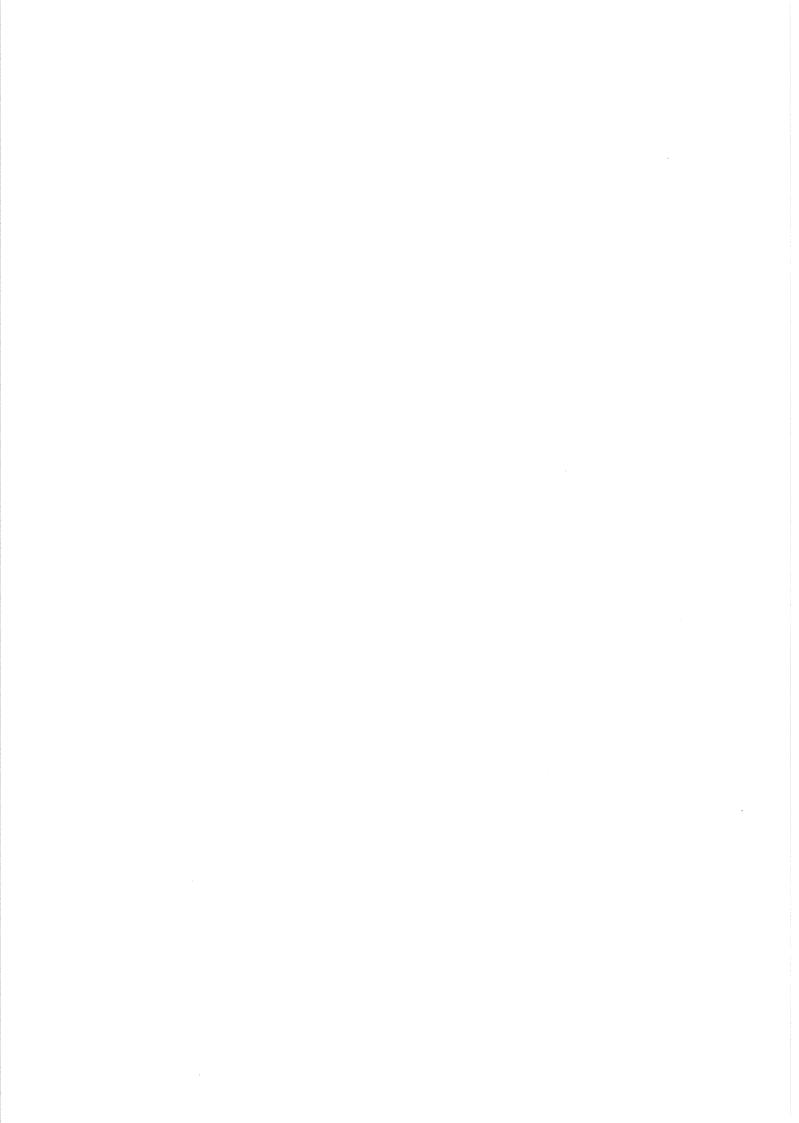
Appendix 4

Record of Feedback Workshop



Appendix 4.1

Meeting Note Feedback for Koto Panjang Hydroelectric Power Project in West Sumatra



Appendix 4.1 Meeting Note Feed-Back Workshop for Koto Panjang Hydroelectric Power Project in West Sumatra

Place:

BAPPEDA Office of West Sumatra Province

Time:

10.00 (a.m.) up to -15.00 (p.m.)

Moderator:

Vice Regent of 50 Kota Regency (Wakil Bupati 50 Kota)

1. Introduction

- BAPPEDA of West Sumatra (Ir. Afriadi Laudin, M.Si)
- The staff from BAPPEDA of West Sumatra said that the head of BAPPEDA
 of West Sumatra could not attend the meeting because of appointment with the
 governor on official business.
- The meeting aimed to explain the result of SAPS Team dealing with Koto Panjang Hydroelectric Power Project.
- 1. H. Amri Darwis (Vice Regent of 50 Koto Regency)

He said that Koto Panjang problems were our problems that had to overcome together with all of us attending the meeting today. He asked the participants to give suggestions or additional input.

- 2. Mr. Minato (SAPS Team JBIC)
 - He hoped that the meeting would be one of the additional input or suggestions in solving Koto Panjang problems.
 - Previously, he had meetings in Tanjung Balik and Tanjung Pauh village in March. He will be back to Indonesia in June-July 2002 to finalize the solution of the current problems. Hopefully all parties concerned with the Project would accept it.
 - He hoped suggestions or input from the government staff and wali nagari (head of village) and all party involved in the Project would be the basis of solution.

2. The Presentation of Study Result of Koto Panjang (preceding data)

• The presentation of the result of survey was made by Dr. Bambang Panudju from Bita Bina Semesta Inc as follows:

- The presentation should be done by UNAND (University of Andalas Padang). Unfortunately it did not attend the meeting.
- The study was the continued study that had done before. The study was conducted by NIPPON KOEI in cooperation with BITA BINA SEMESTA, UNIVERSITY OF ANDALAS PADANG. The study was conducted in a very tight schedule.
- The method of the study was holding PRA meeting asking for the villagers to participate. Average attendance was about 50 villagers per meeting. In addition, using questioner, survey for all of the household in Tanjung Balik and Tanjung Pauh was carried out. The questioner was elaborated by SAPS Study Team in English and translated into Indonesian language by BBS.
- There after the presentation made by BBS contained general points of view of PAFs on compensation, rubber plantation, water supply, MCK (the place of Bath Room, Washing Place, and Toilet), electricity, income, and NGO's involved.

3. Discussions

- 1. Vice Head of Regentcy of 50 Kota, West Sumatera
 - The government duty was to fulfill the promise.
 - The government never wanted to make the people suffering.
 - He hoped that the BAPPENAS could give some information about the budget to local government.
 - The local people would be involved in the programs to solve the Koto Panjang Project's problems.
 - The local government has had action program and it is still in need of additional input.

2. BAPPENAS (Mr. Syahrial)

He asked whether the questioners answered or written down by all household or not. Mr. Bambang answered that the questioner was answered or written down by the all household.

He said that in the previous BAPPENAS meeting attended by Vice Head of Regency of 50 Kota if the BAPPENAS had ever asked to make proposals for action plan to each department of the local government. Also at the meeting if West Sumatra's BAPPEDA office asked the local people to give suggestions or

additional input for the action plan in order to finalize it as Integrated Action Plan.

He also said that the commitment of central government to cope with the problems never stopped but there was budget problem.

Central government had asked to form a Task Force, but until now the ministers have not agreed formulation of the Task Force yet.

He hoped additional inputs from SAPS Team for the Action Plan is duly made.

The central government through each government department had ever asked to allocate the budget to solve the Koto Panjang problems.

3. SAPS TEAM (Mr. Minato)

The SAPS Team would ask to invite head of Villages (Wali Nagari) to clarify and finalize Action Plan in June-July period.

- 4. Wali Nagari of Tanjung Pauh (Mr. Dalpen Aperta)
 - He asked or suggested that we had to find out the solution for the present problems.
 - He hoped that NGO, JBIC, Local Government, and Local People would have to cooperate in formulating the Action Plan in June July period.
 - He also hoped that the local NGO of "Taratak" would have to get involved in formulating the Action Plan because they had known the problem since 1990.
- 5. Wali Nagari of Tanjung Balik (Mr.Petumas)

He suggested that the Action Plan had to be examined carefully before it was implemented.

6. NGO Bina Swadaya

The staff of Bina Swadaya informed that there were 12 persons of Bina Swadaya working in Riau Province and they also would visit to West Sumatra. They would be in Tanjung Balit and Tanjung Pauh till 14 April 2002.

Bina Swadaya would make action plan with local people based on the result of their study.

The method used was PRA (discussion with local people) and no questioner is used.

7. SAPS Team (Mr. Minato)

He said that NGOs from Japan are not involved in formulating Action Plan at the moment.

8. Vice Head of Regency

- He said that local government and the University of Andalas in Padang has made the Action Plan.
- The Action Plan would have to be completed by involving the local people.
- He also suggested to select the organizer for implementation of the action plan and do not want to wait until June – July 2002 when SAPS Study Team returns.

9. Wali Nagari of Tanjung Balik

He would accept whoever to be the organizer but the most important thing was the local people had to be involved.

10. NIPPON KOEI (Mr. Gejo / Team Leader)

He explained the schedule of study as follows:

- From March to April, 2002 impact survey is carried out.
- In the middle of April up to at the middle June, the team would finish the interim report.
- At the middle of June up to at the end of July, the team would come back to the project area in order to complete the Action Plan.
- In August, the team would make draft final report and then all parties should agree the Action Plan.
- In September, the team would hold final workshop to discuss how to implement the Action Plan.
- There are three parties in making action plan: government, SAPS Team, and PAFs assisted by NGO.

11. Wali Nagari of Tanjung Pauh

He said that the villagers of Tanjung Pauh seemed to have rejected to allow the NGO Bina Swadaya in doing survey.

12. Wali Nagari of Tanjung Balik

He said that there was no problem Bina Swadaya to survey in his village.

13. Vice Head of Regency

He requested to Wali Nagari Tanjung Pauh to discuss this problem with his villagers and he should inform him (vice head of regency) at least one week after the meeting.

14. JBIC (Mr. Nakagawa)

He asked about progress in forming TASK FORCE of BAPPENAS.

15. BAPPENAS (Mr. Syarial)

Task Force was established by BAPPENAS. With a decree its primary duty was coordination and monitoring including budget allocation. Regency of each province would be the appropriate agency in implementing the action plan as well as the center of information. He hoped that the people who would work for this department master the information on Koto Panjang Project. This Task Force would be lead by the Director of Budget with members from all party involved. The decree of Task Force officially would be signed in March this year.

16. Directorate General of Agriculture (Mr. Agus)

He asked about to clarify the minimum standard of soil in pH.

He had found some plantations road was broken, so if there was integrated program the road had to be serviced.

Based on budget for past four years the government had planted 1,508 ha, but there were 250 ha of area the plantation did not functioned well.

Rearrangement of plantation area's borders should be clearly established among the farmers and they would have to be responsible for each plantation plot.

He also clarified that there was a program to replant intercropping plants in the rubber plantation with extent 270 ha in 2002. But the area of the plantation was full of weeds so that it needed much budget.

17. Directorate General of Fishery

Developing the potentiality of fishery is needed in the reservoir of Kotapanjang Project. For example providing credit for floating cage is considered. Directorate General of Fishery have prepared training for the program. The floating cage is 7m x 7m and 3-5 m in depth. One floating cage could hold 300 kg of seedlings, which would lead to 1.2 tons of harvest. If four cages were provided per family, it would be 4,8 tons of harvest a year. The investment of each cage would be approximately 40-50 millions including feeding and seedlings. The program would encourage NGOs for implementation and monitoring.

18. PLN

There was no free charge for connecting electricity to each resettled families.

It was better to continue the Action Plan elaborated by all parties concerned with the problem.

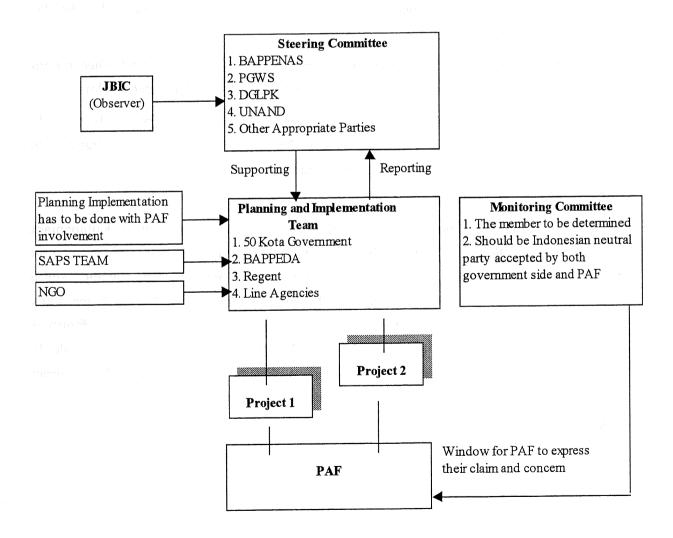
19. Local Government Office of Fishery and Ocean of West Sumatra

There had been program that enhance fishery in the reservoir of Kotapanjang Project.

The Local Government Office of Fishery and Ocean had ever tried hatchery in the reservoir but net was eaten or destroyed by large fish such as Ikan Buntal. The fishery office suggested that the provincial government should play a role of fishery as organizer and BAPPEDA as a main responsible organization for the program. The technical responsibility would be on the related technical institutions of fishery.

4. Conclusion

- 1. All meeting participants had agreed to modify and complete the Regency Government's Action Plan.
- 2. The organization of solving the Koto Panjang Project's problems as explained in the previous meeting was as follows:



- 1. Elaborating a functional Action Plan was the responsibility of local government. The details of the program for implementation of Action Plan had to be reported in the middle of July to Local Government. But, the exactly time would be confirmed by SAPS Study Team.
- 2. In formulating Action Plan, local people will have to get involved.
- 3. In the mean time the Action Plan was elaborate, each government department program should make progress.

LIST OF PARTICIPANTS

DAFTAR ABSEN

Rapat

: Presentasi hasil survey study SAPs Pembangunan Proyek PLTA Koto

Panjang Kab. 50 Kota.

Hari/Tanggal:

No	Nama	Instansi	Tanda Tangan
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Appendix 4.2

Feedback Workshop for Impact Survey JBIC-SAPS Survey Team: PLTA Koto Panjang



Apppendix 4.2 Feedback Workshop for Impact Survey JBIC-SAPS Survey Team: PLTA Koto Panjang

Place:

Provincial Bappeda Meeting Room 3rd Floor, Jl. Gajah Mada 200

Date:

Thursday, 28 March 2002

Time:

09.00 West Indonesia - finished

Moderator:

Ir. Sakti Hutabarat, Magr Econ.

Notulen:

Ms. Nessy

Peserta:

1. Head of Natural Resources Section of Bappeda (Representative)

2. Bappenas

3. Directorate General of Plantation

4. Food crops service

5. Plantation service

Head of Village/Representative of Village

7. Surveyor/ UNRI Team

8. Team JBIC - SAPS

9. NGO

10. PT. Bita Bina Semesta

1. Introduction

The Head of Natural Resource Section explained that the Head of Bappeda could not attend the meeting due to ill health. Hence, chairing of the meeting has been delegated to the Head of Natural Resources.

- 1. The objective of the study is to identify the impacts arising from the Kotopanjang HEPP development.
- 2. In order to preserve the Kotopanjang project's image, it is requested that the actual field conditions be given.

Currently, 3 groups of activities are being implemented:

• JBIC Team in collaboration with PT. Bita Bina Semesta and UNRI.

Bina Swadaya NGO

Government

1. The meeting is expected to provide inputs for the sustainability of the post Kotopanjang HEPP development. Clarification from JBIC (Mr. Minato)

Objective:

- To evaluate the Kotopanjang HEPP, which to date has operated for 8 years.
- For \pm 2 years surveys have been undertaken around Kotopanjang, hence the next step is :
 - Action plan ~ for the future.
 - Resolving the site problems.
- At the sane time PT.Bita Bina Semesta and the University of Riau have conducted impact survey and data tabulation.
- In addition, PRA Meetings and household statistical questionnaires were conducted in order to obtain better results.
 - Questionnaire : carried out by students
 - Hence inputs from the students that performed the survey are also expected.
 - Participation of the Village Heads/ Village Representatives is also expected.

2. Presentation

Presentation by Ir. Sakti Hutabarat, Magr. Econ. ~ of UNRI

- a) Description on the study boundary of the Kotopanjang HEPP project

 Description of the locations of the villages' prior and after resettlement as well as the social economic impacts arising from the resettlement.
- b) Benefits of the Kotopanjang HEPP project
 - High electricity demand
 - The price of fuel that is relatively expensive, hence non-fossil fuel generated electricity is needed.
 - Increase of regional economic activities.
- c) Efforts that could be carried out to ameliorate conditions of the communities

affected by the project:

• It is expected that the level of welfare is higher or at least the same as before the relocation.

± 4152 households in Riau were relocated

Compensation Scheme

 $Land: 4000 m^2$

• Plantation area: 2 Ha

Housing: 7X 7 m (for those with inundated houses)

- d) Conclusion from the PRA meeting conducted at each village are:
 - Disappointing water facilities
 - Non-functioning MCK facilities
 - Some of the rubber plantation areas were not inundated.
- e) Objective of the study

To collect data and facts on the social-economic issues confronting the community.

f. Methodology

- Implementing PRA Meetings at 14 villages and 2 additional villages as comparative study, this being at Karya Bakti and Gunung. Malelo
- Distribution of questionnaires by UNRI students (consisting of 50 enumerators)

. Issues that were investigated

Land Compensation

MCK

Rubber plantation

Electricity

Housing

Transportation

Income

Role of NGO

3. Impression of Each Representative

a) Junior Expert: (Gulat)

State of the community from relocated villages: decline in work mentality.

b) Enumerator from UNRI (Abdul Halim)

Currently many of the community have lost their main livelihoods.

Suggestion: Provide capital + community character building in order to increase welfare.

c) Enumerator from UNRI (Nasukha)

Observation of Batu Bersurat:

Decline in the welfare of the entire community. This is attributed to scarcity of livelihood. Before the project, diversification of land could still be done.

The only current source of the people's income is from catching fish at the lake.

It seems that governmental aid does not correspond to the needs of the community.

The Government provided fish instead of the rods.

Suggestion: The government should provide plant seedlings, land and planting.

Aid that was provided is consumptive in character.

Aid should be directly given to the community on individual basis/HH ~ requires transparency.

It is hoped that the Government gives special attention to education (school) Feedback from the local community.

d) Enumerator of UNRI (Sudisman)

Village that was observed: Tanjung Village

The community moved of their own accord.

It is hoped that the government will fulfill their promises.

e) Enumerator from UNRI (Zamrizal)

Village that was observed: Gunung Bungsu Village

The plasma provided by the Government was of very bad quality.

Problem: The boundary between Gunung Bungsu and the central village should be re-defined.

f) Junior Expert (Ahmad Rivai)

Impression from PRA Meeting

- The community appears to be very disappointed.
- Example: Beforehand many types of livelihoods were available.

 Currently only a few is accessible.
- Road facility (positive impact) from the Kotopanjang HEPP development.
- · Water facility

PIR Villlage ~ community economy is better than Plasma.

g) Conclusion of the moderator against the impressions presented (by Ir. Sakti Hutabarat):

Four (4) elements should be recommended:

- More attention should be given against Natural Resources ~ affects soil fertility.
- Planning ~ for marketing of farm products.
- Market oriented, future programs should give heed to market accessibility
- Organizational structure at the village level should be ameliorated.

4. Remarks - Session I

1. Representative from Bappenas (Bapak Syahrial Luthan)

90 % of the project area of the Kotopanjang HEPP development is located in Riau and 10 % is located in West Sumatra. However, more problems are found in West Sumatra than in Riau. In general, conditions in Riau is relatively better. However, the water condition is currently insufficient ~ a solution must be found.

Statements advanced by various representatives who queried on:

- Furnishing of assistance.

Example: Plantation

- Mechanism for the realization of aid
- Should it be PIR/Plasma pattern.

How did the surveyors perceive remarks made by the community when they were distributing the questionnaires, as emotional people tend to give only negative statements.

2. Head of Team from UNRI (Ir. Sakti Hutabarat)

Perception against the respondents answers: Should not be 100 % trusted.

Because: The community has often been visited by surveyors beforehand, hence the local community's opinion could be biased/structured from the past events.

- 3. Kampar Regent represented by Bappeda Level II of Kampar
 - Has not seen the action plan from the meeting that took place during the last fasting month at Bappenas. The meeting was to prepare integrated coordination between the central and regional agencies to manage the impacts of the Kotopanjang HEPP project.
 - Should a "Desa Binaan" or Cultivated Village be carried out, which in turn could be implemented by the Research team of UNRI?
- 4. Food Crops Agency of Kampar Regency (Bpk Zamrih)
 - What is the parameter used to assess the prosperity level of the community prior to and after implementation of the Kotopanjang HEPP Project.
 - Present condition: Aptness of the community to accept and implement the Kotopanjang HEPP Project (in modules) is still insufficient/lacking. With respect to the Kotopanjang HEPP Program, this is already available.

Suggestion: Small groups should be given capital + instruction.

- 5. Plantation Agency of Kampar
 - Failure of rubber plantation has occurred twice already at the Kotopanjang HEPP area, notably the Batu Bersurat Village success level is \pm 50%.
 - Condition: the plantation area is located far from the settlement area. Hence, what is the solution to this matter?

- Utilization of the Kotopanjang HEPP Area for tourism should be considered, as this could ameliorate community welfare (diversification of livelihood).
- 6. Plantation Agency of Riau (Bpk Faizal)

Person-in-charge of the plantation transition period

Impression: that 3446 households do not want to move from the location area (PIR Pattern). 2 Ha/Household has been planted with rubber (covering 6824 Ha)? \rightarrow 11 Villages.

Yearly budget spent by the Regional Government for :

2000 : 11,2 B

2001: 9,6 B 31 Billion allocated funds for plantation.

2002: 8,9 B

7. The rubber trees are now ± 2 years old.

It is expected that the trees will begin to produce in ± 4 years time.

For marketing: no problems.

8. Head of Village of Muara Mahat Baru, District of Tapung (Abas)

Project teams consist of 2, i.e.

- a. JBIC (Official) from Japan
- b. From Japan in association with an NGO from West Sumatra, this being Taratak
- → Ade, LTH of West Sumatra
- 9. Head of Muara Pongkai Village (Hadi Nalawi)

Promises from the Governor's administration (Saleh Jasit)

Free electricity

Clean water

. MCK

However in reality, none of the above was realized

10. Head of Binamang Village (Ahmad Dahlan)

Notably for Binamang Village, the economic condition of the community is very

precarious. 90 % of the community lives from fishing.

11. Head of Gunung Bungsu Village (Zamhil)

- It is hoped that with current conditions being as it is, the associated agency will participate.
- The error of the HEPP Team, village boundary must be followed up.

12. Head of Pulau Gadang Village (Sofyan)

- The rubber trees were planted by contractors. Hence, only the roadsides were planted with trees. The remaining were dumped in the swamplands.
- Problems with provision of clean water.
- It is hoped that the government will provide capital notably for the development of "patin" fish cultivation.
- The people's housing should be reviewed prior to developing agrotourism in the Kotopang HEPP area. It is hoped that Mr Gejo does not just give recommendations to the government.

13. Head of Koto Mesjid Village (Abdul Kadis)

- To procure information on actual conditions, the village leaders should be approached, as they are the ones that really know the conditions prevailing in the village.
- To the plantation Agency: please provide aid for maintenance.
- Please give attention to providing working opportunities for the youths of the village.

14. Head of Ranah Sungkai Village (Damiri)

- Please follow up the issues notably those related to the economy.
- Please give attention to providing working opportunities for the local youths.

15. Head of Lubuk Agung Village

We are not satisfied with the presence of the students, as what we wish for is the presence of the Officials so that we can address them directly with our complaints.

16. Head of Pongkai Baru Village (Syahruzin)

Problem currently confronting our Village : scarcity of food (scarcity of livelihoods.

- Land compensation that is still not settled: 175 households.
- The rubber plantations are only 2 years old. It is hoped that the living allowance ("jadup") be extended until the trees start to produce.
- Village boundary should be established.
- 17. Head of Tanjung Alai Village (Syarif)

It is hoped that future solutions be given for:

- Please pay the people's land compensation
- Working opportunities
- Living allowance (" jadup") that was promised by the government should be realized.
- 18. Head of Mura Takus Village (Amir D.)

Livelihood: income ranging from Rp 30.000,- to Rp 50.000,-/week is not sufficient to support the families, hence aid is solicited for:

- Cages
- Net
- Fish
- 19. Head of Kota Tuo Village

It is hoped that training facilities be provided for the community affected by the Kotopanjang HEPP project.

- 20. Head of Tanjung Village (Gusandri)
 - 45 Households: obtained compensation but did not receive compensation for houses and other facilities.
 - It is hoped that promises to provide facilities will be realized.
 - Please establish the boundary between Gunung Bungsu and Tanjung Villages.
- 21. Head of Pongkai Istiqomah Village (Darlis M.)
 - Plot 0013 → has not been compensated
 - Please accelerate the aid that is going to be given.

- 22. Head of Batu Bersurat Village (Hamiz)
 - What is the best way to improve the economy of the communities affected by the Kotopanjang HEPP project.
 - Please do not use us anymore as the object of surveys.
- 23. Head (Camat) of XIII Koto Kampar District

With respect to the Socio-economic aspects of Kotopanjang HEPP:

Measures that should be taken:

- Near future
- Provision of living allowance: need 28 ton/month of rice @ Rp 1.000/kg
- · Provision of capital for ventures
- Almost 80% of the project affected families live below the poverty line.
 - PPK (Proyek Pengembangan Kecamatan or District Development Project) through submission of proposals. The community catches fish at the Lake, and is not considered as independent fishermen, hence do not need permits to catch fish.
 - Sustainability of the rubber plantations must be considered.
 - Roadways must be developed along the lake sides to assist sustainability of the people's lives.
 - Many children have dropped out of school. Scholarships are needed.
 - Compensation
 - Livelihoods: previously \pm 60 peopled were trained at PU but are now not used.

5. Remarks - Session Π

- 1. Riau Mandiri NGO (Amsil)
 - Is it possible that we obtain the reports/ narratives of the PRA Meetings?
 - . It is hoped that a Special team could be established that really cares about the impacts arising from the Kotopanjang HEPP project such as the Forum Korban Pembela Dampak Koto Panjang. (Front for the Defense of the Victims Impacted by Kotopanjang).

- When preparing the programs, the village heads should be included in project development.
- Establishment of village boundary should be followed up.

2. Bina Swadaya - NGO (Khadir)

- Problems have arisen because of actions. Hence to overcome this matter the attention (participation) of the relevant agencies is required.
- The community should be involved in the planning.

 Implementation of community activities is hoped to the subject of development and construction of the impacts from Kotopanjang.

3. PLN (State Electricity Company)

- With the realization of the Kotopanjang HEPP Project, PLN feels very fortunate.
- Free electricity is not a policy of the company, hence the mechanism for this must be reviewed in the BUMN. However, when electricity is back to normal, it should be reconsidered. Likewise for agro-tourism in the Kotopanjang HEPP Area.

4. PEMDA (Regional Government)

- The communities affected by the Kotopanjang HEPP project require consensus on policies.
- APBD has allocated funds for improving the economy/ capital for community food farming ventures.

5. BAPPEDA

A special team will be appointed to resolve the issues arising from the Kotoppanjang HEPP project.

6. Riau Mandiri NGO

This meeting must have an output.

7. PEMDA (Regional Government) of Kampar

The Japanese Team should not raise issues that make it appear that PEMDA at Kampar Level II is doing nothing.

8. PLN (State Electricity Company)

It is hoped that gambir trees are not planted in the Kotopanjang Dam/Lake area, as this will cause sedimentation of the lake.

9. JBIC Team from, Japan (Mr. Nakagawa)

After realization of this project, Indonesia was affected by an economic crisis. Hence, the Japanese government could not do much of anything. Mr. Nakagawa extended his gratitude to the Village Heads for providing inputs related to the development of subsequent programs. He is very impressed with the dialogue. It is hoped that the Government and Bina Swadaya NGO can carry out similar things.

The Team will return to Japan next month. However, next July the team will return with action plans for the development of this region. Mr Nakagawa stated that various other teams will also do the same things, thus he asks that the communities be patient as the good cooperation of all is needed.

SAPS Team → will return in July.

4. Closing

1. BAPPENAS

- The Steering Committee will follow up the meeting and will have assistance from the Kotopanjang Clearing House (Information Center). Hence, no misleading information.
- More emphasis will be focused on economic activities.
- Action plan has been prepared but still requires reediting.
- A tested action plan is expected.
- It is expected that the action plan will involve all stakeholders (community).

7. Conclusions

The Kotopanjang HEPP Project affects the lives of the people, notably with respect to socio-economic aspects.

Dominating issues are:

- a. Level of community welfare
- b. Decline of community mentality at the new location, the community appears resigned to their situation.
- c. Governmental pledges have not been fulfilled such as:
 - Free electricity

- MCK
- · Clean water
- Plantation when the parameter are a second and a second
- Transportation (road facilities).
- Concrete action plan is required to restore the trust of the project affected families.
- Improving the economy of the project affected families must be given serious attention, i.e.:
- Potentiality of local natural resources, which is associated to the fertility level of each project affected village.
- Matured planning on marketing of farm products that could be developed at project affected villages.
- Market orientation for the products produced by the villages.
- · Restructuring of village organizations

LIST OF PARTICIPANTS

DAFTAR HADIR WORKSHOP JBIC-SAPS PLTA KOTO PANJANG Tanggal 28 MARET 2002

NO	NAMA	INSTANSI	TANDA TANGAN
1.	T. Gip-	JDIC SAPS Tem	Ton
2.	S. Minato		800
3.	NAKAGAWA	JBIC Jakarta	Rahazam
4.	Muchtan	UBic -SHPS	'Quelitre; -
5.	BAMBANG PANCHOW	BBS/ITAC	AAT
6.	A. Rachman	1288	Jus
7.	T. 20HAR USMAN	PUSPEDAL	
8.	Syntacious AASINTON	LEMIT. UNRY	Stright
9.	Titania Nugrano	LP-UNRI	fecilo
10.	Melilian, Than	Briles	Brief
11.	RARDI. A	KIMRASKE	
12.	M.EVAN ST	BAPEDALIROP-Nian	25.8
13.	Hari Tach	BA-PPEDA Pup.	Mht.
14.	GWP. RICHE W	BalitEaup	Benulles
15.	R.Faire	Bis Bun Rou,	Tar
16.	Agung P	cina swadaya	

	·		
17.	Andi Rohman K	Ama Svalage	mile
18.	BITE MANUNURS	YNR WWENTY	Can
19.	AHMAD RIPAT	NVE	R.A.
20.	S. Si wan zurtah	Distan Pap	
21.	Herlina Sinegar	Distan Prop	Halis.
22.	G. Siboro	BRUT-WIZ	ah,
23.	Irdon	Bid 14 - Beppers Rig	25
24.		OINX Penhanay & Kelautan Prop Peau	July
25.	Tony Ht barat	PLN Seletze P. Ban	Haml.
26.	MUH. KDI VELOPO	SPE 120 /OIT. PM BAPPENAS	stillow !
27.	Fifin Arfrana	UKSDA	Juny 1
28.	ANTONO.5	PLN SEKTOR PKU	· hunter
29.	Vuluman	V.CSDA Rea	
30.	SXPTO NUEROHO	BKEPFDARION	
31.	Syminali	Byyulok.	<u>g</u>
32.	Hasmart	Barry Kisos	7
33.	DWW - E	8XD - N	175
34.	P. Suanto	WWF	(m)

3	35.	Anoul Leavoir	Por masjaga	en Atra
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3	7,	BARANIN	Fon Margan	G TOWN
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39).	MHD. MATIM.	TOKOH M. DISA PLEADANA	material 1
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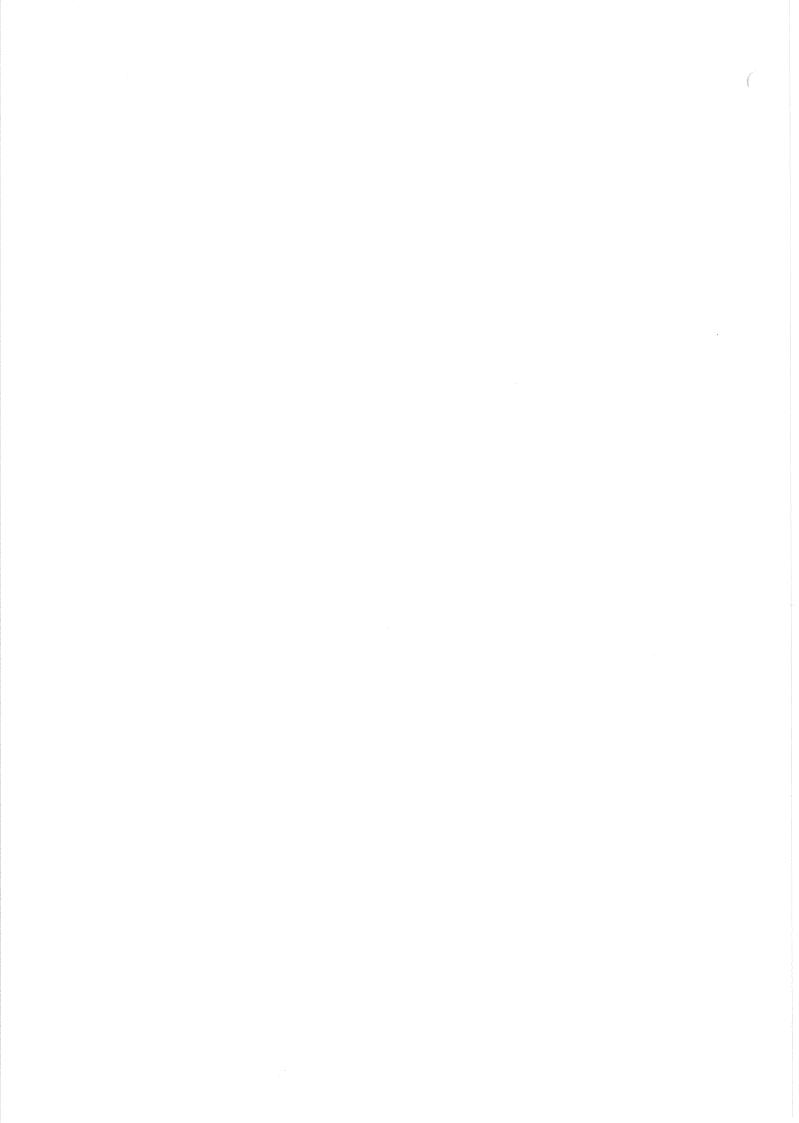
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57.	Spafric	Disken Kanpur	J = 7.
	ABD. JALIL S	Distr Comp	4
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63.	H-20mm (to RES	RERPHOLIAN	
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73.	SUTISNA HERMATI	EN PLN PUSAT	1002
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75.	RAMSES HARINVJA	PLN-PUSAT	Runnye.
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109.		KASE Papung.	
110.	MAKGONO	LKrip.	Miller
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112.	system sin.	Kapes poucty;	
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	AHMAD DAMANHURI.	KAPES BILAMONG	
116.	Rusdiaen	Rapides.	Reale
	NUKHMIDI	KADES & DOURS.	The de
118.	LUR BITNUR	Jamber manaleach	
119.	CAUSS AND DAI	MADES - TANGUNG	- Clubs
120.	Rusl i	serdes	Tark
121.	H. Kan Ing	Camat	
122.	Awn Cup In	KADE · KOTO TUO	Allylr
123.	Stopino Dr. MAJOSAT	KADO PLGORY	
124.	DAMIRI	CADEL AXREE	
		0.7/	7 .

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125.	FADHILAHI REMEDY	MAHASISWA	Tri.
126.	YOSERIZAL	FISIPOL UNPG	· Jul
127.	Limen Hung	Thin worki	292
128.	ABDUL HALIM	Mahossva	' / -
129.	Zefy.	Riau Mandiri	Buji
130.	Tomi	Risu March'	R
131.	Joniwidodo	mahasiswa.	The
132.	JAMIRI 24L	PAPERTA UNIRI	Hin?
133.	MASKA AZWIZ.	MAHASISWA.	M/a.
134.	Henon Parmanan	PAPERTA UNRI	agrico
135.	ZULFAHMI	MAHASISWA	2f
136.	M. TOCIA	MAHASISCUA	mul
137.	ADI CAHYADI	MaHasicka	
138.	JON HENDR,	MAHASIS WA	Man
139.	RUPHIYAN NAPIS	MATERISTA	myars
140.	CALES SAMEDRI	KANGS -Muzuelt	The state of the s
141.	_Swas MAN	Mahasinun	#
142.	Purwono.	MASIS-PIPWX.	Jumus.

			•
143.	ELVITRI NUTKIZA PIZI	Mahasiswa	rejectioned:
144.	YENDRI PURNAMA	MAHASIGWA	Auto.
145.	Mascrkha:	Mahasiswa	ty?
146.	En Hartoni	Mersonewa	Olor
147.	Mui Jen.	Mahanswa	3
148.	A. NUR CHAIRUN. R	Mahanswa	Alland
149.	Dedy SURYANA	MAHASISWA	Jeh.
150.	Lurarito Sapari	Matrasisma	Just 1



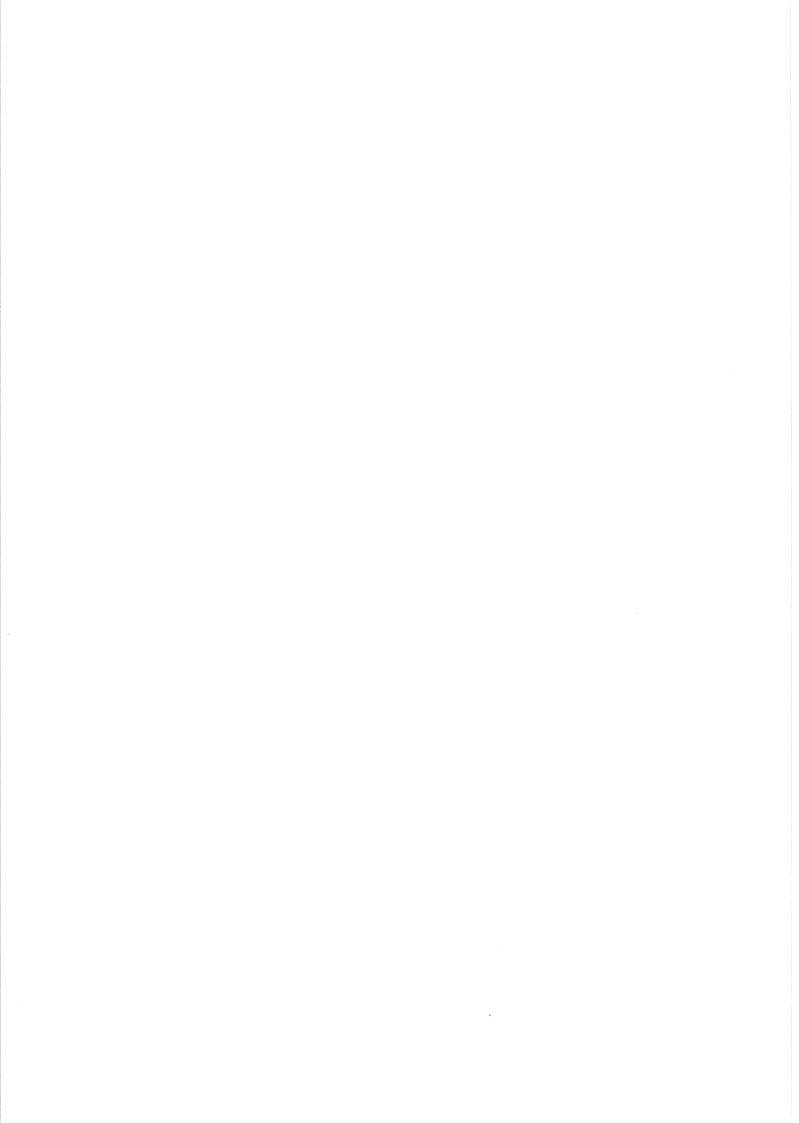
Appendix 5

Record of Feedback Workshop



Appendix 5.1

Data Sheet for Water Supply System



Appendix 5.1 Water Supply System - Data Sheet Template

A	General Name of V District Province	-							
		eyed by NGO							
		ed by study team							
		nic map reference	1:50,000	availal	h1a			no	
		nic map 1:10,000		avana	oie			110	
		(true north)	Elemetica (m)	Lat	00^{0}		Long	101 ⁰	
	Reference	point	Elevation (m)	Lat					
	Water use		3	199		2000			
		f households	gong par house)	12					
		n (estimated 5 per er person (liters/o		60					
		er household	,).	30					
		estic water deman	nd	77	.7				
В	Ministry of Engineerin number of	pply facilities professional fransmigration of report for reservant for reservant frankfilms frankf	s & maps	У	ill in v ves ves	use		no no	
		Irinking and cook	ing	y	es			no	
	4	vashing and bathi		,	yes			no	
		well run dry ?		3	yes			no	
	Water qua	ality for shallow v	vells	wet sea	son		dry se	ason	
		color		wet sea	son		dry se	ason	
		bad smell		wet sea	son		dry se	ason	
		other						F1 18	43.5
		water quality is	good	wet sea	son		dry se	ason	
		average depth of	f water in well	wet sea	son_		dry se	ason_	
	Does each	household have	a storage cistern		yes			no	
	Does each	n house collect rai	inwater		yes	X		no	
	Volume (liters)	Type:						

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C Additional water supply facilities provided under OECF loan SPL-V/VI 1993-94							
	Engineering study report &	drawings		yes		no	
c1	Source:	_					
	surface water	name of stream			4		
	borehole	borehole dep		be confirme	ed)		m ——
	Is water quality data for the		yes		_	no	
	Location	Elevation (m)		Lat 00°	Lor	ig 101°	
c2	Extraction method:						
	pumped intake			infiltration	well next to stre	am	
	gravity intake	earth	dam		concrete w	eir	
	For pumped extraction, wha	t is the pump capacity?		Q _			m3/min
				Head _			m
	Is the pump is operational?		yes			no	
	broken	the pump is mis	ssing	1 11 1	not in	use	
c3	Raw water pipeline (source	to treatment)		no tr	ansmission pipel	ine	
	Location	Size	Ma	terials	Length	m	
]
		* **	· · · · · · · · · · · · · · · · · · ·	1988 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1777 11 E T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 4
			<u> </u>		halow ground	nurfo.co	
	installation:	Above ground sur			below ground s	in use	
	condition:	Lea	ıking		not in		
C4	Treatment facility:	chemical coagula	otion		sedimentation ta		
	Pre-treatment:	slow s			rapid sa		
	Filtration:		lime	뭄		um	
	Chemical used?	in ground concrete rese		片	capacity		m3
	Treated water storage:	or in use but storage by-pa		H	not in	- 7	
	Location	Elevation (m)	Lat		Long		:
	Location	Lievation (iii)					
c5	Distribution system						
	booster pumps:	Qty: 2		Q _			m3/min
	Coostex pumps.			_			m
	Is the pump is operational?		yes			no	
	broken	the pump is mi	-		not	in use	
	diesel generators	Qty 2	_		or rating		kW/kVA
	Ç			engine r	ating		HP
	Is the generator operational	?	yes			no	
	broken		ssing		not	in use	

_								
- e6 <i>L</i>	Distribution piping map:		available				no	
	Location	Size	Mate	erials		Length	m]
	main feeder							-
	branches							-
	laterals							_
	installation:	Above gro	und surface		bel	ow ground sur		
	condition:		Leaking			not in		닐
F	low is the water delivered:			inc	lividual	house connec	ction	
					to pub	lic cistern/hyd	lrant	
			•	61		.1: - 1duomta		
	number of public hydrants	<u> </u>	_ number	of houses	per pu	olic hydrants		
			Elevation (r	n)	Lat	00^{0} N	Long	101°I
	highest point in the village			<u> </u>				
	lowest point in the village							
	point farthest from treatmer	nt facility						
_				TYO.		1	no	П
(Catchment dams provided by	<u>GO1 - PU</u>		yes	· L	J	110	
Ε	Engineering study report			yes			no	
F	Engineering drawings			yes]	no	
1 5	Source							
	River or other surface water	by gravity						
	name of river or stream							
					· · · · · · · · · · · · · · · · · · ·			
	Spring by gravity					concrete wei	-	H
	Structure		earth dam	Ш		concrete wer	1	
	Notes on conditions of chec	k dam and pon	ıd , ,					
5	Source Location	Elevation (m	ı)	Lat 00	U	Long	101°	
								
,	Zar Carina : what is arring w	eld	17	vet season	1	dry se	ason	
l	For Spring: what is spring y	Ciu				-		
			!	spring yie	au not i	neasureu		
	is the spring protected?		yes				no	Щ
	what kind of protect	ion	permanent			temp	orary	Ш
	describe :							

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	For pond behind check dam Surface area of pond	m	2 D	epth of	pond		m
	Estimated storage capaci	ty					m3
	Is there any water catchment	scheme to protect th	e water source	yes			
	Is the source also used for other	her purposes					
	for irrigation			yes		no	
	for watering animal			yes		no	
	Does the source run dry?			yes		no	
	When does the source run	n dry					
	How many days without	rain before the source	e runs dry ?				weeks
	How long does the source	e run dry ?					weeks
12	Raw water pipeline (from so						
) (- 4 - min 1			Longth m	
	Location	Size	Material	.S		Length m	
					.,		
	installation:	Above gro	ound surface		below	ground surface	
	installation: condition: Appear		ound surface Leaking			not in use	
13						_	2
13	condition: Appear	rs good		00°		not in use	_
13	condition: Appear	rs good with storage tank	Leaking	000		not in use	_
13	condition: Appear	rs good with storage tank	Leaking			not in use	_
13	condition: Appear Slow sand filter Location	rs good with storage tank	Leaking Lat Capa			not in use	_
13	condition: Appear Slow sand filter Location Dimensions of storage tank:	with storage tank Elevation (m)	Leaking Lat Capa	acity brick		not in use r of units in use Long 101	_
13	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials:	with storage tank Elevation (m)	Leaking Lat Capa	acity brick		not in use r of units in use Long 101	_
13	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials: Roof materials:	with storage tank Elevation (m)	Leaking Lat Capa	acity brick		not in use r of units in use Long 101	_
13	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials: Roof materials: Operating condition:	rs good	Leaking Lat Capa	acity brick metal		not in use r of units in use Long 101 stone no roof	_
13	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials: Roof materials: Operating condition:	rs good	Leaking Lat Capa	brick metal yes		not in use r of units in use Long 101 stone no roof	_
13	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials: Roof materials: Operating condition:	rs good	Leaking Lat Capa Trugated sheet	acity brick metal		not in use r of units in use Long 101 stone no roof	_

Appendix 5.2 Water Supply System - Data Sheet for Pulau Gadang

A	<u>General</u>				Dulan Cad	lama	
	Name of Village				Pulau Gad Kampar	ang	
	District				Riau		
	Province	20			8 - 14 Apr	il '02	
	Dates surveyed by NO Dates visited by study				22 April 'C		
	Topographic map refe				1816 - 14		
	Topographic map 1:1			available		no	X
			e to TWH	(42)	L		
	Land Form :	(55) asymetric & u					
		(42) Undulating pla					
	Lithology :	(55) sandstone, sha	ile, conglor	nerate, siltstone.			
	7	(42) shale, conglor	nerate, muc	Istone, sandstone, sil	tstone.		
	GPS data (true north)			~		1010	
	Reference point	Elevation	on (m)	Lat 00^{0}		Long 101 ⁰	
	PG S1 ph - stre			20.12		50.23 49.93	
	PG 1	124		20.15		49.61	
	PG 2	112		20.34		49.00	
	PG 3	101		20.78		15.00	
	Water use			1990	2000		
	Number of household	is		592			
	Population (estimated		e)	2960			
	Demand per person (60			
	Demand per househo	ld (liters/day)		300			
	Total domestic water	demand (m3/day)		177.6			
~	Water supply facilit	er manided at tim	o of magatt	oment and still in u	S A		
В	Ministry of transmigr		e of resetti	ement and stm m d	30		
	Engineering report for			yes	П	no	X
	Engineering repert re	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		•			
	Engineering study dra	awings & maps		yes		no	X
							02
	number of shallow w						83
	number of families po	er well					
	Used for drinking and	d cooking		yes	X	no	
	Used for washing and			yes	X	no	
	Does the well run dry			yes	X	no	
	Water quality for sha bad taste	now wens		wet season	П	dry season	П
	bad taste				님	•	一
	color			wet season	닠	dry season	믬
	bad smell			wet season		dry season	Ш
	other						
	water qua	lity potable		wet season	X	dry season	X
	average d	epth of water in well		wet season_	4 m	dry season_	
	Does each household	l have a storage ciste	m	yes		no	X
	Does each house coll	lect rainwater		yes	X	no	
	Volume (liters)	200 liters	Type:	plastic rain barrel w	ith open top		

C Additional water supply facilities provided under OECF loan SPL-V/VI 1993-94

	Engineering study report & di	rawings		yes	لــا	
	One WTP serving Pulau Gad	ang & Koto Mesjid				
c1	Source:					
	surface water X	name of st	ream stre	am	Silam river	
	borehole	borehole d	lepth (to b	e confirm	ed)	m
	Is water quality data for the B	H available?	yes		no	· 🔲
	Location	Elevation (m)	I	at 00^0	Long	100°
	PG S1 STM intake	86		20.12	50	.23
c2	Extraction method:					
	pumped intake X			infiltrati	ion well next to strean	1 X
	`	an	rth dam		concrete wei	
	gravity intake		i iii uaiii			
	For pumped extraction, what	is the pump capacity?		Q		-
				Head		[
	Is the pump is operational?		yes 	님	no	
	broken	the pump is	missing		not in us	=
c3	Raw water pipeline (source	to treatment)		no	o transmission pipeline	e
	Location	Size	Mate	rials	Length	m
					1	
	<u> </u>	1	<u> </u>			
	installation:	Above ground		닐	below ground sur	
	condition:		Leaking		not in	
:4	Treatment facility:				not in us	e X
	Pre-treatment:	chemical coa	gulation		sedimentation tan	k
	Filtration:	slo	w sand		rapid sand	d
	Chemical used ?		lime		alun	n 🗌
	Treated water storage:	in ground concrete r	eservoir		capacity	m3
	filt	er in use but storage by	y-passed		not in us	e 🗌
	Location	Elevation (m)	Lat	00^{0}	Long 10	
	PG S1	86	2	20.12	50.23	
:5	Distribution system					
_	booster pumps:	Qty:		Q		m3/mi
	Cocostor Pantipo.	20.		Head		
	Is the pump is operational?		yes			no X
		the pump is	•	님	not i	
	broken		unssing			1-337/1-3
	diesel generators	Qty		_	tor rating	TTD
				engine	rating	
	T 41		yes			no X
	Is the generator operational?		missing			n use X

istribution piping map:	**************************************	available [no	A
Location	Size	Materia	s	Length	m]
main feeder						_
branches						4
laterals				1		_
installation:	Above gro	ound surface	be	clow ground s	urface	
condition:		Leaking		not	in use	X
ow is the water delivered:			individu	al house conn	ection	
			to pu	iblic cistern/h	ydrant	X
number of public hydrants		_ number of l	ouses per pu	blic hydrants		
		Elevation (m)	Lat	00 ⁰ N	Long	101°E
highest point in the village	PG 1	124	20	.15	49	.93
lowest point in the village	PG 3	101	20	.78	49	0.00
point farthest from treatme	nt facility					
atchment dams provided b	y GOI - PU		yes _		no	X

Appendix 5.1 Water Supply System - Data Sheet for Koto Mesjid

A	General		11 5	•		-	
21	Name of Village				Koto Me	sjid	
	District				Kampar		
	Province				Riau		
	Dates surveyed by N	GO			8 - 14 A	pril '02	
	Dates visited by stud				22 Marc		
	Topographic map re	ference 1:50,000			0816 - 1	4	
	Topographic map 1:	10,000		available		no	X
	Land System :		se to TWH				
	Land Form :	(55) asymetric &					
		(42) Undulating J					
	Lithology :	(55) sandstone, sl					
			omerate, mu	dstone, sandstone,	siltstone.		
	GPS data (true north			Lat 00°		Lang 100 ⁰	
	Reference point		ion (m)			Long 100°	
	KM S1 bridge	85		20.10		51.00	
	KM 1 village	center 93		19.85		30.69	
	Water use			1990	200	<u>0</u>	
	Number of househol	ds		259			
	Population (estimate		ıse)	1295			
	Demand per person			60			
	Demand per househousehousehousehousehousehousehouse			300			
	Total domestic water	r demand (m3/day)		77.7			
D	Water supply facili	tice provided at ti	me of resett	tlement and still ir	nse		
В	Ministry of transmig		me of reser	dement and sem ii	usc		
	Engineering report f		a.	yes		no	X
	Engineering report		-,	3	<u> </u>		
	Engineering study d	rawings & maps		yes		no	X
				•			
	number of shallow v	vells with bucket					65
	number of wells per	family					4
	Used for drinking an	nd cooking		yes	X	no	Ш
	Used for washing ar	nd bathing		yes	X	no	
	Does the well run di	_		yes	X	no	
		•		•			
	Water quality for sh	allow wells		wet season		dry season	П
	bad taste			wet season	님	•	
	color			wet season		dry season	
	bad smel	1		wet season	Ш	dry season	Ш
	other						
	water is j	potable		wet season	X	dry season	X
	average of	lepth of water in w	ell	wet season		dry season_	
	Does each househol	d have a storage cis	stern	yes		no	X
	Does each house col	lect rainwater		yes	X	no	
				,			

C	Additional water supply fa-	cilities provided under OEC	or ivalis	OF L-V/VI	1333-34	
	Engineering study report &	drawings	ye	es	no La constanta	X
	One WTP facility serves Pul	au Gadang & Koto Mesjid.			i de la companya de	
c1	Source:					
	surface water X	name of stream s	tream	Silam 1	iver (one facility w	rith P.G.)
	borehole	borehole depth (t	to be conf	irmed)		m
	Is water quality data for the	BH available? yes	s 🔲		no	
	Location	Elevation (m)		000	Long 101)
•	PG S1	86	20.1	.2	50.23	
C2	Extraction method:		in filter	ation wall	next to stream	X
	pumped intake X	.1 1		ation wen		
	gravity intake	earth dam			concrete weir	2/
	For pumped extraction, what	is the pump capacity?	Q			m3/m
			Hea	d		m
	Is the pump is operational?	ye:			no	X
	broken	the pump is missing	<u></u>		not in use	X
c3	Raw water pipeline (source	to treatment)		no transmi	ssion pipeline	
	Location	Size M	aterials		Length m	
	Docution					
	installation:	Above ground surface	в <u>Ш</u>	belo	w ground surface	Ц
	condition:	Leaking	g 📙		not in use	X
c4	Treatment facility:				not in use	X
	Pre-treatment:	chemical coagulation	1 🗌	sedin	nentation tank	Ш
	Filtration:	slow sand			rapid sand	Ш
	Chemical used?	lime	e 🔲		alum	
	Treated water storage:	in ground concrete reservoi	r 🔲	capa	city	m3
	filte	r in use but storage by-passed	d 🗌		not in use	
	Location	Elevation (m) La			Long 100°	
	PG S1	86	20.12		50.23	
c 5	Distribution system					
	booster pumps:	Qty:	Q		9.5	m3/hr
	GRUNDFOS Model No. B 4		Н		84.9	
	Vertical Multistage Centrfug					
	Is the pump is operational?	ye	s		no	X
	broken	the pump is missing	g 🔲		not in use	X
	diesel generators	Qty	gen	erator ratio	ng	kW/k
	YANMAR Model TS 300 &		eng	ine rating		HP
	Is the generator operational?		s \square		no	X
	broken	missin			not in use	X
	Could not enter the pump ho		· —			

istribution piping map:		available		no X
Location	Size	Materials	Length	n m
main feeder				
branches				
laterals		<u></u>		
installation:	Above gr	round surface	below ground	surface
condition:		Leaking	no	t in use X
w is the water delivered:			individual house con	nection
			to public cistern/l	hydrant X
number of public hydrant	is	number of hou	ses per public hydran	ts
		Elevation (m)	Lat 00° N	Long 10
highest point in the village	ge ;	93	19.85	50.69
lowest point in the villag	e			
point farthest from treatm	nent facility	85	20.10	51.00
atchment dams provided	by GOI - PU	e - 152 m. y	es	no X

Appendix 5.1 Water Supply System - Data Sheet for Ranah Sungkai

A	<u>General</u>						
	Name of Village			Ranah	Sungkai		
	District	•		Kampa	r		
	Province			Riau			
	Dates surveyed by N	1GO		26 - 31			
	Dates visited by stu			27-mar	-02		
	Topographic map re			00816-	14		
	Topographic map 1		available	X		no	
		TWH (42)					
	Land Form	undulating plain on mixed sed	iment.				
	Lithology	shale, conglomerate, mudstone		ne.			
	GPS data (true nort						
	Reference point	Elevation (m)	Lat 00°		Long	100°	
	1						
	RS 5 Block 2	107	23.15		46.6	1	
	RS 6 Village lead	ider's house 121	23.29		46.3	5	
	RS 7 Block 3	129	22.78		46.4	1	
			and the second		1, 1, 2		
	Water use		1990	200	00		
	Number of househo	lds	337				
	Population (estimat	ed 5 persons per house)	1685				
	Demand per person	(liters/day)	60				
	Demand per househ		300				
	Total domestic water	er demand (m³/day)	101.1				
В	Ministry of transmi	-		use X		no	
	Engineering report	for resettlement area,	yes	A		110	
	Engineering study of	drawings & maps	yes	X		no	
	number of shallow number of family po						2
	** 10 1'1'	. 1 1	XIQC.	v		no	
	Used for drinking a	nd cooking	yes	X		110	
	Used for washing a	nd bathing	yes	X		no	Ш
	Does the well run d	ry?	yes	X		no	
	Water quality for sh	allow wells					,
	bad taste		wet season		dry seas	son	
	color	slightly cloudy-white	wet season	X	dry seas	son	
	bad sme	-	wet season		dry seas	son	П
	other	•		<u></u>			
	water is	notabled	wet season	X	dry seas	son	X
		-		7 m	dry seas		<u> </u>
		depth of water in well			ary both	no	X
		d have a storage cistern	yes	$\overline{\mathbf{X}}$			
	Does each house co	•	yes	<u> </u>		no	ш
	Volume (liters)	$=\sim 200 \text{ liter}$ Type: plast	ic rain barrel with	open top			

C	Additional water supply f	facilities provided unde	r OECF	loan SPL	-V/VI 1993	<u>-94</u>	
	Engineering study report &	t drawings		yes		no	X
c1	Source:						
	surface water X	name of st		-	Kinari river		
	borehole	borehole d	-	be confirm	ed)		m
	Is water quality data for the		yes			no	
	Location	Elevation (m)	I	Lat 00°		Long 101°	
c2	Extraction method:						
	pumped intake X			infiltratio	n well next	to stream	
	gravity intake	ear	th dam	X	cond	crete weir	
	For pumped extraction, wh	nat is the pump capacity?	?	Q _			m3/min
				Head			m
	Is the pump is operational?	?	yes			no	X
	broken	the pump is r	nissing		1	not in use	
c3	Raw water pipeline (source	e to treatment)		no t	ransmissio	n pipeline	
	Location	Size	Mat	erials	I	Length m	
	Doubleton						
					1 1	read surface	
	installation:	Above ground			below gi	round surface not in use	
	condition:	L	Leaking		``````````````````````````````````````	not in use	늼
c4	Treatment facility:	1 . 1	.1-4:	ভ	sedimenta		
	Pre-treatment:	chemical coag		X		apid sand	님
	Filtration:	SIO	w sand	X	1	apid sand alum	
	Chemical used ?	·	lime	X	capacity	aum	m3
	Treated water storage:	in ground concrete re				not in use	X
		ter in use but storage by	-passeu Lat	00°		Long 100°	لختا
	Location RS WTP	Elevation (m)		3.32		46.61	
	Distribution system		•				
(5)	en e	Qty: 1		- Q		9.5	m³/hr
	booster pumps: GRUNDFOS Model No. E	~ 7	00	Head			m
	Vertical Multistage Central		.00	11000			
	Is the pump is operational	?	yes			no	X
	broken	the pump is	missing			not in use	X
	diesel generators	Qty 2		generat	tor rating		kW/kVA
	YANMAR Model TS 300	& TS 230		engine	rating		HP
	Is the generator operations	al?	yes			no	X
	YANMAR Model TS 300			 1			T.
	broken		missing	Ш		not in use	X

c 6	Distribution piping map:		available				no	X
	Location	Size	Mar	terials		Length	m	7
	main feeder	Size	1,110	Oritina				1
	branches							7
	laterals							
	installation:	•	und surface	X	belov	v ground sur not in		X
	How is the water delivered:			in	dividual h	ouse connec	ction	
	number of public hydrants		number	of houses	-	c cistern/hyd	lrant 	X
			Elevation (m)	Lat 0	0 ⁰ N	Long	100 ⁰ E
	highest point in the village	e	129 Bloc	k 3	22.78		46	5.41
	lowest point in the village		92		23.74		46	5.50
	point farthest from treatme	ent facility						
D	Catchment dams provided b	y GOI - PU		yes			no	X
	Engineering study report			yes			no	
	Engineering drawings			yes			no	
E	Potential For Alternate Sour	ces						
	River or other surface wat	er by gravity						X
	name of river or stream	Tebat Har	ıtu & Pinanş	g Mancung	g			
	Spring by gravity							
	Structure		earth dam		C	concrete wei	r	
	Notes on conditions of che Waterfall cascading into p Good condition to build a	ool at rock outer concrete dam.						
	Check dam impact on dov	vnstream users.						
	Source Location	Elevation (m))	Lat 00 23.69	U	Long 4	100 ⁰	
	(start of path to proposed montain	stream source)						
	•							
	For Spring : what is spring	yield		wet season		dry sea	ason	
					ia noi me	usurvu		
	is the spring protected?		yes	닏			no	
	what kind of prote	ction	permanent			tempo	orary	
	describe :							

For pond behind check dam Surface area of pond	m2	Depth of	pond		m
Estimated storage capacity				20	m3
Is there any water catchment scheme to	protect the water	source			
		yes		no	X
Is the source also used for other purpos	es				
for irrigation		yes	X	no	
for watering animal		yes		no	X
Does the source run dry?		yes		no	X
When does the source run dry					
How many days without rain before	the source runs di	ry ?			weeks
How long does the source run dry?					weeks

Appendix 5.1 Water Supply System - Data Sheet for Lubuk Agung

A		veyed by N		•••			Lubuk A Kampar Riau 26 - 31 27 Mary	Mar.'02		
	Topograp	hic map 1:1	Ference 1:50,000		ava	ailable	0816 - X		no	
	Land Form	n :	undulating plain							
	Lithology	:	shale, conglome	erate, mudsto	one, sandstone	, siltston	e			
	GPS data	(true north))			0		-		
	Reference	point	Elev	ration (m)	Lat	00°			100°	
	LA1	main road		02		22.70			.46	
	LA2	Dam		.07		22.46			.70	
	LA3	Stream		00		22.48			.96	
	LA4	Storage tank	ζ	132		22.34		46	.91	
					г—	1000	200	20		
	Water us				ļ	1990 220	200	00		
		of household		,		1100				
			d 5 persons per h	ouse)	ļ	60				
	Demand p	per person ((liters/day)			300				
	Demand p	oer househo	old (liter/day)			66				
	Total don	nestic water	demand (m3/day)	<u> </u>	- 00				
В	Ministry of Engineeri Engineeri	of transmig ing report fo ing study dr	or resettlement ar awings & maps		ttlement and	yes yes	X X		no no	
		f shallow w f family per	vells with bucket well							4
	Used for	drinking an	d cooking			yes	X		no	
		washing an				yes	X		no	H
		well run dr				yes	X		no	Ш
	Water qu	ality for sha bad taste	illow wells			season		dry se		
		color			wet	season		city se	ason	ᆜ
		bad smel	1		wet	season		dry se	eason	
		other	-							
			ality is good		wet	season		dry se		
		water qua	ality is good lepth of water in	well		season_		dry se		
	Does eac	water qua						-		X
		water qua average o	lepth of water in			season_	X	-	eason_	X

C	Additional water supply f	acilities provided under	· OECF	loan SPL-	V/VI 1993-94	
	Engineering study report &	drawings		yes		no X
c1	Source: surface water X	name of str	eam]	Kapecong river	
	borehole	borehole de	epth (to b	e confirme	ed)	m
	Is water quality data for the	BH available?	yes		ne	0 🔲
	Location	Elevation (m)	Ι	Lat 00°	Long	100°
- 2	LA 3 Extraction method:	100		22.48	46	.96
c2	r			infiltratio	on well next to stream	
	pumped intake X	egr	th dam		concrete wei	
	gravity intake For pumped extraction, who		ui uaiii	Q	controle wor	m3/mir
	For pumped extraction, who	it is the pump capacity:		Head		m
	Is the pump is operational?		yes		n	
	broken	the pump is r	•	$\overline{\mathbf{X}}$	not in us	
03	Raw water pipeline (source		mssmg		transmission pipelin	
CJ	Nuw water pipetine (source		., <u>.</u>			
	Location	Size	Mate	erials	Length	m
	installation:	Above ground	surface		below ground su	rface
	condition:	L	eaking		not is	L
c4	Treatment facility:				not in us	e X
	Pre-treatment:	chemical coag	ulation		sedimentation tan	k
	Filtration:	slov	w sand		rapid san	d 🔲
	Chemical used?		lime		alur	n 🔲
	Treated water storage:	in ground concrete re	servoir	X	capacity	m3
	, fi l	lter in use but storage by-	passed		not in us	
	Location	Elevation (m)	Lat	00°	Long 10 46.91	000
	LA4	132		2.34	40.91	
c5	Distribution system					
	booster pumps:	Qty: 2		Q _	9.5	m3/hr
	GRUNDFOS Model No. B Vertical Multistage Centrfu		00	Head _	84.9	m
	Is the pump is operational?		yes			no X
	broken	the pump is r	nissing		not i	n use X
	diesel generators	Qty 2		generato	or rating	kW/kV
	YANMAR model TS 300			engine r	ating	HP
	Is the generator operational	?	yes			no X
	broken		nissing		not i	n use X

c 6	Distribution piping map:		available				no	X
	Location	Size	Mat	erials]	Length	m]
	main feeder							
	branches							4
	laterals							J
	installation:	Above grou	und surface		below g	round sur		
	condition:		Leaking			not in	use	X
	How is the water delivered:			in	dividual hou	se connec	tion	
					to public c	istern/hyd	rant	X
	number of public hydrants		number	of houses	per public h	ydrants		
			Elevation (m)	Lat 00°1	N	Long	100°E
	highest point in the village		132 Stora	ige tank	22.34		46.	.91
	lowest point in the village		102 LA1		22.70	· .	46.	.46
	point farthest from treatmen	nt facility	100		22.48		46.	.96
D	Catchment dams provided b	y GOI - PU		yes	X		no	
	Engineering study report			yes			no	X
	Engineering drawings			yes			no	X
d1	Source							
	River or other surface wate	r by gravity						X
	name of river or stream	Bukit Mer	anti river					
	Spring by gravity							
	Structure		earth dam		con	crete weir	<u>.</u>	X
	Notes on conditions of checked dam was built in		nd baanusa si	rfoce run-	off has erode	ed.		
	the foundations. Leak	age occurred.	d because si	mace run-	Oh has croud	, , , , , , , , , , , , , , , , , , ,		
	Distribution pipe from dam		oken.					
	Source Location LA 2	Elevation (m)		Lat 00'		Long 46.	100 ⁰	
	For Spring: what is spring y	rield		wet season	d not measu	dry sea	ason	
	is the spring protected?		yes				no	
	what kind of protec	tion	permanent			tempo	orary	
	describe:							

For pond behind check dam Surface area of pond	m2	2 De	epth of po	nd		m
Estimated storage capaci	ty				14 (1)	m3
Is there any water catchment	scheme to protect the v	water source	yes [no	X
Is the source also used for other	ner purposes					
for irrigation			yes [no	X
for watering animal			yes [no	X
Does the source run dry?			yes		no	X
When does the source run	n dry					
How many days without	rain before the source r	uns dry ?				weeks
How long does the source	e run dry ?					weeks
d2 Raw water pipeline (from s	source to filter)					
Location	Size	Materials		Lei	ngth m]
			N. Y. 178 I.A.	318 41 224	ento de properti de com	-
				400		
. 11 4	A bayla gra	ound surface		helow gro	und surface	
installation:	F	Leaking	H	oolow Bro	not in use	$\overline{\mathbf{x}}$
condition: Appea	ars good with storage tank	X	I	number of	units in use	1
	•	11				
Location LA 5	Elevation (m)	Lat	00 ⁰).96		Long 100° 47.73	
Location	Elevation (m)	Lat).96		_	
Location LA 5 Dimensions of storage tank:	Elevation (m)	Lat 20 Capa).96	X	_	
Location LA 5	Elevation (m) 122	Lat 20	oity	X	47.73	
Location LA 5 Dimensions of storage tank: Wall materials:	Elevation (m) 122 ferro cement	Lat 20	oity	X	47.73	
Location LA 5 Dimensions of storage tank: Wall materials: Roof materials: Operating condition:	Elevation (m) 122 ferro cement	Lat 20	oity	X	47.73	
Location LA 5 Dimensions of storage tank: Wall materials: Roof materials: Operating condition:	Elevation (m) 122 ferro cement galvanized cor	Lat 20	oity	X	47.73	
Location LA 5 Dimensions of storage tank: Wall materials: Roof materials: Operating condition: not in used	Elevation (m) 122 ferro cement galvanized cor	Lat 20	city brick [metal [X	stone no roof	

Appendix 5.1 Water Supply System - Data Sheet for Batu Bersurat

		Appendix 5.1	viator suppry	5,500111					
\mathbf{A}	<u>General</u>								
	Name of Village					Batu Ber	surat		
	District					Kampar			
	Province					Riau			
	Dates surveyed by N	GO				26 - 31 N	March '02		
	Dates visited by stud					28 Mach	'02		
	Topographic map ref)			1816 - 13	3		
	Topographic map 1:1		,	. avai	ilable	X		no	
		BGA (63)				لتنا			L
	•		hill with steep s	lone on metan	nombic	rock			
	Land Form				norpine	TOOK			
	Lithology :	quartzite, sen	ist, phyllite, sha	ile, sandstone.					
	GPS data (true north)			Ŧ.	000		T	1000	
	Reference point	El	evation (m)	Lat	000		Long	100	
	BB 1 entrance to	ST	175	18	3.72		44.		
	BB 2 Existing stor	rage tank	169	18	3.74		44.		
	BB 5 new check of	lam	125	19	9.09		45.	39	
	Water use				1990	2000	0		
	Number of household	ds			522				
	Population (estimate	d 5 persons per	house)		2610				
	Demand per person (60				
	Demand per househo				300				
	Total domestic water		ay)	1	56.6				
D	Water supply facili	tica nuovidad a	t time of reset	tlament and s	till in n	S A			
В	Ministry of transmig	retion	it time of reser	tiement and s	till Hi G	30			
			T-00		yes			no	\mathbf{X}
	Engineering report for	of resemblinein a	iica,		yes			110	لتت
	Engineering study dr	rawings & map	S		yes			no	X
	number of shallow w	alle with bucke	st.						261
			,,						2
	number of families p	er wens							
	Used for drinking an	d cooking			yes	X		no	
	Used for washing an	d bathing			yes	X		no	
	Does the well run dr	y ?			yes	X		no	
	Water quality for sha	allow wells							
	bad taste			wet s	eason		dry se	ason	
	color	slight	ly cloudy	_ wet s	eason	X	dry se	ason	
	bad smel	1		wet s	eason		dry se	ason	
	other								
	water is p	ootable		wet s	eason	X	dry se	ason	X
	_	lepth of water in	n well	wet s	eason		dry se	ason	
	Does each household	-			yes		-	no	X
					•				一
	Does each house col				yes	A		no	Ш
	Volume (liters)	200 liters	Type:	plastic rain b	oarrel w	1th open to)		

C	Additional water supply faci	lities provided under	OECF	loan SPL	<u>-V/VI 19</u>	<u>93-94</u>		
	Engineering study report & dr	awings		yes			no	X
c1	Source: Same system surface water	upplies Binamang name of str	eam		Reservo	ir of PLTA		
	borehole	borehole de	epth (to	be confirm	ned)	W. W		m
	Is water quality data for the Bl	H available?	yes			no)	
	Location	Elevation (m)	-	Lat 00	o ^O	Long	101°	
	BB 3 intake well	106		18.29		44.0		
c2	Extraction method:							
	pumped intake X					intake well	l	
	gravity intake	ear	th dam			concrete weir		
	For pumped extraction, what i	s the pump capacity?		Q				m3/mir
				Head				m
	Is the pump is operational?		yes	П		nc)	X
	broken	the pump is n	•			not in use	;	一
-2	Raw water pipeline (source to				o transmi	ssion pipeline	,	·П
cs	Raw water pipetine (source it	, ir eutment,			.0 4.02202	e igrae		_
	Location	Size	Ma	terials		Length	m	
		4"		GIP				-
				[Tel	11.	d asse	faaa	X
	installation:	Above ground			beio	ow ground sur		
	condition:	sections of the pip	pe have emoved			not in	use	X
c4	Treatment facility:	occii ic		•		not provided	i	X
31.7	Pre-treatment:	chemical coag	gulation		sedir	nentation tank	C	
	Filtration:	slov	w sand			rapid sand	i	
	Chemical used?		lime	,		alum	ı	
		oove ground concrete re	eservoir	X	capac	eity 100		m3
	.	r in use but storage by			-	not in use	•	X
		Elevation (m)	La	0		Long 10	ου	
	BB 2	169		18.74		44.19		
2	D: 41.42	by gravity - no pumpir	no					
c5	Distribution system :		-					
	The water from the storage that						no	$\overline{\mathbf{X}}$
с6	Distribution piping map:	a	vailable	; Ш			no	<u> </u>
	Location	Size	M	aterials		Length	m	
	main feeder							_
	branches laterals							-
	laterars							
	installation:	Above ground	surface	•	bel	ow ground su	rface	Ц
	condition:	I	Leaking	g		not ir	ı use	X
	How is the water delivered:			:	individua	l house conne	ction	
					to pub	olic cistern/hyd	drant	X
	number of public hydrants	s 18	numbe	er of house		lic hydrants	_:	30
	in the state of th		evation			$00^{\circ}N$	Long	g 100°E

	highest point in the village	175	5		18.72	and the same of th	44	.25
	lowest point in the village	106	5		18.29		44	.06
	point farthest from treatment fa	cility						
D	Catchment dams provided by G	<u> OI - PU</u>		yes	X		no	
	Engineering study report			yes			no	X
	Engineering drawings			yes			no	X
d1	Source							
	River or other surface water							X
	name of river or stream	Ngalau river						
	Spring by gravity							Ц
	Structure	ea	irth dam		con	crete weir	,	X
	Notes on conditions of check d Checked dam was built in 200 Some children used pond for boor other material. The water must be pumped up	1 still in good cor athing/swimming	g and the w	ater may b	occure. e poluted b	y soap		
	G T ('	Florestian (m)	т	at 00°		Long	100°	
	Source Location BB 5 check dam	Elevation (m) 125	L	19.09		45.		
	BB 6 Pump	131						
	For Spring: what is spring yield is the spring protected? what kind of protection			et season_ pring yield	not measur	dry sea ed tempo	no	
	describe:							
	For pond behind check dam Surface area of pond	50m	2	Depth of	pond	1.0		m m3
	Estimated storage capacity					20	<u>, </u>	1113
	Is there any water catchment scher	ne to protect the	water sour	ce yes			no	X
	Is the source also used for other pu	rposes						
	for irrigation			yes			no	X
	for watering animal			yes			no	X
	Does the source run dry?			yes			no	X
	When does the source run dry							
	How many days without rain b	pefore the source	runs dry ?					weeks

d2 Raw water pipeline (from source to filter)

Location	Size	Materials		Length m	
	1"	PVC			
					_
installation:		ound surface X	below	ground surface	
	rs good with filter	Leaking X	 numbe	er of units in use	
Raw Water Storage Tank	With fitter	A	numbe	of diffes in disc	•
Location	Elevation (m)	Lat 00) ⁰	Long 100	י
BB 7	129	19.11		45.35	
		·.			
Dimensions of storage tank:	2.5 x 2.5 x 2.0	_ Capacity	12.5 n	n3	
Wall materials:	ferro cement]	k X	stone	
Roof materials:	galvanized cor	rugated sheet meta	1 10	no roof	X
Operating condition: Water tank still in use, sr	nall leakage occured. I	t didn't work since	two weeks	ago	
because electricity connec	etion has broken.				
Is the water flowing into rese	rvoir clean ?	yes	; <u> </u>	no	X
Is the reservoir structure in ge	ood condition	yes	\mathbf{X}	no	
Reservoir is connected to pip	ed distribution system	yes	; <u> </u>	no	X

Appendix 5.1 Water Supply System - Data Sheet for Binamang

General			D:	_	
Name of Village		•	Binamang Kampar	3	
District			Riau		
Province			1 - 7 Apr	1 '02	
Dates surveyed by NGO			28 April		
Dates visited by study team	.50.000		0816 - 13		
Topographic map reference 1 Topographic map 1:10,000	.50,000	available		no	Г
Land System : BGA ((63) close to MPT (5		ш		_
Land Form : (63) lo	ng point of hill with stee		rphic rock		
(55) as	symetric & unoriented po	oint of sediment			
	uartzite, schist, phyllite,				
	indstone, shale, conglom				
GPS data (true north)					
Reference point	Elevation (m)	Lat 00°		Long 100°	
BM 1 old checkdam	140	19.05	w	43.80	
BM 2 MCK	132	19.19		43.67	
BM 4 new check dam	151	19.12		43.62	
BM 5 high point	181	18.93		43.83	
		1000	7000		
Water use		1990	2000	' ——	
		178			
Number of households		000	1		
Number of households Population (estimated 5 perso		890			
Number of households Population (estimated 5 perso Demand per person (liters/day	y)	60			
Number of households Population (estimated 5 perso	y) day) (m ³ /day)	60 300 53.4	<u>e</u>		
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/day Total domestic water demand	y) day) (m ³ /day) ided at time of resettle	60 300 53.4	<u>e</u>	no	<u> </u>
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/ Total domestic water demand Water supply facilities prov Ministry of transmigration	y) day) (m³/day) ided at time of resettler ement area,	60 300 53.4 ment and still in us	<u>e</u>	no	
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/o Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with	y) day) day) (m³/day) ided at time of resettler ement area, t maps	60 300 53.4 ment and still in us	<u>e</u>		\(\frac{\frac{1}{2}}{2} \)
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/ Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings &	y) day) day) (m³/day) ided at time of resettler ement area, t maps	60 300 53.4 ment and still in us	<u>e</u>		8
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/o Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with	y) day) (m³/day) ided at time of resettler ement area, t maps bucket	60 300 53.4 ment and still in us	<u>e</u>		8
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/ Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family Used for drinking and cooking	y) day) day) (m³/day) ided at time of resettler ement area, t maps bucket	60 300 53.4 ment and still in us yes yes	<u>e</u>	no	2
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/day Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family	y) day) day) (m³/day) ided at time of resettler ement area, t maps bucket	60 300 53.4 ment and still in us yes yes	E X X X X	no	[2
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/day Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family Used for drinking and cooking Used for washing and bathing	y) day) day) ided at time of resettler ement area, to maps bucket	60 300 53.4 ment and still in us yes yes yes yes	X X	no	2
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/day Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family Used for drinking and cooking Used for washing and bathing Does the well run dry? Water quality for shallow well	y) day) day) ided at time of resettler ement area, to maps bucket	60 300 53.4 ment and still in us yes yes yes yes yes	X X	no no no	8
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/d Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family Used for drinking and cooking Used for washing and bathing Does the well run dry? Water quality for shallow well bad taste	y) day) (m³/day) ided at time of resettles ement area, t maps bucket	60 300 53.4 ment and still in us yes yes yes yes yes yes wet season	X X	no no no no dry season	8
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/day Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family Used for drinking and cooking Used for washing and bathing Does the well run dry? Water quality for shallow well bad taste color	y) day) (m³/day) ided at time of resettles ement area, t maps bucket	60 300 53.4 ment and still in us yes yes yes yes yes wet season wet season	X X	no no no dry season dry season	2
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/d Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family Used for drinking and cooking Used for washing and bathing Does the well run dry? Water quality for shallow well bad taste color bad smell	y) day) (m³/day) ided at time of resettler ement area, to maps bucket g d d d d d d d d d d d d d d d d d d	60 300 53.4 ment and still in us yes yes yes yes yes wet season wet season	X X	no no no dry season dry season dry season	8
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/day Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family Used for drinking and cooking Used for washing and bathing Does the well run dry? Water quality for shallow well bad taste color bad smell other	y) day) (m³/day) ided at time of resettles ement area, to maps bucket g ills slighly cloudy	de d	X	no no no dry season dry season dry season	8
Number of households Population (estimated 5 perso Demand per person (liters/day Demand per household (liter/d Total domestic water demand Water supply facilities prov Ministry of transmigration Engineering report for resettle Engineering study drawings & number of shallow wells with number of wells per family Used for drinking and cooking Used for washing and bathing Does the well run dry? Water quality for shallow well bad taste color bad smell other water quality pota	y) day) (m³/day) ided at time of resettler ement area, to maps bucket g d d d d d d d d d d d d d d d d d d	de d	X	no no no dry season dry season dry season	[3

C	Additional water supply facilities provided under OECF loan St L-V/VI 1995-94								
	Engineering study report & drawings yes no								
c1	Source: Same system supplies Batu Bersurat								
	surface water X								
	borehole	borehole de	epth (to b	e confirme	d) _		m		
	Is water quality data for the B	H available?	yes			no			
	Location	Elevation (m)	I	Lat 00°		Long 101 ⁰ 44.06			
	BB 3 intake well	106		18.29		44.00			
c2	Extraction method:								
	pumped intake X					intake well			
	gravity intake	ear	th dam			concrete weir			
	For pumped extraction, what i	s the pump capacity?		Q _			m3/min		
				Head _			m		
	Is the pump is operational?		yes			no	X		
	broken	the pump is r	nissing	X		not in use			
с3	Raw water pipeline (source to	o treatment)		no	transm	ission pipeline			
	[*	Size	Mate	erials	1	Length m	٦		
	Location	4"		GIP		Longu m	1		
							4		
	installation:	Above ground	surface	X	belo	ow ground surface	X		
	condition:	sections of pip	e have	X		not in use	X		
		been re	moved						
c4	Treatment facility:	not pr	ovided	X		not in use			
	Pre-treatment:	chemical coag	ulation		sedi				
	Filtration:	_	v sand	一					
	Chemical used ?		lime	百	rapid sand				
		ove ground concrete re	servoir	X	capac	eity 100	m3		
	_	er in use but storage by-		Ħ	•	not in use	X		
	Location	Elevation (m)	-	00°		Long 100°			
	BB 2	169		8.74		44.19			
	Distribution sustan	by gravity - no pumpin	ø						
C2	Distribution system :								
	The water from the storage ta	nk also serves balu be	Isurai						
с6	Distribution piping map:	av	vailable			no	X		
	Location	Size	Mat	erials		Length m	7		
	main feeder	SIZE C	2.2]		
	branches						_		
	laterals	L							
	installation:	Above ground	surface		bel	ow ground surface			
	condition:	I	eaking			not in use	X		
	How is the water delivered:			in	dividua	l house connection			
	to public cistern/hydrant								
		_	_	C1			0		
	number of public hydrants	6	number	of houses p	er publ	ic hydrants 3	0		

			Elevation (m)		Lat 0	00°N L	ong 100°E			
	highest point in the village	BM 5	181		18.93		43.83			
	lowest point in the village	MCK	132		19.19		43.67	_		
	•	•	132					-		
	point farthest from treatme	in facility						_		
D	Catchment dams			yes	X	n	ю [
	Engineering study report			yes		. п	o X			
	Engineering drawings			yes		n	o X			
d1	Source in use						X			
	River or other surface water by gravity									
	name of river or stream Makam river and another stream									
	Spring by gravity						Ш			
	Structure		earth dam		,	concrete weir	X			
	Notes on conditions of che	ck dam and pond				i de grande de la composición de la co				
	1) Check dam was built in 20 completed yet. Height of d	01 by PU still in go	od condition,bu	t pipe	installatio	n has not				
	The water may be contami	nated by up stream	users, (washin	g, toilet	s & garba	age)				
	2) Small check dam built by I	PPK - still in used								
	3) Small check dam with MC	K								
	Source Location	Elevation (m)	Lat	000)	Long 1	00 ⁰			
	BM 4 new check dam	151	- Agai	19.12	\$1.00	43.62	: ·			
	BM1 old check dam by PPK	140		19.05		43.80				
	BM2 MCK with small check	dam 132		19.19		43.07				
location : at higher elevation. Is there any water catchment scheme to protect the water sources yes no X										
	Is the source also used for oth	er purposes								
	for irrigation			yes		r	io X			
	for watering animal			yes	П	r	io X			
	Does the source run dry?			yes	П	r	o X			
	When does the source run	drv		•						
							4			
	How many days without ra	ain before the source	ce runs dry?				week	3		
	How long does the source	run dry ?			_		week	S		
d2	Raw water pipeline (from soi	irce to filter)								
	[-	G:	Materi	ala .	T	Length n				
	Location PU dam	Size 4" dia	PV			Length h	<u>'</u>			
	MCK dam	4"	PV							
	PPK dam	4"	PV	С						
				r	٦.,	1 6	1			
installation: Above ground surface below ground surface										
	has not completed yet									
	condition: Appear	rs good X	Leaking]	not in u	se			
d3	d3 Raw Water Storage Tank									
Storage & filter units have not been provided. Water was transmitted to a public MCK where there is no storage.										

Appendix 5.1 Water Supply System - Data Sheet for Pongkai Baru

		repponding out the		- 0		_	,		
A	<u>General</u>					ъ .	· D		
	Name of Village					Pongka			
	District					Kampa	ır		
	Province					Riau			
	Dates surveyed by 1	NGO				19 - 25	Mar-02		
	Dates visited by stu	dy team				21-mai	r-02		
	Topographic map r	-				0816 -	13		
	Topographic map 1				available	X		no	
		: SAR (41)							
		: undulating tuffac	ceous sedim	entary pl	ains				-
		: mudstone, siltsto				ed tefra			
			nic, sandsto	iie, tuiiit	o, mie gran	ou torru.			
	GPS data (true nort		tion (m)	,	Lat 00°		Long	1000	
	Reference point		tion (m)	1			36.1		
	PB 0		135		21.71		30.1		
	Water use				1990	20	00		
	Number of househo	olds		. [200				
	Population (estimat		ouse)		1000				
	Demand per person				60				
	Demand per housel			114 11	300				
	Total domestic wat)		60				
	Total dolliesue war	or domand (m5/day	,	L					
В	Water supply faci	lities provided at t	ime of reset	Hement	and still in	use			
D	Ministry of transmi		ime of reser	Hement	and Still In	use			
	-	-	20		yes			no	X
	Engineering report	101 resettiement are	za,		yes	닐		110	
	Engineering study	drawings & maps			yes	X		no	
	number of shallow	wells with bucket							100
	number of housing	units per well							2
						-			
	Used for drinking a	ınd cooking			yes	X		no	
					yes	X		no	
	Used for washing a	na bauung			yes			110	
	Does the well run d	lry?			yes	X		no	
	Water quality for sl	hallow wells							
	bad taste			τ.	vet season		dry sea	son	
	bad taste	5		,	vet season		· ·		
	color			_ v	vet season		dry sea	son	
	had sma	11			vet season		dry sea	son	
	bad sme	11		,	vet season		ury sea	DOIL	ш
	other								
	water is	potable		V	vet season	X	dry sea	son	X
		depth of water in w	,a11		vet season		dry sea	son	
	_			`			ary sou		V
	Does each househo		stern		yes			no	X
	Does each house co	ollect rainwater			yes	X		no	
	Volume (liters)	200 liters	Type:	plastic	rain barrel v	with open	top		

C	Additional water supply f	acilities provided	under OEC	t loan SF1	J- V / V I 1333-34		
	Engineering study report &	z drawings		yes		no	X
c1	Source:		of stream str	room.	Kinawai river		
	surface water X	name	or stream su	yes	X	no	
	Does the source run dry?	7 1.	ala damth	yes	<u>A</u>	110	m
	borehole		ole depth			no	
	Is water quality data for the		yes	Lat 00 ⁰) I o	ng 101°	
	Location PB 1	Elevation (m		Lat 00°		35.99	<u> </u>
	Extraction method:		1.				_
CZ				infiltratio	on well next to str	eam	X
	1 1		earth dam		concrete		Ħ
	gravity intake			Q	COMOTOLO	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	m3/min
	For pumped extraction, wh	iat is the pump capa	Head	m			
	*		YIAC			no	X
	Is the pump is operational		yes p is missing	X	not in		
. 2	broken	-	p is missing	<u> </u>	transmission pipe		
cs	Raw water pipeline (source	e to treatment)					
	Location	Size	Ma	terials	Lengt	h m	4
					eg(qi sa laga ega K)	221 1 144	
	installation:	Above gro	ound surface		below ground	surface	X
	condition:		Leaking		n	ot in use	X
c4	Treatment facility:				not ir	use	X
	Pre-treatment:	chemical	coagulation		sedimentation	tank	
	Filtration:		slow sand	X	rapid	sand	
	Chemical used ?		lime		di Try wassanii - 1	lum	
	Treated water storage:	in ground concr	ete reservoir	X	capacity		m3
	by-passed	(directly to distribu	ition system)		not in	ı use	X
	Location PB 2	Elevation (m) 142	Lat 21.8	00 ⁰	Long 10		
c 5	Distribution system						
	booster pumps:	Qty:	2 units	Q	9.5		m3/hr
	GRUNDFOS Model No. F Vertical Multistage Centri				33.0	m	
	Is the pump is operational	?	yes		•	no	X
	broken	the pun	np is missing		n	ot in use	X

	diesel generators	Qty	2 units	genera	tor ratin	g		kW/kVA
	YANMAR Model TS 300			engine	rating			HP
	Is the generator operational?		yes				no	X
	broken X		missing			not i	in use	
c 6	Distribution piping map:		available				no	X
	Location	Size	Mate	erials		Length	m	
	main feeder							_
	branches laterals							-
	laterars							وسمسم
	installation:	Above gro	und surface		belo	w ground si	ırface	X
	condition:		Leaking			not i	in use	
	How is the water delivered:			inc	dividual	house conne	ection	
					to publ	ic cistern/hy	drant	X
		_			_			20
	number of public hydrants	7	_ number	of houses	per pub	lic hydrants		30
			Elevation (n	n)	Lat	00 ⁰ N	Long	100°E
	highest point in the village	;	135		21.	71		36.15
	lowest point in the village		134		21.	78		35.99
	point farthest from treatme	ent facility						
D	Catchment Dams provided b	y GOI - PU		yes			no	X
	Notes: could not find PU c	heck dam						
E	Potential Alternate Source							
	River or other surface water	er by gravity						
	name of river or stream	to be	verified					
	Spring by gravity (± 4	km distance from	om village, to	be verifie	ed)			X
	Structure		earth dam	П		concrete we	eir	
	Notes on conditions of che	ck dam and pon	d:					
	The SAPS team, the NGO			cate the	catchmer	nt dam.		
	Source Location	Elevation (m) I	Lat 00	υ	Lon	g 100 ⁰	
	For spring: what is spring yield no		W	et season		dry s	season _	
	spring yield no	i measuieu		<u> </u>			20	
	is the spring protected?		yes	Ц			no	
	what kind of protect	ction	permanent			tem _j	porary	
	describe :							

Appendix 5.1 Water Supply System - Data Sheet for Mayang Pongkai

	P	P + 22 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4					
A	General				Mariana D	lan alsai	
	Name of Village				Mayang P Kampar	ongkai	
	District				Rampai Riau		
	Province	-00			8 - 14 Ap	ri1 '02	
	Dates surveyed by N				3 April '0		
	Dates visited by stud				0816 - 22	۷.	
	Topographic map re-			available	0810 - 22	no	X
	Topographic map 1:			available		110	[25]
	Land System :	MBI (33)		ous sedimentary plair	ne (V83)		
		undulating to foll	tuffite m	udstone, siltstone, sar	dstone allu	vium.	(
	Lithology :	recent riverine, o	, turrie, mi	d gravels	iditorio, dire		
	CDC data (tomas month		iu saiius aii	d glaveis.			
	GPS data (true north		ion (m)	Lat 00°		Long 101	υ
	Reference point		54	12.46		19.12	
	MP 1		74				
	Water use			1990	2000		
	Number of househol	ds		259			
	Population (estimate		ise)	1295		- 1	
	Demand per person			60			
	Demand per househo			300			
	Total domestic water			77.7			
B	Water supply facili		me of rese	ttlement and still in	<u>use</u>		
	Ministry of transmig	-				70	X
	Engineering report f	for resettlement are	a,	yes		no	
		• 6		TIAC		no	X
	Engineering study d	rawings & maps		yes		110	لتنا
	number of shallow v	rolla with bucket					130
							2
	number of housing u	nnt per wens					
	Used for drinking an	nd cooking		yes	X	no	
				•		no	一
	Used for washing ar	nd bathing		yes	X	по	
	Does the well run di	ry?		yes	X	no	
	Water quality for sh			wet season		dry season	
	bad taste				믐	-	一
	color			_ wet season		dry season	
	bad smel	1		wet season		dry season	
	other				[V]	J	v
	water is j	potable		wet season	X	dry season	
	average o	depth of water in w	ell	wet season_	7 m	dry season	<u>1 m</u>
	Does each househol	d have a storage ci	stern	yes		no	X
	Does each house col	llect rainwater		yes	X	no	
	Volume (liters)	200 liters	Type:	plastic barrel with	open top		_

	Notes: Villagers have increased the depth of existing wells to 9 m in some location to reach the water table during dry season.											
	Houses are widely separated: shared wells are not convinient. Villagers would											
	prefer individual wells for each house.											
C	Catchme	ent dams provided by	GOI - PU				yes				no	X
	Engineer	ing study report					yes		1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		no	
	Engineer	ing drawings					yes				no	
D	Source u	sed by the villagers										
	River	or other surface water	r									X
	name											
	Sprin	g by gravity					·					
	Struc	ture			earth	dam			con	crete we	ir	
	Notes on conditions of river: The water is coloured, should not be used for drinking water. It is used mainly during dry season.											
	Source Location Elevation (m))	Lat 00° Long 10						υ	
	MP 2		45			11.81					18.62	
	Capacity of stream :					wet season dry season stream flow not measured						
E	Cost Dat	a provided by the Vill	lagers.									
e1		ost for 1 meter depth o			Rp.	200,	000.00 (g: er: s:	erial 1.0 m 0.1 m 1.0 m
e2	Electric l	Pump		:	Rp.	300,	000.00 -	600	0,000.00	(varies)		
		ple, UCHIDA pump		:	Rp.	450,	00.00					
e 3	Water Ta	ank nk, capacity : 1000 lit	ers)	:	Rp.	500,	00.000					

Appendix 5.1 Water Supply System - Data Sheet for Tanjung Alai

A		Village veyed by NO ited by study						Kamp Riau 26 - 3	ng Alai ar 1 March ırch '02	'02	
	Topograp	hic map ref hic map 1:1	erence 1:5				available	0816 -	• 14	no	X
	Land For				on mixed						
	Lithology	:	shale, con	nglomer	rate, mudst	one, sands	stone, siltsto	one.			
	GPS data	(true north))				Λ.		_	()	
	Reference	point		Eleva	tion (m)	I	Lat 00°			ıg 100 ⁰	
	TA 1	village centre		15	8		19.28			48.03	
	TA2	bridge		13:	3		19.4			48.03	
	TA 4	abandoned ho	ouses	17	3		19.65			47.98	
	TA 10	abandoned in	ntake	11-	4		19.62			48.45	
									1 7 7		
						511575	1000	7 3	000		
	Water use					-	1990		000		
		of household			`	ļ.	313 1565		1.41		
	•	n (estimated	-		use)	-	60				
		per person (-	300				
		per househo				-	93.9				
	Total don	nestic water	aemana (m /day)	1	L	93.9				
B	Ministry	pply facilit of transmig ing report fo	ration			<u>ettlement</u>	and still in yes	use		no	X
	Engineeri	ing study dr	awings &	maps			yes			no	X
		f shallow w f families p		oucket							$\frac{157}{2}$
	Used for	drinking an	d cooking				yes	X		no	
	Used for	washing and	d bathing				yes	X		no	
	Does the	well run dry	<i>y</i> ?				yes	X		no	
	Water qu	ality for sha bad taste	llow wells	3		v	vet season		dry	season	
		color		brow	n	v	vet season	X	dry	season	
		bad smell				v	vet season		dry	season	
		other									
		water is p	otable			v	vet season		dry	season	
		average de	epth of wa	iter in w	ell	v	vet season_	3 m	dry	season_	
	Does each	h household	have a sto	orage ci	stern		yes			no	X
	Does each	h house coll	ect rainwa	ater			yes	X		no	Ш
	Volume ((liters)	200 liters		Type:	plastic 1	parrel with	open top			

C	Additional water su	pply fac	cilities provided	under OECF	loan SPI	V/VI 199	<u>3-94</u>	
	Engineering study re	port & o	drawings		yes		no	X
c1	Source:						0 1	
	surface water	X		of stream str			r & Bomban rive	
	borehole	Ш	boreh	ole depth (to	be confirm	ned)		m
	Is water quality data:	for the I	BH available?	yes		- 1 ₁ (+	no	
	Location	.	Elevation (m	1)]	Lat 00 ⁰		Long 101 ⁰	
- 2	TA 10 (old check dam at	t Silam riv	rer) 114		19.62		48.43	
CZ	Extraction method:	[]			:£1t=0+i	on well nex	t to stroom	
	pumped intake	X		41. 4				X
	gravity intake	Ш.		earth dam		ÇO	ncrete weir	m3/min
	For pumped extraction	n, what	is the pump capa	acity?	Q			
		. 10			Head			m X
	Is the pump is operat	ional?		yes			no	
	broken		•	p is missing	X		not in use	;
c3	Raw water pipeline (source	to treatment)		по	transmissi	ou bibenne	
	Location		Size	Mat	erials	255	Length m	
	installation:		Ahove gro	ound surface		below	ground surface	X
	condition:		710010 510	Leaking	岡		not in use	X
c4	Treatment facility:			24	L		not in use	X
- 3	Pre-treatment:		chemical	coagulation	X	sedimen	tation tank	X
	Filtration:		Onomous	slow sand			rapid sand	百
	Chemical used?			lime	X		alum	Ħ.
	Treated water storage	a ·	in ground concr		X	capacity		m3
	Treated water storage		r in use but storag				not in use	X
	Location	into	Elevation (m)	Lat	000		Long 100°	Lame of
	TA 3 WTP		139		9.47		48.04	
	TA 11 Pump House TA 6 storage reserv		184		9.23 9.38		47.53	
	TA 6 storage reserv	VOII	134		7.30			
c5	Distribution system							
	booster pumps:		Qty:	2 units	Q		9.5	m3/hr
	GUNDFOS model B)	Head		84.9	m
	Vertical Multistage C Is the pump is operat		gai Pump	yes			no	X
	broken	П	the pum	p is missing	一		not in use	X
	diesel generators	<u> </u>	Qty		genera	tor rating		kW/kVA
	YANMAR Model TS	S 30 & 7			_	rating		HP
	Is the generator opera			yes	П	_	no	X
	broken			missing	X		not in use	

c 6	Distribution piping map:		available				no	X
	Location	Size	Mai	terials	I	ength	m]
	main feeder							
	branches	1 12						
	laterals							_
	installation:	Above grou	and surface		below gr	ound sur		
	condition:		Leaking			not in	use	X
	How is the water delivered:			in	dividual hous	e connec	tion	
	TION IS LIKE WARVE BUSINESS OF				to public cis	stern/hyd	rant	X
	number of public hydrants	s <u>11</u>	number	r of houses	s per public h		30	
			Elevation (m)	Lat 00°N	1	Long	101°E
	highest point in the village		173		19.65		47.	98
	lowest point in the village		133		19.4		48.	03
	point farthest from treatment facil	ity HALPHAN	173		19.05		47.	94
D	Catchment dams provided h	oy GOI - PU	(mosque)	yes	X		no	
	Engineering study report			yes			no	X
	Engineering drawings			yes			no	X
d1	Source	e de la companya de l						
	River or other surface was	er by gravity						X
	name of river or stream	Duku rive	r (near s	auce of sp	ring)			
	Spring by gravity							
	Structure		earth dam		cond	crete wei	r	X
	Notes on conditions of check dam still in good conditions was a full of the pond is fu	ondition, built in	2001.		, , , , , , , , , , , , , , , , , , , ,			
	is contributing to same tu							
						tarin ing		
	Source Location	Elevation (m)		Lat 00) u	Long	101 ⁰	
	TA S1	179		18.5			7.61	
	For Spring : what is spring	yield			neld not measu		ason	X
	is the spring protected?		yes				no	X
	what kind of prote	ection	permanent			tempo	orary	
	describe:							

	Surface area of pond	64 m2	Depth of	pond	1.25	m
	Estimated storage capacit	y			30	m3
	I- 41ton cotchmont	sahama ta protost the	woter cource			
	Is there any water catchment	scheme to protect the			no	X
			yes		110	<u> </u>
	Is the source also used for oth	ier purposes				[1]
	for irrigation		yes		110	X
	for watering animal		yes		no	X
	Does the source run dry?		yes		no	X
	When does the source rur	ı dry		ı		
	How many days without i	ain before the source	runs dry ?			weeks
	How long does the source	erun dry ?				weeks
do.	Raw water pipeline (from so	•				
4	Tun much pipeline (nom so				14	_
	Location	Size	Materials	L	ength m	-
		4" dia	PVC	balvis ay s	no h Januarian	
]
		A1		holow are	ound surface	
	installation:	Above grou				X
				s not been co	ompleted yet	
	condition: Appear	rs good X	Leaking		not in use	Ш
d3	Raw water storage tank	with filter	X Superior Contraction	number of	f units in use	1
	Location	Elevation (m)	Lat 00°		Long 100°	
	TA9	173	19.05		47.94	
	TA 12 (end of outlet from	163	19.07		47.97	
	new check dam, below storage reservoir)			o A- Profilia	ren, who are sufficient	
	Dimensions of storage tank:	4m x 4m x 2m.	Capacity 10:			
	Wall materials:	ferro cement] brick	X	stone	
	Roof materials:	galvanized corr	ugated sheet metal		no roof	X
	Operating condition: Storage reservoir has not to the reservoir. The end aparently not enough pre	of outlet pipe is 10 m	lower than storage	heck dam is reservoir, ar	not connected ad there is	
	Is the water flowing from the	e dam clean ?	yes	X	no	
	Is the reservoir structure in g	good condition	yes	X	no	
	Reservoir is connected to pip	ed distribution systen	n yes		no	X

5.1 Water Supply System - Data Sheet for Muara Takus

A	General Name of Village District Province Dates surveyed by NGO	Muara Takus Kampar Riau 19 - 25 Mar-02 21-mar-02	
	Dates visited by study team Topographic map reference 1:50,000 Topographic map 1:10,000	21-mar-02 0816 - 13 available X no]
	Land System : MPT (55)	0.11	
	Land Form : asymetric & unoriented		_
	Lithology : sandstone, shale, conglo	merate, sitistone.	
	GPS data (true north)	Lat 00° Long 100°	
	Reference point Elevation (m)	19.59 38.91	
	1110 11115	19.73 38.77	
	MII . Mosque	19.43 39.03	
	MT 2 public hydrant 121		
	1		_
	Water use	1990 2000	
	Number of households	244	
	Population (estimated 5 persons per house)	1220	
	Demand per person (liters/day)	60	
	Demand per household (liter/day)	300	
	Total domestic water demand (m3/day)	73.2	
В	Water supply facilities provided at time of a Ministry of transmigration Engineering report for resettlement area, Engineering study drawings & maps	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
	Engineering study drawings to maps		
	number of shallow wells with bucket number of housing units per well	12	2
	Used for drinking and cooking	yes X no	
	Used for washing and bathing	yes X no	_
	Does the well run dry?	yes X no	_
	Water quality for shallow wells bad taste	wet season dry season	7
	color	wet season X dry season	7
	bad smell	wet season dry season	
	other	<u></u>	
	water quality is potable	wet season X dry season X	
	average depth of water in well	wet season 3 m dry season	
	Does each household have a storage cistern	yes no	X.
	Does each house collect rainwater	yes X no	
	Volume (liters) 200 liter Type:	plastic rain barrel with open top	

C	Additional water supply fac-	<u>cilities provided unde</u>	r OECF	loan SPL-	V/VI 1993-94		
	Engineering study report & o	drawings		yes		no	X
c1	Source: surface water						
	borehole X	borehole de	epth			175	m
	Is water quality data for the l	BH available?	yes			no	
	Location MT l borehole	Elevation (m)	L	at 00 ⁰		g 101 ⁰ 9.04	_
c2	Extraction method:						
	pumped intake X			infiltration	well next to stream	am	
	gravity intake	eart	th dam		concrete w	eir	
	For pumped extraction, what	is the pump capacity?		Q _			m3/min
				Head _			m
	Is the pump is operational?		yes			no	X
	broken	the pump is n	nissing		not in 1	ise	X
c3	Raw water pipeline (source	to treatment)		no tr	ansmission pipeli	ne	
	Location	Size	Mate	rials	Length	m]
							-
							.
	installation:	Above ground s	surface		below ground s	urface	
	condition:	L	eaking		not	in use	X
c4	Treatment facility:				not	in use	X
	Pre-treatment:	chemical coag	ulation		sedimentation ta	nk	
	Filtration:	slov	v sand	X	rapid sa	nd	
	Chemical used ?		lime		alı	ım	
	Treated water storage:	in ground concrete re-	servoir	X	capacity		m3
		r in use but storage by-		X	not in t	ise	
			_	ου	Long 101	U	
	MT 1	119	19.41		39.04		
c5	Distribution system			•			
	booster pumps:	Qty:		Q			m3/min
	Pump house overgrown with Could not visit.	vegetation.		Head _			m '
	Is the pump is operational?		yes			no	X
	broken	the pump is n	nissing		not	in use	X
	diesel generators	Qty		generato	r rating		kW/kVA
	-			engine r	ating		HP

	Is the generator operational? broken Distribution piping map:		mis avail	yes sing able				not in	no use no	X X X
.0	Location	Size		Mate			Len	gth	m	7
	main feeder	75 mm			VC					-
	branches	50 mm		P	VC					-
	laterals									_
	installation:	Above grou				belo	ow grou			X
	condition:		Leal	king				not in	use	
	How is the water delivered:				ind	lividual	house c	onnec	tion	
						to pub	lic cister	n/hyd	rant	X
	number of public hydrants	8	nu	ımber o	of houses	per pul	olic hydr	ants		30
			Eleva	tion (m)	Lat	00 ⁰ N		Long	100 ⁰ Ε
	highest point in the villag	6 ;≒	. 1	123		19	.34		3	8.87
	lowest point in the village		1	113		19	.59		3	8.91
	point farthest from treatm			114		1.15	.73		3	8.77
D	Catchment dams provided b	y GOI			yes	X			no	
	Engineering study report & d	rawings			yes				no	X
	Engineering drawings				yes				no	X
d1	Source River or other surface wat	er by gravity								
	name of river or stream									
	Spring by gravity									
	Structure		earth	dam	X		concre	te wei	r	
	Notes on conditions of che there is a pond located at approximately. check dam still in use but only for washing.	just up stream of	check					r drin	king,	
	Source Location MT S1	Elevation (m)		L	at 00 ⁰)		Long 38.9	100 ⁰	
	For spring: what is spring			W	et season		_	dry se	ason _	X
	spring yield no	ot measured								
	is the spring protected?			yes					no	X
	what kind of prote	ection	perma	nent				tempo	orary	
	-	spring water is co	ollected	d in a s	urface po	nd beh	ind the	heck	dam	

	For pond (behind check dam)					
	Surface area of pond	200 m2	Depth of	pond	1.0	m
		E	stimated storage cap	acity	80	m3
	T .1	4 4 4 4 5				
	Is there any water catchment sch	eme to protect the		 1		Ter.
			yes		no	X
	Is the source also used for other	purposes				
	for irrigation		yes		no	X
	for watering animal		yes		no	X
	Does the source run dry?		yes		no	X
	7	. 64.)				
d2	Raw water pipeline (from sourc	e to juter)				
	Location	Size	Materials	Lei	ngth m	
						_
						-
	\$1	:		Haran Sara	gran saylada	<u> </u>
	installation:	Above grou	ind surface X	below grou	ind surface	X
	condition: Appears go	ood X	Leaking		not in use	
42	Slow sand filter	with et	orage tank			
us	Stow suna juiei	With St	orage tank			
	Dimensions:		Capacity			
	Wall materials: fer	rro cement	brick	X	stone	
				X	no roof	H
	Roof materials :	gaivanized corru	igated sheet metal	Δ	110 1001	
	Operating condition:					
						\Box
	Is the water flowing into reservo		yes	님	no	믬
	Reservoir is connected to piped of	listribution system	yes	L	no	Ш

Appendix 5.1 Water Supply System - Data Sheet for Koto Tuo

A	Land Form :	y team ference 1:50,000 10,000 MPT (55) asymetric & unoriented pandstone, shale, conglor	merate, siltstone.	Koto Tuc Kampar Riau 19 - 25 N 20-mar-0 00816-13	Mar-02 02	
	Water use Number of househol Population (estimate Demand per person Demand per househol Total domestic water	d 5 persons per house) (liters/day) old (liter/day)	1990 599 2995 60 300 179.7	2000		
В	Water supply facili	ties provided at time of r	esettlement and still in	use		
_	Ministry of transmig	gration				\Box
	Engineering report f	or resettlement area,	yes	X	no	님
	Engineering study d	rawings & maps	yes	X	no	Ш
	number of shallow v number of wells per					300 2
	Used for drinking an	nd cooking	yes	X	no	
	Used for washing ar		yes	X	no	
	Does the well run dr	y ?	yes	X	no	
	Water quality for sh	allow wells		, , , , , , , , , , , , , , , , , , ,		
	bad taste		wet season	X	dry season	
	color		wet season	X	dry season	Ц
	bad smel	1	wet season		dry season	Ш
	other					
	water is j	ootable	wet season	X	dry season	X
	average o	lepth of water in well	wet season	3.5 m	dry season_	
	Does each househol	d have a storage cistern	yes		no	X
	Does each house col		yes	X	no	
	Volume (liters)	<1m3 Type:	plastic rain barrel	with open to	op	

C	Additional water supply fa	cilities provided under OEC	F loan SPL-	·V/VI 1993-94		
	Engineering study report &	drawings	yes		no	X
c1	Source:					
	surface water	name of stream str	ream _			
	borehole	borehole depth	_		175	m
	Is water quality data for the	BH available? yes			no	X
	Location	Elevation (m)	Lat 00°	Lo	ng 100°	
	KT BH1	134	18.19	- '	40.55	_
	KT BH2	143	17.39		41.63	
c2	Extraction method:					
	pumped intake X		infiltration	n well next to stre	eam	
	gravity intake	earth dam		concrete v	veir	
	For pumped extraction, what	is the pump capacity?	Q			m3/min
	• • •		Head			m
	Is the pump is operational?	yes	\Box	E	no	X
	broken	the pump is missing	$\overline{\mathbf{x}}$	not in	use	
c3	Raw water pipeline (source	• •		ransmission pipe	line	X
						7
	Location	Size Ma	terials	Lengtl	n m	-
]
	installation:	Above ground surface	П	below ground	surface	
	condition:	Leaking	一	no	t in use	
c4		provided 1 at each borehole)		not in	use	X
	Pre-treatment:	chemical coagulation		sedimentation t	ank	
	Filtration:	slow sand	X	rapid s	and	
	Chemical used ?	lime		a	lum	
	Treated water storage:	in ground concrete reservoir	X	capacity		m3
	by-passed (d	lirectly to distribution system)		not in	use	X
c 5	Distribution system					
	booster pumps:	Qty: 2	Q _	9.5		m3/hr
	GRUNDFOS Model No. B 4 Vertical Multistage Centrfug		Head _	84.9		m
	Is the pump is operational?	yes			no	X
	broken	the pump is missing		no	t in use	X
	diesel generators	Qty 2	generate	or rating		kW/kV
	YANMAR Model TS 300 &	TS 230	engine	rating		HP
	Is the generator operational?	yes			no	X
	broken	missing	П	nc	t in use	

Distribution piping map:		available			no	X
Location	Size	Materials		Length	m	7
main feeder						
branches						
laterals						_
installation:	Above grou	and surface	belo	w ground sur		X
condition:		Leaking		not in	use	Ш
How is the water delivered:			individual	house connec	tion	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			to publ	ic cistern/hyd	ront	一
			to puoi	ic cisteribilyu	ıanı	Ш
number of public hydrants	20	number of hou	ses per pub	lic hydrants		30
		Elevation (m)	Lat	00 ⁰ N	Long	100°
highest point in the village	e	162 block C	17.4	7	41.	.78
lowest point in the village		121 block B	18.0	3	41.	.00
•				N		
point farthest from treatme	ent racility					
Catchment dams provided b	y GOI - PU	y	res X		no	
Engineering study report & di	rawings	У	res		no	X
Engineering drawings		у	res		no	X
Source						\Box
River or other surface water	er by gravity					
name of river or stream	2 locations	: 1 near block A &	1 near blo	ck C)		
Spring by gravity						X
				aamamata vyais		$\overline{\mathbf{X}}$
Structure		earth dam		concrete wei	1	Λ
Notes on conditions of che previous check dams have	failed because su	rface run-off has er	oded the fo	oundations		
The new dam structure wi	ll likely sufer the	same fate				
	en de gasjaffen de en er er er. De Maria de en de en er er er er.	And the second s			. n	
Source Location	Elevation (m)		00 ⁰	Long		
KT S1 block A	145	18.05		40.5		
KT S2 block B	133	17.83		40.8		
KT S3	166	16.82		41.1		
KT S4	164	16.81		41.4		
For spring: what is spring	vield	wet seas	son	dry sea	ason	
		Web Boar				TV.
spring yield no	t measured	·				X
is the spring protected?		yes			no	X
what kind of protec	ction	permanent		tempo	rary	
-		llected in a surface	pond behir	-	-	
For pond (behind check dam) Surface area of pond	m2	Dep	th of pond			m
-			ge capacity			m3

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	is there any water catchinent so	neme to protect the	water source	yes		no	X
	Is the source also used for other	purposes		•	<u> </u>		:
	for irrigation	purposss		yes	П	no	X
	-			yes	一	no	X
	for watering animal			-			X
	Does the source run dry?			yes	Ш	no	A
	When does the source run di	ТУ					
	How many days without rain	before the source	runs dry ?				weeks
	How long does the source ru	n dry ?			-		weeks
d2	Raw water pipeline (from source	ce to filter)					
	Location	Size	Material	S		Length m	
	from S1 to Block A	75 mm	GIP				
	from S1 to Block C	75 mm 75 mm	GIP GIP		ye silê	26.63	
	from S3 to Block C	73 Huii	l On		and the same		
	installation:	Above grou	and surface	X	below	ground surface	
	condition: Appears g	ood X	Leaking			not in use	- :
d3	Slow sand filter	with s	torage tank	X			
	Location Elevat	ion (m)	Lat 00°		Lo	ng 100°	
		62	17.47			41.78	
	KT ST2 1	42	18.00			41.46	
						. ,	
	Dimensions:		Capa	city			
	Wall materials: fe	erro cement]	brick	X	stone	
	Roof materials :	galvanized corr	ugated sheet 1	metal	ai 🗀 🗀	no roof	
	Operating condition:				- FATT da Geografia		
	Filter/Storage unit KTC STC) in block C is emr	nty because th	ere is r	not enoug	h pressure	
	in the inlet pipe. The head d	ifferential between	the dam and	the filt	er is too s	small.	
	Is the water flowing into reservo	oir clean ?		yes	X	no	
	Reservoir is connected to piped	distribution system		yes		no	X
E	Potential Sources						
	River or other surface water	by gravity					X
	name of river or stream						
	Source Location	Elevation (m)	Lat	000		Long 100	υ
	KT S3 block C	166		.82		41.18	
	KT S4 block C	164	16	.81		41.21	
	Spring by gravity						X
	Spring by gravity Structure	ea	rth dam	7	co	ncrete weir	X

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Appendix 5.1 Water Supply System - Data Sheet for Muara Mahat Baru

	- *P)	CHUIX C.1 TIUCE	Supproj -5				
A	<u>General</u>				34 3	C. L. at Dam	
	Name of Village					Mahat Baru	
	District				Kampar Riau		
	Province	ICO.			8 - 14 A	pril '02	
	Dates surveyed by N				22 Marc	•	
	Dates visited by stud Topographic map re	•			0816 - 2		
	Topographic map 1			available	m -	no	X
		MBI (33)		4,122			<u></u>
	Land Form	undulating to ro	olling tuffac	eous sedimentary plai	ns (V83)		
	Lithology	fine grained tef	ra, tuffite, n	nudstone, siltstone, sa	ndstone, al	luvium,	
		recent riverine,					
	GPS data (true nort)	h)		0		0	
	Reference point	Elev	ation (m)	Lat 00°		Long 101°	
	MMB BH1		84	29.39		5.31	
	Water use			1990	200	0	
	Number of househo	lde		447			
	Population (estimate		ouse)	2235			
	Demand per person			60	aN ty	- N. S.	
	Demand per househ			300			
	Total domestic water		7)	134.1			
В	Ministry of transmi Engineering report	gration		ettlement and still in yes		no	X
	Engineering study of	lrawings & maps		yes		no	X
	number of shallow number of housing						224
	Used for drinking a	nd cooking		yes	X	no	
	-Used for washing a	nd bathing		yes	X	no	Ш
	Does the well run d	ry?		yes		no	X
	Water quality for sh	nallow wells					
	bad taste			wet season		dry season	
	color			wet season		dry season	
	bad sme	11		wet season		dry season	
	other						
	water is	potable		wet season	X	dry season	X
	average	depth of water in	well	wet season_		dry season_	
	Does each househol			yes		no	X
	Does each house co	llect rainwater		yes	X	no	
	Volume (liters)	200 liter	Type:	plastic barrel with	open top		

C	Additional water supply fa	<u>cilities provided unde</u>	r OEC	F loan SPL-	V/VI 1993-94		
	Engineering study report &	drawings		yes		no	X
c1	Source: surface water	name of st	ream				
	borehole	borehole d	epth (to	be confirme	ed) <u>1</u>	25	m
	Is water quality data for the	BH available?	yes			no	X
	Location MMB BH1	Elevation (m)		Lat 00 ⁰	I NGC Makan	Long 101 ⁰ 5.31	
c2	Extraction method:						
	pumped intake X			infiltration	well next to s	tream	
	gravity intake	ear	th dam		concrete	e weir	
	For pumped extraction, wha	t is the pump capacity?	?	Q _			m3/min
				Head _			m
	Is the pump is operational?		yes			no	X
	broken	the pump is r	nissing			in use	X
c3	Raw water pipeline (source	to treatment)		no tr	ansmission pi	peline	
	Location	Size	Ma	terials	Leng	gth m	
							_
		A TANAS ON SAMPLE	ran ju	arvis ta lossi	rgan da iliyakê Çiyarê]
	installation:	Above ground	surface		below groun	d surface	
	condition:	I	eaking			not in use	X
c4	Treatment facility:					in use	X
	Pre-treatment:	chemical coag	ulation	Ц	sedimentation		
	Filtration:	slov	w sand	X		l sand	H
	Chemical used ?		lime			alum	
	Treated water storage:	in ground concrete re		X	capacity		m3
		er in use but storage by	-			in use	
	Location MMB BH1	Elevation (m)	Lat	00 ⁰		g 101 ⁰	
c5	Distribution system						
	booster pumps:	Qty:		Q			m3/min
				Head _			m
	Is the pump is operational?		yes			no	X
	broken	the pump is i	nissing			not in use	X
	diesel generators	Qty		generato			kW/kVA
				engine r	ating		HP
	Is the generator operational		yes			no	X
	broken	1	nissing	X		not in use	
		<u>,</u>					

c6 Distribution piping map: available	
Location Size Materials	Length m
main feeder	
branches	
laterals	
installation: Above ground surface	below ground surface X
condition: Leaking	not in use X
How is the water delivered : indiv	vidual house connection
	o public cistern/hydrant X
number of public hydrants15 number of houses pe	er public hydrants 30
Elevation (m) L	at 00 ⁰ N Long 101 ⁰ E
highest point in the village	
lowest point in the village	
point farthest from treatment facility	to the second of
D Catchment dams provided by GOI - PU yes	no X
Engineering study report yes	no s
Engineering drawings yes	no
E Potential Sources yes	no X
River or other surface water by gravity	
name of river or stream	

Appendix 5.1 Water Supply System - Data Sheet for Gunung Bungsu

	Appendix 5.1 Water Supply Sys	iem - Data Sheet in	or Outrang Dang	Ju	
A	General Name of Village District Province Dates surveyed by NGO Dates visited by study team		Gunung Bungst Kampar Riau 19 - 25 Mar-02 21-mar-02	1	
	Topographic map 1:10,000 Topographic map 1:10,000 Land System : MPT (55)	available	0816 - 13 X	no	
	Land Form : asymetric & unoriented point of				
	Lithology : sandstone, shale, conglomerate,	sittstone.			
	GPS data (true north) Reference point Elevation (m)	Lat 00^{0}	Lon	g 100°	
	GB 1 flat area 127	19.13		8.07	
	GB 3 village centre 130	19.16	3	7.89	
	Water was	1990	2000		
	Water use Number of households	241	2000		
	Population (estimated 5 persons per house)	1205			
	Demand per person (liters/day)	60			
	Demand per household (liter/day)	300			
	Total domestic water demand (m3/day)	72.3			
В	Water supply facilities provided at time of resettle Ministry of transmigration	ment and still in us	<u>se</u>		 1
	Engineering report for resettlement area,	yes		no	_ 닐
	Engineering study drawings & maps	yes	X	no	
	number of shallow wells with bucket number of housing units per well				121
	Used for drinking and cooking	yes	X	no	
	Used for washing and bathing	yes	X	no	
	Does the well run dry?	yes	X	no	
	Water quality for shallow wells				,
	bad taste	wet season	dry:	season	Ш
	color	wet season	dry	season	
	bad smell	wet season	dry:	season	
	other				
	water is potable	wet season	X dry	season	
	average depth of water in well	wet season	7 m dry	season_	
	Does each household have a storage cistern	yes		no	X
	Does each house collect rainwater	yes		no	X
	Volume (liters) Type:				
	Notes: wells located on hillside are 9 m deep and	one day after 2 weel	ks without rain.		

C	C Additional water supply facilities provided under OECF loan SPL-V/VI 1993-94					
	Engineering study report & d	rawings	yes	no	X	
c1	Source:					
	surface water X	name of stream		Kampar river		
	borehole	borehole depth			m	
	Is water quality data for the E	BH available? yes		no		
	Location	Elevation (m)	Lat 00°	Long 100 ⁶)	
	GB 4	116	19.09	38.40		
c2	Extraction method:					
	pumped intake X	direct suction X	infil	tration well next to stream		
	gravity intake	earth dam		concrete weir		
	For pumped extraction, what	is the pump capacity?	Q		m3/min	
			Head		m	
	Is the pump is operational?	yes		no	X	
	broken	the pump is missing	$\overline{\mathbf{x}}$	not in use		
c3	Raw water pipeline (source	• •		o transmission pipeline	F	
	Aun valor pipeline (source					
	Location	Size Ma	terials	Length m	·	
				1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		
					_	
	installation:	Above ground surface		below ground surface	X	
	condition:	Leaking	同	not in use	X	
c4	Treatment facility:	2	-	not in use	X	
•	Pre-treatment:	chemical coagulation	X	sedimentation tank	一	
	Filtration:	slow sand	X	rapid sand	岡	
		lime	$\overline{\mathbf{x}}$	alum	一	
	Chemical used?			capacity	m3	
	Treated water storage:	in ground concrete reservoir		not in use	\mathbf{x}	
	by-passed (directly to distribution system)		not in use	A	
	Location	Elevation (m) Lat		Long 100°		
	GB 5	129	19.21	37.99		
c 5	Distribution system					
	booster pumps:	Qty: 2 units	Q	9.5	m3/hr	
	GRUNDFOS Model No. B 4: Vertical Multistage Centrfug		Head	33.0	m	
	Is the pump operational?	yes		no	$\overline{\mathbf{x}}$	
	broken	the pump is missing		not in use	$\overline{\mathbf{x}}$	
		· -		tor rating	kW/kVA	
	diesel generators	Qty 2 units	_	rating	HP	
	YANMAR Model TS 300			-	X	
	Is the generator operational?	yes	一	no not in vac		
	broken	missing		not in use	X	

c6 Distribution piping map:	available		no X
Location Size	Materials	Length	n m
main feeder			
branches			
laterals			
installation: Above gr	ound surface	below ground	
condition:	Leaking	no	ot in use X
How is the water delivered:	in	dividual house cor	nection
		to public cistern	/hydrant X
number of public hydrants 8	number of houses	per public hydrant	s <u>30</u>
	Elevation (m)	Lat 00°N	Long 100°E
highest point in the village	140	19.34	37.83
lowest point in the village	126	19.42	37.86
point farthest from treatment facility	130	19.16	37.89
D Catchment dams provide by GOI	yes		no X
Engineering study report & drawings	yes	in the second second	no
Engineering drawings	yes		no
E Potential Alternate Source			
Spring water developed and used by villagers			X
Spring Location Elevation (m GB S1 126) Lat 00 ⁰	Lo	ong 100 ⁰
For spring: what is spring yield	wet season	Good dr	y season <u>Goo</u> d
spring yield not measured			X
is the spring protected ?	yes	4-	no X
what kind of protection	permanent	te	mporary
describe: spring water is pond	ed in a deep dug pit		

Appendix 5.1 Water Supply System - Data Sheet for Tanjung Pauh

A	General Name of V	Village					Tanjun	g Pauh	& Tanju	ng Balit
	District	8					Lima P	uluh K	ota	
	Province						West S	umatra		
	Dates surv	veved by N	GO .				8 - 14 /	April '0	2	
	Dates visi	•					2 - Apr	il '02		
		-	ference 1:50,000				0816 -	11 & 0	816 - 12	
	Topograpi	_			ava	ilable			no	
	Land Syst	_	LWW (34)							
	Land Form		undulating to rolling m	ixed sedime	ntary	plains (I	P02)			
	Lithology		shale, sandstone, alluvi							
	GPS data									
	Reference		Elevation (n	1)	Lat	00_{0}		Lo	100°	
	TP1	F	181			11.95			46.04	
	TP2		189			12.07			45.69	
	TP3		182			12.04			45.75	
	TP4		187			11.97			45.86	
	TP5		181			11.93			45.94	
	TP6		155			11.80			46.19	
	TP7		169			11.62			46.50	
	TB1		178			11.71			46.32	
	TB2		215			11.96			45.62	
	Water use	,				1990	20	00		
	Number of		de		-	313				
			ed 5 persons per house)			1565				
			(liters/day)			60				
	Demand p					300				
	Total dom					93.9		•		
В	Ministry o	of transmig	ties provided at time of gration for resettlement area,	resettlemen	t and	still in	use		no	
	Engineeri	ng study d	rawings & maps			yes			no	
	number of		vells with bucket family							
		•	nd cooking			yes			no	X
	Used for v	washing ar	id bathing			yes			no	X
	Does the					yes	X		no	
	Water qua	ality for sh bad taste	allow wells		wet s	eason	X	dry	season	
		color			wet s	eason	X	dry	season	
		bad smel	1		wet s	eason	X	dry	season	
		other								
		water is	not potable							X
		average (lepth of water in well		wet s	eason_	7 m	dry	season_	
	Notes:		e many MCK facilities bu	t all of those	did r	ot used	anymore,	becaus	se	
		water qu	ality was very bad.							
	Does each	n househol	d have a storage cistern			yes			no	X

	Does each house collect rainy	vater .		yes		no	X
	Volume (liters)	Type:					
C	Additional water supply fac	ilities provided unde	r OECF lo	an SPL-	V/VI 1993-94	<u> </u>	C==1
	Engineering study report & d	rawings		yes		no	X
c1	Source:	name of str	room etroon	n P	anca river		
	surface water X				d)		m
	borehole					no	
	Is water quality data for the F		yes [Lat	00 ⁰		Long 100°	
	Location no measurement	Elevation (m)	Lat	. 00		20119 100	
c2	Extraction method:						
	pumped intake X		in	ıfiltration	well next to	stream	X
	gravity intake	ear	th dam		concre	te weir	
	For pumped extraction, what	is the pump capacity?		Q _			m3/min
	•			Head _			m
	Is the pump is operational?		yes			no	X
	broken	the pump is n	nissing		no	in use	X
c3	Raw water pipeline (source	to treatment)		no ti	ransmission p	ipeline	
	T	Size	Materi	als	Lei	ngth m	7
	Location	Size	TVILLETI	uxb			
							-
		er e ma er weke	4.5			skji i ijek ki	_
	installation:	Above ground		닐	below grou	ind surface	
	condition:	I	eaking			not in use	X
c4	Treatment facility:			-		t in use	
	Pre-treatment:	chemical coag		닐	sedimentati		X
	Filtration:	slov	w sand	X	rap	id sand	
	Chemical used?		lime	닐	- 74 <u>.</u>	alum	2
	Treated water storage:	in ground concrete re		X	capacity		m3
	filte	r in use but storage by				t in use	
	Location	Elevation (m) 183	Lat 11.5	00 ⁰		ng 100 ⁰ 46.65	
	TB3 (WTP) TP ST1 (storage on hilltop)	200	11.9			46.74	
=	Distribution system	•					
co		Qty: 2		Q			m3/min
	booster pumps:	Qty. 2		Head			m
	Is the numn is energtional?		yes		•	no	$\overline{\mathbf{X}}$
	Is the pump is operational?	the pump is	•	H		not in use	$\overline{\mathbf{x}}$
		Qty 1	···	generat	or rating		kW/kVA
	diesel generators	Qty 1		engine			HP
				CHETHO			

broken missing not in use X Coation Size Materials Length m main feeder 4" dia GIP branches laterals installation: Above ground surface mot in use X condition: Leaking mot in use X mumber of public instead mot in use		Is the generator operational?		yes [:	no X	l
Location Size Materials Length m main feeder 4" dia GIP branches laterals lat		-	1	missing [not in u	ise X	ļ
Location Size Materials Length m main feeder 4" dia GIP branches laterals lat								
main feeder	c6	Distribution piping map:	. av	vailable [no X	
main feeder branches laterals installation: Above ground surface below ground surface		Location	Size	Materia	als	Length	m	
installation: Above ground surface below ground surface		130 dataon		GIF)			
installation: Above ground surface below ground surface condition: Leaking not in use It individual house connection to public cistern/hydrant It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream It is planned by PU 50 Kota district to be repaired within this year (2002) Source Location It is planned for PU dam It is planned for PU da		branches						
How is the water delivered: Candition: Leaking		Iaterals				<u> </u>		
How is the water delivered: Individual house connection to public cistern/hydrant X		installation:	ū		bel			_
number of public hydrants number of houses per public hydrants Elevation (m)		condition:	I	Leaking		not in t	ise X]
number of public hydrants number of houses per public hydrants		How is the water delivered:			individua	l house connecti	on	
Elevation (m) Lat 00 ⁰ N Long 100 highest point in the village lowest point in the village point farthest from treatment facility 189 12.07 45.69 D Catchment dams Engineering study report Engineering drawings yes X no X Engineering drawings yes \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \					to pub	lic cistern/hydra	ant X]
highest point in the village lowest point in the village 155 11.8 46.19 point farthest from treatment facility 189 12.07 45.69 D Catchment dams yes X no X Engineering study report yes no X Engineering drawings yes no X Engineering drawings yes no X I provided by PU, 1 provided by villagers with loan from Japan NGO River or other surface water by gravity name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam concrete weir X Notes on conditions of check dam and pond : The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond		number of public hydrants		number of	houses per pu	blic hydrants	-	-
lowest point in the village lowest point in the village 155 11.8 46.19 point farthest from treatment facility 189 12.07 45.69 D Catchment dams yes			Ele	evation (m)	Lat	00 ⁰ N	Long 100	υ°E
lowest point in the village point farthest from treatment facility 189 12.07 45.69		highest point in the village		215	11	1.96	45.62	
D Catchment dams Engineering study report Engineering drawings It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Structure Notes on conditions of check dam and pond: It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Structure Notes on conditions of check dam and pond: It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Structure Structure Notes on conditions of check dam and pond: It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure Notes on conditions of check dam and pond Elevation (m) Lat 00° Long 101° A718				155	1	1.8	46.19	
Engineering study report Engineering drawings Ves Noorce, show 2 (two) sources: 1 provided by PU, 1 provided by villagers with loan from Japan NGO River or other surface water by gravity name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam Concrete weir X Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00° Long 101° no measurement for PU dam		-		189	12	2.07	45.69	
Engineering study report Engineering drawings d1 Source, show 2 (two) sources: 1 provided by PU, 1 provided by villagers with loan from Japan NGO River or other surface water by gravity name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam concrete weir X Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location no measurement for PU dam		point latticst from deathers 110000				1		7
Engineering study report Engineering drawings yes no X d1 Source, show 2 (two) sources: 1 provided by PU, 1 provided by villagers with loan from Japan NGO River or other surface water by gravity name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam concrete weir X Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00° Long 101° no measurement for PU dam	D	Catchment dams			yes X	_] ¬
At Source, show 2 (two) sources: 1 provided by PU, 1 provided by villagers with loan from Japan NGO River or other surface water by gravity name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam concrete weir X Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location no measurement for PU dam		Engineering study report			yes	<u></u>		_
River or other surface water by gravity name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam concrete weir Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00° Long 101° no measurement for PU dam		Engineering drawings			yes		no X]
River or other surface water by gravity name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam concrete weir Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00° Long 101° no measurement for PU dam	d1	Source, show 2 (two) sources: 1	provided by PU,					
name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam concrete weir X Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location no measurement for PU dam 1224 47.18					rith loan from	Japan NGO		
name of river or stream Bukit Lakuak river (planned for T.Pauh & T.Balit) Structure earth dam concrete weir X Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00° Long 101° no measurement for PU dam		River or other surface water b	y gravity		•		X]
Notes on conditions of check dam and pond: The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00° Long 101° no measurement for PU dam				river (pl	anned for T.Pa	auh & T.Balit)		
The villagers informed to SAPS team survey that dam structure built in bukit lakuak river was broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond Notes on conditions of check dam and pond Source Location Elevation (m) Lat 000 Long 1010 no measurement for PU dam			ea	rth dam		concrete weir	X]
broken, so, no water flowing into the village. It is planned by PU 50 Kota district to be repaired within this year (2002) Name of stream Kelok Balacu river Structure natural stone pond Notes on conditions of check dam and pond Source Location no measurement for PU dam 12.24 47.18		The villagers informed to SA	PS team survey t	hat dam stri	acture built in	bukit lakuak riv	er was	_
Structure natural stone pond X concrete weir Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00 ⁰ Long 101 ⁰ no measurement for PU dam		broken, so, no water flowing It is planned by PU 50 Kota d	into the village. listrict to be repa	ired within	this year (2002	2)		_
Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00 ⁰ Long 101 ⁰ no measurement for PU dam		Name of stream	Kelok Balacı	ı river				
Notes on conditions of check dam and pond Source Location Elevation (m) Lat 00 ⁰ Long 101 ⁰ no measurement for PU dam		Structure	natural sto	one pond	X	concrete weir]
Source Location Elevation (m) Lat 00^{0} Long 101^{0} no measurement for PU dam			dam and pond					
no measurement for PU dam		Tiolog off contactions of creati	£					_
no measurement for PU dam								_
12.24 47.18		504400	Elevation (m)	La	t 00°	Long	101°	
IP SZ (Kelok Balacu nver) 231 12.21		TP S2 (Kelok Balacu river)	231		12.24	47	7.18	_

Other potential source by gravity

TP S1	(other potential	192		12.16		47	7.05	
	spring)							
For Spring	g: what is spring	yield	wet se	eason		dry sea	ison	
			sprin	g yield 1	not measu	ıred		X
is the s	pring protected?		yes				no	X
	what kind of prote	ection	manent	7		tempo	rary	
	describe :					4.7		:
-	ehind check dam e area of pond		2 D	epth of j	pond	0.5		m
Estima	ted storage capacit	y				1.5	5	m3
Is there an	y water catchment	scheme to protect the	e water source	;				
				yes			no	X
Is the sour	ce also used for otl	ner purposes						
for irri	gation			yes			no	X
for wat	tering animal			yes			no	X
Does the s	ource run dry ?			yes			no	X
	does the source ru	n dry				****		
		•						weel
			• •					
How n	nany days without	rain before the source	runs dry?					******
			runs dry ?			· · · · · · · · · · · · · · · · · · ·		
How lo	ong does the source	e run dry ?	runs dry ?			<u> </u>		
How lo	ong does the source	e run dry ?				Length	m	
How lo	ong does the source r pipeline (from so	e run dry ? ource to filter) Size	Materia			Length	m	
How lo	ong does the source	e run dry ?				Length	m	
How lo	ong does the source r pipeline (from so on Geeder from	e run dry ? ource to filter) Size	Materia			Length	m	
How lo	ong does the source r pipeline (from so on Geeder from	e run dry ? ource to filter) Size 4" dia	Materia PVC			Length ground sur		
How lo	ong does the source r pipeline (from so on Balacu river stallation:	e run dry ? purce to filter) Size 4" dia Above gro	Materia				rface	
How lo	ong does the source r pipeline (from so on Geeder from Balacu river stallation: Appea	se run dry ? Size 4" dia Above gro	Materia PVC pund surface		below g	ground sur	rface	week
How lo	ong does the source r pipeline (from so on Geeder from Balacu river stallation: Appea	Size 4" dia Above growth storage tank	Material PVC ound surface Leaking	X	below g	ground sur not ir been buil	rface n use nt yet	weel
How lo	ong does the source r pipeline (from so on Geeder from Balacu river stallation: Appea	se run dry ? Size 4" dia Above gro	Materia PVC pund surface	X	below g	ground sur	rface n use nt yet	weel
Location Location Location Location	ong does the source r pipeline (from so on feeder from Balacu river stallation: andition: Appea	Size 4" dia Above growth storage tank Elevation (m)	Material PVC pund surface Leaking Lat	X	below g	ground sur not ir been buil Long	rface i use it yet 101°	weel
How lo	ong does the source r pipeline (from so on Geeder from Balacu river stallation: addition: Appea	Size 4" dia Above growth storage tank Elevation (m)	Material PVC ound surface Leaking Lat llagers locate	X 00° d at high	below g	not in been buil Long	rface i use it yet 101°	weel
How lo	ong does the source r pipeline (from so on feeder from Balacu river stallation: andition: Appea	Size 4" dia Above growth storage tank Elevation (m)	Material PVC ound surface Leaking Lat llagers locate	X	below g	ground sur not ir been buil Long	rface i use it yet 101°	weel
How lo	ong does the source r pipeline (from so on Geeder from Balacu river stallation: Appea all filter all storage (no filte	Size 4" dia Above growth storage tank Elevation (m)	Material PVC ound surface Leaking Lat llagers locate n Cap	X 00° d at high	below g	not ir been buil Long near the	rface i use it yet 101°	weel X X
How lot Raw water Location ins con Slow sand (by PU) Location Note: small	ong does the source r pipeline (from so on eeder from Balacu river stallation: addition: Appea all filter all storage (no filte ms of storage tank:	Above growth storage tank Elevation (m) T) built by T. Pauh vi	Material PVC ound surface Leaking Lat Lat Cap	X 00° d at high	below g	not in been buil Long near the	rface i use it yet 101°	weel X X
How look Raw water Location instance con Slow sand (by PU) Location Note: small Dimension Wall mat Roof mate	ong does the source r pipeline (from so on Geeder from Balacu river stallation: Appea If ilter all storage (no filte ms of storage tank: cerials:	Above growth storage tank Elevation (m) T) built by T. Pauh viriation (m) ferro cement	Material PVC ound surface Leaking Lat Lat Cap	X 00° d at high	below g	not in been buil Long near the	rface n use t yet 101° nations	weel
How lot Raw water Location ins con Slow sand (by PU) Location Note: small Dimension Wall mat Roof mate Operating Water	ong does the source r pipeline (from so on eeder from Balacu river stallation: addition: Appea all storage (no filte ms of storage tank: erials: erials: storage tank built	Above growth storage tank Elevation (m) The built by T. Pauh virth storage tank galvanized core by PU could not be levered.	Material PVC ound surface Leaking Lat llagers locate a Cap rugated sheet	X 00° d at high acity brick metal	below g	not in been buil Long near the	rface n use t yet 101° nations	weel X X
How lot Raw water Location ins con Slow sand (by PU) Location Note: small Dimension Wall mat Roof mate Operating Water - is too	ong does the source r pipeline (from so on Geeder from Balacu river stallation: Appea all storage (no filte us of storage tank: cerials: storage tank built o small and a signi	Above growth storage tank Elevation (m) 2m x 2m x 1.5 m ferro cement galvanized cor by PU could not be leficant amount is lost	Material PVC pvC pund surface Leaking Lat llagers locate Cap rugated sheet pcated (12 m ³)	X 00° d at high acity brick metal	below g	not in been buil Long near the	rface n use t yet 101° nations	weel X X
How lot Raw water Location ins con Slow sand (by PU) Location Note: small Dimension Wall mat Roof mate Operating Water - is too	ong does the source r pipeline (from so on Geeder from Balacu river stallation: Appea all storage (no filte us of storage tank: cerials: storage tank built o small and a signi	Above growth storage tank Elevation (m) The built by T. Pauh virth storage tank galvanized core by PU could not be levered.	Material PVC pvC pund surface Leaking Lat llagers locate Cap rugated sheet pcated (12 m ³)	X 00° d at high acity brick metal	below g	not in been buil Long near the	rface n use t yet 101° nations	week X X
How look Raw water Location Instance Slow sand (by PU) Location Note: small Wall mat Roof mate Operating Water - is too - the p	ong does the source r pipeline (from so on Geeder from Balacu river stallation: Appea all storage (no filte us of storage tank: cerials: storage tank built o small and a signi	Above growth storage tank Elevation (m) The process of the proces	Material PVC pvC pund surface Leaking Lat llagers locate Cap rugated sheet pcated (12 m ³)	X 00° d at high acity brick metal	below g	not in been buil Long near the	rface n use t yet 101° nations	week X X

47.05

	Reservoir is connected to piped (which is built by villagers)	distribution system yes	X	no		
E	Potential Sources					
	River or other surface water by	gravity		X		
	Name of stream	Parmato river		-		
	Location: 3 - 5 km distance	from the village to the North				
	Notes on conditions of source/river: Based on village leader information Parmato river is bigger than Kelok Balacu river, and					
	assumed it would be meet water	demand in the village.				
	Location of source to be verified	l.				

Appendix 5.1 Water Supply System - Data Sheet for Tanjung Balit

A	General Name of Village District Province Dates surveyed by NGO Dates visited by study team Topographic map reference 1:50,000 Topographic map 1:10,000 GPS data (true north) Reference point TP 11 TP 11	available Lat 00 ⁰	West S 8 - 14 A 2 - Apr	ruluh Kota umatra April '02	A . **
	Water use Number of households Population (estimated 5 persons per house) Demand per person (liters/day) Demand per household Total domestic water demand	1990 421 2105 60 300 126.3	20	00	
В	Water supply facilities provided at time of reset Ministry of transmigration Engineering report for resettlement area, Engineering study drawings & maps number of shallow wells with bucket	tlement and still in yes yes	use	no no	
	number of wells per family Used for drinking and cooking Used for washing and bathing Does the well run dry?	yes yes yes	X X X	no no no	
	Water quality for shallow wells bad taste color bad smell	wet season wet season wet season	X X X	dry season dry season dry season	
	water quality is good average depth of water in well Does each household have a storage cistern	wet season wet season _ yes	3 m	dry season dry season_ no	X
	Does each house collect rainwater Volume (liters) Type:	yes		no	X

C	Additional water supply 1a	cilities provided unde	OECI	Toan Si		<u> </u>	
	Engineering study report &	drawings		yes		100	X
c1	Source: x	name of st	ream str	eam	Panca river	1 (48) 114	
	borehole	borehole de	epth (to	be confirm	ned)	Dala.	m
	Is water quality data for the	BH available?	yes			no	
c2	Location no measurement Extraction method:	Elevation (m)]	Lat _. 00°)	Long 101°	
	pumped intake X			infiltratio	on well next t	o stream	
	gravity intake	ear	th dam		conc	rete weir	
	For pumped extraction, what is the pump capacity?						m3/min
				Head			m
	Is the pump is operational?		yes			no	X
	broken	the pump is n	nissing		, , n	ot in use	X
c3	Raw water pipeline (source	to treatment)		no	transmission	pipeline	<u>, </u>
	Location	Size	Mat	erials	L	ength m]
		:				<u> </u>	-
							<u> </u>
	installation:	Above ground	surface		below gro	ound surface	
	condition:		eaking			not in use	
c4	Treatment facility:				n	ot in use	X
	Pre-treatment:	chemical coag	ulation		sedimentat	ion tank	X
	Filtration:		w sand	X	ra	pid sand	
	Chemical used ?		lime			alum	
	Treated water storage:	in ground concrete re	servoir	X	capacity		m3
	-	er in use but storage by-	-passed		n	ot in use	
	Location	Elevation (m)	Lat	000	L	ong 100°	
0 5	Distribution system						
CO	-	Qty: 2		Q			m3/min
	booster pumps:	Qty. 2		Head			m
	Is the pump is operational?		yes			no	X
	broken	the pump is 1	-	一		not in use	X
	diesel generators	Qty 1		genera	ator rating		kW/kVA
	monor Porrorators	<u> </u>		_	e rating		HP
	Is the generator operational	7	yes		5 _	no	X
	broken		missing	一		not in use	X
	Oloveii	•		<u> </u>			<u></u>

ma bra	cation nin feeder	Size	Materi	als	Length	m	
bra	nin feeder						
-							_
llat	anches						_
1444	erals						
	stallation:	Above groun		b	elow ground s		V
CO	ndition:		Leaking		not	in use	X
How i	s the water delivered :			individ	ual house conn	ection	L
				to p	ublic cistern/hy	/drant	X
nu	mber of public hydrants		number of	houses per pu	iblic hydrants		
		I	Elevation (m)	Lat	00 ⁰ N	Long	101
hiş	ghest point in the village			_			
lov	west point in the village			_			
no.	int farthest from treatment	facility					
Po	ar ar mires a cita a conditoria						
Catch	ment dams provided by	GOI - PU		yes 2	X	no	
				and the second	_		_
Engin	eering study report			yes		no	L
Engin	eering drawings			yes		no	
Source	e						
Ri	ver or other surface water	by gravity					X
na	me of river or stream	Bukit Lakua	k river				
Sp	ring by gravity						
Stu	ructure	e	earth dam		concrete we	eir	X
No	otes on conditions of check	dam and pond					
Th	e villagers informed to SA	PS team survey th	at dam struc	ture was broke	en, so, there is		
no	water flowing into the vil	lage. It is plan	ned by PU 5) Kota district	to be repaired	within	
thi	s year (2002).						
		i Santa	1 - 1"	of and or or			
	e Location measurement	Elevation (m)	La	t 00°	Long	g 101°	
							
			44-14-14-14-14-14-14-14-14-14-14-14-14-1	.:		. 4 1	
For Sp	oring: what is spring yi	eld	we	t season	dry s	eason	
	2		en	ring yield not	measured		
			sp.	mg yicid not.			-
	the spring protected?		yes	1 1		no	
is	are spring protocolog:		•				
is	what kind of protecti	on p	ermanent		tem	porary	

	For pond behind check dam Surface area of pond	m2	. De _I	oth of pond		m	
	Estimated storage capacity					m3	
	Is there any water catchment s	cheme to protect the v		ves]	no	
	Is the source also used for other	er purposes					
	for irrigation		7	res]	no X	
	for watering animal		ÿ	/es]	no X	
	Does the source run dry?		Ŋ	/es]	no X	
	When does the source run	dry					
	How many days without ra		uns dry ?			we	eks
	How long does the source	run dry ?				we	eks
d2	Raw water pipeline (from sor						
) Matariala		Length	m	
	Location	Size 4" dia	Materials PVC		Lengar	111	
	main feeder	4 dia	1,0				
d3	Slow sand filter	rs good with storage tank	ound surface Leaking Lat		clow ground surf not in mber of units in Long	use X]
d3	condition: Appear	rs good	Leaking	nu	not in	use X]
d3	condition: Appear	rs good with storage tank	Leaking	nu	not in	use X]
d3	condition: Appear	rs good with storage tank	Leaking	nu 00°	not in	use X]
d3	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials:	with storage tank Elevation (m)	Leaking Lat Capaci	num 00°	not in mber of units in Long	use X use 101^{0} one]
d3	condition: Appear Slow sand filter Location Dimensions of storage tank:	with storage tank Elevation (m)	Leaking Lat Capaci	num 00°	not in mber of units in Long	use X use 101^{0} one]
d3	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials:	rs good	Leaking Lat Capaci	num 0000 ity rick	not in mber of units in Long st	use X use 101^{0} one]
d3	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials: Roof materials: Operating condition: Water storage tank has no There are many MCK faci	rs good with storage tank Elevation (m) ferro cement galvanized const been built yet. Elities provided by PUs very bad.	Leaking Lat Capaci	num 0000 ity rick	not in mber of units in Long st no i	use X use 101^{0} one]
d3	condition: Appear Slow sand filter Location Dimensions of storage tank: Wall materials: Roof materials: Operating condition: Water storage tank has no There are many MCK faci because water quality was	rs good	Leaking Lat Capaci	num 00° aty rick atty did not use	not in mber of units in Long st no i	use X use 101° one]

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Appendix 5.2

Description of Water Supply in Each Village



Appendix 5.2 Description of Water Supply in Each Village

The following sheets were created to record information gathered during the team's field surveys for future reference. Much of the information required to complete the data sheets is still missing and the team intends to fill in the gaps as the information becomes available.

a) Koto Mesjid and Pulau Gadang

Existing wells are hand dug and range in depth from 3 to 4m (to be confirmed by survey). Wells run dry after a prolonged period of drought and villagers in Pulau Gadang report that water quality is a problem. In these two villages 1 well is provided for 4 houses whereas the other villages received 1 well for 2 households.

The villages are located next to each other, and follow the axis of the Silam River. The houses are located in groups on a series of small hills along the paved road. Low-lying areas created by the meandering Silam River separate the small hills.

Additional water supply facilities were provided after resettlement but are no longer operational: one infiltration well next to the Silam river, no filter treatment unit, raw water storage tank and booster pumps with distribution piping to communal hydrants. The treatment plant is located at the point that separates Koto Mesjid from Pulau Gadang.

Villagers in Koto Mesjid have implemented their own small-scale gravity scheme. Clean water is taken from a small stream at higher elevations in the mountain, about 2.5 km from the village and piped to an outlet in the village. PU has identified a budget in 2002 to improve this gravity scheme with check dam, new transmission pipe and filter/storage unit.

b) Ranah Sungkai

The village is divided into two large blocks, located on hilltops in relatively hilly terrain with only one small group of households in each block located in lower lying areas near the stream. Existing wells are hand dug and range in depth from 4 to 7 m in the hilly area and 3 to 4 m (to be confirmed by survey) in the flat area of the village. The wells serving houses on the hilltops are located at lower elevations on the slope more than 25m from the houses. The wells run dry after a prolonged period without rain and villagers complain about the distance and difficulty going up and down slopes to fetch water.

Additional water supply facilities were provided after resettlement but are no longer operational: diversion weir and direct suction pump at Kinari river, sedimentation tank, sand filter treatment, booster pumps and distribution piping to communal hydrants.

There are two potential sources of water from small streams located at higher elevations in the plantation: Pinang Mangu and Tebat Hantu. These sources appear to have a sufficient quantity of water but are not located high enough to feed the whole village by gravity. Nevertheless, the sources could be brought to public distribution points in the lower parts of the village to alleviate water supply problems during

periods of drought. The team has located a good site for a check dam on the Pinang Mangu just downstream of a small waterfall where there is a natural pool and a rocky outcrop.

c) Lubuk Agung

The village is arranged into one large block along the axis of the main road following the Kapecong River. Existing wells were dug to a depth of about 4 m but were abandoned because they frequently run dry. Most villagers are using water from the river. Surface water is relatively clear but there is considerable risk of contamination from runoff, pit latrines and garbage.

Additional water supply facilities were provided after resettlement but are no longer operational: an concrete weir across the river to form a pond, side intake well with direct suction pump to a small reservoir, no treatment, a piped distribution system supplied by booster pumps.

PU has constructed two small gravity schemes. An older check dam on the (????) river provides no water at all because the soil embankment on one side of the dam has been breached. A new check dam has recently been constructed on the Bukit Meranti Water from this check dam is piped to a small storage tank with filter. Water from the tank is flowing freely out a pipe onto the ground.

A number of improvements to the scheme may be possible however a more detailed field investigation and planning will be required:

- Pipe the water to communal taps at a few points in the village by gravity.
- Provide a large storage tank

d) Batu Bersurat

The village is arranged into two large blocks. Housing is located along the relatively flat area near the paved road and on land that slopes gradually up to the top the mountain. Existing wells are hand dug and range in depth from 4 to 5 m in the higher elevations and 3 to 4 m (to be confirmed by survey) in the flat area of the village. The wells run dry after a prolonged period without rain and villagers are using alternate surface water sources in Binamang and water from the reservoir.

Villagers tried to dig deeper wells by hand but encountered "natal" (hard soil or rock). One well near the mosque was dug deeper (7m) using machines and this well provides a good quantity of clean water in all seasons.

Additional water supply facilities were provided after resettlement but are no longer operational: an intake well with direct suction pump at the Kotopanjang reservoir over the hill to the south, a service reservoir on the mountain top, a gravity distribution piping system to communal hydrants in Batu Bersurat and Binamang.

PU has constructed a small catchment dam on the Ngalau River. The water from the pond behind the dam is pumped to a small storage tank near the small mosque. There is no treatment system despite claims by PU that the contract included a filter. The source is not protected and many people are using the pond for bathing. The small pump is

connected to the electrical supply at the Mosque. Although not yet connected, the plan is to distribute the water by gravity to various points in the village.

A number of improvements to the PU scheme may be possible however a more detailed field investigation and planning will be required:

- Increase the amount of storage
- Protect the source
- Provide a slow sand filter and a large storage tank.
- Provide a communal tap at the reservoir and at a few points in the village.

e) Binamang

The village is arranged into one large block. Housing is located up a steep slope. Existing wells are hand dug and range in depth from 4 to 7 m in the higher elevations (to be confirmed by survey). The wells run dry after a prolonged period without rain and villagers are using water from small streams. Surface water is relatively clear but there is considerable risk of contamination from runoff, pit latrines and garbage.

Additional water supply facilities were provided after resettlement but are no longer operational: an intake well with direct suction pump at the Kotopanjang reservoir over the hill to the south, a service reservoir on top of the mountain, a gravity distribution piping system to communal hydrants in Batu Bersurat and Binamang.

PU has constructed two small gravity schemes. An older check dam on the Makam River provides water to an MCK located by the main road. A new check dam has recently been constructed at a much higher on the Makam River. Water from this check dam will be piped to a storage tank with filter located near the MCK. It may be possible to provide additional storage units in other locations if the quantity of water is sufficient.

Another smaller stream also appears to have good potential for providing water by gravity. The team has located a good site for a check dam in a narrow section of the stream where the slopes are steep and rocky.

f) Pongkai Baru

Existing wells are hand dug and range in depth from 3 to 4 m (to be confirmed by survey). Wells run dry after a prolonged period of drought. Some villagers have reportedly dug deeper wells but water quality is poor.

The village is located on relatively flat ground at a high elevation and arranged in a single rectangular plan. Additional water supply facilities were provided after resettlement but are no longer operational: one stream side infiltration well with transmission pump, slow sand filter treatment, clear water storage tank and booster pumps with distribution piping to communal hydrants. The treatment plant is located on a prominent hilltop in the village. Villagers report that the stream has no flow during the dry season.

g) Mayang Pongkai

Existing wells are hand dug and range in depth from 2 to 3 m. The wells run dry and villagers report that water quality is a problem. The village is located on flat ground and the houses are widely distributed, with lot space between neighbors. The sharing of wells between households is inconvenient. Additional water supply facilities were never after resettlement. Villagers use water from the Win river during the dry season. Soil conditions are good for digging and some villagers have already dug individual deeper wells.

h) Pongkai Istiquoma

Facilities were never provided in this village. Villagers have dug their own wells and have requested that the government provide water supply facilities for every household. Oddly, none of the respondents to the statistical survey have reported a problem with the quality or quantity of the wells.

i) Tanjung Alai

The village is spread out over steeply sloping terrain. Houses are located at high elevations along the ridges and in the lower lying area near the Silam River. Existing wells are hand dug and range in depth from 4 to 7 m (to be confirmed by survey). The wells run dry after a prolonged period without rain and villagers and several households have moved to lower elevations closer to sources of surface water.

Additional water supply facilities were provided after resettlement but are no longer operational: a check dam with direct suction pump on Silam River, sedimentation tank, sand filter treatment, booster pumps and distribution piping to communal hydrants and two service reservoirs. Water quality on the Silam was very poor and a second intake was built on the Bomban River several kilometers away.

PU has constructed a small catchment dam on the Duku River. The water from the pond behind the dam flows by gravity the village Mosque. A storage reservoir with slow sand filter has been constructed but it is not connected to the transmission pipe. The transmission pipe has been terminated above ground in the ravine below the Mosque about 10 m lower. Apparently villager claim there is not enough head for water to reach the reservoir.

A number of improvements to the scheme may be possible however a more detailed field investigation and planning will be required:

- Connect the transmission line to the tank (if these is sufficient head)
- Provide a new storage tank at a lower elevation if there is no head
- Pump the water to a large storage tank at a higher elevation and supply the communal taps at a few points in the village by gravity.

i) Muara Takus

Existing wells are hand dug and range in depth from 3 to 4 m (to be confirmed by survey). Wells run dry after a prolonged period of drought and a few villagers report

that quality is a problem. Villagers tried to dig deeper wells but encountered "natal" (hard soil or rock).

The village is located flat ground in a low lying and arranged in a single rectangular plan. Additional water supply facilities were provided after resettlement but are no longer operational: one earth dam that captures water from a spring with slow sand filter treatment, booster pumps and distribution piping to communal hydrants. The source is still in use and provides a good quantity of water. The earth dam is in good condition. The booster station is no longer operational but the water, transmitted by gravity, is treated through the filter. The booster station is by-passed and water is supplied directly into the distribution piping. Three hydrants nearest to the treatment plant have water but there is insufficient head to supply the whole system.

A number of improvements to the scheme may be possible however a more detailed field investigation and planning will be required:

- Increase the amount of storage at the source
- Disconnect the existing distribution system
- Provide storage tanks with a public tap at strategic locations in each block.

k) Koto Tuo

Existing wells are hand dug and range in depth from 3 to 5 m (to be confirmed by survey). Wells in some blocks run dry after a prolonged period of drought. Villagers tried to dig deeper wells by hand but encountered "natal" (hard soil or rock).

The village is located divided into three large blocks each separated by a plantation area. Each block A and B are relatively flat and at lower elevations. Block C is hilly and at higher elevations. Additional water supply facilities were provided after resettlement but are no longer operational: two boreholes, each with slow sand filter treatment, booster pumps and distribution piping to communal hydrants. Villagers claim that water from the boreholes was also poor in quality. Some of the piping is used to distribute water from the gravity supply schemes implemented by PU.

PU has partially developed springs in the plantation above the village but there is potential to do more.

Spring S1 is located near block A and supplies block A and C. Water from the spring is collected by a check dam and is transmitted by gravity In block A the water is fed into the piped water supply system. Pressure is only sufficient to supply two public hydrants. These public hydrants provide only a small amount of storage and water is leaking continuously through the broken taps. In block C the water is passed through a slow sand filter and stored in a concrete structure recently built by PU. This tank is full of water but there is no faucet or connection to distribution the water to the users. The community is using water that comes out the overflow at the top of the tank as a shower for bathing.

Spring S2 is located south of block C and supplies a second storage/filter unit in a higher part of block C. Water is captured by a check dam and transmitted by gravity. Unfortunately the storage tank is empty. At least two previous attempts have been made by PU to build a check dam, each time at slightly higher elevations in the hopes

that the head would be enough to fill the tank. According to GPS readings taken by the team the available head is only about 2 m and not enough to overcome the losses in the rather long (2.3km) and small diameter (75mm) transmission line.

A third spring S3 is located near block B. Villagers presently use this spring as a point source but it is not protected or connected to any piping system. It shows good potential for supplying clean water by gravity to block B, which is located at a lower elevation.

A number of improvements to the scheme may be possible however a more detailed field investigation and planning are required to confirm the technical feasibility:

- Improve the quality and quantity of water captured by building seepage galleries and concrete spring boxes at the source.
- Increase the amount of storage at the source
- Do not feed water into the existing distribution system
- Provide storage tanks with a public tap at strategic locations in each block.

1) Muara Mahat Baru

Existing wells are hand dug and range in depth from 3 to 5 m. The wells do not run dry but villagers report that water quality is a problem and there is some conflict between neighbors who share wells.

The village is located on flat ground and arranged in large square plan. Additional water supply facilities were provided after resettlement but are no longer operational: one deep borehole, a slow sand filter for treatment, a clear water storage well, booster pump and distribution piping to public hydrants. Villagers claim that water from the borehole was poor in quality and quantity.

m) Gunung Bungsu

The village is located flat on relatively flat ground but a few households are located on a hillside. Existing wells are hand dug and range in depth from 9 to 12 m in the hilly area and 3 to 4 m in the flat area of the village. Only the wells located in the hillside area run dry after a prolonged period without rain.

Additional water supply facilities were provided after resettlement but are no longer operational: direct suction pump at Kampar river, sedimentation tank, sand filter treatment, booster pumps and distribution piping to communal hydrants.

There is one unprotected spring in the hilly part of the village. The spring fills a small pit that has been dug into the ground. This spring should be protected from contamination by building a covered infiltration well and installing a simple hand pump.

n) Tanjung Pauh & Tanjung Balit

The villages are side by side and spread out over an area of gently rolling terrain surrounded by high mountains. Existing wells are hand dug and range in depth from 3 – 4 m (to be confirmed by survey). The villagers do not use the wells because the water

quality is bad (high color and turbidity). Villagers buy water at 1000 Rp. Per 20-liter container from PDAM and use water from surface sources including a spring in the old village by the Mahat River.

Additional water supply facilities were provided in 1998 to serve both villages but are no longer operational: a raw water intake on Panca River pumped up to a, sedimentation tank, and sand filter treatment plant, booster pumps and distribution piping to communal hydrants and one service reservoirs with booster station. Operation stopped because villagers were unwilling or unable to assume operating responsibility.

In 2000 PU constructed a gravity scheme consisting of check dam on the Bukit Lakuak River approximately 8 km from the village, a gravity transmission pipeline and a storage tank in Tanjung Pauh. The dam has apparently failed and the scheme does not provide water. PU has a proposal to rehabilitate the dam and improve the gravity scheme.

The villagers in Tanjung Pauh have, with the assistance of a Japanese NGO, developed their own small-scale gravity scheme. A small check dam in the uppermost reaches of the Balacu River provides clean water by gravity to a small storage tank near the village. The transmission pipeline is PVC and runs on the surface over trees and rocks. The pipe is not old but already is damaged and leaking in a few places. Water from the storage tank is distributed to 2 points in each of 3 blocks where the water flows freely and is stored into one of the shallow wells. There is sufficient quantity of water and during our visit we could see water overflowing steadily out of the tank onto the ground. The water from this scheme is apparently not shared with the neighboring villagers in Tanjung Balit.

A number of improvements to the scheme may be possible however a more detailed field investigation and planning will be required:

- Protect the transmission line to the tank
- Provide a larger storage tank
- Provide distribution points in Tanjung Balit
- Provide taps at the distribution points to shut off the water when not in use

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Appendix 5.3

Well Survey



D - 4	NI-		,				
Ref.	140.	 /	٠.,	٠.	٠.	•	

Appendix 5.3 Well Survey

Surve			Date	
villag			F	
1 H	ow is the water taken from the well			
a	with handpump			
b	with electric pump			
С	with bucket or scoop			
	ater quality			
a	bad taste			
b	bad color			
С	bad smell			
d	all of the above a, b, c)			
е	water quality is good		_	
3 W a	here do you wash clothing at home using potable water supply	e y e en e		
b	at home using rainwater catchment			
С	at public MCK			
d	surface water stream			
4 if a	using MCK, how far do you travel			
b	25 - 50m			
C	51 - 100m			
d	101 - 200m			
е	>200m			
5 If a	shared or public well, how far do you travel to get water? <25m		·	
b	25 - 50m			
С	51 - 100m			
d	101 - 200m			
e	>200m			
	water boiled before drinking? yes			
b	no			
С	boiled for drinking but not for brushing teeth			

a <1mb 1-1.5mc 1.5-2md >2m

13 Well casing materiala concreteb masonryc no casing

Survey of Shallow Wells	14 Depth of well casing a entirely b partly	Ref. No/	
	g		
b partly			
15 Depth of well		6-7m	
	_		
	-		
4			
b 5-7m c 7-10m			
additional observations	/rem:	arks	

Appendix 6

Environment



Appendix 6.1

Figures for Physical Parameter



List of Figures

Figure 1	Concentration of Color (in TCU) in water samples collected between
	1994 – 2001 Temperature (degree C) in water samples collected between 1994 -
Figure 2	
	2001
Figure 3	Concentration of Turbidity (in NTU) in water samples collected
	between 1994 – 2001
Figure 4	Concentrations of Dissolved Solid (in mg/L) in water samples
_	collected between 1994 – 2001
Figure 5	Concentrations of Conductivity (DHL) (µmhos/cm) in water
-	samples collected between 1994 - 2001

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Appendix 6.1 Figures for Physical Parameter

Figure 1 Concentrations of Color (in TCU) in water samples collected between 1994 – 2001

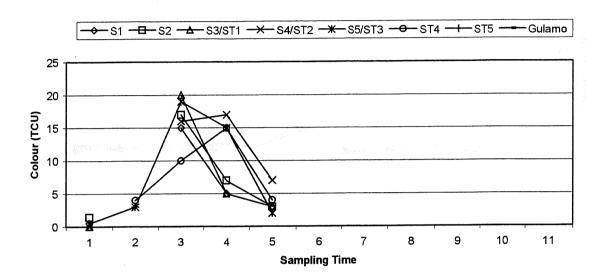


Figure 2 Temperature (degree C) in water samples collected between 1994 – 2001

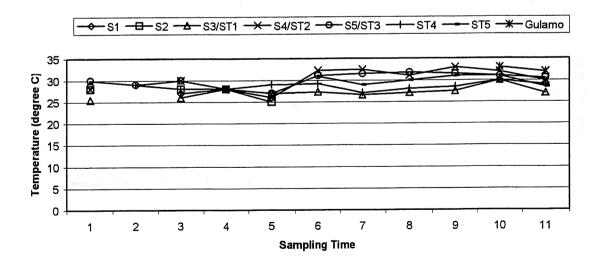


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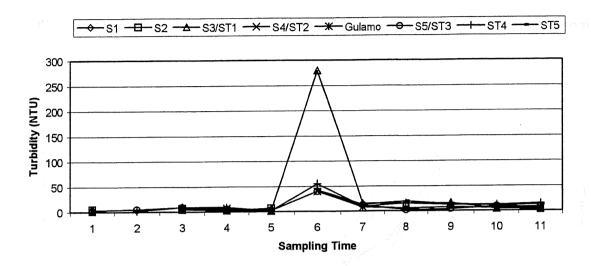


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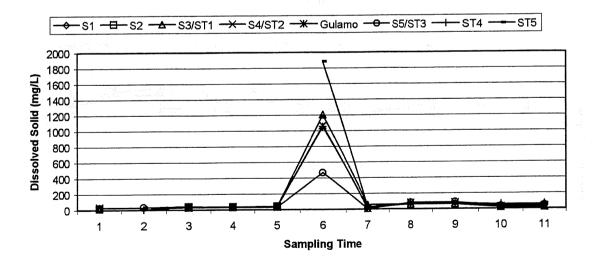
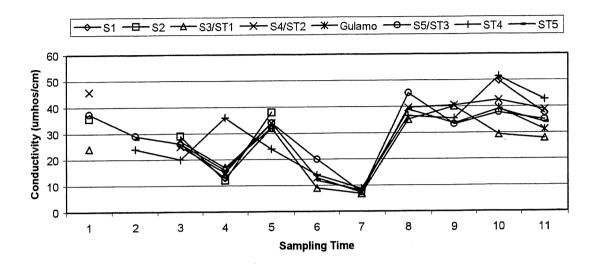


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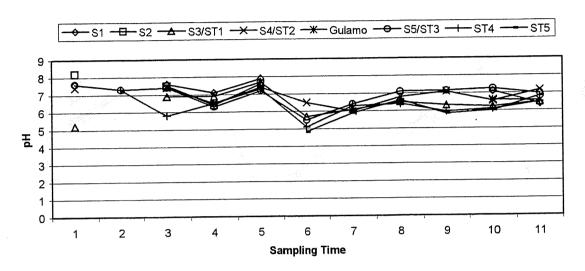


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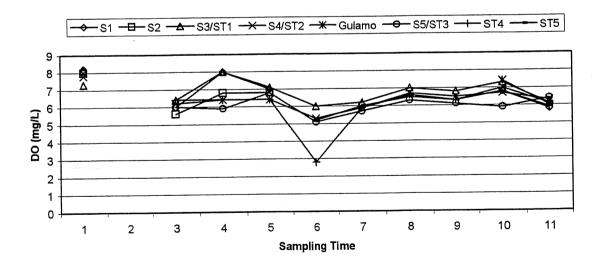


Figure 3 Concentrations of Nitrate (NO₃) (in mg/L) in water samples collected between 1994 – 2001

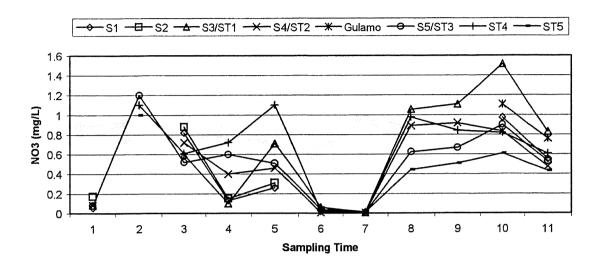


Figure 4 Concentrations of Nitrite (NO₂) (in mg/L) in water samples collected between 1994 – 2001

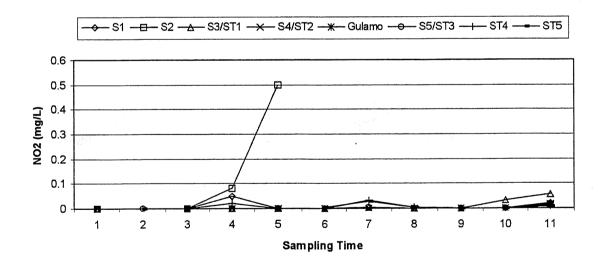


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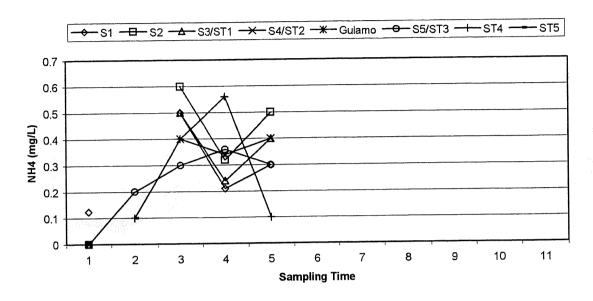


Figure 6 Concentrations of Chloride (Cl) (in mg/L) in water samples collected between 1994 – 2001

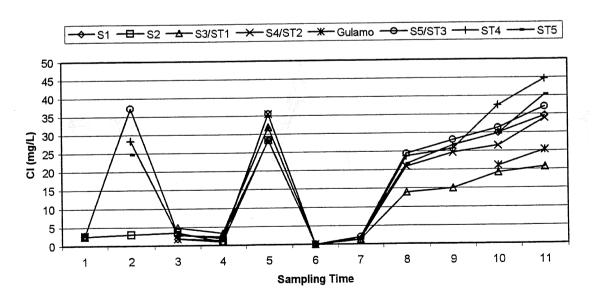


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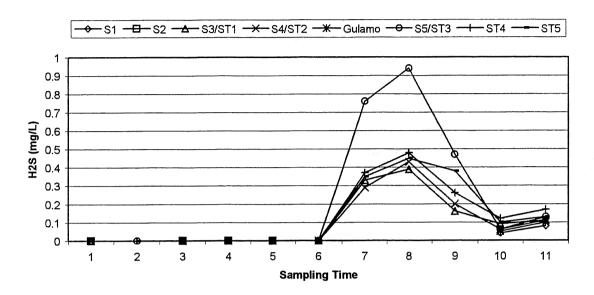


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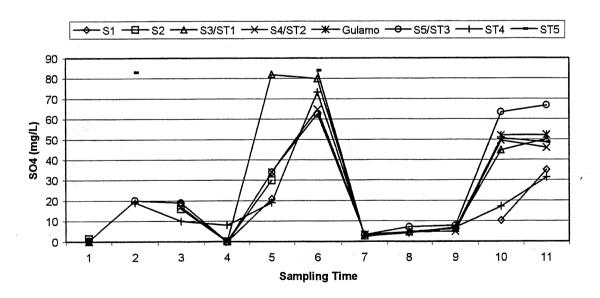


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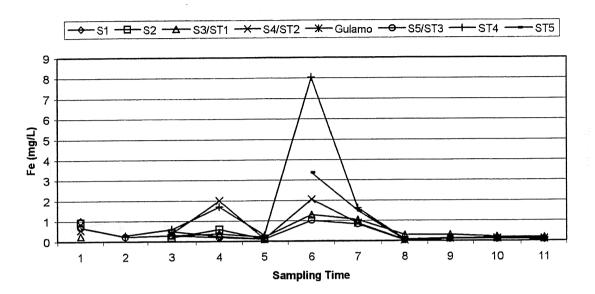


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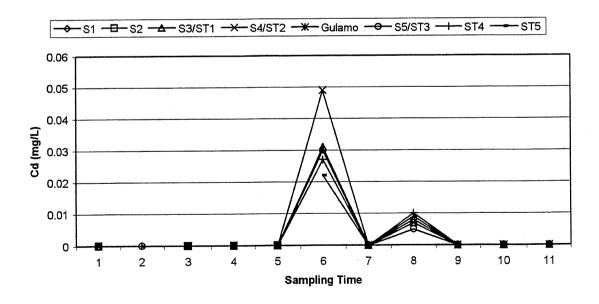


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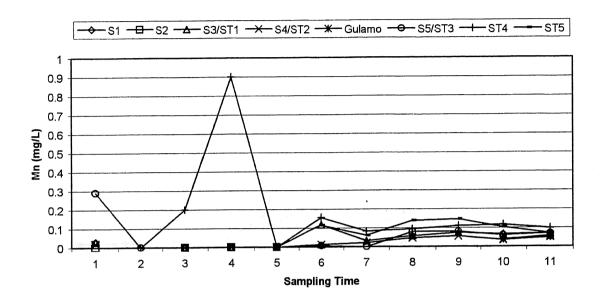


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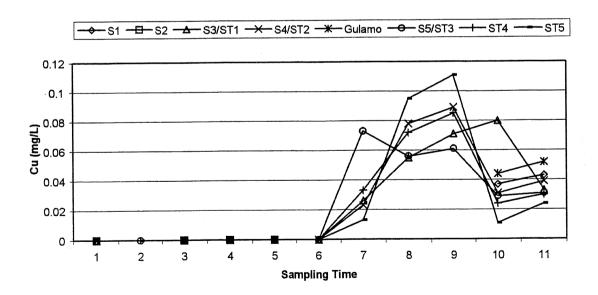


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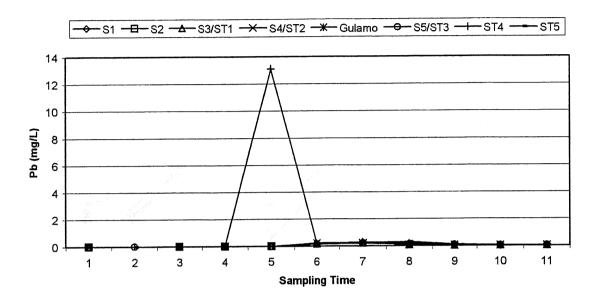


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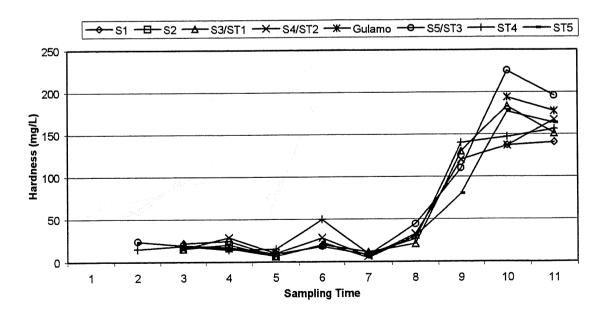


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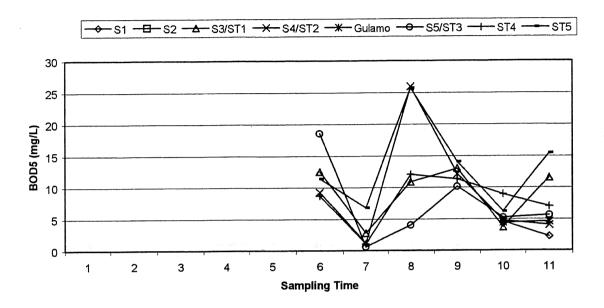
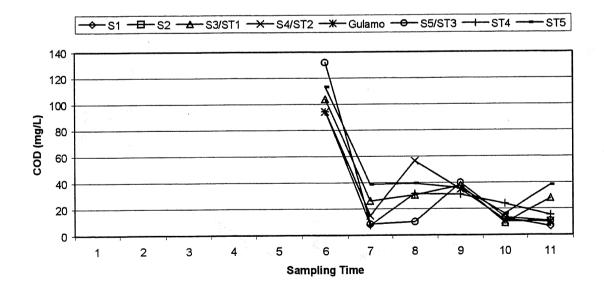


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Appendix 7

Health



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Appendix 7 Health

Table 7.1 Infant Mortality Rate and Under 5 Mortality Rate

And second one of the common		West	Ria	u	
	National	Total	50 Kota	Total	Kampar
Infant Mortality Rate (per	41.44*	47.35	Na	31.27	Na
1000) Under 5 years old Mortality	81	81	Na	72	Na
Rate (per 1000)					

^{*} data from 1997, **data from 1993

Data source: Health Profiles of Republic of Indonesia, Riau Province, West Sumatra Province, Kampar Regency, and 50 Kota

Table 7.2 Rate of Protein-Calorie malnutrition in infants (%) (2000)

	West Sun	natra	Riau				
National	Total	50 Kota	Total	Kampar			
20.7	14.2	17.38*	2.68	2.38			

^{*} data from 1999

Data source: Health Profiles of Republic of Indonesia, Riau Province, West Sumatra Province, Kampar Regency, and 50 Kota

Table 7.3 Population and Annual Morbidity Rate of Malaria in the Areas Near the dam and Distant from the Dam (per 1000), (1997-2001)

	Population	1997	1998	1999	2000	2001
Distant from the dam in W. Sumatra	22,114	NA	NA	0.1	0.3	NA
Near the dam in W. Sumatra	3,411	16.71	NA	11.1	13.78	NA
Distant From the dam in Riau	105,147	NA	NA	2.5	3.2	3.4
Near the dam in Riau	39,816	NA	NA	NA	NA	11.56

Data source: Health Centers

Table 7.4 Monthly Morbidity rate of Malaria (per 1000) in the areas near the dam and Distant from the Dam (2001)

2001	Jan	Feb	Mar	April	May	June	July	Aug.	Sep	Oct	Nov	Dec
	Juli	100	27222				-					
Near the dam in W. Sumatra	1.17	0.88	1.17	NA	1.17	NA	0.88	0.88	1.47	0.00	1.47	0.00
Distant from the dam in					19							0.00
W. Sumatra	0	0	0	0.00	0.09	0	0.00	NA	0.00	0.00	0.00	0.00
Near the dam in Riau	0.55	1.23	1.11	0.65	1.26	1.23	0.68	0.90	0.90	0.88	1.33	0.83
Distant From the dam in										0.05	0.22	0.20
Riau	0.18	0.25	0.33	0.33	0.40	0.37	0.23	0.22	0.19	0.35	0.23	0.28

Figure 7.1 Monthly Morbidity rate of Malaria(Per 1000) in the areas near the dam and Distant from the dam (2001)

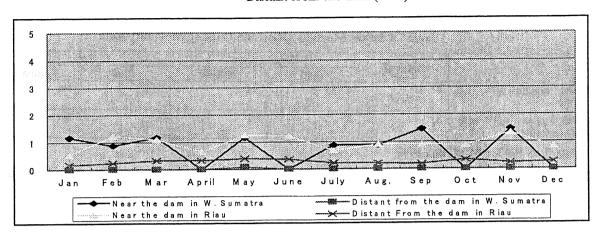


Table 7.5 Monthly Morbidity rate of Malaria (per 1000) in the areas Near the dam and Distant from the Dam (2000)

2000	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Near the dam in W.												
Sumatra	0.88	2.05	2.05	1.17	0.00	2.05	0.59	1.47	0.88	0.00	1.47	1.17
Distant from the dam in												
W. Sumatra	0.05	0.00	0.05	0.09	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Near the dam in Riau	NA	NA	NA	0.33	0.50	NA	0.90	0.68	NA	NA	NA	NA
Distant From the dam in												
Riau	0.37	0.30	0.13	0.20	0.16	0.31	0.19	0.29	0.34	0.33	0.30	0.25

Figure 7.2 Monthly Morbidity rate of Malaria (per 1000) in the areas near the dam and Distant from the Dam (2000)

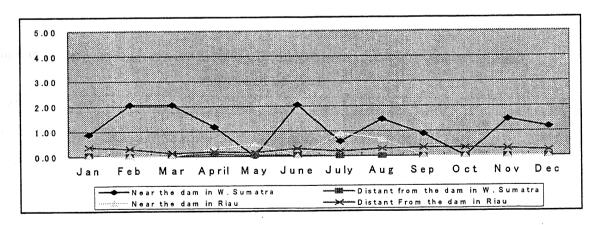


Table 7.6 Monthly Morbidity rate of Malaria (per 1000) in the areas near the dam and Distant from the Dam (1999)

1999	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Near the dam in W.		1 47	1 17	1.17	1 17	0.88	0.59	1.17	1.76	0.00	0.59	0.00
Sumatra	1.17	1.47	1.17	1.17	1.17	0.88	0.57	1.17	1.70	0.00	- 5.67	
Distant from the dam in W. Sumatra	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
Near the dam in Riau	NA	0.18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Distant From the dam in		0.25	0.10	0.00	0.20	0.20	0.16	0.23	0.16	0.15	0.29	0.19
Riau	0.25	0.25	0.10	0.09	0.38	0.28	0.10	0.23	0.10	0.13	0.27	0.17

Figure 7.3 Monthly Morbidity rate of Malaria (per 1000) in the areas near the dam and Distant from the Dam (1999)

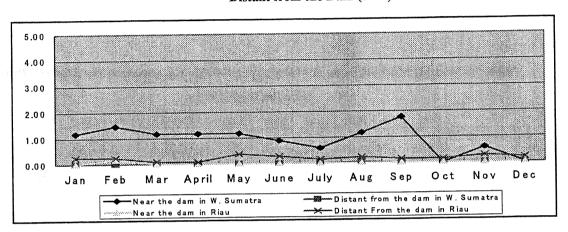


Table 7.7 Monthly Morbidity rate of Malaria (per 1000) in the areas near the dam and Distant from the Dam (1998)

1998	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Near the dam in W. Sumatra	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00
Distant from the dam in W. Sumatra	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Near the dam in Riau	0.50	0.45	0.30	0.38	1.00	0.10	0.23	0.20	0.20	NA	0.13	0.30
Distant From the dam in Riau	NA	NA	NA	0.13	0.10	0.11	0.23	0.16	0.21	0.32	0.26	0.22

Figure 7.4 Monthly Morbidity rate of Malaria (per 1000) in the areas near the dam and Distant from the Dam (1998)

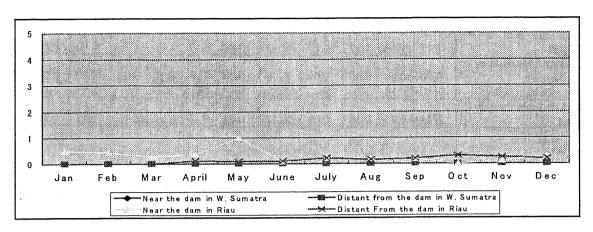


Table 7.8 Monthly Morbidity rate of Malaria (per 1000) in the areas near the dam and Distant from the Dam (1997)

1997	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Near the dam in W. Sumatra	0.88	1.76	0.59	7.92	0.00	3.52	0.00	0.00	0.00	0.88	0.59	0.59
Distant from the dam in W. Sumatra	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Near the dam in Riau	NA	0.43	0.43	NA	0.18	0.45	NA	0.40	NA	0.50	0.28	0.25
Distant From the dam in Riau	0.29	0.20	0.20	NA	0.25	0.17	0.14	0.10	0.15	NA	0.16	0.19

Figure 7.5 Monthly Morbidity rate of Malaria (per 1000) in the areas near the dam and Distant from the Dam (1997)

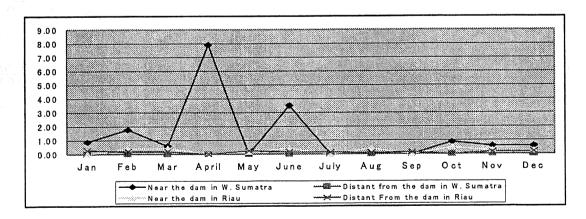


Table 7.9 Monthly Morbidity Rate of Malaria in Rimbo Datar 1994-2001 (per 1000)

	Jan	Feb	Mar	April	May	June	July	Aug.	Sep	Oct	Nov	Dec
1994	NA	NA	NA	NA	NA	NA	NA	NA	0.00	0.29	0	0.29
1995	0	0	0	0.59	0	0	0	0.59	0.29	0	0.59	NA
1996	0.29	0.29	0.59	0	0.29	0.29	0.29	0.29	0	NA	NA	0.29
1997	0.88	1.76	0.59	7.92	0	3.52	0	0	0	0.88	0.59	0.59
1998*	0.59	NA	0.88	0.29	0.29	0	0	0	0	0	0	0
1999	1.17	1.47	1.17	1.17	1.17	0.88	0.59	1.17	1.76	0	0.59	0
2000	0.88	2.05	2.05	1.17	0	2.05	0.59	1.47	0.88	0	1.47	1.17
2001	1.17	0.88	1.17	NA	1.17	NA	0.88	0.88	1.47	0	1.47	0

Data source: Rimbo Datar Health Center

Figure 7.7 Monthly Morbidity Rate of Malaria in Rimbo Datar (1994-2001)

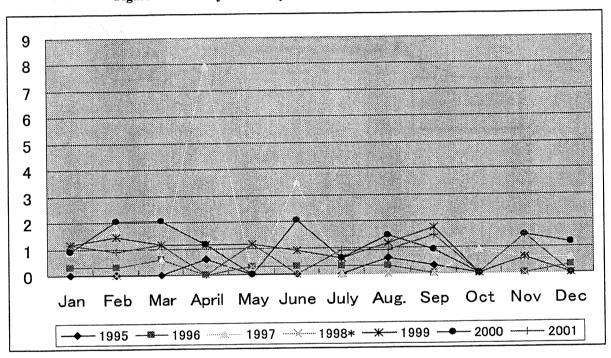


Figure 7.8 Mosquito's life cycle, malaria infection cycle and its countermeasures

