

CPR Coding Manual

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Section I

GENERAL OVERVIEW OF COMMON-POOL RESOURCE PROJECT

Clarification of the Concept of Common-Pool Resource (CPR)

The literature describing the problems that individuals using common-pool resources (CPRs) face often predict different outcomes and recommend contradictory policies. Creating centralized agencies and creating private property institutions have both been recommended as the only way to solve problems involved in using common-pool resources. The first task of the CPR project was to clarify the basic terms related to the study of collective action problems in CPRs. This clarification was a necessary prerequisite to formal game theoretical modelling, in-depth analysis of case studies from field settings, and laboratory experiments of environments motivated by theoretical modelling and field data.

Since the work of R. Hardin (1971) and Dawes (1973), demonstrating that some CPR situations could be represented by an N-Person Prisoner's Dilemma, many scholars have presumed that all public goods and all CPR situations shared that underlying structure (for important exceptions see Kimber, 1981; Runge, 1981, 1984; and Taylor, 1987). But even when the focus is narrowed to CPRs, the incentives confronting individuals in natural settings are not adequately described by games with a dominant strategy for every player. Consequently, a major task was to define the characteristics of a CPR as precisely as possible.

The term common-pool resource refers to a sufficiently large natural or man-made resource for which it is costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use. To understand the processes of organizing and governing CPRs, it is essential to distinguish between the resource system and the flow of resource-units produced by the system, while still recognizing their interdependence. Resource systems are stocks capable of producing flows. Examples of resource systems include fishing grounds, groundwater basins, grazing areas, irrigation canals, bridges, and mainframe computers. Resource units are appropriated from resource systems; for example, the tons of fish harvested from a fishing ground or the acre-feet of water withdrawn from a groundwater basin or an irrigation canal. The appropriation process can be simultaneous or sequential. While the resource system is subject to joint use and/or provision, the resource units are not. Improvements to the system are available to all appropriators. All appropriators benefit from maintenance performed on an irrigation canal, a bridge, or a computer system whether they contribute or not. On the other hand, the resource units consumed by one user are not available to others. The fish harvested by one boat are not landed by another boat. Nor, can the water spread on one field be spread on another.

Failure to distinguish between the subtractability of the resource units and the jointness of the resource system has contributed to past confusion about the relationship of CPRs to public or collective goods.ⁱ The cost of physically excluding joint appropriators from the resource or from improvements made to the resource system is similar to the high costs of excluding beneficiaries from public goods. This shared attribute is

responsible for the ever-present temptation to free ride that exists in regard to both CPRs and public goods. Theoretical propositions that are derived solely from the difficulty of exclusion are applicable to the provision of both CPRs and collective goods.

"Crowding effects" and "overuse" are problems arising in CPRs, but absent from pure public goods. The subtractability of resource units, together with overuse, leads to exploitation of the CPR beyond optimal or safe yield. When the CPR is a man-made structure, such as a bridge, too many crossings lead to congestion. When the CPR is a biological resource, such as a fishery, too many fish landed will destroy the fishery.

Parallel to the distinction between resource systems and resource units is the distinction between the two broad classes of CPR problems, appropriation and provision. Appropriation problems relate to the allocation of the flow of resource units from the resource system and the conflict of this allocation between appropriators. Provision problems relate to the system that produces this flow. Provision problems are concerned with the implications of alternative institutions for assigning responsibility for building, restoring, or maintaining the resource system. Appropriation problems are time-independent; provision problems are time-dependent. In field settings these problems are closely related. The actual structure of appropriation and provision problems depends on the particular configuration of the physical world, the rules in use, and the attributes of appropriators. In theoretical applications and in laboratory experiments, one can examine these problems independently so as to understand some aspects of CPR problems without the complexity added by focusing on two different problems at the same time. Ultimately, however, both problems are faced by real appropriators in natural settings.

When appropriation problems are not solved, individuals tend to invest more inputs than are economically needed to earn the highest return on the effort or to have substantial interference as among the efforts of different appropriators. In either case, the net yield that could have been returned (called rents by natural resource economists) is dissipated. In an open-accessⁱⁱ CPR, overappropriation is likely to be endemic (Gordon, 1954; Scott, 1955).ⁱⁱⁱ In a limited-access CPR, overappropriation may be less severe, depending on the appropriation rules, monitoring, and enforcement. If the spatial and temporal distribution of resource units is heterogeneous and uncertain, there exists conflict in the assignment of appropriation rights. Appropriators face a further problem of assignment. Many fishing grounds are characterized by "fishing spots" that vary in their productivity. Farmers who extract water from the head of an irrigation system can obtain more water than farmers who are located at a tail-end position. When appropriators consider the assignment of rights and duties to the use of a CPR to be unfair, uneconomic, uncertain, and/or inappropriately enforced, this may adversely affect their willingness to invest in provision activities. The particular rules used to regulate appropriation affect monitoring and policing costs and the type of strategic behavior that occurs between appropriators and monitors (the detection/deterrence game).^{iv}

When provision problems are not solved, the resource system is not maintained in an optimal state and its survival may be threatened. Provision problems may occur on the supply side and/or on the demand side. The supply side problem relates to the construction or maintenance of the system. If appropriators act independently, they can expect suboptimal provision due to

free riding. The demand side problem relates to the intertemporal impact of appropriation on the resource system itself. Many of the dynamic models of "rent dissipation" in the fisheries literature (Clark, 1976, 1980) focus on the time-dependent relationship between current withdrawals and future yields.

The above conceptual framework (developed in detail in Gardner, et al., 1989) provides an analytical foundation on which to build. The three major activities of the project all build on this foundation. They are: (1) the formal analysis of the relationship between CPR institutions and underlying physical domains; (2) the design and testing of CPR dilemmas in a laboratory setting, and (3) the coding and analysis of CPR case studies -- are all performed with this framework in mind. Although appropriation and provision problems are empirically linked within natural CPR settings, they are analytically more tractable when studied separately.

The Formal Analysis of Relationship between CPR Institutions and Underlying Physical Domains

Our research has examined the relationship between underlying institutions and physical domains using the framework of game theory. The rules of a game include both physical and deontological statements. Physical statements tell what players are expected to find physically necessary, possible, or impossible to do. Deontological statements tell what players are expected to find obligatory, permitted, or forbidden to do. These are very different realms, subject to different forms of change. Human intervention cannot change fundamental physical regularities, such as the laws of physics and biology. People can use knowledge about such regularities, however, to develop new technologies that reduce the cost of many actions. Change is wrought by finding more efficient uses of physical laws rather than by changing the laws themselves. Deontic regularities, by contrast, exist primarily within a human domain. These regularities involve what people perceive to be right or wrong actions or states of the world to affect in particular kinds of situations. As such, deontic regularities are context-specific constraints that human beings create and change by self-conscious choice or by evolutionary processes.

Game theory ordinarily takes a particular game as given and proceeds to solve for its equilibrium outcomes. Outcomes are thus dependent on physical and deontological statements, as in the following schema:

PHYSICAL STATEMENTS		
	GAME	OUTCOMES
DEONTOLOGICAL STATEMENTS		

When the rules change, the resulting game may produce incentives leading to the same, improved, or worse outcomes for the participants. Of special interest to policy analysts are rule changes (reforms) that lead to improved outcomes. Our work has been interested in the reform of certain naturally occurring games, in particular, fishing games.

Much of the world's fishing occurs in contested waters. Conflicts arise between nations when international conventions overlap, such as the 200 mile limit (Canada vs. France, U.K. vs. Iceland, U.K. vs. Belgium). Even more

frequently, conflicts arise in those coastal or inland waters where neither property rights nor user rights are clearly defined. In settings where all of the rules are set at their default position,^v the resulting rule configuration operationalizes Hobbes's concept of "the state of nature." The only factors affecting the structure of a fishing game in a state of nature are those related to the physical domain on which the game is played. These include the number and value of fishing spots, their regularity over time, the cost of traveling to them, and the technology available to fishers in case of conflict. Using Harsanyi-Selten equilibrium selection theory to focus on a unique equilibrium outcome, we can control for the effects of physical regularities on the extent of fighting between fishers over contested waters. Two main behavioral regularities emerge from such a study. (1) If fishers are of fairly different fighting ability and the fishing spots are of considerably different value, then the stronger fisher will fish the more valuable spot, and no conflict will be observed. (2) If fishers are fairly evenly matched and the fishing spots are of nearly equal value, then a contest is likely on one or more of the spots. (For details see Gardner and E. Ostrom, forthcoming.) As rules are changed from a default condition, the options available to players are less controlled by the physical domain and more controlled by human prescriptive intervention. Not all rule changes are necessarily an improvement, however. It is possible to adopt rule changes leading to increased conflicts. It is also possible--and this is the empirically more interesting case--to find rule changes that lead to fewer fights among fishers and a more efficient allocation of fishing resources.

We have studied the effect of a change in the authority rule, specifying who can fish where, at a nondefault option. A classic rule of allocation used throughout the ages to settle disputes over contested waters is "first in time, first in right" used along the shores of such diverse countries as India and Brazil (Raychaudhuri, 1980; Forman, 1970). Such a rule creates, in effect, a "temporary usufructuary property right" that allows fishers to change locations from day to day without conflict. On a physical domain where fighting is expected to occur, this has the desirable effect of reducing the amount of fighting. It will still not lead, however, to an optimal allocation of resources. Fishers may still engage in a race to the best spot.

An authority rule that does address the excess travel issue is the prior announcement rule, such as is found among the impoverished fishers living along the shores of Bahia, Brazil. A good example of this is the port of Valena, where the local fishers have identified, mapped, and named 258 fishing spots. When a captain wishes to fish in a particular spot, he records his plans in a public forum--the local bar--and marks the location where he intends to fish. One other witness, also a fisher, is required. The captain then marks his claim the day prior to fishing by anchoring a canoe at the spot. The fishing captains enforce the resultant right to fish, thus maintaining the entire fishing system (Cordell and McKean, 1986). The game resulting from such a rule system is essentially one move long, an announcement move, and there are no conflicts observed.

An alternative authority rule that is outcome equivalent to the prior announcement rule is the prearranged rotation rule. When the preassignment is by lottery, such a rotation system assigns fishing spots on an equitable basis to all eligible fishers. Alanya, Turkey, an inshore fishery, provides an intriguing example. Prior to instituting this rule, there had been considerable conflict over access to the better fishing spots (Berkes, 1986).

The Alanya fishers mapped and named all spots. In September of each year, licensed fishers in the village draw lots to gain access to a specific fishing spot on the first day of the season. As the season progresses, they then rotate over the spots. This system is relatively easy to monitor and enforce, and has been maintained for over 15 years, primarily through the verbal and physical actions of the fishers themselves. From a game-theoretic standpoint, however, there is a big difference between a prior announcement rule and a prearranged rotation rule. In the former, there are still moves left to the players, but in the latter, the only move left is to chance.

We have also completed an analysis of the effect of monitoring and sanctioning arrangements in an irrigation setting (Weissing and E. Ostrom, 1991). In a series of four models, we start with a two-person irrigator game where one player is the "turntaker" and decides between taking an authorized quantity of water or stealing, while the other player chooses between monitoring or not monitoring the behavior of the turntaker. The second model extends this two-person game into a N-person game. In the third model, a mechanical guard (or dummy player) is added that monitors the turntaker and discovers infractions with varying probabilities. In the fourth model, the mechanical guard is replaced with a real player that must be motivated to monitor. The probability of stealing and monitoring at Nash equilibria depends upon the parameters of the game including the number of irrigators involved, the size of the punishment that can be inflicted, the reward given to irrigators or guards who discover a stealing event, the loss that is inflicted on others, and the cost of monitoring. At equilibrium, the probability of stealing is never zero in Models 1, 2, and 4. In other words, only a mechanical guard can be totally effective in eliminating stealing. In all other arrangements, there is always some stealing (and usually, some monitoring) going on. The comparative statics generate both intuitive and counterintuitive results. In Model 2, for example, an increase in the value of any one of the parameters, within the regime of a completely mixed equilibrium, produce the following consequences on the equilibrium strategies:

<u>Effect on:</u>		
<u>An Increase in:</u>	<u>Probability of Stealing</u>	<u>Probability of Monitoring</u>
N	increase	decrease
Punishment	decrease	decrease
Reward for discovery of a stealing event	decrease	no change
Loss imposed on irrigators from a stealing event	decrease	no change
Cost of monitoring	increase	no change

Experimental Design and Testing of CPR Environments

As discussed earlier, no single environment defines the "CPR Problem." Depending on the physical characteristics of the resource and/or the institutional framework of the existing user group, a complex set of interrelated decision problems may exist. How does one, therefore, go about designing and parameterizing an experimental environment to analyze a "CPR Problem"?

Our line of reasoning used two main criteria: (1) the separation of CPR problems into appropriation and provision problems and (2) the construction of a baseline foundation on which to build a structure of more complex and interrelated experiments. These two criteria led to the design and software development that has been used in all of our experiments. We sketch the decision environment faced by our experimental subjects:

At the beginning of each experimental session, subjects were told they would be making a series of investment decisions, that all individual investment decisions were anonymous to the group, and that at the end of the experiment they would be paid privately (in cash) their individual earnings. Subjects then proceeded, at their own pace, through a set of instructions that described the investment decisions. Subjects were told that each period they would be endowed with a given number of tokens, which they would invest between two markets. Market 1 was described as an investment opportunity in which each token yielded a fixed (constant) rate of output and that each unit of output yielded a fixed (constant) return. Market 2 (the CPR) was described as a market which yielded a rate of output per token dependent upon the total number of tokens invested by the entire group. The rate of output at each level of group investment was described in functional form as well as tabular form. Subjects were informed that they would receive a level of output from Market 2 that was equivalent to the percentage of total group tokens they invested. Further, subjects knew that each unit of output from Market 2 yielded a fixed (constant) rate of return.

Our environment most closely parallels that of a limited access CPR (see for example, Clark, 1980, and Cornes and Sandler, 1986). All experiments were conducted using the PLATO computer system at Indiana University. This interactive system allows for minimal experimental interaction, across experiment control on procedures, and facilitates the complex accounting that follows any decision period.

Our experiments focused on rent dissipation in a limited access CPR. Would subjects ignore the impact of their own investment decisions on the productivity of others investing in the CPR (our Market 2)? If subjects did exhibit such behavior, what factors would affect the degree of rent dissipation? Our first line of inquiry, focused on: (a) subject sophistication (experience) in the investment environment, (b) the specific parameterizations for the investment return from Markets 1 and 2, and (c) whether subjects were allowed to discuss as a group the strategy space for the social dilemma they faced.

Below, we sketch several empirical regularities that were robust across experimental replications:

- (1) Rents accrued (on average) at approximately 33% of optimum. This observation is based on 27 experiments (570 investment decisions) across several experimental parameterizations.
- (2) Subject sophistication (experience in the decision environment) led to significant reductions in accrued rents. On average, experienced subjects made investment decisions that led to the accrual of rents at a level 11% lower than that of inexperienced subjects. This result is consistent with experimental results reported in other experimental studies of social dilemmas (see Isaac, Walker, and Thomas, 1984).
- (3) Across experimental replications, we observed a general pattern where rents decayed toward zero then rebounded as subjects reduced the level of investment in the common-pool resource. Further, we generally observed a pattern in which average rents decreased with repeated decision periods.
- (4) Holding number of investors constant, an increase in investment resources available to individual subjects tended to reduce average rents. The most striking result is the high level of rent dissipation found in experiments in which subjects were endowed with 25 tokens (as opposed to 10 tokens) to invest. In our 25 Token Design, rents averaged only 1% of optimum. This compared to approximately 37% for the design in which each subject was endowed with only 10 tokens.
- (5) Communication significantly increases rents as a percentage of maximum (see Figure 1.1). All experiments began with a series of 10 decision periods in which there was no opportunity to communicate. For comparison purposes, we conducted a set of baseline experiments in which communication was never allowed. We conducted communication with two treatments: (1) the communication mechanism was provided to subjects at no cost and (2) the subjects had to provide the communication mechanism by their own monetary contributions. For both treatments, the opportunity to communicate began after decision period 10. In the no-cost experiments, players had the opportunity to communicate between every decision period following period 10. In the costly communication experiments, players had the right to fund the communication mechanism between every decision period following period 10. Panel 1 shows that relative to the baseline experiments, efficiency increased from 30% to 98% with the introduction of costless communication. When communication was provided as a "costless" institution, players successfully used the opportunity to: (a) calculate coordinated rent improving strategies, (b) devise verbal agreements to implement these strategies, and (c) deal with nonconforming players. Panel 2 shows the aggregate results from our experiments with costly communication. On average, efficiency in these groups increased from approximately 42% to 80%. In all three experiments, the problem of providing the communication mechanism diminished the ability to coordinate and deal with players who cheated on a previous agreement.

The Coding and Analysis of CPR Case Studies

The fourth activity we have undertaken has been the identification of in-depth case studies that describe how CPR appropriators have succeeded or failed in efforts to manage inshore fisheries, small- to medium-sized irrigation systems, communal forests, or grazing lands. Identifying and coding in-depth case studies is undertaken in several steps. Most of this manual is devoted to an in-depth discussion of this activity.

First, we developed a bibliography that includes published and unpublished CPR case materials as well as relevant theoretical work. In January of 1989, we published a hard-copy version of a bibliography entitled Common Pool Resources and Collective Action: A Bibliography, compiled by the Department of Political Science librarian, Fenton Martin.^{vi} The bibliography contains 4,977 items arranged according to sectors (Fishery Resources, Water Resources, Forest Resources, Grazing Areas) and regions of the world as well as including a section

on pure theory and experimental work. The bibliography has been distributed to scholars and research centers in the U.S. and many other countries. Since January of 1989, we have added over 1750 new citations to a supplemental bibliography and continue to maintain the bibliography in machine readable form.^{vii} We have received frequent requests for computer-assisted searches of the bibliography by researchers who want to know what has been written about a particular sector or region. We have also provided machine readable copies of the full bibliography and supplements to several research libraries located in different parts of the world. We are pleased to hear that our bibliography contains references to cases not previously known to librarians in charge of specialized collections specific to the specialized area.

In addition to a systematic collection of bibliographic citations, we have established a major in-house collection of published and unpublished, original case studies of CPR resources. We have archived over 1800 documents and receive new case materials regularly.^{viii} Considerable international interest has been focused on our collection and the CPR project more generally. Scholars from Denmark, India, Germany, The Netherlands, Norway, France, and the U.S. have spent or intend to spend several months in Bloomington working on these materials and our data base.^{ix} We have also been asked to archive, abstract, and code in-depth CPR case studies contained in archive files and never published.^x

The aim of collecting these in-depth materials is not simply that of archiving and cataloging, although we have seriously pursued these responsibilities. The aim is to identify a subset of in-depth cases that can be used to code structured data about these empirical settings and to analyze the patterns of behavior associated with them. To identify codable materials, we first screen every document. A member of the CPR project staff rapidly reads the article, monograph, archive file, thesis or dissertation and makes initial decisions based on that reading. First, the screener ascertains whether the publication contains high-quality information about a particular location. If the materials do not describe a particular case, the screener identifies the type of document (pure theory, background on particular types of resources in a region, or good sectorial information), writes a short abstract, and enters this information in the CPR data base. If the materials do describe a particular case, the screener evaluates the quality of the data contained, writes a short abstract, and again enters this information in the data base. We have now finished screening and abstracting 1600 documents.

We constructed the CPR data base so that it could easily be used by other researchers. We committed ourselves to use a commercially available program that would run on a micro-computer to insure the capability of transferring the data base to other sites. After studying the assets and liabilities of many different relational data base programs, we decided to use RBASE. It is powerful and user-friendly. It only takes a few days before a new user is able to undertake analyses of the data base. The abstracts written as part of the screening process have already become a valuable tool in and of themselves, since they can be searched for conceptual or substantive content using the powerful RBASE boolean search capabilities. We have distributed the abstracts written about fishery resources, for example, to a number of fishery experts and received enthusiastic responses.

The screening process is important as part of our data collection efforts, as it is the way that we identify cases that we can enter in the more extended data base. To actually code a case, we require that it be written by

a researcher who has spent considerable time in the field and contains key information about the structure of the resource, the rules used in organizing the resource, the strategies adopted by the appropriators, and the outcomes achieved. All of the variables that we use in our formal models and experimental laboratory settings (and many more) are contained in the extended data base.

We have coded and entered 50 irrigation cases, 32 fishery cases, and 3 cases describing forestry, grazing, and other types of resources. We have thus captured in a structured form the results of at least 40 person-years of prior fieldwork conducted by resource economists, political scientists, rural sociologists, anthropologists, historians, and engineers.^{xi}

We are now developing a specialized data base on Nepali irrigation systems because a very large number of outstanding case studies have been written and made available to us. Most of these cases include reliable and valid engineering and economic performance data that is usually difficult to obtain. The diversity of CPR institutions that exist in Nepal will be extremely useful in our proposed research. In order to gain an initial and rapid overview of these systems, we have developed a short coding form containing 70 variables and have coded 124 cases using this form. After we complete the short-form coding, we will undertake the much slower task of a complete coding for each case. We expect to include over 100 Nepali irrigation systems in our CPR data base.

In addition to making substantial progress in the development of a useful data base on CPR institutions and their performance, we have now completed several analyses of the case materials. The first major work based on the cases is a book by Elinor Ostrom entitled Governing the Commons published by Cambridge University Press in 1990 in the series on the "Political Economy of Institutions and Decisions" edited by James E. Alt and Douglass C. North. The presumption that all users of a CPR are trapped in a Prisoners' Dilemma situation has dominated most research and policy analysis during the past two decades. The book examines two sets of cases where the appropriators have escaped from the "traps" of resource destruction or rent dissipation. In the first set of cases, appropriators centuries ago established CPR institutions that limit where, when, how, and how many resource units can be withdrawn from a CPR. These institutions and the corresponding CPRs have survived ever since. Little is known about the origins of these institutions but their effectiveness is well established. The second set of cases includes more recent events where the processes of transforming CPR institutions are well documented. In contrast to these "successful" cases, a third set of cases involves settings where appropriators remain trapped in dilemma type situations and suffer the consequences of severe rent dissipation or free riding behavior.

The central question of the book, therefore, is why and how some appropriators escape from the presumed tragedies of the commons while others do not. The specific institutions that appropriators have created in the successful cases vary from one to another so much that the analyst cannot point to the adoption of particular rules as the answer to this question. Rather, it appears that successful CPR institutions are characterized by a series of design principles that account for their success in sustaining CPRs and in gaining the compliance of generations of appropriators to the rules adopted. A set of seven design principles characterize all of the successful CPR institutions and an eighth is used in the larger, more complex cases. The

"failure" cases are characterized by one or two of these design principles at most. These are listed in Table 1.1. The book analyzes how institutions that meet these design principles affect the incentives of CPR appropriators so that they are willing to commit themselves to these institutions, to monitor each others conformance, and to replicate the institutions across generations. A further question the book addresses is what conditions enhance the likelihood of appropriators adopting institutions that meet these design criteria. The conjectures presented in this book constitute part of the "grist" for our future project. Arguments that are developed informally in the book will be subjected to formal analysis. Empirical regularities found in the initial set of cases will be tested on a much larger set of cases. Consequently, the book can be viewed as an extended progress report for our initial project rather than as a final report for a completed project.

In addition to this analysis, S. Y. Tang completed in 1989 a dissertation entitled, "Institutions and Collective Action in Irrigation Systems." The dissertation has subsequently been awarded the Leonard White award for the best dissertation in the field of Public Administration by the American Political Science Association. An article drawn from the dissertation has appeared in Public Administration Review (Tang, 1991). A book based on the dissertation is being published by the Institute for Contemporary Studies in San Francisco.

The dissertation combines the institutional framework of our project with recent work on transaction cost economics (Williamson, 1975, 1985). As an empirical base, Tang analyzes the 47 irrigation cases contained in the CPR data base (excluding the Nepali irrigation cases that have just been added). He has

Table 1.1

Design Principles Illustrated by Long-Enduring CPR Institutions

1. Clearly Defined Boundaries

Individuals or households with rights to withdraw resource units from the CPR and the boundaries of the CPR itself are clearly defined.

2. Congruence Between Appropriation and Provision Rules and Local Conditions

Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labor, material, or money.

3. Collective Choice Arrangements

Most individuals affected by operational rules can participate in modifying these rules.

4. Active Monitoring

Monitors, who actively audit CPR conditions and appropriator behavior, are accountable to the appropriators and/or are the appropriators themselves.

5. Graduated Sanctions

Appropriators who violate operational rules are likely to receive graduated sanctions (depending on the seriousness and context of the offense) from other appropriators, officials accountable to these appropriators, or from both.

6. Conflict Resolution Mechanisms

Appropriators and their officials have rapid access to low-cost, local arenas to resolve conflict among appropriators or between appropriators and officials.

7. Minimal Recognition of Rights to Organize

The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.

For CPRs that are part of larger systems:

8. Nested Units

Organization of appropriation, provision, monitoring, enforcement, conflict resolution and governance activities are undertaken by smaller units that are nested within larger units.

Table 2.1

The Dimensionality of Outcome Measures in Irrigation Systems

<u>Good Maintenance</u>	<u>Rule Conformance</u>	<u>Adequate Water</u>	<u>Number of Cases</u>
Yes	Yes	Yes	21
Yes	Yes	No	8
Yes	No	No	4
No	No	No	13
No	Yes	No	1
			—
			47

Coefficient of Reproducibility: $1 - 1/(47 \times 3) = 0.99$

Source: S. Y. Tang (1989) "Institutions and Collective Action in Irrigation Systems," Table 4.1, p. 79.

discovered that three of the coded outcome measures can be arrayed as a one-dimensional Guttman scale with a coefficient of reproducibility of .99. These three measures are whether: (1) the irrigation system provides adequate water given the crop patterns adopted by the farmers, (2) the appropriators generally follow the rules governing appropriation and provision activities, and (3) the irrigation systems are well maintained (see Table 2.1).

One might surmise that the adequacy of the water in an irrigation system is not subject to institutional control but simply a physical condition that is present or absent. In an analysis of community irrigation systems (what we call appropriator organized (AO) systems more generally) as contrasted to governmentally organized irrigation systems, Tang shows that all the latter systems use a single boundary rule to define access to irrigation water. This rule is that every farmer in the command area has a right to water and every farmer outside the command area has no such right. AO systems, on the other hand, use a variety of boundary rules, including command area, but also involving shares, membership fees, and differential access. Table 3.1a shows the relationship between boundary rules and adequacy of the water supply; Table 3.1b, the relationship between boundary rules and rule conformance/maintenance.

In the initial design of governmentally organized irrigation systems, the incentives for officials are to demonstrate the size of the project and the number of irrigators that will be benefited. The resulting official command areas of many governmentally organized irrigation systems are much larger than can be supported by the sources of water available (Palanisami and Easter, 1986; see also Wade, 1984). When appropriators design their own institutions, they are highly motivated to insure that those who contribute resources to provide and maintain the system are assured of an adequate supply of water. Thus, the adequacy of water made available to irrigators is not simply an external condition that must be lived with. Rather, it affects the type of institutions used to regulate appropriation and the incentives facing those who devise institutions.

Coastal fisheries are often governed by institutional arrangements, devised

by fishers, that limit who can enter fisheries and how harvesting of fish must be conducted. In Edella Schlager's dissertation, "Model Specification and Policy Analysis: The Governance of Coastal Fisheries," (Schlager, 1990) she presents an analysis and explanation of these institutional arrangements. This explanation is based on data from case studies of thirty different coastal fisheries located throughout the world. Using an institutional analysis approach, the problematic situations fishers confront are examined. These involve problems related to the flows of fish through fishing grounds, or stock externalities; and problems related to the physical space constituting fishing grounds, such as assignment problems and technological externalities. The types of problematic situations fishers attempt to resolve by cooperating to devise property rights and rules to govern the utilization of their fishing grounds are also examined. Fishers typically focus upon governing the physical space of their grounds as opposed to managing the flows of fish. Finally, the performance of different institutional arrangements, and how performance varies depending upon how the arrangements are structured, are evaluated. Groups of fishers that possess more complete sets of property rights in their fishing grounds, and who have devised rules defining the harvesting actions they can take, typically achieve superior outcomes to those fishers who do not have as well defined institutional arrangements.

An institutional analysis approach to fisheries differs significantly from the standard approach used by policy analysts. The bionomic model is based on the assumption that fisheries are "common property", meaning that no institutional arrangements exist to limit access or regulate harvesting activities. In addition, the model presumes a single problematic situation, that of stock externalities, and fails to recognize significant problems arising in relation to multiple fishers interacting within the limited space of fishing grounds. As a consequence, policies based on the bionomic model, and developed for open access, unregulated situations have failed when applied to coastal fisheries where institutions already exist, and the institutional arrangements devised by fishers have, in some cases, been seriously harmed by the imposition of these policies.

Notes for Section I

- i. See, for example, the debate about the effect of group size on the provision of a good summarized in R. Hardin (1982: ch. 3).
- ii. Ciriacy-Wantrup and Bishop (1975) carefully distinguish between an open-access CPR where no one has any property rights and a closed-access CPR where a well-defined group owns property in common. "Common-property resources" is a term that is still used inappropriately in many instances to refer to both open-access and closed-access CPRs.
- iii. Exactly how one models this depends on many underlying parameters. One that is essential to the prediction of full rent dissipation is that the underlying appropriation function (usually called a production function in this literature) is characterized by diminishing returns (Dasgupta and Heal, 1979: 56). While this is a reasonable assumption to make in many environments, the dependence of the incentive structure on underlying parameters, such as the shape of the appropriation function, is a key point we are trying to make. CPRs vary substantially in regard to their values on these underlying parameters. Two CPRs identical in almost all respects except the range of variation found in regard to a important underlying parameter may need quite different representations in terms of their strategic structure.
- iv. A third appropriation problem has to do with technological externalities (see Gardner, E. Ostrom, and Walker, 1989).
- v. See Gardner and E. Ostrom (Appendix A) for a discussion of default rules.
- vi. The compilation and publication of this bibliography was partially supported by a small USAID grant (DHR-1096-G-SS-6042-00) and is thus not shown in our list of publications resulting from our current NSF grant. Indiana University also provided extensive support for this activity.
- vii. Since January 1989, the bibliography activity has been supported by the current NSF grant and by Indiana University.
- viii. On two recent trips to Nepal, for example, Elinor Ostrom has brought back close to 100 in-depth case studies of small- to medium-sized irrigation systems in Nepal. Some of these were "published" in Nepal by Government agencies in initial runs of 25 to 50 copies. Others were reports written and filed in archives of research units there (the Nepal office of the International Irrigation Management Institute and the Irrigation Management Center, for example). We may have now amassed the largest collection of materials on Nepal's irrigation systems outside of Nepal.
- ix. Dr. Katar Singh, Institute of Rural Management in Anand, India, spent January through May of 1989 at the Workshop screening articles related to the forestry sector, learning how to use our data base, and completing the first draft of a monograph, "A Framework for Collecting and Analyzing Information for Case Studies in Common-Pool Resource Management," to be co-authored with Elinor Ostrom during the forthcoming year. Dr. Jos Raadschelders, University of Leiden, intends to spend the spring semester of 1990 at the Workshop in order to learn our framework and begin to design a major study of Dutch farmer-organized drainage associations drawing on historical materials extended back over 1,000 years. Dr. Christine Picht, University of Mainz, is currently spending a two-year period at the Workshop (with field trips to Switzerland) writing a closely parallel monograph on CPR institutions in the Swiss Alps. Dr. Anil K. Gupta, Indian Institute of Management and Dr. Kuldeep Mathur, Chairman, Centre for Political Studies at Jawaharlal Nehru University, have both inquired about working with our CPR project during the 1990-91 academic year. Michel Griffon, directeur adjoint of CIRAD (Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement), has invited Elinor Ostrom to Paris in October to present a seminar on the CPR data base and explore how it could be modified for use in the analysis of CPR problems in the Sahel. Several members of the Research Staff at CIRAD will then spend a couple of

months in Bloomington during 1990.

X. The most recent request came from Francis T. Christy, Jr., who indicated that the archive files at FAO in Rome on inshore fisheries around the world are very rich and untapped. He has invited Elinor Ostrom to join a working group on "Critical Factors Affecting the Management of Small-Scale Fisheries" to meet at FAO in Rome mid-September. Unfortunately, time does not permit participation, but we will explore other ways of working cooperatively with FAO in the future.

Xi. Since some of the studies are based on fieldwork that extended over a one- or two-year period, this is a modest estimate assuming only an average of 6 months of fieldwork for each of the 86 studies that have been coded.

Section II

RELATIONSHIP OF CODING AND INSTITUTIONAL ANALYSIS FRAMEWORK

Drawing on literature in political science, economics, anthropology, game theory, and law, scholars have developed a general framework of institutional analysis and development (IAD) that identifies the key working parts of typical situations facing participants in various circumstances (Kiser and Ostrom, 1982; Oakerson, 1986; E. Ostrom, 1986). The focal point of the IAD framework is the action situation in which individuals adopt actions or strategies. Depending on such factors as the number of participants involved, the types of choices available to participants, and the incentives faced by participants, different outcomes may result from interactions among participants. Many collective-action problems in irrigation systems resemble situations where individuals trying to advance their interests end up producing unintended and harmful consequences for themselves as well as for others.

Like the IAD framework, transaction costs economics adopts transactions, which resemble the concept of an action situation, as the fundamental unit of analysis (Williamson, 1975; 1985).ⁱ Both transaction costs economics and institutional analysis are concerned with identifying appropriate institutional arrangements that can counteract perverse incentives inherent in various transaction situations. While transaction costs economics approach the problem by examining the characteristics of different transaction situations, the IAD framework explicitly identifies a higher level of analysis by delineating the contextual attributes that shape various action situations. At the contextual level of analysis, one examines how rules, physical attributes, and attributes of community shape various action situations.

Transaction Costs and Institutional Arrangements

An individual's choice of action in any particular situation depends on how the individual weighs the benefits and costs of various alternatives and their likely outcomes. In an attempt to pursue benefits, an individual, however, is constrained by his limited information-processing ability. In other words, rationality is bounded. In many economic models, for the sake of simplification, an individual is assumed to be able to process all the information relevant to a decision situation. The individual is assumed to be able to undertake all necessary computations to reach a decision that could maximize his or her expected utilities. This assumption has been challenged by many. Herbert Simon, for example, argues that human behavior is "intendedly rational but only limitedly so" (1961: xxiv). Because the information processing capabilities of humans are limited, individuals frequently make decisions without considering all the possible alternatives and their likely outcomes. Organizations, Simon argues, compensate for this human limitation by assigning each individual a limited task environment and standard operating procedures. Institutions that regulate ways of undertaking activities can also be considered as stores of acquired knowledge. In the words of Richard Langlois:

institutions have an information-support function. They are, in effect, interpersonal stores of coordinative knowledge; as such, they serve to restrict at once the dimensions of the agent's problem-

situation and the extent of the cognitive demands placed upon the agent (1986: 237).

To develop mutually beneficial arrangements in irrigation, participants need rudimentary information about the physical and technological characteristics of the water flow and water delivery facilities, as well as the respective interests of the participants related to the irrigation system. Their existing information and their ability to gain further information affect their ability to develop appropriate institutional arrangements to tackle their problems in water allocation and maintenance.

The long-term viability and performance of a set of institutional arrangements also depend on its ability to process information necessary for effective operation and maintenance. F. A. Hayek (1948) argues that a major economic problem of society is the continuous utilization of information about circumstances of specific time and place. In irrigation, effective water allocation and maintenance require knowledge about the topography, soil types, and crop patterns of the particular area. It is important to ensure that these kinds of information are utilized when making decisions in relation to water allocation and maintenance.

Opportunism, defined as "self-interest seeking with guile," is another important attribute of individuals that affects collective action in irrigation systems (Williamson, 1985: 47). Opportunism, in conjunction with bounded rationality, creates difficulties for both negotiating and enforcing cooperative agreements. In the process of negotiation, individuals may try to hide their true preferences from one another in order to secure a better deal, thus hindering the negotiation process. After individuals have entered into some form of mutually agreed contract, disputes may arise as to the proper interpretation of the contract when novel situations appear or new individuals are involved. This is especially the case because it is impossible to devise rules that take into account all possible contingencies in the future. Furthermore, individuals who have entered into a contract with others may still be inclined to take advantage of their fellow-contractors if circumstances allow them to do so.

Transaction costs economics focus on the potential disputes that may arise when individuals, who are characterized by bounded rationality and opportunism, enter into contractual relationships (Williamson, 1975; 1985). Contrary to the assumption of "legal centralism" that the resolution of these disputes requires adjudication by an external authority, Williamson argues, most disputes can be avoided by recognizing "potential conflict in advance and [devising] governance structures that forestall or attenuate it" (Williamson, 1985: 29). These governance structures represent institutional arrangements that participants voluntarily adopt in order to foster credible commitments and to facilitate recurrent transactions among themselves. The organizational imperative emerging from considering bounded rationality and opportunism, Williamson argues, is: "Organize transactions so as to economize on bounded rationality while simultaneously safeguarding them against the hazards of opportunism" (1985: 32).

The transaction costs economics literature studies contractual problems mostly in relation to the exchange of private goods (i.e., goods that are characterized by the ease of exclusion and subtractibility of resource units) such as labor and machinery (see Joskow, 1988; Putterman, 1986). Williamson (1985) distinguishes three principal dimensions of a transaction that are

related to different organizational problems. First, some transactions are characterized by asset specificity which "refers to durable investments that are undertaken in support of particular transactions, the opportunity cost of which investments is much lower in best alternative uses or by alternative users should the original transaction be prematurely terminated" (Williamson, 1985: 55).

Second, some transactions are subject to uncertainty caused by their environments and their participants' opportunistic behavior. This uncertainty, if accompanied by significant amounts of transaction-specific assets, induces participants to devise institutional arrangements capable of sequential adaptation. Third, transactions are undertaken with different frequencies. If a certain kind of transaction is needed only infrequently, it may not be cost-effective to establish elaborate institutional arrangements to handle the transactions even if transaction-specific assets are involved. On the other hand, specialized institutional arrangements will be more cost-effective if large transactions of a recurring kind are involved.

In irrigation, highly transaction-specific assets are involved: once constructed, irrigation facilities such as dams or canals can hardly be relocated or redeployed for other uses. In some arid areas, farmland is a highly transaction-specific asset whose value depends on the effective functioning of an irrigation system. If an irrigation system is used by many individuals, one individual's opportunistic behavior can affect others considerably.

Uncertainty is also an important factor affecting collective action in irrigation systems. Uncertainty may result from the lack of trust among irrigators. If irrigators cannot trust one another, it is difficult for them to develop and sustain cooperative arrangements among themselves. Uncertainty may also result from external factors that are beyond the immediate control of participants. In watercourses within some large government irrigation systems, for example, the amount of water available may vary unpredictably, subject to arbitrary decisions made by government officials operating at the system level. Frequencies of transactions also affect the choice of institutional arrangements. For example, in irrigation systems that require extensive cooperative efforts in maintenance, elaborate input rules may be needed to specify and coordinate contributions from individual irrigators. In systems that require only occasional maintenance, no specific input rules may even be necessary.

Farmers' Degree of Dependency on an Irrigation System

The degree of dependency of farmers on an irrigation system may affect their incentives to cooperate with one another in fairly complex and counterintuitive ways. Farmers are dependent on an irrigation system in two different senses: (1) they may depend on the system as a major source of income (i.e., their incomes derive mostly from cultivating crops irrigated by the system); and (2) they may depend on the system as a major source of water for irrigation. Depending on the circumstances, farmers' dependency on an irrigation system as a major source of income may either facilitate or impede collective action.

In most situations, the more irrigators depend on an irrigation system, the more likely they are willing to expend substantial private resources to operate and maintain the system. Irrigators without other job obligations are also more likely to be able to participate in collective activities in an

irrigation system. In other situations, if most farmers do not have other sources of income, it may be difficult for them to develop new cooperative ventures that require substantial capital investment or sacrifice before producing benefits to the investors.

By the same token, the availability of alternative water sources may increase or decrease farmers' incentives for cooperation. In some situations, the availability of an alternative source of water may reduce tension among irrigators when water flow in the system is scarce, thus facilitating their long-term cooperation. In other situations, irrigators with access to an alternative source of water may be less willing to contribute to operating and maintaining the system than those without, thus inhibiting their long-term cooperation.

To further understand how these three transactional dimensions affect governance in irrigation systems, it is necessary to analyze systematically contextual attributes that shape various action situations. According to the IAD framework mentioned earlier, three sets of contextual attributes structure the action situation facing participants in an irrigation system: (1) physical attributes of the irrigation system; (2) attributes of the community of participants; and (3) the set of institutional arrangements in use by participants (see Kiser and Ostrom, 1982). These three sets of attributes combine to create different incentives and constraints for participants. Participants, who are characterized by bounded rationality and opportunism, will react differently according to the incentives and constraints inherent in the situations they face. The strategic interactions among participants in an action situation produce different outcomes (see Figure 2.1).

Outcomes for participants in irrigation systems include: (1) whether the water supply in the system meets the water requirements of the crops in the established fields served by the system, (2) whether the water diversion and delivery facilities are well-maintained, and (3) whether some participants have been consistently disadvantaged in relation to the systemⁱⁱ (see Figure 2.2).

Some of these outcomes are influenced by the extent to which participants cooperate in the operation and maintenance of a system. Cultivators' active cooperation is essential for maintaining water diversion and delivery facilities. Whether these facilities are well-maintained reflects the degree of cooperation among cultivators. In some situations, however, outcomes may be beyond the immediate control of the participants. The volume of water flow in a river at any particular moment, for example, is frequently a result of physical and meteorological factors that are beyond immediate human control.

Figure 2.1 here

Figure 2.2 here

Different outcomes may be related to different action situations faced by participants. Outcomes of one action situation may become contextual attributes for another situation. The level of water supply in a system may be partly a result of the way participants constructed the system in the first place. Once constructed, the amount of water supplied by the system becomes a physical attribute that affects irrigators' incentives to cooperate in maintaining the system.

Physical and Community Attributes

Most irrigation systems are characterized by "difficulties of exclusion" and "subtractibility of resource units." These physical attributes create collective-action situations among irrigators in most irrigation systems. Besides these three, other physical attributes including the size of the irrigation system, the pattern of water supply, and the availability of alternative water sources affect interactions among irrigators. Community attributes such as irrigators' sources of incomes and the presence or absence of social, economic, cultural, and locational differences among irrigators also affect irrigators' incentives to cooperate with one another.ⁱⁱⁱ Either by itself or in combination with other attributes, each of these attributes potentially affects collective action and outcomes in an irrigation system. The constraints and opportunities created by these attributes have to be taken into account when designing institutional arrangements for an irrigation system.

Water Scarcity and Uncertainty

Farmers' vulnerability to scarcity and uncertainty in water supply and its effects on their incentives for collective action have drawn special attention in the irrigation literature. Wickham and Valera (1979), in a study of irrigation projects in the Philippines, observe that in order to induce farmers to cooperate in managing their watercourses, an effective system-wide management program is a prerequisite. In other words, farmers have less incentive to organize if they do not have a predictable or sufficient flow of water into their watercourses in the first place. This observation seems to contradict that of Wade (1988a) who, drawing upon experiences in South India, argues that the greater scarcity and uncertainty of the water supply, the greater the likelihood that a community of cultivators will develop collective arrangements to govern their watercourse.

Although these two arguments appear to be directly contradictory, they may be consistent when presented in a more general context. Irrigators' vulnerability to scarcity and uncertainty in water supply may be related to their incentives for cooperation in a curvilinear manner (see Uphoff, Wickramasinghe, and Wijayaratna, 1990). Farmers have to be sure of at least some minimal availability of water before they are willing to invest in collective efforts in water allocation and maintenance. If the water supply is abundant, however, investments in water allocation and maintenance would make little sense as water will be available anyhow. But under conditions of moderate scarcity, keeping regular water allocation and maintenance schedules may strongly affect the amount of water available to farmers' fields. Thus, little collective action by farmers can be expected under conditions of either extreme abundance or scarcity. Most collective activities will occur in situations where water is barely sufficient or moderately scarce and farmers

believe that their collective efforts can improve their chance of securing a more reliable supply of water.^{iv}

An inadequate supply of water, however, could increase coordination costs among farmers. As the supply of water decreases, the temptation for free-riding in water acquisition increases; efforts in monitoring and sanctioning have to be increased to enforce discipline in water allocation. Furthermore, more conflicts are likely to arise among irrigators as they are competing for a scarce source of water. In some situations, farmers may be able to increase the water flow to their fields by damaging, for instance, the canal embankment. This again increases the difficulty for maintaining the irrigation system. All of these could increase the costs for organizing collective action in irrigation.

Irrigated Area and Number of Irrigators

Even if individual irrigators are willing to contribute to collective endeavors, they have to expend resources to organize among themselves to assign responsibilities and undertake water allocation and maintenance jobs. Both the size of the irrigation system and the number of users of the system may affect farmers' actions. Many authors argue that, all other things being equal, information-gathering, communication, decision-making, and monitoring costs increase as the size of a resource increases. By the same token, various kinds of transaction costs increase as the number of irrigators increases (Field, 1986; Buchanan and Tullock, 1962). These two arguments imply that, all other things being equal, it will be easier to organize collective action in irrigation systems of smaller sizes and with less users.

Although it is more costly to organize collective action in large irrigation systems, this does not mean that large systems are doomed to fail. In many circumstances, in order to take advantage of a large source of water, it is more economical to develop a system that irrigates extensive areas and serves many farmers. Depending on the kinds of institutional arrangements adopted, coordination problems in large systems can be solved in various manners.

The type of institutional arrangement that is needed to overcome the problem of organizing large-scale irrigation has long been of interest to social scientists. Wittfogel's thesis that large-scale irrigation (hydraulic agriculture) requires the discipline and direction by an external authority is probably the most famous theory about irrigation known to a general social science audience.^v Wittfogel wrote:

A large quantity of water can be channeled and kept within bounds only by the use of mass labor; and this mass labor must be coordinated, disciplined, and led. Thus a number of farmers eager to conquer arid lowlands and plains are forced to invoke the organizational devices which--on the basis of premachine technology--offer the one chance of success: they must work in cooperation with their fellows and subordinate themselves to a directing authority (1981: 18).

Wittfogel further argued that the need to direct and enforce cooperation in constructing and operating major hydraulic works induced the development of highly centralized bureaucratic regimes in many parts of the world.

This thesis, however, has been contradicted by many examples where farmers or local communities have been able to assemble and discipline massive

local labor and other resources to construct and sustain irrigation systems with command areas of over several hundred hectares (e.g., Lando, 1979; Siy, 1982; Pradhan, 1983). These systems are not governed by any single, unified bureaucratic machinery. Instead, federated forms of arrangements are adopted such that the entire system is governed by multiple layers of farmers' organizations.

Differences among Irrigators

Irrigators may be different from one another in: (1) their cultural and social characteristics such as ethnicity, caste, race, clan, or religion; (2) the amounts of irrigated land or water shares they hold; or (3) the locations of their plots within the system. These differences are important contextual attributes that affect collective action in irrigation.

If a community of irrigators is divided by ethnic, clan, racial, caste, or religious differences that inhibit communication, the costs of organizing collective action within the community will be higher than within those without divisions. In some situations, the divisions among irrigators may be great enough to inhibit any form of cooperation among them. Cases, however, exist where communities with ethnic, caste, or other divisions are able to overcome these obstacles, and develop and sustain long-term cooperative arrangements. In these situations, high levels of potential disagreements and conflicts among irrigators still exist. Institutional arrangements that can mitigate and resolve potential conflicts among farmers and ensure a more equitable sharing of benefits and burdens among irrigators help to sustain their cooperative efforts.

Some literature suggests that a collective good is likely to be provided if a few individuals have disproportionate interests in the good, since these individuals have more to gain from the good and may find it in their own interests to provide the good by themselves or expend resources to organize other potential beneficiaries to provide the good (e.g., Olson, 1965). In irrigation, this means that the presence of individuals with disproportionate landholding or shares of the water flow facilitates collective efforts in water allocation and investment. Contrary to this argument, some authors argue that a highly unequal distribution of landholding inhibits local cooperation in operating and maintaining irrigation facilities (e.g., Palanisami and Easter, 1986). Farmers with disproportionate wealth and influence may be reluctant to cooperate with poorer farmers; or if they do, they expect more privileges and benefits (Harriss, 1977).

Irrigators may have unequal access to the flow of water. This difference among irrigators also affects their incentives for cooperation. In most canal irrigation systems, headenders have a natural advantage in their access to water over tailenders. As documented by many authors, unless irrigation systems are well organized, headenders tend to take more water than is necessary for the growth of their crops to the detriment of tailenders (Bromley, 1982; Chambers, 1977). The temptation to "overuse" water is especially great for the cultivation of rice. Rice is believed by many farmers to be very sensitive to water shortage but tolerant to large amounts of water.^{vi} Standing water is also an important means to control the growth of weeds. For many farmers, to maintain as much water as possible in their rice field is a good way to reduce the risk of lower yields and the amount of labor required to clear weeds (see Abel, 1977). Because of their more favorable location relative to tailenders, headenders may have little incentive to

cooperate with tailenders in water allocation.

The position of headenders is, of course, not invulnerable. Tailenders may go upstream and destroy their banks, gates, or valves and thus hurt the headenders if no one sanctions them. The possibility of destruction of their diversion works induces headenders to cooperate with tailenders to a certain extent. On the other hand, when both headenders and tailenders implement a set of enforceable allocation rules, headenders are probably in a better position to negotiate a more favorable share of water because of their proximity to the source.

The situation is different in irrigation systems where most farmers cultivate plots in both head and tail areas. In this kind of system, most farmers have vested interests in ensuring that enough water is delivered to the tail area; this pattern of plot distribution can facilitate cooperation among farmers. In some irrigation systems, specific rules exist to make sure that every farmer cultivates plots in both the head and tail areas (Coward, 1979).

Physical and community attributes create the setting in which irrigators interact with one another. While many physical and community attributes of an irrigation system affect situations faced by irrigators, most of these attributes do not have deterministic effects on the success or failure of collective action. In some cases, institutional arrangements can mitigate the perverse effects of situations created by these attributes.

Rules-in-Use

From a policy perspective, institutional arrangements are the most important among the three contextual attributes underlying action situations faced by irrigators. Institutional arrangements are rules that "are potentially linguistic entities that refer to prescriptions commonly known and used by a set of participants to order repetitive, interdependent relationships" (E. Ostrom, 1986: 22). In a rule-structured situation, individuals select specific actions from a large set of allowable actions in light of the incentives existing in the situation. Rules as social artifacts are subject to human design and intervention. By identifying the capabilities and limitations inherent in different institutional arrangements, one can anticipate different patterns of social outcomes. By changing rules, it is possible to intervene to change the structure of incentives faced by participants and the way they relate to one another. Such interventions may enhance or reduce irrigators' capabilities to allocate water and maintain an irrigation system effectively.

Operational Rules

Operational rules define who can participate in which situations; what the participants may, must, or must not do; and how they will be rewarded or punished. Operational rules facilitate coordination among participants if the participants share a common knowledge of these rules and are willing to follow them. In a world of rapidly expanding knowledge and changing circumstances, rules have to be able to create enough predictability among individuals yet permit enough flexibility to deal with various contingencies (V. Ostrom, 1989). In irrigation systems, four kinds of operational rules are particularly important for solving collective-action problems.^{vii}

Boundary Rules

A key precondition for successful collective action in common-pool resources is the effective enforcement of a set of boundary rules that limits the number of individuals who are entitled to resource units (E. Ostrom, 1990; Schlager and Ostrom, 1987). Without a well-defined set of rights holders, it is difficult for actual and potential users to negotiate and enforce a common set of rules coordinating various water allocation and investment activities. Arthur Maass and Raymond Anderson, for example, argue, "The strength and coherence of local irrigation organizations in developed regions appears to be correlated with an irrigation community's success in limiting or stabilizing growth, thereby gaining security for its members" (Maass and Anderson, 1986: 368).^{viii} The existence of a closed set of rights holders also distinguishes a common-property resource from an open-access resource (Bromley, 1984). Norman Uphoff suggests that because the resource and the users are more definite in regard to irrigation, water user associations tend to outperform other local organizations responsible for such resources as forests and grazing land (Uphoff, 1986b: 27-28).

Several boundary requirements are frequently used in irrigation systems: (1) ownership or leasing of land within a specified location, (2) ownership or leasing of shares in water delivery facilities, (3) ownership or leasing of shares to a certain proportion of the water flow, (4) payment of certain entry fees, and (5) membership in an organization. A boundary rule may consist of only one requirement or a combination of requirements.

Allocation Rules

Allocation rules prescribe the procedure for withdrawing water from an irrigation system. They are important especially when the supply of water is inadequate to meet the crop requirements of all cultivators simultaneously. If allocation rules are effectively enforced, they can reduce uncertainty and conflict among irrigators in relation to water withdrawal. Three types of procedures--fixed percentage, fixed time slots, and fixed order--are frequently used in water allocation:

1. *fixed percentage*: the flow of water is divided into fixed proportions by some physical device.
2. *fixed time slots*: each individual is assigned fixed time slots during which he or she may withdraw water.
3. *fixed orders*: individuals take turns to get water.

Each of these procedures may be based on different premises such as

amount of land held, amount of water needed for cultivation, number of shares held, historical pattern of use, location of fields, or official discretion. For example, an allocation rule may require each irrigator to withdraw water in specific time slots. The length of the slot for an irrigator may be determined by the amount of land he holds, e.g., the more land he holds, the longer the time period to which he is entitled. As shown in Table 2.1, there are many possible combinations of water distribution procedures and bases.^{ix}

Depending on such diverse attributes as the degree of water scarcity, length and structure of the water carrying facilities, the types of crops cultivated, and the monitoring devices available, different allocation rules may be appropriate under various situations. Among them, the degree of water scarcity deserves specific discussion. The degree of water scarcity affects the type of allocation rules needed to coordinate water appropriation activities.

Input Rules

Input rules prescribe the types and amounts of resources required of each cultivator. In systems that are owned and run entirely by irrigators, irrigators have to raise their own resources to finance their own organization and to construct and maintain water delivery facilities. In large-scale, government-built irrigation systems, human and material resources from irrigators could also be effective and reliable inputs for developing and maintaining systems. An irrigator may be required to contribute four major types of inputs: (1) regular water tax; (2) labor for regular maintenance; (3) labor for emergency repair; and (4) labor, money, or materials for major capital investment. Each of these input requirements may be based on one of two kinds of premises--equal or proportional. Equal rules simply require equal contribution from all irrigators. Proportional rules require contributions from irrigators roughly in proportion to the benefits each gets from the system, e.g., proportional to one's share of the system, to the amount of land cultivated, or to the amount of water needed (see Table 2.2).

Some scholars argue that if farmers are required to contribute labor to maintenance, the inputs required of a farmer should be proportional to the benefits he or she receives. Chambers (1977), for example, argues that in order to have effective maintenance, inputs required of an irrigator should be proportional to the benefits he or she receives. Chambers writes:

Communal labor is most likely to be effective where the community will benefit directly and where labor obligations are proportional to expected benefits.... Conversely, where there is no direct link between the work done and the benefits gained, communal maintenance will be much more difficult (1977: 354).

According to this principle, proportional input rules should be more effective for maintenance than equal input rules. There are, however, exceptions to this principle. First, if an irrigation system only requires relatively small amounts of labor inputs for regular maintenance every year, the costs of implementing proportional rules could exceed their potential benefits. Second, if an important structure, such as the diversion dam, of an irrigation system is

Tables 2.1 and 2.2 here

destroyed and requires emergency repair, it may be easier to implement equal contribution rules than proportional rules.

Penalty Rules

In most cases, rules will be ineffective unless rule-breakers are subject to punishment. Some possible penalties against rule-breakers include community shunning, fines, temporary or permanent loss of rights to water, and incarceration. Which of these penalties is more effective in deterring rule-breakers depends on the features of the community of irrigators and the monitoring mechanisms available. In a closed and homogeneous community, community shunning may be sufficient to deter rule-breakers. In a more diverse and heterogeneous community, more substantial penalties such as fines are necessary. More serious penalties, such as loss of rights to water and incarceration, may not be suitable for every irrigation community because these kinds of penalties may induce a high level of conflict among irrigators. Unless backed by an external authority with legal power for imposing coercion, these penalties may be difficult to enforce.

Collective-Choice Arrangements

Operational rules establish constraints that, if properly designed and followed, facilitate cooperation among participants in various collective-action situations in irrigation. Operational rules, however, are not self-generating nor self-enforcing. In most cases, institutional arrangements have to be established to adjudicate conflicts, enforce decisions, and formulate and modify operational rules. These institutional arrangements represent a second set of rules--collective-choice rules. The study of processes used to create, enforce, and modify collective-choice rules is a different level of institutional analysis--the constitutional level (V. Ostrom, 1987) (see Figure 2.3).

Collective-choice arrangements for determining, enforcing, and altering operational rules are especially important in view of participants' bounded rationality and opportunism. Due to bounded rationality, it is impossible to

Figure 2.3 here

devise operational rules that anticipate all kinds of contingencies; disputes among participants as to the proper meanings and scopes of operational rules could arise frequently. Collective-choice arrangements structure the processes by which disputes among participants can be settled. Given opportunism, individuals are inclined to take advantage of their fellow-contractors; collective-choice arrangements that sanction against rule-breaking behavior are important for sustaining mutually-productive relationships. Furthermore, in a world of changing knowledge and environments, operational rules adopted at one time may become obsolete at another; institutional arrangements that facilitate the adoption and modification of rules enable participants to respond to these changes.

Multiple Levels of Collective-Choice Entities

Different sets of collective-choice rules and different communities of participants may be involved in collective-choice situations. Depending on attributes such as the size and the number of users of the irrigation system, different collective-choice entities may be constituted to exercise collective-choice prerogatives on behalf of the users and other concerned parties. Some irrigation systems, for example, are governed solely by a national government agency; operational rules may be created, changed, and enforced by reference to statutes adopted by the national legislature or executive. The collective-choice entity in this case involves not just one specific community of irrigators but also potential irrigators, interest groups, politicians, government officials, and the general public who share an interest in irrigation and other related activities. In some other irrigation systems, the collective-choice entity is constituted solely by irrigators who adopt and enforce their own collective-choice and operational rules.

Sometimes, a community of irrigators may be subject to multiple sets of operational rules adopted by different collective-choice entities. For example, irrigators in large irrigation systems may be simultaneously subject to two sets of operational rules adopted by two different collective-choice entities--a collective-choice entity at the system level and another at a sub-system level.^x Collective-choice entities at the sub-system level, constituted by farmers themselves, are important for the effective operation and maintenance of large irrigation systems. First, what kinds of water allocation and input rules are the most effective and how these rules should be implemented depend much on such specific attributes as the soil type, field topography, cropping pattern, and the amount of water available in the specific irrigated area. Frequent, quick, but non-routine decisions have to be made about water allocation and maintenance in response to changes such as the volume of water flow, climate, and the growth stage of plants. In many large irrigation systems, different watercourses vary in these attributes. If there is only one collective-choice entity to create and enforce one uniform set of operational rules for an entire system, it is unlikely that the set of rules could serve the needs of all watercourses equally well. Local collective-choice entities at the watercourse level, if properly constituted, are likely to facilitate the utilization of "information of specific time and place" in formulating and enforcing appropriate operational rules and choices (Hayek, 1948).

Second, collective-choice entities at the sub-system level involve irrigators in formulating their own rules. Irrigators are more likely to have incentives to follow and enforce rules adopted by themselves than those handed

down from an outside authority. Irrigators can also mobilize various informal mechanisms such as social shunning to enforce their own rules, mechanisms unavailable to any external officials.

While collective-choice entities at the sub-system level facilitate adaptation to the specific needs of various irrigation units, a collective-choice entity at the system level is necessary to deal with broader collective problems such as the allocation of water among watercourses and the maintenance of diversion works for the entire system. The collective-choice entities at the sub-system level, however, can still maintain their autonomy in relation to water allocation and maintenance within their respective areas. By constituting different levels of collective-choice entities to deal with collective-action problems of different scopes, many coordination and control problems associated with large irrigation bureaucracies can be avoided.

Collective-Choice Rules

Individuals may have little incentive to follow rules unless they believe that their noncompliance will result in substantial punishment. Long-term cooperation among a large group of individuals depends on arrangements that help monitor and sanction against noncompliance (see Hechter, 1987). Mutual monitoring among irrigators can be a means of rule enforcement. It may be effective in situations where (1) only a small group of individuals is involved, (2) each individual's activities can be easily observed by others, and (3) each individual has an incentive to monitor others' activities in order to protect his or her own rights. When many individuals are involved, however, the provision of monitoring is itself subject to the free-riding problem because an individual may have incentives to save the time and energy for monitoring others' activities, hoping that others will do the monitoring job for him. Specialized officials may be needed to enforce rules. Many cooperative activities in irrigation benefit from the involvement of specialized officials.

Officials vested with special prerogatives in rule formulation and enforcement, however, are frequently in a position to interpret rules to their own advantage or demand favor from irrigators when adjudicating their disputes or distributing their water shares. This potential opportunistic behavior of officials is a permanent danger in any collective-choice entity. The design of institutional arrangements that can ensure the accountability of irrigation officials has been a major concern of the literature in irrigation organization and management (Hunt, 1989; Coward, 1980; Chambers, 1988; Wade, 1988b).

To ensure the responsiveness of irrigation officials to irrigators, rules are needed to stipulate how irrigation officials are selected and removed, to whom they have to report, and how they are compensated for their services. These collective-choice rules affect the structures of incentives faced by these officials and their services to irrigators. These officials are more likely to be responsive to irrigators' needs if (1) their tenures are subject to periodic votes by irrigators, (2) they have to report to irrigators in general meetings or hearings periodically, and (3) their salaries depend on direct contributions from irrigators.

The Relationship of the Framework to the Data Base

When designing a data base to code information about a diversity of

irrigation systems (as well as inshore fisheries, grazing areas, forests, and other CPRs), it is difficult to establish a one-to-one correspondence between the working parts of the framework and the working parts of the data base. In Section III of this manual, we describe the working parts of the relational data base in some detail and later in this manual we include all of the coding forms.

Concentrating for now on the coding forms that are directly related to the physical and material conditions, attributes of community, and rules-in-use that affect the structure of an action situation and its outcomes, the related coding forms used in the CPR data base are shown on Figure 2.4. Thus, most of the information that we use related to the physical and materials conditions of a CPR are coded on the Appropriation Resource Coding Form and the Location Coding Form. The Operational Level Coding Form and the Subgroup Coding Form contain information about: (1) Attributes of a Community, (2) the Action Situation, (3) Patterns of Interactions, and (4) Outcomes. The Operational Rules Form contains information about the Operational Rules-in-Use.

We use four more coding forms in the CPR data base. They all relate to the collective and constitutional-choice levels of analysis. The Country/Region/Time Coding Form enables us to code information about the general constitutional-choice processes related to the area where a CPR is located. The Organization Structure and Process Coding Form allows us to code information about the organizations that affect the operational rules of a

Figure 2.4 here

particular CPR. The Interorganizational Level Coding Form allows us to code information about higher-level organizations that are related to the organizations directly affecting operational rules. And the Organizational Inventory matrix, enables us to code information about all of the organizations that affect the production, distribution, appropriation, and use activities in a particular CPR.

Notes for Section II

- i. The concept "action situation" is broader than "transaction" because the former deals with all kinds of social situations while the latter concerns specific exchanges between or among people.
- ii. Other outcomes such as cropping intensities and agricultural productivity are important too. I do not focus on them in this study because information about them is generally absent in case studies on irrigation systems. For a more extensive list of "objectives in irrigation management," see Uphoff (1986a: 20-21).
- iii. This is only a partial list of physical and community attributes that may affect collective action in irrigation systems. Other attributes such as meteorological conditions and irrigators' cosmological views are also important variables to consider. They are not discussed in this study because most cases do not provide detailed information about these attributes.
- iv. In some situations, water abundance may be a problem by itself and requires collective action for its solution. For example, if the water flow is so abundant as to create drainage problems or threaten the physical integrity of the water diversion or delivery works, these kinds of situations could induce farmers to undertake intensive collective efforts to keep their system in a working condition.
- v. Wittfogel distinguished between two types of irrigated agriculture--hydroagriculture and hydraulic agriculture. Hydroagriculture refers to small-scale agriculture for which "strictly local tasks of digging, damming, and water distribution can be performed by a single hushandman, a single family, or a small group of neighbors, and in this case no far-reaching organizational steps are necessary" (Wittfogel, 1981: 18). Hydraulic agriculture, on the other hand, deals with large amounts of water and requires elaborate organizational discipline to work.
- vi. Researchers, however, have discovered through experimentation that rice does not require a continuous stand of water during the growth period and that continuous flow of water through the field is necessary. If farmers could follow a rotational schedule for distributing water, a larger area could be cultivated by the same amount of water (Abel, 1977).
- vii. There are, of course, other kinds of operational rules. I do not focus on them because they are in general less important than the four I am discussing here. I will discuss other operational rules whenever relevant.
- viii. It is possible that individuals who control a water resource use their control to jack up the price of the crops they raise using that resource. This situation, however, would happen only in isolated communities that do not have any connection with other marketing networks. In locations that have regular connections with other marketing networks, individuals monopolizing a water source could not have much influence on the price of the crops they raise.
- ix. In the irrigation literature a distinction is often made between "water allocation" and "water distribution." Martin and Yoder, for example, argue that

Water allocation is the assignment of entitlement to water from a system, both identifying the fields and farmers with access to water from the system and the amount and timing of the water to be delivered to each. Water distribution refers to the physical delivery of water to the fields and may not conform to the water allocation (1986: 2).

"Water allocation," as defined by Martin and Yoder, is analogous to what is called "bases" in this study; "water distribution" is analogous to water delivery "procedures."

- X. In larger irrigation systems, three or even more levels of collective-choice entities may exist.

Screening Coding Form

The purpose of the Screening form is to determine the usefulness of articles to the research project and whether they contain citations to other potentially useful articles. The articles that passed this test are part of the SES Library at ASU and are available at seslibrary.asu.edu. Each form typically has 4 components: 1) Instructions, 2) Variable descriptions, 3) Conceptual Basis for variables, and 4) the coding form for the variables themselves. Not all forms have all 4 components. This form, for example, does not have a conceptual basis component.

If you would like to see the actual coded data from this project, please visit seslibrary.asu.edu/seslibrary/cpr/query.

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CODING INSTRUCTIONS FOR
ROUTING SLIP & SCREENING FORM

by

Libby Anderson

PAPERWORK FLOW

Articles need to be screened to determine their usefulness to the research project and whether they contain citations to other potentially useful articles. Such articles become part of the CPR bibliography which Fenton Martin is compiling, as well as being used for theoretical background information on CPRs or for actual coding. The first step is acquisition of a reference; these come to us via Fenton in several forms: books from the I.U. library or on interlibrary loan; photocopied journal articles; or books we purchase for the project.

When a new book/article comes to Fenton, she and/or her staff go through its bibliography or literature cited section and mark, with a check, any citations that appear relevant to the project but that are not already in the "bib". Then they pass the article on to us. You, the screener, should also be on the look-out for other, less obvious, citations that might give us still more information about the appropriation resource (AR) being discussed in the article; and for citations which, from the context of reading the article, are indeed related to the CPR bibliography but may not be there because the title doesn't clearly "sound" like a CPR article.

After an article has been screened, if there are any additions to (or possibly deletions from) the CPR bibliography, the article goes back to Fenton, and then is returned here for Lin Ostrom to review. When Lin has reviewed an article, it goes to the data enterer to be put into the database. After that, if it is codable, it gets coded.

THE ROUTING SLIP

The routing slip, a separate form which should be stapled inside the front of the manila folder for an article, or paper-clipped inside the front cover of a book, is used to keep track of the processing steps. After you've completed the screening form, write your initials on the routing slip in the blank after "screened" (number 2), and indicate the date.

The screener's initials are required for three reasons. First, if there is some ambiguity in the screening form, the screener can be consulted for clarification. Second, if the AR is selected for further coding, the screener will most likely do the coding. Third, once the screening form has been entered into the computer, the screening form and computer printout will be returned to the screener, who checks the printout for mistakes. Once that's checked, the screener again signs and dates the routing slip on the line labeled "data entry checked."

THE SCREENING FORM

General Notes

The purposes of this form are:

(1) to evaluate whether a case study or set of studies contains sufficient information about a specific appropriation resource (AR) and its location that it would be possible to select this case for further coding and analysis, or whether additional information may be available to supplement the information contained therein;

(2) to provide a short and concise abstract of articles; and

(3) to provide relevant information to aid in the selection process.

This form is to be used to screen:

(1) specific appropriation resources, not articles. Therefore, if an article describes more than one AR and its participants in detail, a separate screening form must be used for each AR (although the citation and abstract may be the same for all forms);

(2) general descriptions of an AR or theoretical articles that pertain to ARs. In screening such an article, give particular attention to writing a concise abstract. The purpose of screening general articles is threefold. First, as for all information screened, it lets other members of the research team know that an article has been reviewed, which prevents redundancy in reading articles. Second, it is a method of keeping an inventory of all the material that has been reviewed. Third, although the general or theoretical articles will (can) not be coded, they may provide valuable background information related to a specific region or country or resource, which will be of help in coding.

When Screening Library Books . . .

The title page and table of contents of a library book should be photocopied before the book is returned. They give a level and kind of detail about the book that the citation and abstract do not. This includes books that really do not pertain to CPRs -- it will be a check against investigating a dead end again. The photocopied material gets filed with the screener form.

When screening a library book it must be decided whether to photocopy the entire book, specific chapters, or nothing besides title page and table of contents. The strategy is a little different depending on whether the book came to us on interlibrary loan or whether it is an I.U. library book: we will copy more liberally from an interlibrary loan because we can keep it only for a short time and it is more difficult to get such a book again. At the end of the citation, include the name of the library from which the book came (if not Indiana University at Bloomington), and the call number.

For interlibrary loan books, select for Xeroxing those chapters that look like good candidates for coding. A chapter should also be Xeroxed if it appears to have useful information, even if it does not contain sufficient data for coding, because more information may be added later on. This may want to be done before the chapters are screened, to save time.

If the book comes from the I.U. library, be more selective. Photocopy the title page and table of contents, then screen from the book itself. Xerox only chapters that meet the following conditions: (1) you assess that there are sufficient data in the chapter that it is codable; and/or (2) the chapter is a generally worthwhile discourse on CPR management, property rights theory, or related topics, which other team members also may want to consult. If a chapter, or entire book, does not describe a resource in codable detail but is useful background or theory, screen it and file the form with the photocopies of the book's title page and table of contents; note on the screening form that the item itself was not photocopied. Be sure the book's call number appears in the citation for all I.U. library books or sections thereof (copied or not).

Section A. Document Identification

Question A1. "Full Citation"

Provide a full citation to the document as it appears in the CPR bibliography. If the article is a chapter in a book, but had originally appeared as a journal article, first provide a complete citation for the journal and then provide a complete citation for the book. Include library call number if relevant. Because screening forms focus on resources, not documents, you may include three citations on one form and combine their information in the abstract ("paragraph" -- described below).

If the document you are reading is in a language other than English, after the author's name and the date of publication write the title in the original language, transcribed into the Roman alphabet if necessary. Then, in brackets, put a translation. If the document is a chapter in a book, put both the original and the translation inside the quotation marks. If the document is a translation, in English, use only its English title.

Question A2. "Delete"

If the item being screened discusses common property resources it probably belongs on the bibliography, so the proper response is (3), "NO, do not delete." Fill in the form as completely as possible.

An article may be relevant to the Project but inappropriate for the bibliography. An example is technical information about a specific CPR or CPRs generally, such as calculating streamflow. It is not codable; it does not mention how people use a resource. However, especially if there are empirical data included, it could be of use when coding. Such an item does not belong on the bib, but is relevant to the project and should be retained in the database. Code (2), complete the form to the extent possible, and route the paperwork past Fenton for deletion from the bibliography.

If the article is clearly not relevant to the CPR project, code (1) and do not complete the form except as indicated. The computer will automatically code the sector (Question B2c) as 0. Do make a copy of title page and table of contents, however. Explain briefly in the paragraph what the item IS about if that's

not obvious from the table of contents, again to avoid going down a blind alley a second time. Return article to Fenton for deletion from the bibliography.

Question A3. "Pure Theory"

If the article does not describe any ARs but discusses some theoretical aspect that underlies appropriation resources or common property in general, place a check in the space provided. As indicated on the screening form, complete only questions A4, A7, A7a, and the summary paragraph. It may happen that an article is theoretical but sector-specific, in which case you may be able to answer B2c also.

Question A4. "Document Type"

Indicate the type of publication of the document being screened. If you are screening more than one document on the same form, pick the one that contains the most information about this AR.

Question A5. "Refereed"

For the document selected to answer A4, indicate whether it has been refereed or not. Generally, types (1), (3), and (4) are refereed.

Question A6. "More Information"

If the author of the article being screened cites other work that appears to provide further information on this same AR, make note of it. In-depth coding may not be possible using the present document alone, but may be possible with the other sources cited by the author.

Questions A7. and A7a.

If the author of the article being screened cites other sources (not already checked by Fenton Martin) that appear to be case studies of other ARs, or otherwise CPR-relevant, circle the citation and note the page number. The citation will be entered into the CPR Bibliography and accessed at a later date.

Section B. Case Quality Evaluation

Question B1. "Document Describes"

Indicate the number of distinct appropriation resources covered by the source(s) being screened. Both the exact AR and its appropriators should be identified in the source(s) for it to be suitable for coding. If more than one resource is discussed, complete a separate screening form for each resource that is potentially codable.

Question B1a. "If 0 then..."

If the document does not distinctly identify an AR and its appropriators, place a check by the statement that most closely

describes the document. Then answer only questions B2a, B2b, possibly B2c, and the summary paragraph.

One generalized resource is not an actual resource, but a model resource reconstituted from information about several specific resources. **Scattered information** about a region or sector does not describe a general or a specific appropriation resource; rather scattered information generally describes a sector or sectors which may be situated in a particular region of the world. **Theoretical analysis** provides general explanations of behavior of individuals in relation to natural resources. Such theoretical explanations are based on empirical data, but these data are either not particular to a specific resource or not specific enough to describe a generalized resource. **Useful information** provides very broad background information about an industry, rules, or behavior within a sector, or technical information about a resource. The information certainly is not codable, although it may be useful as background in coding specific resources.

Question B1b. "Resource Name"

Assign the appropriation resource a unique name that will distinguish it from all other ARs. In some instances, the author will provide a name. If not, some unique identifiers may be the name of the town it is near, or the name of the county, province, district or state in which it resides. If the name still appears too general, include within it the author's last name. For example, instead of labeling an AR "Jamaica fishery," use the author's name and label it "Berkes' Jamaica fishery." If the article describes more than one AR, list the one being screened on the present form first, followed by names for the other resources, screened on other forms. If one could devise a general resource name, collapsing the ARs into one category, fill in B1c. (Example: Long Point perch fisheries and Long Point smelt fisheries collapse into just Long Point fisheries.)

Question B2. "Location Name"

List the name of the location associated with this AR. This is usually the town or village where those who appropriate from this resource live. If there is only one AR, the location name and the resource name may be the same, if this is the most appropriate name for both.

Question B2a. "Country"

Use the name by which the country is known today even if it is referred to in the article(s) by another name. (The historical name will be used if historical coding is done.) Places like Micronesia and Polynesia (which are not countries or states or territories) or Guam and the Faeroe Islands (at some distance from their "owners") can be considered "countries" too, for our purposes.

If the resource crosses national boundaries and thus involves more than one country, proceed as follows:

(1) If all relevant countries can be identified within the 25-character limitation (perhaps by abbreviating), go ahead and do that;

(2) otherwise, select one country on some basis (such as where most of the resource lies, or where the case author did most of the research fieldwork) and enter its name followed by a plus ("+") sign; or

(3) write International Waters or International Airspace.

Question B2b. "World Region"

Leave this blank. It will be filled in automatically when the name of the country is entered into the database.

Question B2c. "Sector Identification"

Identify the sector category best fitting the AR you are coding.

Questions B3 and B3a. "Author Location"

If the document indicates where the author may currently be located, first indicate whether s/he can be contacted by phone and then indicate his or her institutional affiliation. Any tidbit of information about the author's location may potentially be useful. At some later date this AR could be selected for further coding, but complete information may be lacking. The author will then be consulted for further details.

Question B4. "Author Knows Particulars"

If the author simply summarized the research of others concerning this appropriation resource, then chances are s/he may not intimately know the "case." On the other hand, if the author not only summarizes others' data, but also engages in analysis, and possibly adds his or her own primary research, then one can be reasonably sure that the author actually knows the particulars of the "case." As the question says, use your best estimate!

Question B5. "Sufficient Data for Coding"

To answer this question yes, the author must have provided sufficient information that we could begin to complete the location form, the resources form, the operational level coding form, and the subgroup coding form. It would be nice, but not necessary, if we could also complete the rules and collective choice coding forms. You will need to become familiar with these other coding forms and their corresponding manuals before you attempt to answer this question. Generally, a codable case should contain the following information: the sector (irrigation, fisheries, etc.); the general condition and boundaries of the resource; who appropriates from the resource; the appropriation process (equipment, teams); information at the village or town level (for fisheries) or terminal unit (irrigation). Err on the positive side: a coder can always give up on a case that wasn't codable after all, but it is difficult to know that a case marked

negative really is codable.

Question B6. "Persons To Validate"

List here anyone you think would be appropriate to call or write to obtain their estimate of the validity of the case as described by the author(s) who has (have) written the document(s) being screened.

Question B7. "Stakes of Participants"

The question attempts to determine the importance of the AR to its appropriators. Does the livelihood of the appropriators depend on withdrawing units from this AR? Do the appropriators have alternative sources of supply of the units taken from the AR? Have the participants invested much time and effort in improving, maintaining, or protecting the AR? What constitutes "relatively good information" is a judgment call. The information need not be excellent, but it must be more than just a passing reference.

Question B8. "Condition of AR"

In what shape is the resource? Several factors contribute to the condition of the AR. For instance, the AR may be overused. Units may be withdrawn at such a rate that the sustainable yield of the AR is exceeded. Or the AR may be polluted, inhibiting the regeneration of units or the desirability of using the AR's units. For the information to be considered "relatively good," the author should have provided some type of empirical data if s/he discusses or judges the condition of the AR.

Question B9. "Strategies Used by Key Groups"

Strategies are the various actions that appropriators of the resource have taken in regard to other appropriators, potential appropriators, or external groups, in attempting to gain the greatest advantage from the appropriation of the AR. For example, do the individual participants cooperate with each other as they appropriate from the AR, or do they try to cheat each other?

Question B10. "Operational Level Rules"

"Operational level" means the arena of direct action of appropriators and others in their distribution, production, appropriation, and use relationships with the AR. "Direct actions" are those which affect the world of everyday affairs. They include entry and exit from a resource, the production, distribution, appropriation and maintenance activities related to a resource, buying and selling units from the resources, etc. "Operational level rules" are those rules which affect -- enable, prescribe, or constrain -- the direct actions of appropriators in the appropriation from and maintenance of the AR. The operational level excludes the level of action wherein appropriators jointly create, alter, or enforce such rules. That level is the collective choice level of action (see the instructions for question C8). In addition, operational level excludes the level of action wherein appropriators jointly frame rules by which

collective decisions are to be made. That level is the constitutional choice level of action (see the instructions for question C9).

Section C. Case Information for Use in Screening

"Missing in Case" (MIC)

For the questions in this section, if the article does not mention anything about a particular issue, or is too ambiguous to decide whether a question should be answered "yes" or "no," check the line beside MIC.

Question C1. "Known or Estimated Size"

Some case authors will report the area of the appropriation resource. For others, you will have to estimate based on maps, descriptions, or other sources. If there is no evidence on which to base an estimate, check MIC. The "area" may vary depending on factors like the season: an irrigation system may provide water for a larger area in the rainy season, for example. Give the size for the largest area that the resource ever covers -- to reflect its maximum capacity, the maximum demand on it, etc.

Question C2. "Known or Estimated Appropriator Teams"

Mark the range into which falls the total number of appropriator teams of the AR. Appropriators are those who have access to an AR and withdraw units from it. Note that we are coding appropriator teams. For example, if there are 100 fishermen, each using one boat, then the appropriation team is a single person, and the number of appropriator teams is 100. If 100 fishermen have organized themselves in groups of four, each group (team) using one boat, then the appropriator team is four persons and the number of appropriator teams is 25. Grazing might be a special case that affords different handling, because the owners of the resource are not necessarily present on the grazing land to attend their cattle. Rather, all the owners may jointly hire labor to pasture the animals. In this case the number of appropriator teams is the same as the number of owners, because they are the ones who appropriate the value of the grazing land in the end. There are other cases in which grazing rights are connected to hut rights, with each owner of a hut right conducting his own alp enterprise on the common grazing land. In this case it seems to be appropriate to count the number of hut right owners as teams.

If the author records the actual number of teams, post it in the space provided.

Question C3. "Number of Distinct Subgroups"

Code the maximum number of subgroups ever present in any particular period of time. A subgroup is a set of appropriators who are similar in regard to:

(1) legal rights and duties of access, exclusion, improvement and use,

- (2) uses made (i.e. final consumption as contrasted to selling in local or external markets),
- (3) levels of dependency on resource (symmetry in dependency),
- (4) levels of exposure to variation in supply (symmetry in exposure),
- (5) approximate quantity of units withdrawn (symmetry in appropriation).

Subgroups may or may not share cultural, ethnic, or religious attributes.

Question C4a. "Biological Resources at Beginning"

Question C4b. "Physical Resources at Beginning"

Choose which category best describes the relationship between the demand and supply of the system at the beginning of the period discussed by the author. Fisheries, wildlife, forest products, and land products are biological systems. For these, the number of units available should be taken to mean the highest number at which the resource can reproduce itself, i.e. the maximum sustainable number of units. Irrigation facilities are physical resources; the "quantity of units needed" would refer to water need beyond that naturally supplied by rain. Since a resource can be only biological or physical, either C4a or C4b will be "Non Applicable" for any given AR.

Question C5a. "Biological Resources at End"

Question C5b. "Physical Resources at End"

Instructions same as above, but for the end of the period discussed by the author.

Question C6. "Appropriators Organized?"

In order to be considered organized, appropriators should share common understanding about at least some of the following:

- (1) who is and is not entitled to be an appropriator,
- (2) the type of access to the AR conveyed by status as an appropriator or other grounds for such rights (e.g., the rights, duties, liberties, and exposure of different individuals),
- (3) how decisions will be made that affect the development of coordinated strategies for using the AR, and
- (4) how conflicts over these appropriation patterns will be resolved.

Questions C6a. and C6b. "Effective or Ineffective"

A rough estimate of effectiveness might include: (1) whether there were high levels of conflict among the appropriators; (2) whether there was a pollution problem; and (3) whether the amount of units withdrawn was approaching or exceeding the sustainable number of units.

Question C7. "Unorganized"

Answer "Yes" if none of the criteria listed in the instructions

for question C6 apply.

Question C7a. "Open Access"

The answer to this question is "Yes" if you can characterize the resource as an open access one AND/or if co-owners, co-proprietors, co-claimants or authorized appropriators are unorganized. (If an AR is open access, there are no rules regulating who is eligible to appropriate from the resource or how the resource should be used.)

Question C8. "Collective Decision-Making"

Collective decisions are made by officials (including individual appropriators acting as officials) to determine, enforce, continue, or alter actions authorized within institutional arrangements. Collective decisions are plans for future action which are enforceable against nonconforming individuals.

Question C9. "Constitutional Decision-Making"

Constitutional decisions are collective choices about rules governing future collective decisions to authorize action. Constitutional choices, in other words, are decisions about decision rules. Organizing an enterprise is a constitutional decision about rules to constrain future collective choices within the enterprise. But constitutional choice also continues beyond the initial organizing period, for as individuals react to consequences of earlier rules for collective decision-making, participants may change the rules to improve the result.

Questions C10a. C10b. and C10c. "Operational Level Rules"

A rule is considered to be "designed" if you can identify particular occasions and mechanisms by which the rule was chosen. "Design" implies a conscious act of creativity. On the other hand, a rule is "evolved" if no such occasions and mechanisms can be identified. In this case, no conscious act of creativity is involved. We are concerned in this question to determine whether operational level rules originate, in either of these two senses, from the appropriators; from nonappropriators in the same locale as the appropriators, such as a tribal council; and/or from an external authority, such as a district or central bureaucracy or government. Note that the three parts of this question are not mutually exclusive. For example, an operational rule may be designed by an external authority, then "adopted" by the appropriators, where "adopted" means jointly accepted as legitimately pertaining to their direct action.

Questions C11a. C11b. and C11c. "Collective Choice Rules"

The same as above, only for the collective choice level.

PARAGRAPH

The "paragraph" is a concise, one-paragraph abstract of the document being screened. It summarizes the document's central theme but should emphasize information relevant to the CPR project, as levels of decision-making rules and characteristics of the resource (if those are NOT well described, say so). The paragraph may also discuss the organization of the document and make an overall assessment of its quality and its usefulness to the project. It should augment but not merely duplicate information already captured in the form's check-off responses. If the document describes success or failure in management of a CPR, bring out the "whys" the author stated. If some judgement can be made of the fragility or robustness of the resource, try to relate that, and to tell whether the appropriators abused it or kept their demands on it within its limits.

The paragraph is not for us alone; outsiders with an interest in the research may read it too. Therefore, write in a professional tone and keep your comments, especially negative ones, objective. You can mention things like flaws in logic, or questions raised but not addressed; you can describe the author's analysis as "unsophisticated" but avoid the use of words like "inane". Append such in-house comments by some other means, like a separate sheet; the screener form itself will not circulate to outsiders.

Avoid starting your abstract with empty wording such as "This article describes..." Use active voice where possible; it's more readable and more informative. We can do keyword searches on these paragraphs; therefore, be as specific as space allows. Mention the location of the resource (question B2) and other geographic names the author may have included. For example, if the resource is on an estuary, and the author has mentioned the name of the major river feeding that estuary, try to work the river's name in too. Likewise, if technical terms such as "rent dissipation" or "prisoners' dilemma" or "subak" or "harbor gang" apply, use them, even if the author doesn't. Refer to the author by name, at least the first time, rather than as merely "the author ..."

If the article describes two or more ARs and one abstract can be written applicable to all ARs, duplicate it for the other screening form(s) (you may write "see paragraph for ...") This could be the case, for example, in a comparative study of the technological development of three different fishing villages. If there is much information unique to each AR, you may have to write a separate abstract for each.

As of this writing the database has a 1500-character space reserved for each paragraph. If you type your paragraph using the Word-11 system you will get a count of the characters each time you bring the file up afresh, and can see how close you are to the limit.

If you type your abstract, don't bother with hyphens to neaten up the right margin by dividing words. This is because the data-entered version may be transmitted to another format with different margins, and the hyphenated word may wind up in the middle of the sentence like these, look- ing pecu- liar. You

may hyphenate words hyphenated in the document being screened, or those commonly hyphenated such as "ditch-digger".

You may want to make an extra copy of the paragraph for your own records, including a partial or full citation. This is useful when you vaguely remember reading about a certain fact or interpretation but not where you read it or who wrote about it.

VARIABLE LIST SCREENING FORM "S"
Alphabetical

<AUTHKNOW>	<SB7>	In your best estimate, do you have a relatively high level of confidence that the author(s) know(s) the particulars of this "case"?
<CIT>	<SA1>	What is the full citation to the document(s) being screened?
<CODABLE>	<SB8>	In your best estimate, do you have a relatively high level of confidence that the author(s) has (have) provided sufficient data for us to begin a structured coding process?
<COUNTRY>	<SB2a>	What is the name used TODAY for the country in which the location is situated?
<DELETE>	<SA2>	Should this citation be deleted from the CPR bibliography?
<DOC>	<SA1>	What is(are) the id number(s) for the document(s) being screened?
<FORMORG>	<SC5>	Were the appropriator teams for this resource ever formally organized?
<GRESNAME>	<SB1c>	If there is more than 1 resource, what is a generalized name?
<INFCOND>	<SB4>	Is there relatively good information about condition of this resource?
<INFOPRUL>	<SB6>	Is there relatively good information about (or from which may be inferred) the operational rules in use for this resource?
<INFSTAKE>	<SB3>	Is there relatively good information about stakes of participants?
<INFSTRAT>	<SB5>	Is there relatively good information about strategies used by key groups?
<MOREINFO>	<SA5>	Are there citations in any of the documents to other documents which might provide further information about this same CPR?
<NUMBERES>	<SB1>	How many resources do these documents describe in detail?
<PARAGRPH>	<SC6>	Please write an abstract of the document being screened.
<PURETHEO>	<SA3>	Is this document a pure theory article with no empirical information?

<REGION>	<SB2b>	What is the world region in which this country is found?
<RESNAME1>	<SB1b>	What is the name of the first resource described?
<RESNAME2>	<SB1b>	What is the name of the second resource described?
<RESNAME3>	<SB1b>	What is the name of the third resource described?
<RESNAME4>	<SB1b>	What is the name of the fourth resource described?
<SBEGBLNC>	<SC3a>	For biological resources at the [!Ubeginning]!U of the time period discussed by the author(s), what was the balance between the quantity of units withdrawn and the number of units available?
<SBEGBLNC>	<SC3b>	For physical resources at the [!Ubeginning]!U of the time period discussed by the author(s), what was the balance between the quantity of units withdrawn and the quantity of units needed*, given the usual patterns of use for these units?
<SECTOR>	<SB2c>	What is the sector code for this resource?
<SENDBLNC>	<SC4a>	For biological resources at the [!Uend]!U of the reported time period discussed by the author(s) of this [!Ucase]!U, what was the balance between the quantity of units withdrawn and the number of units available?
<SENDBLNC>	<SC4b>	For physical resources at the [!Uend]!U of the reported time period discussed by the author(s) of this [!Ucase]!U, what was the balance between the quantity of units withdrawn and the quantity of units needed, given the usual patterns of use for these units?
<SLOCNAME>	<SB2>	What is the name of the location?
<SLOCsize>	<SC1>	What is the known or estimated size of the appropriation resource?
<SNUMAPP2>	<SC2>	What is the known or estimated number of total appropriator teams for this resource?
<TYPEDOC1>	<SA4>	What type of document is this?
<TYPEDOC2>	<SA4>	If this document type is not listed, what other type is it?
<ZERORES>	<SB1a>	If these documents do not describe a particular resource, then what do they describe?

CPR Screener Number _____
<SCREENID>

This screening form abstracts information
from **1 2 3** document(s) (circle one).

CPR PROJECT -- SCREENING FORM
[Last Revision: November 17, 1989]

DOCUMENT IDENTIFICATION

A. DOCUMENT IDENTIFICATION

A1. Full citation to document(s) (check the citation in the CPR bibliography):
<CIT> <DOC>

- (1) _____

- (2) _____

- (3) _____

A2. Should this citation be deleted from the CPR bibliography? <DELETE>

- (1) _____ Yes; it is not relevant to the Project. (Answer A6 and A6a if possible, and leave the rest of the form blank except for the summary paragraph)
- (2) _____ Yes; but it is relevant to the Project. (Answer as many of the questions as are relevant, and the summary paragraph)
- (3) _____ No; keep on (or add to) the bibliography. (Complete this form)

A3. Is this a pure theory or experimental article with no empirical information from field settings? (If yes, answer A4, A6, A6a, B2c, and the summary paragraph only; leave the rest of this screening form blank)
<PURETHEO>

- (1) _____ Yes
(2) _____ No

DOCUMENT IDENTIFICATION

If coding more than one document, select as a "primary coding document" the one with the most codeable information and use it to answer questions 4 and 5.

A4. This is a: <TYPEDOC1>

- (1) _____ Book
- (2) _____ Monograph
- (3) _____ Journal article
- (4) _____ Chapter in a book
- (5) _____ Paper given at a professional meeting
- (6) _____ Paper issued by scholar or research institution
- (7) _____ Thesis or dissertation
- (8) _____ Other: _____ <TYPEDOC2>

*A5. Are there citations in any of these documents to other documents which might provide further information about this same CPR? <MOREINFO>

- (1) _____ Yes
- (2) _____ No

A5a. If yes, circle the citation(s) in the text(s) and provide in the first column below both the last name of the author and the page numbers on which the citations appear. If you think the document(s) should be accessed immediately, mark an "A" in the second column and route to Julie for accessing before routing to Fenton. If the document(s) is not already in the CPR Bib, mark a "B" in the third column.

- | | | | | | |
|-----|-------|-------|-------|-----------|-------|
| (1) | _____ | _____ | _____ | date acc. | _____ |
| (2) | _____ | _____ | _____ | date acc. | _____ |
| (3) | _____ | _____ | _____ | date acc. | _____ |

*A6. Are there citations in any of these documents to other documents which might be appropriate for the CPR Bibliography, beyond those already checked off by Fenton?

- (1) _____ Yes
- (2) _____ No

A6a. If yes, circle the citations in the text(s) and provide below both the page number(s) on which they appear and the last name of the author(s). If you think these documents should be accessed immediately, route to Julie for accessing before routing to Fenton, marking an "A" by those citations you wish accessed.

- | | | | |
|-----|-------|----------------|-------|
| (1) | _____ | date accessed: | _____ |
| (2) | _____ | date accessed: | _____ |
| (3) | _____ | date accessed: | _____ |

B. CASE QUALITY EVALUATION

B1. These documents describe _____ number of resources in detail.
(i.e. identify location and participants) <NUMBERES>

B1a. If 0 then does this describe: (If 0, then answer question B2a, B2c, and the summary paragraph only; leave the rest of this screening form blank)
<ZERORES>

- (1) _____ One generalized resource
- (2) _____ Scattered information about a region
- (3) _____ Theoretical analysis supported by many examples (information is insufficient to code)
- (4) _____ Useful information on the industry, rules, behavior, or resource
- (5) _____ Experimental
- (-2) _____ Not Applicable (NA)

B1b. If 1 or more, assign each resource a name, with the resource being screened in this form listed first:

- (1) _____ <RESNAME1>
- (2) _____ <RESNAME2>
- (3) _____ <RESNAME3>
- (4) _____ <RESNAME4>

B1c. If there is more than 1 resource, assign a generalized name:
_____ <GRESNAME>

B1d. Type of Irrigation System: <TYPE>

- (1) _____ AMIS
- (2) _____ FMIS
- (3) _____ JMIS
- (4) _____ Other: _____
- (5) _____ Very ambiguous in case
- (-1) _____ Missing in Case (MIC)
- (-2) _____ NA

B2. Assign the location a name: _____ <SLOCNAME>

B2a. Post here the name used TODAY for the country in which the location is situated (or, the country discussed the most in the document):
_____ <COUNTRY>

B2b. World region in which this country is found: _____ <REGION>
(to be entered at time of data entry)

CASE QUALITY EVALUATION

B2c. Sector: <SECTOR>

- (1) ☐ Fisheries
- (2) ☐ Wildlife
- (3) ☐ Forest Products
- (4) ☐ Land Products
- (5) ☐ Water
- (6) ☐ Airsheds
- (7) ☐ Other: _____
- (8) ☐ NA (Pure Theory or Experimental, or other cases for which no sector can be identified)
- (9) ☐ Village or Communal Organization
- (0) ☐ NA (article deleted from the Bibliography and not relevant to the project)

B3. Is there relatively good information about stakes of participants?
<INFSTAKE>

- (1) ☐ Yes
- (2) ☐ No

B4. Is there relatively good information about condition of this resource?
<INFCOND>

- (1) ☐ Yes
- (2) ☐ No

B5. Is there relatively good information about strategies used by key groups?
<INFSTRAT>

- (1) ☐ Yes
- (2) ☐ No

B6. Is there relatively good information about (or from which may be inferred) the operational rules in use for this resource? <INFOPRUL>

- (1) ☐ Yes
- (2) ☐ No

B7. In your best estimate, do you have a relatively high level of confidence that the author(s) know(s) the particulars of this "case"? <AUTHKNOW>

- (1) ☐ Yes
- (2) ☐ No

B8. In your best estimate, do you have a relatively high level of confidence that the author(s) has (have) provided sufficient data for us to begin a structured coding process? <CODABLE>

- (1) ☐ Yes
- (2) ☐ May be codable with citations given by author
- (3) ☐ No

C. CASE INFORMATION FOR USE IN SCREENING

Answer the following questions with primary reference to the appropriation resource.

C1. Known or estimated size in square meters (for irrigation, post here the area of irrigation): <SLOCSIZE> _____ MIC
If not in square meters, give number and unit of measure: _____

C2. Known or estimated number of total appropriator teams for this resource:
<SNUMAPP2>

- (1) _____ Less than 25
- (2) _____ 25-50
- (3) _____ 51-100
- (4) _____ 101-200
- (5) _____ 201-500
- (6) _____ 501-1000
- (7) _____ 1001-2500
- (8) _____ 2501-5000
- (9) _____ Over 5000
- (-1) _____ MIC

C3a. For **biological** resources at the beginning of the time period discussed by the author(s), the balance between the quantity of units withdrawn and the number of units available was*: <SBEGBLNC>

- (1) _____ Extreme shortage
- (2) _____ Moderate shortage
- (3) _____ Apparently balanced
- (4) _____ Moderately abundant
- (5) _____ Quite abundant
- (-1) _____ MIC
- (-2) _____ NA

* In fisheries and other biological systems, this is the maximum sustainable number of units.

C3b. For **physical** resources at the beginning of the time period discussed by the author(s), the balance between the quantity of units withdrawn and the quantity of units needed*, given the usual patterns of use for these units, was: <SBEGBLNC>

- (1) _____ Extreme shortage
- (2) _____ Moderate shortage
- (3) _____ Apparently balanced
- (4) _____ Moderately abundant
- (5) _____ Quite abundant
- (-1) _____ MIC
- (-2) _____ NA

* In irrigation, this refers to the optimal water requirements of the crops in the established fields served by this system.

CASE INFORMATION

C4a. For **biological** resources at the end the reported time period discussed by the author(s) of this case, the balance between the quantity of units withdrawn and the number of units available was*: <SENDBLNC>

- (1) _____ Extreme shortage
- (2) _____ Moderate shortage
- (3) _____ Apparently balanced
- (4) _____ Moderately abundant
- (5) _____ Quite abundant
- (-1) _____ MIC
- (-2) _____ NA

C4b. For **physical** resources at the end of the reported time period discussed by the author(s) of this case, the balance between the quantity of units withdrawn and the quantity of units needed, given the usual patterns of use for these units, was: <SENDBLNC>

- (1) _____ Extreme shortage
- (2) _____ Moderate shortage
- (3) _____ Apparently balanced
- (4) _____ Moderately abundant
- (5) _____ Quite abundant
- (-1) _____ MIC
- (-2) _____ NA

C5. Were the appropriator teams for this resource ever formally organized?
<FORMORG>

- (1) _____ Always
- (2) _____ Sometimes
- (3) _____ Never
- (-1) _____ MIC

C6. Please write an abstract of the document being screened. <PARAGRPH>

Country Region Time Coding Form

This form is comprised of general questions concerning the capabilities and limits of citizens living in this region regarding self organization (constitutional choice) and self governance (collective choice). This section contains only the coding form for the variables themselves. There are no instructions or variable descriptions.

The remainder of this page has intentionally been left blank

COUNTRY/REGION/TIME CODING FORM

Location No.: _____
 <LOCID>

This section need not be completed at the initial time of coding the first case in a country. However, if there is relevant information in the document, please complete questions or indicate the appropriate page numbers where relevant information can be found next to the questions. These questions will usually be completed for a series of regions in the same country after reference to general texts about political structure in a particular region of a country as well as in light of reading a series of cases from that country.

Please list on the back of this form the general sources which have been consulted to complete this section of the form. Also please list the names of any scholars who have been consulted by phone or by mail about these questions. Name of coder for this section: _____

<BEGDATE> <ENDDATE>

A. GENERAL CONSTITUTIONAL CHOICE PROCESSES FOR REGION

- | | | |
|------|-------|-----|
| (1) | _____ | Yes |
| (2) | _____ | No |
| (-1) | _____ | MIC |
| | _____ | CL |

- (1) _____ Full choice - can draft own charter without approval elsewhere
- (2) _____ Considerable choice - can draft own charter subject to approval elsewhere
- (3) _____ Can choose between existing "boilerplate" charters
- (4) _____ Cannot choose charter form -- it is specified for each general purpose government of a particular size,

CONSTITUTIONAL CHOICE

- (5) _____ Cannot choose charter form -- all general purpose, local governments are established under same charter.
- (6) _____ Other _____
- _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A1b. If no, could the basic "charter" of a traditionally evolved local general purpose government be maintained if one existed? <TRADOK1>

- (1) _____ Yes
- (2) _____ No
- (3) _____ Somewhat doubtful
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A2. Could citizens living in this region follow formal procedures to create their own local special purpose enterprises with some public powers (special purpose districts, cooperatives that approach public powers)? <LOCSPEPU>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

A2a. If yes, what level of choice do citizens have regarding the charter of a local special purpose enterprise? <SPECHOIC>

- (1) _____ Full choice - can draft own charter without approval elsewhere
- (2) _____ Considerable choice - can draft own charter subject to approval elsewhere
- (3) _____ Can choose between existing "boilerplate" charters
- (4) _____ Can not choose charter form -- it is specified for each special purpose enterprise of a particular form
- (5) _____ Can not choose charter form -- all general purpose local governments are established under same charter
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A2b. If no, can the basic charter of a traditionally evolved local special purpose enterprise be maintained? <TRADOK2>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

CONSTITUTIONAL CHOICE

A3. Have citizens in this or similar regions created or evolved "public" enterprises with "public treasuries" and "collective decisions" outside the formal governmental structure? <OUTENTER>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

A4. The stance of the national government toward efforts to organize at the local level to create general or special enterprises to cope with local problems is: <STANCE1>

- (1) _____ Aggressively negative
- (2) _____ Mildly negative
- (3) _____ Neutral
- (4) _____ Mildly positive
- (5) _____ Highly supportive
- (7) _____ Irrelevant: an intermediate government instead of the national government is primarily involved
- (-1) _____ MIC
- _____ CL

A4a. If (7), the stance of that intermediate government is: <STANCE2>

- (1) _____ Aggressively negative
- (2) _____ Mildly negative
- (3) _____ Neutral
- (4) _____ Mildly supportive
- (5) _____ Highly supportive
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

COLLECTIVE CHOICE

B. GENERAL COLLECTIVE CHOICE PROCESSES FOR REGION

B1. General collective choice decisions in this region are made by:
<COLLCOIS>

- (1) _____ Locally elected officials who can act on their own without prior review
- (2) _____ Locally elected officials whose actions are reviewed, approved, or rejected by officials of a "higher level" government in some decision areas, but can act on their own in other decision areas
- (3) _____ Locally elected officials whose actions are reviewed, approved, or rejected by officials of a "higher level" government
- (4) _____ Officials appointed by a "higher level" government whose actions are reviewed, approved, or rejected by their superiors in some decision areas and can act on their own in other areas

COLLECTIVE CHOICE

(5) _____ Officials appointed by a "higher level" government whose actions are reviewed, approved or rejected by their superiors

(-1) _____ MIC

_____ CL

B2. The source of public funds used by general purpose local governments in this region are: <FUNDS>

(1) _____ More than 80% from local taxes and related sources

(2) _____ Between 60 and 79 percent local

(3) _____ Between 40 and 59 percent local

(4) _____ Between 20 and 39 percent local

(5) _____ Between 0 and 19 percent local

(-1) _____ MIC

_____ CL

B3. The judiciary system in this region is: <JUDGSYS1>

(1) _____ Entirely a traditional judiciary system

(2) _____ A mixed system -- some conflicts resolved by traditional system and some conflicts are processed by a non-traditional system

(3) _____ Primarily a non-traditional system

(-1) _____ MIC

_____ CL

B4. Judges are: <JUDGSYS2>

(1) _____ Appointed by national officials

(2) _____ Appointed by regional officials

(4) _____ Appointed by local officials

(5) _____ Elected by national citizens

(6) _____ Elected by regional citizens

(7) _____ Elected by local citizens

(8) _____ Hereditary

(-1) _____ MIC

_____ CL

B5. The tenure of the judges is: <JUDGSYS4>

(1) _____ A life term

(2) _____ A fixed term, may serve again

(3) _____ A fixed term, may not serve again

(4) _____ Variable, subject to vote of confidence

(5) _____ Other: _____

(-1) _____ MIC

_____ CL

COLLECTIVE CHOICE

B6. Judges are generally considered to be: <JUDGSYS3>

- (1) _____ Relatively honest
- (2) _____ Moderately dishonest
- (3) _____ Grossly corrupt
- (-1) _____ MIC
- _____ CL

B7. Is there a single dominant legal tradition in use in this region?
<TYPELAW1>

- (1) _____ No
- (2) _____ Yes, Roman law
- (3) _____ Yes, Common law
- (4) _____ Yes, Islamic law
- (5) _____ Other law _____ <OTHERLAW>
- (-1) _____ MIC
- _____ CL

VARIABLE LIST COUNTRY/REGION/TIME FORM
sorted by concept, variable

<u>Concept</u>	<u>Variable</u>	<u>Question#</u>	
<LOCCONCHOIC>	<GENCHOIC>	<CA1a>	What level of choice do citizens have regarding the charter of a local general purpose government?
	<LOCGENPU>	<CA1>	Could citizens living in this location follow formal procedures to create their own local general purpose governments?
	<LOCSPEPU>	<CA2>	Could citizens living in this location follow formal procedures to create their own local special purpose enterprises with some public powers?
	<OUTENTER>	<CA3>	Have citizens in this or similar locations created or evolved "public" enterprises with "public treasuries" and "collective decisions" outside the formal governmental structure?
	<SPECHOIC>	<CA2a>	What level of choice do citizens have regarding the charter of a local special purpose enterprise?
	<STANCE1>	<CA4>	What is the stance of the national government toward efforts to organize at the local level to create general or special enterprises to cope with local problems?
	<STANCE2>	<CA4a>	If an intermediate government is primarily involved instead of the national government, what is its stance toward efforts to organize at the local level to create general or special enterprises to cope with local problems?
	<TRADOK1>	<CA1b>	Could the basic "charter" of a traditionally evolved local

			general purpose government be maintained if one existed?
	<TRADOK2>	<CA2b>	Can the basic charter of a traditionally evolved local special purpose enterprise be maintained?
<LOCCOLCHOIC>	<COLLCOIS>	<CB1>	How are the general collective choice decisions in this region made?
	<FUNDS>	<CB2>	What is the source of public funds used by the general purpose local governments in this region?
	<OTHERLAW>	<CB7>	If there are mulitiple legal traditions in use in this location, what are they?
	<JUDGSYS1>	<CB3>	What type of judiciary system exists in this location?
	<JUDGSYS2>	<CB4>	Are judges appointed or elected by national, regional, or local officials or citizens, or do they hold hereditary seats?
	<JUDGSYS3>	<CB6>	Are judges generally considered to be honest, dishonest or corrupt?
	<JUDGSYS4>	<CB5>	What is the tenure of a judge?
	<TYPELAW1>	<CB7>	If there is a single dominant legal tradition in use, what type is it?

VARLIST COUNTRY/REGION/TIME FORM "C"
 Alphabetical

<COLLCOIS>	<CB1>	How are the general collective choice decisions in this region made?
<FUNDS>	<CB2>	What is the source of public funds used by the general purpose local governments in this region?
<GENCHOIC>	<CA1a>	What level of choice do citizens have regarding the charter of a local general purpose government?
<JUDGSYS1>	<CB3>	What type of judiciary system exists in this location?
<JUDGSYS2>	<CB4>	Are judges appointed or elected by national, regional, or local officials or citizens, or do they hold hereditary seats?
<JUDGSYS3>	<CB6>	Are judges generally considered to be honest, dishonest or corrupt?
<JUDGSYS4>	<CB5>	What is the tenure of a judge?
<LOCGENPU>	<CA1>	Could citizens living in this location follow formal procedures to create their own local general purpose governments?
<LOCSPEPU>	<CA2>	Could citizens living in this location follow formal procedures to create their own local special purpose enterprises with some public powers?
<OTHERLAW>	<CB7>	If there are multiple legal traditions in use in this location, what are they?
<OUTENTER>	<CA3>	Have citizens in this or similar locations created or evolved "public" enterprises with "public treasuries" and "collective decisions" outside the formal governmental structure?
<SPECHOIC>	<CA2a>	What level of choice do citizens have regarding the charter of a local special purpose enterprise?
<STANCE1>	<CA4>	What is the stance of the national government toward efforts to organize at the local level to create general or special enterprises to cope with local problems?
<STANCE2>	<CA4a>	If an intermediate government is primarily involved instead of the national government, what is its stance toward efforts to organize at the local level to create general or special enterprises to cope with local problems?

<TRADOK1>	<CA1b>	Could the basic "charter" of a traditionally evolved local general purpose government be maintained if one existed?
<TRADOK2>	<CA2b>	Can the basic charter of a traditionally evolved local special purpose enterprise be maintained?
<TYPELAW1>	<CB7>	If there is a single dominant legal tradition in use, what type is it?

Location Coding Form

The purpose of this form is to capture general physical and institutional characteristics of the area in which the resource(s) of interest is located. The location not only encompasses the appropriation resource(s) but also other crucial features of the resource environment. For example, in many inshore fisheries, the location entails the fishing ground(s) and the adjacent villages in which the fishers reside. In irrigation cases, the location would include the irrigation system, the irrigated fields, and the villages of the appropriators.

This form has a variable list sorted alphabetically and by concept.

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DRAFTCODING INSTRUCTIONS
LOCATION CODING FORM

by

Edella Schlager

GENERAL NOTES: The purpose of this form is to capture general physical and institutional characteristics of the area in which the resource(s) of interest is located. The location not only encompasses the appropriation resource(s) but also other crucial features of the resource environment. For example, in many inshore fisheries, the location entails the fishing ground(s) and the adjacent villages in which the fishers reside. In irrigation cases, the location would include the irrigation system, the irrigated fields, and the villages of the appropriators.

The information collected in this form is considered to remain stable over long periods of time, therefore, only one location form need be completed for each "case".

Begin by entering the name of the case in the upper left-hand corner. This is a very important step in ensuring that this form remains with its fellow for this case. Ignore the location number and the resource number as the very capable data entry person will take care of them.

Section A. Relation of location and resources

Question A1. "Briefly describe the location..."

To describe the location begin with the most general characteristics and work to the more specific. Sufficient information about the location would include the appropriation resources it contains, villages or other settlements in which the appropriators live, and distinct physical features that mark its boundaries or lie within it such as islands, harbors, rivers, mountains, etc.

Question A2. "How have the boundaries..."

Admittedly many boundaries are fuzzy, but do not let that deter you. In most cases the boundaries of a location will be both natural and institutional. Natural or constructed boundaries are based on physical structure. Examples of natural/constructed boundaries are harbors, lagoons, fences, irrigation ditches, rivers, mountains. Political boundaries are often not sensate but nevertheless seem as real as physical structures. They may be precise, and recorded on maps or charts (boundaries of political units such as villages),

or they may be established on the basis of use (boundaries of fishing grounds). In answering this question simply indicate the type or types of boundaries that define this location.

Question A3. "Draw a picture..."

If the document provides a map of the location and we own the document, then just mark the page number in the document where the map may be located. If we do not own the document and it is possible to make a copy of the map of the location do so and attach it to this form. Indicate that you have made a copy of the map. If there is no way of getting a copy of the map of the location, then you must draw a map. Draw the boundaries of the location, and within the location indicate population centers and all appropriation resources that will be coded. In other words, make a drawing of your answer to A1. Label the most important features such as villages, lakes, oceans, or rivers.

Question A4. "What appropriation resources are present..."

Make a list of all appropriation resources that are contained within this location. For assistance, you may want to refer to the definition of an appropriation resource in the appropriation resource coding manual. Remember to circle only those resources that will be coded.

Question A5. "If multiple resources are present..."

This question applies only to multiple resources, so even if one appropriation resource exists in which several appropriation processes are used, this question does not apply. In answering this question assume that no rules in use exist to regulate the appropriation processes of the different resources of this location. Conflictual affects, answer (3), can be wide ranging both in type and in magnitude. Types of conflictual affects range from interference in appropriation to the damaging of the production, distribution, and appropriation resources. The magnitude of the affects can be moderate to extreme. Use common sense in deciding whether the relationship among appropriation processes are conflictual or not. Most processes within one location will conflict with one another to some extent.

Question A6a. "Is this location..."

No special instructions.

Question A6b. "If no (or if yes and there is a dominant..."

No special instructions.

Question A7. "Time frame"

No special instructions.

Question A8. "Name of the state..."

List the formal political jurisdiction, ie., the state, province

or region (if it exists), in which this location is situated. If the location lies in more than one jurisdiction, list the most dominant one. In addition, if within the formal political jurisdiction there exists a culturally demarcated region which affects the development and configuration of institutions, list that region also. Examples of such regions are Chinese communities within Malayasia, and Moslim region within Nigeria.

Question A9. "If within one country..."

General purpose local jurisdiction refers to the lowest level of formal/governmental units that has a general jurisdiction over an area. Commonly thought of general purpose local jurisdictions are cities, villages, towns, and counties. While its spatial jurisdiction is limited to what we consider a local region, its powers or capacities within that jurisdiction can be diverse. Frequently its capacities include the provision of schools, roads, police, courts, and other services received primarily by citizens living in this jurisdiction. For example, if a fishery location includes a harbor as the appropriation resource and several villages around the harbor whose fishers appropriate from the resource then the fishery would be considered to lie within several general purpose local jurisdictions, answer (2). Note that a formal governmental unit must exist. If a village is simply a collection of dwellings it is not a general purpose local jurisdiction.

Question A9a. & A9b. "Name of local jurisdiction(s)..."

No special instructions.

Question A10. "Size of this location..."

If the author does not report the size of the location, nor provide a map from which the size of the location can be determined, leave this question blank. If the author reports the size of the location in units other than square kilometers, list the size of the location and the unit of measure the author uses. This information will then be translated into square kilometers during data entry.

Question A11. "Is there a permanent population..."

If appropriators who withdraw units from resources in this location also live in this location year around answer yes. These people do not have to have permanent settlements within this location, ie., they may be nomadic, but to answer yes to this question they must live year around in this location.

Question A11a. "If yes, number of inhabitants"

List the number of people who live in this location year around.

Question A11b. "Number of households"

In some cases the author will not provide the number of inhabitants but will provide the number of households.

Question A11c. "If no, how many months..."

No special instructions.

Question A11d. "Reasons for non-resident population."

List the reasons the author gives for people not living within the location year around.

Question A12. "How far is this location..."

If the author provides no information about these questions, leave them blank. Do not insert a -1 for missing in case. If the author does not discuss the mearest administrative center, then using the Times Atlas for this location, one will be assigned later.

A12a. As the crow flies means direct distance, ie. straight line.

A12b. Examples of transport networks are roads, highways, railroads.

A12c. Be sure to list the most common mode of transportation, whether it be foot, moped, or car.

If the author does not provide distance in kilometers, list the distance and the units of measure used by the author; this information will be translated into kilometers during data entry. If the author provides no distance information but does provide other information that may be useful such as names of proximate cities list the page numbers of this information.

Question A13. "Is there frequent contact and communication..."

If the people in the location interact with officials in any regular way answer yes. The interaction need not only concern the resource.

Question A14. "How far is this location..."

The instructions are the same as those for A11.

Question A15. "How would you characterize the economy..."

While this question initially looks complex because of nine different answers, it is based on combinations of two sets of dichotomies that are used to characterize the economy of this location. The first dichotomy is stable/changing. If the economy has remained unaltered during the period covered by this coding, then consider the economy stable. The second dichotomy is tied/autonomous. If the economy is integrated into other economic networks then consider the economy tied. An easy method of determining whether an economy is tied is to consider what happens with the units appropriated from resources within a location. If the units themselves are exchanged in markets that

extend outside of the location, or if the units are used to produce goods which are then traded outside of the location, the economy of the location can be considered tied. After characterizing the economy of the location as either tied or autonomous and either stable or changing then decide whether the economy can be so characterized throughout the entire period or only during most of the period covered by the coding.

Section B. Geographic Data About This Location.

Question B1. "Latitude..."

If the author does not provide this information leave this question blank at least initially. The question will be answered through library research.

Question B2. "Longitude..."

Instructions are the same as those for B1.

Question B3-B3c. "Elevation..."

Instructions are the same as those for B1.

Question B4. "Average annual rainfall/Average annual Evapotranspiration"

Instructions are the same as those for B1.

Question B5. "Distribution of rainfall"

No special instructions.

Question B6. Precipitation/Evapotranspiration Table

Do not complete the table. If the author provides precipitation or transpiration data note the page numbers. For accuracy and consistency the work of C.W. Thornwaithe and Frederick L. Wernstedt will be used to complete the table. In fisheries this table is not applicable.

Question B7. "Average annual temperature"

In the case of fisheries temperature means water temperature. If author does not provide information leave blank to be filled in at later date.

Question B8-B8b. "Average temperature range"

Instructions are the same as those for B7.

Question B9. "Dominant soiltypes"

Instructions are the same as those for B1.

Question B10. "Level of variation..."

No special instructions.

VARIABLE LIST LOCATION FORM
sorted by concept, variable

<u>Concept</u>	<u>Variable</u>	<u>Question#</u>	
<BOUNDARY>	<LOCBOUND>	<LA2>	How have the boundaries of this location been determined?
<DURATION>	<BEGDATE>	<LA7>	What is the approximate beginning date for this location form?
	<ENDDATE>	<LA7>	What is the approximate ending date for this location form?
<LOCGEOG>	<EVAPR>	<LB6>	What is the evapotranspiration level for April for this location?
	<EVAPYEAR>	<LB4>	What is the average annual evapotranspiration for this location?
	<EVAUG>	<LB6>	What is the evapotranspiration level for August for this location?
	<EVDEC>	<LB6>	What is the evapotranspiration level for December for this location?
	<EVFEB>	<LB6>	What is the evapotranspiration level for February for this location?
	<EVJAN>	<LB6>	What is the evapotranspiration level for January for this location?
	<EVJUL>	<LB6>	What is the evapotranspiration level for July for this location?
	<EVJUN>	<LB6>	What is the evapotranspiration level for June for this location?
	<EVMAR>	<LB6>	What is the evapotranspiration level for March for this location?
	<EVMAY>	<LB6>	What is the evapotranspiration level for May for this location?

<EVNOV>	<LB6>	What is the evapotranspiration level for November for this location?
<EVOCT>	<LB6>	What is the evapotranspiration level for October for this location?
<EVSEP>	<LB6>	What is the evapotranspiration level for September for this location?
<HIGHELEV>	<LB3c>	What is the highest elevation of this location?
<HIGHTEMP>	<LB8b>	What is the average high temperature of this location?
<LATITUDE>	<LB1>	What is the latitude of this location?
<LONGITUD>	<LB2>	What is the longitude of this location?
<LOWELEV>	<LB3b>	What is the lowest elevation of this location?
<LOWTEMP>	<LB8a>	What is the average low temperature of this location?
<MEANELEV>	<LB3a>	What is the mean elevation of this location?
<PRAPR>	<LB6>	What is the precipitation level for April for this location?
<PRAUG>	<LB6>	What is the precipitation level for August for this location?
<PRDEC>	<LB6>	What is the precipitation level for December for this location?
<PRFEB>	<LB6>	What is the precipitation level for February for this location?
<PRJAN>	<LB6>	What is the precipitation level for January for this location?
<PRJUL>	<LB6>	What is the precipitation level for July for this location?
<PRJUN>	<LB6>	What is the precipitation level for June for this location?
<PRMAR>	<LB6>	What is the precipitation level for March for this location?

	<PRMAY>	<LB6>	What is the precipitation level for May for this location?
	<PRNOV>	<LB6>	What is the precipitation level for November for this location?
	<PROCT>	<LB6>	What is the precipitation level for October for this location?
	<PRSEP>	<LB6>	What is the precipitation level for September for this location?
	<RAINDIST>	<LB5>	What is the distribution of the rainfall for this location?
	<RAINYEAR>	<LB4>	What is the average annual rainfall for this location?
	<SOILTYPE>	<LB9>	What is/are the dominant soiltype(s) of the location?
	<TEMPERTR>	<LB7>	What is the average annual temperature of this location?
	<VARSOIL>	<LB10>	What is the level of variation in the soil type?
<LOCPop>	<MONTHRES>	<LA11c>	If there is not a permanent population, how many months of the year do people live here?
	<NUMHOU>	<LA11b>	If there is a permanent population, what is the number of households?
	<NUMPOP>	<LA11a>	If there is a permanent population, what is the number of inhabitants?
	<PERMPOP>	<LA11>	Is there a permanent population living year round in this location?
	<WHYNOPOP>	<LA11d>	What are the reasons for a non-resident population?
<LOCRES>	<RESCONF>	<LA5>	If multiple resources are present in this location, characterize the relationship among appropriation processes, if no rules in use were being followed.
	<RESPRES>	<LA4>	What appropriation resources are present in this location?
<LOCSITE>	<COUNTRY>	<LA6b>	What is the name of the

		(dominant) country in which this location is situated?
<JURINAM1>	<LA9a>	What is the name of the local jurisdiction?
<JURINAM2>	<LA9b>	What is/are the name(s) of the other local jurisdiction(s)?
<LOCDCPT>	<LA1>	Briefly describe the location in which the appropriation resources we are coding are situated.
<LOCJURIS>	<LA9>	If the location is within one country, is it divided among several general purpose local jurisdictions at the same level, or not within any general purpose local jurisdiction?
<LOCNAME>	<LA8>	What is the name of the state, province, or region of this location?
<LOCSIZE>	<LA10>	What is the size of this location in square meters?
<ONECOUNT>	<LA6a>	Is this location included within more than one country?
<REMOTE>	<CROMETR2>	<LA13a> How far (as a crow flies) is this location from a major marketing center in the region?
	<ECONOLOC>	<LA14> How would you characterize the economy of this location (stable, changing, autonomous, tied)?
	<FREQCOMM>	<LA12> Is there frequent contact and communication between people in this location and officials in an administrative center?
	<MODETRA2>	<LA13b> What is the most common mode of transport to the closest major marketing center in the region?

Name of Case

Last Revised/Aug. 1, 1989
Doc 51

CPR PROJECT

LOCATION CODING FORM

Location No.: _____
 <LOCAID>

Resource No.: _____
 <RESOURID>

RELATION OF LOCATION AND RESOURCES

A. RELATION OF LOCATION AND RESOURCES

- A1. Briefly describe the location in which the appropriation resources we are coding is situated. <LOCDSCPT>
- A2. How have the boundaries of this location been determined? (e.g. is this primarily a natural or constructed "ecosystem" boundary such as a harbor, or is the location defined institutionally as when a village is the location?) <LOCBOUND>
- A3. Draw a picture of this location and the relationship of it with resources coded in other forms:
- A4. What appropriation resources are present in this location? (Circle those which we are coding) <RESPRES>

RELATION OF LOCATION AND RESOURCES

A5. If multiple resources are present in this location, characterize the relationship among appropriation processes, if no rules in use were being followed: <RESCONF>

- (1) _____ Little adverse effects throughout the entire period
- (2) _____ Complementary effects throughout the entire period
- (3) _____ Conflictual effects throughout the entire period
- (4) _____ Sometimes little adverse effects, and sometimes complementary effects
- (5) _____ Sometimes little adverse effects, and sometimes conflictual effects
- (6) _____ Sometimes complementary effects, and sometimes conflictual effects
- (7) _____ Sometimes little adverse effects, sometimes complementary effects, and sometimes conflictual effects
- (8) _____ nested
- (-1) _____ MIC
- (-2) _____ NA (only one resource)

A6a. Is this location included within more than one country? <ONECOUNT>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC

A6b. If no (or if yes and there is a dominant country in regard to political jurisdiction), enter name here: _____ MIC
<COUNTRY>

If a dominant country does not exist, list relevant countries in the description contained in A1. If location is not in one or more countries, write "international waters", "international air", etc. above.

A7. Time Frame: please fill in the approximate beginning and end dates for this location form. <BEGBDATE> _____ <ENDDATE> _____ MIC

A8. Name of the state, province, or region of this location: <LOCNAME>

_____ MIC

A9. If within one country, location is: <LOCJURIS>

- (1) _____ Not divided among several general purpose local jurisdictions at the same level
- (2) _____ Divided among several general purpose local jurisdictions at the same level
- (3) _____ Not within any general purpose local jurisdiction
- (-1) _____ MIC
- (-2) _____ NA

RELATION OF LOCATION AND RESOURCES

If (1) or (2) above:

A9a. Name of local jurisdiction: _____
 <JURINAM1> _____ MIC _____ NA

A9b. Name of local jurisdictions (if applicable): _____
 <JURINAM2> _____
 _____ MIC _____ NA

Please use the following scale to append a Confidence Level to each question contained on the remainder of this form.

Confidence level (CL) you have in your answer:

- 5 Very confident (author specifically provides information)
- 4 Mildly confident (author generally provides information)
- 3 Confident (a clear inference from this & other cases)
- 2 Sufficient information to make a reasoned guess
- 1 Sufficient information to make a guess but information is quite ambiguous

A10. Size of this location in square meters: <LOCSIZE> _____ CL _____
 Post size here if not in square meters: _____ CL _____
 _____ MIC _____ NA

A11. Is there a permanent population living year round in this location?
 <PERMPOP>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A11a. If yes, number of inhabitants: <NUMPOP> _____ CL _____
 _____ MIC _____ NA

A11b. If yes, number of households: <NUMHOU> _____ CL _____
 _____ MIC _____ NA

A11c. If no: How many months of the year do people live here: <MONTHRES>
 1 2 3 4 5 6 7 8 9 10 11 CL _____ _____ MIC _____ NA

A11d. Reasons for non-resident population: _____
 <WHYNOPOP> _____
 _____ MIC _____ NA

RELATION OF LOCATION AND RESOURCES

A12. Is there frequent contact and communication between people in this location and officials in an administrative center? <FREQCOMM>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A13. How far is this location from a major marketing center in the region? (in most cases the population of the marketing center should be greater than 5,000)

A13a. In meters (as a crow flies): _____ CL _____ <CROMETR2>
 Post here if not in meters: _____ CL _____
 _____ MIC _____ NA

A13b. What is the most common mode of transport? <MODETRA2> _____
 _____ MIC _____ NA

If the document mentions any information that may help answer this question, post relevant pages here: _____

A14. How would you characterize the economy of this location? <ECONOLOC>

- (1) _____ Stable and relatively autonomous with respect to other economic networks throughout the entire time period
- (2) _____ Stable and tied to other economic networks throughout the entire time period
- (3) _____ Changing and relatively autonomous with respect to other economic networks throughout the entire time period
- (4) _____ Changing and tied to other economic networks throughout the entire time period
- (5) _____ Stable and relatively autonomous with respect to other economic networks throughout most of the time period
- (6) _____ Stable and tied to other economic networks throughout most of time period
- (7) _____ Changing and relatively autonomous with respect to other economic networks throughout most of the time period
- (8) _____ Changing and tied to other economic networks throughout most of the time period
- (-1) _____ MIC
- _____ CL

GEOGRAPHIC DATA ABOUT THIS LOCATION

B. GEOGRAPHIC DATA ABOUT THIS LOCATION

B1. Latitude of this location: <LATITUDE> _____ MIC

B2. Longitude of this location: <LONGITUD> _____ MIC

GEOGRAPHIC DATA ABOUT THIS LOCATION

B3. What is the elevation of this location (in meters)?

B3a. Mean elevation: <MEANELEV> _____ CL _____ MIC

B3b. Lowest elevation: <LOWELEV> _____ CL _____ MIC

B3c. Highest elevation: <HIGHELEV> _____ CL _____ MIC

B4. Average annual rainfall (mm): <RAINYEAR> _____ CL _____
MIC _____ NA

Average annual evapotranspiration (mm): _____ CL _____
<EVAPYEAR> _____ MIC _____ NA

B5. Distribution of rainfall is: <RAINDIST>

(1) _____ Spread evenly throughout the year

(2) _____ Concentrated in one rainy season

(3) _____ Concentrated in two rainy seasons

(-1) _____ MIC

(-2) _____ NA

_____ CL

B6. For the following table, please fill in the appropriate information concerning the specific amount of rainfall during each month (in millimeters): _____ MIC _____ NA

	Precipitation (inches/mm)	Evapotranspiration (inches/mm)		Precipitation (inches/mm)	Evapotranspiration (inches/mm)
Jan	_____/_____ <PRJAN>	_____/_____ <EVJAN>	Jul	_____/_____ <PRJUL>	_____/_____ <EVJUL>
Feb	_____/_____ <PRFEB>	_____/_____ <EVFEB>	Aug	_____/_____ <PRAUG>	_____/_____ <EVAUG>
Mar	_____/_____ <PRMAR>	_____/_____ <EVMAR>	Sep	_____/_____ <PRSEP>	_____/_____ <EVSEP>
Apr	_____/_____ <PRAPR>	_____/_____ <EVAPR>	Oct	_____/_____ <PROCT>	_____/_____ <EVOCT>
May	_____/_____ <PRMAY>	_____/_____ <EVMAY>	Nov	_____/_____ <PRNOV>	_____/_____ <EVNOV>
Jun	_____/_____ <PRJUN>	_____/_____ <EVJUN>	Dec	_____/_____ <PRDEC>	_____/_____ <EVDEC>

B7. Average annual temperature: <TEMPERTR> _____ CL _____ MIC
(in degrees centigrade)

GEOGRAPHIC DATA ABOUT THIS LOCATION

B8. Average temperature range (in degrees centigrade):

B8a. Average low temperature: <LOWTEMP> _____ CL _____ MIC

B8b. Average high temperature: <HIGHTEMP> _____ CL _____ MIC

B9. Dominant soil type(s): <SOILTYPE> _____ CL _____
_____ MIC _____ NA

B10. Level of variation in the soil type: <VARSOIL>

- (1) _____ Little
- (2) _____ Moderate
- (3) _____ High
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

Resource Coding Form

The purposes of this form are to (1) capture the major physical characteristics of the appropriation resource, (2) delineate the boundary of the appropriation resource, and (3) describe how the appropriation resource is related to the relevant resources for producing, distributing, and using the unit.

This form has a variable list sorted alphabetically and by concept.

The remainder of this page has intentionally been left blank

DRAFTCODING INSTRUCTIONS
APPROPRIATION RESOURCE CODING FORM

by

S.Y. Tang

GENERAL NOTES:

The purposes of this form are to (1) capture the major physical characteristics of the appropriation resource, (2) delineate the boundary of the appropriation resource, and (3) describe how the appropriation resource is related to the relevant resources for producing, distributing, and using the unit.

The delivery of resource units may involve four stages -- production, distribution, appropriation, and use. A unit may be produced in one place, distributed through a distance to another place where the units are appropriated. After the units are appropriated, they can be used in still another location. An example of this would be water that is produced by holding the flow of a large river back and releasing it during irrigation season. The distribution resource is a large-scale aqueduct that brings the water to local canals, tanks and other works that hold the water for appropriation by farmers or others. The water is then used in any of a wide variety of ways. The boundary of the resource relevant to "use" is the boundary of the irrigated fields when water is used primarily for irrigation. For migratory fish, the production resource is the stock of fish, the distribution resource is their range, the appropriation resource is the fishing grounds, and the "use resource" is the market area or use area.

It is sometimes not obvious how one may distinguish the appropriation resource from the production and distribution resources. For example, in irrigation we define as the production resource the headworks that are subject to control by humans. Depending on where intervention takes place, the production resource may be clearly separated from the distribution and appropriation resources and be located high in the mountains in which a river originates or as the small diversion works that divert water from a river immediately adjacent to an irrigation canal. In some cases, three very distinctive resources are identified. In others, two resources may be contained in the same boundary. For example, if water is directed to the fields immediately after it leaves the headworks, we consider the distribution and appropriation resources as being identical.

In the case of many fisheries, there are not clear distinctions among production, distribution and appropriation resources. Often times the boundaries of the production and distribution resources are nearly identical, with the appropriation resource being contained within the production and distribution resources, as in the case of cod. The

various resource boundaries of non-migratory species are almost always identical as in the case of lobster.

You are permitted, indeed encouraged, to make any marginal notes on the form as you go along, such as how you arrived at an estimate or any other such deductive processes which may have contributed to or affected an answer.

Section A. THE APPROPRIATION UNIT

Question A1. "the unit"

One resource may provide different units. For example, a bay may provide both lobsters and trouts, each of which requires different pattern of appropriation. In each coding form, we focus on only one unit. This question asks the unit we are focusing on in this coding form. In this form, the appropriation resource is defined as a facility in which the unit is available for appropriation.

Question A2. "Type of re existing "boilerplate" charterssource"

Characterize the appropriation resource based on whether the units are biological entities (e.g., fish, wildlife, pasturage, etc.), physical entities (e.g., water, some mineral resource, fuel, etc.), or some mix of biological and physical entities.

Question A3. "Analytical Type of Unit"

Is the unit renewable or not? This is not the same as biological or not. Water from a water system is a non-biological unit which is renewable. Generally place or can it move? Be careful -- what might at first appear to be similar units can differ on this dimension. For example, in a fishery there might be various species of fish that do move plus lobsters that (for all practical purposes) do not.

Question A4. "Sector"

Identify the sector category best fitting in the appropriation resource you are coding.

Question A5. "Sector code"

Questions for irrigation cases:

1. Looking from the top down, how many levels of organizations are related to the production, distribution, and appropriation of the entire system?
2. How many levels of organizations are related to the appropriation of the entire system?
3. Looking from the bottom up (considering the lowest level to be 1), to which level of organization is this appropriation resource closely related?

4. Is there any storage facility that can control the flow of units in the production, distribution and/or appropriation resources?

Note:

1. For questions 1, 2, and 3, "0" = not related to any organization. For question 4, "0" = no; "1" = yes; and "9" = MIC.
2. We will have to develop an operational definition for "levels of organizations." "Levels of organizations" should be distinguished from "levels of hierarchies within an organization." For example, many large canal systems in India are managed by a government department. Within the department, there are multiple levels of hierarchies, ranging from the chief engineer to the ditch tenders, responsible for different activities within the system. The department, however, should be considered as one "level of organization."

An essential characteristic of an organizational level: a high degree of autonomy from other organizational levels in terms of its personnel and operation.

Section B. THE APPROPRIATION RESOURCE

Question B1. "Describe the resource"

The description should include the major physical features of the resource (e.g., canals, reservoirs, bays, etc.)

Question B2. "Describe the boundary of this resource"

The description should include both the physical and institutional boundaries of the resource.

Question B2a. "The boundary is primarily a result of..."

There are natural/constructed attributes which limit entry if the topology of the resource is such as to focus entry to the resource on one or a few places.

Question B3. "Boundary of this resource... location"

Location refers to the area covered in the location coding form.

Question B4. "exist in more than one country"

General purpose local jurisdiction refers to the lowest level of formal/governmental unit that has a general jurisdiction over an area. This definition excludes specialized government agencies, informal local organizations, and local public enterprises.

Question B5. "as part of a development project"

No special instructions.

Question B6a. "Surface area of resource"

For irrigation, this question refers to the area of a tank, reservoir, or lake. It does NOT refer to the area irrigated. Even if the author does not provide the exact numbers, you might be able to do some estimation from maps or other information provided by the author. Please explain briefly how you arrived at the numbers, if they are not directly provided by the author.

Question B6b. "Length of resource"

For irrigation, this question refers to canals or ditches that are shared by more than one irrigator. Do NOT count those serving only one irrigator. Even if the author does not provide the exact numbers, you might be able to do some estimation from maps or other information provided by the author. Please explain briefly how you arrived at the numbers, if they are not directly provided by the author. The question need not be answered in the case of fisheries.

Question B6c. "Storage volume of resource"

Even if the author does not provide the exact numbers, you might be able to do some estimation from maps or other information provided by the author. Please explain briefly how you arrived at the number, if they are not directly provided by the author. This question need not be answered in the case of fisheries.

Question B6d. "Flow Volume"

Please indicate whether the flow volume represents the peak (P), average (A), or low (L) measure of the year. If the author provides several measures, code the peak one. If the author does not specify the measure as peak, average, or low, you may try to estimate by reference to other information provided by the author. If a measure is taken in a monsoon season, it is probably the peak of the year. Please explain briefly how you arrived at your answer, if it is not directly provided by the author. This question need not be answered in the case of fisheries.

Question B7. "Average number of months"

No special instructions.

Section C. INTERNAL BOUNDARIES OR DIVISIONS WITHIN APPROPRIATION RESOURCE

Question C1. "distinct and stable.....zones..."

Focus on the word "distinct"; this is NOT the same as asking if there is spatial variation in the distribution of units. Within the appropriation resource, if there are spatial divisions or spaces which in some way are distinct and which are stable over time (that is, there is some fixity to them, which might often occur because of physical or geologic formations or divisions occurring in the appropriation resource), such that appropriators might relate to them as divisions of the appropriation resource, answer "yes."

Question C1a. 555"quality and/or quantity of units"

If there are distinct and stable micro-environmental or ecological zones, and these zones are differentiated in that one or some are preferable locations to others, answer "yes".

Question C2. "natural barriers within the resource"

This question allows you to indicate, regardless of whether there are distinct micro-zones within the resource, whether there are naturally-occurring valleys, ridges, etc.) within the resource such that appropriators might relate to them as spatial divisions of the resource. Note that distance between locations in the resource may be a barrier in itself if the terrain is such that the movement is difficult or if distances are so great as to make transfers among them time-consuming (by "time-consuming" we mean requiring a day or more of travel).

Question C3. "strategic points within the resource"

If there are points that allow people to control the main flow of units in a relatively easy manner, answer "yes." An example is a dam that can control water flow into a canal.

Question C4. "considerable variation over space"

Looking at the resource as a whole, if units are not fairly evenly distributed over the space, so that (at different times or all the time) units are more plentiful or are better in some places than others, answer "yes" (e.g., depending on the distribution of rainfall, grazing spots might be better in some parts of the resource than in others).

Question C4a. "If Yes, is this variation predictable?"

Can appropriators know what spaces of the resource are going to exhibit what unit supply or quality (e.g., do fish move from one place to another within a fishery with some regularity?), or does spatial variation depend upon unpredictable factors (such as distribution of rainfall)? Of course, there may be elements of both -- a grazing land might have some predictably better spaces and yet also have some unpredictable variation due to rainfall.

Question C5. "variation in the flow of units within a year"

Within a year, if the unit yield of the resource fluctuates enough to make a difference in the behavior of the appropriators (e.g., based on seasons, temperature variation, rainfall, etc.), answer "yes."

Question C5a. "If YES, is this variation predictable?"

If growth, harvest, etc., patterns are regular enough to be anticipated and adjusted for in advance, answer "yes."

Question C6. "variation in the flow of units from year to year"

From year to year, if the unit yield of the resource fluctuates enough to make a difference in the behavior of the appropriators (e.g., based on seasons, temperature variation, rainfall, etc.), answer "yes."

Question C6a. "If YES, is this variation predictable?"

If growth, harvest, etc., patterns are regular enough to be anticipated and adjusted for in advance, answer "yes."

Question C7. "if this is land based resource.....the topography of the resource"

If the resource is land based, such as irrigation systems and grazing lands, what is the topography of the resource (or the land immediately around the resource, as in the case of irrigation)?

Question C8. "The bottom topography of this resource"

This question applies primarily to fisheries. Is the bottom of the fishery made up primarily of mud, sand, gravel, or rock?

Question C9. "relationship among multiple appropriation processes if no rules in use were being followed"

If more than one appropriation process for this units are used within this resource, how would these processes affect one another?

Section D. PRODUCTION, DISTRIBUTION AND USE BOUNDARIES

Question D1. "boundary of production...appropriation resource.."

Please refer to "General Notes" on page 1.

Question D2. "boundary of production...location..."

Please refer to "General Notes" on page 1.

Question D3. "boundary of distribution...appropriation resource."

Please refer to "General Notes" on page 1.

Question D4. "boundary of production...distribution..."

Please refer to "General Notes" on page 1.

Question D5. "...multiple appropriation resources..from same distribution system?"

If the appropriation resource is different from the distribution resource, and the distribution resource is delivering units to more than one appropriation resource, answer "yes." For example, a major canal may distribute water from a reservoir to a number of small canals, each of which serves a group of appropriators.

Question D6. "distance between appropriation resource and the headworks"

If the appropriation resource is connected directly to the headworks, answer "0".

Question D7. "How many hectares are irrigated by this entire system?"

This question refers to the total area irrigated by water coming from the same headworks. It might include area other than that irrigated by the particular appropriation resource we are coding.

Question D8. "headworks operated by the same agency(s)"

If the headworks are operated solely by the agency(s) as the appropriation resource, answer "1". If the agency(s) of the appropriation resource operate the headworks jointly with others, answer "2".

Question D8a. "If no, who operate the headworks"

If the headworks are not operated by the same agency(s) as the appropriation resource, who operate the headworks?

Question D8b. "irrigators select officials of production agency"

No special instructions.

Question D9. "distribution system operated by the same agency(s)"

If the distribution system is operated solely by the agency(s) as the appropriation resource, answer "1". If the agency(s) of the appropriation resource operate the distribution system jointly with others, answer "2".

Question D9a. "If no, who operate the distribution system"

If the distribution system is not operated by the same agency(s) as the appropriation resource, who operate the distribution system?

Question D9b. "irrigators select officials of distribution agency"

NO special instructions.

Question D10. "distribution system operated by the same agency(s) as the headworks"

If the distribution system is operated solely by the agency(s) as the headworks, answer "1". If the agency(s) of the headworks operate the distribution system jointly with others, answer "2".

Question D11. "major sources of water used for irrigation?"

This question refers to both the headworks of the system and other sources from which water is made available for irrigation.

VARLIST RESOURCE FORM
sorted by concept, variable

<u>Concept</u>	<u>Variable</u>	<u>Question#</u>	
<BOUNDARY>	<BOUNDAR2>	<RB2>	Is the boundary the result of natural/constructed attributes and/or institutional arrangements?
	<BOUNDAR3>	<RB3>	Is the boundary the same or smaller than the location?
	<BOUNDAR4>	<RB4>	Does the resource exist in more than one country or general purpose local jurisdiction?
	<BOUNDAR5>	<RB5>	Is the boundary part of a development project designed by non-residents?
	<DISTAPPR>	<RD3>	Is the boundary of the distribution resource roughly equivalent to the boundary of the appropriation resource?
	<PRODAPPR>	<RD1>	Is the boundary of the production resource roughly equivalent to the boundary of the appropriation resource?
	<PRODDIST>	<RD4>	Is the boundary of the production resource roughly equivalent to the boundary of the distribution resource?
	<PRODLOCA>	<RD2>	Is the boundary of the production resource roughly equivalent to the boundary of the location?
<ISTRUCTURE>	<DISTHEAD>	<RD10>	Is the distribution system operated by the same agency(s) (or the same group(s) of people) as the headworks of the system?
	<DISTOPER>	<RD9a>	Who operates the distribution system?
	<DISTSAME>	<RD9>	Is the distribution system operated by the same agency(s) (or the same group(s) of people) as the appropriation resource?

	<HEADOPER>	<RD8a>	Who operates the headworks for this system?
	<HEADSAME>	<RD8>	Are the headworks (production resource) operated by the same agency(s) (or same group(s) of people) as the appropriation resource?
	<MELON>	<RD5>	Are there other appropriation areas receiving units from the same distribution system?
	<METHEAD1>	<RD6>	What is the distance between this appropriation resource and the headworks of the entire irrigation system, via the irrigation system?
	<METHEAD2>	<RD6>	What is the distance between this appropriation resource and the headworks of the entire irrigation system, as a crow flies?
	<SELEDIST>	<RD9b>	Do the irrigators being served by this distribution organization participate in the selection of the officials of the distribution agency?
	<SELPROD>	<RD8b>	Do the irrigators being served by this production organization participate in the selection of the officials of the production agency?
	<SYSTAREA>	<RD7>	How many square meters are irrigated by this entire system?
	<WATERORI>	<RD11>	What are the major sources of water used for irrigation?
<RESDIVIS>	<CONTROL>	<RC3>	Are there strategic points within the resource where the main flow of units can be controlled?
	<GEOGBARR>	<RC2>	Are there natural barriers within the resource?
	<MICROZON>	<RC1>	Are there distinct and stable micro-environmental or ecological zones within the resource?
	<QUALBETR>	<RC1a>	Is the quality and/or quantity

			of units [!Uregularly]!U better in some of the zones than in others?
<RESSIZE>	<FLOWVOL>	<RB6d>	What is the flow volume of the resource?
	<LENGTH>	<RB6b>	What is the length of the resource?
	<STOREVOL>	<RB6c>	What is the storage volume of the resource?
	<SURFAREA>	<RB6a>	What is the surface area of the resource?
<RESUNIT>	<RSRCUNIT>	<RA1>	What is the unit being appropriated?
	<TYPERES>	<RA2>	Is the type of resource producing this unit biological or physical?
<SECTOR>	<ANALUNIT>	<RA3>	Is the unit renewable or non-renewable, stationary or moving?
	<APPRESRC>	<RB1>	What is the resource or facility in which these units are available for appropriation, and the factors which affect the boundary of this resource?
	<SECTOR1>	<RA4>	What is the resource sector of this unit?
	<SECTOR2>	<RA5>	What is the 4-digit detailed sector code?
<STEEP>	<STEEP>	<RC7>	If this is a land based resource, is the topography of the resource flat, undulating or sloping?
<UNITVAR>	<AVGACCES>	<RB7>	What is the average number of months during the year when the resource is accessed?
	<PREDVAR1>	<RC4a>	If there is considerable variation over space in the flow of units, is it predictable?
	<PREDVAR2>	<RC5a>	If there is considerable variation in the flow of units within a single year, is this variation predictable?

	<PREDVAR3>	<RC6a>	If there is considerable variation in the unit flow from year to year, is it predictable?
	<VAROTIME>	<RC6>	Is there considerable variation in the unit flow from year to year?
	<VARSPACE>	<RC4>	Is there considerable variation over space in the availability of these units within the resource?
	<VARYEAR>	<RC5>	Is there considerable variation in the flow of units within a single year?
<unknown>	<CONFLICT>	<RC1b>	If the quality and/or quantity of units is [!Uregularly]!U better in some of the zones than in others, has this created conflict among appropriators?
<unknown>	<DONOR>	<RB5>	If a donor agency is involved, what is the name of that agency?
<unknown>	<MUD>	<RC8>	Does the bottom topography consist primarily of mud, sand, gravel, or rock?
<unknown>	<MULTAPPR>	<RC9>	If multiple appropriation processes are used within this resource, what is the relationship among these processes if no rules in use are being followed?

VARLIST RESOURCE FORM "R"
 Alphabetical

<ANALUNIT>	<RA3>	Is the unit renewable or non-renewable, stationary or moving?
<APPRESRC>	<RB1>	What is the resource or facility in which these units are available for appropriation, and the factors which affect the boundary of this resource?
<AVGACCES>	<RB7>	What is the average number of months during the year when the resource is accessed?
<BOUNDAR2>	<RB2>	Is the boundary the result of natural/constructed attributes and/or institutional arrangements?
<BOUNDAR3>	<RB3>	Is the boundary the same or smaller than the location?
<BOUNDAR4>	<RB4>	Does the resource exist in more than one country or general purpose local jurisdiction?
<BOUNDAR5>	<RB5>	Is the boundary part of a development project designed by non-residents?
<CONFLICT>	<RC1b>	If the quality and/or quantity of units is [!Uregularly]!U better in some of the zones than in others, has this created conflict among appropriators?
<CONTROL>	<RC3>	Are there strategic points within the resource where the main flow of units can be controlled?
<DISTAPPR>	<RD3>	Is the boundary of the distribution resource roughly equivalent to the boundary of the appropriation resource?
<DISTHEAD>	<RD10>	Is the distribution system operated by the same agency(s) (or the same group(s) of people) as the headworks of the system?
<DISTOPER>	<RD9a>	Who operates the distribution system?
<DISTSAME>	<RD9>	Is the distribution system operated by the same agency(s) (or the same group(s) of people) as the appropriation resource?
<DONOR>	<RB5>	If a donor agency is involved, what is the name of that agency?
<FLOWVOL>	<RB6d>	What is the flow volume of the resource?
<GEOGBARR>	<RC2>	Are there natural barriers within the resource?

<HEADOPER>	<RD8a>	Who operates the headworks for this system?
<HEADSAME>	<RD8>	Are the headworks (production resource) operated by the same agency(s) (or same group(s) of people) as the appropriation resource?
<LENGTH>	<RB6b>	What is the length of the resource?
<MELON>	<RD5>	Are there other appropriation areas receiving units from the same distribution system?
<METHEAD1>	<RD6>	What is the distance between this appropriation resource and the headworks of the entire irrigation system, via the irrigation system?
<METHEAD2>	<RD6>	What is the distance between this appropriation resource and the headworks of the entire irrigation system, as a crow flies?
<MICROZON>	<RC1>	Are there distinct and stable micro-environmental or ecological zones within the resource?
<MUD>	<RC8>	Does the bottom topography consist primarily of mud, sand, gravel, or rock?
<MULTAPPR>	<RC9>	If multiple appropriation processes are used within this resource, what is the relationship among these processes if no rules in use are being followed?
<PREDVAR1>	<RC4a>	If there is considerable variation over space in the flow of units, is it predictable?
<PREDVAR2>	<RC5a>	If there is considerable variation in the flow of units within a single year, is this variation predictable?
<PREDVAR3>	<RC6a>	If there is considerable variation in the unit flow from year to year, is it predictable?
<PRODAPPR>	<RD1>	Is the boundary of the production resource roughly equivalent to the boundary of the appropriation resource?
<PRODDIST>	<RD4>	Is the boundary of the production resource roughly equivalent to the boundary of the distribution resource?
<PRODLOCA>	<RD2>	Is the boundary of the production resource roughly equivalent to the boundary of the location?
<QUALBETR>	<RC1a>	Is the quality and/or quantity of units [!Uregularly]!U better in some of the zones than in others?
<RSRCUNIT>	<RA1>	What is the unit being appropriated?
<SECTOR1>	<RA4>	What is the resource sector of this unit?

<SECTOR2>	<RA5>	What is the 4-digit detailed sector code?
<SELEDIST>	<RD9b>	Do the irrigators being served by this distribution organization participate in the selection of the officials of the distribution agency?
<SELPDOD>	<RD8b>	Do the irrigators being served by this production organization participate in the selection of the officials of the production agency?
<STEEP>	<RC7>	If this is a land based resource, is the topography of the resource flat, undulating or sloping?
<STOREVOL>	<RB6c>	What is the storage volume of the resource?
<SURFAREA>	<RB6a>	What is the surface area of the resource?
<SYSTAREA>	<RD7>	How many square meters are irrigated by this entire system?
<TYPERES>	<RA2>	Is the type of resource producing this unit biological or physical?
<VAROTIME>	<RC6>	Is there considerable variation in the unit flow from year to year?
<VARSPACE>	<RC4>	Is there considerable variation over space in the availability of these units within the resource?
<VARYEAR>	<RC5>	Is there considerable variation in the flow of units within a single year?
<WATERORI>	<RD11>	What are the major sources of water used for irrigation?

Name of Case <PROJNAME>

Last Revised/June 13, 1989
Doc 50

CPR PROJECT

APPROPRIATION RESOURCE CODING FORM

Resource No.: _____
<RESOURID>

Doc Nos.: _____
<DOC>

A. THE APPROPRIATION UNIT

THE APPROPRIATION UNIT

A1. What is the unit being appropriated which is the focus of this coding form? <RSCUNIT>

A2. Type of resource producing this unit: <TYPERES>

- (1) _____ Biological
- (2) _____ Physical

A3. Analytical Type of Unit: <ANALUNIT>

- (1) _____ Renewable stationary
- (2) _____ Renewable moving (fugitive)
- (3) _____ Non-renewable stationary
- (4) _____ Non-renewable moving (fugitive)

A4. Sector: <SECTOR1>

- (1) _____ Fisheries
- (2) _____ Wildlife
- (3) _____ Forest Products
- (4) _____ Land Products
- (5) _____ Water
- (6) _____ Airsheds
- (7) _____ Other

A5. Detailed sector code (4 digit): <SECTOR2> _ _ _ _

THE APPROPRIATION RESOURCE

B. THE APPROPRIATION RESOURCE

B1. Describe the resource or facility in which these units are **available** for appropriation. This is the resource which will be referred to as the appropriation resource. Include in this description what factors affect the boundary of this resource. <APPRESRC>

THE APPROPRIATION RESOURCE

B2. The boundary is primarily a result of: <BOUNDAR2>

- (1) ☐ Natural/constructed attributes which limit entry
- (2) ☐ Natural/constructed attributes which do not limit entry
- (3) ☐ Institutional arrangements
- (4) ☐ Natural/constructed and institutional arrangements which limit entry
- (5) ☐ Natural/constructed and institutional arrangements which do not limit entry

B3. Boundary of this resource is: <BOUNDAR3>

- (1) ☐ The same as, or
- (2) ☐ Smaller than the location.

Please draw small map of the location and resource to illustrate this relationship. (If this drawing would be the same as on the location form, write "same" here.)

B4. Does this resource exist in more than one country? <BOUNDAR4>

- (1) ☐ Yes
- (2) ☐ No, and this resource is not divided among several general purpose local jurisdictions at the same level
- (3) ☐ No, and this resource is divided among several general purpose local jurisdictions at the same level
- (4) ☐ No, this resource is not within any general purpose local jurisdiction.

B5. Is this boundary designated as part of a development project designed by non-residents? <BOUNDAR5>

- (1) ☐ Yes
- (2) ☐ No

If a donor agency is involved, what is the name of that agency?
<DONOR>

THE APPROPRIATION RESOURCE

Please use the following scale to append a Confidence Level to each question contained on the remainder of this form.

Confidence Level (CL) you have in your answer:

- 5 Very confident (author specifically provides information)
- 4 Mildly confident (author generally provides information)
- 3 Confident (a clear inference from this and other cases)
- 2 Sufficient information to make a reasoned guess
- 1 Sufficient information to make a guess but
information is quite ambiguous

B6. Size of APPROPRIATION resource (in appropriate metric measurements).
(Coder post in measurement units given in documents, data will be
converted upon entry to appropriate measurement units).

B6a. Surface area of resource: <SURFAREA> _____ CL _____
(Fishing or hunting grounds, lake, tank, reservoir, forest,
grazing lands; in square meters)

B6b. Length of resource: <LENGTH> _____ CL _____
(Irrigation canal, bridge, road; in meters)

B6c. Storage volume of resource: <STOREVOL> _____ CL _____
(Groundwater basin, lakes, tanks; in meters cubed)

B6d. Flow volume: <FLOWVOL> _____ CL _____
(power, water; (P)eak, (A)verage, (L)ow, in liters/second)

B7. Average number of months during the year when the resource is
accessed: _____ <AVGACCES> _____ CL _____

INTERNAL BOUNDARIES OR DIVISIONS

C. INTERNAL BOUNDARIES OR DIVISIONS WITHIN APPROPRIATION RESOURCE

C1. Are there distinct and stable micro-environmental or ecological zones
within this resource? <MICROZON>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

C1a. If yes, is the quality and/or quantity of units regularly better in
some of the zones than in others? <QUALBETR>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

INTERNAL BOUNDARIES OR DIVISIONS

C1b. If yes to C1a, at some point in time has this condition created conflict among appropriators? <CONFLICT>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C2. Are there natural barriers within the resource? <GEOGBARR>

- (1) _____ Yes AND coincide with microzones
- (2) _____ Yes and do NOT coincide with microzones
- (3) _____ No
- (-1) _____ MIC
- _____ CL

C3. Are there strategic points within the resource where the main flow of the units can be controlled? <CONTROL>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

C4. Is there considerable variation over space in the availability of these units within the resource? <VARSPACE>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

C4a. If yes, is this variation predictable? <PREDVAR1>

- (1) _____ Highly predictable
- (2) _____ Predictable
- (3) _____ Mildly predictable
- (4) _____ Unpredictable
- (5) _____ Highly unpredictable
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C5. Is there considerable variation in the flow of units within a single year? <VARYEAR>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

INTERNAL BOUNDARIES OR DIVISIONS

C5a. If yes, is this variation predictable? <PREDVAR2>

- (1) _____ Highly predictable
- (2) _____ Predictable
- (3) _____ Mildly predictable
- (4) _____ Unpredictable
- (5) _____ Highly unpredictable
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C6. Is there considerable variation in the flow of units from year to year? <VAROTIME>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

C6a. If yes, is this variation predictable? <PREDVAR3>

- (1) _____ Highly predictable
- (2) _____ Predictable
- (3) _____ Mildly predictable
- (4) _____ Unpredictable
- (5) _____ Highly unpredictable
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C7. If this is a land based resource, is the topography of the resource (or the land immediately around the resource): <STEEP>

- (1) _____ Relatively flat
- (2) _____ Gently undulating
- (3) _____ Moderately sloping
- (4) _____ Steeply sloping
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C8. The bottom topography of this resource is primarily: <MUD>

- (1) _____ Mud
- (2) _____ Sand
- (3) _____ Gravel
- (4) _____ Rock
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

INTERNAL BOUNDARIES OR DIVISIONS

C9. If multiple appropriation processes are used within this resource, characterize the relationship among these processes if no rules in use were being followed: <MULTAPPR>

- (1) _____ Little adverse effects
- (2) _____ Complementary effects
- (3) _____ Conflictual effects
- (-1) _____ MIC
- (-2) _____ NA (only one appropriation process)
- _____ CL

If the boundaries of the relevant resources for producing, distributing, and using the unit are approximately the same as the boundaries for the appropriation resource, stop here, as no further questions are relevant.

PRODUCTION, DISTRIBUTION AND USE BOUNDARIES

D. PRODUCTION, DISTRIBUTION AND USE BOUNDARIES

D1. Is the boundary of the production resource roughly equivalent to the boundary of the appropriation resource? <PRODAPPR>

- (1) _____ Yes
- (2) _____ No, production is within the boundary of appropriation
- (3) _____ No, appropriation is within the boundary of production
- (4) _____ No, the two boundaries overlap partially
- (5) _____ No, the two boundaries are totally separated
- (6) _____ No, the production resource is a facility connected to the appropriation resource
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

D2. Is the boundary of the production resource roughly equivalent to the boundary of the location? <PRODLOCA>

- (1) _____ Yes
- (2) _____ No, production is within the boundary of location
- (3) _____ No, location is within the boundary of production
- (4) _____ No, the two boundaries overlap partially
- (5) _____ No, the two boundaries are totally separated
- (6) _____ No, the production resource is a facility connected to the appropriation resource
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

PRODUCTION, DISTRIBUTION AND USE BOUNDARIES

D3. Is the boundary of the distribution resource roughly equivalent to the boundary of the appropriation resource? <DISTAPPR>

- (1) _____ Yes
- (2) _____ No, appropriation is within the boundary of distribution
- (3) _____ No, the two boundaries overlap partially
- (4) _____ No, the two boundaries are totally separate
- (5) _____ No, the distribution resource is a facility connected to the appropriation resource
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

D4. Is the boundary of the production resource roughly equivalent to the boundary of the distribution resource? <PRODDIST>

- (1) _____ Yes
- (2) _____ No, production is within the boundary of distribution
- (3) _____ No, distribution is within the boundary of production
- (4) _____ No, the two boundaries overlap partially
- (5) _____ No, the two boundaries are totally separated
- (6) _____ No, the production resource is a facility connected to the distribution resource
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

D5. Are there other appropriation areas (besides the one you are coding) receiving units from the same distribution system? <MELON>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

THE FOLLOWING QUESTIONS RELATE INITIALLY TO IRRIGATION.

D6. What is the distance between this appropriation resource and the headworks of the entire irrigation system?

_____ Meters via irrigation system (distribution resource).
<METHEAD1>
_____ Meters as a crow flies.
<METHEAD2>
_____ NA

D7. How many square meters are irrigated by this entire system? <SYSTAREA>
(post here if not in square meters:

_____ MIC _____ NA _____ CL _____)

PRODUCTION, DISTRIBUTION AND USE BOUNDARIES

D8. Are the headworks (production resource) operated by the same agency(s) (or the same group(s) of people) as the appropriation resource?

<HEADSAME>

- (1) ☐ Yes, the agency(s) or the group(s) of people is/are the sole operator of the headworks
- (2) ☐ Yes, but the agency(s) or the group(s) of people is/are **not** the sole operator of the headworks
- (3) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

D8a. If (2) or (3) above, who operates the headworks for this system?

<HEADOPER>

- (1) ☐ A regular agency(s) of the National Government (e.g. Ministry of Resources)
- (2) ☐ A regular agency(s) of a regional Government (e.g. State Department of Water Resources)
- (3) ☐ A regular agency(s) of a local Government (e.g. Los Angeles County Flood Control District)
- (4) ☐ Specially designated national enterprise(s) or officials
- (5) ☐ Specially designated regional governmental enterprise(s) or officials
- (6) ☐ Specially designated local governmental enterprise(s) or officials
- (7) ☐ A private (for profit) enterprise(s)
- (8) ☐ A private (not-for-profit) enterprise(s)
- (9) ☐ Local communal enterprises or AGO
- (10) ☐ Any combination of the above
- (11) ☐ Other _____
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

D8b. If (2) or (3) in question D8, do the irrigators being served by this production organization participate in the selection of the officials of the production agency? <SELEPROD>

- (1) ☐ No, except as citizens in a general election
- (2) ☐ Yes, special direct elections by irrigators
- (3) ☐ Yes, through a federated arrangement -- local irrigation enterprises help select officials of the production agency
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

PRODUCTION, DISTRIBUTION AND USE BOUNDARIES

D9. Is the distribution system operated by the same agency(s) (or the same group(s) of people) as the appropriation resource? <DISTSAME>

- (1) ☐ Yes, the agency(s) or the group(s) of people is/are the sole operator of the distribution system
- (2) ☐ Yes, but the agency(s) or the group(s) of people is/are **not** the sole operator of the distribution system
- (3) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

D9a. If (2) or (3) above, who operates the distribution system? <DISTOPER>

- (1) ☐ A regular agency(s) of the National Government (e.g. Ministry of Resources)
- (2) ☐ A regular agency(s) of a regional Government (e.g. State Department of Water Resources)
- (3) ☐ A regular agency(s) of a local Government (e.g. Los Angeles County Flood Control District)
- (4) ☐ Specially designated national enterprise(s) or officials
- (5) ☐ Specially designated regional governmental enterprise(s) or officials
- (6) ☐ Specially designated local governmental enterprise(s) or officials
- (7) ☐ A private (for profit) enterprise(s)
- (8) ☐ A private (not-for-profit) enterprise(s)
- (9) ☐ Local communal enterprises or AGO
- (10) ☐ Any combination of the above
- (11) ☐ Other _____
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

D9b. If (2) or (3) in question D9, do the irrigators being served by this distribution organization participate in the selection of the officials of the distribution agency? <SELEDIST>

- (1) ☐ No, except as citizens in a general election
- (2) ☐ Yes, special direct elections by irrigators
- (3) ☐ Yes, through a federated arrangement -- local irrigation enterprises help select officials of the production agency
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

PRODUCTION, DISTRIBUTION AND USE BOUNDARIES

D10. Is the distribution system operated by the same agency(s) (or the same group(s) of people) as the headworks of the system? <DISTHEAD>

- (1) _____ Yes, the agency(s) or the group(s) of people is/are the sole operator of the distribution system
- (2) _____ Yes, but the agency(s) or the group(s) of people is/are **not** the sole operator of the distribution system
- (3) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

D11. What are the major sources of water used for irrigation? <WATERORI>

- (1) _____ Surface water (e.g. canal, tank, reservoir)
- (2) _____ Ground water (e.g. well)
- (3) _____ Rainfall
- (4) _____ Both surface water and ground water
- (5) _____ Both surface water and rainfall
- (6) _____ Both ground water and rainfall
- (7) _____ Both surface water, ground water, and rainfall
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

Collective Choice Coding Form

This form is comprised of general questions concerning the nature of organizational structures for Collective Choice. There are no explicit instructions for this form - it is very short.

The remainder of this page has intentionally been left blank

VARIABLE LIST COLLECTIVE CHOICE "H"
Alphabetical

<ACTIVITY>	<HA2>	What is the type of activity that this organization has organized (provision, production, distribution, appropriation, use)?
<LEVELOP>	<HA2>	What is the level of operation at which this organization operates (operational, collective choice, constitutional choice)?
<ORGANID>	<HA2>	What is the id number of the organization?
<ORSTATUS>	<HA2>	Has this organization been coded?

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COLLECTIVE CHOICE CODING FORM

Collective Choice No.: _____
<COLCHID>

Resource No.: _____
<RESOURID>

ORGANIZATIONAL INVENTORY

A. ORGANIZATIONAL INVENTORY

- A1. Are the appropriators of this resource organized in any manner in relation to provision, production, distribution, appropriation, or use?

- (1) _____ Yes
(2) _____ No (do not complete this form)
(-1) _____ MIC (do not complete this form)

- A2. If yes to the above question complete the proceeding matrix using the following instructions.

The columns of the matrix represent the activities in relation to the resource that have been organized. They are provision, production, distribution, appropriation, and use.
The rows of the matrix represent the level at which the activities have been organized. They are operational, collective choice, and constitutional choice.

Use the following code to indicate what type of organization the appropriators are subject to. The appropriators can be part of more than one organization. If there is more than one organization of a particular type distinguish between the organizations using subscripts. For example if there are two unions organized in relation to a resource they would be indicated by N1 and N2 respectively.

[1] General Purpose Government and Communal Enterprises

- (1) A = a regular agency of the national government
(2) B = a regular agency of a regional government
(3) C = a regular agency of a local government
(4) D = a local communal enterprise

[2] Sector Specific Government

- (1) E = a specially created national enterprise
(2) F = a specially created regional governmental enterprise
(3) G = a specially created local governmental enterprise

ORGANIZATIONAL INVENTORY

[3] Special Organizations Related to Resource

- (1) I = an AGO organized as a cooperative
- (2) J = an AGO not organized as a cooperative
- (3) K = a group that has achieved coordination without formal organization

[4] General Voluntary and Private Associations

- (1) L = private for profit
- (2) M = co-ops with broader jurisdiction than resource
- (3) N = unions

[5] Others

- (1) Z = others

Mark the appropriate code of an organization in the column or columns representing the activity or activities that it organized, and in the rows indicating the levels at which the organization operates. (If you have coded a particular organization (i.e., filled out an organizational structure form), please indicate this by circling the code of the organization below <ORGSTATUS>.)

LEVEL OF \ OPERATION \		TYPE OF ACTIVITY <ACTIVITY>				
<LEVELOP> \		C1	C2	C3	C4	C5
		Provision	Production	Distribution	Appropriation	Use
R1	Operational					
R2	Collective Choice					
R3	Consti- tutional Choice					

Interorganizational Level Coding Form

This form is comprised of general questions concerning the nature of interorganizational structure. As with the Collective Choice coding form, there are no explicit instructions for this form - it is very short.

The remainder of this page has intentionally been left blank

VARIABLE LIST INTERORGANIZATIONAL LEVEL "I"
Alphabetical

<BRIBE>	<IA5>	Do members of the appropriation resource regularly bribe the higher level officials for water delivery and other related services (such as maintenance)?
<CONTROL>	<IA6>	Do members of the appropriation resource have full control of the water delivery process after water has entered its area?
<FSOURCE>	<IA2>	What are the major financial sources of the higher level organization?
<IMPART>	<IA3>	Are the higher level officials generally impartial in handling conflict within and between appropriation resources?
<INTERACT>	<IA8>	Are there any other patterns of interactions between the higher level officials and members of the appropriation resource which you think are important?
<MBOUND>	<IA7>	Are there clear-cut physical boundaries of responsibility for maintenance between the higher level organization and members of the appropriation resource?
<RELIABLE>	<IA4>	Are the higher level officials generally reliable in delivering water to the appropriation resource?

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INTERORGANIZATIONAL LEVEL CODING FORM

(Initially for Irrigation Cases)

Organization No.: _____
 <ORGANID>

Resource No.: <RESOURID>

* If there are multiple layers of system level organizations code the one immediately above the appropriation resource you are coding. For example, if there are two organizations above the appropriation resource, one responsible for production and the other for distribution, you should code only the one responsible for distribution.

A1. What is the code name of the higher level organization as it appears in the Collective Choice Coding Form?

A2. The major financial sources of the higher level organization are (Mark 0 for not used, 1 for used, and 2 for MIC): <FSOURCE>

- (1) _____ Payment or fee paid by appropriators
- (2) _____ External government
- (3) _____ Development agency
- (4) _____ Sales of units from the resource
- (5) _____ Own taxes
- (6) _____ Other: _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A3. Are the higher level officials generally impartial in handling conflict within and between appropriation resources? <IMPART>

- | | | |
|------|-------|-----|
| (1) | _____ | Yes |
| (2) | _____ | No |
| (-1) | _____ | MIC |
| (-2) | _____ | NA |
| | _____ | CL |

A4. Are the higher level officials generally reliable in delivering water to the appropriation resource? <RELIABLE>

- | | | |
|------|-------|-----------------|
| (1) | _____ | Highly reliable |
| (2) | _____ | Mildly reliable |
| (3) | _____ | Unreliable |
| (-1) | _____ | MIC |
| (-2) | _____ | NA |
| | _____ | CL |

A5. Do members of the appropriation resource regularly bribe the higher level officials for water delivery and other related services (such as maintenance)? <BRIBE>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A6. Do members of the appropriation resource have full control of the water delivery process after water has entered its area? <CONTROL>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A7. Are there clear-cut physical boundaries of responsibility for maintenance between the higher level organization and members of the appropriation resource? <MBOUND>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A8. Are there any other patterns of interactions between the higher level officials and members of the appropriation resource which you think are important? (e.g. how frequent officials and appropriators meet; whether officials reside near the appropriation unit). <INTERACT>

Organizational Structure Coding Form

Before filling in this form, you have to fill in the Collective Choice Form. For the first round of coding, you only have to code organizations that are related to the appropriation process of the resource (i.e., organizations under column C4 "Appropriation" in the Collective Choice Form.)

This form has a variable list sorted alphabetically.

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DRAFT

CODING INSTRUCTIONS

ORGANIZATIONAL STRUCTURE AND PROCESS FORM

by

S.Y. Tang

GENERAL NOTES:

Before filling in this form, you have to fill in the Collective Choice Form. For the first round of coding, you only have to code organizations that are related to the appropriation process of the resource (i.e., organizations under column C4 "Appropriation" in the Collective Choice Form.)

If K (i.e., a group that has achieved coordination without formal organization) is coded under column C4 in the Collective Choice Form, you have to answer A1 and A24 (the short paragraph) of this form and leave the other questions blank.

Section A. **STRUCTURE AND PROCESS**

Question A1. "Identify.. organization... in the matrix"

Identify the code (i.e., A, B, etc.,) of the organization as it appears in the matrix of the Collective Choice Form.

Question A2a. "name of this organization or group"

Give the formal name of the organization if it has one. If not, assign a name that can best reflect the nature and scope of the organization.

Question A2b. "How long has this organization had the structure and process..."

This question asks how long this organization has had the structure and process as described in this form. The beginning date may not been the same as the date when the organization was established. If an organization has undergone significant changes in regard to its structure and process, you may have to fill in separate forms for the two or more periods.

Question A3. "relationship of the territorial jurisdiction of the organization to the physical boundaries of this resource?"

Remember that the resource here refers to the appropriation resource. If the production resource is different from the appropriation resource and the organization is responsible for both, you have to answer (3) "the resource is within the organization."

Question A4. "relationship of the territorial jurisdiction of the organization to the smallest relevant general purpose government/administrative unit (e.g. a village)"

The smallest relevant general purpose government/administrative unit refers to any collective unit which has general authority over an area. It is not necessarily a collective unit instituted by a formal government. It may be a traditional village community within which general purpose authority can be exercised.

Question A5. "relationship of the size of this organization to the number of appropriators"

In this questions, "appropriators" refers to those who appropriate units from the particular appropriation resource we coded on the resource forms.

Question A6. "is the membership the same as a subgroup?"

Answer this question if there are multiple subgroups related to the resource. Otherwise, answer (-2) "NA".

Question A7. "express needs and concerns to those officials of other organizations"

If there are other organizations that are responsible for the production and/or distribution resources or have a higher level of jurisdiction, how do officials or members of this organization express their needs and concerns to these organizations.

Question A8. "express needs and concerns to those officials of this organization"

No special instructions.

Question A9. "services in addition to provision, production, distribution, and use activities that are already provided?"

If your answer is (2) "no", the code for this organization as it appears in question A1 should be either I, J, or K. Conversely, if the answer is (1) "yes", the code should be neither I, J, nor K. Please check if you have got this right.

Question 9a. "If yes, what are the major services provided?"

The space limit for this variable is 300 characters.

Question A10. "If the appropriators do participate in elections... are these elections contested?"

Are there usually more than one candidate who are competing for the positions?

Question A11. "Do most of the officials who are responsible for the appropriation resource reside in or near the resource?"

This question asks about those officials who make major operating decisions related to the appropriation resource.

Question A12. "what level of administrator you are coding for questions A13 to A20"

No special instructions.

Question A13. "Is the chief executive(s) or administrator(s) positions filled by appropriators?"

No special instructions.

Question A14. "Can an external or higher level authority remove the chief executive(s) or administrator(s)?"

No special instructions.

Question A15. "Does the chief executive(s) or administrator(s) report to any external or higher level authority?"

Does the executive or administrator files reports to any external or higher level authority regularly as part of his or her usual responsibility?

Question A16. "The period which the chief executive(s) or administrator(s) serve is:"

No special instructions.

Question A16. "Is the chief executive(s) or administrator(s) paid?"

No special instructions.

Question A18. "Does the chief executive(s) or administrator(s) own assets or capital whose uses depend on the units from the resource(s) "

No special instructions.

Question A19. "Given the economy of this location, is the average annual income of the chief executive(s) or administrator(s) :"

No special instructions.

Question A20. "Does the chief executive(s) or administrator(s) hold leading positions in other collective or governmental bodies?"

No special instructions.

Question A21. "major financial sources of the organization"

Response (8) "own taxes" refers to taxes raised by a general purpose government. Regular levies by other kinds of organizations should be referred to as (2) "membership fee".

Question A22. "classify these rules according to the following scale:"

No special instructions.

Question A23. "The enforcement of the rules of this organization (or group) is primarily undertaken by:"

No special instructions.

Question A24. "short paragraph"

The space limit for this variable is 1000 characters.

VARIABLE LIST: ORGANIZATIONAL STRUCTURE AND PROCESS "O"
 Alphabetical

<ADDSERV>	<OA9>	Does the organization provide the appropriators with services in addition to provision, production, distribution, appropriation, and use activities that are already provided?
<ADMLEVEL>	<OA12>	What level of administrator is being coded for the administrator(s) who makes major operating decisions for the appropriation resource?
<BEGDATE>	<OA2b>	What is the beginning date for when this organization had the structure and process as described herein?
<CONELECT>	<OA10>	If the appropriators participate in elections for representatives and officials of this organization, are these elections contested?
<ENDDATE>	<OA2b>	What is the end date for when this organization had the structure and process as described herein?
<ENFRULE>	<OA23>	Who primarily enforces the rules of this organization (or group)?
<EXECAPPR>	<OA13>	Is the chief executive(s) or administrator(s) position(s) filled by appropriators?
<EXECINC>	<OA19>	Given the economy of this location, what is the average annual income (including all non-monetary forms of income) of the chief executive(s) or administrator(s)?
<EXECOTHR>	<OA20>	Does the chief executive(s) or administrator(s) hold leading positions in other collective or governmental bodies?
<EXECOWN>	<OA18>	Does the chief executive(s) or administrator(s) own assets or capital whose uses depend on the units from the resource(s)?
<EXECPAID>	<OA17>	Is the chief executive(s) or administrator(s) paid?
<EXECPER>	<OA16>	What time period does the chief executive(s) or administrator(s) serve?
<EXPOTHER>	<OA7>	What activities do the members of this organization (or group) use to express their needs and concerns to those officials <u>of other organizations</u> who make collective choice decisions in relation to the resource, and do the appropriators find them useful?

<EXPOWN>	<OA8>	What activities do the members of this organization (or group) use to express their needs and concerns to those officials of <u>this</u> organization who make collective choice decisions in relation to the resource, and do the appropriators find them useful?
<EXTREMOV>	<OA14>	Can an external or higher level authority remove the chief executive(s) or administrator(s)?
<EXTREP>	<OA15>	Does the chief executive(s) or administrator(s) report to any external or higher level authority?
<FISOURCE>	<OA21>	What are the major financial sources of the organization (or group)?
<MEMBAPPR>	<OA5>	What is the relationship of the size of this organization (or group) to the number of appropriators?
<MEMBSUB1>	<OA6>	If the membership is smaller than total, is the membership the same as a subgroup?
<MEMBSUB2>	<OA6>	If the membership is the same as a subgroup, then what is the subgroup id number?
<OFFNEAR>	<OA11>	Do most of the officials who are responsible for the appropriation resource reside in or near the resource?
<ORGNAME>	<OA2a>	What is the name of this organization or group?
<ORGPARG>	<OA24>	What is the day-to-day operating structure for this organization (or group) and the decisions individuals are allowed to take; the strategic decision-making structure, who composes it, and how often it convenes; and any information about this organization (or group) that is important but has not been captured elsewhere?
<RULECLAS>	<OA22>	How easily understood are the rules this organization (or group) has evolved/adopted to govern the activity it has organized?
<SERVICES>	<OA9a>	If the organization provides the appropriators with services in addition to provision, production, distribution, appropriation, and use activities that are already provided, what are the major services provided?
<TERJUR1>	<OA3>	What is the relationship of the territorial jurisdiction of the organization (or group that has achieved coordination without a formal organization) to the physical boundaries of this resource?
<TERJUR2>	<OA4>	What is the relationship of the territorial

jurisdiction of the organization (or group that has achieved coordination without a formal organization) to that of the smallest relevant general purpose government/administrative unit?

ORGANIZATIONAL STRUCTURE AND PROCESS CODING FORM

Resource No.: _____
 <RESOURID>

A. STRUCTURE AND PROCESS

- (1) _____ The two boundaries are roughly equivalent
- (2) _____ The organization is within the government/administrative unit
- (3) _____ The government/administrative unit is within the organization
- (4) _____ The two boundaries overlap partially
- (5) _____ The two boundaries are totally separated
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

STRUCTURE AND PROCESS

A5. What is the relationship of the size of this organization (or group) to the number of appropriators? <MEMBAPPR>

- (1) _____ Organization (or group) has more members than the number of appropriators
- (2) _____ Organization (or group) has fewer members than the number of appropriators
- (3) _____ Organization (or group) has roughly the same members as the number of appropriators
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A6. If the membership is smaller than total, is the membership the same as a subgroup? <MEMBSUB1>

- (1) _____ Yes, and the subgroup id is _____ <MEMBSUB2>
- (2) _____ No _____ NA
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A7. In the following list mark which activities the members of this organization (or group) use to express their needs and concerns to those officials of other organizations who make collective choice decisions in relation to the resource (if there are multiple layers of organizations, code the one immediately above this organization). Use the following code:
<EXPOTHER>

- "0": that activity is not used.
- "1": that activity is used and appropriators have a favorable evaluation of its usefulness.
- "2": that activity is used and appropriators have an unfavorable evaluation of its usefulness.
- "3": that activity is used and the document does not indicate the appropriators' evaluation of its usefulness
- "4": MIC

- (1) _____ Elections
- (2) _____ Formal petitions
- (3) _____ Formal hearings
- (4) _____ Advice and consent on nominations to nonelected positions
- (5) _____ Demonstrations
- (6) _____ General meetings
- (7) _____ Illegal exchanges with officials
- (8) _____ Other: _____
- (-2) _____ NA
- _____ CL

STRUCTURE AND PROCESS

A8. In the following list mark which activities the members of this organization (or group) use to express their needs and concerns to those officials of this organization who make collective choice decisions in relation to the resource. Use the code outlined above (question A7). <EXPOWN>

- (1) _____ Elections
- (2) _____ Formal petitions
- (3) _____ Formal hearings
- (4) _____ Advice and consent on nominations to nonelected positions
- (5) _____ Demonstrations
- (6) _____ General meetings
- (7) _____ Illegal exchanges with officials
- (8) _____ Other: _____
- (-2) _____ NA
- _____ CL

A9. Does the organization provide the appropriators with services in addition to provision, production, distribution, appropriation, and use activities that are already provided? <ADDSERV>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A9a. If yes, what are the major services provided: _____
<SERVICES>

_____ MIC _____ NA

A10. If the appropriators do participate in elections for representatives and officials of this organization, are these elections contested? <CONELECT>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A11. Do most of the officials who are responsible for the appropriation resource reside in or near the resource? <OFFNEAR>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

STRUCTURE AND PROCESS

A12. In questions A13 to A20, you are asked a series of variables about the administrator(s) who makes major operating decisions for the appropriation resource. Please identify what level of administrator you are coding for those questions. <ADMLEVEL>

- (1) _____ The highest level (chief) executive(s) of the organization
- (2) _____ A mid-level administrator(s) who is responsible for this resource only
- (3) _____ A mid-level administrator(s) who is responsible for this and other resources
- (4) _____ The lowest level administrator(s) who is responsible for this resource only
- (5) _____ The lowest level administrator(s) who is responsible for this and other resources
- (6) _____ Others: _____
- (-1) _____ MIC
- (-2) _____ NA (no executive or administrative position)
- _____ CL

A13. Is the chief executive(s) or administrator(s) position(s) filled by appropriators? <EXECAPPR>

- (1) _____ No
- (2) _____ Yes, through direct or indirect elections by appropriators
- (3) _____ Yes, appointed by external government with active advice by appropriators
- (4) _____ Yes, appointed by external government without active advice by appropriators
- (5) _____ Yes, through inheritance
- (6) _____ Other: _____
- (-1) _____ MIC
- (-2) _____ NA (no executive positions)
- _____ CL

A14. Can an external or higher level authority remove the chief executive(s) or administrator(s)? <EXTREMOV>

- (1) _____ Yes, at the discretion of the external or higher level authority
- (2) _____ Yes, with substantiated evidence from malfeasance
- (3) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A15. Does the chief executive(s) or administrator(s) report to any external or higher level authority? <EXTREP>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

STRUCTURE AND PROCESS

A16. The period which the chief executive(s) or administrator(s) serve is:
<EXECPER>

- (1) ☐ A life term
- (2) ☐ Fixed period of time, may be re-elected
- (3) ☐ Fixed period of time, may not be re-elected
- (4) ☐ Variable subject to vote of confidence
- (5) ☐ Administrative tenure subject to rules of relevant agency
- (6) ☐ Other: _____
- (-1) ☐ MIC
- (-2) ☐ NA (no executive positions)
- ☐ CL

A17. Is the chief executive(s) or administrator(s) paid? <EXECPAID>

- (1) ☐ No
- (2) ☐ Yes, from the general fund of the organization
- (3) ☐ Yes, mostly by receiving shares of the appropriation units
- (4) ☐ Yes, mostly by receiving reduced obligations
- (5) ☐ Yes, mostly by receiving voluntary contributions of the appropriators
- (6) ☐ Yes, mostly by a local or external government
- (7) ☐ Yes, mostly by a development agency
- (8) ☐ Yes, mostly by receiving special levies
- (9) ☐ Yes, by other means: _____
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

A18. Does the chief executive(s) or administrator(s) own assets or capital whose uses depend on the units from the resource(s) (e.g., farmland that depends on water from an irrigation system; fishing boats that fish in a lake; livestock that feed on a grazing land)? <EXECOWN>

- (1) ☐ No
- (2) ☐ Yes, the amount is below average in the location
- (3) ☐ Yes, the amount is average in the location
- (4) ☐ Yes, the amount is above average in the location
- (5) ☐ Yes, the amount is very high in the location
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

STRUCTURE AND PROCESS

A19. Given the economy of this location, is the average annual income (including all non-monetary forms of income) of the chief executive(s) or administrator(s): <EXECINC>

- (1) _____ Very low
- (2) _____ Low
- (3) _____ Average
- (4) _____ High
- (5) _____ Very high
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A20. Does the chief executive(s) or administrator(s) hold leading positions in other collective or governmental bodies? <EXECOTHR>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A21. The major financial sources of the organization (or group) are (Mark "0" for not used, "1" for used, and "2" for MIC): <FISOURCE>

- (1) _____ Voluntary contribution
- (2) _____ Membership fee
- (3) _____ Payments that substitute for labor input
- (4) _____ Fines
- (5) _____ External government
- (6) _____ Development agency
- (7) _____ Sales of units from the resource
- (8) _____ Own taxes
- (9) _____ Special levies
- (10) _____ Other: _____
- (-1) _____ MIC
- _____ CL

A22. Keeping in mind the rules this organization (or group) has evolved/adopted to govern the activity it has organized, classify these rules according to the following scale: <RULECLAS>

- (1) _____ Simple, easily understood
- (2) _____ Relatively complex, can be understood through learning and experience
- (3) _____ Very complex, difficult to understand
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

STRUCTURE AND PROCESS

A23. The enforcement of the rules of this organization (or group) is primarily undertaken by: <ENFRULE>

- (1) _____ Members of the organization (or group) itself
- (2) _____ Members and external officials
- (3) _____ External officials only
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A24. In a short paragraph summarize the following information about this organization (or group): 1) the day-to-day operating structure and the decisions these individuals are allowed to take; 2) the strategic decision-making structure, who composes it, and how often it convenes; and 3) any information about this organization (or group) that you believe is important but has not been captured elsewhere: <ORGPARG>

Operational Level Coding Form

This form is used to characterize the operational level where individuals take direct actions or adopt strategies for future actions, depending on expected contingencies. At this level, each individual faces an action situation.

This form has a variable list sorted alphabetically and by concept.

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DRAFTCODING INSTRUCTIONS
OPERATIONAL LEVEL CODING FORM

by

S.Y. Tang

GENERAL NOTES:

At the operational level, individuals take direct actions or adopt strategies for future actions, depending on expected contingencies. At this level, each individual faces an action situation.

An action situation is a "time slice." It is a period of no determinate length -- that is, it could be a year, it could be centuries -- during which actions of the appropriators of the resource were relatively consistent. By "relatively consistent," we mean that the rules governing the appropriation resource were the same throughout the period, the configuration of appropriators was similar throughout the period, the technology or technologies employed were the same throughout the period, the physical characteristics of the resource were the same throughout the period, and the patterns of appropriation were the same throughout the period. The purpose of this form is to record information about the appropriation patterns of the resource and the actions of the appropriators during such a "time slice." When one of the elements listed above -- rules, appropriators, technologies, physical characteristics, appropriation patterns -- changes, then one should code another Operational Level Coding Form after that change.

The information you record on this form will be entered into a data base. Then the completed form itself will be saved and filed. Therefore, you are permitted, indeed encouraged, to make any marginal notes on the form which might explicate how you arrived at a particular answer.

Section A. TYPE OF SITUATION

Question A1. "processes...primarily related to"

The primary focus of this form is the appropriation process. However, if the author of a document also discusses the production, distribution, or use processes explicitly and the information about these other processes is coded in some of the answers to this form, you should code from among (2) to (8).

Question A2. "formal owner"

The "formal owner" of a resource is defined as one holding a

full set of property rights including:

Access: The right to enter a defined physical property.

Withdrawal: The right to obtain the "products" of this resource (e.g., catch fish, appropriate water).

Management: The right to regulate internal use patterns and transform the resource by making improvements.

Exclusion: The right to determine who will have access to a resource or a share thereof.

Transfer: The right to sell, lease, or bequeath all of the above rights in whole or in part.

If the answer is (7) "Other", please specify the kind of formal owner. If there is no person or organization that has the full set of property rights, answer (8) "No formal owner".

Question A3. "set of individuals...well-defined"

If the set of rules about withdrawal rights is ambiguous or it is practically difficult to determine who has the rights, answer "no".

Question A4. "owners exercising or attempting to exercise closed access"

Closed access is exercised on a de jure base if it is sanctioned by some legitimate authority. "Effectiveness" refers to the actual result of the effort, i.e., whether unwanted individuals are actually prevented from accessing the resource. Owners here refer to the formal owners identified in A2.

Question A5. "appropriators exercising or attempting to exercise closed access"

Closed access is exercised on a de facto base if it is NOT specifically sanctioned by some legitimate authority. Outsiders are persons who are not originally appropriators.

Question A6. "more appropriators than productive spots"

TBA

Section B. EVENT(S) MARKING THE BEGINNING OF ACTION SITUATION

Question B1. "precise information about the beginning"

The beginning date refers to the date when the action situation actually begins. It does NOT refer to the date when authors begin their field research. The end date refers to either the date when the action situation actually ends or the date beyond which author provides no further information.

Question B2. "estimate the decade when these patterns ended"

Estimate the decade when the action situation ended. If the action situation still exists now, enter "1985".

Question B3. "duration of the patterns"

No special instructions.

Question B4. "Is there a major change in operational, collective, or constitutional rules?"

If the answer is "yes", you have to determine who approved or adopted, instead of who suggested, the change.

Question B5. "Is there a change in the size and/or structure of the resource?"

No special instructions.

Question B6. "Is new technology introduced?"

If a new technology is introduced such that it becomes more efficient or economical to withdraw units, answer "2". If a new technology is introduced such that units are USED in a more efficient or economical way thus reducing the demand for the units, answer "3".

Question B7. "substantial external change in exchange value of units"

No special instructions.

Question B8. "Is the quantity of units available changing because of change in appropriate patterns of other appropriators withdrawing units from the same production or distribution resource?"

This question applies to situations where the appropriation resource is different from the production or distribution resources, and appropriators other than the ones we are coding are withdrawing units from the same production or distribution resources.

Question D9. "Is a new group starting to withdraw units from the appropriation resource"

"Local groups" refer to people who reside in or near the location of the appropriation resource.

Question B10. "Is there a change in one or more variables internal to the operational level?"

If there is a change in one or more variables internal to the operational level which has not been captured in the preceding questions, answer "yes" and post the question number(s) where these variables appear.

Question B11. "Does the author begin the description of this case at this point in history?"

If this is the first "time period" the author discusses in the document, answer "yes". Otherwise, answer "no".

Question B11a. "reason author gave for starting at this point"

No special instructions.

Section C. CONDITIONS AT THE BEGINNING AND END OF PERIOD COVERED BY
THIS FORM

Question C1a. "biological resources....the balance"

Based on the information provided by the author and your best judgement, determine whether the beginning and ending rate of withdrawal exceeded the maximum sustainable yield of the resource. If this is the case, answer either "1" or "2" depending on how much the maximum sustainable yield was exceeded. If the withdrawal rate equals the maximum sustainable yield, answer "3". Otherwise, answer "4" or "5".

Question C1b. "physical resources....the balance"

To answer this question, you have to consider two things. One is the rate of withdrawal of units. The other is the quantity of units needed, given the usual patterns of use for these units. Sometimes, it would be difficult to determine the extent to which a unit is needed; you may have to make some inference from the information provided by the author. In irrigation, "needs" refers to the optimal requirements of the crops in the established fields served by this system.

Question C2. "please describe the type of evidence given"

Please also indicate the relevant pages of the document.

Question C3. "the volume of withdrawal from this resource"

No special instructions.

Question C4. "average size of the units"

This question applies initially to fisheries cases.

Question C5. "average age of the units"

This question applies initially to fisheries cases.

Question C5a. "are the units sexually mature at this size or age?"

This question applies initially to fisheries cases.

Question C6. "the quality of units"

In consideration of the way(s) in which the units are used, how would you characterize the quality of these units?

Question C7. "problems of pollution resulting from the way units are appropriated?"

Does the appropriation process(es) of the units create any problem of pollution (contamination, spoilage, loss of value,

etc.) for this or other resources?

Question C8. "the extent of technical externalities resulting from....participants"

What is the extent of technical externalities among appropriators from this resource? There are three ways by which the activity of an appropriator may affect that of another. First, some appropriators may use an appropriation technology or method that raises the costs of the appropriation activity of other appropriators. For example, in some fisheries cases, the operation of trawlers may destroy the fixed gears of other fishers. Second, if the number of units is very limited in comparison with the total number demanded, the cost of withdrawal for each appropriator increases in proportion to the rates of withdrawal by others. Third, if the number of units available is very limited, one's appropriation reduces the number of units available to others.

Question C9. "interference between the appropriation technology for this resource and the appropriation processes for other resources in this location"

Answer only if there ARE multiple appropriation resources in the location noted on the location form.

Question C10a. "how well-maintained is the appropriation resource?"

In consideration of the initial construction and physical environment of the appropriation resource and the financial and technological capabilities of the appropriators, how well-maintained is the appropriation resource? In cases where a major natural disaster occurs and damages the resource, which is beyond the appropriators' or the responsible agent's capability to prevent or repair immediately, answer "5".

Question C10b. "how well-maintained is the distribution resource?"

This question refers to the distribution resource. For further details, please refer to the instructions for C10a.

Question C10c. "how well-maintained is the production resource?"

This question refers to the production resource. For further details, please refer to the instructions for C10b.

Question C11. "the level of mutual trust"

No special instructions.

Question C12. "At the end....has a change occurred in the property rights regime"

At the end of the period, is there any change in the property rights related to the appropriate resource? A set of property rights includes:

Access: The right to enter a defined physical property.

Withdrawal: The right to obtain the "products" of this resource (e.g. catch fish, appropriate water).
Management: The right to regulate internal use patterns and transform the resource by making improvements.
Transfer: The right to sell, lease, or bequeath all of the above rights in whole or in part.
A change in any of these four rights would constitute a change in the property rights regime.

Question C12a. "If 1 or 2 above, does the formal ownership change?"

The "formal owner" of a resource is defined as one holding a full set of property rights including access, withdrawal, management, and transfer rights. Please refer to instructions for the last question for definitions of these rights.

Question C12b. "The initiation of this change was sponsored by"

No special instructions.

Question C12c. "At the end....owners exercising or attempting to exercise closed access"

Closed access is exercised on a de jure base if it is sanctioned by some legitimate authority. "Effectiveness" refers to the actual result of the effort, i.e, whether unwanted individuals are actually prevented from accessing the resource. Owners are the "formal owners" identified in A2.

Question C12d. "At the end....appropriators exercising or attempting to exercise closed access"

Closed access is exercised on a de facto base if it is NOT specifically sanctioned by some legitimate authority. Outsiders are persons who are not originally appropriators.

Section D. INFORMATION LEVELS

Question D1. "maps or charts of the appropriation resource"

No special instructions.

Question D2. "maps and/or charts of the production and distribution resource available"

Answer "2", "3", or "4" only if the maps and/or charts are readily available to most appropriators.

Question D3. "appropriators....readily observed by each other?"

No special instructions.

Question D4. "appropriators....in radio communication"

No special instructions.

Question D5. "records of the condition of the resource kept in any

systematic way?"

Are records about the level of pollution of the resource, the amount of units available, etc., kept in a way that allows for easy inspection by appropriators.

Question D6. "actions being taken....to generate information about condition of the resource?"

Are actions being taken, by appropriators or officials, to generate information about the level of pollution of the resource, the amount of the units available, etc.?

Question D7. "records of the withdrawals....kept in any systematic way?"

The record of withdrawals may include the amount of units withdrawn by each appropriator or the total amount withdrawn by all appropriators.

Question D8. "Are records of the physical factors which directly affect the resource kept in any systematic way?"

In irrigation, these records includes rainfall. In fisheries, water temperature is relevant.

Question D9. "Are records of the appropriator's contributions to monitoring of the resource kept in any systematic way?"

This question only refers to monitoring in official capacity.

Question D10. "Are records of the appropriators' contributions to the maintenance of the resource kept in any systematic way?"

Contributions to the maintenance of the resource may include both labor, material, and money.

Question D11. "records kept in a language accessible to most of the appropriators"

No special instructions.

Question D11a. "officials....keep this records?"

"Officials" can refer to either governmental or nongovernmental officials. For example, officials in a private cooperative may keep records of the catch of individual fishermen.

Question D11b. "record available for inspection?"

No special instructions.

Question D12. "arenas being used for the exchange of information"

Appropriators of a resource might discuss the conditions of the resource during casual encounters, or there might be particular places, times, or occasions where they discuss conditions of the

resource. It is these later situations we are interested in, not just casual encounters. Further, we are interested in arenas actually "being used."

Question D12a. "how frequently do appropriators get together and discuss mutual problems?"

How often do appropriators get together and discuss mutual problems of the resource in the arenas coded in the last question?

Question D13. "well-developed understanding of the characteristics of this resource"

Appropriators might have different degree of understanding of the physical structure of the resource, the peculiarity and flow of units, and in some biological systems, the reproductive, living, or growth patterns of units. What is the appropriators' level of understanding of the resource?

Section E. POTENTIAL ACTIONS AND LEVELS OF CONTROL

Question E1. "a set of appropriators....generate a substantial improvement of the demand conditions"

Assuming that the supply conditions remain unchanged, could a set of appropriators, less than the total number of appropriators, coordinate to generate a substantial improvement of the demand conditions of the resource? In biological resources, how many appropriators would have to cut back in order to restore the resource to its maximum sustainable yield? In physical resources, how many appropriators would have to cut back in order to ensure a balance between the quantity of units available and the quantity of units needed, given the usual patterns of use for these units. In the case of irrigation, "units needed" refers to the optimal water requirement of the crops in the established fields served by this system.

Question E2. "a set of appropriators....generate a substantial improvement of the supply conditions"

Assuming that the demand conditions remain unchanged, could a set of appropriators, less than the total number of appropriators, coordinate to generate a substantial improvement of the supply conditions of the appropriation, distribution, and/or production resource(s)? In biological resources, how many appropriators would have to cooperate to increase substantially the maximum sustainable yield? In physical resources, how many appropriators have to coordinate to increase the quantity of units to match the quantity of units needed, given the usual patterns of use for these units. In the case of irrigation, "units needed" refers to the optima water requirement of the crops in the established fields served by this system.

Question E2a. "the characteristic of being a 'step good'"

In some cases, some basic facility or project has to be established first before any improvement appears. This is different from cases in which one can expect some incremental improvement for every effort or resource invested. For the former case, answer "yes."

Question E3. "specialized staff or workers to undertake maintenance?"

Besides regular labor contributions by appropriators, are there specialized staff or workers to undertake maintenance?

Question E4. "person-days of labor per year....to maintain and/or repair the resource(s)"

How many person-days of labor per year are mobilized from among the appropriators of this appropriation resource to maintain and/or repair the appropriation, distribution, and/or production resources?

Question E5. "adversely affected by the strategies of prior appropriators"

In some cases, other appropriators receive units from the same production or distribution resource, prior the appropriators we are coding. Do the activities of these other appropriators adversely affect the quality or quantity of the units available to the appropriators we are coding.

Question E6. "pollution resulting from activities of others who are not appropriators of this resource and who are not necessarily inhabitants of this location"

No special instructions.

Question E7. "unit....used predominately in the same location as this resource"

Are the units used or consumed predominately in the same location as the resource. For example, water may either be used to cultivate crops in the same location or be bottled and sold elsewhere; fish may either be consumed locally or sold elsewhere.

Question E8. "appropriators sell this unit in more than one market location"

The market need not be the one coded in A14 of the Location Form.

Question E9. "insurance mechanism....related to variability of income from resource"

No special instructions.

Question E9a. "If Yes, please describe"

No special instructions.

Section F. PATTERNS OF INTERACTION

Question F1. "Communication Patterns..."

"Clan" in F1c refers to a set of people who shares common ancestors. It also includes extended families.

Question F2. "general manner in which appropriators related to one another"

No special instructions.

Question F3. "cooperation in regard to other activities besides the management of this resource"

No special instructions.

Question F4. "social sanctions imposed by other appropriators"

How likely are appropriators who are not official monitors to impose social sanctions on rule violators? By social sanctions, we mean that the violators may get a bad reputation, be criticized, be excluded from other social activities, etc. Do not count physical violence as a form of social sanction.

Question F5. "physical sanctions by other appropriators"

How likely are appropriators who are not official monitors to impose physical sanctions on rule violators? The physical sanctions may be used against the violators, their families, or their properties.

Question F6. "how likely is it that the appropriators imposing physical sanctions will themselves be punished?"

How likely is it that a formal authority will punish those appropriators who impose physical sanctions on rule violators? The formal authority may be a government agency, or an appropriators' organization.

Question F7. "an official monitor or guard will move to impose sanctions"

If there are official monitors or guards, how likely are they to impose sanctions on rule violators?

Question F8. "a gradation of social, physical, and official sanctions that varies with the severity of rule violations"

Considering all possible social, physical and official sanctions, is the severity of these sanctions dependent on the type of rule infraction? If no social, physical and official sanctions are imposed, answer "-2".

Question F9. "how likely is it that local appropriators will attempt to bribe the official?"

No special instructions.

Section G. POSITIONS AND PARTICIPANTS

Question G1. "Does the position of non-appropriator exist"

Non-appropriators are those interested in appropriating from the resource but are prevented from doing so. According to this definition an individual living in the location of the resource but not interested in appropriating from the resource is not a non-appropriator.

Question G1A. "estimated number of participants in this position at the end"

No special instructions.

Question G2. "the position the appropriator"

Appropriators are individuals who withdraw units from the resource. They may be doing so either legally or illegally.

Question G3. "how many teams are appropriating"

Some appropriation activities involve teams. For example, a fishing boat may have to be operated by a group of people. All individuals working on the boat then constitute a team.

Question G4. "'official' position of monitor"

Answer "Yes" only if the monitors act on behalf of some organization or authority. Do not include appropriators who monitor others on their own initiation.

Question G4a. "What level of rules is being monitored by the above position"

What level of rules is being monitored by the official monitor coded in the last question?

Question G4b. "appropriators monitor... each other"

TBA

Question G4c. "How many official monitors are on duty at one time during the peak period?"

During the period when the units are in the greatest demand, how many official monitors are on duty at one time? This number could be less than the total number of official monitors available.

Question G4e. "How many official monitors are on duty at one time during the off peak period?"

During the period when the units are not in great demand, how

many official monitors are on duty at one time? This number could be less than the total number of official monitors available.

Question G4f. "If official position exists, are these monitors paid?"

No special instructions.

Question G4h. "Full-time status of official monitors."

No special instructions.

Section H. NUMBER AND RELATIONSHIPS AMONG SUBGROUPS

Question H1. "subgroup forms....in relation to this operational level form"

No special instructions.

Question H2. "List their ID numbers"

These number will be filled in by the computer operator.

Question H3. "on which criteria the subgroups differ from one another"

No special instructions.

Section I. EVALUATION OF RESULTS

Question I1. "the time, funds, and energy devoted to making and enforcing decisions and rules about appropriation"

Based on your knowledge of other resource systems of the same sector (i.e., fisheries, irrigation, etc.) of approximately the same size, is the cost of making and enforcing decisions and rules for this appropriation resource higher, about the same, or lower than the average? In some cases, appropriators do not spend much time managing a formal organization related to the resource. Each of them, however, may have to spend much time and energy in protecting his or her appropriation rights against the intrusion of others. In these cases, the answer could be "1".

Question I2. "any appropriators....consistently disadvantaged"

This question refers only to appropriators. An appropriator is disadvantaged if he or she is always assigned a smaller amount of units, a bad time slot, lower priority in withdrawing units, etc.

Question I2a. "If yes, describe:"

No special instructions.

Question I3. "relatively worst off been cut out of their benefits from this resource or substantially harmed"

This question refers to individuals who used to be or are currently appropriators. For further discussion of the theory, please read Douglas Rae, Inequalities, Cambridge, MA: Harvard University Press, 1981.

Question I4. "the distance....."

This question refers to individuals who used to be or are currently appropriators. For further discussion of the theory, please read Douglas Rae, Inequalities, Cambridge, Ma: Harvard University Press, 1981.

Section J. AUTHORS EVALUATION AND CAUSAL ASSUMPTIONS

Question J1. "Does the author focus on our concept of results and the evaluation of results?"

Does the author focus on our concepts of results as laid out in section C and the evaluation of results as laid out in section I of this form?

Question J2. "What type of variables does the author consider as affecting results?"

According to the author, what type of variables affects what kind of results? How does the causal relationship work?

Question J3. "Have we captured the variables the author thinks are important?"

Do questions in all our coding forms capture the variables the author thinks are important in affecting results? If not, explain the missing variables.

Question J4. "Does the author refer to transaction costs?"

In general transaction costs refer to the time, funds, and energy devoted to making and enforcing decisions and rules. If the author suggests means of estimating or comparing this kind of costs, answer "yes". You could answer "yes" even if the author does not directly use the term "transaction costs".

Question J4a. "If yes, what indicator of transaction costs does the author use?"

If yes, explain briefly what kinds of transaction costs, (e.g, negotiation costs, enforcement costs, etc.,) the author discusses. Does the author discuss any means of measuring or comparing these different kinds of costs?

Question J4b. "If yes, do they report transaction costs as:"

No special instructions.

Question J4c. "If high or medium,... any means of lowering transaction costs without simultaneously lowering benefits"

No special instructions.

Question J5. "Does the author evaluate efficiency?"

Does the author mention the concept of efficiency and use it to evaluate results?

Question J5a. "If yes, what indicators of efficiency does the author use?"

If yes, briefly explain what indicators of efficiency (e.g. pareto-optimality, input-output ratio, etc.,) the author discusses. Does the author discuss any means of measuring or comparing efficiency?

Question J5b. "If yes, does the author evaluate efficiency as being"

No special instructions.

Question J5c. "If low or medium,... any means of increasing efficiency without lowering benefits"

No special instructions.

Question J6. "discuss how the author evaluates withdrawals per unit of effort for this resource"

No special instructions.

VARLIST OPERATIONAL LEVEL FORM
sorted by concept, variable

<u>Concept</u>	<u>Variable</u>	<u>Question#</u>	
<BEGCONDITION>	<BAPCLOSE>	<VA5>	As of the beginning of this period, are the appropriators exercising or attempting to exercise closed access to this resource?
	<BAVERAGE>	<VC4>	What is the average age of the units withdrawn from this resource at the beginning of this time period?
	<BAVRESIZ>	<VC3>	What is the average size of the units withdrawn from this resource at the beginning of this time period?
	<BEGBLNC>	<VC1a>	For biological resources at the beginning of this period, what is the balance between the quantity of units withdrawn and the number of units available?
	<BEGBLNC>	<VC1b>	For physical resources at the beginning of this period, what is the balance between the quantity of units withdrawn and the quantity of units needed, given the usual patterns of use for these units?
	<BEGCONDA>	<VC11a>	As of the beginning of this period, how well-maintained is the appropriation resource?
	<BEGCONDD>	<VC11b>	As of the beginning of this period, how well-maintained is the distribution resource?
	<BEGCONDP>	<V11c>	As of the beginning of this period, how well-maintained is the production resource?
<BEGNTFER>	<VC9>		As of the beginning of this period, how extensive is the interference between the appropriation technology for this resource and the appropriation processes for

		other resources in this location?
<BEGPOLL>	<VC7>	As of the beginning of this period, are there problems of pollution of this or other resources resulting from the way units are appropriated?
<BEGQUAL>	<VC6>	As of the beginning of this period, what was the quality of the units withdrawn?
<BEGRATE1>	<VC2>	What is the volume of withdrawal from this resource, in tons of fish harvested, at the beginning of this time period?
<BEGRATE2>	<VC2>	What is the volume of withdrawal from this resource, in square meters of fields irrigated, at the beginning of this time period?
<BEGRATE3>	<VC2>	What is the volume of withdrawal from this irrigation resource, in volume of annual flow, at the beginning of this time period?
<BEGTECHX>	<VC8>	As of the beginning of this period, what is the extent of technical externalities resulting from the appropriation activities of participants from this resource?
<BEGTRUST>	<VC12>	As of the beginning of this period, how would you characterize the levels of mutual trust described among appropriators?
<BMARKETS>	<VC>	As of the beginning of this period, how are the appropriated units disposed of?
<BNUMAPP1>	<VG2>	What is a close estimate of the number of participants in the position of appropriator at the beginning, where the author has provided it?
<BNUMAPP2>	<VG2>	What is a general estimate of the number of participants in the position of appropriator at the beginning?

	<BNUMTEM1>	<VG3>	If the appropriation process is organized as a team process, how many teams are appropriating from this resource at the beginning?
	<BNUMTEM2>	<VG3>	What is a general estimate of the number of teams in the position of appropriator at the beginning?
	<BOWNCLOS>	<VA4>	As of the beginning of this period, are the owners exercising or attempting to exercise closed access to this resource?
	<BRENTDIS>	<VC10>	As of the beginning of this period, holding all inputs constant, are the same or even greater amounts of resource units withdrawn with few appropriator teams and/or equipment?
	<BSEXDEVL>	<VC4a>	As of the beginning of this period, are the units sexually mature at this size or age?
<COMMUNICATION>	<CLANID>	<VF1c>	How does clan identification affect communication between subgroups?
	<COMMLANG>	<VF1g>	How do the language spoken affect communication between subgroups?
	<CULTVWR>	<VF1h>	How does the general cultural view of the resource system and its use affect communication between subgroups?
	<ETHNCID>	<VF1b>	How does ethnic identification affect communication between subgroups?
	<GENRELTN>	<VF2>	How would you characterize the general manner in which appropriators related to one another during this time period?
	<LISTPRBS>	<VF1j>	What problems which affect communication between subgroups does the author identify?
	<OTHRCOMM>	<VF1i>	How do any other problems between subgroups affect

			communication?
	<OTHRCOOP>	<VF3>	Is there any evidence presented in the documents that these appropriators have engaged in cooperation in regard to other activities besides the management of this resource?
	<RACEID>	<VF1d>	How does racial identification affect communication between subgroups?
	<RELANIMS>	<VF1f>	How does religious identification affect communication between subgroups?
	<SEX>	<VF1a>	How does gender identification affect communication between subgroups?
	<SOCSTRAT>	<VF1e>	How does caste affect communication between subgroups?
<DURATION>	<BEGDATE>	<VB1>	What is the beginning date of the operational level coded on this form?
	<DURATION>	<VB3>	What is the duration of the patterns described on this form?
	<ENDDATE>	<VB1>	What is the ending date of the operational level coded on this form?
	<ESTNDATE>	<VB2>	What is the decade when these appropriation patterns ended?
<ENDCONDITION>	<EAPCLOSE>	<VC13b>	At the end of this period, are the appropriators exercising or attempting to exercise closed access to this resource?
	<EAVERAGE>	<VC4>	What is the average age of the units withdrawn from this resource at the end of this time period?
	<EAVRESIZ>	<VC3>	What is the average size of the units withdrawn from this resource at the end of this time period?
	<EFFINDC>	<VJ4>	If the author evaluates efficiency, what are the indicators used, does the author propose any means of increasing

		efficiency, and if so, what are those means?
<EMARKETS>	<VC5>	As of the end of this period, how are the appropriated units disposed of?
<ENDBLNC>	<VC1a>	For biological resources at the end of this period, what is the balance between the quantity of units withdrawn and the number of units available?
<ENDBLNC>	<VC1b>	For physical resources at the end of this period, what is the balance between the quantity of units withdrawn and the quantity of units needed, given the usual patterns of use for these units?
<ENDCONDA>	<VC11a>	As of the end of this period, how well-maintained is the appropriation resource?
<ENDCONDD>	<VC11b>	As of the end of this period, how well-maintained is the distribution resource?
<ENDCONDP>	<VC11c>	As of the end of this period, how well-maintained is the production resource?
<ENDNTFER>	<VC9>	As of the end of this period, how extensive is the interference between the appropriation technology for this resource and the appropriation processes for other resources in this location?
<ENDPOLL>	<VC7>	As of the end of this period, are there problems of pollution of this or other resources resulting from the way units are appropriated?
<ENDQUAL>	<VC6>	As of the end of this period, what was the quality of the units withdrawn?
<ENDRATE1>	<VC2>	What is the volume of withdrawal from this resource, in tons of fish harvested, at the end of this time period?
<ENDRATE2>	<VC2>	What is the volume of withdrawal

		from this resource, in square meters of fields irrigated, at the end of this time period?
<ENDRATE3>	<VC2>	What is the volume of withdrawal from this irrigation resource, in volume of annual flow, at the end of this time period?
<ENDTECHX>	<VC8>	As of the end of this period, what is the extent of technical externalities resulting from the appropriation activities of participants from this resource?
<ENDTRUST>	<VC12>	As of the end of this period, how would you characterize the levels of mutual trust described among appropriators?
<ENUMAPP1>	<VG2>	What is a close estimate of the number of participants in the position of appropriator at the end, where the author has provided it?
<ENUMAPP2>	<VG2>	What is a general estimate of the number of participants in the position of appropriator at the end?
<ENUMTEM1>	<VG3>	If the appropriation process is organized as a team process, how many teams are appropriating from this resource at the end?
<ENUMTEM2>	<VG3>	What is a general estimate of the number of teams in the position of appropriator at the end?
<EOWNCLOS>	<VC13a>	At the end of this period, are the owners exercising or attempting to exercise closed access to this resource?
<ERENTDIS>	<VC10>	As of the end of this period, holding all inputs constant, are the same or even greater amounts of resource units withdrawn with few appropriator teams and/or equipment?
<ESEXDEVL>	<VC4a>	As of the end of this period, are the units sexually mature at this size or age?

<EVALUATION>	<AINDICT>	<VJ3>	Comment on any evidence that is presented in this case regarding the nature and level of transaction costs.
	<ARESULTS>	<VJ1>	Does the author focus on our concept of results and the evaluation of results?
	<AWITHEFF>	<VJ5>	If the author discusses withdrawals per unit of effort, what are the indicators s/he uses, and how does the author evaluate these withdrawals for this resource?
	<REALOSER>	<VI1>	Are there <u>any appropriators</u> who have been consistently disadvantaged in this period?
	<REALYES>	<VI1a>	If there have been any appropriators who have been consistently disadvantaged in this period, please describe.
	<RELEQUTY>	<VI3>	By the end of the situation, would you characterize the distance between those who are the least advantaged and those who are the most advantaged as increasing, constant, or decreasing?
	<TYPRESUL>	<VJ2>	Comment on the author's identification of results, evaluation of results, the causal model the author is using, and whether we have captured these.
	<WORSTOFF>	<VI2>	Have the <u>relatively worst off</u> been cut out of their benefits from this resource or substantially harmed?
<EXTERCONTROL>	<EXTPOLL>	<VE4>	Are there problems of pollution resulting from activities of others who are not appropriators of this resource and who are not necessarily inhabitants of this location?
<INFORMATION>	<ARENAS>	<VD12>	Are there arenas being used for the exchange of information about conditions of the resource?

<ARENFREQ>	<VD12a>	If there are arenas being used for the exchange of information about conditions of the resource, how frequently do appropriators get together and discuss mutual problems of the resource?
<GENINFO>	<VD6>	Are there any actions being taken, by appropriators or officials, to generate information about the condition of the resource?
<MAPAVAIL>	<VD1>	Are maps or charts of the appropriation resource used by appropriators?
<MAPPROD>	<VD2>	Are maps and/or charts of the production and distribution resource available if these differ from appropriation resource?
<RECORDAV>	<VD11b>	Are records of appropriators' contributions to the maintenance of the resource available for inspection by appropriators?
<RECORDCO>	<VD5>	Are records of the condition of the resource kept in any systematic way?
<RECORDKE>	<VD11a>	If most of the records of appropriators' contributions to the maintenance of the resource are kept in a language accessible to most of the appropriators, do officials at some level keep these records?
<RECORDLA>	<VD11>	Are most of the records of appropriators' contributions to the maintenance of the resource kept in a language accessible to most of the appropriators?
<RECORDMA>	<VD10>	Are records of the appropriators' contributions to the maintenance of the resource kept in any systematic way?
<RECORDMO>	<VD9>	Are records of the appropriators' contributions to monitoring of the resource kept in any systematic way?

	<RECORDPH>	<VD8>	Are records of the physical factors which directly affect the resource kept in any systematic way?
	<RECORDWI>	<VD7>	Are records of the withdrawals from this resource kept in any systematic way?
	<UNDERRES>	<VD13>	Do the appropriators have a well-developed understanding of the characteristics of this resource?
	<USERSEEN>	<VD3>	Are appropriators of this resource readily observed by each other?
<MAINTENANCE>	<LABRDAYS>	<VE2>	How many person-days of labor per year are mobilized to maintain and/or repair the resources (s)?
	<MAINTRES>	<VE1>	Are there specialized staff or workers to undertake maintenance?
	<PRIORAPP>	<VE3>	Has the quality or quantity of the units available to the appropriators who are the focus of this operational level form been adversely affected by the strategies of prior appropriators?
<MONITOR>	<FULLTIME>	<VG4f>	What proportion of official monitors have full-time status?
	<MONPAID>	<VG4e>	If an official monitor position exists, are these monitors paid?
<POSITION>	<GUARD>	<VG4>	Does an "official" position of monitor exist (apart from the willingness of all appropriators to monitor)?
	<NONAPP>	<VG1>	Does the position of non-appropriator exist at the end (i.e. those prevented from using)?
	<NUMNON1>	<VG1>	If the position of non-appropriator exists, what is a close estimate of the number of participants (where author has provided it)?

<NUMNON2>	<VG1a>	If position of non-appropriator exists, what is the estimated number of participants in this position at the end?
<OFFPGRD>	<VG4d>	If official monitoring positions exist, what is a general estimate of the number of participants (of all types) who are on duty at one time during off peak periods?
<OFFPNUM>	<VG4d>	If official monitoring positions exist, what is a close estimate of the number of participants (of all types) who are on duty at one time during off peak periods?
<PEAKGRD>	<VG4c>	If "official" monitoring positions exist, what is a general estimate of the number of participants (of all types) who are on duty at one time during peak periods?
<PEAKNUM>	<VG4c>	If "official" monitoring positions exist, what is a close estimate of the number of participants (of all types) who are on duty at one time during peak periods?
<PRIORCHANGE>	<BEGHIST>	<VB11> Does the author begin the description of this case at this point in history?
<EXTINCAP>	<VB8>	Is the quantity of units available changing because of change in appropriation patterns of other appropriators withdrawing units from the same production or distribution resource?
<INTCHANG>	<VB10>	Is there a change in one or more variables internal to the operational level?
<INTERNAL>	<VB10>	What are the variable(s) which have changed internal to the operational level?
<NEWGROUP>	<VB9>	Is a new group starting to withdraw units from the appropriation resource?

	<NEWOPRUL>	<VB4>	Is there major change in the operational, collective, or constitutional rules?
	<NEWTECH>	<VB6>	Is there new technology introduced?
	<NEWVALUE>	<VB7>	Is there a substantial external change in exchange value of units appropriated?
	<REASON>	<VB11a>	If the author begins the description of this case at this point in history, what is the reason?
	<RESCHANG>	<VB5>	Is there change in the size and/or structure of the resource?
<PROCESSES>	<PROBLEM>	<VA1>	Are the processes described in related documents primarily related to appropriation, production, distribution, and/or use?
<REGIMETYPE>	<PROPREG2>	<VC13>	At the end of this period, has a change occurred in the property rights regime related to the appropriation resource?
	<BFORMOWN>	<VA2>	Who is the formal owner of the resource?
<SANCTIONS>	<BRIBERY>	<VF8>	If an official monitor or guard does move to impose sanctions, how likely is it that local appropriators will attempt to bribe the official?
	<MONSANCT>	<VF6>	If someone violates rules-in-use related to the appropriation process from this resource, how likely is it that an official monitor or guard will move to impose sanctions?
	<PHYSANCT>	<VF5>	If someone violates rules-in-use related to the appropriation process from this resource, how likely is he/she to encounter physical sanctions imposed by other appropriators (who are not filling positions as official monitors)?
	<SOCSANCT>	<VF4>	If someone violates rules-in-use

			related to the appropriation process from this resource, how likely is he/she to encounter social sanctions imposed by other appropriators (who are not filling positions as official monitors)?
	<VARSANCT>	<VF7>	Is there a gradation of social, physical, and official sanctions that varies with the severity of rule violations?
<SUBGROUP>	<NUMSUBGP>	<VH1>	How many subgroup forms are being completed in relation to this operational level form?
	<SG1TOSG2>	<VH3a>	How does the first subgroup compare to the second subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
	<SG1TOSG3>	<VH3b>	How does the first subgroup compare to the third subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
	<SG1TOSG4>	<VH3c>	How does the first subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
	<SG2TOSG3>	<VH3d>	How does the second subgroup compare to the third subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
	<SG2TOSG4>	<VH3e>	How does the second subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
	<SG3TOSG4>	<VH3f>	How does the third subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
	<SUBGP1>	<VH2>	What is the ID number of the first subgroup form relating to this operational level form?

	<SUBGP2>	<VH2>	What is the ID number of the second subgroup form relating to this operational level form?
	<SUBGP3>	<VH2>	What is the ID number of the third subgroup form relating to this operational form?
	<SUBGP4>	<VH2>	What is the ID number of fourth subgroup form relating to this operational form?
<USE>	<INSURANC>	<VE6>	Does there appear to be any insurance mechanism available to the appropriators related to variability of income from the resource?
	<INSURDES>	<VE6a>	If there appears to be an insurance mechanism available to the appropriators related to variability of income from the resource, what is it?
	<ONEMARKT>	<VE5>	Do appropriators sell this unit in more than one market?
<unknown>	<RADIOCOM>	<VD4>	Are the appropriators of this resource in radio communication with each other while appropriating from the resource?
<unknown>	<RLEVEL>	<VG4a>	What level of rules is being monitored by the "official" position of monitor?
<unknown>	<SELFMON>	<VG4b>	Do appropriators monitor the appropriation activities of each other apart from the monitoring of any "official" guards?
<unknown>	<WELLDEFN>	<VA3>	Is the set of individuals who have rights to withdraw from this resource well-defined?

VARLIST OPERATIONAL LEVEL FORM "V"
Alphabetical

<AINDICT>	<VJ3>	Comment on any evidence that is presented in this case regarding the nature and level of transaction costs.
<ARENAS>	<VD12>	Are there arenas being used for the exchange of information about conditions of the resource?
<ARENFREQ>	<VD12a>	If there are arenas being used for the exchange of information about conditions of the resource, how frequently do appropriators get together and discuss mutual problems of the resource?
<ARERESULTS>	<VJ1>	Does the author focus on our concept of results and the evaluation of results?
<AWITHEFF>	<VJ5>	If the author discusses withdrawals per unit of effort, what are the indicators s/he uses, and how does the author evaluate these withdrawals for this resource?
<BAPCLOSE>	<VA5>	As of the beginning of this period, are the appropriators exercising or attempting to exercise closed access to this resource?
<BAVERAGE>	<VC4>	What is the average age of the units withdrawn from this resource at the beginning of this time period?
<BAVRESIZ>	<VC3>	What is the average size of the units withdrawn from this resource at the beginning of this time period?
<BEGBLNC>	<VC1a>	For biological resources at the beginning of this period, what is the balance between the quantity of units withdrawn and the number of units available?
<BEGBLNC>	<VC1b>	For physical resources at the beginning of this period, what is the balance between the quantity of units withdrawn and the quantity of units needed, given the usual patterns of use for these units?
<BEGCONDA>	<VC11a>	As of the beginning of this period, how well-maintained is the appropriation resource?
<BEGCONDD>	<VC11b>	As of the beginning of this period, how well-maintained is the distribution resource?
<BEGCONDP>	<V11c>	As of the beginning of this period, how well-maintained is the production resource?

<BEGDATE>	<VB1>	What is the beginning date of the operational level coded on this form?
<BEGHIST>	<VB11>	Does the author begin the description of this case at this point in history?
<BEGNTFER>	<VC9>	As of the beginning of this period, how extensive is the interference between the appropriation technology for this resource and the appropriation processes for other resources in this location?
<BEGPOLL>	<VC7>	As of the beginning of this period, are there problems of pollution of this or other resources resulting from the way units are appropriated?
<BEGQUAL>	<VC6>	As of the beginning of this period, what was the quality of the units withdrawn?
<BEGRATE1>	<VC2>	What is the volume of withdrawal from this resource, in tons of fish harvested, at the beginning of this time period?
<BEGRATE2>	<VC2>	What is the volume of withdrawal from this resource, in square meters of fields irrigated, at the beginning of this time period?
<BEGRATE3>	<VC2>	What is the volume of withdrawal from this irrigation resource, in volume of annual flow, at the beginning of this time period?
<BEGTECHX>	<VC8>	As of the beginning of this period, what is the extent of technical externalities resulting from the appropriation activities of participants from this resource?
<BEGTRUST>	<VC12>	As of the beginning of this period, how would you characterize the levels of mutual trust described among appropriators?
<BFORMOWN>	<VA2>	Who is the formal owner of the resource?
<BMARKETS>	<VC>	As of the beginning of this period, how are the appropriated units disposed of?
<BNUMAPP1>	<VG2>	What is a close estimate of the number of participants in the position of appropriator at the beginning, where the author has provided it?
<BNUMAPP2>	<VG2>	What is a general estimate of the number of participants in the position of appropriator at the beginning?
<BNUMTEM1>	<VG3>	If the appropriation process is organized as a team process, how many teams are appropriating from this resource at the beginning?
<BNUMTEM2>	<VG3>	What is a general estimate of the number of teams

		in the position of appropriator at the beginning?
<BOWNCLOS>	<VA4>	As of the beginning of this period, are the owners exercising or attempting to exercise closed access to this resource?
<BRENTDIS>	<VC10>	As of the beginning of this period, holding all inputs constant, are the same or even greater amounts of resource units withdrawn with few appropriator teams and/or equipment?
<BRIBERY>	<VF8>	If an official monitor or guard does move to impose sanctions, how likely is it that local appropriators will attempt to bribe the official?
<BSEXDEVL>	<VC4a>	As of the beginning of this period, are the units sexually mature at this size or age?
<CLANID>	<VF1c>	How does clan identification affect communication between subgroups?
<COMMLANG>	<VF1g>	How do the language spoken affect communication between subgroups?
<CULTVWR>	<VF1h>	How does the general cultural view of the resource system and its use affect communication between subgroups?
<DURATION>	<VB3>	What is the duration of the patterns described on this form?
<EAPCLOSE>	<VC13b>	At the end of this period, are the appropriators exercising or attempting to exercise closed access to this resource?
<EAVERAGE>	<VC4>	What is the average age of the units withdrawn from this resource at the end of this time period?
<EAVRESIZ>	<VC3>	What is the average size of the units withdrawn from this resource at the end of this time period?
<EFFINDC>	<VJ4>	If the author evaluates efficiency, what are the indicators used, does the author propose any means of increasing efficiency, and if so, what are those means?
<EMARKETS>	<VC5>	As of the end of this period, how are the appropriated units disposed of?
<ENDBLNC>	<VC1a>	For biological resources at the end of this period, what is the balance between the quantity of units withdrawn and the number of units available?
<ENDBLNC>	<VC1b>	For physical resources at the end of this period, what is the balance between the quantity of units withdrawn and the quantity of units needed, given

the usual patterns of use for these units?

<ENDCONDA>	<VC11a>	As of the end of this period, how well-maintained is the appropriation resource?
<ENDCONDD>	<VC11b>	As of the end of this period, how well-maintained is the distribution resource?
<ENDCONDP>	<VC11c>	As of the end of this period, how well-maintained is the production resource?
<ENDDATE>	<VB1>	What is the ending date of the operational level coded on this form?
<ENDNTFER>	<VC9>	As of the end of this period, how extensive is the interference between the appropriation technology for this resource and the appropriation processes for other resources in this location?
<ENDPOLL>	<VC7>	As of the end of this period, are there problems of pollution of this or other resources resulting from the way units are appropriated?
<ENDQUAL>	<VC6>	As of the end of this period, what was the quality of the units withdrawn?
<ENDRATE1>	<VC2>	What is the volume of withdrawal from this resource, in tons of fish harvested, at the end of this time period?
<ENDRATE2>	<VC2>	What is the volume of withdrawal from this resource, in square meters of fields irrigated, at the end of this time period?
<ENDRATE3>	<VC2>	What is the volume of withdrawal from this irrigation resource, in volume of annual flow, at the end of this time period?
<ENDTECHX>	<VC8>	As of the end of this period, what is the extent of technical externalities resulting from the appropriation activities of participants from this resource?
<ENDTRUST>	<VC12>	As of the end of this period, how would you characterize the levels of mutual trust described among appropriators?
<ENUMAPP1>	<VG2>	What is a close estimate of the number of participants in the position of appropriator at the end, where the author has provided it?
<ENUMAPP2>	<VG2>	What is a general estimate of the number of participants in the position of appropriator at the end?
<ENUMTEM1>	<VG3>	If the appropriation process is organized as a team process, how many teams are appropriating

from this resource at the end?

<ENUMTEM2>	<VG3>	What is a general estimate of the number of teams in the position of appropriator at the end?
<EOWNCLOS>	<VC13a>	At the end of this period, are the owners exercising or attempting to exercise closed access to this resource?
<ERENTDIS>	<VC10>	As of the end of this period, holding all inputs constant, are the same or even greater amounts of resource units withdrawn with few appropriator teams and/or equipment?
<ESEXDEVL>	<VC4a>	As of the end of this period, are the units sexually mature at this size or age?
<ESTNDATE>	<VB2>	What is the decade when these appropriation patterns ended?
<ETHNCID>	<VF1b>	How does ethnic identification affect communication between subgroups?
<EXTINCAP>	<VB8>	Is the quantity of units available changing because of change in appropriation patterns of other appropriators withdrawing units from the same production or distribution resource?
<EXTPOLL>	<VE4>	Are there problems of pollution resulting from activities of others who are not appropriators of this resource and who are not necessarily inhabitants of this location?
<FULLTIME>	<VG4f>	What proportion of official monitors have full-time status?
<GENINFO>	<VD6>	Are there any actions being taken, by appropriators or officials, to generate information about the condition of the resource?
<GENRELTN>	<VF2>	How would you characterize the general manner in which appropriators related to one another during this time period?
<GUARD>	<VG4>	Does an "official" position of monitor exist (apart from the willingness of all appropriators to monitor)?
<INSURANC>	<VE6>	Does there appear to be any insurance mechanism available to the appropriators related to variability of income from the resource?
<INSURDES>	<VE6a>	If there appears to be an insurance mechanism available to the appropriators related to variability of income from the resource, what is it?

<INTCHANG>	<VB10>	Is there a change in one or more variables internal to the operational level?
<INTERNAL>	<VB10>	What are the variable(s) which have changed internal to the operational level?
<LABRDAYS>	<VE2>	How many person-days of labor per year are mobilized to maintain and/or repair the resources(s)?
<LISTPRBS>	<VF1j>	What problems which affect communication between subgroups does the author identify?
<MAINTRES>	<VE1>	Are there specialized staff or workers to undertake maintenance?
<MAPAVAIL>	<VD1>	Are maps or charts of the appropriation resource used by appropriators?
<MAPPROD>	<VD2>	Are maps and/or charts of the production and distribution resource available if these differ from appropriation resource?
<MONPAID>	<VG4e>	If an official monitor position exists, are these monitors paid?
<MONSANCT>	<VF6>	If someone violates rules-in-use related to the appropriation process from this resource, how likely is it that an official monitor or guard will move to impose sanctions?
<NEWGROUP>	<VB9>	Is a new group starting to withdraw units from the appropriation resource?
<NEWOPRUL>	<VB4>	Is there major change in the operational, collective, or constitutional rules?
<NEWTECH>	<VB6>	Is there new technology introduced?
<NEWVALUE>	<VB7>	Is there a substantial external change in exchange value of units appropriated?
<NONAPP>	<VG1>	Does the position of non-appropriator exist at the end (i.e. those prevented from using)?
<NUMNON1>	<VG1>	If the position of non-appropriator exists, what is a close estimate of the number of participants (where author has provided it)?
<NUMNON2>	<VG1a>	If position of non-appropriator exists, what is the estimated number of participants in this position at the end?
<NUMSUBGP>	<VH1>	How many subgroup forms are being completed in relation to this operational level form?
<OFFPGRD>	<VG4d>	If official monitoring positions exist, what is a

		general estimate of the number of participants (of all types) who are on duty at one time during off peak periods?
<OFFPNUM>	<VG4d>	If official monitoring positions exist, what is a close estimate of the number of participants (of all types) who are on duty at one time during off peak periods?
<ONEMARKT>	<VE5>	Do appropriators sell this unit in more than one market?
<OTHRCOMM>	<VF1i>	How do any other problems between subgroups affect communication?
<OTHRCOOP>	<VF3>	Is there any evidence presented in the documents that these appropriators have engaged in cooperation in regard to other activities besides the management of this resource?
<PEAKGRD>	<VG4c>	If "official" monitoring positions exist, what is a general estimate of the number of participants (of all types) who are on duty at one time during peak periods?
<PEAKNUM>	<VG4c>	If "official" monitoring positions exist, what is a close estimate of the number of participants (of all types) who are on duty at one time during peak periods?
<PHYSANCT>	<VF5>	If someone violates rules-in-use related to the appropriation process from this resource, how likely is he/she to encounter physical sanctions imposed by other appropriators (who are not filling positions as official monitors)?
<PRIORAPP>	<VE3>	Has the quality or quantity of the units available to the appropriators who are the focus of this operational level form been adversely affected by the strategies of prior appropriators?
<PROBLEM>	<VA1>	Are the processes described in related documents primarily related to appropriation, production, distribution, and/or use?
<PROPEG2>	<VC13>	At the end of this period, has a change occurred in the property rights regime related to the appropriation resource?
<RACEID>	<VF1d>	How does racial identification affect communication between subgroups?
<RADIOCOM>	<VD4>	Are the appropriators of this resource in radio communication with each other while appropriating from the resource?
<REALOSER>	<VI1>	Are there <u>any appropriators</u> who have been

		consistently disadvantaged in this period?
<REALYES>	<VI1a>	If there have been any appropriators who have been consistently disadvantaged in this period, please describe.
<REASON>	<VB11a>	If the author begins the description of this case at this point in history, what is the reason?
<RECORDAV>	<VD11b>	Are records of appropriators' contributions to the maintenance of the resource available for inspection by appropriators?
<RECORDCO>	<VD5>	Are records of the condition of the resource kept in any systematic way?
<RECORDKE>	<VD11a>	If most of the records of appropriators' contributions to the maintenance of the resource are kept in a language accessible to most of the appropriators, do officials at some level keep these records?
<RECORDLA>	<VD11>	Are most of the records of appropriators' contributions to the maintenance of the resource kept in a language accessible to most of the appropriators?
<RECORDMA>	<VD10>	Are records of the appropriators' contributions to the maintenance of the resource kept in any systematic way?
<RECORDMO>	<VD9>	Are records of the appropriators' contributions to monitoring of the resource kept in any systematic way?
<RECORDPH>	<VD8>	Are records of the physical factors which directly affect the resource kept in any systematic way?
<RECORDWI>	<VD7>	Are records of the withdrawals from this resource kept in any systematic way?
<RELANIMS>	<VF1f>	How does religious identification affect communication between subgroups?
<RELEQUTY>	<VI3>	By the end of the situation, would you characterize the distance between those who are the least advantaged and those who are the most advantaged as increasing, constant, or decreasing?
<RESCHANG>	<VB5>	Is there change in the size and/or structure of the resource?
<RLEVEL>	<VG4a>	What level of rules is being monitored by the "official" position of monitor?
<SELFMON>	<VG4b>	Do appropriators monitor the appropriation activities of each other apart from the monitoring

of any "official" guards?

<SEX>	<VF1a>	How does gender identification affect communication between subgroups?
<SG1TOSG2>	<VH3a>	How does the first subgroup compare to the second subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG1TOSG3>	<VH3b>	How does the first subgroup compare to the third subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG1TOSG4>	<VH3c>	How does the first subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG2TOSG3>	<VH3d>	How does the second subgroup compare to the third subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG2TOSG4>	<VH3e>	How does the second subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG3TOSG4>	<VH3f>	How does the third subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SOCSANCT>	<VF4>	If someone violates rules-in-use related to the appropriation process from this resource, how likely is he/she to encounter social sanctions imposed by other appropriators (who are not filling positions as official monitors)?
<SOCSTRAT>	<VF1e>	How does caste affect communication between subgroups?
<SUBGP1>	<VH2>	What is the ID number of the first subgroup form relating to this operational level form?
<SUBGP2>	<VH2>	What is the ID number of the second subgroup form relating to this operational level form?
<SUBGP3>	<VH2>	What is the ID number of the third subgroup form relating to this operational form?
<SUBGP4>	<VH2>	What is the ID number of fourth subgroup form relating to this operational form?
<TYPRESUL>	<VJ2>	Comment on the author's identification of results, evaluation of results, the causal model the author is using, and whether we have captured these.
<UNDERRES>	<VD13>	Do the appropriators have a well-developed understanding of the characteristics of this resource?

<USERSEEN>	<VD3>	Are appropriators of this resource readily observed by each other?
<VARSANCT>	<VF7>	Is there a gradation of social, physical, and official sanctions that varies with the severity of rule violations?
<WELLDEFN>	<VA3>	Is the set of individuals who have rights to withdraw from this resource well-defined?
<WORSTOFF>	<VI2>	Have the <u>relatively worst off</u> been cut out of their benefits from this resource or substantially harmed?

Name of Case

Last Revision/January 10, 1990
Doc 48

CPR PROJECT

OPERATIONAL LEVEL CODING FORM

OpLevel No.: _____
 <OPLEVID>

Resource No.: _____
 <RESOURID>

A. TYPE OF SITUATION

TYPE OF SITUATION

A1. The processes described in the related documents are primarily related to: <PROBLEM>

- (1) _____ Appropriation alone
- (2) _____ Appropriation and use
- (3) _____ Appropriation and distribution
- (4) _____ Appropriation and production
- (5) _____ Appropriation, distribution, and use
- (6) _____ Appropriation, production, and use
- (7) _____ Appropriation, distribution, and production
- (8) _____ Appropriation, production, distribution and use
- (-1) _____ MIC

A2. Who is the formal owner? <BFORMOWN>

- (1) _____ Central government
- (2) _____ Regional government
- (3) _____ Local government
- (4) _____ Private corporation
- (5) _____ Local appropriators
- (6) _____ Central and regional governments
- (7) _____ Other: _____
- (8) _____ No formal owner
- (-1) _____ MIC

A3. Is the set of individuals who have rights to withdraw from this resource well-defined? <WELLDEFN>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA

A4. As of the beginning of this period, are the owners exercising or attempting to exercise closed access to this resource? <BOWNCLOS>

- (1) _____ Yes, de jure and effective
- (2) _____ Yes, de jure but not effective
- (3) _____ No
- (-1) _____ MIC
- (-2) _____ NA

TYPE OF SITUATION

A5. As of the beginning of this period, are the appropriators exercising or attempting to exercise closed access to this resource? <BAPCLOSE>

- (1) _____ No
- (2) _____ Yes, de jure and effective
- (3) _____ Yes, de jure, but "outsiders" are beginning to appropriate at a moderate level
- (4) _____ Yes, de jure, but "outsiders" are beginning to appropriate at a relatively substantial level
- (5) _____ Yes, de facto
- (6) _____ Yes, de facto, but "outsiders" are beginning to appropriate at a moderate level
- (7) _____ Yes, de facto, but "outsiders" are beginning to appropriate at a relatively substantial level
- (-1) _____ MIC

EVENT(S) MARKING THE BEGINNING

B. EVENT(S) MARKING THE BEGINNING OF ACTION SITUATION

B1. Where relatively precise information exists about the beginning and ending of the operational level coded on this form, post it below:

<BEGBDATE> _____ <ENDDATE> _____

B2. If precise information is not available about end date, please estimate the decade when these patterns ended. If "current" enter 1985:

<ESTNDATE> _____

B3. An estimate of the duration of the patterns described on this form is:
<DURATION>

- (1) _____ Less than one year
- (2) _____ 1 to 10 years
- (3) _____ 11 to 25 years
- (4) _____ 26 to 50 years
- (5) _____ 51 to 75 years
- (6) _____ 76 to 100 years
- (7) _____ 101 to 200 years
- (8) _____ 201 to 300 years
- (9) _____ 301 to 500 years
- (10) _____ 501 to 1000 years
- (11) _____ More than 1000 years
- (-1) _____ MIC

B4. Is there a major change in operational, collective, or constitutional rules? <NEWOPRUL>

- (1) _____ No
- (2) _____ Yes, change was made primarily by the appropriators
- (3) _____ Yes, change made primarily by local collective choice processes involving others besides the appropriators
- (4) _____ Yes, made primarily by an external authority
- (-1) _____ MIC

EVENT(S) MARKING THE BEGINNING

B5. Is there a change in the size and/or structure of the resource?
<RESCHANG>

- (1) ☐ No, no change in resource size or structure
- (2) ☐ Yes, a planned change in resource size only
- (3) ☐ Yes, a planned change in resource structure only
- (4) ☐ Yes, a planned change in resource size and structure
- (5) ☐ Yes, a major natural disaster occurred
- (-1) ☐ MIC

B6. Is new technology introduced? <NEWTECH>

- (1) ☐ No
- (2) ☐ Yes, an enhancement of physical capabilities to withdraw units (e.g. introduction of turbine pump)
- (3) ☐ Yes, and it enhances efficiency in the use of units (thus, potentially reducing demand).
- (-1) ☐ MIC

B7. Is there a substantial external change in exchange value of units appropriated? <NEWVALUE>

- (1) ☐ No
- (2) ☐ Yes, a major increase in the value of the unit
- (3) ☐ Yes, a major decrease in the value of the unit
- (-1) ☐ MIC

B8. Is the quantity of units available changing because of change in appropriation patterns of other appropriators withdrawing units from the same production or distribution resource? <EXTINCAP>

- (1) ☐ No
- (2) ☐ Yes, other appropriators have increased withdrawals
- (3) ☐ Yes, other appropriators have decreased withdrawals
- (-1) ☐ MIC

B9. Is a new **group** starting to withdraw units from the appropriation resource? <NEWGROUP>

- (1) ☐ No
- (2) ☐ Yes, and it is a local group
- (3) ☐ Yes, and it is a non-local group with no externally sanctioned access authority
- (4) ☐ Yes, and it is a non-local group with externally sanctioned access authority
- (-1) ☐ MIC

B10. Is there a change in one or more variables internal to the operational level? <INTCHANG>

- (1) ☐ Yes, and the variable(s) are: _____ <INTERNAL>
- (2) ☐ No _____ MIC _____ NA
- (-1) ☐ MIC

EVENT(S) MARKING THE BEGINNING

B11. Does the author begin the description of this case at this point in history? <BEGHIST>

- (1) _____ Yes
(2) _____ No

B11a. If yes, reason author gave for starting at this point: <REASON>

B _____ Post B4-B9 here if that variable is author's reason,
otherwise write the reason below:

CONDITIONS AT THE BEGINNING/END

C. CONDITIONS AT THE BEGINNING AND END OF PERIOD COVERED BY THIS FORM

Please use the following scale to append a Confidence Level to each question contained on the remainder of this form.

Confidence level you have in your answer:

- 5 Very confident (author specifically provides information)
4 Mildly confident (author generally provides information)
3 Confident (a clear inference from this & other cases)
2 Sufficient information to make a reasoned guess
1 Sufficient information to make a guess but
information is quite ambiguous

C1a. For biological resources at the beginning and end of this period, the balance between the quantity of units withdrawn and the number of units available is*:

<BEGBLNC>

- (1) _____ Extreme shortage
(2) _____ Moderate shortage
(3) _____ Apparently balanced
(4) _____ Moderately abundant
(5) _____ Quite abundant
(-1) _____ MIC
(-2) _____ NA
_____ CL

<ENDBLNC>

- (1) _____ Extreme shortage
(2) _____ Moderate shortage
(3) _____ Apparently balanced
(4) _____ Moderately abundant
(5) _____ Quite abundant
(-1) _____ MIC
(-2) _____ NA
_____ CL
_____ Check here if the
condition of the
resource is due to a
natural disaster or
disease

* In fisheries and other biological systems, this is the maximum sustainable number of units.

CONDITIONS AT THE BEGINNING/END

- C1b. For physical resources at the beginning and end of this period, the balance between the quantity of units withdrawn and the quantity of units needed,* given the usual patterns of use for these units, is:

<BEGBLNC>

(1) _____ Extreme shortage
(2) _____ Moderate shortage
(3) _____ Apparently balanced
(4) _____ Moderately abundant
(5) _____ Quite abundant
(-1) _____ MIC
(-2) _____ NA
_____ CL

<ENDBLNC>

(1) _____ Extreme shortage
(2) _____ Moderate shortage
(3) _____ Apparently balanced
(4) _____ Moderately abundant
(5) _____ Quite abundant
(-1) _____ MIC
(-2) _____ NA
_____ CL
_____ Check here if the
condition of the
resource is due to a
natural disaster

- * In irrigation, this refers to the optimal water requirements of the crops in the established fields served by this system.

- C2. What is the volume of withdrawal from this resource at the beginning and end of this time period?

For fisheries, tons of fish harvested (per year): _____
_____ CL _____ MIC _____ NA <BEGRATE1>

For fisheries, tons of fish harvested (per year): _____
_____ CL _____ MIC _____ NA <ENDRATE1>

For irrigation, square meters of fields irrigated: _____
_____ CL _____ MIC _____ NA <BEGRATE2>

For irrigation, square meters of fields irrigated: _____
_____ CL _____ MIC _____ NA <ENDRATE2>

For irrigation, volume of annual flow used: _____
_____ CL _____ MIC _____ NA <BEGRATE3>

For irrigation: volume of annual flow used: _____
_____ CL _____ MIC _____ NA <ENDRATE3>

- C3. The average size (in mm) of the units withdrawn from this resource at the beginning and end of this time period is:

_____ <BAVERSIZ> _____ CL _____ MIC _____ NA
_____ <EAVERSIZ> _____ CL _____ MIC _____ NA

- C4. The average age (in years) of the units withdrawn from this resource at the beginning and end of this time period is:

_____ <BAVERAGE> _____ CL _____ MIC _____ NA
_____ <EAAVERAGE> _____ CL _____ MIC _____ NA

CONDITIONS AT THE BEGINNING/END

C4a. As of the beginning and end of this period, are the units sexually mature at this size or age?

<BSEXDEVL>

(1) _____ Yes
(2) _____ No
(-1) _____ MIC
(-2) _____ NA
_____ CL

<ESEXDEVL>

(1) _____ Yes
(2) _____ No
(-1) _____ MIC
(-2) _____ NA
_____ CL

C5. As of the beginning and end of this period, how are the appropriated units disposed of? (Mark "1" for utilized or disposed of by that method, "0" for not utilized or disposed of by that method, or "2" for MIC):

<BMARKETS>

(1) _____ Sold in a local market(s)
(2) _____ Sold in an external market(s)
(3) _____ Not sold, used to produce other units
(4) _____ Not sold, consumed by appropriators and families
(-1) _____ MIC
(-2) _____ NA
_____ Here indicate which of the above is more dominant

<EMARKETS>

(1) _____ Sold in a local market(s)
(2) _____ Sold in an external market(s)
(3) _____ Not sold, used to produce other units
(4) _____ Not sold, consumed by appropriators and families
(-1) _____ MIC
(-2) _____ NA
_____ Here indicate which of the above is more dominant

C6. As of the beginning and end of this period, characterize the quality of units being withdrawn:

<BEGQUAL>

(1) _____ Extremely high quality
(2) _____ High quality
(3) _____ Passable
(4) _____ Poor quality
(5) _____ Extremely poor quality
(-1) _____ MIC
(-2) _____ NA
_____ CL

<ENDQUAL>

(1) _____ Extremely high quality
(2) _____ High quality
(3) _____ Passable
(4) _____ Poor quality
(5) _____ Extremely poor quality
(-1) _____ MIC
(-2) _____ NA
_____ CL

CONDITIONS AT THE BEGINNING/END

- C7. As of the beginning and end of this period, are there problems of pollution of this or other resources resulting from the way units are appropriated?

<BEGPOLL>

- (1) _____ No, no problems
 (2) _____ Yes, the appropriation process leads to pollution of this resource
 (3) _____ Yes, the appropriation process leads to pollution of other resources
 (4) _____ Yes, the appropriation process leads to pollution of this and other resources
 (-1) _____ MIC
 (-2) _____ NA
 _____ CL

<ENDPOLL>

- (1) _____ No, no problems
 (2) _____ Yes, the appropriation process leads to pollution of this resource
 (3) _____ Yes, the appropriation process leads to pollution of other resources
 (4) _____ Yes, the appropriation process leads to pollution of this and other resources
 (-1) _____ MIC
 (-2) _____ NA
 _____ CL

- C8. As of the beginning and end of this period, what is the extent of technical externalities resulting from the appropriation activities of participants from this resource?

<BEGTECHX>

- (1) _____ The level of technical externalities is quite low
 (2) _____ The level of technical externalities is relatively low
 (3) _____ Modest levels of technical externalities exist
 (4) _____ Relatively high levels of technical externalities exist
 (5) _____ Very high levels of technical externalities exist
 (-1) _____ MIC
 (-2) _____ NA
 _____ CL

<ENDTECHX>

- (1) _____ The level of technical externalities is quite low
 (2) _____ The level of technical externalities is relatively low
 (3) _____ Modest levels of technical externalities exist
 (4) _____ Relatively high levels of technical externalities exist
 (5) _____ Very high levels of technical externalities exist
 (-1) _____ MIC
 (-2) _____ NA
 _____ CL

CONDITIONS AT THE BEGINNING/END

- C9. As of the beginning and end of this period, how extensive is the interference between the appropriation technology for this resource and the appropriation processes for other resources in this location? (Only answer if there ARE multiple appropriation resources in this location noted on the location form.)

<BEGNTFER>

- (1) _____ Extensive interference
 (2) _____ Moderate interference
 (3) _____ Various appropriation processes have no effect
 (4) _____ Modest levels of enhancement
 (5) _____ High levels of enhancement
 (-1) _____ MIC
 (-2) _____ NA
 _____ CL

<ENDNTFER>

- (1) _____ Extensive interference
 (2) _____ Moderate interference
 (3) _____ Various appropriation processes have no effect
 (4) _____ Modest levels of enhancement
 (5) _____ High levels of enhancement
 (-1) _____ MIC
 (-2) _____ NA
 _____ CL

- C10. As of the beginning and end of this period, holding all inputs constant, are the same or even greater amounts of resource units withdrawn with fewer appropriator teams and/or equipment?

<BRENTDIS>

- (1) _____ Yes, and rent dissipation is due to too many teams
 (2) _____ Yes, and rent dissipation is due to overcapitalization
 (3) _____ Yes, and rent dissipation is due to both too many teams and overcapitalization
 (4) _____ Yes, there is rent dissipation, but it is hard to isolate the source
 (5) _____ No rent dissipation
 (-1) _____ MIC
 (-2) _____ NA
 _____ CL

<ERENTDIS>

- (1) _____ Yes, and rent dissipation is due to too many teams
 (2) _____ Yes, and rent dissipation is due to overcapitalization
 (3) _____ Yes, and rent dissipation is due to both too many teams and overcapitalization
 (4) _____ Yes, there is rent dissipation, but it is hard to isolate the source
 (5) _____ No rent dissipation
 (-1) _____ MIC
 (-2) _____ NA
 _____ CL

CONDITIONS AT THE BEGINNING/END

C11a. As of the beginning and end of this period, how well-maintained is the appropriation resource?

<BEGCONDA>

- (1) _____ Well maintained -
excellent working order
- (2) _____ moderately well
maintained - good
working order
- (3) _____ Some resource
deterioration occurring
due to insufficient
maintenance
- (4) _____ Considerable resource
deterioration occurring
due to poor maintenance
- (5) _____ Considerable resource
deterioration, but due
to a natural disaster
- (-1) _____ MIC
- (-2) _____ NA
_____ CL

<ENDCONDA>

- (1) _____ Well maintained -
excellent working order
- (2) _____ moderately well
maintained - good
working order
- (3) _____ Some resource
deterioration occurring
due to insufficient
maintenance
- (4) _____ Considerable resource
deterioration occurring
due to poor maintenance
- (5) _____ Considerable resource
deterioration, but due
to a natural disaster
- (-1) _____ MIC
- (-2) _____ NA
_____ CL

C11b. As of the beginning and end of this period, how well-maintained is the distribution resource (if this is different from the appropriation resource)?

<BEGCONDD>

- (1) _____ Well maintained -
excellent working order
- (2) _____ moderately well
maintained - good
working order
- (3) _____ Some resource
deterioration occurring
due to insufficient
maintenance
- (4) _____ Considerable resource
deterioration occurring
due to poor maintenance
- (5) _____ Considerable resource
deterioration, but due
to a natural disaster
- (-1) _____ MIC
- (-2) _____ NA
_____ CL

<ENDCONDD>

- (1) _____ Well maintained -
excellent working order
- (2) _____ moderately well
maintained - good
working order
- (3) _____ Some resource
deterioration occurring
due to insufficient
maintenance
- (4) _____ Considerable resource
deterioration occurring
due to poor maintenance
- (5) _____ Considerable resource
deterioration, but due
to a natural disaster
- (-1) _____ MIC
- (-2) _____ NA
_____ CL

CONDITIONS AT THE BEGINNING/END

C11c. As of the beginning and end of this period, how well-maintained is the production resource (if this is different from the appropriation or distribution resource)?

<BEGCONDP>

- (1) _____ Well maintained -
excellent working order
- (2) _____ moderately well
maintained - good
working order
- (3) _____ Some resource
deterioration occurring
due to insufficient
maintenance
- (4) _____ Considerable resource
deterioration occurring
due to poor maintenance
- (5) _____ Considerable resource
deterioration, but due
to a natural disaster
- (-1) _____ MIC
- (-2) _____ NA
_____ CL

<ENDCONDP>

- (1) _____ Well maintained -
excellent working order
- (2) _____ moderately well
maintained - good
working order
- (3) _____ Some resource
deterioration occurring
due to insufficient
maintenance
- (4) _____ Considerable resource
deterioration occurring
due to poor maintenance
- (5) _____ Considerable resource
deterioration, but due
to a natural disaster
- (-1) _____ MIC
- (-2) _____ NA
_____ CL

C12. As of the beginning and end of this period, how would you characterize the levels of mutual trust among appropriators?

<BEGTRUST>

- (1) _____ Moderate to high levels
of trust (e.g. oral
oral promises given
high credence)
- (2) _____ Modest levels of trust
(e.g. oral promises are
used but appropriators
may be uncertain about
performance)
- (3) _____ Low levels of trust
(e.g. oral promises
rarely used)
- (-1) _____ MIC
- (-2) _____ NA
_____ CL

<ENDTRUST>

- (1) _____ Moderate to high levels
of trust (e.g.
oral promises given
high credence)
- (2) _____ Modest levels of trust
(e.g. oral promises are
used but appropriators
may be uncertain about
performance)
- (3) _____ Low levels of trust
(e.g. oral promises
rarely used)
- (-1) _____ MIC
- (-2) _____ NA
_____ CL

C13. At the end of this period, has a change occurred in the property rights regime related to the appropriation resource? <PROPREG2>

- (1) _____ Yes, a definite change has occurred
- (2) _____ Yes, developments have occurred which tend toward a change
- (3) _____ No change
- (-1) _____ MIC
_____ CL

CONDITIONS AT THE BEGINNING/END

C13a. At the end of this period, are the owners exercising or attempting to exercise closed access to this resource? <EOWNCLOS>

- (1) _____ Yes, de jure and effective
- (2) _____ Yes, de jure but not effective
- (3) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C13b. At the end of this period, are the appropriators exercising or attempting to exercise closed access to this resource? <EAPCLOSE>

- (1) _____ Yes, de jure and effective
- (2) _____ Yes, de jure, but "outsiders" began to appropriate at a moderate level
- (3) _____ Yes, de jure, but "outsiders" began to appropriate at a relatively substantial level
- (4) _____ de facto
- (5) _____ Yes, de facto, but "outsiders" began to appropriate at a moderate level
- (6) _____ Yes, de facto, but "outsiders" began to appropriate at a relatively substantial level
- (7) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

INFORMATION LEVELS

D. INFORMATION LEVELS

D1. Are maps or charts of the appropriation resource used by appropriators? <MAPAVAIL>

- (1) _____ Maps and charts are readily available to all
- (2) _____ Maps and charts have been made, but are not readily available to all
- (3) _____ No maps and charts are available to appropriators
- (-1) _____ MIC
- _____ CL

D2. Are maps and/or charts of the production and distribution resource available if these differ from appropriation resource? <MAPPROD>

- (1) _____ Do not differ
- (2) _____ Maps or charts of production resource available
- (3) _____ Maps or charts of distribution resource available
- (4) _____ Maps or charts of production and distribution available
- (5) _____ No maps and charts are available to appropriators
- (-1) _____ MIC
- _____ CL

INFORMATION LEVELS

- D3. Are appropriators of this resource readily observed by each other?
<USERSEEN>
- (1) ☐ Rarely seen
 - (2) ☐ May be seen while withdrawing units from resource
 - (3) ☐ May be seen while delivering "harvest" to a central location
 - (4) ☐ May be seen both while withdrawing and delivering
 - (-1) ☐ MIC
 - ☐ CL
- D4. Are the appropriators of this resource in radio communication with each other while appropriating from the resource? <RADIOCOM>
- (1) ☐ Most appropriators are in radio communication with each other
 - (2) ☐ Some appropriators are in radio communication with each other
 - (3) ☐ No appropriators are in radio communication with each other
 - (-1) ☐ MIC
 - ☐ CL
- D5. Are records of the condition of the resource kept in any systematic way? <RECORDCO>
- (1) ☐ No
 - (2) ☐ Yes, always
 - (3) ☐ Yes, most times
 - (4) ☐ Yes, sometimes
 - (-1) ☐ MIC
 - ☐ CL
- D6. Are there any actions being taken, by appropriators or officials, to generate information about the condition of the resource? <GENINFO>
- (1) ☐ Yes
 - (2) ☐ No
 - (-1) ☐ MIC
 - ☐ CL
- D7. Are records of the withdrawals from this resource kept in any systematic way? <RECORDWI>
- (1) ☐ No
 - (2) ☐ Yes, always
 - (3) ☐ Yes, most times
 - (4) ☐ Yes, sometimes
 - (-1) ☐ MIC
 - ☐ CL

INFORMATION LEVELS

D8. Are records of the physical factors which directly affect the resource kept in any systematic way? <RECORDPH>

- (1) ☐ No
- (2) ☐ Yes, always
- (3) ☐ Yes, most times
- (4) ☐ Yes, sometimes
- (-1) ☐ MIC
- ☐ CL

D9. Are records of the appropriators' contributions to monitoring of the resource kept in any systematic way? <RECORDMO>

- (1) ☐ No
- (2) ☐ Yes, always
- (3) ☐ Yes, most times
- (4) ☐ Yes, sometimes
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

D10. Are records of the appropriators' contributions to the maintenance of the resource kept in any systematic way? <RECORDMA>

- (1) ☐ No
- (2) ☐ Yes, always
- (3) ☐ Yes, most times
- (4) ☐ Yes, sometimes
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

D11. Are most of the above records kept in a language accessible to most of the appropriators? <RECORDLA>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

D11a. If yes, do officials at some level keep these records? <RECORDKE>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

INFORMATION LEVELS

D11b. Are these records available for inspection by appropriators?

<RECORDAV>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

D12. Are there arenas being used for the exchange of information about conditions of the resource? <ARENAS>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

D12a. If yes, how frequently do appropriators get together and discuss mutual problems of the resource? <ARENFREQ>

- (1) _____ Daily
- (2) _____ Weekly
- (3) _____ Monthly
- (4) _____ Quarterly
- (5) _____ Annually
- (6) _____ Infrequently/Irregularly
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

D13. Do the appropriators have a well-developed understanding of the characteristics of this resource? (e.g. structure, peculiarity and flow of units; in fisheries this would be the case when fishermen intimately know the reproductive habits of the fish, the favorite locations, etc.) <UNDERRES>

- (1) _____ Intimate knowledge of resource
- (2) _____ Considerable familiarity with resource
- (3) _____ Moderately familiar with resource
- (4) _____ Little knowledge of the resource
- (5) _____ Ignorant of resource
- (-1) _____ MIC
- _____ CL

POTENTIAL ACTIONS AND LEVELS OF CONTROL

E. POTENTIAL ACTIONS AND LEVELS OF CONTROL

- E1. Are there specialized staff or workers to undertake maintenance?
<MAINTRES>
- (1) _____ No
(2) _____ Yes, all are appropriators
(3) _____ Yes, all are non-appropriators
(4) _____ Yes, some are appropriators; some are non-appropriators
(-1) _____ MIC
(-2) _____ NA
_____ CL
- E2. How many person-days of labor per year are mobilized to maintain and/or repair the resource(s)? <LABRDAYS> _____ MIC _____ CL
- E3. Has the quality or quantity of the units available to the appropriators who are the focus of this form been adversely affected by the strategies of prior appropriators? <PRIORAPP>
- (1) _____ No, there are no prior appropriators
(2) _____ No, the strategies of prior appropriators have no adverse effect
(3) _____ Yes, the strategies of prior appropriators have an adverse effect
(-1) _____ MIC
_____ CL
- E4. Are there problems of pollution resulting from activities of others who are not appropriators of this resource and who are not necessarily inhabitants of this location? (e.g. acid rain, sewage disposal)
<EXTPOLL>
- (1) _____ Yes
(2) _____ No
(-1) _____ MIC
_____ CL
- E5. Do appropriators sell this unit in more than one market?
<ONEMARKT>
- (1) _____ Almost all appropriators sell in one market
(2) _____ Most appropriators sell in one market
(3) _____ About half of the appropriators sell in one market
(4) _____ Most appropriators sell in multiple markets
(5) _____ Almost all appropriators sell in multiple markets
(-1) _____ MIC
(-2) _____ NA (unit not sold)
_____ CL

POTENTIAL ACTIONS AND LEVELS OF CONTROL

E6. Does there appear to be any insurance mechanism available to the appropriators related to variability of income from the resource?
<INSURANC>

- (1) _____ Yes
(2) _____ No
(-1) _____ MIC
_____ CL

E6a. If yes, please describe: _____
<INSURDES>

_____ MIC _____ NA

PATTERNS OF INTERACTION

F. PATTERNS OF INTERACTION

F1. Communication patterns: Only answer this question if there is more than one subgroup. Please characterize the differences between subgroups with respect to the following variables that may affect capacity to communicate effectively. Please use the following coding scheme to answer all questions in this section. (Place confidence level after your substantive coding in relationship to each variable.)

- 1 No differences along this variable
2 Whatever differences there are do not affect communication
3 Small differences and mild communication problems
4 Small differences and they do affect communication
5 Large differences which significantly affect communication
-1 MIC

F1a. Gender identification	_____ CL _____	<SEX>
F1b. Ethnic identification	_____ CL _____	<ETHNCID>
F1c. Clan identification	_____ CL _____	<CLANID>
F1d. Racial identification	_____ CL _____	<RACEID>
F1e. Caste identification	_____ CL _____	<SOCSTRAT>
F1f. Religious identification	_____ CL _____	<RELANIMS>
F1g. Languages spoken	_____ CL _____	<COMMLANG>
F1h. General cultural view of resource system and its use	_____ CL _____	<CULTVWR>
F1i. Any other problems that affect communication	_____ CL _____	<OTHRCOMM>

F1j. List problems that the author identifies: _____
<LISTPRBS>

_____ MIC _____ NA

PATTERNS OF INTERACTION

F2. How would you characterize the general manner in which appropriators related to one another during this time period? <GENRELTN>

- (1) _____ In a relatively neutral, quid-pro-quo manner -- each exchange is evaluated for what it might bring.
- (2) _____ In a relatively positive, reciprocal manner -- the presumption is made that long-term relationships are involved and positive actions are undertaken without a specific expectation of return.
- (3) _____ In a relatively negative, perhaps even spiteful manner -- one indicator of this would be vandalism by appropriators against appropriators.
- (-1) _____ MIC
_____ CL

F3. Is there any evidence presented in the documents that these appropriators have engaged in cooperation in regard to other activities besides the management of this resource? <OTHRCOOP>

- (1) _____ No concurrent or prior history of cooperative actions
- (2) _____ Yes, specific types of cooperative activities related primarily to other local resources.
- (3) _____ Yes, they have a general cultural pattern that stresses various types of cooperative activities.
- (4) _____ Yes, both (2) and (3)
- (-1) _____ MIC
_____ CL

F4. If someone violates rules-in-use related to the appropriation process from this resource, how likely is he/she to encounter social sanctions imposed by other appropriators (who are not filling positions as official monitors)? <SOCSANCT>

- (1) _____ Very likely
- (2) _____ Likely
- (3) _____ Likely as not
- (4) _____ Unlikely
- (5) _____ Very unlikely
- (-1) _____ MIC
_____ CL

F5. If someone violates rules-in-use related to the appropriation process from this resource, how likely is he/she to encounter physical sanctions by other appropriators (who are not filling positions as official monitors)? <PHYSANCT>

- (1) _____ Very likely
- (2) _____ Likely
- (3) _____ Likely as not
- (4) _____ Unlikely
- (5) _____ Very unlikely
- (-1) _____ MIC
_____ CL

PATTERNS OF INTERACTION

F6. If someone violates rules-in-use related to the appropriation process from this resource, how likely is it that an official monitor or guard will move to impose sanctions? <MONSANCT>

- (1) _____ Very likely
- (2) _____ Likely
- (3) _____ Likely as not
- (4) _____ Unlikely
- (5) _____ Very unlikely
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F7. Is there a gradation of social, physical, and official sanctions that varies with the severity of rule violations? <VARSANCT>

- (1) _____ Yes, considerable range of sanctions are imposed depending on type of rule infractions
- (2) _____ Yes, moderate range of sanctions are imposed depending on type of rule infractions
- (3) _____ Yes, limited range of sanctions are imposed depending on type of rule infractions
- (4) _____ No, little or no variation on sanctions
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F8. If an official monitor or guard does move to impose sanctions, how likely is it that local appropriators will attempt to bribe the official? <BRIBERY>

- (1) _____ Very likely
- (2) _____ Likely
- (3) _____ Likely as not
- (4) _____ Unlikely
- (5) _____ Very unlikely
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

POSITIONS AND PARTICIPANTS

G. POSITIONS AND PARTICIPANTS

G1. Does the position of non-appropriator exist at the end (i.e. those prevented from using)? <NONAPP>

- (1) _____ No
- (2) _____ Yes, and close estimate of number of participants where author has provided it: _____ CL
- (-1) _____ MIC _____ MIC _____ NA <NUMNON1>
- _____ CL

POSITIONS AND PARTICIPANTS

G1a. If yes, estimated number of participants in this position at the end is: <NUMNON2>

- (1) _____ Less than 25
- (2) _____ 25-50
- (3) _____ 51-100
- (4) _____ 101-200
- (5) _____ 201-500
- (6) _____ 501-1000
- (7) _____ 1001-2500
- (8) _____ 2501-5000
- (9) _____ Over 5000
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G2. The position of appropriator exists (or, you should not be coding this form). Give a close estimate of the number of participants at the beginning and end, where author has provided it:

_____	_____ CL	_____	_____ CL
<BNUMAPP1>	_____ MIC	<ENUMAPP1>	_____ MIC

General estimate of number of participants in this position at the beginning and end is:

- | | |
|------------------------|------------------------|
| <BNUMAPP2> | <ENUMAPP2> |
| (1) _____ Less than 25 | (1) _____ Less than 25 |
| (2) _____ 25-50 | (2) _____ 25-50 |
| (3) _____ 51-100 | (3) _____ 51-100 |
| (4) _____ 101-200 | (4) _____ 101-200 |
| (5) _____ 201-500 | (5) _____ 201-500 |
| (6) _____ 501-1000 | (6) _____ 501-1000 |
| (7) _____ 1001-2500 | (7) _____ 1001-2500 |
| (8) _____ 2501-5000 | (8) _____ 2501-5000 |
| (9) _____ Over 5000 | (9) _____ Over 5000 |
| (-1) _____ MIC | (-1) _____ MIC |
| (-2) _____ NA | (-2) _____ NA |
| _____ CL | _____ CL |

G3. If the appropriation process is organized as a team process, how many teams are appropriating from this resource at the beginning and end? Give a close estimate if the author has provided it:

_____	_____ CL	_____	_____ CL
<BNUMTEM1>	_____ MIC	<ENUMTEM1>	_____ MIC

POSITIONS AND PARTICIPANTS

General estimate of number of participants in this position is:

<BNUMTEM2>

- (1) _____ Less than 10
- (2) _____ 10-25
- (3) _____ 26-50
- (4) _____ 51-75
- (5) _____ 76-100
- (6) _____ 101-200
- (7) _____ 201-500
- (8) _____ More than 500
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

<ENUMTEM2>

- (1) _____ Less than 10
- (2) _____ 10-25
- (3) _____ 26-50
- (4) _____ 51-75
- (5) _____ 76-100
- (6) _____ 101-200
- (7) _____ 201-500
- (8) _____ More than 500
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G4. Does an "official" position of monitor exist (apart from the willingness of all appropriators to monitor)? <GUARD>

- (1) _____ No
- (2) _____ Yes, appropriators (not necessarily all) rotate into this position
- (3) _____ Yes, appropriators are selected by appropriators for this position
- (4) _____ Yes, local non-appropriators are selected by appropriators for this position
- (5) _____ Yes, local non-appropriators are selected by a local general purpose government
- (6) _____ Yes, monitors are employees of an external governmental authority
- (7) _____ Yes, some are selected by appropriators and some are selected by a local general purpose government
- (8) _____ Yes, some are selected by appropriators and some are employees of an external government authority
- (9) _____ Yes, some are selected by a local general purpose government and some are employees of an external government authority
- (10) _____ Yes, some are selected by appropriators, some are selected by a local general purpose government, and some are employees of an external government authority
- (11) _____ Yes, others? _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

POSITIONS AND PARTICIPANTS

G4a. What level of rules is being monitored by the above position? (mark "1" by those rules which are being monitored by the above position, and "0" by those rules which are not being monitored) <RLEVEL>

- (1) _____ Rules devised by national collective choice processes
(column 1 of the rules form)
- (2) _____ Rules devised by regional collective choice processes
(column 2 of the rules form)
- (3) _____ Rules devised by local collective choice processes
(column 3 of the rules form)
- (4) _____ Rules-in-Use
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G4b. Do appropriators monitor the appropriation activities of each other apart from the monitoring of any "official" guards? <SELFMON>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G4c. How many official monitors are on duty at one time during the peak period?

If "official" monitoring positions exist, give a close estimate of the number of participants (of all types), during peak periods, where author has provided it: _____ <PEAKNUM> _____ MIC _____ NA _____ CL

General estimate of number of participants in this position is: <PEAKGRD>

- (1) _____ 1-5 participants
- (2) _____ 6-10
- (3) _____ 11-25
- (4) _____ 26-50
- (5) _____ 51-100
- (6) _____ 101-200
- (7) _____ 201-500
- (8) _____ Over 500
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G4d. How many official monitors are on duty at one time during the off peak period?

If "official" monitoring positions exist, give a close estimate of the number of participants (of all types), during off peak periods, where author has provided it: _____ <OFFPNUM> _____ MIC _____ NA _____ CL

POSITIONS AND PARTICIPANTS

General estimate of number of participants in this position is:
<OFFPGRD>

- (1) _____ 1-5 participants
- (2) _____ 6-10
- (3) _____ 11-25
- (4) _____ 26-50
- (5) _____ 51-100
- (6) _____ 101-200
- (7) _____ 201-500
- (8) _____ Over 500
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G4e. If an official position exists, are these monitors paid? (Mark "1" by those methods which apply, "0" for those which do not apply) <MONPAID>

- (1) _____ Yes, paid in commodities
- (2) _____ Yes, paid in money
- (3) _____ Yes, paid with shares of the appropriation units
- (4) _____ Yes, paid in reduced obligations (e.g. reduced labor input, membership fees, etc.)
- (5) _____ Yes, paid by other means
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G4f. Full-time status of official monitors: <FULLTIME>

- (1) _____ Almost all are full-time
- (2) _____ Most are full-time
- (3) _____ About half are full-time
- (4) _____ Some are full-time
- (5) _____ Very few are full-time
- (6) _____ None are full-time
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

NUMBER AND RELATIONSHIPS

H. NUMBER AND RELATIONSHIPS AMONG SUBGROUPS

There must be at least one Subgroup Coding form for each operational level coding form you complete. Frequently, there will be more than one Subgroup Coding Forms and to determine how many, you need to ask yourself a series of questions.

If we code only one Operational Level Form, we need to ask ourselves the following questions about the appropriators. Are the persons who are appropriating units from this resource approximately similar in regard to:

NUMBER AND RELATIONSHIPS

- (1) Their legal rights to appropriate units (having a single rule configuration form for the entire set of participants is appropriate). Symmetry in rights.
- (2) Their withdrawal rate from the resource (this will never be identical for all appropriators, but are most of the appropriators taking units at a similar level such as a fishery where appropriators are all "small boat fishermen" or an irrigation canal where all appropriators are holders of either very large parcels or of medium to small parcels of land.) Symmetry in appropriation.
- (3) Their exposure to variation in supply (most fishermen are equally exposed if the supply of fish goes down but those irrigators located at the tail end of a system with great variation over time are far more exposed than head enders). Symmetry in exposure.
- (4) Their level of dependency on the units withdrawn from this resource. (If all of the appropriators are largely dependent on or largely independent of this unit for their family income, then they are similar in this regard). Symmetry in dependency.
- (5) How they use the appropriation units. (They are similar if most of the appropriators sell the units in a market or if most of the appropriators use the units for home consumption but dissimilar if some sell most of the units while others use the resource only for autoconsumption). Symmetry in use.

If the participants are not relatively symmetrical in rights, appropriation, exposure, dependency and use, we will consider there to be more than one SUBGROUP. Our definition of Subgroup is not related to presence or absence of organization, but rather similar or dissimilar conditions represented by the above five key types of variables. We will code the four most important Subgroups for each Action Situation. If there are more than four Subgroups, select the four which have the largest impact on the resource -- or those who, together, appropriate the largest number of use-units.

If you complete more than one Operational Level coding form, you may or may not need to code new Subgroup forms. If none of the variables on the Subgroup Form change from one time period to the next, then, you simply fill out the number of the Subgroup Form completed for the first operational level form.

H1. How many subgroup forms are you completing in relation to this operational level form? (Limit of 4) _____ <NUMSUBGP>

H2. List their ID numbers here: _____ _____ _____ _____
 <SUBGP1> <SUBGP2> <SUBGP3> <SUBGP4>

NUMBER AND RELATIONSHIPS

H3. Examine the five criteria listed above, and indicate for each dyad, on which criterion (C1, C2, C3, C4, or C5) the subgroups differ from one another, writing "1" for Yes, "2" for No, "3" for Missing In Case, "4" for Not Applicable, and on the lines provided.

	_____ NA	C1	C2	C3	C4	C5	CL
H3a. SG1 compared to SG2	_____	_____	_____	_____	_____	_____	<SG1TOSG2>
H3b. SG1 compared to SG3	_____	_____	_____	_____	_____	_____	<SG1TOSG3>
H3c. SG1 compared to SG4	_____	_____	_____	_____	_____	_____	<SG1TOSG4>
H3d. SG2 compared to SG3	_____	_____	_____	_____	_____	_____	<SG2TOSG3>
H3e. SG2 compared to SG4	_____	_____	_____	_____	_____	_____	<SG2TOSG4>
H3f. SG3 compared to SG4	_____	_____	_____	_____	_____	_____	<SG3TOSG4>

EVALUATION OF RESULTS

I. EVALUATION OF RESULTS

I1. Are there any appropriators who have been consistently disadvantaged in this period? <REALOSER>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

I1a. If yes, describe: _____
 <REALYES> _____ MIC _____ NA

I2. Have the relatively worst off been cut out of their benefits from this resource or substantially harmed? <WORSTOFF>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

EVALUATION OF RESULTS

I3. Think about the relationship among those who are the least advantaged and those who are the most advantaged during this period and the distance between them. By the end of the situation, would you characterize this distance as: <RELEQUTY>

- (1) _____ Increasing over time
- (2) _____ Remaining relatively constant over time
- (3) _____ Decreasing over time
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

AUTHOR'S EVALUATION

J. AUTHOR'S EVALUATION AND CAUSAL ASSUMPTIONS

J1. Does the author focus on our concept of results and the evaluation of results? <ARESULTS>

- (1) _____ Yes
- (2) _____ No
- _____ CL

J2. Comment on the author's identification of results, evaluation of results, the causal model the author is using, and whether we have captured the above. <TYPRESUL> _____ MIC _____ NA

J3. Comment on any evidence that is presented in this case regarding the nature and level of transaction costs. <AINDICTC> _____ MIC _____ NA

J4. If the author evaluates efficiency, describe the indicators used, whether the author proposes any means of increasing efficiency, and if so, what means the author proposes to achieve increased efficiency. <EFFINDC> _____ MIC _____ NA

J5. If the author discusses withdrawals per unit of effort list the indicators she/he uses, and discuss how the author evaluates withdrawals per unit of effort for this resource (use back if necessary). <AWITHEFF> _____ MIC _____ NA

Subgroup Coding Form

This form is used to characterize the Subgroups that act at operational level. This form is closely related to the Operational level form.

This form has a variable list sorted alphabetically.

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DRAFT

CODING INSTRUCTIONS

SUBGROUP CODING FORM

by

Edella Schlager

Section A. Participants

Question A1. "Please provide a brief description"

Identify the subgroup that is the focus of this form. Begin with a general identification, and fill it out with more specific significant characteristics. For example, if the group has a particular name begin with that and add other details such as where they live, if they use a particular technology, if they grow the same crops, etc. In other words, specify what makes this subgroup distinct from other subgroups appropriating from the resource.

Question A2. "Are the criteria for who"

The criteria for who may be an appropriator can be quite diverse (see boundary section of rule form). What is most important in answering this question is whether members of this group can identify who is and who is not entitled to be an appropriator with this subgroup. If the basis for being a member of the group is clear enough that members can identify who is or is not eligible to be a member then answer yes to this question.

Question A3. "Number of individuals in this group"

The group is made up of a number of appropriators. Appropriators are individuals who actually withdraw units from the resource. The group is not made up of appropriators PLUS their families, their relatives, or anyone else who may directly benefit from appropriation. This question can get confusing when others close to the appropriators, usually family members, use or process the appropriated units. Individuals who are not appropriators cannot be counted as a part of this subgroup.

Question A4a.-A4c. "Approximately what proportion"

Each category is mutually exclusive, therefore, the percents must add up to 100.

Question A5. "What proportion of this group is literate"

Note that this question does not ask whether this group is considered literate or not, or even whether this group is literate in the national language. Rather the question is attempting to

determine whether, and what proportion of this group is literate in a language which permits the members access to information about the resource.

Question A6. "For this subgroup characterize"

See instructions on operational level coding form for Question F1. In addition to identifying the magnitude of the difference the characteristic makes, also identify the particular characteristic. Identify the characteristic in each case, not just when the characteristic makes a difference. Remember who are members of this subgroup. The members are appropriators only, not family, not friends, etc. Given the confusion about what is exactly an ethnic group and what is meant by race you need not fill in these blanks unless you so choose.

Question A7. "If the appropriation process is organized"

A team is a group of individuals, who working together (often using the same equipment), withdraw units from the resource. For example, in some fisheries the technology used requires more than one person to operate it. In such a case each group is considered a team.

Question A7a. "The average number of persons"

No special instructions.

Question A7b. "The head of appropriation"

Is the relationship between the head of the appropriation team and the other team members based on any of the following relationships. A nuclear family is a group composed of mother, father, and children. If the team members are also members of the same nuclear family then answer (1). Extended family or clan relationships entail groups of families that claim a common ancestor. If the head of the team and the other members are from one clan or extended family answer (2). Exchange relationships are relationships which involve the selling of labor on the part of individuals. If the head of the team hires other team members who are not related to her or him answer (3).

Question A8. "Do many members of this group"

For whatever reason, do individuals of this group who would have traditionally become appropriators now seek employment elsewhere? If so, then indicate who are the primary appropriators at present.

Question A8a. "If yes to A8 are the members"

No special instructions.

Section B. Legal Rights

General Instructions to this section.

De jure basis means that the particular right is recognized by a formal collective choice institution/organization in the region or country where the resource is located. Most often the collective choice institution is part of a formal judicial system, although administrative bodies are also included. The easiest way to evaluate whether a right has a de jure basis is if that right is challenged, the subgroup could have the right sustained either by a judicial or administrative body. On the other hand, de facto basis means that the particular right is not recognized by a formal collective choice institution/organization. Note that the right does exist. The members of this subgroup have forged this right as amongst themselves and others, but if the right were challenged it would not be sustained by a formal judicial or administrative body. The attitude towards the right by the formal collective choice institutions is not a determinant of whether the right is de facto. The right and the exercise of it may be considered explicitly illegal and a threat to the formal jurisdictions, or the right and the exercise of it may be "winked" at, however, either way the right is still de facto if it would not be sustained.

Question B1. "subgroup...exercise right of access"

If members of this subgroup have authority to enter this resource answer either (1) or (2).

Question B2. "Subgroup ...exercise right of withdrawal"

If the members of this subgroup have the authority to remove units from this resource then answer either (1) or (2) given the above instructions.

Question B3. "Subgroup...exercise right of management"

If the members of this subgroup have the capability to make decisions over the use of the resource then answer yes. This question does not ask the magnitude of the capability, just whether it exists and whether it is being exercised.

Question B4. "Subgroup...exercise right of exclusion"

Exclusion means the right to determine who will have access to the resource or a share of the resource. Exclusion in this case encompasses the entire resource.

Question B5. "Subgroup...exclude from particular zones"

Exclusion is the same as in the above question, except in this case exclusion refers to particular zones within the resource. In other words does the subgroup decide who will have access to certain portions of the resource. The basis of this exclusion can be many things. For example, in fisheries often times a subgroup will divide the fishing ground (the appropriation resource) into zones where only certain technologies can be used-- so one area of the grounds can only be fished by

stationary traps while another area can be fished only by handlines.

Question B6. "Subgroup...transfer to flow"

Transfer means the right to sell, lease, or bequeath. Flow means the stream of units that passes through the resource. The present question is asking whether members of this subgroup can sell, lease, or bequeath their share of the flow to someone else.

Question B7. "Subgroup...transfer to shares of resource"

Transfer has the same meaning as in the previous question. This question is only applicable if the members of the subgroup actually do own shares of the physical facilities. If they do not then answer no. Examples of physical facilities include the canals and ditches that make up an irrigation appropriation resource, or an enclosed lagoon in the case of a fishery. By answering yes to this question you are stating that the appropriators are owners of this resource. As owners they possess the rights of access, withdrawal, management, and exclusion, and the full alienability of all of these rights. This means that if you answered yes to this question then you must also have answered yes to questions B1 through B4.

Question B8. "Subgroup...transfer shares of equipment"

This question is only applicable if members of the subgroup do own shares in appropriation equipment. If members own shares in a single piece of equipment such that an individual could not say that this entire boat or this entire net is hers or his then the question is applicable.

Section C. Stakes and Resources

Question C1. "The length of time this subgroup"

Here you are not being asked only about the members of this subgroup who are living today. Rather you are being asked about this subgroup as a group that has existed over generations. Regular use means that the resource plays a significant enough role to affect the appropriators' withdrawal strategies. This length of time can be different than the length of the action situation that is being coded. For example, if you know that this subgroup has been appropriating from this resource for 100 years but the action situation being coded is only for 50 years, you would still answer 100 years.

Question C2. "The proportion of this subgroup"

No special instructions.

Question C3. "In general how many offspring"

This question attempts to discern whether the appropriators of this subgroup believe future generations will appropriate from this resource. Its one way of getting at a discount rate for

this group. Several in answer (2) means more than one.

Question C4a. "Estimate the amount of resources"

Resource in this question is used in the economic sense. It includes the trinity of economic inputs--land, labor, and capital. Capital is equipment, buildings, and other resources which are not land or labor, that are used to appropriate units from this resource. Indicate in terms of days worked the amount of resources necessary to establish an appropriation team.

Question C4b. "Dollar amount"

No special instructions.

Question C5. "Does the amount of capital required"

Capital in this question is again being used in the economic sense. Essentially what this question is asking is whether the cost of capital is so high that to get a sufficient return (ie, payoff the mortgage or feed the family) the appropriators have to intensify their withdrawal activities. The implications are that if yes the cost of capital is that high then more likely than not the resource is going to suffer from degradation problems.

Question C6. "For most people in this subgroup"

In considering the members of this subgroup estimate how dependent they are on this resource for income. Note that most (meaning at least 75%) members must have a similar level of dependency otherwise this collection of individuals cannot be considered a subgroup. See Section H of the Operational Level Form for a definition of a subgroup.

Question C7. "What proportion of this subgroup works"

In keeping with the definition of a subgroup your answer to this question should never be (3) or (4). If your answer is either (3) or (4) you should reconsider whether or not this group is actually a subgroup. Answers (3) and (4) mean that these individuals do not possess symmetry in dependence on the resource. They would therefore fail to qualify as a subgroup.

Question C8. "What proportion of this subgroup currently"

The phrase "similar units from other resources" means that the units do not have to be identical, however, they do have to be very closely related. For example in fisheries demersal fish in some regions have similar feeding habits, can be found at the same ocean depth, and can be caught with the same gear. These fish would be considered similar units even though they are of different species. Note once again that your answer to this question should never be (3) or (4). If it is you should reconsider whether or not this group is actually a subgroup.

Question C9. "Economy of this location...average annual income"

This question basically asks you to rank this subgroup on the basis of its income. Obviously this question is only answerable if the author has provided you with sufficient information about the economy of the location and the relative level of other income earning groups.

Question C10. "Variance of average annual family income"

Admittedly the answers to this question are not precise but you might think of the answers in this way. Low means that there is very little variation in the level of average annual family income across families. Everybody pretty much has the same level of income. Moderate means that some variation exists but that it is not extreme. High means that the variation among families is great. The difference between those with the highest incomes and those with the lowest incomes is great.

Question C11. "Variance overtime...average annual family income"

Overtime in this question means more than 5 years. Low variance means that income does vary, however the change is not significant enough to be noticed, or it is not significant enough to cause the members of the subgroup hardship. Moderate variance means that the variation is significant enough to be noticed, however, the appropriators are able to manage the change with some effort. High variance means that the variation is significant and that it causes much hardship for the appropriators, leaving them vulnerable.

Question C12. "What proportion of this group own land"

Remember the definition of a subgroup.

Question C13. "What is the cost of alternative sources of supply"

Costs in this question means the cost of additional economic inputs necessary to exploit or create additional appropriation resources.

Section D. Potential Actions and Levels of Control

Question D1. "If there are multiple subgroups using the resource"

This question focuses on how vulnerable this subgroup is to the actions of other subgroups given this subgroup's position in the flow of units.

Question D2. "If this subgroup were to (drastically) reduce"

In other words does this subgroup appropriate a sufficient amount of units that halting appropriation would have a significant impact on the resource?

Question D3. "For the following three questions"

For all three questions take the physical constraints as a given and focus on the rules which limit choice in relation to technology, time, and quantity. Remember to focus on the rules that limit choice not on the physical constraints that limit choice. For example in fisheries, if fishermen cannot fish from January through March because of poor weather conditions, that is a physical constraint. If fishermen are permitted to catch a particular type of fish only during two months of the year even though the fish is available year around, that is considered a rule constraint. If no rules constrain choice then choose answer (-2).

Question D4. "How large is the immediate return"

This question does not ask whether the units appropriated are valuable. It asks how valuable additional units would be. Existing levels of appropriation may be valuable, but additional units may not be.

Section E. Technology Used By This Subgroup

Question E1. "Other than the possible change at the beginning"

If the beginning of this action situation is marked by a change in technology, do not consider that change in answering this question. Technological change should be understood to be major, i.e., something that has a notable impact on appropriation processes or methods of organization.

Question E1a. "Considering other technologies tha have not"

Indicate how long those technologies, other than the ones covered by Question E1, have been in use.

Question E2. "Relative to other technologies that the"

No special instructions

Question E3. "Does the appropriative power of the"

[We need to discuss what this question really means]

Section F. Strategies Adopted By This Group

Question F1. "At the beginning of this period"

No special instructions

Question F1a. "If the author provides specific data"

No special instructions

Question F2. "At the end of this period"

No special instructions

Question F2a. "If the author provides specific data"

No special instructions

Question F3. "At the beginning of this period"

The categories of this question are mutually exclusive, therefore the proportions should add up to 100.

Question F3a. "...how are appropriated items disposed of"

This question is designed for the times when the author does not provide specific enough information to answer F3, yet still discusses generally how appropriated units are disposed of. Remember to indicate which method is most dominant.

Question F3b. "If ten percent or more of the units"

The F3b questions should only be answered if you are coding a grazing or an irrigation case. Remember to mark "1" if the good or animal is produced and "0" otherwise. On the bottom line indicate which crop/animal is dominant by using its representative number. If you have any ideas on how to expand this question into other sectors please speak up.

Question F4. "At the end of this period"

Once again, the proportions should add up to 100.

Question F4a. "...at end, how are appropriated items disposed"

No special instructions.

Question F5. "Do the uses made of these appropriation units"

Essentially what this question asks is whether the appropriators can by simply examining the units they appropriate determine the condition of the resource.

Question F6. "During this time period, have members"

Focus on the physical structure of the resource. In the case of irrigation this includes canals, other waterways, holding tanks, etc, but not water since that is the unit being appropriated. In the case of fisheries this includes any physical boundaries, the floor of the fishing ground, and the water since water is part of the physical structure of a fishing ground.

Question F7. "During this time period, have members"

Production and distribution are identical in meaning to those same terms used in the Resource Form. This question has obvious application to irrigation, however, it will also be meaningful at times for fisheries. An example of a constructed production facility in fisheries would be a hatchery.

Question F8. "During this time period, have members"

As opposed to Question F6 which focused on positive actions that members of this subgroup might take to maintain the resource, this question asks whether the subgroup avoids certain actions that may be destructive to the appropriation resource.

Question F9. "Is the amount of maintenance or improvement"

No special instructions

Question F10. "Access to an alternative source"

Alternative source of supply means that identical units are being supplied but from a different resource. In other words the appropriators are exploiting an alternative appropriation resource. This would include appropriators who own land in other areas and appropriate from similar resources in those areas.

Question F10a. "Increased use of alternative sources"

No special instructions.

Question F11. "Has any member of this group assumed"

Has any member of the group invested notable amounts of money and/or time in an effort to coordinate appropriators' strategies.

Question F12. "Characterize the usual behavior"

In other words, to what degree are members of this subgroup rule followers.

Question F12a. "Do the members of this group who basically"

This question may be not applicable if there is no maximum allowable level of appropriation associated with this resource.

Question F12b. "Is the level of infraction of those members"

When members of this subgroup break rules do they only fudge a little or do their actions take them considerably beyond the scope of the rules.

Question F13. "Has this subgroup proposed action"

No special instructions.

Question F14. "Have members of this subgroup threatened appropriators"

No special instructions.

Question F15. "Have members of this subgroup threatened officials"

No special instructions.

Section G. Results For This Subgroup

Question G1. "Of the total number of units appropriated"

If this subgroup is the only subgroup appropriating from this resource then the answer will be (6).

Question G2. "By the end of this time period"

No special instructions

Question G3. "Has the absolute quantity of appropriation"

No special instructions.

SUBGROUP VARIABLE LIST "G"
Alphabetical

<ABSOQUAN>	<GG3>	Has the absolute quantity of appropriation units obtained by this group become larger, remained constant, or become smaller?
<ACCESS>	<GB1>	Do members of this subgroup exercise the right of access?
<ALTSUPPLY>	<GC13>	What is the cost of alternative sources of supply for this unit for this subgroup?
<ASSETS>	<GC12>	What proportion of this group owns land or capital?
<AVERINC>	<GC9>	Given the economy of this location, what is the average annual income (including all non-monetary forms of income) of this subgroup?
<AVOIDHRM>	<GF7>	During this time period, have members of this group expended resources (at least their own time) to avoid actions that would harm the structure of the appropriation resource?
<BNUMUSR1>	<GA3>	What is the actual number of individuals in this group at the beginning?
<BNUMUSR2>	<GA3>	What is an estimate of the number of individuals in this group at the beginning?
<CAPDATE>	<GC4b>	What is the approximate year of the estimate for the dollar amount required to set up an appropriation team?
<ENHANCE>	<GF6>	During this time period, have members of this group invested their own labor or other resources in constructing or improving production and/or distribution works for maintaining or improving the appropriation resource?
<ENTACT>	<GF10>	Has any member of this group assumed entrepreneurial activity in trying to achieve coordinated strategies?
<ENUMUSR1>	<GA3>	What is the actual number of individuals in this group at the end?
<ENUMUSR2>	<GA3>	What is an estimate of the number of individuals in this group at the end?
<EQIPSHAR>	<GB8>	Do members of this subgroup exercise the separable right of transfer to shares of major appropriation equipment?

<EXCLUDED>	<GB4>	Do members of this subgroup exercise the right to decide who can be excluded from the entire resource?
<EXCLUDIN>	<GB5>	Do members of this subgroup exercise the right to decide who can be excluded from particular zones within the resource?
<FAMINCDE>	<GC6>	For most people in this subgroup, how dependent are they on this resource as a major source of family income?
<KPRESURE>	<GC5>	Does the amount of capital required to set up an appropriation team, given the assets of members of this subgroup, place pressure upon the appropriators to get immediate returns from appropriation?
<LGTHUSE>	<GC1>	What is the length of time this subgroup has regularly appropriated from this resource?
<LISTPROB>	<GA5j>	What are the problems which affect communication for this subgroup that the author identifies?
<LITERACY>	<GA4>	What proportion of this group is literate in a language in which records or publications about this resource and/or location (or other similar resources) is kept?
<LONGVAR>	<GC11>	What is the variance over time of the average annual family income in this subgroup?
<MAINCONT>	<GF8>	Is the amount of maintenance or improvement work contributed by members of this group dependant or contingent on the quantity of units appropriated by members of this group?
<MANAGE>	<GB3>	Do members of this subgroup have the right to participate in the management of this resource?
<MARGVALU>	<GD4>	How large is the immediate return which could be obtained by increasing levels of appropriation?
<OFFSPRNG>	<GC3>	In general, about how many offspring of the members of this group become appropriators of this resource when they are adults?
<OLSON>	<GD2>	If this subgroup were to (drastically) reduce its appropriation activities would this have noticeable impact on the balance of the quantity of units withdrawn and the number of units available in this resource?
<OTHCURR>	<GC4b>	If given in another currency, what is the amount of currency required to set up an appropriation team?

<OWNLABOR>	<GF5>	During this time period, have members of this group invested their own labor or other resources in maintaining or improving the structure of the appropriation resource?
<PRONURUL>	<GF12>	Has this subgroup proposed action in a collective-choice or constitutional choice arena to alter the operational or collective-choice rules affecting the appropriation from this resource?
<RESIDENT>	<GC2>	What proportion of this subgroup resides in or near this resource?
<RULEBRAK>	<GF11a>	Is the level of infraction of those members of the group who are not rule followers usually small, medium or large?
<RULEFOLL>	<GF11>	What is the usual behavior of the members of this subgroup with respect to local operational level rules-in-use related to the appropriation process from this resource in years other than extreme shortage?
<RULQUANC>	<GD3c>	To what extent do the rules in use with regards to quantity constrain appropriation by limiting the range of choice for this subgroup?
<RULTECHC>	<GD3a>	To what extent do the rules in use with regards to technology constrain appropriation by limiting the range of choice for this subgroup?
<RULTIMEC>	<GD3b>	To what extent do the rules in use with regards to time constrain appropriation by limiting the range of choice for this subgroup?
<SBGPDES>	<GA1>	Please provide a brief description of this appropriation subgroup.
<SCASTE1>	<GA5e>	How does caste affect communication?
<SCASTE2>	<GA5e>	What is the caste of most members of this subgroup?
<SCLANID1>	<GA5c>	How does clan identification affect communication?
<SCLANID2>	<GA5c>	What is the clan identification of most members of this subgroup?
<SCULTVWR>	<GA5h>	What is the general cultural view of the resource system and its use for this subgroup?
<SETHID1>	<GA5b>	How does ethnic/cultural identification affect communication?
<SETHID2>	<GA5b>	What is the ethnic identification of most members of this subgroup?

<SGENDER1>	<GA5a>	How does gender identification affect communication?
<SGENDER2>	<GA5a>	Approximately what proportion of this subgroup are women?
<SHARCHNG>	<GG2>	By the end of this time period, has this percentage the group appropriates from this resource become larger, remained constant, or become smaller?
<SHARE%>	<GG1>	Of the total number of units appropriated from this resource, what is the percentage this subgroup appropriates at the [!Uend]!U of this period?
<SLANG1>	<GA5g>	How does the languages spoken affect communication?
<SLANG2>	<GA5g>	What is the language used by most members of this subgroup?
<SNUMTEM1>	<GA6>	If the appropriation process is organized as a team process, what is a close estimate of the number of teams in this group?
<SNUMTEM2>	<GA6>	If the appropriation process is organized as a team process, what is a general estimate of the number of teams in this group?
<SOTHCOMM>	<GA5i>	Are there any other problems that affect communication for this subgroup?
<SRACEID1>	<GA5d>	How does racial identification affect communication?
<SRACEID2>	<GA5d>	What is the racial identification of most members of this subgroup?
<SRELID1>	<GA5f>	How does religious identification affect communication?
<SRELID2>	<GA5f>	What is the religious identification of most members of this subgroup?
<SUBALT1>	<GF9>	Do the members of this group have access to an alternative source of supply of this unit?
<SUBALT2>	<GF9a>	During this time period, have the members of this group increased their use of alternative sources of supply of this unit?
<SUBNOT>	<GC7>	What proportion of this subgroup works a substantial amount of time in activities not associated with appropriation from this resource?
<SUBSIM>	<GC8>	What proportion of this subgroup currently

		appropriates similar units from other resources?
<SUBVAR>	<GC10>	What is the variance in the average annual family income across families in this subgroup?
<SUBWHERE>	<GD1>	If there are multiple subgroups using this resource, do most of the appropriators of this subgroup withdraw units from this resource?
<TEAMBASE>	<GA6b>	Is the head of appropriation team based on nuclear family relationships, extended family or clan relationships, or exchange relationships?
<TEAMCAP>	<GC4a>	What is an estimate of the amount of time needed to build or to earn enough income to purchase the equipment for an appropriation team?
<TEAMSIZE>	<GA6a>	What is the average number of persons in an appropriation team?
<TECHEXTR>	<GE2>	Does the appropriative power of the technology as used by members of this subgroup threaten the balance between units withdrawn and units available even if no new users were added?
<TECHTIME>	<GE1>	When was the most recent technological change experienced by this subgroup?
<TECHUSED>	<GE1a>	Considering other technologies that have not changed, how long have they been in use?
<TRANFLOW>	<GB6>	Do members of this subgroup exercise the separable right of transfer to the flow of units from this resource?
<TRANSHAR>	<GB7>	Do members of this subgroup exercise the separable right of transfer to shares of this appropriation resource, or closely related production and/or distribution resources?
<USERATE1>	<GF1>	At the beginning of this period, is the rate of withdrawals of units for this subgroup accelerating, increasing, constant, decreasing or decelerating?
<USERATE2>	<GF2>	At the end of this period, is the rate of withdrawals of units for this subgroup accelerating, increasing, constant, decreasing or decelerating?
<USES1>	<GF3a>	For irrigation, at the beginning of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USES1>	<GF3b>	For grazing, at the beginning of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?

<USES1>	<GF3c>	For forestry, at the beginning of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USES2>	<GF4a>	For irrigation, at the end of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USES2>	<GF4b>	For grazing, at the end of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USES2>	<GF4c>	For forestry, at the end of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<VIOLENC1>	<GF13>	Have members of this subgroup threatened, or actually used, violence to attempt to alter the behavior of other appropriators?
<VIOLENC2>	<GF14>	Have members of this subgroup threatened, or actually used, violence to attempt to alter the behavior of officials?
<WELDEFIN>	<GA2>	Are the criteria for who is a member of this group well defined?
<WITHDRAW>	<GB2>	Do members of this subgroup exercise the right to withdraw?
<\$AMOUNT>	<GC4b>	What is the dollar amount required to set up an appropriation team?

Name of Case

Last Revision/January 10, 1990
Doc 47

CPR PROJECT

SUBGROUP CODING FORM

Subgroup No.: _____
 <SUBGRPID>

Resource No.: _____
 <RESOURID>

Earlier or later Subgroup Coding Forms for this group if this is a series:

# of this form in the series	1	2	3	4	5	6	7	8	9	10
------------------------------	---	---	---	---	---	---	---	---	---	----

PARTICIPANTS

A. PARTICIPANTS

A1. Please provide a brief description of this appropriation subgroup:
<SBGPDES>

A2. Are the criteria for who is a member of this group well defined?
<WELDEFIN>

(1)	_____	Yes
(2)	_____	No
(-1)	_____	MIC
		CL

A3. Actual number of individuals in this group at the beginning and end:

_____ CL _____

<BNUMUSR1> <ENUMUSR1>

Estimate number of individuals in this group at the beginning and end:

<BNUMUSR2>

(1)	_____	Less than 25
(2)	_____	25-50
(3)	_____	51-100
(4)	_____	101-200
(5)	_____	201-500
(6)	_____	501-1000
(7)	_____	1001-2500
(8)	_____	2501-5000
(9)	_____	Over 5000
(-1)	_____	MIC
	_____	CL

<ENUMUSR2>

(1)	_____	Less than 25
(2)	_____	25-50
(3)	_____	51-100
(4)	_____	101-200
(5)	_____	201-500
(6)	_____	501-1000
(7)	_____	1001-2500
(8)	_____	2501-5000
(9)	_____	Over 5000
(-1)	_____	MIC
	_____	CL

PARTICIPANTS

A4. What proportion of this group is literate in a language in which records or publications about this resource and/or location (or other similar resources) is kept? <LITERACY>

- (1) _____ Less than 10%
- (2) _____ 10%-25%
- (3) _____ 26%-50%
- (4) _____ 51%-75%
- (5) _____ 76%-90%
- (6) _____ 91%-100%
- (-1) _____ MIC
- _____ CL

A5. For this subgroup characterize the composition of its population with respect to the following variables that may affect capacity to communicate effectively. Please use the following coding scheme to answer all questions in this section.

- 1 No difference
- 2 Whatever differences there are do not affect communication
- 3 Small differences and mild communication problems
- 4 Small differences and they do affect communication
- 5 Large differences which significantly affect communication
- 1 MIC
- 2 NA

A5a. Gender identification _____ CL _____ <SGENDER1>
Approximately what proportion of this subgroup are women:
_____. <SGENDER2>

A5b. Ethnic/cultural identification _____ CL _____ <SETHID1>
What is the ethnic identification of most members of this subgroup:
_____. <SETHID2>

A5c. Clan identification _____ Cl _____ <SCLANID1>
What is the clan identification of most members of this subgroup:
_____. <SCLANID2>

A5d. Racial identification _____ CL _____ <SRACEID1>
What is the racial identification of most members of this subgroup:
_____. <SRACEID2>

A5e. Caste _____ CL _____ <SCASTE1>
What is the caste of most members of this subgroup:
_____. <SCASTE2>

A5f. Religious identification _____ CL _____ <SRELID1>
What is the religious identification of most members of this subgroup:
_____. <SRELID2>

A5g. Languages spoken _____ CL _____ <SLANG1>
What is the language used by most members of this subgroup:
_____. <SLANG2>

PARTICIPANTS

A5h. What is the general cultural view of the resource system and its use? _____ CL _____ <SCULTVWR>

A5i. Any other problems that affect communication? _____ CL _____ <SOTHCOMM>

A5j. List problems that the author identifies: _____
<LISTPROB>

A6. If the appropriation process is organized as a team process, how many teams are in this group? Give a close estimate if the author has not provided it: _____ <SNUMTEM1> _____ MIC _____ NA

<SNUMTEM2>

- (1) _____ Less than 5
- (2) _____ 5-15
- (3) _____ 16-30
- (4) _____ 31-45
- (5) _____ 46-60
- (6) _____ 61-99
- (7) _____ 100-200
- (8) _____ more than 200
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

A6a. The average number of persons in an appropriation team: _____
<TEAMSIZE>

A6b. The head of appropriation team is based on: <TEAMBASE>

- (1) _____ Nuclear family relationships
- (2) _____ Extended family or clan relationships
- (3) _____ Exchange relationships
- (4) _____ Other: _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

LEGAL RIGHTS

B. LEGAL RIGHTS

B1. Do members of this subgroup exercise the right of access? <ACCESS>

- (1) _____ Yes, de jure
- (2) _____ Yes, de facto
- (3) _____ No, they exercise neither de facto nor de jure rights
- (4) _____ No, but they have de jure rights
- (-1) _____ MIC
- _____ CL

LEGAL RIGHTS

B2. Do members of this subgroup exercise the right to withdraw? <WITHDRAW>

- (1) _____ Yes, de jure
- (2) _____ Yes, de facto
- (3) _____ No, they exercise neither de facto nor de jure rights
- (4) _____ No, but they have de jure rights
- (-1) _____ MIC
- _____ CL

B3. Do members of this subgroup have the right to participate in the management of this resource? <MANAGE>

- (1) _____ Yes, de jure
- (2) _____ Yes, de facto
- (3) _____ No, they exercise neither de facto nor de jure rights
- (4) _____ No, but they have de jure rights
- (-1) _____ MIC
- _____ CL

B4. Do members of this subgroup exercise the right to decide who can be excluded from the entire resource? <EXCLUDED>

- (1) _____ Yes, de jure
- (2) _____ Yes, de facto
- (3) _____ No, they exercise neither de facto nor de jure rights
- (4) _____ No, but they have de jure rights
- (-1) _____ MIC
- _____ CL

B5. Do members of this subgroup exercise the right to decide who can be excluded from particular zones within the resource? <EXCLUDIN>

- (1) _____ Yes, de jure
- (2) _____ Yes, de facto
- (3) _____ No, they exercise neither de facto nor de jure rights
- (4) _____ No, but they have de jure rights
- (-1) _____ MIC
- _____ CL

B6. Do members of this subgroup exercise the separable right of transfer to the flow of units from this resource? (e.g. in irrigation, the separable right means that the right to the flow can be sold apart from ownership of land.) <TRANFLOW>

- (1) _____ Yes, de jure
- (2) _____ Yes, de facto
- (3) _____ No, they exercise neither de facto nor de jure rights
- (4) _____ No, but they have de jure rights
- (-1) _____ MIC
- _____ CL

LEGAL RIGHTS

B7. Do members of this subgroup exercise the separable right of transfer to shares of this appropriation resource, or closely related production and/or distribution resources? <TRANSHAR>

- (1) ☐ Yes, de jure
- (2) ☐ Yes, de facto
- (3) ☐ No, they exercise neither de facto nor de jure rights
- (4) ☐ No, but they have de jure rights
- (-1) ☐ MIC
- ☐ CL

B8. Do members of this subgroup exercise the separable right of transfer to shares of major appropriation equipment (e.g. boats, beachseines), which are necessary to engage in appropriation? <EQIPSHAR>

- (1) ☐ Yes, de jure
- (2) ☐ Yes, de facto
- (3) ☐ No, they exercise neither de facto nor de jure rights
- (4) ☐ No, but they have de jure rights
- (-1) ☐ MIC
- ☐ CL

STAKES AND RESOURCES

C. STAKES AND RESOURCES

C1. The length of time this subgroup has regularly appropriated from this resource is: <LGTHUSE>

- (1) ☐ Less than one year
- (2) ☐ 1 thru 10 years
- (3) ☐ 11 thru 25 years
- (4) ☐ 26 thru 50 years
- (5) ☐ 51 thru 75 years
- (6) ☐ 76 thru 100 years
- (7) ☐ 101 thru 200 years
- (8) ☐ 201 thru 300 years
- (9) ☐ 301 thru 500 years
- (10) ☐ 501 to 1000 years
- (11) ☐ More than 1000 years
- (-1) ☐ MIC
- ☐ CL

C2. The proportion of this subgroup who reside in or adjacent to this resource: <RESIDENT>

- (1) ☐ Less than 10%
- (2) ☐ 10%-25%
- (3) ☐ 26%-50%
- (4) ☐ 51%-75%
- (5) ☐ 76%-90%
- (6) ☐ 91%-100%
- (-1) ☐ MIC
- ☐ CL

STAKES AND RESOURCES

C3. In general, about how many offspring of the members of this group become appropriators of this resource when they are adults: <OFFSPRNG>

- (1) _____ One child of each appropriator
- (2) _____ Several children of each appropriator
- (3) _____ For some appropriators in this group, no children will become appropriators
- (-1) _____ MIC
- _____ CL

C4a. Estimate the amount of time needed to build or to earn enough income to purchase the equipment for an appropriation team: <TEAMCAP>

- (1) _____ 0 days thru 6 days
- (2) _____ 1 week thru 1 month
- (3) _____ 2 months thru 3 months
- (4) _____ 4 months thru 5 months
- (5) _____ one half year to one year
- (6) _____ more than one year of work
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C4b. If the author listed the dollar amount required to set up an appropriation team, post it here: <\$AMOUNT> _____
Approximate year of estimate: <CAPDATE> _____

If given in another currency, enter amount here, indicate currency and the approximate date: _____ <OTHCURR> _____ <CAPDATE>

C5. Does the amount of capital required to set up an appropriation team, given the assets of members of this subgroup, place pressure upon the appropriators to get immediate returns from appropriation? <KPRESURE>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C6. For most people in this subgroup, how dependent are they on this resource as a major source of family income? <FAMINCDE>

- (1) _____ very dependent (most of the family income)
- (2) _____ moderately dependent (about half of the family income)
- (3) _____ slightly dependent (a small part of the family income)
- (-1) _____ MIC
- _____ CL

STAKES AND RESOURCES

C7. What proportion of this subgroup works a substantial amount of time in activities not associated with appropriation from this resource?
<SUBNOT>

- (1) _____ Less than 10%
- (2) _____ 10% - 25%
- (3) _____ 26% - 50%
- (4) _____ 51% - 75%
- (5) _____ 76% - 90%
- (6) _____ 91% - 100%
- (-1) _____ MIC
- _____ CL

C8. What proportion of this subgroup currently appropriates similar units from other resources? <SUBSIM>

- (1) _____ Less than 10%
- (2) _____ 10% - 25%
- (3) _____ 26% - 50%
- (4) _____ 51% - 75%
- (5) _____ 76% - 90%
- (6) _____ 91% - 100%
- (-1) _____ MIC
- _____ CL

C9. Given the economy of this location, is the average annual family income (including all non-monetary forms of income) of this subgroup:
<AVERINC>

- (1) _____ Very low
- (2) _____ Low
- (3) _____ Average
- (4) _____ High
- (5) _____ Very high
- (-1) _____ MIC
- _____ CL

C10. The variance of the average annual family income across families in this subgroup is: <SUBVAR>

- (1) _____ Low
- (2) _____ Moderate
- (3) _____ High
- (-1) _____ MIC
- _____ CL

C11. The variance over time of the average annual family income in this subgroup is: <LONGVAR>

- (1) _____ Low
- (2) _____ Moderate
- (3) _____ High
- (-1) _____ MIC
- _____ CL

STAKES AND RESOURCES

C12. What proportion of this group owns land or capital? <ASSETS>

- (1) _____ Less than 10%
- (2) _____ 10%-25%
- (3) _____ 26%-50%
- (4) _____ 51%-75%
- (5) _____ 76%-90%
- (6) _____ 91%-100%
- (-1) _____ MIC
- _____ CL

C13. What is the cost of alternative sources of supply for this unit for this subgroup? <ALTSUPPLY>

- (1) _____ Low cost alternatives are available
- (2) _____ Moderate cost alternatives are available
- (3) _____ High cost alternatives are available
- (4) _____ No real alternative is available
- (-1) _____ MIC
- _____ CL

POTENTIAL ACTIONS

D. POTENTIAL ACTIONS AND LEVELS OF CONTROL

D1. If there are multiple subgroups using this resource, do most of the appropriators of this subgroup withdraw units from this resource:
<SUBWHERE>

- (1) _____ Where the flow of units first enters into the resource (i.e. headenders)
- (2) _____ After one or more other subgroups have withdrawn
- (3) _____ After all other subgroups have withdrawn (i.e. tailenders)
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

D2. If this subgroup were to (drastically) reduce its appropriation activities would this have noticeable impact on the balance of the quantity of units withdrawn and the number of units available in this resource? <OLSON>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

D3. For the following three questions, keeping in mind the physically available levels of withdrawal that are possible from this resource, to what extent do the rules in use constrain appropriation?

POTENTIAL ACTIONS

D3a. The rules in use with regard to technology limit the range of choice for this subgroup: <RULTECHC>

- (1) _____ Heavily
- (2) _____ Moderately
- (3) _____ Lightly
- (-1) _____ MIC
- (-2) _____ NA (no rules)
- _____ CL

D3b. The rules in use with regard to time limit the range of choice for this subgroup: <RULTIMEC>

- (1) _____ Heavily
- (2) _____ Moderately
- (3) _____ Lightly
- (-1) _____ MIC
- (-2) _____ NA (no rules)
- _____ CL

D3c. The rules in use with regard to quantity limit the range of choice for this subgroup: <RULQUANC>

- (1) _____ Heavily
- (2) _____ Moderately
- (3) _____ Lightly
- (-1) _____ MIC
- (-2) _____ NA (no rules)
- _____ CL

D4. How large is the immediate return which could be obtained by increasing levels of appropriation? <MARGVALU>

- (1) _____ Marginal units have high values
- (2) _____ Marginal units have moderate values
- (3) _____ Marginal units have low values
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

TECHNOLOGY

E. TECHNOLOGY USED BY THIS SUBGROUP

E1. Other than the possible change at the beginning of this action situation, when was the most recent technological change experienced by this subgroup? <TECHTIME>

- (1) _____ Less than one year
- (2) _____ 1 thru 10 years
- (3) _____ 11 thru 25 years
- (4) _____ 26 thru 50 years
- (5) _____ 51 thru 75 years
- (6) _____ 76 thru 100 years

TECHNOLOGY

- (7) _____ 101 thru 200 years
- (8) _____ 201 thru 300 years
- (9) _____ 301 thru 500 years
- (10) _____ 501 to 1000 years
- (11) _____ More than 1000 years
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

E1a. Considering other technologies that have not changed, how long have they been in use? <TECHUSED>

- (1) _____ Less than one year
- (2) _____ 1 thru 10 years
- (3) _____ 11 thru 25 years
- (4) _____ 26 thru 50 years
- (5) _____ 51 thru 75 years
- (6) _____ 76 thru 100 years
- (7) _____ 101 thru 200 years
- (8) _____ 201 thru 300 years
- (9) _____ 301 thru 500 years
- (10) _____ 501 to 1000 years
- (11) _____ More than 1000 years
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

E2. Does the appropriative power of the technology as used by members of this subgroup threaten the balance between units withdrawn and units available even if no new users were added? <TECHEXTR>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

STRATEGIES ADOPTED

F. STRATEGIES ADOPTED BY THIS GROUP

F1. At the beginning of this period, is the rate of withdrawals of units for this subgroup: <USERATE1>

- (1) _____ Accelerating
- (2) _____ Increasing
- (3) _____ Remaining constant
- (4) _____ Decreasing
- (5) _____ Decelerating
- (-1) _____ MIC
- _____ CL

STRATEGIES ADOPTED

- F1a. If the author provides specific data about this question, please provide the evidence given within the case here:
- F2. At the end of this period, is the rate of withdrawals of units for this subgroup: <USERATE2>
- (1) _____ Accelerating
 - (2) _____ Increasing
 - (3) _____ Remaining constant
 - (4) _____ Decreasing
 - (5) _____ Decelerating
 - (-1) _____ MIC
 - _____ CL
- F2a. If the author provides specific data about this question, please provide the evidence given within the case here:
- F3. If the appropriation units are frequently used to produce other goods, what are these other goods? (Mark "0" for not produced, "1" for produced)
- F3a. For irrigation: <USES1>
- (1) _____ Paddy rice
 - (2) _____ Grains other than paddy rice
 - (3) _____ Legumes
 - (4) _____ Edible tree crops
 - (5) _____ Non-tree fruits and vegetables
 - (6) _____ Coffee, tea, cocoa, tobacco, spices, decorative
 - (7) _____ Fibers
 - (8) _____ Rubber, timber, other forest products
 - (9) _____ Fodder
 - (10) _____ Sugar cane/beets
 - (11) _____ Edible oils
 - (12) _____ Other
 - (-1) _____ MIC
 - (-2) _____ NA
 - _____ (here, indicate the number 1 thru 12 from above for the crop which was the more dominant)
- F3b. For grazing: <USES1>
- (1) _____ Cattle
 - (2) _____ Goats
 - (3) _____ Sheep
 - (4) _____ Horses and donkeys
 - (5) _____ Camels, llamas, alpacas, vicunas, guanacos
 - (6) _____ Reindeer and caribou

STRATEGIES ADOPTED

- (7) _____ Game/wildlife
- (8) _____ Other
- (-1) _____ MIC
- (-2) _____ NA
- _____ (here, indicate the number 1 thru 8 from above for the animals which were the more dominant)

F3c. For forestry: <USES1>

- (1) _____ Cattle
- (2) _____ Goats and sheep
- (3) _____ Game/Wildlife
- (4) _____ Yak, llama, horses
- (5) _____ Other animals
- (6) _____ Construction materials
- (7) _____ Paper and pulp
- (8) _____ Matchsticks
- (9) _____ Sports goods
- (10) _____ Medicines
- (11) _____ Handicrafts
- (12) _____ Silk
- (13) _____ Charcoal
- (14) _____ Processed food
- (15) _____ Energy
- (16) _____ Other
- (-1) _____ MIC
- (-2) _____ NA
- _____ (here, indicate the number 1 thru 16 from above for the dominant use)

F4. If the appropriation units are frequently used to produce other goods, what are these other goods? (Mark "0" for not produced, "1" for produced)

F4a. For irrigation: <USES2>

- (1) _____ Paddy rice
- (2) _____ Grains other than paddy rice
- (3) _____ Legumes
- (4) _____ Edible tree crops
- (5) _____ Non-tree fruits and vegetables
- (6) _____ Coffee, tea, cocoa, tobacco, spices, decorative
- (7) _____ Fibers
- (8) _____ Rubber, timber, other forest products
- (9) _____ Fodder
- (10) _____ Sugar cane/beets
- (11) _____ Edible oils
- (12) _____ Other
- (-1) _____ MIC
- (-2) _____ NA
- _____ (here, indicate the number 1 thru 12 from above for the crop which was the more dominant)

STRATEGIES ADOPTED

F4b. For grazing: <USES2>

- (1) _____ Cattle
- (2) _____ Goats
- (3) _____ Sheep
- (4) _____ Horses and donkeys
- (5) _____ Camels, llamas, alpacas, vicunas, guanacos
- (6) _____ Reindeer and caribou
- (7) _____ Game/wildlife
- (8) _____ Other
- (-1) _____ MIC
- (-2) _____ NA
- _____ (here, indicate the number 1 thru 8 from above for the animals which were the more dominant)

F3c. For forestry: <USES2>

- (1) _____ Cattle
- (2) _____ Goats and sheep
- (3) _____ Game/Wildlife
- (4) _____ Yak, llama, horses
- (5) _____ Other animals
- (6) _____ Construction materials
- (7) _____ Paper and pulp
- (8) _____ Matchsticks
- (9) _____ Sports goods
- (10) _____ Medicines
- (11) _____ Handicrafts
- (12) _____ Silk
- (13) _____ Charcoal
- (14) _____ Processed food
- (15) _____ Energy
- (16) _____ Other
- (-1) _____ MIC
- (-2) _____ NA
- _____ (here, indicate the number 1 thru 16 from above for the dominant use)

F5. During this time period, have members of this group invested their own labor or other resources in maintaining or improving the structure of the appropriation resource? <OWNLABOR>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- _____ CL

STRATEGIES ADOPTED

F6. During this time period, have members of this group invested their own labor or other resources in constructing or improving production and/or distribution works for maintaining or improving the appropriation resource? <ENHANCE>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA (production, distribution, and appropriation are the same resource)
- ☐ CL

F7. During this time period, have members of this group expended resources (at least their own time) to avoid actions that would harm the structure of the appropriation resource (e.g. fishermen who bring fuel tanks back to the harbour for disposal rather than disposing them at less cost in the sea, or irrigators who fence their animals or assign someone to watch them so that they do not destroy irrigation works)? <AVOIDHRM>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- ☐ CL

F8. Is the amount of maintenance or improvement work contributed by members of this group dependent or contingent on the quantity of units appropriated by members of this group? <MAINCONT>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

F9. Do the members of this group have access to an alternative source of supply of this unit? <SUBALT1>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

F9a. During this time period, have the members of this group increased their use of alternative sources of supply of this unit? <SUBALT2>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

STRATEGIES ADOPTED

F10. Has any member of this group assumed entrepreneurial activity in trying to achieve coordinated strategies: <ENTACT>

- (1) _____ No
- (2) _____ Yes, in relationship to withdrawal of appropriation units
- (3) _____ Yes, in relationship to investment or maintenance
- (4) _____ Yes, in relationship to both withdrawal and investment
- (5) _____ Other _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F11. Characterize the usual behavior of the members of this subgroup with respect to local operational level rules-in-use related to the appropriation process from this resource in years other than extreme shortage: <RULEFOLL>

- (1) _____ Almost all members follow the rules
- (2) _____ Most members follow the rules
- (3) _____ About half of the members follow the rules
- (4) _____ Most members do not follow the rules
- (5) _____ Almost all members do not follow the rules
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F11a. Is the level of infraction of those members of the group who are not rule followers usually: <RULEBRAK>

- (1) _____ Small
- (2) _____ Medium
- (3) _____ Large
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F12. Has this subgroup proposed action in a collective-choice or constitutional-choice arena to alter the operational or collective-choice rules affecting the appropriation from this resource? <PRONURUL>

- (1) _____ No
- (2) _____ Yes, collective choice arena
- (3) _____ Yes, constitutional-choice arena
- (4) _____ Yes, both
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

STRATEGIES ADOPTED

F13. Have members of this subgroup threatened, or actually used, violence to attempt to alter the behavior of other appropriators? (Mark "1" for those reasons which apply, "0" for those which don't apply) <VIOLENC1>

- (1) ☐ Yes, primarily to enforce compliance with existing rules
- (2) ☐ Yes, primarily to obtain a more favorable situation, regardless of the rules
- (3) ☐ Yes, primarily to try to get the rules changed
- (4) ☐ Other: _____
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

F14. Have members of this subgroup threatened, or actually used, violence to attempt to alter the behavior of officials? (Mark "1" for those reasons which apply, "0" for those which don't apply) <VIOLENC2>

- (1) ☐ Yes, primarily to enforce compliance with existing rules
- (2) ☐ Yes, primarily to obtain a more favorable situation, regardless of the rules
- (3) ☐ Yes, primarily to try to get the rules changed
- (4) ☐ Other: _____
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

RESULTS

G. RESULTS FOR THIS SUBGROUP

G1. Of the total number of units appropriated from this resource, what is the percentage this subgroup appropriates at the end of this period: <SHARE%>

- (1) ☐ Less than 10%
- (2) ☐ 10%-25%
- (3) ☐ 26%-50%
- (4) ☐ 51%-75%
- (5) ☐ 76%-90%
- (6) ☐ 91%-100%
- (-1) ☐ MIC
- ☐ CL

G2. By the end of this time period, has this percentage the group appropriates from this resource: <SHARCHNG>

- (1) ☐ Become larger
- (2) ☐ Remained approximately constant
- (3) ☐ Become smaller
- (-1) ☐ MIC
- ☐ CL

RESULTS

G3. Has the absolute quantity of appropriation units obtained by this group: <ABSOQUAN>

- (1) _____ Become larger
- (2) _____ Remained approximately constant
- (3) _____ Become smaller
- (-1) _____ MIC
- _____ CL

Operational Rules Coding Form

This form is designed to provide information about the operational-level rules, particular to a single subgroup who appropriates from this resource. This form is subgroup specific.

The questions on this form, what is being asked is "what are the rules", not "what is the behavior". Rules are human-made prescriptions and proscriptions, but they may not be followed or observed exactly as they are written or understood.

This form has a variable list sorted alphabetically.

The remainder of this page has intentionally been left blank

DRAFT

CODING INSTRUCTIONS

OPERATIONAL RULES CODING FORM

by

Edella Schlager

- General Notes:
- (1) This form is designed to provide information about the operational-level rules, particular to a single subgroup who appropriates from this resource. This form is subgroup specific. The operational level describes the arena of action of appropriators and others in their interaction with the appropriation resource. Operational level excludes the level of action wherein people organize and act to take collective decisions concerning the rules for action and the structure of their relations with one another. That level is collective choice and there are other forms to deal with it. In addition, the operational level excludes the level of action wherein people organize and act to frame rules for the taking of collective decisions. That level is constitutional choice. This form focuses only on the rules which affect, prescribe, and constrain the direct actions of individuals as they interact with the appropriation resource.
- (2) In answering questions on this form, be especially conscious that what is being asked is "what are the rules", not "what is the behavior". Rules are human-made prescriptions and proscriptions, but they may not be followed or observed exactly as they are written or understood. Human beings are certainly capable of ignoring, misunderstanding, and violating rules. When you encounter a question such as "Are users required...", respond with respect to whether or not there is such a rule, and not with respect to the degree of its enforcement or of individuals' compliance.

Section A. Processing Information

General Information.

- (1) Operational level rules may originate from several sources. When answering the questions about what are the rules, you will also have to identify the sources. These sources include national collective choice, regional collective choice, local collective choice, and rules-in-use.
- (2) National, regional, and local collective choice processes may include a variety of organizations or institutions, from agencies and ministries to representative assemblies. For this

form it does not matter which agency or organization at a particular level adopted the rule. What does matter is the level of collective choice process from which the rule originated. Sometimes it is not easy to distinguish between local collective choice and rules-in-use. An organization of appropriators should be coded as local collective choice when the appropriators within the organization meet together as a body to discuss the appropriation resource; when they follow rules about how operational level rules are devised and adopted; when they have agreed upon sanctions for rule violations. The organization may or may not have officers, but it must have some type of structure, and adoption of rules must be self-conscious. We do not consider groups of appropriators who have evolved coordinated strategies to be engaged in collective choice processes, rather their strategies should be considered rules-in-use.

(3) Rules-in-use are the rules that the members of this subgroup are using in practice, rather than formal rules that may be written about the rights and duties of the members of this subgroup. Rules-in-use include those rules that appropriators have evolved over long periods of time. In other words, the appropriators never met as a group and self-consciously adopted the rules. Rather the appropriators coordinated their actions, and now that is how things are done. Another way to think of rules-in-use is to imagine the rules-in-use to be those working rules that older members of this appropriation subgroup tell to their children as the way that things work related to this resource.

(4) Deontic Reponse Categories.

N= Use N when neither the appropriators nor collective choice processes use or have adopted such a rule. For example, under Boundary Rules, if the concept of caste is alien to the appropriators the response for B2f. is N.

R= Use R only when a specific action or attribute is required. The person must act in a particular way or must possess a particular attribute.

P= Use P when an action or attribute is permitted. Appropriators may or they may not engage in a particular action, however, that action is permitted. Remember that rules about behavior, not actual behavior, is being coded in this form. Just because appropriators take a particular action does not mean that action is permitted. If the action or attribute is not specifically required or specifically forbidden then it is permitted.

F= Use F only when a particular act or attribute is forbidden. A person must not possess a particular attribute or must not engage in a particular act.

?= Use ? only when you do not have sufficient information to determine whether the attribute, action or condition is required, not required, forbidden, or simply not used.

S= Use S only when a set of actions/attributes exist in which one or more of the actions are required. For example, if in Boundary Rules, to gain access to a resource an individual must either live in a local community (B2c.) or pay a fixed entry fee (B2l.), if he or she must only meet one of the requirements then you would mark S in B2l and B2c. Remember, S should never appear in isolation. It is used to identify a set of actions/attributes.

Section B. Boundary Rules

Question B1. "Is the default condition"

Only answer yes if no rules exist that define who may be an appropriator. This is very different from (-1) in which rules exist but no information is provided about them.

Question B2. "Requirements individuals must meet"

Place the appropriate deontic operator in each blank. You need only complete the columns for which in Section A you said existed and that information was provided concerning operational level rules.

Question B2z*. "Other"

If you know that no other boundary rules exist use N, otherwise use ?.

Question B3. "If an entry fee or license is required..."

For this question NA means that no licenses or entry fees are required or permitted and therefore this question is not applicable. MIC means that entry fees or licenses are required or permitted and that you do not know whether or not an upper limit exists. If you know that no upper limit exists then answer (1).

Question B4. "sum of fees"

no special instructions

Question B5. "sum of fees"

no special instructions

Question B6. "are the fees the same"

no special instructions

Question B7. "entry rights transmitted through inheritance"

Entry rights refer to the rights of access and how they have been translated into operational use through boundary rules. Answer (1) is not to be used casually. In other words, it is not a miscellaneous category. If it is not possible to write a

will or if inheritance rules are ambiguous then use (1). Answer (6) refers to specific rules which give individuals considerable discretion in deciding who to transmit property to.

Question B8. "entry rights transmitted within one generation"

no special instructions

Question B8a. "Transfer on a temporary or permanent basis"

no special instructions

Question B9. "unequal privileges"

no special instructions

Section C. Authority and Scope Rules.

Question C1. "Are the default conditions..."

Remember the difference between no rules and no information about rules.

Question C2. "Specify the number of cycles"

Cycles refers to the number of rule sets the appropriators utilize from period to period. for example, in irrigation...[Help Tang!]

Question C3. "More than one set of rules..."

No specific instructions

Question C4. "The assignment procedure for withdrawing units"

This matrix is somewhat different than the one in B2. Here you are not only asked from which collective choice mechanism the rule arose, but also the basis for the rule. The basis describes the underlying mechanism which activates the rule. For example, the rule may be C4g. "withdraw at specific locations/spots". The basis may be m--a periodic lottery. In other words, fishermen can withdraw only at specific locations and how those locations are divided among the fishermen is based on a lottery.

The deontic operators are the same as in B2, however, no basis is required with ? or N.

Remember once again that rules are being coded in this form, not behavior. For example, C4e. "withdraw only during specific seasons" refers to a rule, not the behavior of the appropriators, or the physical constraints they may face. If the appropriators only withdraw during certain seasons because they face physical constraints that is not a rule.

Question C4b. "Withdraw up to a fixed percentage"

The basis can never be r "quantity of units withdrawn".

Question C4d. "Withdraw at a fixed time slot"

This rule entails a time dimension. Appropriators can only withdraw units during specific periods of time. This is in contrast to C4f "withdraw in a fixed order". C4f does not entail a time dimension. You may encounter cases in which appropriators are required to withdraw during fixed time slots and take turns doing so, in which case you would mark both C4d and C4f as required.

Question C4h. "Withdraw whenever and wherever"

If any rules exist that regulate appropriation then C4h must be marked F. (That's a rule).

Question C4j. "Other"

If no other scope/authority rules are used mark N, or if you do not know mark ?.

Question C5. "Answer to row e"

no special instructions

Question C6. "Substantially unequal privileges"

no special instructions

Question C7. "Status of various types of input actions"

no special instructions

Question C7b. "Tax assessed periodically"

The tax may include money or commodities.

Question C7f. "Other"

If you know that no other input activities are required mark N; if you do not know mark ?

Question C8-C12 [Your turn Tang]

Section D. Information Rules.

Question D2. "Types of information in relation to the resource"

In referring to the matrix the columns are identical to those in the boundary rules section, ranging from (1) national legislative to (4) rules-in-use. In columns 1-4 the responses are one of the deontic categories. Column 5 is used to indicate who, if anyone, records the information. Use the responses given.

Question D2j. "Quantity of assets in use"

For irrigation this refers to the land cultivated. For grazing

this refers to the animals owned.

Question D2k. "Other"

same as the other others

Section E. Payoff Rules.

Question E2. "Is incarceration a penalty"

no special instructions

Question E3. "Can fines be imposed"

Fines may be either money or commodities.

Question E4. "Lose their entry or appropriation rights"

no special instructions

Question E5. "Severe community shunning"

no special instructions

Question E6. "external aid...appropriation technologies"

external aid includes technical advice, grants, or low interest loans

Question E7. "repair production, distribution, appropriation"

no special instructions

Question E8. "technologies for using resource units"

no special instructions

Question E9. "price support contracts"

no special instructions

Question E10a. "unequal rewards"

no special instructions

Question E10b. "unequal punishments"

no special instructions

Question E11. "Specify the number of different"

Indicate the number of different arrangements that exist to divide the appropriation units among team members.

Question E12. "If there are more than one..."

no special instructions

Question E13. "set percentage"

Each question refers to a particular position, and asks what percentage the position as a whole receives of the units. The questions do not ask what each individual holding each position receives. For example, if appropriators fish in teams of four, with each fisherman owning equal shares of appropriation equipment and the fishers split the catch among themselves then 100% would be placed in E13b. That is, the entire catch goes to the position of owner.

Primary appropriation equipment in the case of fisheries entails boat, canoes, etc. Supplementary appropriation equipment in the case of fisheries entails nets, lines and hooks, etc.

Question E14. "If the ownership of the primary..."

In describing a system of share of appropriation equipment indicate the maximum and minimum number of shares an individual may own, whether and how these shares are transferable, and how shares in equipment translate into shares of appropriated units. Also sometimes the author does not provide enough information to fill out the E13 questions. If that is the case provide whatever information the author gives in relation to the division of units.

Question E15. "If wage laborers are used..."

no special instructions

Question E16. "If any position holds property rights..."

no special instructions

Section F. Aggregation Rules

no special instructions

Section G. Overall Questions About Rule Configuration

no special instructions

Well people I have nothing more to say. Please add whatever is necessary. Also we need to discuss how much of the description in the form should be incorporated into the manual.

VARLIST OPERATIONAL RULES "U"
Alphabetical

<ADJOINFD>	<UC11>	If labor force is organized in small teams, is each team formed by individuals who farm adjoining fields?
<AGE>	<UB2s>	What requirements must individuals meet before appropriating from this resource in regards to age as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<AGRRULE>	<UF1a>	If there is an aggregation rule relevant to the operational level, what is it?
<APPMONIT>	<UD2g>	Is the monitoring that is done by individual appropriators required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<APPRIGHT>	<UD2i>	Are rights and duties of the appropriators required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<APPRTAX>	<UC7b>	What is the status of tax assessed periodically related to appropriation from the resource as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<APPWORK>	<UD2f>	Is maintenance work done by appropriators required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<AUCTION>	<UB2y>	What requirements must individuals meet before appropriating from this resource in regards to the purchasing of access rights in an auction as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<A1OTHER>	<UC4j>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource in to other authority and scope rules by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<A2OTHER>	<UC7f>	What is the status of other various types of input actions or activities as determined by national,

		regional, or local constitutional or collective decisions or appropriator rules-in-use?
<BEGDATE>	<UA>	What is the approximate beginning date for this operational rules form?
<BOTHER>	<UB2z*>	What requirements must individuals meet before appropriating from this resource in regards to any other boundary rule as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CAPINV>	<UC7e>	What is the status of labor, money, or materials to be used for major capital investment as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CASTE>	<UB2f>	What requirements must individuals meet before appropriating from this resource in regards to membership in a caste as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CITCOUNT>	<UB2b>	What requirements must individuals meet before appropriating from this resource in regards to citizenship of a country as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CITLOCAL>	<UB2d>	What requirements must individuals meet before appropriating from this resource in regards to citizenship or residence of a local community as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CITSUBDI>	<UB2c>	What requirements must individuals meet before appropriating from this resource in regards to citizenship of a major subdivision of a country as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CLAGGR>	<UF1a>	What is the confidence level for the entire Aggregation Rules Section?
<CLAN>	<UB2e>	What requirements must individuals meet before appropriating from this resource in regards to membership in a clan as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CLASS>	<UB2h>	What requirements must individuals meet before appropriating from this resource in regards to membership in a class as determined by national, regional, or local constitutional or collective

		decisions or appropriator rules-in-use?
<CLAUTH>	<UC1a>	What is the confidence level for the entire Authority and Scope Rules Section?
<CLBOUND>	<UB1a>	What is the confidence level for the entire Boundary Rules Section?
<CLEAR>	<UG4b>	Are the rules-in-use clear as to what constitutes rule conforming and rule breaking behavior?
<CLINF>	<UD1a>	What is the confidence level for entire Information Rules Section?
<CLPAY>	<UE1a>	What is the confidence level for entire Payoff Rules Section?
<CONDRES>	<UD2d>	Is the condition of the resource required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<CONUSAGE>	<UB2t>	What requirements must individuals meet before appropriating from this resource in regards to continuing usage of entry rights as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<DEFAGGR>	<UF1>	Is the default condition for aggregation rules applicable?
<DEFAUTH>	<UC1>	Are the default conditions for both authority and scope rules applicable?
<DEFBOUND>	<UB1>	Is the default condition for boundary rules applicable?
<DEFINF>	<UD1>	Is the default condition for information rules applicable?
<DEFPAY>	<UE1>	Is the default condition for payoff rules applicable?
<DEMSKILL>	<UB2u>	What requirements must individuals meet before appropriating from this resource in regards to demonstration of knowledge or skills as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<EASYUND>	<UG4a>	Are the rules-in-use easy to understand by the appropriators?
<ELABSUBS>	<UC9>	If labor input for maintenance is required, can the input be substituted by other means?
<ELIGIBLE>	<UB2x>	What requirements must individuals meet before appropriating from this resource in regards to

		registration on an eligibility list as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<EMERGLAB>	<UC7d>	What is the status of labor input for emergency repair as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<ENDDATE>	<UA>	What is the approximate end date for this operational rules form?
<ENTRYFEE>	<UB21>	What requirements must individuals meet before appropriating from this resource in regards to the payment of a fixed entry fee as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<EQSHARED>	<UE14>	If the ownership of the primary or supplemental appropriation equipment is itself divided into shares, please describe this share system. In addition, if any other share arrangement is in force, please describe.
<ETHNIC>	<UB2g>	What requirements must individuals meet before appropriating from this resource in regards to membership in an ethnic group as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<EXTAID1>	<UE6>	Can appropriators obtain external aid to develop their appropriation technologies?
<EXTAID2>	<UE7>	Can appropriators obtain external aid to develop and/or repair their production, distribution, or appropriation resources?
<EXTAID3>	<UE8>	Can appropriators obtain external aid to develop technologies for using the resource units?
<FAIR>	<UG4d>	Are the rules-in-use perceived by members of this subgroup as fair?
<FINES>	<UE3>	Can fines be imposed on appropriators for breaking rules related to the appropriation of this resource?
<FIXNUM>	<UC4c>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource up to a FIXED NUMBER of units during a period by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<FIXORDER>	<UC4f>	What is the assignment procedure (and relevant basis) for withdrawing units from this

appropriation resource in a FIXED ORDER by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?

<FIXPERC>	<UC4b>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource up to a FIXED PERCENTAGE of total number of units available during a period by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<FIXTIME>	<UC4d>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource at a FIXED TIME SLOT by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<FLEXIBLE>	<UG4c>	Are the rules-in-use flexible in dealing with times of emergency or unusual problems facing particular members of the subgroup?
<FREEWITH>	<UC4h>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource WHENEVER and WHEREVER DESIRED by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<GENDER>	<UB2q>	What requirements must individuals meet before appropriating from this resource in regards to gender as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<HOWTRAN>	<UG3a>	How is knowledge about the rules-in-use transmitted from one generation of appropriators to another?
<INCARCER>	<UE2>	Is incarceration a penalty that can be imposed on appropriators for breaking rules related to the appropriation of this resource?
<IOTHER>	<UD2k>	What other types of information in relation to the resource are required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<LABORG>	<UC10>	If labor input for maintenance is required, how is the labor force organized most of the time?
<LEGITIM>	<UG4e>	Are the rules-in-use perceived by members of this subgroup as legitimate?

<LEVEDUC>	<UB2p>	What requirements must individuals meet before appropriating from this resource in regards to completion of particular level of education as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<LICENSE>	<UB2a*>	What requirements must individuals meet before appropriating from this resource in regards to the obtaining of a license for entry or for required equipment as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<LICLIMIT>	<UB3>	If an entry fee or license is required or permitted, is there an upper limit on the number of licenses that can be issued?
<LOCCOLCH>	<UA3>	How much information does the author (or another authoritative source) provide about local collective choice mechanisms?
<LOSEENTR>	<UE4>	Is it possible for appropriators to lose their entry or appropriation rights for breaking rules related to the appropriation of this resource?
<LOTTERY>	<UB2z>	What requirements must individuals meet before appropriating from this resource in regards to the obtaining of access rights through lottery as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<MAINTLAB>	<UC7c>	What is the status of labor input for maintenance as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<MINSIZE>	<UC4i>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource only units of AT LEAST CERTAIN SIZE by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<NARRANGE>	<UE11>	What is the number of different arrangements for payoff rules?
<NATCOLCH>	<UA1>	How much information does the author (or another authoritative source) provide about national collective choice mechanisms?
<NCYCLES>	<UC2>	What is the number of cycles coded for authority and scope rules?
<NOSETPER>	<UE16>	If any position holds property rights to the residual profit other than through a set

percentage, please describe.

<NUMUNIT>	<UD2b>	Are number of units withdrawn required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<ORGANIZA>	<UB2i>	What requirements must individuals meet before appropriating from this resource in regards to membership in an organization as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<OWNAPPRO>	<UB2o>	What requirements must individuals meet before appropriating from this resource in regards to ownership of some other form of limited property related to the appropriation from this resource as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<OWNLAND>	<UB2n>	What requirements must individuals meet before appropriating from this resource in regards to ownership or leasing of land in the location as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<OWNRIGHT>	<UB2k>	What requirements must individuals meet before appropriating from this resource in regards to ownership or leasing of rights to a certain proportion of the flow as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<PERPOS11>	<UE13a>	What is the first arrangement for the set percentage that is assigned to each individual position for owner(s) (non-operator(s)) of primary appropriation equipment?
<PERPOS12>	<UE13a>	What is the second arrangement for the set percentage that is assigned to each individual position for owner(s) (non-operator(s)) of primary appropriation equipment?
<PERPOS13>	<UE13a>	What is the third arrangement for the set percentage that is assigned to each individual position for owner(s) (non-operator(s)) of primary appropriation equipment?
<PERPOS21>	<UE13b>	What is the first arrangement for the set percentage that is assigned to each individual position for owner(s)-operator(s) of primary appropriation equipment?
<PERPOS22>	<UE13b>	What is the second arrangement for the set percentage that is assigned to each individual

position for owner(s)-operator(s) of primary appropriation equipment?

<PERPOS23> <UE13b> What is the third arrangement for the set percentage that is assigned to each individual position for owner(s)-operator(s) of primary appropriation equipment?

<PERPOS31> <UE13c> What is the first arrangement for the set percentage that is assigned to individual position for owner(s) (non-operator(s)) of supplementary appropriation equipment?

<PERPOS32> <UE13c> What is the second arrangement for the set percentage that is assigned to individual position for owner(s) (non-operator(s)) of supplementary appropriation equipment?

<PERPOS33> <UE13c> What is the third arrangement for the set percentage that is assigned to individual position for owner(s) (non-operator(s)) of supplementary appropriation equipment?

<PERPOS41> <UE13d> What is the first arrangement for the set percentage that is assigned to individual position for owner(s)-operator(s) of supplementary appropriation equipment?

<PERPOS42> <UE13d> What is the second arrangement for the set percentage that is assigned to individual position for owner(s)-operator(s) of supplementary appropriation equipment?

<PERPOS43> <UE13d> What is the third arrangement for the set percentage that is assigned to individual position for owner(s)-operator(s) of supplementary appropriation equipment?

<PERPOS51> <UE13e> What is the first arrangement for the set percentage that is assigned to individual position for crew with special assets (including non-owner captain)?

<PERPOS52> <UE13e> What is the second arrangement for the set percentage that is assigned to individual position for crew with special assets (including non-owner captain)?

<PERPOS53> <UE13e> What is the third arrangement for the set percentage that is assigned to individual position for crew with special assets (including non-owner captain)?

<PERPOS61> <UE13f> What is the first arrangement for the set percentage that is assigned to individual position for regular crew (each)?

<PERPOS62>	<UE13f>	What is the second arrangement for the set percentage that is assigned to individual position for regular crew (each)?
<PERPOS63>	<UE13f>	What is the third arrangement for the set percentage that is assigned to individual position for regular crew (each)?
<PERPOS71>	<UE13g>	What is the first arrangement for the set percentage that is assigned to individual position for others (what is this position)?
<PERPOS72>	<UE13g>	What is the second arrangement for the set percentage that is assigned to individual position for others (what is this position)?
<PERPOS73>	<UE13g>	What is the third arrangement for the set percentage that is assigned to individual position for others (what is this position)?
<PHYSFACT>	<UD2h>	Are physical factors affecting the resource required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<PRICESUP>	<UE9>	Are appropriators party to price support contracts or guaranteed purchase agreements for the selling of resource units or commodities produced by resource units?
<QASSETS>	<UD2j>	Is the quantity of assets in use required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<QUALUNIT>	<UD2c>	Are quality of units withdrawn required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<RACE>	<UB2r>	What requirements must individuals meet before appropriating from this resource in regards to race as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<REGCOLCH>	<UA2>	How much information does the author (or another authoritative source) provide about regional collective choice mechanisms?
<RTRANS1>	<UB7>	How are entry rights transmitted through inheritance?
<RTRANS2>	<UB8>	How are entry rights transmitted WITHIN one generation of potential appropriators?

<RTRANS3>	<UB8a>	If transfer on a temporary or permanent basis is allowed, who determines to whom such rights can be transferred?
<RULEDUR>	<UG1>	Approximately how long has the general framework of the rules-in-use described above governed the activities of this subgroup?
<RULETRAN>	<UG3>	Does the author discuss how knowledge about the rules-in-use is transmitted from one generation of appropriators to another?
<RULSETSA>	<UC3>	If there are more than one set of rules, please explain briefly under what conditions they can be evoked or adopted, and in which periods, months, or years they are adopted/used.
<RULSETSB>	<UB10>	If there are more than one set of rules, under what conditions they can be evoked or adopted, and in which periods, months, or years they are adopted/used?
<RULSETSP>	<UE12>	If there is more than one arrangement, under what conditions does it apply?
<SAMEFEES>	<UB6>	If an entry fee or license is required or permitted, are the fees the same across all categories of applicants?
<SEASFEE>	<UB2m>	What requirements must individuals meet before appropriating from this resource in regards to the payment of a fixed seasonal fee as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SEASONLN>	<UC5>	Based on quantity of units withdrawn, if units are withdrawn only during specific seasons then how long is the length of the season?
<SHAREORG>	<UB2b*>	What requirements must individuals meet before appropriating from this resource in regards to ownership of shares in an organization as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SHARERES>	<UB2j>	What requirements must individuals meet before appropriating from this resource in regards to ownership of shares in the resource facility itself as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SHUNNING>	<UE5>	Is severe community shunning a sanction that may be consciously imposed on appropriators who break rules related to the appropriation of this appropriation resource?

<SPLOC>	<UC4g>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource at SPECIFIC LOCATIONS/SPOTS by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SPSEASON>	<UC4e>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource only DURING SPECIFIC SEASONS by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SUMFEES1>	<UB4>	If an entry fee or license is required or permitted, is the sum of the fees and or licenses low, moderate or high?
<SUMFEES2>	<UB5>	If an entry fee or license is required or permitted, is the sum of the fees and/or licenses low, moderate or high?
<UNEQDUTA>	<UC12>	Do the authority and scope rules assign substantially unequal duties to some subgroups than others?
<UNEQPRIA>	<UC6>	Do the authority and scope rules assign substantially unequal privileges to some subgroups than others?
<UNEQPRIB>	<UB9>	Do the boundary rules assign substantially unequal privileges to some subgroups than others?
<UNEQPUN>	<UE10b>	Do the payoff rules assign substantially unequal punishments to some subgroups than others?
<UNEQREW>	<UE10a>	Do the payoff rules assign substantially unequal rewards to some subgroups than others?
<UNITFLOW>	<UD2e>	Are appropriators' claims to the flow of units from the resource required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<UNITSUSE>	<UB2w>	What requirements must individuals meet before appropriating from this resource in regards to the purpose for which the withdrawn units will be devoted as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<USETECH>	<UB2v>	What requirements must individuals meet before appropriating from this resource in regards to use of a particular technology as determined by national, regional, or local constitutional or

collective decisions or appropriator rules-in-use?

- | | | |
|------------------------|---------------------|--|
| <p><WAGEUSE></p> | <p><UE15></p> | <p>If wage laborers are used in the team production process, please describe who hires, how wages are set, if wage earners are organized and other relevant factors.</p> |
| <p><WORKOWN></p> | <p><UC8></p> | <p>Are individuals required to work primarily on those parts of the resource(s) that can affect their own level of appropriation from the resource?</p> |
| <p><WRITTEN></p> | <p><UG2></p> | <p>Are the rules-in-use available in a written form to the appropriators?</p> |

Name of Case

Last Revised/Aug. 1, 1989
Doc 52

CPR PROJECT

OPERATIONAL RULES CODING FORM

PROCESSING INFORMATION

A. PROCESSING INFORMATION

Rules No.: _____
<OPRULEID>

Resource No. : _____
<RESOURID>

of this form in a series 1 2 3 4 5 6 7 8 9 10

Time Frame: please fill in the approximate beginning and end dates for this operational rules form. <BEGBDATE> _____ <ENDDATE> _____

The rules coding form will be used to code the rules affecting the operational level related to a particular subgroup. Where sufficient information is available, information will be coded about the rules-in-use of the appropriators as well as the rules established by local, regional, and/or national collective choice (or constitutional choice) mechanisms.

This form should be completed first for the largest subgroup of appropriators. For other groups, you will complete a form which enables you to state the CHANGES which should be made (if any) for that group.

Please indicate first the amount of information the author (or another authoritative source) provides about national sources of rules.

A1. National Collective Choice: <NATCOLCH>

- 1 _____ The author provides NO information about operational level rules as devised by national collective choice mechanisms (do not fill out any column 1s)
- 2 _____ There is a national level of government, but it does not exercise jurisdiction in relation to the type of resource appropriated by this subgroup
- 3 _____ The author provides a few detailed references to operational level rules as devised by national collective choice mechanisms which I have coded below.
- 4 _____ The author provides relatively full information about operational level rules as devised by national collective choice mechanisms which I have coded below.

PROCESSING INFORMATION

A2. Regional Collective Choice: <REGCOLCH>

- 1 _____ A regional level of government exists but the author provides NO information about operational level rules as devised by regional collective choice mechanisms
- 2 _____ There is a regional level of government, but it does not exercise jurisdiction in relation to the type of resource appropriated by this subgroup
- 3 _____ A regional level of government exists and author provides a few detailed references to operational level rules as devised by regional collective choice mechanisms which I have coded below.
- 4 _____ A regional level of government exists and author provides relatively full information about operational level rules as devised by regional collective choice mechanisms which I have coded below.
- 5 _____ There is no regional level of government with collective choice responsibilities (do not fill out any column 2's)

A3. Local Collective Choice: <LOCCOLCH>

- 1 _____ A level of government or organization of appropriators exists at the location but the author provides NO information about operational level rules as devised by collective choice mechanisms
- 2 _____ There is a local level of government or organization of appropriators, but it does not exercise jurisdiction in relation to the type of resource appropriated by this subgroup
- 3 _____ A level of government or organization of appropriators exists at the location and the author provides a few detailed references about operational level rules as devised by collective choice mechanisms which I have coded below
- 4 _____ A level of government or organization of appropriators exists at the location and the author provides relatively full information about operational level rules as devised by collective choice mechanisms which I have coded below
- 5 _____ There is no level of government or organization of appropriators at the location with operational level rules as devised by collective choice mechanisms (do not fill out any column 3)

Rules-In-Use

To code Column 4 for the questions below, keep in mind that these are the rules that the members in this subgroup are using in practice, rather than

PROCESSING INFORMATION

the formal rules that may have been written somewhere, about the rights and duties of the members of this subgroup. Imagine the rules-in-use to be those working rules that older members of this appropriation subgroup tell to their children as the way that things work related to this resource.

For each section of this form, the first question to be asked is whether a particular default condition should be considered as the applicable "rule-in-use". In other words, we have specified what the default rule would be if no one has evolved or designed a particular rule for this portion of the rule configuration.

For the matrices in sections B, C, and D:

The columns stand for sources of the rules in question. The sources include:

- (1) National constitutional or collective decisions
- (2) Regional constitutional or collective decisions
- (3) Local constitutional or collective decisions
- (4) Appropriator rules-in-use

The matrices should be filled in with the following deontic response categories:

- N = default condition (No rule in regard to this attribute, action, or condition)
- R = the attribute, action, or condition is specifically required
- P = the attribute, action, or condition is permitted
- F = the attribute, action, or condition is specifically forbidden
- ? = missing information (given the information we have about the remainder of the rule configuration from a particular source, we could not state whether the attribute, action or condition is required, not required, or forbidden).
- X = not applicable, that level of government or organization does not exist (use only for entire column)
- Y = not applicable, that level of government or organization does not have jurisdiction over the resource (use only for entire column)
- S = a set of attributes, actions, or conditions, at least one of which must be met

BOUNDARY RULES

B. BOUNDARY RULES

Boundary rules define what requirements must be fulfilled before individuals are eligible to harvest or withdraw units from the appropriation resource.

The default condition for boundary rules is that no rules are used to limit who can become an appropriator.

BOUNDARY RULES

B1. Is the default condition for boundary rules applicable? <DEFBOUND>

- (1) _____ Yes, skip to next section
- (2) _____ No, complete remainder of this section
- (-1) _____ No information about Boundary Rules, skip to next section

B1a. Confidence Level for entire Boundary Rules Section: _____ <CLBOUND>

B2. Please check off requirements that individuals must meet before appropriating from this resource.

	(1)	(2)	(3)	(4)
B2a. Overall response for the entire column, if any (could be N, ?)	_____	_____	_____	_____
B2b. Citizenship of a country <CITCOUNT>	_____	_____	_____	_____
B2c. Citizenship of a major sub-division of a country (e.g., U.S. state) <CITSUBDI>	_____	_____	_____	_____
B2d. Citizenship or residence of a local community <CITLOCAL>	_____	_____	_____	_____
B2e. Membership in a clan <CLAN>	_____	_____	_____	_____
B2f. Membership in a caste <CASTE>	_____	_____	_____	_____
B2g. Membership in an ethnic group <ETHNIC>	_____	_____	_____	_____
B2h. Membership in a class <CLASS>	_____	_____	_____	_____
B2i. Membership in an organization (e.g. a co-op) <ORGANIZA>	_____	_____	_____	_____
B2j. Ownership of shares in the resource facility itself (can be separated from land ownership) <SHARERES>	_____	_____	_____	_____
B2k. Ownership or leasing of rights to a certain proportion of the flow (can be separated from land ownership, and not associated with ownership of shares in the resource facility) <OWNRIGHT>	_____	_____	_____	_____
B2l. The payment of a fixed entry fee (every time) <ENTRYFEE>	_____	_____	_____	_____

BOUNDARY RULES

B2m.	The payment of a fixed seasonal fee <SEASFEE>	_____	_____	_____	_____
B2n.	Ownership or leasing of land in the location <OWNLAND>	_____	_____	_____	_____
B2o.	Ownership of some other form of limited property related to the appropriation from this resource (such as a fishing berth) <OWNAPPRO>	_____	_____	_____	_____
B2p.	Completion of particular level of education <LEVEDUC>	_____	_____	_____	_____
B2q.	Gender <GENDER>	_____	_____	_____	_____
B2r.	Race <RACE>	_____	_____	_____	_____
B2s.	Age <AGE>	_____	_____	_____	_____
B2t.	Continuing usage of entry rights <CONUSAGE>	_____	_____	_____	_____
B2u.	Demonstration of knowledge or skills (skill license) <DEMSKILL>	_____	_____	_____	_____
B2v.	Use of a particular technology <USETECH>	_____	_____	_____	_____
B2w.	The purpose for which the withdrawn units will be devoted <UNITSUSE>	_____	_____	_____	_____
B2x.	Registration on an eligibility list <ELIGIBLE>	_____	_____	_____	_____
B2y.	The purchasing of access rights in an auction <AUCTION>	_____	_____	_____	_____
B2z.	The obtaining of access rights through lottery <LOTTERY>	_____	_____	_____	_____
B2a*.	The obtaining of a license for entry or for required equipment <LICENSE>	_____	_____	_____	_____
B2b*.	Ownership of shares in an organization <SHAREORG>	_____	_____	_____	_____
B2z*.	Other <BOTHER>: _____	_____	_____	_____	_____

BOUNDARY RULES

Questions B3 to B6 below are follow-up questions for rows x and y of the above matrix. If multiple sources are involved, code the lowest relevant level only.

If multiple sets of rules are involved, code the most restrictive set (i.e. "1") only.

B3. If an entry fee or license is required or permitted, is there an upper limit on the number of licenses that can be issued (if multiple sources, code lowest relevant level)? <LICLIMIT>

- (1) ☐ No
- (2) ☐ Yes, but the upper limit is large compared to the number of persons likely to apply for a license
- (3) ☐ Yes, and the upper limit is likely to lead to the exclusion of some potential appropriators
- (4) ☐ Yes, and the upper limit severely restricts the number of potential appropriators who could appropriate from this resource
- (-1) ☐ MIC
- (-2) ☐ NA

B4. If an entry fee or license is required or permitted, is the sum of the fees and or licenses: <SUMFEES1>

- (1) ☐ Relatively low given the resources of most of the appropriators
- (2) ☐ Moderate given the resources of most of the appropriators
- (3) ☐ High given the resources of most of the appropriators
- (-1) ☐ MIC
- (-2) ☐ NA

B5. If an entry fee or license is required or permitted, is the sum of the fees and/or licenses: <SUMFEES2>

- (1) ☐ Relatively low given the benefits that can be obtained from withdrawing units from this resource
- (2) ☐ Moderate given the benefits that can be obtained from withdrawing units from this resource
- (3) ☐ Relatively high given the benefits that can be obtained from withdrawing units from this resource
- (-1) ☐ MIC
- (-2) ☐ NA

B6. If an entry fee or license is required or permitted, are the fees the same across all categories of applicants? <SAMEFEES>

- (1) ☐ Yes
- (2) ☐ No, local residents pay less than non-local residents
- (3) ☐ No, non-commercial appropriators pay less than commercial appropriators
- (4) ☐ No, some other form of pricing is used
- (-1) ☐ MIC
- (-2) ☐ NA

BOUNDARY RULES

Additional Questions on Boundary Rules (please code the rules-in-use only):

B7. How are entry rights transmitted through inheritance? <RTRANS1>

- (1) ☐ No rules-in-use related to inheritance
- (2) ☐ Entry rights can NOT be inherited
- (3) ☐ Entry rights are transmitted for an entire household or production unit (such as a boat) from one generation to another
- (4) ☐ Entry rights may be transmitted to one or more offspring
- (5) ☐ Entry rights may be transmitted to one or more members of the family
- (6) ☐ Entry rights may be transmitted to anyone designated by "owner"
- (7) ☐ Other: _____
- (-1) ☐ MIC
- (-2) ☐ NA

B8. How are entry rights transmitted WITHIN one generation of potential appropriators? <RTRANS2>

- (1) ☐ Entry rights cannot be transferred to anyone else
- (2) ☐ Entry rights can be transferred to members of a family but not outside family
- (3) ☐ Entry rights can be given, leased, or returned to others on a temporary basis, but not permanently severed
- (4) ☐ Entry rights can be given, leased, rented, sold or transferred to others
- (5) ☐ Other: _____
- (-1) ☐ MIC
- (-2) ☐ NA

B8a. If transfer on a temporary or permanent basis is allowed, who determines to whom such rights can be transferred? <RTRANS3>

- (1) ☐ The person who makes the transfer
- (2) ☐ The set of local appropriators
- (3) ☐ A local collective choice arena containing some non-appropriators
- (4) ☐ A regional government
- (5) ☐ A national government
- (6) ☐ Other: _____
- (-1) ☐ MIC
- (-2) ☐ NA

B9. Do the boundary rules assign substantially unequal privileges to some subgroups than others? <UNEQPRIB>

- (1) ☐ Yes, and this subgroup is in the most privileged position
- (2) ☐ Yes, and this subgroup is in the 2nd most privileged position
- (3) ☐ Yes, and this subgroup is in the 3rd most privileged position

BOUNDARY RULES

- (4) ☐ Yes, and this subgroup is in the 4th most privileged position
- (5) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA (only one subgroup)

* Here "privileged" means higher percentage of total number of units, greater number of units, preferred time slots, preferred seasons, early in queue, or preferred locations/spots.

- B10. If there are more than one set of rules, please explain briefly (1) under what conditions they can be evoked or adopted; and (2) in which periods, months, or years they are adopted/used (in the space provided below). <RULSETSB>

AUTHORITY AND SCOPE RULES

C. AUTHORITY AND SCOPE RULES

Authority rules define what appropriators must, must not, or may do at a particular stage of the appropriation process in light of the actions taken by others and the conditions of the physical resource.

Scope rules specify the conditions in the world which must, must not, or may be affected as a result of actions taken.

Frequently scope rules and authority rules are stated together (e.g. a permitted or required action is limited to one location but not others or in regard to one species but not others, etc.).

The default condition for authority rules is that no rules limit the actions of appropriators. Any physically possible action may be taken by any appropriator.

The default condition for scope rules is that no rules limit the states of affairs or conditions in the world that may be affected by appropriators.

- C1. Are the default conditions for both authority and scope rules applicable? <DEFAUTH>

- (1) ☐ Yes, skip to next section
- (2) ☐ No, complete remainder of this section
- (-1) ☐ No information about Authority and Scope Rules exists, skip to next section

- C1a. Confidence Level for entire Authority and Scope Rules Section: ☐
<CLAUTH>

AUTHORITY AND SCOPE RULES

If different rules are adopted/used for different periods, please identify the set of rules adopted/used for a same period by writing "0", "1" or "2" after the deontic response categories.

- 0 = adopted/used only in extraordinary circumstances (e.g. drought)
- 1 = the most restrictive set of rules which is adopted/used regularly from year to year (or period to period).
- 2 = a less restrictive set of rules which is adopted/used regularly from year to year (or period to period).

- C2. Specify the number of cycles coded (maximum 3): _____ <NCYCLES>
- C3. If there are more than one set of rules, please explain briefly (1) under what conditions they can be evoked or adopted; and (2) in which periods, months, or years they are adopted/used (in the space provided below). <RULSETSA>

For the following matrices, enter the deontic response categories under "source" columns 1, 2, 3, and 4. Enter the basis categories under the "basis" columns B.

The basis categories include:

- a = based on ownership of shares to the resource (shares can be separated from landholding).
- b = based on ownership or leasing of rights to a certain proportion of the flow (shares can be separated from landholding and not associated with ownership of shares to the resource).
- c = based on periodic auction of flow rights
- d = based on amount of land held
- e = based on patterns of appropriation assigned to land or person
- f = based on needs during time period (e.g. types of crops that an irrigator is cultivating; adequate amount of water for the crops)
- g = based on location (e.g. whether upstream or downstream)
- h = based on historical pattern of appropriation (prior appropriation)
- i = based on ethnic, caste, clan, or class identity
- j = based on technology used
- k = based on type of license issued by governing authority
- l = based on equal division to all appropriators or teams of appropriators
- m = based on periodic lottery
- n = determined by formula related to conditions of resource
- o = set annually/periodically by someone living in the location

AUTHORITY AND SCOPE RULES

p = set annually/periodically by an external public official
q = membership/non-membership in an organization
r = quantity of units withdrawn
s = based on registration and/or ownership of equipment
t = first in time, first in right
y = other basis (describe): _____
z = no basis at all
? = MIC

C4. The assignment procedure (and relevant basis) for withdrawing units from this appropriation resource by this subgroup is:

	1 B	2 B	3 B	4 B
C4a. Overall response for the entire column, if any (could be N, ?)	_____	_____	_____	_____
C4b. Withdraw up to a FIXED PERCENTAGE of total number of units available during a period <FIXPERC>	___/___	___/___	___/___	___/___
C4c. Withdraw up to a FIXED NUMBER of units during a period <FIXNUM>	___/___	___/___	___/___	___/___
C4d. Withdraw at a FIXED TIME SLOT <FIXTIME>	___/___	___/___	___/___	___/___
C4e. Withdraw only DURING SPECIFIC SEASONS <SPSEASON>	___/___	___/___	___/___	___/___
C4f. Withdraw in a FIXED ORDER (take turns) <FIXORDER>	___/___	___/___	___/___	___/___
C4g. Withdraw at SPECIFIC LOCATIONS/SPOTS <SPLOC>	___/___	___/___	___/___	___/___
C4h. Withdraw WHENEVER and WHEREVER DESIRED <FREEWITH>	___/___	___/___	___/___	___/___
C4i. Only withdraw units of AT LEAST CERTAIN SIZE <MINSIZE>	___/___	___/___	___/___	___/___
C4j. Other <A1OTHER>: _____	___/___	___/___	___/___	___/___

C5. If any answer to row "e" in the above matrix is R, the length of the season is _____ weeks (If multiple sources are involved, code the lowest relevant level only). <SEASONLN> _____ MIC _____ NA

AUTHORITY AND SCOPE RULES

C6. Do the authority and scope rules assign substantially unequal privileges to some subgroups than others? <UNEQPRIA>

- (1) _____ Yes, and this subgroup is in the most privileged position
- (2) _____ Yes, and this subgroup is in the 2nd most privileged position
- (3) _____ Yes, and this subgroup is in the 3rd most privileged position
- (4) _____ Yes, and this subgroup is in the 4th most privileged position
- (5) _____ No
- (-1) _____ MIC
- (-2) _____ NA (only one subgroup)

* Here "privileged" means higher percentage of total number of units, greater number of units, preferred time slots, preferred seasons, early in queue, or preferred locations/spots.

C7. What is the status of various types of input actions or activities?

	S1	B	S2	B	S3	B	S4	B
C7a. Overall response for the entire column, if any (could be N, ?)	_____		_____		_____		_____	
C7b. Tax assessed periodically related to appropriation from the resource <APPRTAX>	____/____		____/____		____/____		____/____	
C7c. Labor input for maintenance (regular) <MAINTLAB>	____/____		____/____		____/____		____/____	
C7d. Labor input for emergency repair <EMERGLAB>	____/____		____/____		____/____		____/____	
C7e. Labor, money, or materials to be used for major capital investment <CAPINV>	____/____		____/____		____/____		____/____	
C7f. Other <A2OTHER>: _____	____/____		____/____		____/____		____/____	

Questions C8 to C12 below are follow-up questions for the above matrix. If multiple sources are involved, code the lowest relevant level only.

If multiple sets of rules are involved, code the most restrictive set (i.e. "1") only.

AUTHORITY AND SCOPE RULES

C8. Are individuals required to work primarily on those parts of the resource(s) that can affect their own level of appropriation from the resource? <WORKOWN>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA

C9. If labor input for maintenance is required, can the input be substituted by other means? <ELABSUBS>

- (1) ☐ Yes, by some payment (e.g. money, materials)
- (2) ☐ Yes, by hired labor
- (3) ☐ Yes, by other means; please specify: _____
- (4) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA

C10. If labor input for maintenance is required, how is the labor force organized most of the time? <LABORG>

- (1) ☐ Labor force is organized in relatively small teams
- (2) ☐ The entire labor force works as a team
- (3) ☐ Each worker works independently
- (4) ☐ Other: _____
- (-1) ☐ MIC
- (-2) ☐ NA

C11. If labor force is organized in small teams, is each team formed by individuals who farm adjoining fields? <ADJOINFD>

- (1) ☐ Yes
- (2) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA

C12. Do the authority and scope rules assign substantially unequal duties to some subgroups than others? <UNEQDUTA>

- (1) ☐ Yes, and this subgroup has the most duty(s)
- (2) ☐ Yes, and this subgroup has the 2nd most duty(s)
- (3) ☐ Yes, and this subgroup has the 3rd most duty(s)
- (4) ☐ Yes, and this subgroup has the 4th most duty(s)
- (5) ☐ No
- (-1) ☐ MIC
- (-2) ☐ NA (only one subgroup)

INFORMATION RULES

D. INFORMATION RULES

The information section would consist of a matrix which would indicate all the possible types of information that may be recorded, the source of the requirement, and who actually records the information. So in referring to the matrix located below, the columns are identical to those in the boundary rules section, ranging from (1) national legislative to (4) rules-in-use. In columns 1-4 the responses would be one of the deontic categories. Column 5 would be used to indicate who, if anyone, records the information, and the responses would be as follows:

- 0 = no one records
- 1 = AGO
- 2 = local communal enterprise
- 3 = private enterprise
- 4 = local administrative body
- 5 = regional administrative body
- 6 = national administrative body
- 7 = international administrative body

D1. Is the default condition for information rules applicable? <DEFINF>

- (1) _____ Yes, skip to next section
- (2) _____ No, complete remainder of this section
- (-1) _____ No information about information rules exists,
skip to next section

D1a. Confidence Level for entire Information Rules Section: _____ <CLINF>

D2. Please check off the types of information in relation to the resource that are required to be recorded.

	Nat	Reg	Loc	Rul	Who
D2a. Overall response for the entire column, if any (could be N, ?)	_____	_____	_____	_____	_____
D2b. Number of units withdrawn <NUMUNIT>	_____	_____	_____	_____	_____
D2c. Quality of units withdrawn <QUALUNIT>	_____	_____	_____	_____	_____
D2d. Condition of the resource <CONDRES>	_____	_____	_____	_____	_____
D2e. Appropriators' claims to the flow of units from the resource <UNITFLOW>	_____	_____	_____	_____	_____
D2f. Maintenance work done by appropriators <APPWORK>	_____	_____	_____	_____	_____

INFORMATION RULES

D2g. Monitoring done by individual appropriators <APPMONIT>					
D2h. Physical factors affecting the resource <PHYSFACT>					
D2i. Rights and duties of the appropriators <APPRIGHT>					
D2j. Quantity of assets in use <QASSETS>					
D2k. Other <IOTHER>: _____					

PAYOFF RULES

E. PAYOFF RULES

These rules specify the external rewards or sanctions that must, must not, or may be assigned to specific actions or outcomes.

We have already asked about some payoff rules closely related to boundary, authority and scope rules. In this section, we will cover some additional payoff rules not covered above.

The default condition for payoff rules is that all appropriators can retain whatever they can physically keep hold of and no external rewards, taxes, or sanctions are imposed.

For the following questions, please code the rules-in-use only.

If multiple sets of rules are involved, code the most restrictive set (i.e. "1") only.

E1. Is the default condition for payoff rules applicable? <DEFPAY>

- (1) Yes, skip to next section
- (2) No, complete remainder of this section
- (-1) No information about Payoff Rules exists, skip to next section

E1a. Confidence Level for entire Payoff Rules Section: <CLPAY>

E2. Is incarceration a penalty that can be imposed on appropriators for breaking rules related to the appropriation of this resource? <INCARCER>

- (1) No
- (2) Yes, duration unclear
- (3) Yes, one week or shorter
- (4) Yes, longer than one week
- (-1) MIC
- (-2) NA

PAYOFF RULES

- E3. Can fines be imposed on appropriators for breaking rules related to the appropriation of this resource? <FINES>
- (1) ☐ No
 - (2) ☐ Yes, light
 - (3) ☐ Yes, moderate
 - (4) ☐ Yes, heavy
 - (-1) ☐ MIC
 - (-2) ☐ NA
- E4. Is it possible for appropriators to lose their entry or appropriation rights for breaking rules related to the appropriation of this resource? <LOSEENTR>
- (1) ☐ No
 - (2) ☐ Yes, temporarily
 - (3) ☐ Yes, permanently
 - (4) ☐ Yes, duration unclear
 - (-1) ☐ MIC
 - (-2) ☐ NA
- E5. Is severe community shunning a sanction that may be consciously imposed on appropriators who break rules related to the appropriation of this appropriation resource? <SHUNNING>
- (1) ☐ No
 - (2) ☐ Yes, temporarily
 - (3) ☐ Yes, permanently
 - (4) ☐ Yes, duration unclear
 - (-1) ☐ MIC
 - (-2) ☐ NA
- E6. Can appropriators obtain external aid to develop their appropriation technologies? <EXTAID1>
- (1) ☐ Yes, from a local (private or public) agency(s)
 - (2) ☐ Yes, from a regional (private or public) agency(s)
 - (3) ☐ Yes, from a national (private or public) agency(s)
 - (4) ☐ Yes, from an international (private or public) agency(s)
 - (5) ☐ No
 - (-1) ☐ MIC
 - (-2) ☐ NA
- E7. Can appropriators obtain external aid to develop and/or repair their production, distribution, or appropriation resources? <EXTAID2>
- (1) ☐ Yes, from a local (private or public) agency(s)
 - (2) ☐ Yes, from a regional (private or public) agency(s)
 - (3) ☐ Yes, from a national (private or public) agency(s)
 - (4) ☐ Yes, from an international (private or public) agency(s)
 - (5) ☐ No
 - (-1) ☐ MIC
 - (-2) ☐ NA

PAYOFF RULES

E8. Can appropriators obtain external aid to develop technologies for using the resource units (e.g. in irrigation for new methods of planting crops or new seed varieties, in fishing for new technologies in processing, storing, or transporting fish)? <EXTAID3>

- (1) _____ Yes, from a local (private or public) agency(s)
- (2) _____ Yes, from a regional (private or public) agency(s)
- (3) _____ Yes, from a national (private or public) agency(s)
- (4) _____ Yes, from an international (private or public) agency(s)
- (5) _____ No
- (-1) _____ MIC
- (-2) _____ NA

E9. Are appropriators party to price support contracts or guaranteed purchase agreements for the selling of resource units (i.e. fish) or commodities produced by resource units (i.e. irrigated crops)? <PRICESUP>

- (1) _____ Yes, with a local (private or public) agency(s)
- (2) _____ Yes, with a regional (private or public) agency(s)
- (3) _____ Yes, with a national (private or public) agency(s)
- (4) _____ Yes, with an international (private or public) agency(s)
- (5) _____ No
- (-1) _____ MIC
- (-2) _____ NA

E10a. Do the payoff rules assign substantially unequal rewards to some subgroups than others? <UNEQREW>

- (1) _____ Yes, and this subgroup receives the most rewards
- (2) _____ Yes, and this subgroup receives the 2nd most rewards
- (3) _____ Yes, and this subgroup receives the 3rd most rewards
- (4) _____ Yes, and this subgroup receives the 4th most rewards
- (5) _____ No
- (-1) _____ MIC
- (-2) _____ NA (only one subgroup)

E10b. Do the payoff rules assign substantially unequal punishments to some subgroups than others? <UNEQPUN>

- (1) _____ Yes, and this subgroup receives the most punishments
- (2) _____ Yes, and this subgroup receives the 2nd most punishments
- (3) _____ Yes, and this subgroup receives the 3rd most punishments
- (4) _____ Yes, and this subgroup receives the 4th most punishments
- (5) _____ No
- (-1) _____ MIC
- (-2) _____ NA (only one subgroup)

PAYOFF RULES

IF THE APPROPRIATION PROCESS IS ORGANIZED BY TEAMS:

E11. Specify the number of different arrangements (maximum 3): _____
<NARRANGE>

E12. If there is more than one arrangement, please explain briefly under what conditions they apply. <RULSETSP>

E13. If there is a set percentage that is assigned to various individual positions, list percentage for each position (each column represents a different arrangement):

E13a.	_____	_____	_____	Owner(s) (non-operator(s)) of primary appropriation equipment _____ MIC _____ NA
	<PERPOS11>	<PERPOS12>	<PERPOS13>	
E13b.	_____	_____	_____	Owner(s)-operator(s) of primary appropriation equipment _____ MIC _____ NA
	<PERPOS21>	<PERPOS22>	<PERPOS23>	
E13c.	_____	_____	_____	Owner(s) (non-operator(s)) of supplementary appropriation equipment _____ MIC _____ NA
	<PERPOS31>	<PERPOS32>	<PERPOS33>	
E13d.	_____	_____	_____	Owner(s)-operator(s) of supplementary appropriation equipment _____ MIC _____ NA
	<PERPOS41>	<PERPOS42>	<PERPOS43>	
E13e.	_____	_____	_____	Crew with special assets (including non-owner captain) _____ MIC _____ NA
	<PERPOS51>	<PERPOS52>	<PERPOS53>	
E13f.	_____	_____	_____	Regular crew (each) _____ MIC _____ NA
	<PERPOS61>	<PERPOS62>	<PERPOS63>	
E13g.	_____	_____	_____	Other (what is this position): _____ _____ MIC _____ NA
	<PERPOS71>	<PERPOS72>	<PERPOS73>	

E14. If the ownership of the primary or supplemental appropriation equipment is itself divided into shares, please describe this share system. In addition, if any other share arrangement is in force, please describe. <EQSHARED>

PAYOFF RULES

E15. If wage laborers are used in the team production process, please describe who hires, how wages are set, if wage earners are organized and other relevant factors. <WAGEUSE>

E16. If any position holds property rights to the residual profit other than through a set percentage, please describe. <NOSETPER>

AGGREGATION RULES

F. AGGREGATION RULES

These rules are applicable when authority rules assign multiple position partial control over the same action. Aggregation rules assign a weight to each appropriator and specify a formula to be used in adding up the contribution of each person's decision to a final decision about action. (Aggregation rules are far more frequent at collective and constitutional choice levels than at operational choice levels).

The default condition for aggregation rules is that no rules specify constraints or requirements on the process to be used in deciding which actions will be taken. Appropriators can have as much independence in deciding upon actions as they are physically able to exert. Please Note: If authority rules are at the default condition, aggregation rules must be also at default condition.

F1. Is the default condition for aggregation rules applicable? <DEFAGGR>

- (1) _____ Yes, skip to next section
- (2) _____ No, complete remainder of this section
- (-1) _____ No information about aggregation rules exists, skip to next section

F1a. Confidence Level for entire Aggregation Rules Section: _____ <CLAGGR>

If there is an aggregation rule relevant to the operational level, please describe it briefly below: <AGGRRULE>

OVERALL QUESTIONS

G. OVERALL QUESTIONS ABOUT RULE CONFIGURATION

G1. Approximately how long has the general framework of the rules-in-use described above governed the activities of this subgroup? <RULEDUR>

- (1) _____ Less than one year
- (2) _____ 1 to 10 years
- (3) _____ 11 to 25 years
- (4) _____ 26 to 50 years
- (5) _____ 51 to 75 years
- (6) _____ 76 to 100 years
- (7) _____ 101 to 199 years
- (8) _____ 200 to 300 years
- (9) _____ 301 to 500 years
- (10) _____ 501 to 1000 years
- (11) _____ More than 1000 years
- (-1) _____ MIC

G2. Are the rules-in-use available in a written form to the appropriators? <WRITTEN>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC

G3. Does the author discuss how knowledge about the rules-in-use is transmitted from one generation of appropriators to another? <RULETRAN>

- (1) _____ Yes
- (2) _____ No

G3a. If yes, describe: _____
<HOWTRAN>

_____ NA

G4. In your estimation are the rules-in-use:

G4a. Easy to understand by the appropriators? <EASYUND>

- (1) _____ Yes
- (2) _____ No
- (3) _____ Don't Know

G4b. Clear as to what constitutes rule conforming and rule breaking behavior? <CLEAR>

- (1) _____ Yes
- (2) _____ No
- (3) _____ Don't Know

OVERALL QUESTIONS

G4c. Flexible in dealing with times of emergency or unusual problems facing particular members of the subgroup? <FLEXIBLE>

- (1) _____ Yes
- (2) _____ No
- (3) _____ Don't Know

G4d. Perceived by members of this subgroup as fair? <FAIR>

- (1) _____ Yes
- (2) _____ No
- (3) _____ Don't Know

G4e. Perceived by members of this subgroup as legitimate? <LEGITIM>

- (1) _____ Yes
- (2) _____ No
- (3) _____ Don't Know

Nepal Irrigation Cases Short Coding Form

This form has questions specific to cases in Nepal. There are no instructions or variable lists.

The remainder of this page has intentionally been left blank

<SCREENID>: _____

Last Revision/October 19, 1989
doc 152

CPR PROJECT
Nepal Irrigation Cases Short Coding Form

A. DOCUMENT SOURCE

A1. Short citations to documents where this system is described (not to be entered, for bookkeeping only)

A2. Date of latest report about this system used in coding: <NEPAL: RPTDATE>
_____ MIC

B. SYSTEM OVERVIEW

B1. Name of Irrigation System: <NEPAL: RESNAME1>

B2. Type of Irrigation System: <SCREENER: TYPE>

- (1) _____ AMIS
(2) _____ FMIS
(3) _____ JMIS
(4) _____ Other: _____
(5) _____ Very ambiguous in case
(-1) _____ MIC
(-2) _____ NA
_____ CL

B3. Name of District where system is located: <SCREENER: SLOCNAME>

B4. Terrain of system location is: <NEPAL: TERRAIN>

- (1) _____ Mountain
(2) _____ Hills--River Valley
(3) _____ Hills
(4) _____ Terai--River Valley
(5) _____ Terai
(6) _____ Kathmandu Valley
(7) _____ Other: _____
(-1) _____ MIC
(-2) _____ NA
_____ CL

SYSTEM OVERVIEW

B5. Is this irrigation system a component of a larger irrigation system?
<NEPAL: PARENT>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

B6. If yes, name of larger system: <NEPAL: PARNAME>

B7. Does this system encompass smaller component irrigation systems?
<NEPAL: OFFSPRNG>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

B8. If yes, how many smaller irrigation systems belong to this system?
<NEPAL: OFFNUM>

_____ MIC _____ NA _____ CL

B9. Please provide a short description of these systems. <NEPAL: DESCRIPT>

_____ MIC _____ NA

B10. What is the estimated area of land that is irrigated by this system as of the most recent report: <OPERATIONAL LEVEL: ENDRATE1>

_____ in square meters _____ MIC _____ CL
_____ if not in square meters, give number and unit of measure.

B11. What is the potential amount of land that could be irrigated by this system? <OPERATIONAL LEVEL: POTNTIAL>

_____ in square meters _____ MIC _____ CL
_____ if not in square meters, give number and unit of measure.

C. HISTORY OF THE SYSTEM

C1. Approximate date when this irrigation system was first constructed:
<NEPAL: WHENBILT>

_____ MIC _____ NA _____ CL

HISTORY OF THE SYSTEM

C2. Who constructed (or initiated and directed)? <NEPAL: WHOBUILT>

- (1) _____ Farmers themselves or farmers hiring workers to construct the system
- (2) _____ Government official
- (3) _____ Royal directives
- (4) _____ Church, guthi, or other private, not-for-profit group
- (5) _____ DIHM or DOI
- (6) _____ MPLD
- (7) _____ FIWUD
- (8) _____ Other agency: _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C3. Donor assistance when first constructed? <NEPAL: DONATION>

- (1) _____ No
- (2) _____ Yes, AID
- (3) _____ Yes, Asian Development Bank
- (4) _____ Yes, World Bank
- (5) _____ Yes, Food For Work
- (6) _____ Yes, other multilateral donor: _____
- (7) _____ Yes, other national donor: _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

C4. If there has been any improvement/rehabilitation of this system, describe briefly a) who initiated, b) when, and c) what was done. <NEPAL: IMPROVED>
_____ MIC _____ NA

D. THE PHYSICAL SYSTEM

D1. What are the major sources of water used for irrigation? <NEPAL: SOURCES>

- (1) _____ Surface water (e.g. canal, tank, reservoir)
- (2) _____ Ground water (e.g. well)
- (3) _____ Rainfall
- (4) _____ Both surface water and ground water
- (5) _____ Both surface water and rainfall
- (6) _____ Both ground water and rainfall
- (7) _____ Both surface water, ground water, and rainfall
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

THE PHYSICAL SYSTEM

D2. Name of the primary source of water for this system? <NEPAL: PRIMESRC>

D3. Is this source shared by several water systems (including mills)?
<NEPAL: SHARED>

- (1) _____ Yes
(2) _____ No
(-1) _____ MIC
(-2) _____ NA
_____ CL

D4. If yes, describe briefly, including whether or not water rights to this source are well defined or a subject of dispute and whether this system has prior rights to those of others: <RESOURCE FORM: DISPUTE>
_____ MIC _____ NA

D5. What kind of headworks does this system have? <RESOURCE FORM: HEADWORK>

- (1) _____ Permanent
(2) _____ Temporary
(-1) _____ MIC
(-2) _____ NA
_____ CL

D6. Are the canals in the irrigation system lined? <RESOURCE FORM: LINED>

- (1) _____ No
(2) _____ Yes, entirely
(3) _____ Yes, partly
(-1) _____ MIC
(-2) _____ NA
_____ CL

D7. How many branch canals are there in this system? <NEPAL: BRANCHES>
_____ MIC _____ NA _____ CL

D8. What is the total length of main canal? <NEPAL: LNTHMAIN>
_____ (in meters) _____ MIC _____ CL

D9. What is the total length of branch canals? <NEPAL: LNTHBRCH>
_____ (in meters) _____ MIC _____ NA _____ CL

THE PHYSICAL SYSTEM

D10. Does the report indicate that expansion of system is limited? <NEPAL: EXPAND>

- (1) _____ No
- (2) _____ Yes, primarily due to limited water supply
- (3) _____ Yes, primarily due to the availability of land (or its terrain)
- (4) _____ Yes, primarily due to water rights
- (5) _____ Yes, a mixture of the above
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

E. AGRICULTURE SYSTEM AND LAND HOLDING

E1a. What is the cropping intensity in the head portion of the command area of the system? <NEPAL: HEADINT>

_____ (in percentage) _____ MIC _____ CL

E1b. What is the cropping intensity in the tail portion of the command area of the system? <NEPAL: TAILINT>

_____ (in percentage) _____ MIC _____ CL

E1c. What is the average cropping intensity in the entire command area of the system? <NEPAL: AVERGINT>

_____ (in percentage) _____ MIC _____ CL

E2. If the appropriation units are frequently used to produce other goods, what are these other goods? (Mark "0" for not produced, "1" for produced, "2" for MIC) <SUBGROUP: USES2>

- (1) _____ Paddy rice
- (2) _____ Grains other than paddy rice
- (3) _____ Legumes
- (4) _____ Edible tree crops
- (5) _____ Non-tree fruits and vegetables
- (6) _____ Coffee, tea, cocoa, tobacco, spices, decorative
- (7) _____ Fibers
- (8) _____ Rubber, timber, other forest products
- (9) _____ Fodder
- (10) _____ Sugar cane/beets
- (11) _____ Edible oils
- (12) _____ Other
- (-1) _____ MIC
- (-2) _____ NA
- _____ (here, indicate the number 1 through 12 from above for the crop which was the more dominant)

E3. What is the average size of land holding? <NEPAL: AVESIZE>

_____ (in square meters) _____ MIC _____ CL

AGRICULTURE SYSTEM AND LAND

E4. What is the maximum size of land holding? <NEPAL: MAXSIZE>
 _____ (in square meters) _____ MIC _____ CL

E5. What is the proportion of landless families resident in command area?
 <NEPAL: LANDLESS>
 _____ (in percentage) _____ MIC _____ CL

E6. What is the share formula used in most ternary agreements? <NEPAL: FORMULA>

- (1) _____ 50-50 to landowner, farmers
- (2) _____ 60-40 to landowner, farmers
- (3) _____ Other: _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

E7. What is the proportion of land owned by absentee landowners? <NEPAL: ABSENTEE>
 _____ (in percentage) _____ MIC _____ CL

F. OPERATION AND MAINTENANCE ACTIVITIES

F1. How many households or families are actually served by this system?
 <NEPAL: NUMSERVD>
 _____ _____ MIC _____ CL

F2. How many households or families could potentially be served by this system? <NEPAL: MAXSERVD>
 _____ _____ MIC _____ CL

F3. What is the social composition of families living in command area?
 <NEPAL: FAMILIES>
 _____ _____ MIC _____ CL

F4. What proportion of the irrigators using this system have other means of family income in addition to the returns they receive for farming?
 <NEPAL: DEPENDNC>

- (1) _____ All irrigators are full-time farmers
- (2) _____ Most irrigators are full-time farmers
- (3) _____ A substantial proportion of irrigators have other sources of income besides farming
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F5. How many person-days of labor per year are mobilized to maintain, operate, and/or repair the system(s)? <OPERATIONAL LEVEL: LABRDAYS>
 _____ _____ MIC _____ CL

OPERATION AND MAINTENANCE

F6. What is the basis of labor mobilization? <NEPAL: BASIS>

- (1) ☐ According to land
- (2) ☐ According to water allocated
- (3) ☐ According to family or caste regardless of water share
- (4) ☐ According to equal participation of each household
- (5) ☐ Whoever comes
- (6) ☐ Other: _____
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

F7. Are fines for failing to attend "labor" days: <NEPAL: PENALTY>

- (1) ☐ No
- (2) ☐ Relatively low and well enforced
- (3) ☐ Relatively low and not enforced
- (4) ☐ Relatively high and well enforced
- (5) ☐ Relatively high and not enforced
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

F8. Describe any aspects of labor mobilization not covered by F5 through F7, particularly any information regarding the presence of records kept about labor, materials or other resource mobilization. <NEPAL: LABOR>

☐ MIC ☐ NA

F9. Are there specialized staff or workers to undertake maintenance?
<OPERATIONAL LEVEL: MAINTRES>

- (1) ☐ No
- (2) ☐ Yes, all are local irrigators
- (3) ☐ Yes, all are non-local irrigators
- (4) ☐ Yes, some are local irrigators, some are not
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

OPERATION AND MAINTENANCE

F10. Does an "official" position of monitor (or water distributor) exist (apart from the willingness of all local irrigators to monitor)? <OPERATIONAL LEVEL: GUARD>

- (1) _____ No
- (2) _____ Yes, local irrigators (not necessarily all) rotate into this Position
- (3) _____ Yes, local irrigators are selected by local irrigators for this position
- (4) _____ Yes, local non-irrigators are selected by local irrigators for this position
- (5) _____ Yes, local non-irrigators are selected by a local general purpose government
- (6) _____ Yes, monitors are employees of an external government authority
- (7) _____ Yes, some are selected by local irrigators and some are selected by a local general purpose government
- (8) _____ Yes, some are selected by local irrigators and some are employees of an external government authority
- (9) _____ Yes, some are selected by a local general purpose government and some are employees of an external government authority
- (10) _____ Yes, some are selected by local irrigators, some are selected by a local general purpose government, and some are employees of an external government authority
- (11) _____ Yes, others? _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F11. Do local irrigators monitor the irrigation activities of each other apart from the monitoring of any "official" guards? <OPERATIONAL LEVEL: SELFMON>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F12. If official position exists, are these monitors paid? (Mark "1" by those methods which apply, "0" for those which do not apply) <OPERATIONAL LEVEL: MONPAID>

- (1) _____ Yes, paid in commodities
- (2) _____ Yes, paid in money
- (3) _____ Yes, paid with shares of the appropriation units
- (4) _____ Yes, paid in reduced obligations (e.g. reduced labor input, membership fees, etc.)
- (5) _____ Yes, paid by some other means
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

OPERATION AND MAINTENANCE

F13. Full-time status of official monitors: <OPERATIONAL LEVEL: FULLTIME>

- (1) _____ Almost all are full-time
- (2) _____ Most are full-time
- (3) _____ About half are full-time
- (4) _____ Some are full-time
- (5) _____ Very few are full-time
- (6) _____ None are full-time
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F14. If someone violates rules-in-use related to the appropriation process from this system, how likely is it that an official monitor or guard will move to impose sanctions? <OPERATIONAL LEVEL: MONSANCT>

- (1) _____ Very likely
- (2) _____ Likely
- (3) _____ Likely as not
- (4) _____ Unlikely
- (5) _____ Very unlikely
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F15. If this system is a AMIS or JMIS, are monetary fees assessed by the relevant government agency? <NEPAL: FEES>

- (1) _____ No
- (2) _____ Yes, and regularly collected
- (3) _____ Yes, and some fees collected
- (4) _____ Yes, only insignificant or no fees collected
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F16. If 2, 3, or 4 above, do fees collected cover operating costs of the government agency spent on this irrigation system? <NEPAL: ENOUGH>

- (1) _____ No
- (2) _____ Substantially
- (3) _____ Fully
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F17. If fees collected, what agency assesses or determines the fees?
<NEPAL: FEEDETER>

_____ MIC _____ NA _____ CL

OPERATION AND MAINTENANCE

F18. If fees collected, what agency collects the fees? <NEPAL: FEECOLL>

_____ MIC _____ NA _____ CL

F19. Is there any direct relationship between the budget for operation and the fees collected? <NEPAL: RELATION>

- (1) _____ No
- (2) _____ Yes
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F20. In the following questions, you are asked a question about the administrator(s) or leader(s) who makes major operating decisions for this irrigation system. Please identify what level of administrator you are coding for those questions. <ORGANIZATIONAL STRUCTURE: ADMLEVEL>

- (1) _____ The highest level (chief) executive(s) of the organization
- (2) _____ A mid-level administrator(s) who is responsible for this resource only
- (3) _____ A mid-level administrator(s) who is responsible for this and other resources
- (4) _____ The lowest level administrator(s) who is responsible for this resource only
- (5) _____ The lowest level administrator(s) who is responsible for this and other resources
- (6) _____ Others: _____
- (-1) _____ MIC
- (-2) _____ NA (no executive or administrative position)
- _____ CL

F21. Is the leader, chief executive(s) or administrator(s) position(s) filled by irrigators? <ORGANIZATIONAL STRUCTURE: EXECAPPR>

- (1) _____ No
- (2) _____ Yes, through direct or indirect elections by local irrigators
- (3) _____ Yes, appointed by external government with active advice by local irrigators
- (4) _____ Yes, appointed by external government without active advice by local irrigators
- (5) _____ Yes, through inheritance
- (6) _____ Other: _____
- (-1) _____ MIC
- (-2) _____ NA (no executive positions)
- _____ CL

OPERATION AND MAINTENANCE

F22. Does the leader, chief executive(s) or administrator(s) report to any external or higher level authority including potentially a larger irrigation organization? <ORGANIZATIONAL STRUCTURE: EXTREP>

- (1) _____ Yes
- (2) _____ No
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F23. The period which the leader, chief executive(s) or administrator(s) serve is: <ORGANIZATIONAL STRUCTURE: EXECPER>

- (1) _____ A life term
- (2) _____ Fixed period of time, may be re-elected
- (3) _____ Fixed period of time, may not be re-elected
- (4) _____ Variable subject to vote of confidence
- (5) _____ Administrative tenure subject to rules of relevant agency
- (6) _____ Other: _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F24. Is the leader, chief executive(s) or administrator(s) paid? <ORGANIZATIONAL STRUCTURE: EXECPAID>

- (1) _____ No
- (2) _____ Yes, from the general fund of the organization
- (3) _____ Yes, mostly be receiving shares of the appropriation units
- (4) _____ Yes, mostly by receiving reduced obligations
- (5) _____ Yes, mostly by receiving voluntary contributions of the local irrigators
- (6) _____ Yes, mostly by a local or external government
- (7) _____ Yes, mostly by a development agency
- (8) _____ Yes, mostly by receiving special levies
- (9) _____ Yes, by other means: _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

F25. Does the leader, chief executive(s) or administrator(s) own assets or capital whose uses depend on the units from the resource(s) (e.g., farmland that depends on water from an irrigation system; fishing boats that fish in a lake; livestock that feed on a grazing land)? <ORGANIZATIONAL STRUCTURE: EXECOWN>

- (1) _____ No
- (2) _____ Yes, the amount is below average in the location
- (3) _____ Yes, the amount is average in the location
- (4) _____ Yes, the amount is above average in the location
- (5) _____ Yes, the amount is very high in the location
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

OPERATION AND MAINTENANCE

F26. The major financial sources of the organization (or group) are (Mark "0" for not used, "1" for used, and "2" for MIC) <ORGANIZATIONAL STRUCTURE: FISOURCE>

- (1) _____ Voluntary contribution
- (2) _____ Membership fee
- (3) _____ Payments that substitute for labor input
- (4) _____ Fines
- (5) _____ External government
- (6) _____ Development agency
- (7) _____ Sales of units from the resource
- (8) _____ Own taxes
- (9) _____ Special levies
- (10) _____ Other: _____
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G. OVERALL EVALUATION

From reading the document describing this system, please use your best judgments in assigning the following "summary" evaluations to the performance of this system.

G1. **Technical Effectiveness:** the water legally available to this system is being allocated among farmers so as to enable them to obtain as high crop yields as is feasible, given the other constraints they face. <NEPAL: TECHEFF>

- (1) _____ Highly effective
- (2) _____ Moderately effective
- (3) _____ Moderately ineffective
- (4) _____ Highly ineffective
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G2. **Short-run Economic Technical Efficiency:** the costs of operating and maintaining this system (ignoring cost recovery related to the construction of the system) are less than the benefits obtained from this operation and maintenance. <NEPAL: ECONEFF>

- (1) _____ Highly efficient
- (2) _____ Moderately efficient
- (3) _____ Moderately inefficient
- (4) _____ Highly inefficient
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

OVERALL EVALUATION

G3. **Condition of the system:** the physical condition of the system is as well maintained as is economically feasible given the terrain and technology available to the farmers or agency managing this system. <NEPAL: CONDTION>

- (1) _____ System is in excellent condition
- (2) _____ System is in moderately good condition
- (3) _____ System is in moderately poor condition
- (4) _____ System is in very bad condition
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G4. **Availability and predictability of water to tailenders:** water is allocated so that tailenders are able to obtain sufficient quantity in a predictable manner that they can use their land efficiently. <NEPAL: TAILEND>

- (1) _____ Tailenders receive an inadequate but predictable supply of water
- (2) _____ Tailenders receive an inadequate and unpredictable supply of water
- (3) _____ Tailenders receive an adequate and predictable supply of water
- (4) _____ Tailenders receive an adequate but unpredictable supply of water
- (-1) _____ MIC
- (-2) _____ NA
- _____ CL

G5. If any further evaluative criteria are discussed in the reports available, please provide a brief synopsis of how this system is evaluated an any reasons given in the reports for why performance is so evaluated.
<NEPAL: EVALUATE> _____ MIC _____ NA

H. INTERVENTION

INTERVENTION

H1. If irrigation system has been a FMIS during the past 25 years, is there any information indicating that some government or private agency has attempted to provide assistance to the system through grants, loans, technical assistance or other major forms of intervention? <NEPAL: INTERVEN>

- (1) ☐ No
- (2) ☐ Yes, Either DIHM or DOI has rebuilt system or otherwise made major investments.
- (3) ☐ Yes, FIWUD has undertaken major investments
- (4) ☐ Yes, MPLD has under taken major investments
- (5) ☐ Yes, CARE/NEPAL ADB/Nepal has funded major investments
- (6) ☐ Yes, some other agency has undertaken major investments:
- (7) ☐ Yes, an Irrigation Line of Credit Program: _____
- (-1) ☐ MIC
- (-2) ☐ NA
- ☐ CL

H2. If YES to any of the above, write a short paragraph describing the intervention to the extent contained in this document. Who initiated the request and when, who did the engineering, how was the intervention paid for, what role did the farmers have in the design, construction, and operation of the system? If the intervention is completed, give date of completion. Were the property rights of the farmers respected? What has happened to the system since the intervention -- are the farmers still maintaining it well? Are prior water allocation systems still used? Is the command area larger or smaller? Have crop yields increased?
<NEPAL: PARAGRAF> _____ MIC _____ NA

Master Variable List

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MASTER VARIABLE LIST
sorted by variable, concept
(Old List)

<u>Variable</u>	<u>Concept</u>	<u>Question#</u>	
<ABSOQUAN>		<GG3>	Has the absolute quantity of appropriation units obtained by this group become larger, remained constant, or become smaller?
<ACCESS>		<GB1>	Do members of this subgroup exercise the right of access?
<ACTIVITY>		<HA2>	What is the type of activity that this organization has organized (provision, production, distribution, appropriation, use)?
<ADDSERV>		<OA9>	Does the organization provide the appropriators with services in addition to provision, production, distribution, appropriation, and use activities that are already provided?
<ADJOINFD>		<UC11>	If labor force is organized in small teams, is each team formed by individuals who farm adjoining fields?
<ADMLEVEL>		<OA12>	What level of administrator is being coded for the administrator(s) who makes major operating decisions for the appropriation resource?
<AGE>		<UB2s>	What requirements must individuals meet before appropriating from this resource in regards to age as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<AGRRULE>		<UF1a>	If there is an aggregation rule relevant to the

			operational level, what is it?
<AINDICT>	<EVALUATION>	<VJ3>	Comment on any evidence that is presented in this case regarding the nature and level of transaction costs.
<ALTSUPPLY>		<GC13>	What is the cost of alternative sources of supply for this unit for this subgroup?
<ANALUNIT>	<SECTOR>	<RA3>	Is the unit renewable or non-renewable, stationary or moving?
<APPMONIT>		<UD2g>	Is the monitoring that is done by individual appropriators required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<APPRESRC>	<SECTOR>	<RB1>	What is the resource or facility in which these units are available for appropriation, and the factors which affect the boundary of this resource?
<APPRIGHT>		<UD2i>	Are rights and duties of the appropriators required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<APPRTAX>		<UC7b>	What is the status of tax assessed periodically related to appropriation from the resource as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<APPWORK>		<UD2f>	Is maintenance work done by appropriators required by an AGO, local communal enterprise, private

			enterprise, or local, regional, national or international administrative body to be recorded?
<ARENAS>	<INFORMATION>	<VD12>	Are there arenas being used for the exchange of information about conditions of the resource?
<ARENFREQ>	<INFORMATION>	<VD12a>	If there are arenas being used for the exchange of information about conditions of the resource, how frequently do appropriators get together and discuss mutual problems of the resource?
<ARERESULTS>	<EVALUATION>	<VJ1>	Does the author focus on our concept of results and the evaluation of results?
<ASSETS>		<GC12>	What proportion of this group owns land or capital?
<AUCTION>		<UB2y>	What requirements must individuals meet before appropriating from this resource in regards to the purchasing of access rights in an auction as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<AUTHKNOW>		<SB7>	In your best estimate, do you have a relatively high level of confidence that the author(s) know(s) the particulars of this "case"?
<AVERINC>		<GC9>	Given the economy of this location, what is the average annual income (including all non-monetary forms of income) of this subgroup?
<AVGACCES>	<UNITVAR>	<RB7>	What is the average number of months during the year when the resource is accessed?
<AVOIDHRM>		<GF7>	During this time period, have members of this group

			expended resources (at least their own time) to avoid actions that would harm the structure of the appropriation resource?
<AWITHEFF>	<EVALUATION>	<VJ5>	If the author discusses withdrawals per unit of effort, what are the indicators s/he uses, and how does the author evaluate these withdrawals for this resource?
<A1OTHER>		<UC4j>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource in to other authority and scope rules by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<A2OTHER>		<UC7f>	What is the status of other various types of input actions or activities as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<BAPCLOSE>	<BEGCONDITION>	<VA5>	As of the beginning of this period, are the appropriators exercising or attempting to exercise closed access to this resource?
<BAVERAGE>	<BEGCONDITION>	<VC4>	What is the average age of the units withdrawn from this resource at the beginning of this time period?
<BAVRESIZ>	<BEGCONDITION>	<VC3>	What is the average size of the units withdrawn from this resource at the beginning of this time period?
<BEGBLNC>	<BEGCONDITION>	<VC1a>	For biological resources at the beginning of this period, what is the balance

			between the quantity of units withdrawn and the number of units available?
<BEGBLNC>	<BEGCONDITION>	<VC1b>	For physical resources at the beginning of this period, what is the balance between the quantity of units withdrawn and the quantity of units needed, given the usual patterns of use for these units?
<BEGCONDA>	<BEGCONDITION>	<VC11a>	As of the beginning of this period, how well-maintained is the appropriation resource?
<BEGCONDD>	<BEGCONDITION>	<VC11b>	As of the beginning of this period, how well-maintained is the distribution resource?
<BEGCONDP>	<BEGCONDITION>	<V11c>	As of the beginning of this period, how well-maintained is the production resource?
<BEGDATE>	<DURATION>	<LA7>	What is the approximate beginning date for this location form?
<BEGDATE>	<DURATION>	<VB1>	What is the beginning date of the operational level coded on this form?
<BEGDATE>		<OA2b>	What is the beginning date for when this organization had the structure and process as described herein?
<BEGDATE>		<UA>	What is the approximate beginning date for this operational rules form?
<BEGHIST>	<PRIORCHANGE>	<VB11>	Does the author begin the description of this case at this point in history?
<BEGNTFER>	<BEGCONDITION>	<VC9>	As of the beginning of this period, how extensive is the interference between the appropriation technology for this resource and the appropriation processes for other resources in this location?

<BEGPOLL>	<BEGCONDITION>	<VC7>	As of the beginning of this period, are there problems of pollution of this or other resources resulting from the way units are appropriated?
<BEGQUAL>	<BEGCONDITION>	<VC6>	As of the beginning of this period, what was the quality of the units withdrawn?
<BEGRATE1>	<BEGCONDITION>	<VC2>	What is the volume of withdrawal from this resource, in tons of fish harvested, at the beginning of this time period?
<BEGRATE2>	<BEGCONDITION>	<VC2>	What is the volume of withdrawal from this resource, in square meters of fields irrigated, at the beginning of this time period?
<BEGRATE3>	<BEGCONDITION>	<VC2>	What is the volume of withdrawal from this irrigation resource, in volume of annual flow, at the beginning of this time period?
<BEGTECHX>	<BEGCONDITION>	<VC8>	As of the beginning of this period, what is the extent of technical externalities resulting from the appropriation activities of participants from this resource?
<BEGTRUST>	<BEGCONDITION>	<VC12>	As of the beginning of this period, how would you characterize the levels of mutual trust described among appropriators?
<BFORMOWN>	<REGIMETYPE>	<VA2>	Who is the formal owner of the resource?
<BMARKETS>	<BEGCONDITION>	<VC>	As of the beginning of this period, how are the appropriated units disposed of?
<BNUMAPP1>	<BEGCONDITION>	<VG2>	What is a close estimate of the number of participants in the position of appropriator at the

			beginning, where the author has provided it?
<BNUMAPP2>	<BEGCONDITION>	<VG2>	What is a general estimate of the number of participants in the position of appropriator at the beginning?
<BNUMTEM1>	<BEGCONDITION>	<VG3>	If the appropriation process is organized as a team process, how many teams are appropriating from this resource at the beginning?
<BNUMTEM2>	<BEGCONDITION>	<VG3>	What is a general estimate of the number of teams in the position of appropriator at the beginning?
<BNUMUSR1>		<GA3>	What is the actual number of individuals in this group at the beginning?
<BNUMUSR2>		<GA3>	What is an estimate of the number of individuals in this group at the beginning?
<BOTHR>		<UB2z*>	What requirements must individuals meet before appropriating from this resource in regards to any other boundary rule as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<BOUNDAR2>	<BOUNDARY>	<RB2>	Is the boundary the result of natural/constructed attributes and/or institutional arrangements?
<BOUNDAR3>	<BOUNDARY>	<RB3>	Is the boundary the same or smaller than the location?
<BOUNDAR4>	<BOUNDARY>	<RB4>	Does the resource exist in more than one country or general purpose local jurisdiction?
<BOUNDAR5>	<BOUNDARY>	<RB5>	Is the boundary part of a development project designed by non-residents?
<BOWNCLOS>	<BEGCONDITION>	<VA4>	As of the beginning of this

			period, are the owners exercising or attempting to exercise closed access to this resource?
<BRENTDIS>	<BEGCONDITION>	<VC10>	As of the beginning of this period, holding all inputs constant, are the same or even greater amounts of resource units withdrawn with few appropriator teams and/or equipment?
<BRIBE>		<IA5>	Do members of the appropriation resource regularly bribe the higher level officials for water delivery and other related services (such as maintenance)?
<BRIBERY>	<SANCTIONS>	<VF8>	If an official monitor or guard does move to impose sanctions, how likely is it that local appropriators will attempt to bribe the official?
<BSEXDEVL>	<BEGCONDITION>	<VC4a>	As of the beginning of this period, are the units sexually mature at this size or age?
<CAPDATE>		<GC4b>	What is the approximate year of the estimate for the dollar amount required to set up an appropriation team?
<CAPINV>		<UC7e>	What is the status of labor, money, or materials to be used for major capital investment as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CASTE>		<UB2f>	What requirements must individuals meet before appropriating from this resource in regards to membership in a caste as determined by national, regional, or local constitutional or collective decisions or appropriator

		rules-in-use?
<CIT>	<SA1>	What is the full citation to the document(s) being screened?
<CITCOUNT>	<UB2b>	What requirements must individuals meet before appropriating from this resource in regards to citizenship of a country as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CITLOCAL>	<UB2d>	What requirements must individuals meet before appropriating from this resource in regards to citizenship or residence of a local community as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CITSUBDI>	<UB2c>	What requirements must individuals meet before appropriating from this resource in regards to citizenship of a major subdivision of a country as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CLAGGR>	<UF1a>	What is the confidence level for the entire Aggregation Rules Section?
<CLAN>	<UB2e>	What requirements must individuals meet before appropriating from this resource in regards to membership in a clan as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CLANID>	<COMMUNICATION> <VF1c>	How does clan identification

			affect communication between subgroups?
<CLASS>		<UB2h>	What requirements must individuals meet before appropriating from this resource in regards to membership in a class as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<CLAUTH>		<UC1a>	What is the confidence level for the entire Authority and Scope Rules Section?
<CLBOUND>		<UB1a>	What is the confidence level for the entire Boundary Rules Section?
<CLEAR>		<UG4b>	Are the rules-in-use clear as to what constitutes rule conforming and rule breaking behavior?
<CLINF>		<UD1a>	What is the confidence level for entire Information Rules Section?
<CLPAY>		<UE1a>	What is the confidence level for entire Payoff Rules Section?
<CODABLE>		<SB8>	In your best estimate, do you have a relatively high level of confidence that the author(s) has (have) provided sufficient data for us to begin a structured coding process?
<COLLCOIS>	<LOCCOLCHOIC>	<CB1>	How are the general collective choice decisions in this region made?
<COMMLANG>	<COMMUNICATION>	<VF1g>	How do the language spoken affect communication between subgroups?
<CONDRES>		<UD2d>	Is the condition of the resource required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative

			body to be recorded?
<CONELECT>		<OA10>	If the appropriators participate in elections for representatives and officials of this organization, are these elections contested?
<CONFLICT>		<RC1b>	If the quality and/or quantity of units is <u>regularly</u> better in some of the zones than in others, has this created conflict among appropriators?
<CONTROL>	<RESDIVIS>	<RC3>	Are there strategic points within the resource where the main flow of units can be controlled?
<CONTROL>		<IA6>	Do members of the appropriation resource have full control of the water delivery process after water has entered its area?
<CONUSAGE>		<UB2t>	What requirements must individuals meet before appropriating from this resource in regards to continuing usage of entry rights as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<COUNTRY>	<LOCSITE>	<LA6b>	What is the name of the (dominant) country in which this location is situated?
<COUNTRY>		<SB2a>	What is the name used TODAY for the country in which the location is situated?
<CROMETR2>	<REMOTE>	<LA13a>	How far (as a crow flies) is this location from a major marketing center in the region?
<CULTVWR>	<COMMUNICATION>	<VF1h>	How does the general cultural view of the resource system and its use affect communication between subgroups?

<DEFAGGR>		<UF1>	Is the default condition for aggregation rules applicable?
<DEFAUTH>		<UC1>	Are the default conditions for both authority and scope rules applicable?
<DEFBOUND>		<UB1>	Is the default condition for boundary rules applicable?
<DEFINF>		<UD1>	Is the default condition for information rules applicable?
<DEFPAY>		<UE1>	Is the default condition for payoff rules applicable?
<DELETE>		<SA2>	Should this citation be deleted from the CPR bibliography?
<DEMSKILL>		<UB2u>	What requirements must individuals meet before appropriating from this resource in regards to demonstration of knowledge or skills as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<DISTAPPR>	<BOUNDARY>	<RD3>	Is the boundary of the distribution resource roughly equivalent to the boundary of the appropriation resource?
<DISTHEAD>	<ISTRUCTURE>	<RD10>	Is the distribution system operated by the same agency(s) (or the same group(s) of people) as the headworks of the system?
<DISTOPER>	<ISTRUCTURE>	<RD9a>	Who operates the distribution system?
<DISTSAME>	<ISTRUCTURE>	<RD9>	Is the distribution system operated by the same agency(s) (or the same group(s) of people) as the appropriation resource?
<DOC>		<SA1>	What is(are) the id number(s) for the document(s) being screened?

<DONOR>		<RB5>	If a donor agency is involved, what is the name of that agency?
<DURATION>	<DURATION>	<VB3>	What is the duration of the patterns decribed on this form?
<EAPCLOSE>	<ENDCONDITION>	<VC13b>	At the end of this period, are the appropriators exercising or attempting to exercise closed access to this resource?
<EASYUND>		<UG4a>	Are the rules-in-use easy to understand by the appropriators?
<EAVERAGE>	<ENDCONDITION>	<VC4>	What is the average age of the units withdrawn from this resource at the end of this time period?
<EAVRESIZ>	<ENDCONDITION>	<VC3>	What is the average size of the units withdrawn from this resource at the end of this time period?
<ECONOLOC>	<REMOTE>	<LA14>	How would you characterize the economy of this location (stable, changing, autonomous, tied)?
<EFFINDC>	<ENDCONDITION>	<VJ4>	If the author evaluates efficiency, what are the indicators used, does the author propose any means of increasing efficiency, and if so, what are those means?
<ELABSUBS>		<UC9>	If labor input for maintenance is required, can the input be substituted by other means?
<ELIGIBLE>		<UB2x>	What requirements must individuals meet before appropriating from this resource in regards to registration on an eligibility list as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?

<EMARKETS>	<ENDCONDITION>	<VC5>	As of the end of this period, how are the appropriated units disposed of?
<EMERGLAB>		<UC7d>	What is the status of labor input for emergency repair as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<ENDBLNC>	<ENDCONDITION>	<VC1a>	For biological resources at the end of this period, what is the balance between the quantity of units withdrawn and the number of units available?
<ENDBLNC>	<ENDCONDITION>	<VC1b>	For physical resources at the end of this period, what is the balance between the quantity of units withdrawn and the quantity of units needed, given the usual patterns of use for these units?
<ENDCONDA>	<ENDCONDITION>	<VC11a>	As of the end of this period, how well-maintained is the appropriation resource?
<ENDCONDD>	<ENDCONDITION>	<VC11b>	As of the end of this period, how well-maintained is the distribution resource?
<ENDCONDP>	<ENDCONDITION>	<VC11c>	As of the end of this period, how well-maintained is the production resource?
<ENDDATE>	<DURATION>	<LA7>	What is the approximate ending date for this location form?
<ENDDATE>	<DURATION>	<VB1>	What is the ending date of the operational level coded on this form?
<ENDDATE>		<OA2b>	What is the end date for when this organization had the structure and process as described herein?

<ENDDATE>		<UA>	What is the approximate end date for this operational rules form?
<ENDNTFER>	<ENDCONDITION>	<VC9>	As of the end of this period, how extensive is the interference between the appropriation technology for this resource and the appropriation processes for other resources in this location?
<ENDPOLL>	<ENDCONDITION>	<VC7>	As of the end of this period, are there problems of pollution of this or other resources resulting from the way units are appropriated?
<ENDQUAL>	<ENDCONDITION>	<VC6>	As of the end of this period, what was the quality of the units withdrawn?
<ENDRATE1>	<ENDCONDITION>	<VC2>	What is the volume of withdrawal from this resource, in tons of fish harvested, at the end of this time period?
<ENDRATE2>	<ENDCONDITION>	<VC2>	What is the volume of withdrawal from this resource, in square meters of fields irrigated, at the end of this time period?
<ENDRATE3>	<ENDCONDITION>	<VC2>	What is the volume of withdrawal from this irrigation resource, in volume of annual flow, at the end of this time period?
<ENDTECHX>	<ENDCONDITION>	<VC8>	As of the end of this period, what is the extent of technical externalities resulting from the appropriation activities of participants from this resource?
<ENDTRUST>	<ENDCONDITION>	<VC12>	As of the end of this period, how would you characterize the levels of mutual trust described among appropriators?
<ENFRULE>		<OA23>	Who primarily enforces the

			rules of this organization (or group)?
<ENHANCE>		<GF6>	During this time period, have members of this group invested their own labor or other resources in constructing or improving production and/or distribution works for maintaining or improving the appropriation resource?
<ENTACT>		<GF10>	Has any member of this group assumed entrepreneurial activity in trying to achieve coordinated strategies?
<ENTRYFEE>		<UB21>	What requirements must individuals meet before appropriating from this resource in regards to the payment of a fixed entry fee as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<ENUMAPP1>	<ENDCONDITION>	<VG2>	What is a close estimate of the number of participants in the position of appropriator at the end, where the author has provided it?
<ENUMAPP2>	<ENDCONDITION>	<VG2>	What is a general estimate of the number of participants in the position of appropriator at the end?
<ENUMTEM1>	<ENDCONDITION>	<VG3>	If the appropriation process is organized as a team process, how many teams are appropriating from this resource at the end?
<ENUMTEM2>	<ENDCONDITION>	<VG3>	What is a general estimate of the number of teams in the position of appropriator at the end?
<ENUMUSR1>		<GA3>	What is the actual number of individuals in this group at the end?

<ENUMUSR2>		<GA3>	What is an estimate of the number of individuals in this group at the end?
<EOWNCLOS>	<ENDCONDITION>	<VC13a>	At the end of this period, are the owners exercising or attempting to exercise closed access to this resource?
<EQIPSHAR>		<GB8>	Do members of this subgroup exercise the separable right of transfer to shares of major appropriation equipment?
<EQSHARED>		<UE14>	If the ownership of the primary or supplemental appropriation equipment is itself divided into shares, please describe this share system. In addition, if any other share arrangement is in force, please describe.
<ERENTDIS>	<ENDCONDITION>	<VC10>	As of the end of this period, holding all inputs constant, are the same or even greater amounts of resource units withdrawn with few appropriator teams and/or equipment?
<ESEXDEVL>	<ENDCONDITION>	<VC4a>	As of the end of this period, are the units sexually mature at this size or age?
<ESTNDATE>	<DURATION>	<VB2>	What is the decade when these appropriation patterns ended?
<ETHNCID>	<COMMUNICATION>	<VF1b>	How does ethnic identification affect communication between subgroups?
<ETHNIC>		<UB2g>	What requirements must individuals meet before appropriating from this resource in regards to membership in an ethnic group as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?

<EVAPR>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for April for this location?
<EVAPYEAR>	<LOCGEOG>	<LB4>	What is the average annual evapotranspiration for this location?
<EVAUG>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for August for this location?
<EVDEC>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for December for this location?
<EVFEB>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for February for this location?
<EVJAN>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for January for this location?
<EVJUL>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for July for this location?
<EVJUN>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for June for this location?
<EVMAR>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for March for this location?
<EVMAY>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for May for this location?
<EVNOV>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for November for this location?
<EVOCT>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for October for this location?
<EVSEP>	<LOCGEOG>	<LB6>	What is the evapotranspiration level for September for this location?
<EXCLUDED>		<GB4>	Do members of this subgroup exercise the right to decide who can be excluded from the entire resource?

<EXCLUDIN>	<GB5>	Do members of this subgroup exercise the right to decide who can be excluded from particular zones within the resource?
<EXECAPPR>	<OA13>	Is the chief executive(s) or administrator(s) position(s) filled by appropriators?
<EXECINC>	<OA19>	Given the economy of this location, what is the average annual income (including all non-monetary forms of income) of the chief executive(s) or administrator(s)?
<EXECOTHR>	<OA20>	Does the chief executive(s) or administrator(s) hold leading positions in other collective or governmental bodies?
<EXECOWN>	<OA18>	Does the chief executive(s) or administrator(s) own assets or capital whose uses depend on the units from the resource(s)?
<EXECPAID>	<OA17>	Is the chief executive(s) or administrator(s) paid?
<EXECPER>	<OA16>	What time period does the chief executive(s) or administrator(s) serve?
<EXPOTHER>	<OA7>	What activities do the members of this organization (or group) use to express their needs and concerns to those officials <u>of other organizations</u> who make collective choice decisions in relation to the resource, and do the appropriators find them useful?
<EXPOWN>	<OA8>	What activities do the members of this organization (or group) use to express their needs and concerns to those officials of <u>this</u> organization who make collective choice decisions in relation to the resource,

			and do the appropriators find them useful?
<EXTAID1>		<UE6>	Can appropriators obtain external aid to develop their appropriation technologies?
<EXTAID2>		<UE7>	Can appropriators obtain external aid to develop and/or repair their production, distribution, or appropriation resources?
<EXTAID3>		<UE8>	Can appropriators obtain external aid to develop technologies for using the resource units?
<EXTINCAP>	<PRIORCHANGE>	<VB8>	Is the quantity of units available changing because of change in appropriation patterns of other appropriators withdrawing units from the same production or distribution resource?
<EXTPOLL>	<EXTERCONTROL>	<VE4>	Are there problems of pollution resulting from activities of others who are not appropriators of this resource and who are not necessarily inhabitants of this location?
<EXTREMOV>		<OA14>	Can an external or higher level authority remove the chief executive(s) or administrator(s)?
<EXTREP>		<OA15>	Does the chief executive(s) or administrator(s) report to any external or higher level authority?
<FAIR>		<UG4d>	Are the rules-in-use perceived by members of this subgroup as fair?
<FAMINCDE>		<GC6>	For most people in this subgroup, how dependent are they on this resource as a major source of family income?
<FINES>		<UE3>	Can fines be imposed on

		appropriators for breaking rules related to the appropriation of this resource?
<FISOURCE>	<OA21>	What are the major financial sources of the organization (or group)?
<FIXNUM>	<UC4c>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource up to a FIXED NUMBER of units during a period by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<FIXORDER>	<UC4f>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource in a FIXED ORDER by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<FIXPERC>	<UC4b>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource up to a FIXED PERCENTAGE of total number of units available during a period by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<FIXTIME>	<UC4d>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource at a FIXED TIME SLOT by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator

			rules-in-use?
<FLEXIBLE>		<UG4c>	Are the rules-in-use flexible in dealing with times of emergency or unusual problems facing particular members of the subgroup?
<FLOWVOL>	<RESSIZE>	<RB6d>	What is the flow volume of the resource?
<FORMORG>		<SC5>	Were the appropriator teams for this resource ever formally organized?
<FREEWITH>		<UC4h>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource WHENEVER and WHEREVER DESIRED by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<FREQCOMM>	<REMOTE>	<LA12>	Is there frequent contact and communication between people in this location and officials in an administrative center?
<FSOURCE>		<IA2>	What are the major financial sources of the higher level organization?
<FULLTIME>	<MONITOR>	<VG4f>	What proportion of official monitors have full-time status?
<FUNDS>	<LOCCOLCHOIC>	<CB2>	What is the source of public funds used by the general purpose local governments in this region?
<GENCHOIC>	<LOCCONCHOIC>	<CA1a>	What level of choice do citizens have regarding the charter of a local general purpose government?
<GENDER>		<UB2q>	What requirements must individuals meet before appropriating from this resource in regards to gender as determined by

			national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<GENINFO>	<INFORMATION>	<VD6>	Are there any actions being taken, by appropriators or officials, to generate information about the condition of the resource?
<GENRELTN>	<COMMUNICATION>	<VF2>	How would you characterize the general manner in which appropriators related to one another during this time period?
<GEOGBARR>	<RESDIVIS>	<RC2>	Are there natural barriers within the resource?
<GRESNAME>		<SB1c>	If there is more than 1 resource, what is a generalized name?
<GUARD>	<POSITION>	<VG4>	Does an "official" position of monitor exist (apart from the willingness of all appropriators to monitor)?
<HEADOPER>	<ISTRUCTURE>	<RD8a>	Who operates the headworks for this system?
<HEADSAME>	<ISTRUCTURE>	<RD8>	Are the headworks (production resource) operated by the same agency(s) (or same group(s) of people) as the appropriation resource?
<HIGHELEV>	<LOCGEOG>	<LB3c>	What is the highest elevation of this location?
<HIGHTEMP>	<LOCGEOG>	<LB8b>	What is the average high temperature of this location?
<HOWTRAN>		<UG3a>	How is knowledge about the rules-in-use transmitted from one generation of appropriators to another?
<IMPART>		<IA3>	Are the higher level officials generally impartial in handling conflict within and between appropriation resources?

<INCARCER>		<UE2>	Is incarceration a penalty that can be imposed on appropriators for breaking rules related to the appropriation of this resource?
<INFCOND>		<SB4>	Is there relatively good information about condition of this resource?
<INFOPRUL>		<SB6>	Is there relatively good information about (or from which may be inferred) the operational rules in use for this resource?
<INFSTAKE>		<SB3>	Is there relatively good information about stakes of participants?
<INFSTRAT>		<SB5>	Is there relatively good information about strategies used by key groups?
<INSURANC>	<USE>	<VE6>	Does there appear to be any insurance mechanism available to the appropriators related to variability of income from the resource?
<INSURDES>	<USE>	<VE6a>	If there appears to be an insurance mechanism available to the appropriators related to variability of income from the resource, what is it?
<INTCHANG>	<PRIORCHANGE>	<VB10>	Is there a change in one or more variables internal to the operational level?
<INTERACT>		<IA8>	Are there any other patterns of interactions between the higher level officials and members of the appropriation resource which you think are important?
<INTERNAL>	<PRIORCHANGE>	<VB10>	What are the variable(s) which have changed internal to the operational level?
<IOTHER>		<UD2k>	What other types of information in relation to the resource are required by

			an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<JUDGSYS1>	<LOCCOLCHOIC>	<CB3>	What type of judiciary system exists in this location?
<JUDGSYS2>	<LOCCOLCHOIC>	<CB4>	Are judges appointed or elected by national, regional, or local officials or citizens, or do they hold hereditary seats?
<JUDGSYS3>	<LOCCOLCHOIC>	<CB6>	Are judges generally considered to be honest, dishonest or corrupt?
<JUDGSYS4>	<LOCCOLCHOIC>	<CB5>	What is the tenure of a judge?
<JURINAM1>	<LOCSITE>	<LA9a>	What is the name of the local jurisdiction?
<JURINAM2>	<LOCSITE>	<LA9b>	What is/are the name(s) of the other local jurisdiction(s)?
<KPRESURE>		<GC5>	Does the amount of capital required to set up an appropriation team, given the assets of members of this subgroup, place pressure upon the appropriators to get immediate returns from appropriation?
<LABORG>		<UC10>	If labor input for maintenance is required, how is the labor force organized most of the time?
<LABRDAYS>	<MAINTENANCE>	<VE2>	How many person-days of labor per year are mobilized to maintain and/or repair the resources(s)?
<LATITUDE>	<LOCGEOG>	<LB1>	What is the latitude of this location?
<LEGITIM>		<UG4e>	Are the rules-in-use perceived by members of this subgroup as legitimate?

<LENGTH>	<RESSIZE>	<RB6b>	What is the length of the resource?
<LEVEDUC>		<UB2p>	What requirements must individuals meet before appropriating from this resource in regards to completion of particular level of education as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<LEVELOP>		<HA2>	What is the level of operation at which this organization operates (operational, collective choice, constitutional choice)?
<LGTHUSE>		<GC1>	What is the length of time this subgroup has regularly appropriated from this resource?
<LICENSE>		<UB2a*>	What requirements must individuals meet before appropriating from this resource in regards to the obtaining of a license for entry or for required equipment as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<LICLIMIT>		<UB3>	If an entry fee or license is required or permitted, is there an upper limit on the number of licenses that can be issued?
<LISTPRBS>	<COMMUNICATION>	<VF1j>	What problems which affect communication between subgroups does the author identify?
<LISTPROB>		<GA5j>	What are the problems which affect communication for this subgroup that the author identifies?
<LITERACY>		<GA4>	What proportion of this

			group is literate in a language in which records or publications about this resource and/or location (or other similar resources) is kept?
<LOCBOUND>	<BOUNDARY>	<LA2>	How have the boundaries of this location been determined?
<LOCCOLCH>		<UA3>	How much information does the author (or another authoritative source) provide about local collective choice mechanisms?
<LOCDSIPT>	<LOCSITE>	<LA1>	Briefly describe the location in which the appropriation resources we are coding are situated.
<LOCGENPU>	<LOCCONCHOIC>	<CA1>	Could citizens living in this location follow formal procedures to create their own local general purpose governments?
<LOCJURIS>	<LOCSITE>	<LA9>	If the location is within one country, is it divided among several general purpose local jurisdictions at the same level, or not within any general purpose local jurisdiction?
<LOCNAME>	<LOCSITE>	<LA8>	What is the name of the state, province, or region of this location?
<LOCsize>	<LOCSITE>	<LA10>	What is the size of this location in square meters?
<LOCSPEPU>	<LOCCONCHOIC>	<CA2>	Could citizens living in this location follow formal procedures to create their own local special purpose enterprises with some public powers?
<LONGITUD>	<LOCGEOG>	<LB2>	What is the longitude of this location?
<LONGVAR>		<GC11>	What is the variance over time of the average annual family income in this

			subgroup?
<LOSEENTR>		<UE4>	Is it possible for appropriators to lose their entry or appropriation rights for breaking rules related to the appropriation of this resource?
<LOTTERY>		<UB2z>	What requirements must individuals meet before appropriating from this resource in regards to the obtaining of access rights through lottery as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<LOWELEV>	<LOCGEOG>	<LB3b>	What is the lowest elevation of this location?
<LOWTEMP>	<LOCGEOG>	<LB8a>	What is the average low temperature of this location?
<MAINCONT>		<GF8>	Is the amount of maintenance or improvement work contributed by members of this group dependant or contingent on the quantity of units appropriated by members of this group?
<MAINTLAB>		<UC7c>	What is the status of labor input for maintenance as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<MAINTRES>	<MAINTENANCE>	<VE1>	Are there specialized staff or workers to undertake maintenance?
<MANAGE>		<GB3>	Do members of this subgroup have the right to participate in the management of this resource?
<MAPAVAIL>	<INFORMATION>	<VD1>	Are maps or charts of the appropriation resource used by appropriators?

<MAPPROD>	<INFORMATION>	<VD2>	Are maps and/or charts of the production and distribution resource available if these differ from appropriation resource?
<MARGVALU>		<GD4>	How large is the immediate return which could be obtained by increasing levels of appropriation?
<MBOUND>		<IA7>	Are there clear-cut physical boundaries of responsibility for maintenance between the higher level organization and members of the appropriation resource?
<MEANELEV>	<LOC GEOG>	<LB3a>	What is the mean elevation of this location?
<MELON>	<ISTRUCTURE>	<RD5>	Are there other appropriation areas receiving units from the same distribution system?
<MEMBAPPR>		<OA5>	What is the relationship of the size of this organization (or group) to the number of appropriators?
<MEMBSUB1>		<OA6>	If the membership is smaller than total, is the membership the same as a subgroup?
<MEMBSUB2>		<OA6>	If the membership is the same as a subgroup, then what is the subgroup id number?
<METHEAD1>	<ISTRUCTURE>	<RD6>	What is the distance between this appropriation resource and the headworks of the entire irrigation system, via the irrigation system?
<METHEAD2>	<ISTRUCTURE>	<RD6>	What is the distance between this appropriation resource and the headworks of the entire irrigation system, as a crow flies?
<MICROZON>	<RESDIVIS>	<RC1>	Are there distinct and stable micro-environmental or ecological zones within the resource?

<MINSIZE>		<UC4i>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource only units of AT LEAST CERTAIN SIZE by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<MODETRA2>	<REMOTE>	<LA13b>	What is the most common mode of transport to the closest major marketing center in the region?
<MONPAID>	<MONITOR>	<VG4e>	If an official monitor position exists, are these monitors paid?
<MONSANCT>	<SANCTIONS>	<VF6>	If someone violates rules-in-use related to the appropriation process from this resource, how likely is it that an official monitor or guard will move to impose sanctions?
<MONTHRES>	<LOCPop>	<LA11c>	If there is not a permanent population, how many months of the year do people live here?
<MOREINFO>		<SA5>	Are there citations in any of the documents to other documents which might provide further information about this same CPR?
<MUD>		<RC8>	Does the bottom topography consist primarily of mud, sand, gravel, or rock?
<MULTAPPR>		<RC9>	If multiple appropriation processes are used within this resource, what is the relationship among these processes if no rules in use are being followed?
<NARRANGE>		<UE11>	What is the number of different arrangements for payoff rules?
<NATCOLCH>		<UA1>	How much information does

			the author (or another authoritative source) provide about national collective choice mechanisms?
<NCYCLES>		<UC2>	What is the number of cycles coded for authority and scope rules?
<NEWGROUP>	<PRIORCHANGE>	<VB9>	Is a new group starting to withdraw units from the appropriation resource?
<NEWOPRUL>	<PRIORCHANGE>	<VB4>	Is there major change in the operational, collective, or constitutional rules?
<NEWTECH>	<PRIORCHANGE>	<VB6>	Is there new technology introduced?
<NEWVALUE>	<PRIORCHANGE>	<VB7>	Is there a substantial external change in exchange value of units appropriated?
<NONAPP>	<POSITION>	<VG1>	Does the position of non-appropriator exist at the end (i.e. those prevented from using)?
<NOSETPER>		<UE16>	If any position holds property rights to the residual profit other than through a set percentage, please describe.
<NUMBERES>		<SB1>	How many resources do these documents describe in detail?
<NUMHOU>	<LOCPOP>	<LA11b>	If there is a permanent population, what is the number of households?
<NUMNON1>	<POSITION>	<VG1>	If the position of non-appropriator exists, what is a close estimate of the number of participants (where author has provided it)?
<NUMNON2>	<POSITION>	<VG1a>	If position of non-appropriator exists, what is the estimated number of participants in this position at the end?

<NUMPOP>	<LOCPop>	<LA11a>	If there is a permanent population, what is the number of inhabitants?
<NUMSUBGP>	<SUBGROUP>	<VH1>	How many subgroup forms are being completed in relation to this operational level form?
<NUMUNIT>		<UD2b>	Are number of units withdrawn required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<OFFNEAR>		<OA11>	Do most of the officials who are responsible for the appropriation resource reside in or near the resource?
<OFFPGRD>	<POSITION>	<VG4d>	If official monitoring positions exist, what is a general estimate of the number of participants (of all types) who are on duty at one time during off peak periods?
<OFFPNUM>	<POSITION>	<VG4d>	If official monitoring positions exist, what is a close estimate of the number of participants (of all types) who are on duty at one time during off peak periods?
<OFFSPRNG>		<GC3>	In general, about how many offspring of the members of this group become appropriators of this resource when they are adults?
<OLSON>		<GD2>	If this subgroup were to (drastically) reduce its appropriation activities would this have noticeable impact on the balance of the quantity of units withdrawn and the number of units available in this resource?
<ONECOUNT>	<LOCSITE>	<LA6a>	Is this location included

			within more than one country?
<ONEMARKT>	<USE>	<VE5>	Do appropriators sell this unit in more than one market?
<ORGANID>		<HA2>	What is the id number of the organization?
<ORGANIZA>		<UB2i>	What requirements must individuals meet before appropriating from this resource in regards to membership in an organization as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<ORGNAME>		<OA2a>	What is the name of this organization or group?
<ORGPARG>		<OA24>	What is the day-to-day operating structure for this organization (or group) and the decisions individuals are allowed to take; the strategic decision-making structure, who composes it, and how often it convenes; and any information about this organization (or group) that is important but has not been captured elsewhere?
<ORSTATUS>		<HA2>	Has this organization been coded?
<OTHERLAW>	<LOCCOLCHOIC>	<CB7>	If there are multiple legal traditions in use in this location, what are they?
<OTHRCOMM>	<COMMUNICATION>	<VF1i>	How do any other problems between subgroups affect communication?
<OTHRCOOP>	<COMMUNICATION>	<VF3>	Is there any evidence presented in the documents that these appropriators have engaged in cooperation in regard to other activities besides the management of this resource?
<OTHCURR>		<GC4b>	If given in another

			currency, what is the amount of currency required to set up an appropriation team?
<OUTENTER>	<LOCCONCHOIC>	<CA3>	Have citizens in this or similar locations created or evolved "public" enterprises with "public treasuries" and "collective decisions" outside the formal governmental structure?
<OWNAPPRO>		<UB2o>	What requirements must individuals meet before appropriating from this resource in regards to ownership of some other form of limited property related to the appropriation from this resource as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<OWNLABOR>		<GF5>	During this time period, have members of this group invested their own labor or other resources in maintaining or improving the structure of the appropriation resource?
<OWNLAND>		<UB2n>	What requirements must individuals meet before appropriating from this resource in regards to ownership or leasing of land in the location as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<OWNRIGHT>		<UB2k>	What requirements must individuals meet before appropriating from this resource in regards to ownership or leasing of rights to a certain proportion of the flow as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?

<PARAGRPH>		<SC6>	Please write an abstract of the document being screened.
<PEAKGRD>	<POSITION>	<VG4c>	If "official" monitoring positions exist, what is a general estimate of the number of participants (of all types) who are on duty at one time during peak periods?
<PEAKNUM>	<POSITION>	<VG4c>	If "official" monitoring positions exist, what is a close estimate of the number of participants (of all types) who are on duty at one time during peak periods?
<PERMPOP>	<LOCPop>	<LA11>	Is there a permanent population living year round in this location?
<PERPOS11>		<UE13a>	What is the first arrangement for the set percentage that is assigned to each individual position for owner(s) (non-operator(s)) of primary appropriation equipment?
<PERPOS12>		<UE13a>	What is the second arrangement for the set percentage that is assigned to each individual position for owner(s) (non-operator(s)) of primary appropriation equipment?
<PERPOS13>		<UE13a>	What is the third arrangement for the set percentage that is assigned to each individual position for owner(s) (non-operator(s)) of primary appropriation equipment?
<PERPOS21>		<UE13b>	What is the first arrangement for the set percentage that is assigned to each individual position for owner(s)-operator(s) of primary appropriation equipment?
<PERPOS22>		<UE13b>	What is the second

		arrangement for the set percentage that is assigned to each individual position for owner(s)-operator(s) of primary appropriation equipment?
<PERPOS23>	<UE13b>	What is the third arrangement for the set percentage that is assigned to each individual position for owner(s)-operator(s) of primary appropriation equipment?
<PERPOS31>	<UE13c>	What is the first arrangement for the set percentage that is assigned to individual position for owner(s) (non-operator(s)) of supplementary appropriation equipment?
<PERPOS32>	<UE13c>	What is the second arrangement for the set percentage that is assigned to individual position for owner(s) (non-operator(s)) of supplementary appropriation equipment?
<PERPOS33>	<UE13c>	What is the third arrangement for the set percentage that is assigned to individual position for owner(s) (non-operator(s)) of supplementary appropriation equipment?
<PERPOS41>	<UE13d>	What is the first arrangement for the set percentage that is assigned to individual position for owner(s)-operator(s) of supplementary appropriation equipment?
<PERPOS42>	<UE13d>	What is the second arrangement for the set percentage that is assigned to individual position for owner(s)-operator(s) of supplementary appropriation equipment?
<PERPOS43>	<UE13d>	What is the third arrangement for the set

		percentage that is assigned to individual position for owner(s)-operator(s) of supplementary appropriation equipment?
<PERPOS51>	<UE13e>	What is the first arrangement for the set percentage that is assigned to individual position for crew with special assets (including non-owner captain)?
<PERPOS52>	<UE13e>	What is the second arrangement for the set percentage that is assigned to individual position for crew with special assets (including non-owner captain)?
<PERPOS53>	<UE13e>	What is the third arrangement for the set percentage that is assigned to individual position for crew with special assets (including non-owner captain)?
<PERPOS61>	<UE13f>	What is the first arrangement for the set percentage that is assigned to individual position for regular crew (each)?
<PERPOS62>	<UE13f>	What is the second arrangement for the set percentage that is assigned to individual position for regular crew (each)?
<PERPOS63>	<UE13f>	What is the third arrangement for the set percentage that is assigned to individual position for regular crew (each)?
<PERPOS71>	<UE13g>	What is the first arrangement for the set percentage that is assigned to individual position for others (what is this position)?
<PERPOS72>	<UE13g>	What is the second arrangement for the set

			percentage that is assigned to individual position for others (what is this position?)?
<PERPOS73>		<UE13g>	What is the third arrangement for the set percentage that is assigned to individual position for others (what is this position?)?
<PHYSANCT>	<SANCTIONS>	<VF5>	If someone violates rules-in-use related to the appropriation process from this resource, how likely is he/she to encounter physical sanctions imposed by other appropriators (who are not filling positions as official monitors)?
<PHYSFACT>		<UD2h>	Are physical factors affecting the resource required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<PRAPR>	<LOCGEOG>	<LB6>	What is the precipitation level for April for this location?
<PRAUG>	<LOCGEOG>	<LB6>	What is the precipitation level for August for this location?
<PRDEC>	<LOCGEOG>	<LB6>	What is the precipitation level for December for this location?
<PREDVAR1>	<UNITVAR>	<RC4a>	If there is considerable variation over space in the flow of units, is it predictable?
<PREDVAR2>	<UNITVAR>	<RC5a>	If there is considerable variation in the flow of units within a single year, is this variation predictable?
<PREDVAR3>	<UNITVAR>	<RC6a>	If there is considerable variation in the unit flow from year to year, is it

			predictable?
<PRFEB>	<LOCGEOG>	<LB6>	What is the precipitation level for February for this location?
<PRICESUP>		<UE9>	Are appropriators party to price support contracts or guaranteed purchase agreements for the selling of resource units or commodities produced by resource units?
<PRIORAPP>	<MAINTENANCE>	<VE3>	Has the quality or quantity of the units available to the appropriators who are the focus of this operational level form been adversely affected by the strategies of prior appropriators?
<PRJAN>	<LOCGEOG>	<LB6>	What is the precipitation level for January for this location?
<PRJUL>	<LOCGEOG>	<LB6>	What is the precipitation level for July for this location?
<PRJUN>	<LOCGEOG>	<LB6>	What is the precipitation level for June for this location?
<PRMAR>	<LOCGEOG>	<LB6>	What is the precipitation level for March for this location?
<PRMAY>	<LOCGEOG>	<LB6>	What is the precipitation level for May for this location?
<PRNOV>	<LOCGEOG>	<LB6>	What is the precipitation level for November for this location?
<PROBLEM>	<PROCESSES>	<VA1>	Are the processes described in related documents primarily related to appropriation, production, distribution, and/or use?
<PROCT>	<LOCGEOG>	<LB6>	What is the precipitation level for October for this location?

<PRODAPPR>	<BOUNDARY>	<RD1>	Is the boundary of the production resource roughly equivalent to the boundary of the appropriation resource?
<PRODDIST>	<BOUNDARY>	<RD4>	Is the boundary of the production resource roughly equivalent to the boundary of the distribution resource?
<PRODLOCA>	<BOUNDARY>	<RD2>	Is the boundary of the production resource roughly equivalent to the boundary of the location?
<PRONURUL>		<GF12>	Has this subgroup proposed action in a collective-choice or constitutional choice arena to alter the operational or collective-choice rules affecting the appropriation from this resource?
<PROPREG2>	<REGIMETYPE>	<VC13>	At the end of this period, has a change occurred in the property rights regime related to the appropriation resource?
<PRSEP>	<LOCGEOG>	<LB6>	What is the precipitation level for September for this location?
<PURETHEO>		<SA3>	Is this document a pure theory article with no empirical information?
<QASSETS>		<UD2j>	Is the quantity of assets in use required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<QUALBETR>	<RESDIVIS>	<RC1a>	Is the quality and/or quantity of units <u>regularly</u> better in some of the zones than in others?
<QUALUNIT>		<UD2c>	Are quality of units withdrawn required by an AGO, local communal enterprise, private

			enterprise, or local, regional, national or international administrative body to be recorded?
<RACE>		<UB2r>	What requirements must individuals meet before appropriating from this resource in regards to race as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<RACEID>	<COMMUNICATION>	<VF1d>	How does racial identification affect communication between subgroups?
<RADIOCOM>		<VD4>	Are the appropriators of this resource in radio communication with each other while appropriating from the resource?
<RAINDIST>	<LOCGEOG>	<LB5>	What is the distribution of the rainfall for this location?
<RAINYEAR>	<LOCGEOG>	<LB4>	What is the average annual rainfall for this location?
<REALOSER>	<EVALUATION>	<VI1>	Are there <u>any appropriators</u> who have been consistently disadvantaged in this period?
<REALYES>	<EVALUATION>	<VI1a>	If there have been any appropriators who have been consistently disadvantaged in this period, please describe.
<REASON>	<PRIORCHANGE>	<VB11a>	If the author begins the description of this case at this point in history, what is the reason?
<RECORDAV>	<INFORMATION>	<VD11b>	Are records of appropriators' contributions to the maintenance of the resource available for inspection by appropriators?
<RECORDCO>	<INFORMATION>	<VD5>	Are records of the condition of the resource kept in any

			systematic way?
<RECORDKE>	<INFORMATION>	<VD11a>	If most of the records of appropriators' contributions to the maintenance of the resource are kept in a language accessible to most of the appropriators, do officials at some level keep these records?
<RECORDLA>	<INFORMATION>	<VD11>	Are most of the records of appropriators' contributions to the maintenance of the resource kept in a language accessible to most of the appropriators?
<RECORDMA>	<INFORMATION>	<VD10>	Are records of the appropriators' contributions to the maintenance of the resource kept in any systematic way?
<RECORDMO>	<INFORMATION>	<VD9>	Are records of the appropriators' contributions to monitoring of the resource kept in any systematic way?
<RECORDPH>	<INFORMATION>	<VD8>	Are records of the physical factors which directly affect the resource kept in any systematic way?
<RECORDWI>	<INFORMATION>	<VD7>	Are records of the withdrawals from this resource kept in any systematic way?
<REGCOLCH>		<UA2>	How much information does the author (or another authoritative source) provide about regional collective choice mechanisms?
<REGION>		<SB2b>	What is the world region in which this country is found?
<RELANIMS>	<COMMUNICATION>	<VF1f>	How does religious identification affect communication between subgroups?
<RELEQUTY>	<EVALUATION>	<VI3>	By the end of the situation, would you characterize the

			distance between those who are the least advantaged and those who are the most advantaged as increasing, constant, or decreasing?
<RELIABLE>		<IA4>	Are the higher level officials generally reliable in delivering water to the appropriation resource?
<RESCHANG>	<PRIORCHANGE>	<VB5>	Is there change in the size and/or structure of the resource?
<RESCONF>	<LOCRES>	<LA5>	If multiple resources are present in this location, characterize the relationship among appropriation processes, if no rules in use were being followed.
<RESIDENT>		<GC2>	What proportion of this subgroup resides in or near this resource?
<RESNAME1>		<SB1b>	What is the name of the first resource described?
<RESNAME2>		<SB1b>	What is the name of the second resource described?
<RESNAME3>		<SB1b>	What is the name of the third resource described?
<RESNAME4>		<SB1b>	What is the name of the fourth resource described?
<RESPRES>	<LOCRES>	<LA4>	What appropriation resources are present in this location?
<RLEVEL>		<VG4a>	What level of rules is being monitored by the "official" position of monitor?
<RSRCUNIT>	<RESUNIT>	<RA1>	What is the unit being appropriated?
<RTRANS1>		<UB7>	How are entry rights transmitted through inheritance?
<RTRANS2>		<UB8>	How are entry rights transmitted WITHIN one generation of potential

		appropriators?
<RTRANS3>	<UB8a>	If transfer on a temporary or permanent basis is allowed, who determines to whom such rights can be transferred?
<RULEBRAK>	<GF11a>	Is the level of infraction of those members of the group who are not rule followers usually small, medium or large?
<RULECLAS>	<OA22>	How easily understood are the rules this organization (or group) has evolved/adopted to govern the activity it has organized?
<RULEDUR>	<UG1>	Approximately how long has the general framework of the rules-in-use described above governed the activities of this subgroup?
<RULEFOLL>	<GF11>	What is the usual behavior of the members of this subgroup with respect to local operational level rules-in-use related to the appropriation process from this resource in years other than extreme shortage?
<RULETRAN>	<UG3>	Does the author discuss how knowledge about the rules-in-use is transmitted from one generation of appropriators to another?
<RULQUANC>	<GD3c>	To what extent do the rules in use with regards to quantity constrain appropriation by limiting the range of choice for this subgroup?
<RULSETSA>	<UC3>	If there are more than one set of rules, please explain briefly under what conditions they can be evoked or adopted, and in which periods, months, or years they are adopted/used.

<RULSETSB>	<UB10>	If there are more than one set of rules, under what conditions they can be evoked or adopted, and in which periods, months, or years they are adopted/used?
<RULSETSP>	<UE12>	If there is more than one arrangement, under what conditions does it apply?
<RULTECHC>	<GD3a>	To what extent do the rules in use with regards to technology constrain appropriation by limiting the range of choice for this subgroup?
<RULTIMEC>	<GD3b>	To what extent do the rules in use with regards to time constrain appropriation by limiting the range of choice for this subgroup?
<SAMEFEES>	<UB6>	If an entry fee or license is required or permitted, are the fees the same across all categories of applicants?
<SBEGBLNC>	<SC3a>	For biological resources at the <u>beginning</u> of the time period discussed by the author(s), what was the balance between the quantity of units withdrawn and the number of units available?
<SBEGBLNC>	<SC3b>	For physical resources at the <u>beginning</u> of the time period discussed by the author(s), what was the balance between the quantity of units withdrawn and the quantity of units needed*, given the usual patterns of use for these units?
<SBGPDES>	<GA1>	Please provide a brief description of this appropriation subgroup.
<SCASTE1>	<GA5e>	How does caste affect communication?
<SCASTE2>	<GA5e>	What is the caste of most members of this subgroup?

<SCLANID1>		<GA5c>	How does clan identification affect communication?
<SCLANID2>		<GA5c>	What is the clan identification of most members of this subgroup?
<SCULTVWR>		<GA5h>	What is the general cultural view of the resource system and its use for this subgroup?
<SEASFEE>		<UB2m>	What requirements must individuals meet before appropriating from this resource in regards to the payment of a fixed seasonal fee as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SEASONLN>		<UC5>	Based on quantity of units withdrawn, if units are withdrawn only during specific seasons then how long is the length of the season?
<SECTOR>		<SB2c>	What is the sector code for this resource?
<SECTOR1>	<SECTOR>	<RA4>	What is the resource sector of this unit?
<SECTOR2>	<SECTOR>	<RA5>	What is the 4-digit detailed sector code?
<SELEDIST>	<ISTRUCTURE>	<RD9b>	Do the irrigators being served by this distribution organization participate in the selection of the officials of the distribution agency?
<SELFMON>		<VG4b>	Do appropriators monitor the appropriation activities of each other apart from the monitoring of any "official" guards?
<SELPROD>	<ISTRUCTURE>	<RD8b>	Do the irrigators being served by this production organization participate in the selection of the

		officials of the production agency?
<SENDBLNC>	<SC4a>	For biological resources at the <u>end</u> of the reported time period discussed by the author(s) of this <u>case</u> , what was the balance between the quantity of units withdrawn and the number of units available?
<SENDBLNC>	<SC4b>	For physical resources at the <u>end</u> of the reported time period discussed by the author(s) of this <u>case</u> , what was the balance between the quantity of units withdrawn and the quantity of units needed, given the usual patterns of use for these units?
<SERVICES>	<OA9a>	If the organization provides the appropriators with services in addition to provision, production, distribution, appropriation, and use activities that are already provided, what are the major services provided?
<SETHID1>	<GA5b>	How does ethnic/cultural identification affect communication?
<SETHID2>	<GA5b>	What is the ethnic identification of most members of this subgroup?
<SEX>	<COMMUNICATION>	<VF1a> How does gender identification affect communication between subgroups?
<SGENDER1>		<GA5a> How does gender identification affect communication?
<SGENDER2>		<GA5a> Approximately what proportion of this subgroup are women?
<SG1TOSG2>	<SUBGROUP>	<VH3a> How does the first subgroup compare to the second subgroup in relation to the criteria of rights,

			appropriation, exposure, dependency, and use?
<SG1TOSG3>	<SUBGROUP>	<VH3b>	How does the first subgroup compare to the third subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG1TOSG4>	<SUBGROUP>	<VH3c>	How does the first subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG2TOSG3>	<SUBGROUP>	<VH3d>	How does the second subgroup compare to the third subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG2TOSG4>	<SUBGROUP>	<VH3e>	How does the second subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SG3TOSG4>	<SUBGROUP>	<VH3f>	How does the third subgroup compare to the fourth subgroup in relation to the criteria of rights, appropriation, exposure, dependency, and use?
<SHARCHNG>		<GG2>	By the end of this time period, has this percentage the group appropriates from this resource become larger, remained constant, or become smaller?
<SHAREORG>		<UB2b*>	What requirements must individuals meet before appropriating from this resource in regards to ownership of shares in an organization as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SHARERES>		<UB2j>	What requirements must

		individuals meet before appropriating from this resource in regards to ownership of shares in the resource facility itself as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SHARE%>	<GG1>	Of the total number of units appropriated from this resource, what is the percentage this subgroup appropriates at the <u>end</u> of this period?
<SHUNNING>	<UE5>	Is severe community shunning a sanction that may be consciously imposed on appropriators who break rules related to the appropriation of this appropriation resource?
<SLANG1>	<GA5g>	How does the languages spoken affect communication?
<SLANG2>	<GA5g>	What is the language used by most members of this subgroup?
<SLOCNAME>	<SB2>	What is the name of the location?
<SLOCsize>	<SC1>	What is the known or estimated size of the appropriation resource?
<SNUMAPP2>	<SC2>	What is the known or estimated number of total appropriator teams for this resource?
<SNUMTEM1>	<GA6>	If the appropriation process is organized as a team process, what is a close estimate of the number of teams in this group?
<SNUMTEM2>	<GA6>	If the appropriation process is organized as a team process, what is a general estimate of the number of teams in this group?

<SOCSANCT>	<SANCTIONS>	<VF4>	If someone violates rules-in-use related to the appropriation process from this resource, how likely is he/she to encounter social sanctions imposed by other appropriators (who are not filling positions as official monitors)?
<SOCSTRAT>	<COMMUNICATION>	<VF1e>	How does caste affect communication between subgroups?
<SOILTYPE>	<LOCGEOG>	<LB9>	What is/are the dominant soiltype(s) of the location?
<SOTHCOMM>		<GA5i>	Are there any other problems that affect communication for this subgroup?
<SPECHOIC>	<LOCCONCHOIC>	<CA2a>	What level of choice do citizens have regarding the charter of a local special purpose enterprise?
<SPLOC>		<UC4g>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource at SPECIFIC LOCATIONS/SPOTS by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SPSEASON>		<UC4e>	What is the assignment procedure (and relevant basis) for withdrawing units from this appropriation resource only DURING SPECIFIC SEASONS by this subgroup as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<SRACEID1>		<GA5d>	How does racial identification affect communication?
<SRACEID2>		<GA5d>	What is the racial identification of most members of this subgroup?

<SRELID1>		<GA5f>	How does religious identification affect communication?
<SRELID2>		<GA5f>	What is the religious identification of most members of this subgroup?
<STANCE1>	<LOCCONCHOIC>	<CA4>	What is the stance of the national government toward efforts to organize at the local level to create general or special enterprises to cope with local problems?
<STANCE2>	<LOCCONCHOIC>	<CA4a>	If an intermediate government is primarily involved instead of the national government, what is its stance toward efforts to organize at the local level to create general or special enterprises to cope with local problems?
<STEEP>	<STEEP>	<RC7>	If this is a land based resource, is the topography of the resource flat, undulating or sloping?
<STOREVOL>	<RESSIZE>	<RB6c>	What is the storage volume of the resource?
<SUBALT1>		<GF9>	Do the members of this group have access to an alternative source of supply of this unit?
<SUBALT2>		<GF9a>	During this time period, have the members of this group increased their use of alternative sources of supply of this unit?
<SUBGP1>	<SUBGROUP>	<VH2>	What is the ID number of the first subgroup form relating to this operational level form?
<SUBGP2>	<SUBGROUP>	<VH2>	What is the ID number of the second subgroup form relating to this operational level form?
<SUBGP3>	<SUBGROUP>	<VH2>	What is the ID number of the

			third subgroup form relating to this operational form?
<SUBGP4>	<SUBGROUP>	<VH2>	What is the ID number of fourth subgroup form relating to this operational form?
<SUBNOT>		<GC7>	What proportion of this subgroup works a substantial amount of time in activities not associated with appropriation from this resource?
<SUBSIM>		<GC8>	What proportion of this subgroup currently appropriates similar units from other resources?
<SUBVAR>		<GC10>	What is the variance in the average annual family income across families in this subgroup?
<SUBWHERE>		<GD1>	If there are multiple subgroups using this resource, do most of the appropriators of this subgroup withdraw units from this resource?
<SUMFEES1>		<UB4>	If an entry fee or license is required or permitted, is the sum of the fees and or licenses low, moderate or high?
<SUMFEES2>		<UB5>	If an entry fee or license is required or permitted, is the sum of the fees and/or licenses low, moderate or high?
<SURFAREA>	<RESSIZE>	<RB6a>	What is the surface area of the resource?
<SYSTAREA>	<ISTRUCTURE>	<RD7>	How many square meters are irrigated by this entire system?
<TEAMBASE>		<GA6b>	Is the head of appropriation team based on nuclear family relationships, extended family or clan relationships, or exchange relationships?

<TEAMCAP>		<GC4a>	What is an estimate of the amount of time needed to build or to earn enough income to purchase the equipment for an appropriation team?
<TEAMSIZE>		<GA6a>	What is the average number of persons in an appropriation team?
<TECHEXTR>		<GE2>	Does the appropriative power of the technology as used by members of this subgroup threaten the balance between units withdrawn and units available even if no new users were added?
<TECHTIME>		<GE1>	When was the most recent technological change experienced by this subgroup?
<TECHUSED>		<GE1a>	Considering other technologies that have not changed, how long have they been in use?
<TEMPERTR>	<LOCGEOG>	<LB7>	What is the average annual temperature of this location?
<TERJUR1>		<OA3>	What is the relationship of the territorial jurisdiction of the organization (or group that has achieved coordination without a formal organization) to the physical boundaries of this resource?
<TERJUR2>		<OA4>	What is the relationship of the territorial jurisdiction of the organization (or group that has achieved coordination without a formal organization) to that of the smallest relevant general purpose government/administrative unit?
<TRADOK1>	<LOCCONCHOIC>	<CA1b>	Could the basic "charter" of a traditionally evolved local general purpose

			government be maintained if one existed?
<TRADOK2>	<LOCCONCHOIC>	<CA2b>	Can the basic charter of a traditionally evolved local special purpose enterprise be maintained?
<TRANFLOW>		<GB6>	Do members of this subgroup exercise the separable right of transfer to the flow of units from this resource?
<TRANSHAR>		<GB7>	Do members of this subgroup exercise the separable right of transfer to shares of this appropriation resource, or closely related production and/or distribution resources?
<TYPEDOC1>		<SA4>	What type of document is this?
<TYPEDOC2>		<SA4>	If this document type is not listed, what other type is it?
<TYPELAW1>	<LOCCOLCHOIC>	<CB7>	If there is a single dominant legal tradition in use, what type is it?
<TYPERES>	<RESUNIT>	<RA2>	Is the type of resource producing this unit biological or physical?
<TYPRESUL>	<EVALUATION>	<VJ2>	Comment on the author's identification of results, evaluation of results, the causal model the author is using, and whether we have captured these.
<UNDERRES>	<INFORMATION>	<VD13>	Do the appropriators have a well-developed understanding of the characteristics of this resource?
<UNEQDUTA>		<UC12>	Do the authority and scope rules assign substantially unequal duties to some subgroups than others?
<UNEQPRIA>		<UC6>	Do the authority and scope rules assign substantially unequal privileges to some subgroups than others?

<UNEQPRIB>		<UB9>	Do the boundary rules assign substantially unequal privileges to some subgroups than others?
<UNEQPUN>		<UE10b>	Do the payoff rules assign substantially unequal punishments to some subgroups than others?
<UNEQREW>		<UE10a>	Do the payoff rules assign substantially unequal rewards to some subgroups than others?
<UNITFLOW>		<UD2e>	Are appropriators' claims to the flow of units from the resource required by an AGO, local communal enterprise, private enterprise, or local, regional, national or international administrative body to be recorded?
<UNITSUSE>		<UB2w>	What requirements must individuals meet before appropriating from this resource in regards to the purpose for which the withdrawn units will be devoted as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<USERATE1>		<GF1>	At the beginning of this period, is the rate of withdrawals of units for this subgroup accelerating, increasing, constant, decreasing or decelerating?
<USERATE2>		<GF2>	At the end of this period, is the rate of withdrawals of units for this subgroup accelerating, increasing, constant, decreasing or decelerating?
<USERSEEN>	<INFORMATION>	<VD3>	Are appropriators of this resource readily observed by each other?
<USES1>		<GF3a>	For irrigation, at the beginning of this period, if

			the appropriation units are frequently used to produce other goods, what are these other goods?
<USES1>		<GF3b>	For grazing, at the beginning of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USES1>		<GF3c>	For forestry, at the beginning of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USES2>		<GF4a>	For irrigation, at the end of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USES2>		<GF4b>	For grazing, at the end of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USES2>		<GF4c>	For forestry, at the end of this period, if the appropriation units are frequently used to produce other goods, what are these other goods?
<USETECH>		<UB2v>	What requirements must individuals meet before appropriating from this resource in regards to use of a particular technology as determined by national, regional, or local constitutional or collective decisions or appropriator rules-in-use?
<VAROTIME>	<UNITVAR>	<RC6>	Is there considerable variation in the unit flow from year to year?
<VARSANCT>	<SANCTIONS>	<VF7>	Is there a gradation of social, physical, and

			official sanctions that varies with the severity of rule violations?
<VARSOIL>	<LOCGEOG>	<LB10>	What is the level of variation in the soil type?
<VARSPACE>	<UNITVAR>	<RC4>	Is there considerable variation over space in the availability of these units within the resource?
<VARYEAR>	<UNITVAR>	<RC5>	Is there considerable variation in the flow of units within a single year?
<VIOLENC1>		<GF13>	Have members of this subgroup threatened, or actually used, violence to attempt to alter the behavior of other appropriators?
<VIOLENC2>		<GF14>	Have members of this subgroup threatened, or actually used, violence to attempt to alter the behavior of officials?
<WAGEUSE>		<UE15>	If wage laborers are used in the team production process, please describe who hires, how wages are set, if wage earners are organized and other relevant factors.
<WATERORI>	<ISTRUCTURE>	<RD11>	What are the major sources of water used for irrigation?
<WELDEFIN>		<GA2>	Are the criteria for who is a member of this group well defined?
<WELLDEFN>		<VA3>	Is the set of individuals who have rights to withdraw from this resource well-defined?
<WHYNOPOP>	<LOCPop>	<LA11d>	What are the reasons for a non-resident population?
<WITHDRAW>		<GB2>	Do members of this subgroup exercise the right to withdraw?
<WORKOWN>		<UC8>	Are individuals required to

			work primarily on those parts of the resource(s) that can affect their own level of appropriation from the resource?
<WORSTOFF>	<EVALUATION>	<VI2>	Have the <u>relatively worst off</u> been cut out of their benefits from this resource or substantially harmed?
<WRITTEN>		<UG2>	Are the rules-in-use available in a written form to the appropriators?
<ZERORES>		<SB1a>	If these documents do not describe a particular resource, then what do they describe?
<\$AMOUNT>		<GC4b>	What is the dollar amount required to set up an appropriation team?

Glossary

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GLOSSARY OF TERMS

Access: The right to enter a defined physical property.

Aggregation Rules: These rules are applicable when authority rules assign multiple positions partial control over the same action. Example: Safe deposit boxes.

Allocation Rules: Allocation rules prescribe the procedure for withdrawing water from an irrigation system: they are important especially when the supply of water is inadequate to meet the crop requirements of all the cultivators simultaneously. Three types of procedures: 1) Fixed percentage; 2) Fixed time slots; 3) Fixed order

AGO: Appropriator Group Organization

Appropriation: Activity in relation to the resource that has been organized.
Forms: Collective Choice Coding Form (49)

Appropriation Resource: One of four stages of the delivery of a resource: production, distribution, appropriation, and use. Manual: Coding Instructions, Appropriation Resource Coding Form (28)

Appropriation Resource Form: Examines the boundaries and physical characteristics of an appropriation resource. (from Tang, p.62)

Appropriators: Appropriators are individuals who actually withdraw units from the resource.

Authority Rules: Authority rules define what appropriators must, must not, or may do at a particular stage of the appropriation process in light of the actions taken by others and the conditions of the physical resource.

Boundary Rules: The existence of a set of boundary rules that limits the number of individuals who have had rights to withdraw resource units is a key pre-condition for successful collective action in common pool resources. Without a well-defined set of rights holders, it will be difficult for actual and potential users to negotiate and enforce a common set of rules coordinating various water allocation and investment activities...The existence of a closed set of rights holders also distinguishes a common property resource from an open access resource.

Case; Case-study: A case is an instance of a set of rules governing institutional use of a resource within a definable period of time. If the rules change, we would have a new case. Similarly, if the resource changes, we would also have a new case.

Collective Choice: Collective decisions are made by officials (including citizens acting as officials) to determine, enforce, continue, or alter actions authorized within institutional arrangements. Like individual strategies in the world of action, collective decisions are plans for future action. Unlike individual strategies, collective decisions are enforceable against non-conforming individuals. An individual failing to abide by a personal diet strategy, for example, may feel guilty, but no official has the power to enforce a diet plan. Officials have the power, however, to enforce a

collective plan such as a city ordinance. City officials can impose sanctions against individuals who violate the ordinance. The authority to impose sanctions is a key attribute of the collective choice level of decision-making. (p.207-208, Kiser and Ostrom)

Collective Choice Form: Examines the collective choice entities that govern an irrigation system. (Tang, p.62)

Collective Choice Level - The level of action wherein people organize and act to take collective decisions concerning the rules for action and the structure of their relations with others.

Confidence Level: Please use the following scale to append a Confidence Level to each question contained on the remainder of this form.

Confidence level you have in your answer:

- 5 Very confident (author specifically provides information)
- 4 Mildly confident (author generally provides information)
- 3 Confident (a clear inference from this & other cases)
- 2 Sufficient information to make a reasoned guess
- 1 Sufficient information to make a guess but information is quite ambiguous

Constitutional Choice: Constitutional decisions are collective choices about rules governing future collective decisions to authorize actions. Constitutional choices, in other words, are decisions about decision rules. Organizing an enterprise is a constitutional decision about rules to constrain future collective choices within the enterprise. But constitutional choice also continues beyond the initial organizing period, for as individuals react to consequences of earlier rules for collective decision-making, participants may change the rules to improve the result. (p.208, Kiser and Ostrom)

De jure, De facto: De jure basis means that the particular right is recognized by a formal collective choice institution/organization in the region or country where the resource is located. Most often the collective choice institution is part of a formal judicial system, although administrative bodies are also included. The easiest way to evaluate whether a right has a de jure basis is if that right is challenged, the subgroup could have the right sustained either by a judicial or administrative body. On the other hand, de facto basis means that the particular right is not recognized by a formal collective choice institution/organization. Note that the right does exist. The members of this subgroup have forged this right as amongst themselves and others.

Deontic Response Categories: [Deontology: the theory or study of moral obligation] Responses that are required, permitted, or forbidden. In this manual, "R" = required, "P" = permitted, and "F" = forbidden.

Distribution Resource: The means by which water is brought from the production resource to the appropriation resource

Exclusion: The right to determine who will have access to a resource or a share thereof and who will, therefore, be excluded.

Information Rules: Information that may be recorded.

Input Rules: Input rules prescribe the types and amounts of resources required of each cultivator. Four major types of inputs an irrigator may be required to contribute: 1) regular water tax; 2) labor for regular maintenance; 3) labor for emergency repair; 4) labor, money, or materials for major capital investment. Input requirements based on one of two premises: 1) equal; 2) proportional.

Location Form: Captures general physical and institutional characteristics of the area in which the resource(s) of interest is/are located. The location not only encompasses the appropriation resource(s) but also other crucial features of the resource environment. For example, in many inshore fisheries, the location entails the fishing ground(s) and the adjacent villages in which the fishers reside. In irrigation cases, the location would include the irrigation system, the irrigated fields, and the villages of the appropriators.

Management: The right to regulate internal use patterns and transform the resource by making improvements.

MIC: Missing in Case

Operational: Operational level - the arena of action of appropriators and others in their interaction with the appropriation resource. (Forms: collective choice coding form (49))

Operational level: The world of action; individuals functioning at this level either take direct action or adopt a strategy for future actions, depending on expected contingencies. Decisions in a market or in a tennis game occur at this level.

In a highly organized and free society, individuals are authorized to take a wide variety of actions at this level without prior agreement with other individuals. Authority derives from institutional arrangements, including property law, business, and corporate law, and constitutional guarantee of individual freedom (pp. 207-208, Kisor & E. Ostrom, 1982. *The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches*. In *Strategies of Political Inquiry*. Beverly Hills: Sage Publications, E. Ostrom ed.)

Operational Level Form: Examines the types of situations faced by participants, the level of information available to them, their potential actions and levels of control, their patterns of interactions, and the outcomes they obtain. Each operational level form reports a "time slice" during which the actions of the appropriators are relatively consistent. By "relatively consistent," it is meant that the rules governing the appropriation resource, the community of appropriators, and the physical characteristics of the resource are the same through out the period when any one of these attributes coded for a new "time slice." Therefore, there will be more than one case for each irrigation system if more than one operational level form is coded.

Operational Rules (OR): Operational rules define who can participate in which situations, what the participants may, must, or must not do, and how they will be awarded or punished. OR facilitate coordination among the participants if the participants share a common knowledge of these rules and are willing to follow them. In a world of rapidly expending knowledge and changing circumstances, rules have to be able to create enough predictability among

individuals yet permit enough flexibility to deal with various contingencies. Four kinds of operational rules imp: 1) boundary rules; 2) allocation rules; 3) input rules; and 4) penalty rules.

Operational Rules Form: Examines the kinds of boundary authority, scope, information, payoff, and aggregation rules used in an appropriation resource. (Tang p. 62)

Organizational Structural Form: Examines the structure and process of a collective choice entity. Multiple organizational structure forms have to be filled out if more than one collective choice entity is involved in governing an appropriation resource. (Tang p. 62)

Organizational Inventory: Forms: Collective choice coding form (49)

Payoff Rules: These rules specify the external rewards or sanctions that must, must not, or may be assigned to specific actions or outcomes.

Penalty Rules: In most cases, rules will be ineffective unless there are penalty rules to punish rule-breakers. Some possible penalties against rule breakers include community shunning, fines, temporary or permanent loss of rights to water and incarceration.

Production Resource: The production of water for irrigation involves making water available at locations and times when it does not naturally occur in the form of precipitation and immediate runoff.

Provision: Provision has a distinct and separate meaning from production. The following quotation provides a definition for provision:

The organization of provision relates primarily to consuming, financing, arranging for production, and monitoring the production of a set of goods and services. Thus, in regard to rural infrastructure development, provision refers to the entire set of activities involved in articulating the demand for, financing, arranging for the production of, and monitoring the production of the activities related to both the construction and maintenance of a facility. The organizational arrangements related to the provision of the construction of a facility may differ rather substantially from those related to the provision of its maintenance. A highly organized process may exist to design and finance large-scale infrastructure projects. This process may or may not involve the ultimate users but will frequently involve design engineers trained to undertake site studies of various types. Institutional Incentives and Rural Infrastructure Sustainability, Elinor Ostrom, Larry Schroeder, and Susan Wynne, (Decentralization: finance & Management Project, Associates in Rural Development, Burlington, Vt., May 1990.)

Rules-in-use: Are rules that the members of a sub-group are using in practice, rather than formal rules that may be written about the rights and duties of this subgroup.

Scope Rules: Scope rules specify the conditions in the world which must, must not, or may be affected as a results of actions taken.

Social Sanction: Violators may achieve a bad reputation, be criticized, be excluded from other social activities, be shunned, or otherwise ostracized.

Subgroup Form: Examines the stakes and resources, potential actions and levels of control, and strategies of participants in a subgroup. There will be more than one subgroup and more than one subgroup form that has to be filled out if the participants in an appropriation resource are not relatively symmetrical in their legal rights to appropriate water, their withdrawal rate from the resource, their exposure to variation in water supply, their level of dependency on water from the resource, and how they use the water. (Tang, p.62)

Transaction Costs: Refer to the time, funds, and energy devoted to making and enforcing decisions and rules.

Transfer: The right to sell, lease, or bequeath all of the above rights in whole or in part.

Use: Activity in relation to the resource that has been organized. For irrigation, this is the activity that the individual appropriator performs; he brings water to his fields for use.

Withdrawal: The right to obtain the "products of a resource (e.g. catch fish, appropriate water)."