GUIDELINES FOR RAPID APPRAISAL OF IRRIGATION SYSTEMS EXPERIENCE FROM NEPAL

Prachanda Pradhan, Robert Yoder, and Ujjwal Pradhan[1]

THE UTILITY OF RAPID APPRAISAL

Given constraints of time, money, and manpower, rapid appraisal is a useful tool for assessing existing irrigation systems. It can be used to identify key issues and problem areas and to give direction for further investigation. The effort of rapid appraisal should lead to a wide variety of options and possible alternative arrangements for irrigation management.

The "quick and dirty image" often associated with rapid appraisals can be overcome with a well-developed framework and a team that is integrated in its effort. Intensive interaction of the team while in the field leads to cross-checking of information and an opportunity for follow-up questions.

One must recognize that rapid appraisal has limitations. Not all questions can be answered by it. Complex issues cannot be unraveled in a short time. Some results and conclusions will inevitably be wrong. Increased skill in cross-checking can reduce this problem but there is always danger that the investigator will be misled by one or a few informants. It is important to examine rapid appraisal results within the context of its limitations.

This guideline for rapid appraisal of irrigation systems was largely prepared on the basis of experience with farmer-managed irrigation systems in Nepal. With some modification it could be used to investigate agency-managed systems as well.

INTRODUCTION TO RAPID APPRAISAL

Agrarian change and agricultural development are quite intimately associated with the status of irrigation in Nepal. Irrigation systems are complex socio-technical units, and development activities have directly and indirectly affected the status of these systems. Due to resource constraints of a developing country, a detailed and in-depth study of each irrigation system under consideration is not possible. This is certainly not possible in Nepal where it is estimated that there are between 20,000-50,000 irrigation systems.

Effective rapid appraisal studies cannot be conducted by simply putting together a comprehensive question guide and taking it to the field for systematic investigation. Before a team goes to the field it is important that each member understand "what" the nature of a rapid appraisal study is, "why" rapid appraisal methods have been selected, "how" it will be applied, and what the nature of the "product" of the study will be.

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[1]Prachanda Pradhan and Robert Yoder are resident scientists in Nepal for the International Irrigation Management Institute (IIMI). Ujjwal Pradhan is a research fellow affiliated with IIMI and Cornell University.

What Is Rapid Appraisal?

Rapid appraisal is a methodology for collecting information quickly. Appraisal is used in the general sense to mean investigation and analysis, and primary attention is given to practical investigation. Since the time-frame for field investigation is shortened, there is an attempt *to* compensate by intensive preparation and carefully planned procedures in the field. It is particularly well-suited for studies of irrigation systems since there is usually more than one system to examine, and time, funds, and skilled manpower are often a constraint to conventional studies. The output of rapid appraisal studies is generally a report for a specific purpose. The purpose **for** the study must be well defined in advance. The study is usually carried out by an interdisciplinary team.

Why Use Rapid Appraisal?

A rapid appraisal study can be used for various purposes. In some cases it can be used as a way to identify and describe systems for which there is no written documentation. It can be used to assess the physical system and problems associated with it such as identifying the need for rehabilitation. It can be used to assess the organizational strength and weaknesses of a system. A study can be used to lay out the socio-technical processes involved in the operation **of** a system and this information used to solicit participation in organizational activities **or** collaborative resource mobilization for improving the system. The utility of rapid appraisal methods will vary depending on the type and depth of information that is needed and how the results are to be used.

A series of rapid appraisal studies can be used to provide a comparative picture of irrigation operation across systems. By identifying pertinent variables such as maintenance labor mobilized per hectare, sanctions for water theft, leadership roles, etc., it is possible to make cross system comparisons and in some cases rank the strengths and weakness **of** each system.

A general picture of a single system or a comparative understanding of a series of systems helps decision makers focus on key issues. It might point toward the need for more in-depth research or identify the physical areas or social interactions that require further study. It may thus be a tool for identifying further research needs.

How to Undertake Rapid Appraisal?

Since irrigation is multidimensional with interacting physical, biological, and social environments, an interdisciplinary team has a definite advantage. This assumes, however, that the team will work together and interact: it is an ideal that cannot be taken for granted. A balance is needed among the team members to insure that the necessary multitude of perspectives are properly integrated and incorporated into the report.

There should be a conscious effort to cover the range of disciplines needed to understand the complex interaction of the biological, social, and physical environments. A valuable contribution that should not be overlooked is the opportunity for cross-fertilization of research methods among the different disciplines represented on the team.

Unstructured, small-group interviews and careful observation are powerful tools for collecting accurate information and should be used as much as possible. Interviews should be conducted with a checklist to ensure that the

important points are not missed. Open-ended discussion should be encouraged by avoiding formal questionnaires. Since time is a factor in rapid appraisal, choose a guide who knows the people and is familiar with the part of the system to be visited. This will assist in moving about and meeting key informants, allowing for rapid investigation. Use maps or aerial photos to select locations and pick out key categories of information to determine which people to visit. Key infcrmants to interview should be selected for their specialized knowledge: irrigators (head, middle, and tail), women, agriculture workers, and project staff. When different versions of issues are given by different informants, they must be interpreted from the perspective of the different interests within the community. On sensitive issues one must be careful to remain neutral.

For many irrigation systems in Nepal, what one sees in the field visit will be dependent upon the time of the year. Some systems are not operating in the dry season. Most systems have been built for irrigating monsoon rice. It would be desirable to visit them during the monsoon even though that is the time when travel is most difficult. If a system is visited while it is not operating one must look for clues to how the system might function. For example, the cropping pattern and the extent and location of fallow land would lead to questions about water adequacy and the management of distribution. The logic for type and location of physical structures like aqueducts, siphons, and gates, or lack of structures, are easier to understand if the system is seen in operation but can also be visualized by imaginative questioning.

Preparatory steps before a rapid appraisal study. Gathering all available information such as maps, previous reports and air photos, is the logical way to begin any study. To become familiar with the study area, there is no substitute for desk work. If a large area or large number of systems are assigned for study, it may be necessary to do a reconnaissance. It is not necessary that all team members participate in this step. One or two persons can do the reconnaissance. The purpose of the reconnaissance is to help in selecting, or limiting, the type and number of systems for further study. It should give an overview of the situation and the reconnaissance report should provide valuable background material for briefing the team.

Formation of the team. For irrigation studies it is useful to have at least a mix of four disciplinary skills on the team--organizational, cultural/social, technical, and agronomic. However, even more important than the disciplinary mix is mutual respect and an attitude and desire to learn from each other's point of view. Three to six members on a team allow easy interaction and discussion. If a portable computer is available, an experienced typist with the team in the field would help reduce the drudgery of writing and speed up the report writing.

Rapid appraisal activities. There should be an organizational meeting where information is shared and roles for the study are established. A team leader should be selected to assign tasks: logistics, public relations, scheduling. All of the background material available should be shared among all of the team members. There should be discussion about the purpose of the study and the format of the report. The checklist or question guide should be discussed and amended by consensus. It is useful if this checklist can be arranged in the desired outline for the field notes. This facilitates merging each individual team member's notes into one complete set of comprehensive field notes containing all observations and data collected. Such a set of notes can be more easily checked for consistency than each member's separate complete set of

notes. A sample checklist that doubles as an outline for merging the field notes is included in Appendix 1.

A useful exercise for the team in the first meeting would be to discuss the interaction of the various irrigation activities. This would help to underscore the need for different perspectives to establish a comprehensive Understanding of the irrigation system and how it operates. A matrix showing the interrelationship of organizational, physical and water use activities is given in Appendix 2. This matrix could be used to facilitate discussion.

If at all possible the team should be resident in the command area while in the field. There should be as much interaction as possible with farmers on an informal basis. The team must be disciplined in not displaying authoritative behavior. They should answer questions asked by farmers about the reason for the study as soon as they are raised with as much detail as necessary but without giving false assurances about assistance. Sensitivity about intruding upon the farmer's time is important. Food and services should be paid for.

The team should travel through the system together the first time (walking, if possible) to share observations and jointly conduct farmer interviews. Then the group should break into smaller units of two or three for subsequent visits. Useful suggestions from Chambers and Carruthers (1986) for offsetting frequent appraisal biases while carrying out field work are given in Table 1.

In addition to writing notes in the field (while observing the system and discussing with informants), the team members should spend time alone each day rewriting the notes according to the agreed-upon outline and making certain the notes are complete. If a typist is part of the field team the team members should have these rewritten field notes entered into the word processor. The emphasis should be on simple statements and phrases rather than polished sentences and paragraphs in order to record the raw data quickly and make it available for discussion with the rest of the team.

The most important group activity is to have frequent meetings to share and discuss what has been measured, observed, and heard. Different and contradictory points of view need to be aired and hypotheses formulated for testing in order to identify gaps in understanding and interpretation. This intensive discussion will help the team to comprehend the relationship among the physical, social, and agronomic environmenta. The group discussion sessions will generate new questions to be taken back to the field on the next visit.

Before leaving a system it is essential that each team member's notes be compiled into a master note file according to the agreed-upon outline. This can be done by each team member or one individual and is greatly facilitated by having a typist and computer in the field. Even though doing it by hand is time consuming and difficult when a computer and typist are not available, it improves accuracy and ease in report preparation later. The master note file assures that discussion of each point has taken place and discrepancies resolved before leaving the opportunity to ask a few final questions or make additional observations in the field. Analysis of the information while compiling the master note file allows weeding out of misleading information. It also assures that all of the information of one system has been processed before moving on to another system with the possibility of getting the two systems mixed and confused.

Table 1. Offsetting appraisal biases.

Source Bias	What to do
Visiting only head reaches and traveling canal roads by car.	Go to the tails and off the roads: walk around.
Examining the distribution system. Visiting only during working hours and in daylight.	Look at the drains. Go before and after working hours, and at night.
Making only one visit, or visiting at the same time each season. seasons.	Inquire about the situation at other times, and in other
Observing only physical works such as headworks, canals, cross regulators, and gates.	Find out about process--distribution, communication--and meet people.
Visiting only demonstration trials or special projects.	Visit fanners lower down the same channel who may get less water because of a trial or project.
Meeting only the elite: staff, better-off farmers, influential people, and men.	Make an effort to meet poorer fanners, laborers, and women.
Blaming farmers for misusing the system.	Find out why farmers do what they do.
Telling people what they should do.	Listen to people and learn from them.
Visiting people hurriedly.	Plan to spend more time and be patient with people.

Source: Chambers, Robert and Ian Carruthers, 1986. Rapid appraisal to improve canal irrigation performance: experience and options. IIMI Research Paper No. 3, IIMI, Digana Village, Sri Lanka.

THE PRODUCT OF RAPID APPRAISAL

The product of rapid appraisal is a report which reflects a well-integrated team effort. The integration begins with the organizational meeting when tasks and roles are assigned and continues in the field as notes of discussions are compiled. The effectiveness of rapid appraisal is due to the team effort and utilization of input from all team members on all issues.

The style of the report should reflect the purpose for which the information is intended to be used. If the primary purpose is identification and description of systems, the report will be mostly narration. However, if comparison of systems is planned, the variables to be compared should be identified before the report is written so that the material to be compared in different reports is presented in an identical format and is easily found in each report.

The structure of the final report should be decided by the group and does not need to follow the organization of the question guide. To ensure continuity in style and content it is best if one person writes the first draft of the report. The report should contain appropriate maps and sketches of important features. If possible, photos should be included to assist in communicating the information that has been collected.

Under constraints of time, finances, and manpower, rapid appraisal is a useful tool for compiling information that can only be acquired through field studies. Experience and skill in cross-checking are necessary to reduce the errors often associated with rapid appraisals. This requires a well developed framework and an integrated team effort.

APPENDIX 1

RAPID APPRAISAL CHECKLIST

I. INTRODUCTION

A. Arta overview

-Location: zone, district, village panchayat, ward.
-Access to the system.
-Access to support services and markets.
-Physical information of the surrounding area.
-Food sufficiency.
-Labor availability in each season: daily wage, contract.

B. Settlement pattern of surrounding area

-History of settlement.
-Population.
-Milestones in agricultural development (establishment of support services, introduction of new crops, etc.).
-In- and out-migration patterns.
-Ethnic composition.

C. History of the surrounding area's irrigation development

-Map or sketch including the following for each system: relative location, water source, diversion point, command area, name.
-For each system: type (hill, river valley,or tarai), management (agency, farmers, **or** joint).

II.HISTORY OF THE SYSTEM

A. Original construction

-When?
-Who initiated and directed?
-Amount and source of resources invested: cash, labor, materials.
-Basis for internal resource mobilization: household, landholding.
-External resources.

B. Improvements/rehabilitation

-Other than routine maintenance, when have major inputs and improvement8 been made?
-Who initiated? When? What was done?
-Internal **or** external resources.
-Basis for internal resource mobilization.
-Are there regular external resources given?

C. System expansion

-How have boundaries **of** system changed over time?

-Have new settlers (authorized or unauthorized) been allowed to join?
-Have segments of the system left?
-Has there been amalgamation, incorporation of systems?

III. DESCRIPTION OF THE SYSTEM

A. The physical system

1. Hydrology

-Source(s) of water.
-Catchment area.
-Rights to water in source: upstream and downstream systems.
-Seasonal variation of water supply at extraction point.
-Discharge in canal at extraction: maximum and minimum for each crop.
-Flood frequency.
-Drought frequency.
-Water quality: salt, lime, etc.
-Other uses of water: power, fire protection, animals, etc.
-Water constraints **to** expansion/intensification of irrigation.

2. Canals: main and branch

-Type **of** construction, materials, quality, and condition.
-Seasonal and long-term changes.
-Sketch or map of layout.
-Distance from source to first fields.
-Length of main canal in command area.
-Design capacity of main and branch canals.
-Density: including field canals (m/ha).
-Condition of rock and soil along alignment.
-Condition (specify in which season).

3. Structures

-Type of construction, materials, quality, and condition.
-Seasonal and long-term changes.
-Intake/diversion.
-Regulators: gates, fixed.
-***Cross*** drains.
-Aqueducts, siphons, drop structures.
-Measuring devices.
-Main turnouts: type, number.

4. Boundaries of the irrigated area

-Irrigated area for each crop.
-Changes in system over time: amalgamation, expansion, **or** loss.
-Limitation of expansion for each crop: physical, water rights.

5. Drainage

-In command area.
-Escapes from canals.

6. Soils.

-Type: head, middle, tail.
-Fertility and suitability for irrigated agriculture.

IV. OPERATION AND MAINTENANCE

A. Activity/problems

-Related to water acquisition: water rights, paucity of supply, damage from floods, etc.
-Related to water delivery: canal cleaning, landslide repair, flood damage, crabs, animals, seepage.
-Related to water distribution and drainage.
-Priority tasks in O&M: maintenance of diversion and canal or water distribution.

B. Water distribution tasks (Frequency and magnitude of effort)

-Method of water distribution for each **crop** and variation during each crop: rotation (who and how initiated, frequency of turn); continuous flow; contract; turns (head to tail).
-Distribution during water-short period: rotation among outlets, among field neighbors within outlet.
-Match between water distribution and allocation: method of matching, proportioning weir, timed rotation.
-Relationship of water distribution to physical infrastructure.
-Who is responsible for water distribution activities?

C. Routine maintenance

-What work is done.
-Frequency.
-Purpose: improve performance, preventive.
-How long does it take?
-Who initiates and directs work?

D. Emergency maintenance

-Reasons.
-Frequency.
-How long does it take?
-Who determines it is an emergency?
-Who organizes and leads the work?

E. Extent of agency involvement in system

-What agency is involved?
-Management input of agency.
-Agency organization for water delivery and O&M.

V. INSTITUTIONS AND SOCIAL ENVIRONMENT

A. Social structure

-Landholding pattern.
-Nature of tenancy (criteria: owner, tenant, sharecropper).
-Ethnic composition in the command.
-Villages.
-Settlement pattern and irrigation labor availability.
-Power structure (related to land and panchayat affiliations).
-Religion.
-Kinship pattern.
-Leadership: formal, informal,
-Migrants: where from, previous irrigation experience.
-Non-agriculture employment.
-Seasonal migration for employment.

B. Organization for irrigation operation and maintenance

1. Membership

-Criteria: land, water share, crop, tenancy, official panchayat position, contractual, ethnic (exclusions), gender, age, labor, investment input.
-Membership in other systems.
-Absentee members.

2. Roles and positions

-For each position include: method of nomination, appointment, tenure, remuneration (cash, in kind, labor exemption).

-Appointed functionaries.
Chairman.
Vice-chairman.
Secretary.
Treasurer, etc.
Water supply and/or system damage monitor.
Crier.
External communications.
Moderator of meetings.
Tool keeper,

-Committees: regular and ex officio.
-Informal leaders.
-Relationship of panchayat and political leadership to system.

3. Tiers of organization

-Federation/unitary.
-Central.
-Regional/distributory.
-Village/farm channel (mauja).

4. Meetings

-Regular: time, place, who calls.
-Extra.
-Purpose: resource mobilization, accounts, maintenance, conflict.
-Attendance: landlords, tenants, women.
-Penalty for not attending.
-Leadership: moderator, minute keeper, how selected.

-How are resolutions passed'? vote, consensus.
-Records of meeting.

5. Conflict and conflict management

-Cause, nature, frequency of conflict.
-Specific to cropping season?
-Internal or external to the system.
-Among systems.
-Non-water issues.
-To whom is first appeal for conflict resolution and what is the step-by-step procedure for difficult cases?
-What is handled within the organization and what is taken outside?
-Police cases.
-Court cases,
-Panchayat involvement.
-Rules and sanctions.
-Records of conflict resolution.

6. Water rights at system level

-Sharing with other system.
-Permit, rent, prior appropriation, riparian.
-Customary rights.
-Evidence of conflict among systems.

7. Water allocation (water righta of members within system)

-Rases for allocation principle: land area, soil, investment, purchased, traded.
-How does water allocation change with crop, level of water supply.
-Outside influence due to assistance.
-Dominance of one social group.

8. Internal resource mobilization

-Purposes for resource mobilization.
-Basis: same as water allocation, household.
-Type of resource: cash, labor, in kind (remuneration, etc.), animal, bullock cart, local knowledge.
-Organization to manage.
-Accounts of resources due and contributed.
-Annual quantity of each type of resource.
-Sanctions for not contributing.
-Annual amount realized from fines, how collected and used?
-What is consequence of not paying fine?
-Where are funds and in-kind resources held? Is there intermediate (short-term loans) use?
-Discrimination against contribution: caste, sex, age.
-What if family does not have male member?
-Contractual arrangements for maintenance: method, reason.
-Resource generating activity: mill.

9. External resources

-Purpose.
-Source: connections, contacts.

-Who (person) initiated contact with outside agency, incumbent or previous experience in government position.
-Frequency.
-Type: cash, food-for-work, cement, gabion wire, technical advice.
-Equipment: bulldozer, jackhammer.

C. Organizational development.

-Changes over time in: rules, roles, resource mobilization, processes for electing functionaries, etc.
-Changes in decision-making process.
-Process of allowing new outlet from main canal.
-Terms and conditions of external agency for providing aid and resolving conflict.
-Change in involvement of panchayat or district offices.
-Changes in relationships with other systems: water sharing when temporary damage in canal, sharing resources *for* maintenance.

VI. DESCRIPTION OF THE AGRICULTURAL SYSTEM AND SERVICES

A. Agricultural system

1. General

-Main crops.
-General condition of crops.
-Cropping pattern (provide a rough sketch map indicating the crops growN in different locations).
-Crop calendar.
-Cropping intensity.
-Estimated yield.
-Change in agricultural practices in past 25 years: new crops, varieties, technology.
-Mechanization vs. labor-intensive system.

2. Production inputs

-Use of improved of seed.
-Use of fertilizer.
-Extension services (types, training, production campaign).
-Price of inputs.

3. Agricultural practices

-Land preparation methods.
-Use of manure, fertilizer.
-Broadcasting or transplantation.
-Yield per crop.
-Total yield per year.
-Prices and marketing.

VII. SYSTEM STRENGTH AND WEAKNESS

A. Strengths.
B. Weaknesses.

APPENDIX 2

IRRIGATION SYSTEM **ACTIVITIES** MATRIX

All irrigation systems require that certain essential tasks be accomplished if the system is to function productively. One set of management activities focuses directly on the water. Water must be acquired, allocated, distributed, and, if there is excess, drained. A second set of management activities deals with the physical structures for controlling the water. A final set of activities focusses on organization which manages the water and structures and includes decision making, resource mobilization, communication, and conflict management.

There is interaction among the activities of the three sets; for example, the organization must decide how to operate the structures to distribute the water. The matrix shown in the figure illustrates these interactions. Not all activities are equally important in each environment, and the farmers' irrigation management institutions will reflect the relative importance of activities in a particular location.

For a rapid appraisal study it is instructive to use the matrix to formulate questions about the management of the system. Each of the 64 boxes is a potentially important interaction. For example, one might ask what decisions need to be made about the operation of the system as it relates to water allocation. Often whole blocks of interactions "boxes" are not relevant for a particular system. This matrix is useful for examining the activities internal to the irrigation system.

IRRIGATION SYSTEM ACTIVITIES MATRIX

Adapted from: Uphoff, Norman, Ruth Meinzen-Dick, and Nancy St. Julien. 1985. Getting the process right: farmer organization and participation in irrigation water management. A State-of-the-Art Paper prepared at Cornell University for the Water Management Synthesis II Project, Consortium for International Development, Cornell University, Ithaca, NY.