11	141.7
		Viengsa	1 farmer	31	8	55.6
		Bo	2 farmers	38	13	97.8
	Beng district	Pangthong	1 farmer	13	12	48.5
		Houaylor	-	15	7	314.7
		Nalai	-	13	13	18.2
		Bengkham	1 farmer	29	10	20.9
		Thakath	-	40	20	185.3
		Nabon	-	20	20	65.2
		Xaignabouli province	Phiang district	Kewkhem	-	15
Muangphiang	-			33	20	51.1
Phonxai	-			23	20	41.8
Phonhine	-			45	20	98.1
Nakhem	-			46	20	39
Nale	-			25	17	33.8
Xaignabouli district	Houayxam-O			-	27	17
	Houaysa-Ngem		-	54	14	150.4
	Khengkhoi		1 farmer	79	14	146.4
	Donengun		2 farmers	24	8	193.4
	Nalao		1 farmer	23	10	249
	Natonoy		-	14	13	214.2
	Paphoun		-	8	2	57.5
Sub-total (North)				677	342	116
Savannakhet province	Phin district	Napho	-	19	10	24.5
		Nathalang	-	20	6	118.3
		Non Gnayng	-	17	1	100
		Nonsa At	-	27	10	40
		Pasomxai	-	89	20	19
		Sibounhuang	-	37	19	71.7
		Xaisomboun	-	37	1	17
	Sepon district	Alai-kaleng	-	8	8	16
		Dongsavan	-	20	11	72.3
		Phonhay	-	25	20	48.8
		Nabo	-	20	20	58.8
		Phonmouang	-	20	9	85
		Seponkao	-	3	1	17
		Vongvilay	-	8	6	25.3
Salavan province	Laongam district	Bak Gnai	-	20	20	44.3
		Len	-	n. a.	8	150
		Ngew	-	30	20	13.7
		Phonouan	-	13	10	15

		Sandong	-	5	n. a.	n. a.
		Temephopoum	-	21	n. a.	n. a.
		Vangpuay	-	21	8	306
	Salavan district	Bungxai	-	79	20	48.4
		Nakhoysao	-	19	19	82.2
		Nathanko	-	22	22	190.9
		Naxai Gnai	-	17	10	41.1
		Nongsai	-	12	7	173
		Phao	-	20	19	388
		Naxai Noy	-	17	16	34.5
			Sub-total (South)		607	305
		Total		1284	647	105

### Annex 13 Improved culture methods and their application

Items	Contents	% of farmers applying the improved method			
		Oudomxai (N=193)	Xaignaboul (N=198)	Savannakhet (N=152)	Salavan (N=185)
Pond management	Cleaning and repair of pond, construction of water gate, use of screen net for water intake, etc	84%	62%	37%	72%
Pond drying	Drying up of the pond for elimination of predators and propagation of natural food organisms	65%	42%	15%	62%
Using fertilizer	Adequate amount of livestock manure, lime and chemical fertilizer	51%	34%	20%	50%
Fingerlings stocking method	Selection of good quality fingerlings, adequate stocking rate, how to release fingerlings	73%	48%	49%	58%
Bamboo sticks	Installation of bamboo sticks in fish pond in order to propagate natural feed and prevent fish stealing	12%	6%	1%	10%
Boiled feed	Using rice bran, broken rice, corn and soy bean	22%	19%	8%	19%
Feeding method	Adequate feeding times, use of feeding plate	9%	18%	5%	13%
Intermediate culture	Growing fry to fingerlings	9%	8%	9%	7%
Seed production	Hatchery operation	3%	1%	1%	2%
Catfish culture by net cage	Combination boiled feed and formula feed, Set up the net cage in the fish pond	1%	6%	1%	2%
Group fish culture	Group aquaculture by WU, school or village community	13%	2%	1%	3%
Book / Record keeping	How to record input and output of fish culture	-	-	-	-

Source: Monitoring survey of the Project in August 2009

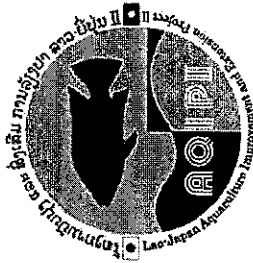
Annex 14. Duties and roles of relevant organizations towards aquaculture extension after termination of the Project

Level	Organization	Duties and roles
Central	DLF / NAFRI / NAFES	<ul style="list-style-type: none"> <li>- General administration for whole country</li> <li>- Policy making</li> <li>- Law making</li> <li>- Budgeting</li> <li>- VADW certification</li> </ul>
	NADC	<ul style="list-style-type: none"> <li>- Training for trainers (PAS, PLFS, DAFO staff, VADW)</li> <li>- Technical development</li> <li>- RAPP tool making</li> <li>- Site monitoring and guidance (yearly)</li> </ul>
Province	PAFO	<ul style="list-style-type: none"> <li>- General administration for whole province</li> <li>- Policy making</li> <li>- Budgeting</li> </ul>
	PLFS	<ul style="list-style-type: none"> <li>- On-site monitoring and guidance (bi-monthly) to pilot villages</li> <li>- Reporting to PAFO, DLF, NADC</li> </ul>
	PAS	<ul style="list-style-type: none"> <li>- DAFO staff, VADW training</li> <li>- Broodstock management</li> <li>- Seed production</li> <li>- RAPP tool making</li> <li>- Technical improvement</li> </ul>
District	DAFO	<ul style="list-style-type: none"> <li>- On-site monitoring and guidance (monthly) to pilot villages</li> <li>- Reporting to PLFS</li> </ul>
	TSC	<ul style="list-style-type: none"> <li>- Technical advice to pilot villages</li> </ul>

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# Self Evaluation for The Joint Terminal Evaluation



## Aquaculture Improvement and Extension Project Phase 2

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October 2009

# Annex 1. Activity chart (Terminal Evaluation)

Output 1: Adequate aquaculture methods are verified according to the local conditions of pilot sites

Planned ████████ Conducted ████████

Activities	Detailed Activities	2005		2006		2007		2008		2009		2010		Inputs	Results	Progress & Problem
		4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3			
1-1 Identify pilot villages and target farmers (4 focal districts, 12 villages, 120 target farmers in pilot villages)	1-1-1 Collect and analyse data on focal districts 1-1-2 Determine pilot villages													Human Resources: All experts, Tokyo University, C/Ps, staff of PAFO and DAFO Materials & Equipment: Vehicle, Computer, Questionnaire General implementation costs	The survey for collection of information was conducted between May to June, 05. The report was prepared on the life and aquaculture situation in each candidate village.	Progressed as planned without problem.
1-2 Prepare operation and management plan of pilot sites	1-2-1 Determine indicators in PDM 1-2-2 Prepare pilot operation plan by district													All experts, C/Ps, staff of PAFO, DLF and DAFO Vehicle, Reports of DLF and DAFO General implementation costs	All candidate villages recommended by DAFOs were judged as suitable for pilot operation; Houayhang, Houaythong, Houaykhoum in Oudomxai, Nasomnyai, Netane, Somsavanh in Xeimabouli, Nonsoung, Houakhouaset, Dondou in Salavan, and Oudomxai, Saysamphan, Phir in Savannakhet	Progressed as planned without problem.
														All experts, C/Ps, staff of PAFO and DAFO Vehicle, Computer, Questionnaire General implementation costs	The PRA workshop in July, 05 clarified situation and problems in aquaculture extension at each focal district and pilot village. The baseline survey between June to November, 05, provided a large amount of data on life and aquaculture situation in pilot village, and clarified characteristics of each village. PDM indicators were decided based on information collected, and approved at the 1st JCC meeting in February 2006.	Progressed as planned. Since the situation of life and aquaculture at pilot villages is not stable, AQJP 2 should have enough flexibility to respond any changes that will occur at pilot villages.
														All experts, C/Ps, staff of PAFO and DAFO Reports of PRA workshop, Baseline survey, etc. General implementation costs	Action plan for village aquaculture promotion was prepared based on the results of PRA workshop and baseline data.	The operation plan was made on February 2006, getting behind the original work plan. The action plan should be explained well to YAPC and target farmers. It will take some time to get their full understanding on the plan. Furthermore, as situation in the villages is always changing, AQJP 2 should be highly flexible to modify the action plan responding to such changes.

1-3 Carry out pilot operation	1-2-3 Determine target farmers and organize a Village Aquaculture Promotion Committee (VAPC) at each pilot village		All experts, C/Ps, staff of PAFO and DAFO	Vehicle, Motorcycle, Computer, Water pump, Scale, Net cage, Fish seed, Feed, Fertilizer, VCD, Peper theater, etc.	General implementation costs	Target fish farmers and members of VAPC were selected at each village. The number of target farmers and VAPC members were decided depending on the village size.	Progressed as planned. Target farmers and members of VAPC should be continuously monitored, and if there is any change, appropriate action could be taken.
1-4 Improve methods on seed production and grow-out culture mainly at NADC			All experts, C/Ps	NADC facilities, Net cage, Feed, Fertilizer, pH meter, DO meter, Microscope, etc.	General implementation costs	By periodical on-site guidance, VAPC at most of the pilot village has been well established as an organization to lead aquaculture development at the village. There are many cases in which VAPC transfers useful improved aquaculture techniques to villagers. Two core farmers at each pilot village have acquired sufficient ability as YADW. At some pilot villages, WJ group is active in fish culture to accumulate a sizable amount of fund for the group. As other types of group fish culture, community fish culture and school fish culture have shown high potential as aquaculture activities in rural area.	Progressed as planned. Full scale technical guidance to target farmers started in the second year. As most of target villagers stock fish seed in April to June, a system of technical guidance in March to April, when Japanese experts are absent, should be established. Low income groups are organized at two pilot villages. However, they have difficulties in finding ponds available for them. Only one group at Houwaysang village has started some activities.
			All experts, C/Ps	NADC facilities, Net cage, Feed, Fertilizer, pH meter, DO meter, Microscope, etc.	General implementation costs	To develop low-input, low-risk fish culture techniques to be applied at pilot villages, experiments are being conducted on the following topics 1) Efficient and easy seed production method of tilapia by partitioning a pond into broodstock part and fish fry part. 2) Study on feed efficiency of rice bran fed to tilapia. 3) Prevention of fish poaching and enhancement of natural feed production by sticking bamboo poles on the pond bottom. 4) Optimum stocking density of common carp and tilapia fry into a grow-out pond. 5) Intermediate culture of tilapia, common carp, Puntius and catfish.	Progressed as planned without problem.

Output 2: The capacity of relevant persons such as target farmers, province/district extension staff and staff of PASs regarding aquaculture technology and extension is improved

Activities	Detailed Activities	2005		2006		2007		2008		2008		2010		Inputs	Results	Progress & Problem
		4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3			
2-1 Prepare training programs and materials considering conditions of localities	2-1-1 Prepare training programs 2-1-2 Prepare textbooks													Human Resources All experts, C/Ps	Contents of aquaculture training at NADC and PAS and study trip for local government staff, and target farmers were decided, and course guides were prepared.	Progressed as planned
2-2 Conduct training for extension staff and target farmers at NADC, PASs and in Thailand														All experts, expert from Thailand, C/Ps	Up to second year, two textbooks, 1) on tilapia seed production, 2) on common carp seed production, and one manual on aquaculture extension in Lao PDR were prepared. Guideline to gender mainstreaming in aquaculture extension was also prepared. Fourth year, guideline of aquaculture techniques was prepared for the use by staffs of PAFO, PLFS, PAS, DAFO, as well as by VADW and VAPC members.	Progressed as planned. Revised edition of aquaculture techniques, fish farm management methods and extension methods will be prepared in fifth year.
														All experts, expert from Thailand, C/Ps	Aquaculture training at NADC, OJT at PAS, on-site aquaculture training and study trip to Thailand, inside Lao and Japan were conducted. Total number of participants in each training and study trip are as follow: NADC training local government officers 24 farmers 98 OJT at PAS pilot village farmers 128 expansion village farmers 112 (+112) DAFO staff members 24 On-site aquaculture training expansion village farmers 415 Study trip to Thailand NADC, PAFO, DAFO 20 Study trip to inside Lao farmers 227 Training in Japan DLF, NADC, PAFO, DAFO 18(+1)	All planned training were conducted.

Annex 1. Activity chart

2-3 Strengthen function of PASs				All experts, C/Ps, staff of PAFO and DAFO	Vehicle, pH meter, DO meter, Thermometer, etc.	Facility improvement costs, general improvement costs	Facilities of PASs in Oudomxai, Xaignabouli, Savannakhet and Salavan provinces, and aquaculture station of Leongum district, were much improved, and training and seed production ability of those stations were strengthened.	Progressed as planned
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Output 3: Fish farmers of the focal districts introduce improved aquaculture methods

Activities	Detailed Activities	Timeline												Results	Progress & Problem	
		2005		2006		2007		2008		2009		2010				
		4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12
3-1	Select villages (extension villages) and farmer groups for which outputs of pilot operations are to be introduced (8 focal districts, 50-60 villages, 200 farmers in the northern provinces and 400 farmers in the southern provinces, 800 target farmers in total in extension villages)													All villages recommended by DAFOs have been found to be suitable as target villages except for two villages (Boung villages and Donegane village) recommended by Xaignabouli DAFO. Thus, 56 target villages have been selected for the aquaculture expansion operation. Baseline data for each village, such as population, year of establishment, main production activity, situation of aquaculture, activity of WU, profiles of village leaders, etc. have been collected. Also, an activity plan for the aquaculture expansion operation has been prepared.	Progressed as planned	
3-2	Prepare visual extension materials on practical aquaculture and train selected farmers													One VCD showing techniques necessary in tilapia and common carp culture, including breeding, intermediate culture, water management, grow-out culture, feeding, etc. has been prepared. As visual extension materials, large hanging paper sheets illustrating good fish culture practice and a "paper theatre" on water environment protection have been prepared. The hanging sheets were used to explain good fish culture practice to VAPC members and fish farmers, and the "paper theatre" was shown to school children at class rooms of village primary schools.	Progressed as planned	
3-3	Carry out aquaculture expansion operation for selected farmers													Characteristics of aquaculture at target villages and expectations of villagers toward AQIP 2 at target villages are clarified (refer to "Report of the participatory workshop in the newly selected villages for aquaculture expansion operation, January 2007"). Various aquaculture techniques and extension techniques developed in the pilot operation were applied to 56 aquaculture expansion villages selected in 8 focal districts. Many villagers at aquaculture expansion villages improved their knowledge and techniques through on-site guidance, on-site training and PAS training.	Progressed as planned	

Output 4: The roles of relevant organizations are clarified and their collaboration mechanism is developed regarding the aquaculture extension matched with the local conditions

Activities	2005		2006		2007		2008		2009		2010		Inputs	Results	Progress & Problem		
	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3				Human Resources	Materials & Equipment
4-1 Collect and compile information on the aquaculture activities of target provinces													All experts, C/ps, staff of PAFO, DAFO	Vehicle, Reports from AQIP 2	General implementation costs	Aquaculture information has been collected in the target provinces on the occasion of field activities and workshop on PADS. Provincial aquaculture development strategy, making "Provincial Aquaculture Profile" has been updated for each target provinces.	Progressed as planned
4-2 Assist preparation of aquaculture development strategies of the target provinces													All experts, C/ps, staff of PAFO, DAFO	Vehicle, Reports from AQIP 2	General implementation costs	At workshops held at PAFO of target provinces between January to February 2009, RAPP, Rural Aquaculture Promotion Package, was presented as a standard method of rural aquaculture extension in the country. Participants from DLF, PAFO, PLFS, and DAFO discussed on the contents of RAPP, and recognized RAPP as a useful method in rural aquaculture extension in the province. Provincial aquaculture development strategy (PADS) using RAPP method was formulated for each target province.	Progressed as planned
4-3 Make an action plan of the project after its cooperation period													All experts, C/ps, staff of PAFO, DAFO	Vehicle, Reports from AQIP 2	General implementation costs	DLF has declared to PAFO and DAFO throughout the country that (1)RAPP is applied as the standard method of rural aquaculture extension, and (2) NADC is the organization to train VADW and to issue official certificates to them. RAPP shows a direction of rural aquaculture extension after AQIP 2 under the cluster development policy.	Progressed as planned
4-4 Hold a seminar on the action plan of the relevant organizations for further aquaculture extension													All experts, C/ps, staff of PAFO, DAFO, Laos Univ., Tokyo Univ., Tokai Univ., JIRCAS	Reports from AQIP 2	General implementation costs	A national aquaculture seminar was organized 1st and 2nd of October 2009 in Vientiane, inviting participants from PAFO, PLFS and PAS of all provinces, DAFO of target districts, MAF, DLF, LARRC, NAFRI, NAFES, MRO, FAO, NUOL, etc. Achievements of AQIP 2, technical improvement accomplished by other organizations were presented and discussed in the seminar. The National University of Lao, the University of Tokyo and Tokai University, Japan, presented results of their researches jointly conducted with NADC.	Progressed as planned

First workshop was organized at each province to discuss the situation of aquaculture, problems to be solved for sustainable aquaculture development, possible solutions for the problems, etc. The first step report on PADS Provincial Aquaculture Development Strategy, has been prepared.

2nd workshop

3rd workshop

## Annex 2. Accomplishment Grid (Terminal Evaluation)

Note: 3: satisfactory, 2: moderate, 1: not satisfactory

Category	Indicators	Evaluation Methods	Accomplishment	Grade
Input	J-1 Japanese side			
	J-1 Japanese experts			
	J-1-1 Amount	<ul style="list-style-type: none"> <li>- Comparison between plan and result by reviewing reports.</li> <li>- Interview to both J/E and C/P</li> </ul>	By October 2009, chief adviser and three (3) long-stay experts were dispatched as scheduled. Twelve (12) short-term experts were dispatched as required.	3
	J-1-2 Quality and timing	<ul style="list-style-type: none"> <li>- Comparison between plan and result by reviewing reports.</li> <li>- Interview to both J/E and C/P</li> </ul>	Since the project activities started in late April every year, input timing of Japanese experts did not meet well with aquaculture cycle of Lao rural farmers. In other aspects, timing and quality of Japanese experts were appropriate.	2
	J-2 Counterpart training in Japan			
	J-2-1 Amount	<ul style="list-style-type: none"> <li>- Comparison between plan and result by reviewing reports.</li> <li>- Interview to both J/E and C/P</li> </ul>	Up until October 2009, eighteen (18+1) C/Ps were sent to Japan and twenty-one (21) were sent to Thailand for training as scheduled.	3
	J-2-2 Quality and Timing	<ul style="list-style-type: none"> <li>- Comparison between plan and result by reviewing reports.</li> <li>- Interview to both J/E and C/P</li> </ul>	see attachment 3: Counterpart training The input has been timely and adequate.	3
	J-3 Provision of materials, equipment, and facilities			
	J-3-1 Amount	<ul style="list-style-type: none"> <li>- Comparison between plan and result by reviewing reports.</li> <li>- Interview to both J/E and C/P</li> </ul>	Equipments of fifteen million Yen and facilities of nineteen million Yen, in value, have been provided by the government of Japan to NADC, and pilot and expansion villages as planned.	3
	J-3-2 Quality and timing	<ul style="list-style-type: none"> <li>- Comparison between plan and result by reviewing reports.</li> <li>- Interview to both J/E and C/P</li> </ul>	see attachment 5: Provision of equipment and materials, and attachment 6: Facility improvement Most of the equipments have been maintained well and used for the Project activities effectively.	3
	J-4 Local cost expense			
	J-4-1 Amount	<ul style="list-style-type: none"> <li>- Examination of reports</li> <li>- Interview to both J/E and C/P</li> </ul>	Up until October 2009, 56 million Yen, in value, has been spent as local expenses for the improvement and maintenance of the facilities and the Project activities.	3
	J-4-2 Item and timing	<ul style="list-style-type: none"> <li>- Examination of reports</li> <li>- Interview to both J/E and C/P</li> </ul>	see attachment 7: Local expenses The input was timely and adequate in items.	3

Annex 2. Accomplishment grid

Category	Indicators	Evaluation Methods	Accomplishment	Grade
Input	L-1 Laos side			
	L-1 Land, building and facilities at the project site			
	L-1-1 Amount	Joint site inspection by J/E and C/P.	Land (12ha), buildings and facilities for the project have been provided by Laos government as decided by R/D.	3
	L-1-2 Quality and timing	Interview to both J/E and C/P.	The input has been timely and adequate.	3
	L-2 Allocation of C/P			
	L-2-1 Amount	Discussion among and interview to J/E and C/P.	By October 2009, DLF assigned the ten (10) researchers to NADC as counterparts of AQIP2.	3
	L-2-2 Quality and timing	Discussion among and interview to J/E and C/P.	The timing and quality of C/P input has been adequate.	3
	L-3 Tools and other materials			
	L-3-1 Amount	Discussion among and interview to J/E and C/P.	One (1) truck, three (3) four-wheeled drive cars, one (1) minibus, two (2) motorbikes, three (3) computers and one (1) printer.	3
	L-3-2 Quality and timing	Discussion among and interview to J/E and C/P.	The input has been timely and adequate.	3
	L-4 Operation cost			
	L-4-1 Amount	Checking the financial record and interview to C/P.	Laos government has provided 80 million kip in 2005, 150 million kip in 2006, 100 million in 2007, 100 million in 2008 and 215 million in 2009 for the operation of NADC. However, the amount of budget has not been sufficient to cover all of the operation costs of NADC.	2
	L-4-2 Quality and timing	Discussion among and interview to J/E and C/P.	Sometimes, budget was not disbursed on time.	2
	Final note for the Input Achievements 3			
Summary for the Input Achievements				
In general, inputs from both Japanese and Lao side have been made appropriately in terms of amount, timing and quality.				

Annex 2. Accomplishment grid

Category	Summary of Activities	Evaluation Methods	Accomplishment	Grade
Activities	1.1 Identify pilot villages and target farmers (4 focal districts, 12 villages, 120 target farmers in pilot villages)	Examine the training and results of the activity based on the reports.	Three pilot villages were selected in each of four focal districts. They are Houaysang, Houaythong, Houaykhout in Xai district, Oudomxai province, Nasonmayi, Nuan, Somsavanh in Phiang district, Xaignabouli province, Nonsoung, Houakhouaset, Dondou in Laongam district, Salavan province, and Oudomxai, Saysamphan, Plain in Plain district, Savannakhet province. Target fish farmers (progressive farmers and ordinary farmers) and members of "Village Aquaculture Promotion Committee (VAPC)" were listed at each village. Also, aquaculture group was organized by the members of village women's union at each village. The number of target farmers (including women aquaculture group members) at each pilot village was decided depending on the socio-economic condition of the villages, not fixing 10 farmers at each village to make total target farmers at 120.	3
	1.2 Prepare operation and management plan of pilot sites	-Examine the inception report and plans of operation	Action plan for aquaculture promotion at pilot villages was prepared based on the results of PRA workshop, baseline survey, and monitoring survey. A clear operation and management plan has been prepared by the end of the first year.	3
	1.3 Carry out pilot operation	-Examine two reports. -Discussion among J/E and C/P.	1. Extension methods appropriate for rural villages have been clarified as follows: 1) in active type extension, core farmers or organization at the pilot villages conduct aquaculture extension with economic motivation, 2) in passive type extension, good aquaculture practices at the pilot villages are gradually spread through observation and informal communication. 2. Through on-site guidance, collaboration among NADC, PLFS, DAFO and villages has become strengthened. 3. VAPCs of some villages have shown good performances in promoting aquaculture in the villages. 4. Women's unions of some villages have shown good performances in aquaculture activities, and become core bodies for spreading group aquaculture. 5. By periodical on-site guidance, VAPC at most of the pilot village has been well established as an organization to lead aquaculture development at the village. 6. There are many cases in which VAPC transfers useful improved aquaculture techniques to villagers. 7. Two core farmers at each pilot village have acquired sufficient ability as VADW (Village Aquaculture Development Worker). 8. At some pilot villages, WU group is active in fish culture to accumulate a sizable amount of fund for the group. 9. As other types of group fish culture, community fish culture and school fish culture have shown high potential as aquaculture activities in rural area.	3
	1.4 Improve methods on seed production and grow-out culture mainly at NADC	-Examine final reports -Discussion among J/E and C/P	Rural farmers can accept only low-cost, low-risk, and easy-to apply techniques. Experiments were conducted and techniques were improved on the following topics 1) Efficient and easy seed production method of tilapia by partitioning a pond into broodstock part and fish fry part. 2) Study on feed efficiency of rice bran 3) Prevention of fish poaching and enhancement of natural feed production by sticking bamboo poles on the pond bottom 4) Optimum stocking density of common carp and tilapia fry into a grow-out pond 5) Intermediate culture of tilapia, common carp, Funtius and catfish	3
	2.1 Prepare training programs and materials considering conditions of localities	-Examine final reports -Discussion among J/E and C/P	1. Contents of aquaculture training at NADC and PAS and study trip for local government staff and target farmers were discussed, and course guides were prepared. 2. Two textbooks, 1) on tilapia seed production, 2) on common carp seed production and one manual, on aquaculture extension in Lao PDR were prepared. 3. Guideline to gender mainstreaming in aquaculture extension was prepared. 4. Guideline of aquaculture techniques was prepared for the use by staffs of PAFO, PLFS, PAS, DAFO, as well as by VADW and VAPC members.	3
	2.2 Conduct training for extension staff and target farmers at NADC, PASs and in Thailand	-Examine final reports -Discussion among J/E and C/P	Aquaculture training at NADC, OJT at PAS, on-site aquaculture training and study trip to Thailand, inside Lao and Japan were conducted. Total number of participants in each training and study trip are as follow: NADC training for local government staff 24, for farmers 96; OJT at PAS 264; On-site aquaculture training for extension village farmers 415; Study trip to Thailand 20, to inside Lao 227; Training in Japan 18+1 Ability of trained local government staff and farmers on aquaculture extension has been significantly improved.	3

	<p>2.3 Strengthen function of PASs</p> <p>3.1 Select villages (extension villages) and farmer groups for which outputs of pilot operations are to be introduced (8 focal districts, 50-60 villages, 200 farmers in the northern provinces and 400 farmers in the southern provinces, 600 target farmers in total in extension villages)</p> <p>3.2 Prepare visual extension materials on practical aquaculture and train selected farmers</p> <p>3.3 Carry out aquaculture expansion operation for selected farmers</p> <p>4.1 Collect and compile information on the aquaculture activities of target provinces</p> <p>4.2 Assist preparation of aquaculture development strategies of the target provinces</p> <p>4.3 Make an action plan of the project after its cooperation period</p> <p>4.4 Hold a seminar on the action plan of the relevant organizations for further aquaculture extension</p>	<p>-Examine reports -Discussion among J/E and CP</p> <p>-Examine reports -Discussion among J/E and CP</p> <p>-Examine VCD -Discussion among J/E and CP</p> <p>-Examine reports -Discussion among J/E and CP</p> <p>-Examine provincial aquaculture profiles -Discussion among J/E and CP</p> <p>-Examine the report</p>	<p>Facilities of PASs in Oudomxai, Xaignabouli, Savannakhet and Salavan provinces, and aquaculture station of Laonguon district were much improved, and training and seed production ability of those stations were strengthened</p> <p>All villages recommended by DAFOs have been found to be suitable as target villages except for two villages (Boung village and Donegene village) recommended by Xaignabouli DAFO. 56 target villages have been selected for the aquaculture expansion operation. Baseline data for each village, such as population, year of establishment, main production activity, situation of aquaculture, activity of WU, profiles of village leaders, etc. have been collected. Also, an activity plan for the aquaculture expansion operation has been prepared.</p> <p>One VCD showing techniques necessary in tilapia and common carp culture, including breeding, intermediate culture, water management, grow-out culture, feeding, etc. has been prepared. As visual extension materials, large hanging paper sheets illustrating good fish culture practice and a "paper theatre" on water environment protection have been prepared. The hanging sheets were used to explain good fish culture practice to VAPC members and fish farmers, and the "paper theatre" was shown to school children at class rooms of village primary schools.</p> <p>Many villagers at aquaculture expansion villages improved their knowledge and techniques through on-site guidance, on-site training and PAS training.</p> <p>Aquaculture information has been collected in the target provinces on the occasion of field activities and workshop on PADS (Provincial Aquaculture Development Strategy). "Provincial Aquaculture Profile" has been updated for each target provinces.</p> <p>At workshops held at PAFO of target provinces between January to February 2009, RAPP (Rural Aquaculture Promotion Package, Annex 2), was presented as a standard method of rural aquaculture extension in the country. Participants from DLF, PAFO, PLFS, and DAFO discussed on the contents of RAPP, and recognized RAPP as a useful method in rural aquaculture extension in the province. PADS to apply RAPP method was formulated for each target province.</p> <p>DLF has declared to PAFO and DAFO throughout the country that (1) RAPP is applied as the standard method of rural aquaculture extension, and (2) NADC is the organization to train VADW and to issue official certificate to them. RAPP shows a direction of rural aquaculture extension after AQIP 2 under the cluster development policy.</p> <p>A national aquaculture seminar was organized 1st and 2nd of October 2009 in Vientiane, inviting participants from PAFO of all provinces, PLFS of target provinces, DAFO of target districts, MAF, DLF, LARRAC, NAFRI, NAFES, MRC, FAO, NUOL, etc. Achievements of AQIP 2 were presented and discussed in the seminar. The University of Tokyo and Tokai University, Japan, and the National University of Laos presented results of their researches jointly conducted with NADC.</p>	<p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p>
<p>Final note for the Achievements in Activities: 3</p>				
<p>Summary for the Achievements in Activities</p>				
<p>As a whole, the accomplishment of the activities has been evaluated as satisfactory at the time of final evaluation.</p>				

Category	Indicators	Evaluation Methods	Accomplishment	Grade
<p><b>Outputs</b></p> <p>1. Adequate aquaculture methods are verified according to the local conditions of pilot sites.</p>	<p>1-1 Manuals on aquaculture techniques suitable to local condition are prepared</p> <p>1-2 Production of fish culture by target farmers in pilot villages increases by more than 40% on average</p> <p>1-3 More than 60% of target farmers in pilot villages are well motivated to continue aquaculture at the time of termination of the pilot operation</p>	<p>-Examine reports</p> <p>-Discussion among J/E and C/P</p>	<p>By the pilot operation up to the 3rd year, it has been shown that a pilot village can be established if NADC, PAFO, PLFS, PAS and DAFO collaborate each other to conduct three activities, (1) organizing and guiding VAPC, (2) assisting fish culture by a group of WU members, and (3) assisting fish culture by progressive farmers at a targeted village.</p> <p>In the 4th year, two activities were added to the pilot operation by extending the operation period for one year in order to strengthen function of the pilot village.</p> <p>(1) Fish culture by groups, such as, group of poor farmers, school, and village community, were encouraged at pilot villages and extension villages. Some groups made good results.</p> <p>(2) Active progressive farmers were trained at NADC and acquired ability as VADW.</p> <p>A standard method for rural aquaculture extension, RAPP, has been formulated based on the results obtained in four years of the pilot operation.</p> <p>1-1. Manuals on tilapia seed production, on common carp seed production and on aquaculture extension in Lao PDR were prepared in the first and second years. In the fourth year, guideline of aquaculture techniques was prepared for the use by staffs of PAFO, PLFS, PAS, DAFO, as well as by VADW and VAPC members. Revised edition of aquaculture techniques, fish farm management methods, and extension methods will be prepared in fifth year.</p> <p>1-2. Based on data obtained by the monitoring surveys in 2006 and 2009, average fish production shows increase rate higher than 40% at 8 villages out of 12 villages. The average rate of production increase for all pilot villages is 120.2% (Attached table 1).</p> <p>AOIP 2 put priority on stabilization of fish production (lowering risk in fish production) and increase in actual amount of fish production consumable by fish farming household, rather than increase in fish productivity. Fish productivity per 1 m<sup>2</sup> remains in a wide range of 2 - 150 kg.</p> <p>1-3. The monitoring survey at the pilot villages in 2009 showed that 76.2% - 100% of fish farmers want to continue aquaculture (Attached table 2).</p>	3

Annex 2. Accomplishment grid

<p>2. The capacity of relevant persons such as target farmers, province/district extension staff and staff of PASs regarding aquaculture technology and extension is improved.</p>	<p>2-1 More than two staff members of each PAS can train district staff and farmers</p> <p>2-2 More than two staff members of each PLFS can make provincial aquaculture plan and give necessary guidance for aquaculture extension to PAS and DAFO</p> <p>2-3 More than two staff members of each DAFO can give guidance to farmers</p> <p>2-4 At least one target farmer at each target village becomes the Village Aquaculture Development Worker (VADW) well motivated to extend aquaculture to other farmers</p>	<p>-Examine reports -Discussion among J/E and C/P</p>	<p>Capacity of local government staff has been improved through participation to training, study trip, workshops, on-site guidance, etc.</p> <p>Core farmers at pilot villages have improved their knowledge on aquaculture and enhance their motivation to conduct aquaculture through participation to NADC training course, study trip in Laos and on-site guidance. Ability of some core farmers has been up-graded to the level of VADW.</p> <p>VADW should basically satisfy three criteria (1) recommendation by VAPC, (2) recognition of ability on technique and extension by NADC, PLFS, PAS and DAFO, and (3) participation to one-week NADC training on role and duty of VADW.</p> <p>2-1. Ability in aquaculture techniques and extension of the two staff members of each PAS has been much improved through participation to NADC training, training in Japan, study trip in Thailand and on-site guidance survey. They can train district staff and farmers.</p> <p>2-2. Ability in aquaculture techniques and extension of the two staff members of each PLFS has been much improved through participation to NADC training, training in Japan, study trip in Thailand, on-site guidance survey and the workshops for formulation of provincial aquaculture development strategy. They can make provincial aquaculture plan and give guidance for aquaculture extension to PAS and DAFO. (Attached table 3-1)</p> <p>2-3. Ability in aquaculture techniques and extension of the two staff members of each targeted DAFO has been much improved through participation to NADC training, training in Japan, study trip in Thailand and on-site guidance survey. They can give guidance to farmers. (Attached table 3-2)</p> <p>2-4. Two core farmers at each pilot village (except for two at Oudomxai village and one at Dondeouy village) have been certified as VADW in October 2009. (Attached table 3-3)</p>	<p>3</p>
<p>3. Fish farmers of the focal districts introduce improved aquaculture methods.</p>	<p>3 At least 600 target farmers (extension villages) apply improved methods in 8 focal districts</p>	<p>-Examine reports -Discussion among J/E and C/P</p>	<p>VAPC has been established at most of aquaculture expansion villages. Members of VAPC were trained in PAS training. PAS training trained 108 farmers (2 farmers/village x 54 villages) in February 2009, and will train another 108 farmers in January-February 2010. Study trips to pilot villages were organized for villagers of expansion villages. In total 191 farmers participated to the study tours. On-site trainings were organized for all expansion villages. 415 villagers of expansion villages were trained in the On-site-training. The total number of farmers of expansion villages trained by AQIP 2 will reach as many as 822. At some expansion villages, fish culture activities by WU members, progressive farmers, or school have been started under support by AQIP2.</p> <p>Various improved culture methods have been applied by 1,094 fish farmers at expansion villages (Attached table 4).</p>	<p>3</p>
<p>4. The roles of relevant organizations are clarified and their collaboration mechanism is developed regarding the aquaculture extension matched with the local conditions.</p>	<p>4-1 Related organizations approve a collaboration agreement defining duties of each organization</p> <p>4-2 The project makes recommendations for sustainable development of aquaculture in Lao PDR</p>	<p>-Examine reports -Discussion among J/E and C/P</p>	<p>4-1. Collaboration networks among DLF, NADC, PAFO, PAS, DAFO and pilot villages have been further strengthened through various field works, workshops and meeting. RAPP has been formulated as basic method of aquaculture expansion in rural area. (see Additional items recommended by mid-term evaluation team. - Clarification of roles and strengthening of relationship among related organizations for better aquaculture.)</p> <p>4-2. RAPP has been authorized by DLF as a standard method of rural aquaculture extension in the country. PAFO, PLFS, PAS and DAFO staffs have recognized RAPP as a useful method for rural aquaculture extension. PADS to apply RAPP method has been formulated for each target province.</p>	<p>2</p>



Attached table 1: Average fish production by fish farmers at pilot villages

Village	2005 (kg)	2008 (kg)	Rate of increase (%)	Remarks	2005 (number of FF)	2008 (number of FF)
Houaysang	28.5	54.0	92.9		18	58
Houaythong	37.5	53.6	42.9		31	39
Houaykhom	70.0	231.4	230.6		33	77
Natare	139.0	130.0	-6.5		84	91
Somsavanh	173.0	238.0	37.6		70	97
Nasomnyai	119.0	406.0	241.2		60	70
Phin	175.0	55.4	-63.7	Shortage of rainfall in rainy season.	32	32
Saysamphan	113.5	216.1	90.4		15	37
Oudomxai	22.1	88.4	300.0		25	30
Houakhouaset	68.0	99.6	46.5		15	15
Dondou	42.5	171.7	304.0		12	11
Nonsoung	122.0	46.9	-61.6	An active fish farmer suspended production in 2008.	16	9+
				Estimated total production	46,270.6 kg	101,899.5 kg
				Average rate of increase for all pilot villages		120.3%

Attached table 2: Percentage of fish farmers who want to continue fish farming at pilot villages (2009)

Village	Number of sample farmers interviewed	Number of sample farmers who want to continue	% of farmers who want to continue
Houaysang	20	20	100.0
Houaythong	20	20	100.0
Houaykhom	20	20	100.0
Natare	20	20	100.0
Somsavanh	20	20	100.0
Nasomnyai	20	20	100.0
Phin	15	15	100.0
Saysamphan	18	18	100.0
Oudomxai	21	16	76.2
Houakhouaset	15	15	100.0
Dondou	11	11	100.0
Nonsoung	9	8	88.9

Attached table 3-1. AQIP 2 counterparts at target PLFS

Oudomxai	Mr. Lantaphone, Mr. Kongthasith
Xaignabouli	Mr. Vileaphong, Mr. Pasouth
Savanakhet	Mr. Pharsy, Mr. Khanthavong
Salavan	Mr. Tongon, Mr. Bounliang

Attached table 3-2. AQIP 2 counterparts of target DAFO

Xai	Ms. Amphai, Ms. Chalouny
Beng	Mr. Keiwanoya, Mr. Thongnan
Phiang	Mr. Sio, Mr. Phommasy
Xaignabouli	Mr. Thongsalop, Mr. Charleune
Phin	Mr. Khamsanong, Ms. Somvandy
Sepon	Mr. Keououon, Mr. Bounna

Attached table 3-3. VADW at pilot villages

Xai	Houaysang	Mr. Keunoy, Mr. Khamsao
	Houaythong	Mr. Ounset, Ms. Bouaphan
	Houaykhom	Mr. Bounvai, Ms. Keolai
Phiang	Natare	Mr. Phansou, Mr. Mouth
	Saosaub	Mr. Xiengbounthanh, Ms. Pan
	Nasomnyai	Mr. Deng, Ms. Vieng

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Laongam	Mr. Ath, Ms. Outarna
Salavan	Mr. Saly, Mr. Thongdee

Phin	Phin	Mr. Lingbong, Ms. Mo
	Saisomphean	Mr. Lamhouan, Mr. Khamtan
	Oudomxai	Mr. Boumrayn, Ms. Phoungmahy, Ms. Panchar
Laongam	Houaktouset	Mr. Thongdeuan, Ms. Yone
	Dondou	Mr. Khamsay
	Nonsoung	Mr. Thongdan, Mr. Khaunray

Attached table 4: Number of fish farmers who applied improved techniques at expansion villages in focal districts (2009)

District	Number of expansion villages	Number of sample farmers interviewed	Number of sample farmers who applied improved methods	% of farmers who applied improved methods	Total number of fish farmers	Estimated number of farmers who applied improved methods
Xai	7	101	87	86.1	131	113
Beng	6	92	80	87.0	130	113
Xaignabouli	7	84	71	84.5	229	194
Phiang	6	114	62	54.4	187	102
Phin	7	62	50	80.6	192+	155+
Sepon	7	90	84	93.3	84+	78+
Laongam	7	66	49	74.2	113+	84+
Salavan	7	119	112	94.1	175	165
Total	54	728	595	81.7	1,241+	1,004+

Category	Indicators	Evaluation Methods	Accomplishment	Grade								
<b>Project Purpose</b> Aquaculture suitable for local conditions is established in the 4 target provinces	<ol style="list-style-type: none"> <li>720 fish farmers (120 pilot villages, 600 extension villages) increase their fish production by more than 40% on average by applying improved aquaculture methods in 4 target provinces</li> <li>Aquaculture development plans are prepared at province and district levels</li> </ol>	<ul style="list-style-type: none"> <li>Examine reports</li> <li>Discussion among J/E and CP</li> </ul>	<p>By the pilot operation, various aquaculture technique and method, as well as aquaculture extension method suitable for the natural, social and economic conditions of the target area have been clarified.</p> <ol style="list-style-type: none"> <li><b>Pilot villages:</b> More than 431 fish farmers applied improved aquaculture methods, and more than 333 fish farmers are estimated to increase fish production more than 40% on average.</li> <li><b>Expansion villages:</b> More than 1,014 fish farmers applied improved aquaculture methods, and more than 653 fish farmers are estimated to increase fish production more than 40% on average. (Attached table 5)</li> <li>DLF has authorized RAPP developed by AQIP 2 and distributed a guidebook of RAPP to PAFO and DAFO throughout the country. DLF has approved that (1) RAPP is applied as a standard method of rural aquaculture extension throughout the country, and (2) NADC is the organization to train VADW and to issue official certificate to them. Provincial Aquaculture Development Strategy has been formulated jointly by AQIP 2, PAFO, PAS, and DAFO of target provinces/districts.</li> </ol>	3								
<b>Overall goal</b> Standard of living of rural fish farmer is improved through the dissemination of aquaculture suitable for local conditions in the 4 target provinces.	Fish consumption of 22kg/person/year by the rural people in 4 target provinces.	<ul style="list-style-type: none"> <li>Examine reports</li> <li>Discussion among J/E and CP</li> </ul>	<p>Small scale fish farming plays a very important role in the supply of animal protein source to rural people.</p> <p>Fish farms small than 100 kg in annual fish production account for 71% of total number of fish farms in rural area, as shown in the figure below. Those small scale fish farms produce fish mainly for self-consumption. As shown in the table below, about 61% of fish produced by those small scale fish farms is self-consumed.</p> <table border="1"> <thead> <tr> <th>Size of fish farm (fish production in kg/year)</th> <th>Self-consumption rate of fish produced</th> </tr> </thead> <tbody> <tr> <td>More than 500 kg</td> <td>16.2 %</td> </tr> <tr> <td>100 - 500 kg</td> <td>35.5 %</td> </tr> <tr> <td>Less than 100 kg</td> <td>60.9 %</td> </tr> </tbody> </table>	Size of fish farm (fish production in kg/year)	Self-consumption rate of fish produced	More than 500 kg	16.2 %	100 - 500 kg	35.5 %	Less than 100 kg	60.9 %	
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Attached table 5. Summary of pilot operation and aquaculture expansion operation.




Category	District	Total number of fish farmers in 2009	Number of farmers who applied improved methods in 2009	Number of fish farmers at villages where average fish production increased more than 40%*
Pilot villages	Xai	174	165	165
	Phiang	258	231	70
	Phin	99	86	67
	Laongam	35+	29+	26+
Pilot village total		566+	511+	346+
Expansion villages	Xai	131	113	19
	Beng	130	113	82
	Phiang	229	194	168
	Xaignabouli	187	102	25
	Phin	192+	155+	192+

Annex 2. Accomplishment grid

Sepon	84+	78+	76+
Laongam	113+	84+	41+
Salavan	175	165	50+
Expansion village total	1,241+	1,014	653+

\* 2005-2008: pilot operation, 2007-2008: expansion operation

Additional items recommended by mid-term evaluation team			Accomplishment	Grade																										
Items and its summary	Evaluation methods																													
<p><b>Clarification of roles and strengthening of relation ship among related organizations for better aquaculture</b></p> <p>Coordination among agencies concerned with aquaculture development / extension such as DLF, NADC, PAFO and DAFO have been strengthened through the project activities. In order to expand the aquaculture techniques suitable to the local condition to other districts of target provinces and other provinces, the role of national level organization such as DLF, NAFES, NAFRI, and local level organization such as PAFO and DAFO should be clarified. Also, specific collaboration measure should be considered.</p>	<p>Examine reports</p> <p>Discussion among, J/E and C/P</p>	<p>Collaboration networks for the aquaculture extension activities among DLF, NADC, PAFO, PLFS, PAS and DAFO have been strengthened through implementation of the pilot operation, aquaculture expansion operation, JCC meetings, etc. as already mentioned in the Mid-term evaluation. Duties and collaborating system among those organizations have been further clarified and strengthened through various discussions for formulation of RAPP and Provincial Aquaculture Development Strategies (PADS) for the four target provinces. RAPP shows the standard method of rural aquaculture extension in the national aquaculture development after AQP 2, under collaboration net works as shown below. However, recognition on PADS and RAPP by local government organizations should be further strengthened through effort of DLF and PAFO.</p>	2																											
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<p><b>Group aquaculture</b></p> <p>Successful cases of improvement of fish production and accumulation of found by group aquaculture conducted by Women's Union are found. Since group aquaculture has advantages that needy villages who don't have own pond and equipment can participate in aquaculture. They can share the necessary input for aquaculture and transfer the techniques among the group members. Also maintaining of pond and feeding can be shared. From these cases, group aquaculture is evaluated to be effective to expand the aquaculture. Through the first half of the project, it was confirmed that group aquaculture by Women's Union (WU), school and low income farmers is likely to be effective. Considering the results of pilot operation, further analysis is needed to establish the methodology of group aquaculture method.</p>	<p>-Examine reports among J/E and CP</p>	<p>3</p> <p>It has been shown that three types of group aquaculture, namely, (1) WU group fish culture, (2) community fish culture, and (3) school fish culture, have high potential for aquaculture development in rural area. Fish culture by low-income farmer's group has been found to be difficult in securing a pond for the group. There is only one group of low income farmers that has started aquaculture activities at Houaysang village, Xai district, Oudomxai province. There are two new attempts of group aquaculture. One is group aquaculture by VAPC members in the southern pilot villages, and the other is organization of seed producers group in Phiang district in the Xaignabouli province. The former attempt will be a model of group fish farming by progressive farmers aiming at purely commercial fish farming through accumulation of limited input resources of members. The latter attempt will be a model of joint effort of seed producers to assure more economic incentive for VADW in farmers to farmers aquaculture extension.</p>   <p>This group, mainly composed of VAPC members, conducts floating net cage culture of catfish. Phin village, Phin, Savannakhet</p>  <p>An old fish pond at the school was improved by Youth Union of the village. School fish culture started in September 2007 with technical support of AQIP2. The school produced 70 kg fish in 2008. In November 2008, the pond was further improved by school children. Houaylo villages, Beng, Oudomxai</p>
<p><b>Method of measuring fish consumption</b></p> <p>Measuring accurate fish consumption is important to monitor the goal of fish consumption amount which is set by Lao government as well as to confirm the situation of food security at the village / household level, however, the method for measuring fish consumption is not standardized at the moment.</p>	<p>-Examine reports among J/E and CP</p>	<p>3</p> <p>The present method of fish consumption survey in rural area is</p> <ol style="list-style-type: none"> <li>(1) To ask farmers the following two questions. <ol style="list-style-type: none"> <li>1) How many days did your family consume fish during the last one month?</li> <li>2) How much fish did your family consume in each day, less than 100g, 100g-500g, or more than 500g?</li> </ol> </li> <li>(2) To estimate monthly fish consumption of each family by [consumption days in a month x amount of consumption in a day (50g, if less than 100g, 300g, if 100-500g and 750g, if more than 500g)].</li> <li>(3) To estimate annual fish consumption by [monthly consumption x 12 months], as there seems no significant difference in fish consumption between rainy season and dry season.</li> <li>(4) To estimate annual fish consumption per persons of the family by [annual fish consumption / number of family members]</li> </ol> <p>A good point of this method is easiness in application. A shortcoming is inaccuracy of the data obtained, as the data totally depend on the memory of the</p>

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		<p>farmers interviewed. It should be noted that this method can be used only for examination on long term tendency in fish consumption. .  The only method to obtain accurate data on the fish consumption is to distribute recording sheets to farmers on which farmers record their daily fish consumption. However, data obtained by this method should have some bias as those who can record daily fish consumption are not ordinary farmers in rural village (for example high education, etc.) Also, this method costs much as farmers are not willing to record daily fish consumption without any fee. AQP 2 will try this method at some pilot villages before the end of the project.</p>	
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<p><b>Certification system of Village Aquaculture Development Worker</b></p> <p>VADW certification system which has been under consideration by DLF is considered to be effective for clarifying the role of core farmer in aquaculture extension and promoting farmer-to-farmer / village-to-village aquaculture promotion.</p> <p><b>Collaboration with Forest Management and Community Support Project (FORCOM)</b></p> <p>AQIP2 is aiming to promote integrated agriculture with the slogan "For a better aquaculture, for better rural village". FORCOM which covers Xaignabouli Province as one of target provinces same as AQIP2, has been supporting income generation activities such as livestock and fruit cultivation. It is expected that villagers in AQIP2 target villages improve livelihood effectively and efficiently by utilizing techniques and experiences of FORCOM. Aquaculture techniques developed by AQIP2 also can be helpful for villagers in FORCOM target villages many of whom are conducting aquaculture activities</p>	<p>-Examine reports among J/E and C/P</p> <p>-Discussion among J/E and C/P</p>	<p>Through a series of discussion between DLF and AQIP2 team, the organization to issue VADW certificate is decided as NADC. NADC organizes training course to good progressive farmers to give them sufficient ability as VADW. NADC also maintains database for all VADWs, and keeps sufficient quality of VADWs, throughout the country.</p> <p>24 farmers selected from pilot villages are invited to NADC on 16 October, and are given DLF certificate of VADW in a certification ceremony.</p>	3
<p><b>Aquaculture expansion system in consideration of village cluster approach</b></p> <p>In these years, Lao government has been forwarding Village Cluster Approach which improves the access of government services for villagers and has been setting Technical Service Center in each cluster. It is necessary to establish suitable aquaculture expansion system by considering cluster system in order to strengthen farmer-to-farmer / village-to-village aquaculture expansion for effective expansion of the AQIP2 outcome.</p>	<p>-Examine reports among J/E and C/P</p> <p>-Discussion among J/E and C/P</p>	<p>Two target villages were selected, one target village from each project, for collaboration activities, such as (1) joint training and observation trip, (2) information and opinion exchanges among farmers of target villages and local extension officers, and (3) improvement of integrated agricultural production system of villagers</p> <p>In May 2008, training on fish culture technique was conducted at Namone village (FORCOM target village), while training on pig culture integrated with fish culture was conducted at Hoaysa-Ngem village (AQIP2 target village). Later on, follow-up guidance and monitoring survey were conducted at those villages as shown in the table below.</p> <p>Aquaculture techniques have been much improved at Namone village. Some fish farmers have introduced pig culture to integrate to their fish culture at Hoaysa-Ngem village. Extension ability of DAFO staff and some core farmers has been improved through the collaborative activities between AQIP2 and FORCOM. The present collaboration work has shown the effectiveness of collaboration between two different projects targeted to the same village for rural development.</p>	3
<p><b>Allocation of staff to NADC</b></p> <p>It would be more effective to conduct the activities of NADC and AQIP2, if Ministry</p>	<p>-Examine reports among J/E and C/P</p> <p>-Discussion among J/E and C/P</p>	<p>As a standard method of aquaculture extension in rural areas under the cluster development policy, RAPP has been formulated by AQIP2 and authorized by DLF. RAPP will be distributed to organizations concerned throughout the country.</p> <p>Acting director and three diploma graduate researchers were allocated to NADC. Two field workers also were allocated. One counterpart assigned since beginning of AQIP2 received bachelor degree from National University of LAO. By October 2009, DLF assigned the ten (10) researchers to NADC as counterparts of AQIP2.</p>	3

*Annex 2. Accomplishment grid*



<p>of Agriculture and Forestry Allocates the Director of NADC. In addition, it is considered that if graduate level researchers and field workers are allocated, it would contribute to effective operations of expansion activities in latter half of the project period and thus, to ensure the sustainability after the project.</p>			
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2. Current status of Input for Lao Counterparts

	2005				2006				2007				2008				2009				2010															
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Project Director (Director General of the Department of Livestock and Fisheries)	Dr. Boun Av NOUNUANVONG				Dr. Bounthoung KHAMBOUNHEUANG				Mr. Chanthaboung				Mr. Nounhak LEPVISAY (Acting Director)																							
Project Manager (Director of NADC)																																				
Project Manager (Head of Technical Division, DLF) → (Head of Fishery Division, DLF)	Mr. Bounbong SAPHANDY								Mr. Somphan CHAMPINGXAY				Mr. Chanthaboung SRIMAROTHAM																							
Project Coordinator (Head of Planning and Cooperation Division, DLF)	Ms. Nounhak LEPVISAY				Mr. Bounhong MUNSOUPHOM				Mr. Bousasoueh VENGSONBATH				Move to Acting Director of NADC				Pass away																			
Technical /Training/ Extension Staff (NADC)	Mr. Thongsouan KHONGALJANG				study in National University of Lao				study in Chulalongkorn University in Thailand				study in Germany University in Germany				study in Japanese language in Japan				Move to DLF															
	Mr. Vongsapha THAMMAJEDY																																			
	Ms. Vongsavay DALASAEN																																			
	Ms. Savanbay PHILAVONG																																			
	Mr. Boukeao YONG-AMNAT																																			
	Mr. Phouhadong NORACHACK																																			
	Ms. Khomsavanh DUGANGPHACHAN																																			
	10 staff, Apr. 2005																																			
					Ms. Sisamouth PHENGSAKOUN (New staff)																															
					Ms. Serevong THAMMAJEDY (New Staff)																															
				Ms. Manochit LATHICHAK (New Staff)																																
																				11 staff, Oct. 2009																

<p>Technical / Training/ Extension Staff (PLFS)</p>	<p>Mr. Landhaphone (Oudomxay)</p> <p>Mr. Vilaphong (Xaignabouli)</p> <p>Mr. Phansy (Savannakhet)</p>	<p>Mr. Non thasth (Oudomxay)</p> <p>Mr. Prasouh (Xaignabouli)</p> <p>Mr. Khambovise (Savannakhet)</p> <p>Mr. Siengchaphone (Salavan)</p> <p>Mr. Boudling (Salavan)</p> <p>Mr. Chalorny (Xat)</p> <p>Mr. Thongnat (Beng)</p> <p>Mr. Kewmolya (Beng)</p> <p>Mr. Phonemary (Phiang)</p> <p>Mr. Thongsalob (Xaignabouli)</p> <p>Mr. Chaleune (Xaignabouli)</p> <p>Mr. Sonvandy (Phin)</p> <p>Mr. Keo-ekhone (Xepone)</p> <p>Mr. Bouma (Xepone)</p> <p>Mr. Duttana (Luangnam)</p> <p>Mr. Saly (Salavan)</p> <p>Mr. Thongdee (Salavan)</p>	<p>Ms. Amphai (Xat)</p> <p>Mr. Sio (Phiang)</p> <p>Mr. Khansamone (Phin)</p> <p>Mr. Ath (Luangnam)</p>
<p>Technical / Training/ Extension Staff (DAFO)</p>			





5. Provision of equipment and materials

Item	Year (JFY, Apr.- Mar.)	Place													NADC	Quan.	Unit Price(US\$)	Total Price(US\$)
		DAFO						Provincial and District Aquaculture Station										
		Xai	Phiang	Laongam	Phin	Ben	Xagna	Salavan	Sepon	Donekeo	30-h/Namntian	Pakbo	Nonden	Yangyen				
Desktop PC	2005	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	1,290	10,320
Printer	2005	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	250	2,000
Facsimile	2005	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	400	1,600
Motorbike	2005	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	2,420	19,360
Microscope	2005															4	2,685	10,740
Water pump	2005															4	1,920	7,680
Hund tractor	2005															4	1,200	4,800
Seine net	2005															4	550	2,200
Air blower	2005															4	120	480
Photocopy machine	2005															1	4,000	4,000
Generator	2005															1	1,320	5,280
4WD vehicle	2006															1	33,200	33,200
Motorbike	2006															4	1,050	4,200
Color photocopy machine	2006															1	3,000	3,000
Notebook PC	2006															1	1,500	1,500
LCD Projector	2006															1	950	950
pH meter	2007															2	1,230	2,460
DO meter	2007															2	1,350	2,700
Handy microscope	2007															2	850	1,700
Thermometer	2007															10	110	1,100
Motorbike	2007	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	1,250	10,000
Desktop PC	2007															4	1,280	5,120
Color printer	2007															1	800	800
Mini-bus	2008															1	22,000	22,000
																		157,190

6. Facility improvement

Station	Description	Year (JFY, Apr. -Mar.)	Cost (US\$)
Donekeo Aquaculture Station (Oudomxai)	Construction of training building, and renovation of piping system and reservoir tank	2005	24,100
Pakbo Aquaculture Station (Savannakhet)	Renovation of office, training center, ponds and raft of water intake pump, and repairing filter tank	2005	28,700
Nongdeng Aquaculture Station (Salavan)	Renovation of nursery ponds, spawning tanks and construction of filter tank	2005	6,800
Vangyen Aquaculture Station (Laongam District)	Renovation of broodstock ponds, nursery ponds, hatchery tanks, training building and water piping system	2005	17,500
Nam-Tien Aquaculture Station (Xaignabouli)	Construction of hatchery, nursing pond and water intake system	2006	21,000
Namxouang Aquaculture Development Center (NADC, Vientiane)	1. Repairing ceiling board of main building 2. Renovation of five experimental ponds 3. Construction of two concrete tanks of 7mx7m and six concrete tanks of 3mx3m 4. Construction of concrete floor for 5t of FRP tanks 5. Repairing roof of main building	2006	35,700
Vangyen Aquaculture Station (Laongam District)	Construction of training building	2007	19,800
Namxouang Aquaculture Development Center (NADC, Vientiane)	Renovation of five experimental ponds	2007	17,500
Nam-Tien Aquaculture Station (Xaignabouli)	Construction of training building	2008	23,900
	<b>Total</b>		<b>195,000</b>



7. Local expenses

Item	Item of expenditure	Expense (US\$)					Total (US\$)
		2005(JFY) 1\$=115	2006(JFY) 1\$=117	2007(JFY) 1\$=115	2008(JFY) 1\$=101	2009(JFY)* 1\$=96	
Training	NADC training, Study trip, OJ training,	27,900	22,600	24,100	20,400	31,000	126,000
Consumption	Materials for pilot and expansion operation, Artificial food, Fertilizaer, Fuel, communication, etc.	25,500	35,000	34,400	34,900	26,000	155,800
Employment	Driver, Secretary, Baseline and monitoring survey, Thierd country expert,	19,300	24,100	24,100	19,300	18,500	105,300
Travel	On-site guidance, Participatory workshop, etc.	19,700	23,500	28,100	24,900	17,600	71,300
Text	Audio-visual materials, Brochure, Hand book for fish culture, etc.	15,100	5,100	5,200	5,500	7,800	38,700
Maintenance and management	Fuel, NADC facilities and equipment, Maintenance of official cars, etc.	3,400	11,800	11,900	7,400	19,400	53,900
		110,900	122,100	127,800	112,400	120,300	551,000

\*Fiscal Year 2009 is Budget (JFY) is Japanese Fiscal year, from Apr. to Mar.

Annex 4. Evaluation Grid (Terminal Evaluation)

Evaluation item/ Survey subjects	Necessary information and data	Method of survey	Results	Evaluation
<b>Relevance</b>				
<p>Is overall goal consistent with the national development plan? Overall goal: "Standard of living of rural fish farmers is improved through the dissemination of aquaculture suitable for local conditions in the 4 target provinces"</p>	<p>① National development policy ② Fisheries development policy ③ Significance of aquaculture in above policies</p>	<p>- Review of the national, agriculture, and fisheries development plans</p>	<p>Fish and other aquatic animals are the most important animal protein source in the diet of rural people. Food security and poverty alleviation through development of agricultural are among one of the important items in national and agriculture development plan. Development of aquaculture is considered as one of the most important policies of the Ministry of Agriculture and Forestry.</p>	<p>The overall goal is fully consistent with the national development plan.</p>
<p>Is the project purpose consistent with the needs of country? Project purpose: "Aquaculture suitable for local conditions is established in the 4 target provinces"</p>	<p>① Needs of the fisheries sector in Lao PDR ② Needs of the aquaculture sector in Lao PDR ③ Needs of rural fish farmers</p>	<p>- Questionnaire and interview to all stakeholders - Review of reports on aquaculture and natural-social-economic conditions of rural villages - Review of JICA's cooperation policy and cooperation program for Lao PDR</p>	<p>The purpose of the project has been decided based on a large amount of data on the conditions and needs of rural area in the target provinces collected during AQIP 1. Also the project purpose has been confirmed through village surveys, meetings with stakeholders, participatory workshops, and gender surveys conducted in the initial stage of AQIP 2.</p>	<p>The project purpose is fully consistent with the needs of country.</p>
<p>Is the overall goal consistent with Japan's cooperation policy?</p>	<p>The international cooperation plan by the Japanese government</p>		<p>Overall goal of the project is consistent with Japan's cooperation policy stressing human security and poverty alleviation in the developing countries.</p>	<p>The overall goal of the Project is consistent with the JICA's cooperation plan to the country of Lao PDR.</p>
<p>Is Japan's cooperation for this project justified?</p>	<p>Comparative advantage of Japan's technology and extension in aquaculture</p>	<p>- Interview to DLF staff members - Review of the past technical cooperation projects in aquaculture implemented by organizations other than JICA</p>	<p>The Japan's high technologies and extension abilities in aquaculture justify the relevant of this project.</p>	<p>The Project is justified from the view of Japan's technical advantage in the aquaculture sector.</p>

Evaluation Item/ Survey subjects	Necessary information and data	Method of survey	Results	Evaluation
<b>Effectiveness</b>				
Achievement of project purpose	Refer to the Accomplishment Grid		Refer to the Accomplishment Grid.	
Do the project activities and outputs effectively contribute to the achievement of the project purpose?	<p>① Reports on project progress monitoring survey for the first to the fourth year</p> <p>② Final reports for the first to the fourth year</p>	<p>- Review of the project reports</p> <p>- Interview DLF and other stakeholders</p>	Pilot operation, aquaculture expansion operation, training courses, experiments for technical improvement, various field surveys, have achieved planned project outputs and effectively contributed to the achievement of the project purpose.	Project activities will effectively contribute to the achievement of the project purpose.
What are the contributory/obstructive factors, which affect effectiveness?	<p>Contributory factors</p> <p>Extent of collaboration among AQIP 2, DLF, and local government organizations</p> <p>Obstructive factors</p> <p>None</p> <p><u>Matters of concern</u></p> <p>Further application of aquaculture extension method to areas other than target provinces</p>	<p>- Review of the project reports</p> <p>- Interview to staff of DLF and local government organizations</p>	<p>Contributory factors</p> <p>Close collaboration networks among AQIP 2, DLF and local government organizations has been established through the project activities. AQIP 2 has established "Rural Aquaculture Promotion Package (RAPP)" in close collaboration with DLF and local government organizations of target provinces. RAPP has been authorized by DLF as a standard method for the aquaculture extension in rural areas. 24 progressive farmers have been officially certified as "Village Aquaculture Development Worker (VADW)" by DLF based on RAPP.</p> <p><u>Matters of concern</u></p> <p>Effectiveness of RAPP should be further verified in provinces other than present target provinces.</p>	

Evaluation item/ Survey subjects	Necessary information and data	Method of survey	Results	Evaluation
<b>Efficiency</b>				
Are outputs corresponding to the resources of inputs provided?	Appropriateness of: ① Dispatch of Japanese experts; -Field, number, period, timing ② Allocation of NADC C/Ps; -Qualification, number ③ Allocation of local government staff -Qualification, number ④ Facilities ⑤ Equipment and materials provided -Kind, amount, timing ⑥ Training -Capacity building, knowledge dissemination ⑦ Project implementation expenses	- Examination of project reports - Evaluation by Japanese experts, DLF staff members related to the project and NADC C/Ps - Interview to local government staff	① Fields and number of dispatched Japanese experts have been appropriate for the smooth implementation of the project. ② All NADC C/Ps have fully participated to the project activities. However, if more persons were allocated at NADC as C/Ps, input of C/Ps will become more efficient. ③ Qualification and number of staff members of PAFO, PAS and DAFO have been sufficient to conduct the pilot operation and the aquaculture expansion operation in target provinces. ④ Facilities at NADC, PAS and other local government organizations have been fully utilized in the project activities. ⑤ All items of field, office and laboratory equipment and materials, provided to NADC and local government organizations have been fully utilized. ⑥ Participants from pilot villages have been utilizing knowledge and technique acquired during the training in their own production activities. Some of them have been disseminating knowledge and technique acquired to other villagers. Some participants from local government organizations have also been utilizing acquired knowledge and technique in their extension activities, and have been making effort to disseminate knowledge and technique to their colleagues. ⑦ Project implementation expenses, both from Japanese side and Lao side, have been utilized efficiently for project activities.	Inputs from Japanese side are appropriate. Inputs from Lao side are appropriate. Trainings for local government staff and farmers have been conducted efficiently and created useful results.
What are the contributory/obstructive factors, which affect to efficiency?	Contributory factors None Obstructive factors ① Timing of Japanese expert dispatch ② Number of NADC C/P	- Review of the reports on former cooperation - Self evaluation by Japanese experts and NADC C/Ps	Obstructive factors ① Some modification should be made in the year-end/year-start procedures of JICA. ② Number of university graduate members and field workers was short, but DLF recruited sufficient number of employees in the fourth and fifth years.	

Evaluation item/ Survey subjects	Necessary information and data	Method of survey	Results	Evaluation
<b>Impact</b>				
Contribution to overall goal	Data on living standard (cash income, animal protein intake, education, health care, etc.) and aquaculture situation in the pilot villages	- Review of monitoring survey reports	There is no sufficient data yet to examine changes occurred in the living standard of villagers.	
Positive impact	<ul style="list-style-type: none"> <li>① Changes occurred in the pilot villages</li> <li>② Changes occurred in the aquaculture expansion village</li> <li>③ Collaboration with organizations other than JICA and DLF.</li> </ul>	<ul style="list-style-type: none"> <li>-Review of monitoring survey reports</li> <li>-Interview to villagers at pilot villages and aquaculture expansion villages</li> </ul>	<ul style="list-style-type: none"> <li>① Aquaculture techniques and information are gradually spreading to villages surrounding the pilot villages.</li> <li>② There is no sufficient data yet to examine changes occurred in the living standard of villagers</li> <li>③ Several non-governmental organizations have shown interest on collaborative work with AQIP 2. They are Nagao Environmental Foundation and Japan International Cooperation Foundation. Also, there are some persons who want to contribute to the development of rural villages in Lao PDR.</li> </ul>	The project has been creating various positive impacts.
Negative impact	① Changes occurred in the pilot villages	<ul style="list-style-type: none"> <li>- Questionnaire to C/Ps - Experts</li> <li>- Questionnaire to small-holder farmers</li> </ul>	So far, there has been no negative impact of the project to village life and environmental conditions of the village.	
What are the contributory/obstructive factors, which affect impact?	<u>Contributory factors</u> ① None <u>Obstructive factors</u> ① None	<ul style="list-style-type: none"> <li>- Questionnaire and interview to C/Ps - Experts</li> </ul>	Establishment of RAPP and YADW certification system are expected to achieve various types of useful impacts for the sustainable development of aquaculture in rural areas.	

Evaluation item/ Survey subjects	Necessary information and data	Method of survey	Results	Evaluation
<b>Sustainability</b>				
Institutional and financial sustainability of NADC	<ul style="list-style-type: none"> <li>① Ability and skill of NADC staff members</li> <li>- Ability to carry out research and experiment</li> <li>- Ability to carry out field survey</li> <li>- Ability to collaborate with local government staff</li> <li>- Ability to collaborate with villagers</li> <li>- Ability to carry out training courses</li> <li>- Ability to generate cash income by producing and selling fish seeds</li> <li>- Ability to manage money flow</li> <li>② Income and expenditure of NADC</li> <li>③ Budget allocation by DLF to NADC</li> <li>④ Number of staff members</li> </ul>	<ul style="list-style-type: none"> <li>- Interview and discussion at NADC, DLF and MAF</li> </ul>	<ul style="list-style-type: none"> <li>① Ability and skill of all CFs have been upgraded.</li> <li>- Ability to carry out research and experiment:</li> <li>- Ability to carry out field survey:</li> <li>- Ability to collaborate with local government staff:</li> <li>- Ability to collaborate with villagers:</li> <li>- Ability to carry out training courses:</li> <li>- Ability to generate cash income by producing and selling fish seeds: Modest</li> <li>- Ability to manage money flow: High</li> <li>② Ability of NADC to cover expenses by income: Modest</li> <li>③ Allocation of budget by DLF: Modest</li> <li>④ Allocation of NADC staff members: Modest</li> </ul>	NADC will be able to attain institutional and financial sustainability by the end of the project.
Aquaculture extension by local government staff	<ul style="list-style-type: none"> <li>Ability and skill of local government organizations</li> <li>- Ability to collect necessary information from villages</li> <li>- Ability to transfer necessary information and technique to farmers</li> <li>- Ability to adopt aquaculture techniques suitable to local conditions</li> <li>- Ability to organize training for farmers and DAFO extension workers</li> <li>- Ability to collaborate with related organizations</li> </ul>	<ul style="list-style-type: none"> <li>- Questionnaire survey, interview and discussion at PAFO, PLFS and DAFO</li> </ul>	<ul style="list-style-type: none"> <li>Ability and skill of local government organizations have been upgraded.</li> <li>- Ability to collect information from villages: High</li> <li>- Ability to transfer information and technique to farmers: High</li> <li>- Ability to adopt suitable aquaculture techniques: Modest</li> <li>- Ability to organize training for farmers and extension workers: Modest</li> <li>- Ability to collaborate with related organizations: Modest</li> </ul>	Local government organizations will be able to establish sustainable aquaculture extension system by the end of the project.
Results of pilot operation at pilot villages	<ul style="list-style-type: none"> <li>Ability of pilot villages in attaining sustainable aquaculture development</li> <li>- Number of fish farmers</li> <li>- Number of group fish farms</li> <li>- Technical and management improvements of fish farmers</li> <li>- Activities of VAPC</li> <li>- Aquaculture activities of village women's unions</li> <li>- Number of potential core farmers</li> </ul>	<ul style="list-style-type: none"> <li>- Village survey, interview and discussion at pilot villages</li> <li>- Questionnaire survey, interview and discussion at PAFO, PLFS and DAFO</li> </ul>	<ul style="list-style-type: none"> <li>Ability of pilot villages in attaining sustainable aquaculture development has been upgraded*.</li> <li>- Increase in the number of fish farmers: Modest</li> <li>- Increase in the number of group fish farms: Poor</li> <li>- Degree of technical and management improvement of fish farmers: Modest</li> <li>- Activeness of VAPC: High in some villages, Modest in general</li> <li>- Activeness of village women's unions: High in some villages, Modest in general</li> <li>- Possibility of creating core farmers: High</li> </ul>	Aquaculture activities have been enhanced at all pilot villages by the pilot operation.

\* Review for the aquaculture situations at pilot villages are shown in the attached sheet.

<p>What are the contributory/obstructive factors, which affect to sustainability?</p>	<p>① Contributory factors: - Collaborative works with Japanese organizations</p> <p>② Obstructive factors: - Under-employment at NADC - Short period allocated for the pilot operation</p>	<p>- Interview and discussion at NADC, DLF and MAF</p>	<p>① Contributory factors: - Establishment of RAPP and VADW certification system. - Collaborative researches and works with the University of Tokyo, Nagao Environment Foundation, Japan International Cooperation Foundation, and some NGOs will help attaining sustainable development of NADC and sustainability of project outputs at PAFO, DAFO and pilot villages. - Collaboration in daily activities between NADC and LARReC will enhance sustainability of the project outputs.</p> <p>② Obstructive factors: - Sufficient number of employees was recruited to NADC. However, some of the new members still do not have sufficient experience and skill in rural aquaculture extension. Furthermore, research capability of NADC for the improvement of aquaculture method should have been further upgrade.</p>
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## Annex 5. Review of the pilot operation and aquaculture extension operation (Terminal evaluation)

### 1. Pilot operation

#### (1) Profile of pilot villages

Province	Village	Village size <sup>1)</sup>	Rice production (Self-sufficiency)	Source of cash income	Average cash income/HH <sup>2)</sup>
Oudomxai province Xai district	Houaysang (HYS)	Small	Upland/rain-fed (No)	Livestock, NTFP	Low
	Houaythong (HYT)	Medium	Upland/rain-fed (No)	Livestock, NTFP	Low
	Houaykhoun (HYK)	Medium	Rain-fed/upland (No)	Non-agriculture, livestock	Medium
Xaignabouli province Phiang district	Natane (NTN)	Large	Rain-fed, irrigated (Yes)	Rice, livestock	Medium
	Somsavanh (SSV)	Medium	Rain-fed, irrigated (Yes)	Rice, non-agriculture (brick)	High
	Nasomnyai (NSN)	Large	Rain-fed, irrigated (Yes)	Rice, non-agriculture	High
Savannakhet province Phin district	Phin (PHN)	Large	Rain-fed (Yes)	Non-agriculture, livestock	Medium
	Xaisamphan (XSP)	Medium	Rain-fed (Yes)	Non-agriculture, livestock	Medium
	Oudomxai (ODX)	Medium	Rain-fed (Yes)	Non-agriculture, livestock	Medium
Salavan province Laongam district	Houakouaset (KHS)	Small	Rain-fed (Yes)	Livestock, fruits, tourism	Medium
	Dondou (DND)	Small	Rain-fed/upland (No)	Coffee, banana	High
	Nonsoung (NNS)	Small	Rain-fed/upland (No)	Livestock, banana	Medium

#### 1) Village size

Population	Class
<700	Small
700-1200	Medium
>1200	Large

#### 2) Cash income

Kip/HH/year	Class
<10 million	Low
10-20 million	Medium
>20 million	High



(2) Achievements of the pilot operation

Oudomxai province Xai district	
Houaysang	<p>VAPC</p> <p>VAPC has 14 members.</p> <p>VAPC has prepared regulation on aquaculture activities in the village.</p> <p>AQIP 2 supplied 900 fingerlings to VAPC in 2006. VAPC distributed the fingerlings to six fish farmers.</p> <p>VAPC saves 936,000kip as VAPC fund through collection of fee for supply of fingerlings and equipment rental in January 2009.</p> <p>Some members of VAPC gave a guidance of fish culture technique to teacher for school pond.</p> <p>According to monitoring survey in 2009, 85% of fish farmers applied improved method through AQIP2 activity.</p> <p>- Progressive farmers: 5 farmers</p> <p>- VADW: Mr. Keunoy and Mr. Khamsao</p> <p>Mr. Keunoy went to sell fingerlings and to give a guidance in Bounhieang villages and Longrya village in June 2009</p> <p>There are two WU fish culture groups in the village, one in the north area and one in the south area.</p> <p>All of 59 members of WU joined the fish culture group.</p> <p>WU member in the south area of the village has been conducting growing out culture since 2006. They save 700,000kip as WU fund through selling table size fish in July 2009.</p> <p>WU member in the north area of the village has been conducting intermediate culture since 2006. They save 956,000kip through selling fingerlings in July 2009.</p> <p>The former WU leader in the north area of the village died by disease.</p> <p>- School fish culture</p> <p>School teacher and pupils has been conducting grow out culture since 2007.</p> <p>They harvested 9kg in 2009 and 10kg in 2008.</p> <p>Mr. Keunoy and Mr. Khamsao as VADW supplied fingerlings to the school free.</p> <p>- Low income farmers group fish culture</p> <p>VAPC established low income fish culture group in 2008. The member of low income fish culture harvested 2kg table fish in 2009.</p> <p>The members suspended the fish culture activities due to low barvest.</p> <p>Mr. Keunoy is the present VAPC leader in the village, replacing Mr. Khamsao the former VAPC leader.</p>
	<p>Progressive farmers and VADW</p> <p>WU fish culture group</p> <p>Group fish culture</p> <p>Remarks</p> <p>VAPC</p>
Houaythong	<p>VAPC has 23 members.</p> <p>VAPC has prepared regulation on aquaculture activities in the village.</p> <p>AQIP2 supplied 4,135 fingerlings to VAPC. VAPC distributed the fingerlings to 17 fish farmers in 2006.</p> <p>VAPC save 137,000kip as VAPC fund through collection of fee for supply of fingerlings and equipment rental in January 2009.</p> <p>According to monitoring survey in 2009, 60% of fish farmers applied improved method through AQIP2 activity.</p>

<p>Progressive farmers and VADW</p>	<p>- Progressive farmers: 5 farmers - VADW: Mr. Ounset and Ms. Bouaphan</p>
<p>WU fish culture group</p>	<p>There are two WU, one for Lao Thung ethnic group and one for Lao Soung ethnic group. Lao Soung WU does not conduct aquaculture activities. Village head has suggested that Lao Soung should join to fish culture activities with Lao Thung WU. WU has been conducting intermediate culture since 2007. The fish pond of WU was broken by flood in August 2008. The members of WU made their new fish pond in January 2009. WU saves 595,000kip through selling the fingerlings in February 2009.</p>
<p>Group fish culture</p>	<p>AQIP2 supplied materials of one cement hatchery tank. VAPC members constructed a hatchery tank in the end of 2008. The members of WU and VAPC conducted common carp seed production using the hatchery tank. 43 fish ponds were broken by flood in August 2008.</p>
<p>Remarks</p>	<p>VAPC has 28 members. VAPC has prepared regulation on aquaculture activities in the village. AQIP2 supplied 7,175 fingerlings to VAPC. VAPC distributed fingerlings to 29 fish farmers in 2006. VAPC has 760,000kip as VAPC fund through collecting fee of fingerling supply and equipment rental in January 2009. Some VAPC members are conducting seed production of Tilapia and common carp. Agriculture School students helped an experiment of common carp seed production in 2009. According to monitoring survey in 2009, 85% fish farmers applied improved method through AQIP2 activity.</p>
<p>Progressive farmers and VADW</p>	<p>- Progressive farmers: 5 farmers - VADW: Mr. Bounvai, Ms. Kcolai</p>
<p>WU fish culture group</p>	<p>WU had been conducting intermediate culture for 3 years. WU returned the fish pond to owner and suspend group fish culture. 11 WU members, who are conducting fish culture individually, have been conducting micro credit through collecting of 5,000kip/person/month since August 2007. WU saves 1,856,000kip as WU fund through selling the fingerlings and collecting member fee. Some VAPC members and WU members jointly conduct seed production.</p>
<p>Group fish culture</p>	<p>Some VAPC members and WU members jointly conduct seed production.</p>
<p>Remarks</p>	<p></p>

Xaignabouli province Phiang district	
Natane	<p>VAPC</p> <p>VAPC has 26 members. VAPC has prepared regulation on aquaculture activities in the village. AQIP 2 supplied 20,800 fingerlings to VAPC. VAPC distributed fingerlings to 21 fish farmers in 2006. VAPC saves 20,000kip as VAPC fund collecting fee of equipment rental in November 2008. According to monitoring survey in 2009, 80% of fish farmers applied improved method through AQIP-2 activity.</p> <p>Progressive farmers and VADW</p> <ul style="list-style-type: none"> <li>- Progressive farmers: 5 farmer</li> <li>- VADW: Mr. Phanseun and Mr. Mouth</li> </ul> <p>WU fish culture group</p> <p>WU has been conducting grow out culture since 2006. WU saves 240,000kip as WU fund through selling the table size fish by January 2009.</p> <p>Group fish culture</p> <p>Some of VAPC member joined the seed producer's group in Phiang district supported by AQIP2.</p> <p>Remarks</p>
Somsavanh	<p>VAPC</p> <p>VAPC has 32 members. VAPC has prepared regulation on aquaculture activities in the village. AQIP2 supplied 30,700 fingerlings to VAPC. VAPC distributed to 18 fish farmers in 2006. VAPC saves 300,000kip as VAPC fund through collecting fee of fingerling supply and equipment rental. According to monitoring survey in 2009, 95 % of fish farmers applied improved method through AQIP2 activity.</p> <p>Progressive farmers and VADW</p> <ul style="list-style-type: none"> <li>- Progressive farmers: 5 farmers</li> <li>- VADW: Mr. Xiengbounthanh and Ms. Pan</li> </ul> <p>WU fish culture group</p> <p>WU currently keeps a fund of about 3.4 million Kip, and is increasing its fund by earning interest of investment to village revolving fund. WU fish culture group has a fish culture pond in the ground of primary school. They have been conducting grow out culture since 2007. WU earned 970,000kip through selling table size fish.</p> <p>Group fish culture</p> <ul style="list-style-type: none"> <li>- School fish culture</li> </ul> <p>In 2007, primary school started fish culture using their fish pond. VAPC members supported fish culture activities to the school. The school harvested 30kg table fish in 1st January 2009.</p> <p>Remarks</p>

Nasomnyai	VAPC	VAPC has 23 members. VAPC has prepared regulation on aquaculture activities in the village. AQIP2 supplied 5,000 fingerlings to VAPC. VAPC distributed the fingerlings to 25 fish farmers in 2006. VAPC saves 40,000kip as VAPC fund through collecting fee of equipment rental in June 2009. According to monitoring survey in 2009, 80% of fish farmers applied improved method through AQIP2 activity.
	Progressive farmers and VADW	- Progressive farmers: 5 farmers - VADW: Mr. Deng and Ms. Vieng
	WU fish culture group	AQIP2 supported 50% of budget to construct a water gate of WU pond in 2006. WU sold 20kg fish (18,000kip/kg) and consumed 10kg by members in 2009. WU saves 360,000kip as WU fund through selling the fish.
	Group fish culture	- Low income farmers group fish AQIP2 supported catfish fingerlings and net-cages to 4 farmers in June 2009. VAPC members give a technical guidance to them. The group is continuing culture.
	Remarks	

Savanakhet province, Phin district		
Phin	VAPC	(1) VAPC has 11 members in 2009. (2) VAPC has prepared regulation on aquaculture activities in the village. (3) VAPC organized a fish culture group for floating net cage culture and women's group for making net cage in 2008. (4) AQIP 2 supplied to VAPC 1,150 catfish seeds and floats, 2 net cages (2m x 3m) and concrete fish tanks. (5) VAPC constructed a frame for floating net cage and 2 concrete fish tanks. (1) Mr. Lingthong and Ms. Mo are VADW of this village.
	Progressive farmers and VADW	(1) WU currently holds 20,000,000 Kip as funds for village micro-finance. WU manages a micro finance with the fund raised from villagers. The union currently holds amount of 20,000,000kip. Villagers can get a loan from the union at 3% interest a year. (2) Ms.Mo, Ms.Lea, Ms.Somphone and Ms.Done Shom have made women's aquaculture group in 2008. They learned a net cage making from Ms. Phoungmaly and Ms. Panchar, women's union in Oudomxai village. (4) Ms. Somphone has carried out a test culture on catfish with boiled feed.
	Women's union	
	Group fish culture	(1) Mr. Linthong, village chief and leader of VAPC, organized fish culture group and carried out a test on catfish floating net cage culture in April-June 2008. Catfish grew to 220.1g in body weight and 84.0% in survival rate by 27th June in 2008.

Saisamphan	VAPC	<p>(1) VAPC has 10 members in 2009.</p> <p>(2) VAPC has prepared regulation on aquaculture activities in the village.</p> <p>(3) VAPC organized a fish culture group for floating net cage culture in 2008.</p> <p>(3) AQIP-2 supplied VAPC with 1,150 catfish seeds and floats and 2 net cages (2m×3m).</p> <p>(4) VAPC constructed a frame for floating net cage.</p> <p>(5) VAPC is culturing fish in a pond borrowed from a pond owner (see group fish culture).</p> <p>(1) By intermediate culture, small fish fry grow to fingerling big enough to stock into the pond for grow-out in a short period.</p> <p>(2) Silver carp grows fastest under poor feeding condition among three species in poly-culture.</p> <p>(3) Mr. Lamthoun and Mr. Khamtan are VADW of the village.</p> <p>(1) WU members conduct fish culture together with VAPC fish culture group.</p> <p>(1) Mr. Khamtan, leader of VAPC, organized fish culture group and carried out a test culture on catfish floating net cage culture in July-December 2008. Catfish grew to 250g, large size fish, and 109g, small size fish, in body weight by 12 December in 2008. They sold 29Kg of fish.</p>
Oudomxay	VAPC	<p>(1) VAPC has 14 members in 2009.</p> <p>(2) VAPC has prepared regulation on aquaculture activities in the village.</p> <p>(3) VAPC renovated community pond and started seed production in 2008. They have produced tilapia seeds from 2009.</p> <p>(4) VAPC reared brood catfish in member's ponds.</p> <p>(5) AQIP 2 supplied VAPC with material for fish tank.</p> <p>(6) VAPC members scattered chemical fertilizer into the community pond every week. The pond have keep good quantity of phytoplankton to enhance fish growth.</p> <p>(7) VAPC conducted common carp seed production. Member reared brood fish in their fish ponds, gathered their fish and laid eggs in propagation season.</p> <p>(8) VAPC produced and sold tilapia seeds. VAPC members managed to keep green water in the pond to enhance growth of tilapia fry.</p> <p>(1) Mr. Bounraym Ms. Phoungmaly and Ms. Panchar are VADW of the village.</p>
	<p>Progressive farmers and VADW</p> <p>Women's union</p> <p>Group fish culture</p>	<p>(1) WU conducts fish culture.</p> <p>(2) Member of WU taught Women's group of Phin village how to make a net cage.</p> <p>(1) Mr. Bounray, leader of VAPC, organized fish culture group and carried out fish seed production from 2008. They produced brood catfish and common carp. They sold 9,500 tilapia seeds to expansion villages in Sepon and Phin districts and VAPC fish culture group in Phin village.</p>

Salavan province, Laongham district	
Houakouaset	<p>VAPC</p> <p>(1) VAPC has 7 members in 2009.  (2) VAPC has prepared regulation on aquaculture activities in the village.  (3) VAPC made arrangement for fish pond for seed production in 2007.  (4) AQIP 2 supplied to VAPC 58 female tilapia and 20 male tilapia and partition net in June 2008.  (5) VAPC is conducting group fish culture.</p> <p>Progressive farmers and VADW</p> <p>(1) Progressive farmers recognized an importance of pond management such as keeping water level, making green water.  (2) Mr. Thongdeuan and Ms. Vone are VADW of the village.</p> <p>Women's union</p> <p>(1) WU conducts fish culture and seed production.  (2) Ms. Manivone, leader of WU, made concrete fish seed production tanks by herself.  (3) WU tried common carp and catfish seed production by themselves in February 2009. They produced fish seeds and released them into fish pond for further growing.  (4) AQIP 2 supplied to WU 50 females tilapia and 17 males tilapia and provided material for fish concrete tanks in 2008.  (5) WU tried to produce common carp and catfish fry.</p> <p>Group fish culture</p> <p>(1) Mr. Thongdeuan, leader of VAPC, provided one of his fish ponds for tilapia seed production using partition net in 2007. VAPC carried out a test culture on tilapia seed production in June to November 2008. They sold 300 tilapia fry in November. VAPC sold tilapia seed at 50kip each to VAPC members and at 100kip to other farmers.</p>
Dondou	<p>VAPC</p> <p>(1) VAPC has 7 members in 2009.  (2) VAPC has prepared regulation on aquaculture activities in the village.  (3) VAPC provided a community pond for tilapia seed production in 2007.  (4) AQIP 2 gave guidance on a technique to stop water leakage of the fish pond.  (5) AQIP 2 supplied to VAPC 30 females tilapia and 12 males tilapia and partition net in June 2008.</p> <p>Progressive farmers and VADW</p> <p>(1) Tilapia grows to certain size with feeding rice bran.  (2) Mr. Khamstay is VADW of the village.</p> <p>Women's union</p> <p>(1) Ms. Nitiakhone, leader of the group, Organized a Women's Group in 2007. Ms. Peu took over the leader from Ms. Nitiakhone in 2008.  (2) AQIP 2 gave instruction in making net cage to member of Women's group.  (3) Women's Group made net cages for expansion village to AQIP 2 order.</p> <p>Group fish culture</p> <p>(1) Mr. Khamstay, leader of VAPC, organized fish culture group and carried out a test seed production using partition net on tilapia in June-December 2008.</p>

Nonsoung	VAPC	<p>(1) VAPC has 4 members in 2009.</p> <p>(2) VAPC has prepared regulation on aquaculture activities in the village.</p> <p>(3) VAPC organized a fish culture group for seed production in 2008.</p> <p>(4) VAPC prepared three community ponds for test culture in the village in May 2008.</p> <p>(5) VAPC borrowed Mr. Khamray's pond for its group fish culture.</p> <p>(6) AQIP 2 provided VAPC with 50 female tilapia and 17 male tilapia and partition net in June 2008.</p> <p>(7) Mr. Khamray and Mr. Thongdan, VAPC member, have produced fish seeds at constant number nowadays.</p>
	Progressive farmers and VADW	(1) Mr. Thongdan and Mr. Khamray are VADW of the village.
	Women's union	(1) WU conducted frog culture.
	Group fish culture	<p>(1) Mr. Souban, leader of VAPC, prepared community ponds.</p> <p>(2) Mr. Khamray provided his fish pond for rearing brood fish.</p>

(3) Results of the pilot operation (data for 2008)

Province	Village	Number of fish culture HH (%want to continue)	Seed production	Fish production (kg/fish culture HH/year)	Fish consumption (kg/person/year)
Oudomxai province Xai district	Houaysang (HYS)	58 (100%, n=20)	50,000 - 60,000 fingerlings/year produced by Mr. Keunoy and Mr. Khamsao	54.0 kg (n=12)	10.2 kg
	Houaythong (HYT)	39 (100%, n=20)	VAPC and WU members are trying common carp seed production. (Mr. Nangysong, Mr. Thongpheng, Ms. Bouapban)	53.6 kg (n=3)	4.2 kg
	Houaykhoum (HYK)	77 (100%, n=20)	2,000 - 4,000 fingerlings (20g/head)/year produced by VAPC members	231.4 kg (n=14)	14.3 kg
Xaignabouli province Phiang district	Natane (NTN)	91 (100%, n=20)	30,000 - 50,000 fingerlings/year produced by Mr. Pansoun, Mr. Mounh, Mr. Phiang	130.0 kg (n=14)	13.9 kg
	Somsavanh (SSV)	97 (100%, n=20)	20,000 - 30,000 fingerlings/year produced by Mr. Xiengbounthan	238.0 kg (n=20)	12.4 kg
	Nasomnyai (NSN)	70 (100%, n=20)	200,000 - 250,000 fingerlings/year produced by Mr. Bounthavy and Mr. Sio	406 kg (n=18)	17.6 kg

Savannakhet province Phin district	Phin (PHN)	32 (100%, n=15)	VAPC intends to try seed production.	55.4 kg (n=13)	11.6 kg
	Xaisamphan (XSP)	37 (100%, n=18)	(1) Mr. Lamthoun produced 4,800 tilapia seeds in 2007 and 4,000 tilapia seeds in 2008. (2) Mr. Lamthoun has delivered 4,000 tilapia seeds for expansion villages and 500 tilapia seeds for Xaisampan pilot village in Phin district in August 2009.	216.1 kg (n=15) Mr. Hamnoy, VAPC member, have cultured tilapia commercially and produced 1,900Kg in 2008. He hopes to harvest tilapia 7,000Kg in 2009.	16.4 kg
Salavan province Laoongam district	Oudomxai (ODX)	30 (76.2%, n=21)	(1) VAPC produced 3,760 common carp seeds in April 2009. (2) VAPC has sold 6,000 tilapia seeds for 6 expansion villages in Sepon district and 3,000 tilapia seeds for 3 expansion villages in Phin district and 500 tilapia seeds for Phin pilot village in Phin district in August 2009.	88.4 kg (n=14)	10.9 kg
	Houakouaset (KHS)	15 (100%, n=15)	VAPC produced 300 tilapia seeds in 2008. WU produced 1,000 common carp seeds and 2,000 Puntius seeds.	99.6 kg (n=13)	12.0 kg
	Dondou (DND)	11 (100%, n=11)		171.7 kg (n=3)	11.6 kg
	Nonsoung (NNS)	9+ (88.9%, n=9)	(1) Mr. Khamray, VAPC member, has produced 4,800 tilapia seeds in 2007 and 130,000 tilapia seeds in 2008. (2) Mr. Thongdan, VAPC member, produced 12,000 common carp seeds in 2007.	46.9 kg (n=8)	15.0 kg



## 2. Aquaculture expansion operation

### (1) Profile of aquaculture expansion villages

Province	Village	Village size <sup>1)</sup>	Rice production (fish culture farmer)*	Source of cash income*	Cash income (kip/fish culture HH/year)*
Oudomxai province Xai district	KM 10	Small	200 – 4,010 kg	Upland rice	5 – 8 million
	Hornxai	Medium	1,000 – 5,700 kg	Wet season rice, livestock, upland rice	5 – 15 million
	Donxai	Medium	1,000 – 1,800 kg	Rice, vegetable, fish, livestock	8 – 25 million
	Donkeo	Medium	1,000 – 5,000 kg	Rice, livestock, fish	1.5 – 200 million
	Nale	Medium	1,700 – 3,000 kg	Rice, noodle	9 – 15 million
	Viengsa	Medium	700 kg	Vegetable, livestock, fish	4 – 5 million
	Bo	Large	2,000 – 15,000 kg	Rice, trading, fish	5 – 12 million
	Pangthong	Small	3,500 – 4,500 kg	Corn, sesame	2 – 6 million
	Houaylor	Medium	-	-	-
Oudomxai province Beng district	Nalai	Small	3,000 – 6,000 kg	Corn	5 – 12 million
	Bengkham	Small	400 – 6,000 kg	Corn	5 – 15 million
	Thakath	Small	2,800 – 5,500 kg	Corn	4 – 30 million
	Nabon	Small	3,200 – 5,200 kg	Corn	10 – 15 million
	Kewkhem	Small	700 – 10,000 kg	Corn, rice, livestock, vegetable	10 – 60 million
	Muangphiang	Large	2,200 – 3,200 kg	Rice, vegetable, livestock, trading, transportation	3 – 60 million
	Phonxai	Large	2,800 – 5,500 kg	Rice, livestock, corn, rice mill, trading, furniture making	5 – 17 million
	Phonhine	Large	2,000 – 6,000 kg	Rice, livestock, fish, rice mill	3 – 60 million
	Nakhem	Large	3,500 – 5,000 kg	Rice, vegetable, livestock, corn, fish, carpenter	6 – 10 million
Xaignabouli province Phiang district	Nale	Medium	-	-	-
	Houayxam-O	Large	2,000 – 6,300 kg	Livestock	7 – 25 million
	Houaysa-Ngem	Small	2,000 – 7,800 kg	Livestock	5 million
	Khengkhoey	Large	3,500 – 4,000 kg	Livestock, vegetable, trading, construction	5 – 20 million
	Donengum	Medium	2,500 – 5,000kg	Non-agricultural income	6 – 25 million
	Nalao	Large	2,500 – 4,000 kg	Rice, livestock, vegetable, fish	11 – 30 million

	Natonoy	Large	800 – 5,000 kg	Rice, livestock, vegetable	7 – 21 million
Savannakhet province Phim district	Paphoun	Small	4,000 – 5,500 kg	Rice, livestock, vegetable, fish	5 – 15 million
	Napho	Medium	2,400 – 9,000 kg	Rice, livestock	2 – 8 million
	Natbalang	Medium	3,000 – 6,000 kg	Rice, livestock, vegetable	5 – 12 million
	Non Gnayng	Medium	250 – 3,600 kg	Rice, livestock	3 – 6 million
	Nonsa At	Small	2,200 – 5,000 kg	Rice, livestock	2 – 40 million
	Pasomxai	Large	1,200 – 3,600 kg	Fish, livestock	2 – 10 million
	Sibounhuang	Medium	3,600 – 12,000 kg	Rice, non-agricultural income	1.5 – 100 million
	Xaisomboun	Large	4,000 – 5,000 kg	Livestock, non-agricultural income	2.5 – 150 million
	Alai-kaleng	Small	650 – 1,800 kg	Non-agricultural income	1 – 1.5 million
	Dongsavan	Medium		Non-agricultural income	5 – 15 million
Savannakhet province Sepon district	Phonhay	Large	3,200 – 8,000 kg	Livestock	2 – 20 million
	Nabo	Large	1,200 – 4,000 kg	Livestock	0.5 – 5.5 million
	Phonnouang	Large	2,000 – 8,000 kg	Livestock	2 – 20 million
	Seponkao	Small	2,000 – 2,800 kg	Vegetable	1 – 1.5 million
	Vongvilay	Medium	3,600 – 3,800 kg	Non-agricultural income	0.5 – 20 million
	Bak Gnai	Small	500 – 10,000 kg	Banana	1 – 13.5 million
	Len	Small	500 – 1,500 kg	Peanut, banana	2 – 10 million
	Ngew	Small	4,000 kg	Peanut, banana	4 – 15 million
	Phonouan	Small	200 – 3,100 kg	Peanut, banana	2 – 10 million
	Saoudong	Small	3,000 – 4,500 kg	Livestock	0.6 – 8 million
Salavan province Laongam district	Temphopoum	Small	2,000 kg	Coffee	5 – 15 million
	Yanguay	Small	1,000 kg	Banana	10 – 25 million
	Bungxai	Medium	3,500 – 18,700 kg	Rice	1.5 – 15 million
	Nakhosao	Large	3,000 – 8,000 kg	Rice	1 – 17 million
	Nathanko	Small	6,000 – 8,000 kg	Rice	1.5 – 20 million
	Naxai Gnai	Small	3,000 – 7,000 kg	Rice, fish, livestock	0.6 – 3 million
	Nongsai	Medium	3,000 – 14,000 kg	Rice, fish, livestock	2 – 6 million
	Phao	Large	6,000 kg	Rice, fish, livestock	6 million
	Naxai Noy	Small	1,200 – 5,000 kg	Rice, corn	2 – 6 million
	Salavan province Salavan district				

\* Report of the survey for collection of baseline data of target villages for aquaculture expansion operation selected by District Agriculture and Forestry Extension Offices in 2007

(2) Achievements of the aquaculture expansion operation

Province	Village	VAPC (female)	Progressive farmers	WU aquaculture group	Group aquaculture
Oudomxai province Xai district	KM 10	9 members (2)	Ms. Khamnang, Mr. Bounthone, Mr. Yuem	WU group fish culture	
	Homxai	12 members (2)	Mr. Khamtoui, Mr. Bounphan, Mr. KHampouth		
	Donxai	12 members	Mr. So, Mr. Kham ai, Mr. Ngouan		
	Donkeo	12 members (3)	Mr. Pheng, Ms. Boun, Mr. Sangvane		
	Nale	9 members (1)	Mr. Maixang, Mr. Thonkhoun, Ms. Xai		
	Viengsa	12 members (1)	Mr. Thoy, Mr. Thongxai, Mr. Khampbeng		School fish culture
	Bo	11 members (1)	Mr. Kham, Mr. Khampiew, Ms. KHambak		
	Pangthong	9 members (1)	Mr. Mai inkham, Mr. Khamphan, Mr. Moiboun		
	Houytor	9 members (1)	Mr. Mai khamdi, Mr. Mai ouchan, Ms. Chansouk		School fish culture
	Nalai	12 members (1)	Mr. Nanephay, Mr. Onkham, Mr. Mai chanthi		
Beng district	Bengkham	9 members (1)	Mr. Thith on, Mr. Vongdeuan, Mr. Bouakhai		
	Thakath	9 members (1)	Mr. Thith kone, Mr. Thith chan, Mr. Mai enc		
	Nabon	9 members (2)	Mr. Maiyom, Mr. Soun, Mr. Mai khamdi		
	Kewkhem	12 members (1)	Mr. Heryang, Mr. Lien, Mr. Iouli	WU group fish culture	
	Muangphiang	9 members (1)	Mr. Khammanh, Mr. Salong, Mr. Khampbad		School fish culture
	Phonxai	9 members (1)	Mr. Wi, Mr. Peng, Mr. Hom		
	Phonbine	9 members (2)	Mr. Lao, Mr. Peng, Ms. Bouavan		
	Nakhem	9 members (2)	Mr. Xiengchan, Mr. Pan, Mr. Xiengxouang		School fish culture
	Nale	5 members	Mr. Bouanna, Mr. Xiengtan, Mr. Da		
	Houayxam-O	9 members (1)	Mr. Laoyearthor, Mr. Laothierthor, Mr. Bouaneng		
Xaignabouli province Xaignabouli district	Houaysa-Nigem	9 members	Mr. Northevang, Mr. Yeerthor, Mr. Chantala	WU group fish culture	Village fish culture
	Khengkhoy	9 members (4)	Mr. Soulikone, Mr. Souphan, Mr. Xiengphay	WU group fish culture	
	Donengun	9 members (3)	Ms. Banhom, Mr. Thong, Mr. Noyvilai	WU group fish culture	
	Nalao	9 members (3)	Mr. Phengsitha, Ms. Phantengdouan, Mr. Chothi		

	Natonoy	9 members (1)	Mr. Soulan, Ms. Bounsida, Mr. Sengpheth		School fish culture
Savannakhet province Phin district	Paphoun	9 members (2)	Mr. Bouanmi, Mr. Da, Mr. Sithat		
	Napho	9 members (0)	Mr. Dokchan, Mr. bounsoung		
	Nathalang	9 members (3)	Mr. Phonthong, Mr. thongsouk		Community pond
	Non Gnayng	12 members (4)	Ms. Santisouk, Mr. phongthale		
	Nonsa At	9 members (1)	Mr. Naly,		
	Pasomxai	10 members (3)	Mr. Kikeo, Ms. Thongbai		
	Sibounhuang	9 members (3)	Mr. Somsarouk, Mr. Bounngok		
	Xaisomboun	9 members (1)	Mr. Somvang, Mr. Phonmany		
	Alai-kaleng		Mr. Kongtee, Mr. Aket		
	Dongsavan	9 members (1)	Mr. Vanlakhone, Mr. Bounny		
	Phonhay	12 members (4)	Mr. Deng		
	Nabo	7 members (0)	Mr. Kongja, Mr. Bouala		
	Phonnuang	9 members (2)	Mr. Khammong, Ms. Somchai		
Salavan province Laongam district	Seponkao	3 members (0)	Mr. Boungnok		Community pond
	Yongvilay	7 members (1)	Mr. Sengkeo, Mr. Odai		Community pond
	Bak Gnai	9 members (1)	Mr. Khon, Mr. Xanneua		
	Len	9 members (2)	Mr. Sonexai, Mr. Siha		
	Ngew	9 members (4)	Mr. Somchit, Ms. Viengsavan		
	Phonouan	9 members (1)	Mr. Leuan roy, Mr. Meuan		
	Sandong	9 members (3)	Mr. Chanthi, Mr. Heun		Frog and fish culture
	Temepopoum	9 members (2)	Mr. Say, Mr. Khamphan		
	Vangpuay	9 members (1)	Mr. Kongthong, Mr. Thongsouk		
	Bungxai	9 members (2)	Mr. Vansy, Mr. Thongsa		
	Nakhosao	9 members (1)	Mr. Suanteng, Mr. Xiengrai		
	Nathanko	9 members (1)	Mr. Somphone, Mr. Teng		
	Naxai Gnai	9 members (2)	Mr. Tui, Ms. Thounchai		
Nongsai	9 members (1)	Mr. Soumang, Mr. Tui			
Phao	9 members (1)	Mr. Leito, Mr. Somvang			
Naxai Noy	9 members (4)	Mr. Thong On, Ms. Southchai		Fish culture	
					Group fish culture

(3) Results of the aquaculture expansion operation

Province	Village	Seed production	Fish production (kg/fish culture HH/year)	Total number of fish farmers	Number of fish farmers who apply improved method
Oudomxai province Xai district	KM 10	0	33.3 kg (n=3)	8	8
	Homxai	0	44.4 kg (n=8)	9	6
	Donxai	2 farmers	234.0 kg (n=10)	15	14
	Donkeo	6 farmers (Ms. Boun produced 5,750 fingerlings in 2009)	378.4 kg (n=17)	19	15
	Nale	0	141.7 kg (n=11)	11	11
	Viengsa	1 farmer	55.6 kg (n=8)	31	20
Oudomxai province Beng district	Bo	2 farmers	97.8 kg (n=13)	38	17
	Pangthong	1 farmer (Mr. Khamphan produced 100 tilapia fingerlings in 2009)	48.5 kg (n=12)	13	9
	Houaylor	0	314.7 kg (n=7)	15	6
	Nalai	0	18.2 kg (n=13)	13	13
	Bengkham	1 farmer (Mr. Vongdeuan produced 1,200 fingerlings in 2009)	20.9 kg (n=10)	29	19
	Thakath	0	185.3 kg (n=20)	40	18
	Nabon	0	65.2 kg (n=20)	20	16
	Kewkhem	0	70.0 kg (n=15)	15	8
	Muangphiang	0	51.1 kg (n=20)	33	16
	Phonxai	0	41.8 kg (n=20)	23	4
Phiang district	Phonhine	0	98.1 kg (n=20)	45	14
	Nakhem	0	39.0 kg (n=20)	46	8
	Nale	0	33.8 kg (n=17)	25	13
	Houayxam-O	0	99.8 kg (n=17)	27	20
	Houaysa-Ngem	0	150.4 kg (n=14)	54	12

Xaignabouli district	Khengkhoi	1 farmer (Mr. Xiengphay produced 4,000 fingerlings in 2009)	146.4 kg (n=14)	79	10
	Donengun	2 farmers (Ms. Banthom produced 20,000 fingerlings in 2009)	193.4 kg (n=8)	24	8
	Nalao	1 farmer (Ms. Phaiphengdouane produced 2,000 tilapia fingerlings in 2009)	249.0 kg (n=10)	23	11
Savannakhet province Phin district	Natony	0	214.2 kg (n=13)	14	12
	Paphoun	0	57.5 kg (n=2)	8	8
	Napho	0	24.5 kg (n=10)	19	n. a.
	Nathalang	0	118.3 kg (n=6)	20	14
	Non Gnayng	0	100.0 kg (n=1)	17	n. a.
	Nonsa At	0	40.0 kg (n=10)	27	7
	Pasomxai	0	19.0 kg (n=20)	89	n. a.
	Sibounhuang	0	71.7 kg (n=19)	37	4
	Xaisornboun	0	17.0 kg (n=1)	37	n. a.
	Alai-kaleng	0	16.0 kg (n=8)	8	8
Savannakhet province Sepon district	Dongsavan	0	72.3 kg (n=11)	20	18
	Phonhay	0	48.8 kg (n=20)	25	25
	Nabo	0	58.8 kg (n=20)	20	15
	Phonmuang	0	85.0 kg (n=9)	20	12
	Seponkao	0	17.0 kg (n=1)	3	n. a.
	Vongvilay	0	25.3 kg (n=6)	8	5
	Bak Gnai	0	44.3 kg (n=20)	20	19
	Len	0	150.0 kg (n=8)	n. a.	3
	Ngew	0	13.7 kg (n=20)	30	30
	Phonuan	0	15.0 kg (n=10)	13	7
Salavan province Laongam district	Saandong	0	n. a.	5	n. a.
	Temphopoun	0	n. a.	21	n. a.
	Vangpuay	0	306.0 kg (n=8)	21	9
	Bungxai	0	48.4 kg (n=20)	79	79

Salavan district	Nakhosao	0	82.2 kg (n=19)	19	19
	Nathanko	0	190.9 kg (n=22)	22	19
	Naxai Gnai	0	41.1 kg (n=10)	17	17
	Nongsai	0	173.0 kg (n=7)	12	8
	Phao	0	388.0 kg (n=19)	20	20
	Naxai Noy	0	34.5 kg (n=16)	17	17

### 3. Capacity building of local government organizations

Province	District	PLFS	PAS	DAFO
Oudomxai province	Xai district	- Mr. Lanthaphone and Mr. Kongthasith are counterparts of AQIP2. They are able to organize technical training at PAS and to the lead guidance team. - PADS has been formulated based on RAPP.	- Mr. Somphe is counterpart of AQIP2. He is able to give technical guidance to farmers. - AQIP2 renovated water intake system and training building at Donkeo station. AQIP2 provided hand tractor, drag net and motorcycle. Those machineries are fully used in their activities.	- Ms. Amphai and Ms. Chalouny are counterparts of AQIP2. They are able to give guidance on aquaculture and group fish culture to farmers. - Mr. Keivmoyna and Mr. Thongnan are counterparts of AQIP-2. They are able to give guidance to farmers.
	Beng district			
Xaignabouli province	Phiang district	- Mr. Vilaphong and Mr. Pasouth are counterparts of AQIP2. They are able to organize technical training and to lead the guidance team. - PADS has been formulated based on RAPP.	- 30 ba station in Phiang district. Mr. Feng is counterpart of AQIP2. He is able to give technical guidance to farmers. AQIP2 provided hormone and drag net. Those materials are used in their activities. - Namdiane station in Xaignabouli district. AQIP2 constructed facilities at Namdiane station in 2007 and office in 2008	- Mr. Sio and Mr. Phonmany are counterparts of AQIP2. They are able to give guidance on aquaculture and group fish culture to farmers. - Mr. Thongsalop and Mr. Chanleune are counterparts of AQIP2. They are able to give guidance on aquaculture and group fish culture to farmers.
	Xaignabouli district			
Savannakhet province	Phin district	- Mr. Phansy is counterpart of AQIP 2. His knowledge on aquaculture activities has improved very well. - Mr. Phansy attended NADC aquaculture training course and study trip to Thailand. - PADS has been formulated based on RAPP.	- Pakbo Fish Farm organized an aquaculture training course every year for DAFO staff, pilot village and expansion village farmers. - Skill of aquaculture training of Pakbo Fish Farm staff has improved clearly since they took part in the NADC training course, study trip in Thailand and training in Japan. - AQIP 2 provided Pakbo Fish Farm with a motorcycle, a hand tiller, and water pump. - AQIP 2 improved training facilities and culture ponds of Pakbo Fish Farm.	- Mr. Khamsamong is counterpart of AQIP 2 from 2005, and has been a member of on-site guidance team. He attended NADC and PAS training course and study trip to Thailand. - Ms. Sonvandy is counterpart of AQIP 2 from 2005, and has been a member of on-site guidance team from 2007. She attended NADC and PAS training course. - AQIP 2 provided DAFO with a motorcycle and other equipment and materials. - Mr. Keououdon is counterpart of AQIP 2 from 2007, and has been a member of on-site guidance team. He attended NADC and PAS training course in 2007. He is a member of on-site training team at expansion village in 2007.
	Sepon district			



Salavan province	Laongann district	<ul style="list-style-type: none"> <li>- Mr. Tongon, chief of PLFS, was transferred to another section in April 2008. Mr. Bounliang became chief. Mr. Bounliang is working for AQIP 2 as a member of the on-site guidance team from April 2008.</li> <li>- AQIP 2 provided PAFO with a motorcycle.</li> <li>- PADS has been formulated based on RAPP.</li> </ul>	<ul style="list-style-type: none"> <li>- Nongdeng Fish Farm organized aquaculture training course for DAFO staff and pilot village farmers.</li> <li>- Mr. Phouangkeo is promoting fish farming actively since participated aquaculture technical training in Japan.</li> <li>- The skills of aquaculture training at Nongdeng Fish Farm improved clearly since its staff participated to the aquaculture technical training in NADC and Japan and study trip in Thailand.</li> <li>- Renovations of the facilities by AQIP 2 have an effect to improve training ability and fish seed productivity.</li> <li>- AQIP 2 supplied to Nongdeng Fish Farm a hand tiller with a water pump, a computer and a printer.</li> </ul>	<ul style="list-style-type: none"> <li>- Mr. Bounna is counterpart of AQIP 2 from 2007, and has been a member of on-site guidance team. He attended NADC and PAS training course in 2008. He is a member of an on-site training team in trainer in 2008.</li> <li>- AQIP 2 provided DAFO with a motorcycle in 2007</li> <li>- Mr. Athi, in charge of Vangen Fish Farm, is counterpart of AQIP 2 from 2005. He is a member of the on-site guidance team.</li> <li>- Ms. Outama, staff of Vangen fish station, is a member of the on-site guidance team from 2007.</li> <li>- DAFO operates Wangan Fish Farm that produces thousands of several kinds of fish seeds every year. The production capacity and productivity of Wangan Fish Farm is increasing after improvement of its facility by AQIP 2 and participation of its technicians to NADC and PAS training.</li> <li>- Mr. Pompanom, the director of DAFO, is promoting fish farming actively since participated aquaculture technical training in Japan. He moved to the higher management government college for studying from 2007.</li> <li>- Mr. Phonthai, new director of DAFO, is very cooperative to AQIP 2.</li> <li>- AQIP 2 supplied to Wangan Fish Farm a motorcycle and a hand tiller with a water pump, a computer and a printer. AQIP 2 renovated Wangan Fish Farm facilities and constructed a training building.</li> </ul>
Salavan province	Salavan district			<ul style="list-style-type: none"> <li>- Mr. Saly is counterpart of AQIP 2 from 2007, and has been a member of the on-site guidance team. He attended NADC and PAS training course in 2007. He was a member of the on-site training team at expansion village in 2008.</li> <li>• Mr. Thongdee is counterpart of AQIP 2 from 2007, and has been a member of the on-site guidance team. He attended NADC and PAS training course in 2007. He was a member of the on-site training team at expansion village in 2008.</li> <li>• AQIP II provided DAFO with a motorcycle in 2007.</li> </ul>

