

ODA Loan Project Mid-Term Review 2007

Evaluator: Hajime Onishi (Mitsubishi UFJ Research and Consulting)
Field survey: April 2008

Project title: The Republic of Indonesia “Batang Hari Irrigation Project (II)” (L/A No. IP-504)

[Loan Outline]

Loan amount/Contract approved amount/Disbursed amount :7,639 million yen/8,028 million yen/5,194 million yen (as of the end of March 2008)

Loan agreement :July 2001 (7 years after L/A)

Original completion date :December 2006

Loan expiry date :October 2009

Executing agency :Directorate General of Water Resources (DGWR), Ministry of Public Works,
Directorate General of Food Crops Production (DGFCP), Ministry of Agriculture

*Mid-Term Review 2007 includes additional investigation on the status of growing different crops under “Batang Hari Irrigation Project (II)”.

[Project Objective]

To increase rice production by constructing irrigation facilities, farm land consolidation and providing guidance on farming in West Sumatra and Jambi provinces of Sumatra Island, thereby contributing to increasing farmers’ income.

[Project Overview]

Implement the following as the 2nd phase of the project, following the 1st phase.

- New construction, rehabilitation, and upgrading of main, secondary, tertiary and quarternary canals, drainages and inspection and farm roads
- New farm land consolidation (approximately 14,000ha)
- Agricultural extension services (technical assistance programs, strengthening of agricultural & farmer support facilities, procurement of machinery & equipment, and provision of farm inputs & tools)
- Provision of operation and maintenance equipment for irrigation facilities
- Consulting services for the implementation of the above components

[Mid-Term Review Result]

Survey items	<u>Result of mid-term review</u>
[Analysis of the situation/issues]	Outstanding issues: Government of Indonesia upholds rice production increase as its target. The targeted area of the project was originally meant to be developed as rice paddy when the project was planned. However, demand-driven price hike of natural rubber triggered by recent price increase of oil gave

Survey items	Result of mid-term review
	<p>incentive for farmers in Indonesia centering Sumatra Island to grow natural rubber. Currently, many farmers in the project target area grow natural rubber which has lower water requirement than rice. Since the product harvest is at its peak and the price of rice is cheaper than natural rubber, farmers have little interest in growing rice, which causes delay in the progress of development of tertiary canals and farm land development. It is estimated that irrigation area is limited to 6,000 ha, compared to the target of 19,000 ha (including the existing irrigation area) by the loan expiry date.</p> <p>Points of survey:</p> <ul style="list-style-type: none"> • Confirm the status of the project implementation (based on operation and effect indicators) • If there is any change to the project scope, when it was changed if any and confirm the background ✓ How the scope was changed in specific ✓ Background of necessitating the change ✓ Standing of Indonesian government about the scope change • Review factors that hinder progress of the project in the future <p>Survey result:</p> <p>(1) Current status of the project (2) Changes to the project scope and the background (3) Factors that hinder progress of the project in the future</p> <p>(1) Current status of the project</p> <p>① Baseline and the latest value of operation indicators Currently, irrigated paddy field with irrigation water supply totals 3,263 ha of land (used data of irrigated rice paddy area only). The baseline of 4,983 ha is estimated to include rice paddy and other farm lands and because of this, the two numbers should not allow simple comparison. However, due to various factors detailed below, irrigated rice paddy is not increasing quickly enough. So far, 143 water users associations (WUAs) are confirmed to be founded, against the total 187 tertiary blocks with existing and/or irrigated paddy. (credibility of the baseline number of 176 is unclear¹)</p> <p>② Baseline and the latest value of effect indicators Based on the agreement “executing agency will collect baseline data after the start of the project for setting realistic value”², data was collected with support of the consultant. The baseline numbers were modified as shown in tables below. (based on the project survey report “Survey, Investigation and Design (SID) Work / 1999-2005”)</p> <p>In comparison to base numbers, total rice cultivated area increased by 34% (rainy season) or 44% (dry season), while unit rice yield increased by 27% (rainy season) or 68% (dry season).</p>

¹ The baseline numbers above were collected by Sub-branch of Irrigation Service Office (SISO), the then Dinas PU of West Sumatra. (Source: KRI International (2000) *Batang Hari Irrigation Project – Establishment of Performance Monitoring Indicators and Re-evaluation of Economic Viability*)

² Source: appraisal documents

Survey items	Result of mid-term review			
	Table Baseline and the latest value of operation indicators			
	Operation indicators	Baseline (Actual in 1996)	Latest value	
	Irrigation area (ha)	4,983	3,263	*1
	Actual irrigation area (ha)	4,983 (rainy season) 1,250 (dry season)	3,263 (rainy season) 3,263 (dry season)	*1 *1
	Ratio of water users associations active in operation ³	79% (actual in 1999)	Unknown	
	Number of farmers (household)	About 6,000	Unknown ⁴	
	Number of water users associations	176 (actual in 1999)	143 (against the tertiary irrigation block of 187)	*2
	Source: Answers to questionnaire from consultant, DGWR of Ministry of Public Works and DGFCP of Ministry of Agriculture			
	*1: Current irrigated rice paddy area (= existing irrigated rice paddy 2,263ha + newly irrigated rice paddy 1,000ha)			
	*2: Based on Agricultural Extension Service Programme (AESP, one of the components of the project) and BAPEDA data (year is unknown)			
	Table Baseline and the latest value of effect indicators			
	Effect indicators	Baseline (Referential value during F/S in 1996)	Baseline (After change)	Latest value
	Arable area (ha)	22,260 *9	21,178	21,178 *1
	Cultivated area by crops (ha)			
	Rice (rainy season)	3,772	2,882 *2	3,882 *4
	Rice (dry season)	3,772	2,263 *2	3,263 *5
	Soybean	2,693	2,802 *3	N/A
	Peanut	0		N/A
	Production volume of rice and other major crops (t / year)			
	Rice (rainy season)	10,977	8,358 *6	14,363 *7
	Rice (dry season)	9,430	5,658 *6	13,705 *7
	Soybean	1,885	N/A	N/A
	Peanut	0	N/A	N/A
	Gross annual average farm income/year (1,000Rp/year)			
	Rice (rainy season)	1,004	N/A	N/A
	Rice (dry season)	863	N/A	N/A
	Yield per unit area (t /ha)			
	Rice (rainy season)	2.9	N/A	3.7 *8
	Rice (dry season)	2.5	N/A	4.2 *8
	Source: Answers to questionnaire from consultant, DGWR of Ministry of Public Works and DGFCP of Ministry of Agriculture			
	*1: Based on land use data of "Survey, Investigation and Design (SID) Work / 1999-2005", survey report of the project. (arable area includes irrigated rice paddy, rice paddy dependent on rain water, field for other crops, rubber/oil palm plantation, wet area, forest, grass field etc., canals, farm road, path between rice paddies, idle land etc.)			
	*2: Sum of irrigated rice paddy and rice paddy dependent on rain water based on the above SID (irrigated 2,263ha + non-irrigated (rain-fed) 619ha = 2,882ha)			
	*3: Total area of agricultural fields including soybean and peanuts based on the SID			
	*4: Based on the SID and the progress status of farm land consolidation (rice paddy development) (existing irrigated rice paddy 2,263ha + newly irrigated rice paddy with water supply 1,000ha + non-irrigated (rain-fed) rice paddy 619ha = 3,882 ha)			
	*5: Based on the SID and the progress status of farm land consolidation (rice paddy development) (existing irrigated rice paddy 2,263ha + newly irrigated rice paddy with water supply 1,000ha = 3,263 ha)			
	*6: Estimated value based on modified baseline numbers (2,882ha * 2.9t = 8,358t and 2,263ha * 2.5t = 5,658t)			
	*7: Estimated value (3,882ha * 3.7t = 14,363t and 3,263ha * 4.2t = 13,705t)			
	*8: Data limited to newly developed rice paddy (source: survey on yield periodically conducted by the consultant)			
	*9: Based on appraisal documents			

³ Number of WUAs carrying out operation and maintenance of canals and holding regular meetings. (source: appraisal documents)

⁴ Estimated to be approximately 7,620 households(=6,000 households *127%) in consideration of population increase ratio in Dharmasraya of West Sumatra (average of 1996-2005)

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	<p>(2) Changes to the project scope and the background</p> <p>① Changes to the project scope</p> <p>Stakeholders in the government already acknowledge that the project scope requires change. Operation and effect indicators are not officially changed yet but expected to be officially changed once revised target is approved by related parties following the mid-term review.</p> <p>As mentioned above, actual irrigated paddy field with irrigation water supply is 3,263 ha now, merely 17% of the original target of 18,936 ha. Due to multiple factors stated below, it is considered extremely difficult to drastically increase irrigated areas in the future. Therefore, major scale back of the original target is unavoidable. Revised target considered attainable by the executing agencies (Ministry of Public Works and Ministry of Agriculture) and the consultant is 5,690 ha⁵, which is 30% of the original target.</p> <p>For the same reason, major scale back of target cultivated area by crops is unavoidable. Ministry of Public Works and Ministry of Agriculture assume that the revised target will be around 10%~40% (by crops) of the original target. Consequently, target figures of production volume of major crops and gross annual average farm income require scale back.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>Table Original target and assumed adjustment to target operation indicators</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Operation indicators</th> <th style="text-align: center;">Original target (Target year : 2007)</th> <th style="text-align: center;">Target after adjustment (estimate)</th> </tr> </thead> <tbody> <tr> <td>Irrigation area (ha)</td> <td style="text-align: center;">18,936 (newly irrigated approx. 14,000 ha)</td> <td style="text-align: center;">5,690 *1</td> </tr> <tr> <td>Actual irrigation area (ha)</td> <td style="text-align: center;">18,936 (both rainy and dry seasons)</td> <td style="text-align: center;">5,690 *1 (both rainy and dry seasons)</td> </tr> <tr> <td>Ratio of water users associations active in operation</td> <td style="text-align: center;">100%</td> <td style="text-align: center;">100%</td> </tr> <tr> <td>Number of farmers (household)</td> <td style="text-align: center;">22,124</td> <td style="text-align: center;">6,648 *2</td> </tr> <tr> <td>Number of water users associations</td> <td style="text-align: center;">598</td> <td style="text-align: center;">239 *3</td> </tr> </tbody> </table> <p>Source: Answers to questionnaire from consultant, DGWR of Ministry of Public Works and DGFCP of Ministry of Agriculture</p> <p>*1: Based on the latest update of LCB Package, expected changes to the contract and survey report "Survey, Investigation and Design (SID) Work / 1999-2005" etc. (existing irrigation 2,263 ha + newly irrigated 3,427 ha = 5,690 ha)</p> <p>*2: Estimate in proportion to reduction in irrigation area { 5,690 ha * (22,124 households ÷ 18,936ha)}</p> <p>*3: Based on the latest update of LCB Package and expected changes to the contract</p> </div> <div style="width: 48%;"> <p>Table Original target and assumed adjustment to target effect indicators</p> <table border="1" style="width: 100%; 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⁵ Estimate based on the latest contract modification etc. of LCB Package (existing irrigation area 2,263 ha + newly irrigated area 3,427 ha)

Survey items	Result of mid-term review
	<p>*2: Adjustment of target 21,178 ha (estimate) is according to current arable area. Difference between 21,178 ha and target rice cultivated area of 5,690 ha is due to ①7,200 ha for rubber/oil palm etc, ② upland field of 1,400 ha, ③rice paddy dependent on rainwater of 250 ha, ④wet area of 2,500 ha, ⑤ forest/grass field of 1,800 ha etc.</p> <p>*3: Based on the latest update of LCB Package and expected changes to the contract. (existing irrigation 2,263 ha + newly irrigated 3,427 ha = 5,690 ha)</p> <p>*4: Estimate based on the reduction in rice cultivated area</p> <p>*5: Estimate based on the reduction in rice cultivated area</p> <p>*6: Estimate (target unit yield in Definitive Plan * target cultivated area after adjustment)</p> <p>*7: Based on “Definitive Plan” drafted by the consultant of the project</p>
	<p>② Background of requiring changes to the project scope Background of requiring changes to the project scope varies wide but largely classified in a) economic factor, b) social factor and c) technical/institutional factors.</p> <p><u>No.1: Economic factor (steep rise in the market price of plantation products)</u> Due to price increase of natural rubber and oil palm in the international market, farmers of the target area started to grow more of such products rather than rice, whose price is lower. Because of this, many farmers refused farm land consolidation (rice paddy development) agreement, causing decrease in demand for irrigation water. Market price of plantation product started to rise around 2000-2001, 2 years after the 1st phase of the project that started in 1998. At first, the price hike was mainly caused by sudden increase in the demand of rubber for tire of a car, whose use was spread in China and other emerging markets. Then, added by another cause of international price hike of crude oil (demand of natural rubber increased because of chemical rubber) and new factors such as surge in demand of oil palm as bio fuel. Trend of price hike of rubber and oil palm still lasts, and the total plant area of the two products within the project area reached approximately 6,000 ha.</p> <p><u>No.2: Social factor (Unclear land ownership centering common land)</u> A number of common lands⁶ exist in the project area. The land ownership (including area held by right holder) is not clear, which triggers suspension of civil works and design changes that have major impact to construction progress. Common lands are owned by a community group and a committee established by the group decides allocation and usage of the land. Because of this, agreement at the committee is required to start farm land consolidation (rice paddy development) in common lands. In addition, a) disputes between communities over the boundary of common lands occur constantly since it is not clear, b)(even if boundaries are clear) difficult to form consensus on land allocation and the usage due to strong claim about one’s entitlement to the land, within a community and c) (even if a certain common land is already allocated by community chief and/or committee of community) boundary of land individual people claim their right are not clear in many cases. Because of that, the project frequently confronts with problems like more than one person claim right to the same land and a person newly claim entitlement to the land appears just before or during implementation of farm land consolidation.</p> <p>*Note: Some say the land owning system mentioned above is one of the traditional social systems of an ethnic group Menang widely reside in the project area (complicated forms of ownership, no title certificate, unclear land registration (no specification of area or boundary except for name))</p>

⁶ Common area of 3,000 ha existed in total at the start of the project. (source: hearing from the consultant)

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	<p>etc.)</p> <p><u>No. 3: Technical/institutional factor (Due to economic and social factors, agreed areas are scattered around and difficult to connect canals)</u> As a result of factors 1 and 2 above, agreed lands for farm land consolidation (rice paddy development) are scattered around in the project area and it is extremely difficult to extend the secondary canals to agreed areas, because land without agreement exists in the middle. In such cases, unless tertiary canals passing through non-agreement land is secured, rice paddy development cannot be achieved even for agreed land. Since these cases occur frequently, areas possibly irrigated are reduced further.</p> <p>*Note: In Indonesia, purchase of land for canal construction is allowed for primary and secondary canals. Small canals like tertiary and quaternary are possibly constructed if a farmer that owns the land offers land for the purpose for free, basically. For example, if land without agreement exists between a secondary canal and agreed land and construction of a tertiary canal is indispensable, the executing agency has nothing but to wait for the landowner to offer land to build tertiary canals for free, due to aforementioned institutional restriction. Since there is no incentive for a landowner to offer part of his/her land for free, development of rice paddy at many agreed lands has to be abandoned.</p>																									
	<p>Reference 1) Changes to plant area of natural rubber in Dharmasraya in West Sumatra by year (unit : ha)</p> <table border="1" data-bbox="479 651 1059 815"> <thead> <tr> <th>Year</th> <th>Productive Rubber</th> <th>Young Rubber</th> <th>Old Rubber</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2003</td> <td>21,895</td> <td>8,467</td> <td>4,152</td> <td>34,514</td> </tr> <tr> <td>2004</td> <td>21,145</td> <td>9,217</td> <td>4,902</td> <td>35,264</td> </tr> <tr> <td>2005</td> <td>21,145</td> <td>9,217</td> <td>4,902</td> <td>35,264</td> </tr> <tr> <td>2006</td> <td>25,848</td> <td>8,633</td> <td>2,983</td> <td>37,464</td> </tr> </tbody> </table> <p>Source : Answers to questionnaire from consultant (original data is statistics of Dharmasraya in West Sumatra in 2006). Total rubber plantation area in Dharmasraya</p> <p>Reference 2) Development of 3rd canals for irrigation in project area</p> <p>2003 : 0 km (Package-8, 1 Package in total) 2004 : 6 km (Package-8, 1 Package in total) 2005 : 3 km (Package-8, 1 Package in total) 2006 : 25 km (Package-3,4,5,6,7-1 & 7-2, 6 Packages in total) 2007 : 43 km (Package-3,4,5,6,7-1 & 7-2, 6 Packages in total)</p> <p>③ Standing of Indonesian Government about changing the project scope</p> <p>After hearing, it was confirmed that Ministry of Agriculture, Ministry of Public Works and local governments strongly recognize the need for downsizing the project scope. They seem to be in concert with reducing the target irrigation area. They also desperately wish to have effective resolution to problems mentioned in economic and social factors above, based on their full recognition of the issues.</p> <p>On the other hand, as for developed rice paddy, confirmed wishes to increase PPL for continuous support on farming thereby improve effective use of irrigation water (agricultural office of Dharmasraya), maintain performance of irrigation facilities, proper operation and maintenance of facilities at tertiary block level (DGWR of Ministry of Public Works) and so on. Agricultural office of Dharmasraya specifically pointed out by saying “farmers’ needs for irrigation water in target area remain high. Since it took time from planning to start construction of the facility⁷, farmers could not wait for completion and unwillingly chose to grow palm oil and natural rubber”.</p>	Year	Productive Rubber	Young Rubber	Old Rubber	Total	2003	21,895	8,467	4,152	34,514	2004	21,145	9,217	4,902	35,264	2005	21,145	9,217	4,902	35,264	2006	25,848	8,633	2,983	37,464
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⁷ Original plan of Batang Hari irrigation project dates back in 1970’s (pre- F/S survey was conducted in 1976 by the then Ministry of Public Works and F/S was completed in 1980). Project of the present scale was set in a plan called Judgment Study which was completed in 1996, then 1st phase of the project started in 1998 that led to development until today. In the meantime, due to market price hike of plantation products, needs of beneficiary farmers have changed. This is an external factor beyond control of the project and the resulting change in the needs of farmers was unavoidable. In the 2nd phase of the project from 1999 to 2004, SID (Survey, Investigation, Design) survey was conducted aimed at pre-detailed design for farm land consolidation (rice paddy development). During this period, many plantation farm households such as natural rubber turned objection to the final agreement of rice paddy development. (source: interview from the consultant)

Survey items	Result of mid-term review
	<p>Additionally, note some extreme minority opinions saying “the project needs to be suspended immediately given the prospect of how project effect might evolve in the future, cost verses effect and obligation to repay loan for the project implementation” or “wants to give up the project”.</p> <p>(3) Factors that hinder progress of the project in the future</p> <p><u>Trend of international market price of plantation product</u> Oil price rise and demand for bio fuel are unlikely to calm down in short to mid term basis, accordingly, price increase of natural rubber and oil palm at international market will continue for the time being. These are external factors unable to be controlled by the project. There is a need to cautiously watch the future trend.</p> <p><u>Difficulty of coordination among government organizations involving changes of parties responsible for the project implementation and organizational immaturity of local government</u> Dharmasraya is a relatively new district established in 2004. It is concerned that it takes time for the local government to mature as an organization. In addition, responsibility of farm land consolidation (rice paddy development) was shifted “Ministry of Agriculture for Sungai Dareh Sitiung Irrigation Project (SEDASI)→DGWR of Ministry of Public Works for Batang Hari Irrigation Project→Ministry of Agriculture” in short time, adding confusion to the implementation of the project. In response to question about Ministry of Agriculture of its capacity and skill for farm land consolidation (rice paddy development), there is a need to focus on the project management system in the future.</p> <p>Note*Factors possibly promote progress of the project</p> <p><u>Food price increase worldwide</u> Due to surge in rice price worldwide since the 2nd half of 2007, India and Vietnam, the 2nd and the 3rd biggest exporters of rice announced in 2008 that they will limit the export, inflating concern about availability of rice exchanged in international market, showing the aspect of “food crisis”. This crisis is not a temporary one, almost dominant view is that “it will last for a long time due to active demand in emerging countries like China and India”. On the other hand, self-sufficiency ratio of rice in Indonesia is less than 100%. Pressure for production increase of rice is expected to increase domestically, which might bring opportunity for the project.</p>
[Recommendations]	<p>(1) Possibility of effective water use other than rice production</p> <p>① Micro hydraulic power generation project Launch power generation project by renovating old pump facility (constructed by Chiat Irrigation Project (World Bank) in the past but not operating now) existing in the project area and adding new power generating facility. According to the consultant, excessive water of 6 tons per second is available and based on the estimate, it can generate 1,700kW (1.7MW) of electricity. Laying power transmission wire from the facility is deemed not difficult and the existing facility is maintained in good condition. Simple implementation review survey is desirable in the future. (EIA obligation does not apply the case for it does not fall under the specification of “height of dam \geq 15m”, “area of reservoir \geq 200 ha” or “power generation \geq 50MW”)</p> <p>Anticipated benefits : a)Provision of electricity to residents in the area, b) gain income by selling electricity to a utility company, c) mitigate global warming (contribute to CO₂ reduction even to a small degree, with the introduction of small hydraulic power</p>

Survey items	Result of mid-term review
	<p>generation system recently re-evaluated as an environmentally friendly power generator)</p> <p>Restriction/issue etc. : a)Cost versus effect is unclear at the moment (however, compared to building a new facility, efficient use of existing facility can dramatically reduce project cost), b) electricity demand in the surrounding area and the local resident is unclear, c) possibly take time to establish project implementation system including finding of electricity buyer, d) need to clarify parties responsible for operation and maintenance of completed facility, source of funds and so on.</p> <p>② Fish pond</p> <p>Introduction of fish pond to take advantage of excessive water. Build small scaled fish pond for farmers who show interest (consider large scaled fish pond depending on the intension of farmers and land availability). According to the consultant, there are 70 fish ponds totaling 4 ha now, which indicate that there are potential demands for the business. Since fish farming can be conducted while being engaged in agriculture, there is no negative impact to the ongoing project. It is desirable to implement simple social survey etc. to examine the demand of fish pond and review the possibility of implementing systematic fish farming.</p> <p>Anticipated benefits : a)Directly compensate the purpose of the project (increase income of the local farmers), b)diversify means of livelihood (diversify source of income at each farming household), c)improve nutrition of individual farmers (improve diet of each farm household with additional source of protein) and so on.</p> <p>Restriction/issues etc. : a) Cost versus effect is unclear (construction cost at each fish pond is considered marginal), b) adjustment to the irrigation fee is needed (agreement with WUA members is separately needed to adjust irrigation fee for farm household that newly introduces fish pond), c) need to clarify responsibility of operation and maintenance of fish pond, the source of fund, and so on.</p> <p>③ Other means of water use</p> <p><u>Drinking water</u> : Diversion of excessive water as drinking water. Separate survey is needed on a) the status of present tap water supply system in the target area, b) demand of drinking water by residents in the area, c) type and size of water supply system to be newly constructed and so on.</p> <p><u>Encourage farming of crops</u> : Shift the focus from rice to other crops that require irrigation water. Separate survey is needed on a) types of crops to grow, b) intention of farming households and so on.</p> <p>④ Recommendation to executing agencies</p> <p>Other than measures above, executing agencies need to immediately review effective means of utilizing excessive water in a way to actively involve beneficiary farm households and the community. For example, options realizable at small scaled additional investment like a) diversion of water for everyday life use for the community (include installation of simple waterworks facility), b) diversion of water use for public purposes in the community (firefighting, recreation purposes, environmental education for school children)</p> <p>(2) Recommendations related to the change of project target and others</p> <ul style="list-style-type: none"> • Prompt official approval to adjusted value of the target is necessary. JBIC, DGWR of Ministry of Public Works and DGFCP of Ministry of Agriculture should start 3-party discussion as soon as possible and conclude M/D and so on.

Survey items	Result of mid-term review
	<ul style="list-style-type: none"> • As specific target setting, figures shown in “(2) Changes to the project scope and the background” should be applied. (it is desirable to once again review calculation ground of the figures) • Even though ad-hoc meetings seem to have been held among related parties regarding various issues of the project, it is desirable to hold periodic discussions in the future to compensate for the lack of coordination between Ministry of Agriculture and Ministry of Public Works. • As countermeasures to various problems involving ownership form of common land, continuous discussion with community group is indispensable since they own the land and their agreement is needed to realize farm land consolidation (rice paddy development). Since resources including personnel are limited, it is important to prioritize in targeting common land and community group based on the easiness of problem resolution (or cooperative committee).