

**Terms of Reference for a Collaborative Agreement between the
Faculty of Agricultural Technology of Gadjah Mada University and the
International Irrigation Management institute**

**STUDY OF ROTATIONAL IRRIGATION
IN MANEUNGTEUNG IRRIGATION SYSTEM,
WEST JAVA**



H040336

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Study of Rotational Irrigation in Maneungteung Irrigation System, West Java

Background

In 1988-89, the Faculty of Agricultural Technology of Gadjah Mada University (hereafter referred to as GMU), the West Java Provincial Irrigation Service and the International Irrigation Management Institute (hereafter referred to as IIMI) conducted collaborative research on rotational irrigation in the 7,611-ha East Maneungteung irrigation scheme, which is located in the Cirebon District of West Java, on the north coast near the border with Central Java. The scheme takes its water from the last diversion along the Cikeusik river.

The study examined the existing dry season rotational arrangement and assessed it accordingly to its requirements for staff time, control and measurement tasks, its compatibility with existing infrastructure, and its effects on efficiency and equity of water distribution and cropping intensity. The study team also did canal inspections four times per week (2 daytime and 2 nighttime inspections) and compared how the water was actually distributed with the official plan. After analysing data from the 1988 dry season, the study team identified four alternative rotational arrangements which differed according to their management requirements, compatibility with infrastructure and effects on efficiency and equity.

Farmer representatives and irrigation scheme managers selected one of the alternative arrangements and this was implemented in the 1989 dry season. The study team then carried out similar inspections and compared how the water was actually distributed with the official plan. Actual management requirements, compatibility with infrastructure and effects of the new procedure on efficiency and equity were assessed. During the pilot experiment, farmers deployed night watch groups to guard water distribution, put flags up to notify others about which canals should receive water on what days and arranged for the rotation turns to change at midday instead of midnight.

Objectives

It is not known whether the new rotational arrangement and farmer participation was continued after 1989 in each dry season until the present or whether it has been changed. The purpose of this proposed study is to determine whether the pilot rotation was continued or changed since 1989 and if it has been changed, to determine by whom, for what reasons and with what effects on performance. Performance measurements include :

- * efficiency and equity of water distribution,
- * spatial distribution of cropping intensity, diversification and yields,
- * time and cost requirements for staff and farmers and
- * proximity of actual implementation to the official plan.

Responsibilities and Rights of GMU

1. The GMU will be a member of the Study Team (together with IIMI and possibly representatives of the West Java Provincial Irrigation Service). The Study Team will oversee design and execution of the Study.
2. The GMU will form a Research Team to be the primary implementing group for the Study. The Team will consist of senior members of the Faculty of Agricultural Technology and students or other field workers contracted and supervised by Research Team leaders.
3. The Research Team will obtain all necessary approvals and permits and make all necessary logistical arrangements for implementation of the Study.
4. The Research Team will be responsible for data collection for the Study. Data collection will begin in early July or as close to the beginning of the 1997 dry season rotational irrigation period as is possible. It will continue until the end of the 1997 dry season rotational irrigation period. Data collection will include making field inspections four times per week of all canals which have water in them at the time of the inspection. Two of the inspections will be conducted during the daytime and two will be conducted late at night. Each inspection will be timed and conducted to be completed within a single rotation turn, so as to not cross over the time boundary between two different rotation turns.

The Research Team will also collect data on the following:

- the official rotation plan,
- spatial identification of where the water is going (canals and blocks),
- spatial identification of all cases of unofficial manipulation of water distribution, including location of beneficiaries of such manipulations,
- key informant farmer perceptions of the rotational arrangement and the role of farmers in the matter,
- staff and farmer management inputs for implementing the rotation,
- compatibility between rotation arrangement and spatial distribution of control structures,
- conveyance efficiencies,
- water distribution equity,
- spatial distribution of cropping intensity, patterns, yields and area irrigated,
- Relative Water Supply and Relative Irrigation Water Supply, daily at the headworks and selected downstream locations.

5. The Research Team will be responsible for checking, correcting, entering, organizing and processing data. It will also do at least the first round of data analysis and production of essential tables, charts and statistical analyses.
6. The Research Team will send short progress messages (about 1 page) to IIMI via email or fax at least once a month. It will coordinate with IIMI in organizing a final research

report and will prepare a report in Bahasa Indonesia within four months of the end of the 1997 dry season rotational irrigation period.

7. The GMU will have the right to keep and utilize data collected in the Study as it sees fit. It has the right to publish papers from the Study either by its own staff or in co-authorship with IIMI staff. In all cases, proper written recognition should be made of the role of IIMI and its financial sponsors of the Study.

8. At the end of the Study, GMU will provide a short summary of the budget expenditures and a brief written report (of about 2-3 pages) explaining what activities were implemented in the Study and what is the current and anticipated output. This should be submitted to IIMI within four months of the end of the 1997 dry season rotational irrigation period.

9. GMU will provide US \$3,000 towards the total cost of the Study, which is estimated to be US \$8,000.

Responsibilities and Rights of IIMI

1. IIMI will be a member of the Study Team (together with GMU and possibly representatives of the West Java Provincial Irrigation Service). The Study Team will oversee design and execution of the Study.

2. Dr. Douglas Vermillion will be primarily responsible for this study in IIMI's behalf. Ian Makin will also provide inputs in the form of advice and technical editing of a final report. Dr. Vermillion will visit the research site at least once to help design and initiate Study activities.

3. IIMI will closely interact with the Research Team at GMU and review and advise on all methodological issues as needed, including organization of data collection, sampling, inspections, data recording, data analysis, design of presentational output and preparation of research reports.

4. IIMI will take primary responsibility for preparing the final IIMI Research Report, in collaboration with the Research Team.

5. IIMI will retain the right of access to and control over a total set of data collected in the Study and will have the right to produce and publish papers from the Study either by its own staff or in co-authorship with GMU staff. In future publications, IIMI will give due recognition to the inputs of the GMU Research Team and the financial sponsors of the Study.

6. IIMI will disburse to GMU US \$5,000 towards the total cost of the Study.

Disbursement of Funds

IIMI will transfer US \$5,000 to a designated official GMU bank account in two installements as follows:

1. first installment of \$2,500 to be transferred one month after initiation of field research activities by the GMU Research Team.
2. second and final installment of \$2,500 to be transferred upon completion of the first round of data analysis and preparation of a final report in Bahasa Indonesia.

Standard Provisions

1. Allowable Costs The GMU shall be reimbursed for costs incurred in carrying out the purpose of this collaborative agreement which are determined by IIMI to be reasonable, allocable and allowable in accordance with the terms of this collaborative agreement.
2. Reasonable Costs shall mean those costs that do not exceed those which would be incurred by an ordinarily prudent person in the conduct of normal business.
3. Unallowable Costs Unallowable costs, direct or indirect, include but are not limited to the following examples: advertising, bad debts, contingencies, entertainment, fines and penalties, interest, fund raising, investment management costs, losses on other award, taxes, first class air fare unless specifically approved. Additionally, public information service costs are unallowable as indirect costs.

Prior to incurring a questionable or unique cost, the GMU should obtain the written determination of IIMI's Director of Finance and Administration as whether the cost will be allowable.

4. Accounting, Audit and Records The GMU shall maintain books, records, documents, and other evidence in accordance with GMU's usual accounting procedures to sufficiently substantiate charge to the collaborative agreement. These records shall be maintained for three years after final payment. These records may be audited by IIMI's representatives.

The GMU agreed to have the funds provided under the grant audited by an independent auditor during the course of GMU's normal annual audit. Copies of GMU's audit reports will be provided to IIMI. If the audit coverage is not sufficient to verify the source and application of grant funds or the audit does not meet the requirements of an independent audit, a second audit will be requested of the GMU and that audit shall meet the requirements of IIMI.

5. Termination and Suspension


- a. For Cause - This collaborative agreement may be terminated for cause at any time, in whole or in part, by IIMI's Director General whenever it is determined that the GMU has failed to comply with the conditions of the collaborative agreement.
 - b. For Convenience This grant may be terminated for convenience at any time by either party, in whole or in part, if both parties agree that the continuation of the grant would not produce beneficial results commensurate with the further expenditure of funds. Both parties shall agree upon termination, the portion to be terminated. The agreement to terminate shall be set forth in a letter from the IIMI's Director General to the GMU.
 - c. Suspension: Termination for Changed Circumstances - If at any time IIMI determines that continuation of funding under this collaborative agreement should be suspended or terminated because such is not in the interest of IIMI or the GMU, suspend this collaborative agreement and prohibit the GMU from incurring additional obligations chargeable to this collaborative agreement other than necessary and proper costs of suspension. If the situation causing the suspension continues for 60 days or more, then IIMI may terminate this collaborative agreement on written notice to the GMU and cancel that portion of this collaborative agreement which has not been disbursed or irrevocably committed to third parties.
 - d. Termination Procedure - Upon receipt of and in accordance with a termination notice as specified in either 1, or 2 above, the GMU shall take immediate action to minimize all expenditures and obligations financed by this collaborative agreement and shall cancel such unliquidated obligations whenever possible. Except as provided below, no further reimbursement shall be made after the effective date of the termination. The GMU shall within 30 calendar days after the effective date of such termination repay to IIMI all unexpected IIMI funds which are not otherwise obligated by a legally binding transaction applicable to this collaborative agreement. Should the fund paid by IIMI to the GMU prior to the effective date of the termination of the collaborative be insufficient to cover the GMU's obligations in the legally binding transaction, the GMU may submit to IIMI within 90 calendar days after the effective date of such termination a written claim covering such obligations. IIMI's Director for Finance and Administration shall determine the amount(s) to be paid by IIMI to the GMU under such claim in accordance with the applicable cost principles.
6. Disputes Any disputes under this collaborative agreement shall be resolved by IIMI's Director General or his nominee in consultation with Rector of GMU or his nominee.

7. Amendments This collaborative agreement, together with its attachments, constitutes the entire agreement between IIMI and GMU and shall not be modified or contradicted by any prior or contemporaneous negotiations, representations or agreements, either written or oral. This agreement may be amended only by a written instrument by each party.

Agreement

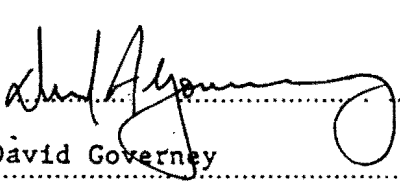
The above terms of reference are hereby acknowledged and agreed to by the following representatives of the University of Gadjah Mada and International Irrigation Management Institute.

Representative of Gadjah Mada University:

Signed:  Date: 2/8/1997
Name: SUPRODJO PUSPOSUTARDJO

Position: Dean of Faculty of Agricultural Technology, Gadjah Mada University

Representative of the International Irrigation Management Institute:

Signed:  Date: 29/8/97
Name: David Governey

Position: Director General or Acting Director General of IIMI

Annex 1 Preliminary Work Plan

July 1997

Senior faculty members at GMU will organize a Research Team and hold their first meeting to plan division of tasks among members and prepare a more detailed work plan. In consultation with the Cirebon Provincial Irrigation Service (Dinas Pengairan, Cirebon), the Team will obtain necessary approvals and permits for the Study and will deploy at least three field staff in the East Maneungteung Irrigation System by the beginning of the 1997 Dry Season rotational irrigation period, or as soon thereafter as is possible.

Field data collection will then begin immediately, with the conducting of four scheme inspections per week. The Research Team will select strategic sample locations to make daily measurements of discharge. Key informant interviews will be held with Dinas Pengairan and scheme-level staff about the current official rotational arrangement and how and why it has changed since 1989. Secondary data collection on water supply, cropping patterns around the scheme, faktor-k levels, etc. will begin. The Research Team will prepare a color-coded situation map (using an existing base map) which identifies the spatial configuration of rotation blocks. Summary data will be prepared which describes the location, service area, area by crop type and irrigation requirement for each rotational block.

Field researchers will attend meetings which are held to plan and discuss the rotational irrigation arrangement. They will make a concise written record of the number of participants (Pengairan staff, other government staff, and farmer representatives) and key issues discussed, the perspectives of different stakeholders about dry season rotational irrigation and what key decisions were made (and for what reason).

August 1997

Data collection will continue and data checking and correcting and entry of data onto computer diskettes will begin. Additional key informant interviews will be conducted with farmer representatives in different parts of the scheme to obtain their views about rotational irrigation and how and why it has changed over the past eight years. Research staff will begin to estimate the number of gates per rotation turn which need to be checked and adjusted and the staff and time requirements involved.

September 1997

Data collection, checking and correcting and entry onto computer diskettes will continue. Key informant interviews will be held. Qualitative field notes from interviews and meetings will be summarized and categorized by type of theme or issue.

October 1997

According to the weather and as long as the 1997 Dry Season rotational irrigation continues, data collection, checking and correction and entry, interviews with informants and record-keeping of relevant meetings will be conducted. Preliminary data analysis will begin.

November 1997

Data analysis will be conducted immediately following the end of the Dry Season rotational irrigation period. Through a return visit to the field or correspondence, the Research Team will convey preliminary findings to Pengairan staff at the Maneungteung scheme and make inquiries from local key informants about interpretations of the findings. The Research Team, in collaboration with IIMI staff, will prepare an outline for the final report and begin writing.

December 1997

Data analysis will be completed and the Research Team will focus on writing a preliminary draft final report in Bahasa Indonesia and/or English. IIMI staff will assist with some data analysis tasks and will begin work on writing the draft final report in English.

January--February 1998

All necessary revisions will be made in the Indonesian and English versions of the final research report and second draft copies of research reports will be completed. The Bahasa Indonesia final report will be produced and disseminated. IIMI will conduct internal and external reviews of the research report and will submit the paper for publication as an IIMI Research Report.

Annex 2 Budget

(Figures in current Indonesian rupiah, with totals in US dollars)

I. PREPARATION

1. Transp. Ygy-Crb.	: 3prs x 3 tms x Rp. 100.000,-	= Rp.	900.000,-
2. Local transport	: 3tms x Rp. 100.000,-	= Rp.	300.000,-
3. Lodging	: 3prs x2days x 3tms x Rp. 75.000,-	= Rp.	1.350.000,-
4. Food	: 3prs x2days x 3tms x Rp. 10.000,-	= Rp.	540.000,-
		-----	Rp. 3.090.000,-

II. FIELD WORK

2. Motor bikes	: 2bikes x 2 months x Rp. 300.000,-	= Rp.	1.200.000,-
3. Fuel	: 2bikes x 150 lt x 2 months xRp.700,-	= Rp.	420.000,-
		-----	Rp. 1.620.000,-

III. LODGING

3. Researchers	: 3prsx2months x2tmsx3daysxRp.60.000,-	= Rp.	2.160.000,-
4. Data Collectors	: 4prs x 2months xRp. 300.000,-	= Rp.	2.400.000,-
		-----	Rp. 4.560.000,-

IV. FOODS

4. Researchers	: 3prsx2monthx2tmsx3daysx3tmsxRp10.000	= Rp.	1.080.000,-
5. Data Collectors	: 4prsx2monthx30daysx3tms xRp.10.000,-	= Rp.	7.200.000,-
		-----	Rp. 8.280.000,-

V. OFFICE SUPPLIES

5. Papers, disket, copy, telecommunication		= Rp.	500.000,-
6. Computer	: 1 x 3months xRp. 250.000,-	= Rp.	750.000,-
		-----	Rp. 1.250.000,-

VI. REPORT AND MATERIALS

6. Papers	: 30 ex.x50pages xRp. 50,-	= Rp.	75.000,-
7. Binding	: 30 ex. X Rp. 5000,-	= Rp.	150.000,-
		-----	Rp. 225.000,-

Rp. 19.025.000,-

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(app. US\$ 8.000,-)

Total provided by GMU	\$3,000
Total provided by IIMI	\$5,000
Total budget	\$8,000
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