IIMI Working Paper No. 2

TURNING OVER IRRIGATION SYSTEMS FROM THE GOVERNMENT OF INDONESIA TO FARMERS

by

Douglas Vermillion

IIMI Pub 87-15A (November)

IIMI Working Papers are produced for discussion and should not be quoted. Although the contents have been reviewed by IIMI staff who are knowledgeable in the subject area, Working Papers are only lightly edited and generally present preliminary results of on-going research. Comments are invited and should be sent directly to the author at: IIMI-Indonesia, 435 KBY, Jakarta 12001, Indonesia.

This Working Paper was published by:

International Irrigation Management Institute
Digana Village via Kandy, Sri Lanka

Telephone (08) 74274, 74334, 74251, 74265, and 74268; IDD 32191;
Telex 22318 IIMIHQ CE

TURNING OVER IRRIGATION SYSTEMS FROM THE GOVERNMENT OF INDONESIA TO FARMERS[1]

Douglas Vermillion*

INTRODUCTION

The purpose of this paper is to contribute to discussions about the process of turning over irrigation systems from the Government of Indonesia to water users. The intent is to identify and briefly describe the major issues concerning policy and the process of implementation as well as express some personal viewpoints.

Recently, several Asian governments (such as the Philippines, Nepal, and Indonesia) -- as well as development agencies, the Ford Foundation, the World Bank, the Asian Development Bank, and the International Irrigation Management Institute (IIMI) -- have become concerned with the need to turn over control and/or ownership of assets of government irrigation systems to water users. The growing movement toward turning irrigation systems over to farmers is consistent with the current interest in "privatizing" the production sectors of the economies of developing countries. It is based on a desire to decrease the budgetary burdens of governments for irrigation operations and maintenance (O&M) and to enhance the long-term sustainability of irrigation systems through local control. It is hoped that this will slow down the deterioration of systems and limit the need for frequent rehabilitation.

Over the last 15 years, irrigation system O&M budgets in Indonesia have not been able to keep up with the increase in the number of government systems constructed or incorporated into the Public Works Department (Department Pekerjaan Umum or DPU) through the Prosida and Sederhana Programs. There has been a trend toward ever larger proportions of DPU provincial irrigation service O&M budgets being used for routine personnel costs and less for maintenance-oriented supplies and resources.

In IIMI research sites, section heads (kepala seksi) report that roughly only one-third of requested O&M funds are actually allocated by the DPU. On the maintenance side, the section heads tend to place first priority on the repair and maintenance of major water division structures of larger, "technical" systems, then on the repair and desilting of main and secondary canals in such systems, then on the routine weeding and cleaning of these canals, and finally on the repair and maintenance of smaller and "semi-technical" systems. Generally speaking, both budgetary allocations as well as actual outlays for smaller "less technical" systems are far less than those of larger systems (either on a per-hectare or per-meter-of-channel basis). Even in larger DPU systems, it is common for irrigation inspectors (juru pengairan) to be responsible for setting and controlling twenty or more gates (each of which, in principle, requires daily inspection, discharge recordings and resetting if needed).

History tells us that the deterioration of irrigation systems is not

*Social Scientist, IIMI-Indonesia, PO Box 435 KBY, Jakarta 12001, Indonesia.

inevitable. Systems may appreciate in value, design capacity, and manageability over time, without dependence on the state. In Indonesia and elsewhere, irrigation systems built by farmers often evolved from small diversions irrigating a few hectares to larger, integrated networks (sometimes with only brush and stone weirs) which irrigate several thousand hectares. In locations such as in Bali, West and North Sumatra, Himachal Pradesh in India, Northern Thailand, and the lowlands of Nepal, locally self-sustaining irrigation systems expanded and even improved over time through the regular investments and maintenance efforts of organized farmers.[2]

During the colonial and post-colonial era, governments made huge investments in irrigation systems, usually designing, constructing, and operating systems with little fanner participation. The ensuing pattern of dependence on the government for irrigation investments left the fanners without a sense of ownership of the systems and subsequently eroded the farmers' sense of responsibility for O&M as well. However, fanners were expected to maintain the systems regularly at the tertiary level and occasionally to help repair damages at the secondary level. Requirements for payment of water service fees were often established.

Nevertheless, farmers often report dissatisfaction with government-built structures. They often become accustomed to the government providing free water deliveries and maintenance services. They come to expect that the government will rehabilitate the system every few years. Hence, they tend to feel that it should be the role of the government to maintain its own systems.[3] If Indonesia is to move toward a more self-sustaining pattern of irrigation development, such attitudes will have to change, as well as the policies which encourage them. Only then can the turnover of systems be effective in the long-run.

By the nature of the issue, turning over government systems to farmers is embedded in numerous legal, topographical, hydrological, agricultural, socioeconomic, and organizational matters. Answers to questions of exactly what management roles should be turned over, which systems are to be turned over and how they should be turned over will require considerable adaptability to local physical and social conditions. The scope and style of system turnover must adapt to local settings, needs and capacities. Furthermore, national-level policies affecting turnover processes will evolve over time in response to changing economic and budgetary priorities.

If these assumptions are true, then it seems that what is needed is not a rigid, standard framework for implementing turnovers, which inevitably would be dependent on what are assumed to be universally-applicable criteria, but rather a policy providing general guidelines and resources which would enable the evolution of flexible and locally-coherent turnover processes.

POLICY ISSUES

What Roles Should Be Turned Over?

It may be that only maintenance obligations are turned over, or both O&M

below the offtake, or both O&M within the system as well as control (limited or full) of the system offtake gate. Turnover also could include farmer acquisition of representative authority for managing diversions along a river course, coordinated by a federation of water users' associations. Turnover may include only **O&M** control or also ownership of the system property or assets. And the government may turn over systems with or without any future expectation for providing assistance for major repairs or rehabilitation.

Each degree of turnover has its **own** advantages and disadvantages. For example, if only additional maintenance obligations are turned over to the farmers, they may see little benefit for them in the turnover. At present the Government of Indonesia has maintenance responsibility for the offtake structures (weirs in small DHJ systems and tertiary offtakes, sadap, in larger systems) and ***50*** meters of channel below the offtake. In such situations turnover of maintenance could mean giving farmers this responsibility and perhaps also (inverting the 50-meter rule) giving farmers responsibility for maintaining 50 meters upstream and downstream from the offtake. However systems may continue to deteriorate, or do ***so*** even more rapidly, unless the current expectations and incentives of farmers are altered. If not, turnover might only help decrease government maintenance expenses in the short-term only to increase rehabilitation expenses in the long-term.

Some view turnover as handing over a complete maintenance role but incomplete water distributional role. That is, leaving distribution within the system up to the farmers, but keeping offtake gate Operation in the hands of either the DPU weir keeper (benjaga bendung), if there is ane, the DFU gate keeper (penjaga pintu) or else the irrigation inspector. Another variation of this is officially to turn over the weir keeper function (including the gate key) to a water user association (WUA) representative. This might be the WUA head if it were to become a decision-making role, or else an assistant, if it were to be merely a gate setting and regular maintenance role. Where weir or gate keepers or irrigation inspectors have too many gates to control, it appears that the **WUA** head ***are*** often informally given the gate key ***anyway. Also*** it seems that even in larger, more **technical** systems, the irrigation inspector tends to delegate the function of **measuring** discharge rates to the gate keeper, a function which could be delegated to a water users' representative without much training. In some cases, farmers are able to, and often do, reset the gate after the gate keeper or irrigation inspector have come and gone. It is possible that a farmer weir or gate keeper, with some training, could be given official responsibility to maintain and operate the gate within certain guidelines and seasonal maximum discharge limits provided by the irrigation inspector. In such cases, the irrigation inspector would still be responsible for coordinating water use along a river come. Presumably, a farmer weir or gate keeper would receive additional remuneration for services from the users. Farmer representatives undoubtedly have social attachments which might hinder a sense of responsibility for the broader irrigation network or river course. However, DHJ gate keepers generally are local residents, often renting or owning land, or having other "sideline" jobs. **So** they also tend to develop local social attachments that may relate to water distribution.

In some settings (such as where multiple small diversions are located along a river course), it may also be possible to organize a federation of water users' representatives along a river course, thus directly involving fanners in water management at this level. This could enhance farmer appreciation of water distribution constraints at the river course level by setting up a direct communication mechanism between fanner representatives of systems which have been turned over to fanners. This could further decrease the management burden of DPU at both the gate keeper and inspector levels.

From observations of farmer O&M activities on Java and elsewhere in Indonesia, it seems that farmers sometimes have little incentive to maintain channels if the timing of water deliveries is not felt to be appropriate or is not known in advance, especially at the outset of the planting season. Hence, with regard to fanner involvement in O&M, the two functions are interrelated. Turning over maintenance but not some operational functions as well will probably not alter the status quo. Even if the irrigation inspectors could always guarantee appropriate deliveries, if the fanners are not aware of conditions elsewhere along the river course and do not have a decision-making voice in operations, they are not likely to develop a sense of responsibility either for maintaining their own systems or for the equity of distribution along the river course.

Studies have shown that indirect investment approaches to irrigation development, such as the Village Subsidy Program (<u>Subsidi Desa</u>), which are based on local initiative and decision-making, prompt greater farmer participation in O&M (within the systems) than do the less participatory, direct investment approaches, such as in the Sederhana Program (Hafid and Hayami 1979). However, at the river course level, it has been reported that O&M performance within these systems eventually tends to decline where Subsidi Desa weirs proliferate along a river course, in an uncoordinated manner, causing water scarcity or siltation problems in lower sections of river courses (Direktorat Jeneral Pengairan 1985). As yet there is no formal institution for regular farmer coordination between such systems.

The question remains whether having a measure of local control will be sufficient to provide fanners with a "sense of responsibility." It has been argued that a "sense of ownership" (if not actual ownership as well) of system assets is necessary in order to develop this corporate sense of responsibility among farmers (Coward 1985). At present there already is a legal structure in place to enable the district government head (<u>bupati</u>) to turn over management control of irrigation systems to farmers. However, the actual turnover of ownership of system assets, which are currently public property (<u>milik negara</u>), is apparently a much more complicated and time-consuming process which would involve higher levels of government, including the finance department.

If this is the case, then turnover (if it is to happen soon) may have to proceed in a two-step process. First, control of O&M is turned over. Later, actual ownership of system assets is turned over. To the extent to which having actual ownership is a necessary precondition for the farmers' sense of responsibility, it would make sense, if possible, to attempt to turn over ownership as well as control, at the same time.

And yet it is not clear that ownership is necessarily something the fanners would value as an end in itself. Various incentives or disincentives may be connected to it. On the positive side, these may entail the legal right to contract for and supervise system repair. Or it may grant the right for water users to apply as a corporate body for loans or rehabilitation assistance (perhaps in some sort of DPU/water users joint-supported arrangement). % the negative side, turnover of assets could entail the loss of services and rehabilitation support from DPU. Or perhaps it could result in the new obligation to pay a tax on the assets.

If farmers have the expectation that the government will pay for rehabilitation (requiring no counterpart support from farmers), they will be more likely to defer making minor repairs and desilting work to some anticipated government rehabilitation. Care should be taken that neither the turnover of control nor ownership entail unwanted side-effects on fanner incentives to ensure the long-term sustainability of "their" systems.

What Should Be the Criteria for Selecting Systems for Turnover?

Preliminary discussions among developnent bank and DPU personnel have emphasized the criterion of system size as the main basis for selecting which systems should be turned over to farmers. Some propose that systems under 150 hectares (ha) be turned over. Others propose that the maximum system size limit for turnover should be 500 ha. Currently, 2,304 systems (about 34 per cent of the total 6,731 DPU irrigation systems in Indonesia) are below 150 ha, 4,028 systems (60 per cent of DPU systems) are below 300 ha, and 4,717 (70 per cent of DPU systems) are below 500 ha. However all systems below 500 ha in size only constitute about 18.7 per cent of the total design area of DPU systems (which is about 4.8 million ha). Systems below 150 ha constitute only about 3.9 per cent of the total area. Hende, a turnover of all systems below 150 ha would constitute a sizeable proportion of all DPU systems, although it would be a less significant part of the total area.

Given the nature of maintenance priorities mentioned above, a large reduction in the number of small-scale systems under the O&M purview of DPU may have more effect on decreasing personnel requirements than on decreasing actual maintenance expenditures (apart from the question of rehabilitation). However, turnover of smaller systems will allow more intensive use of O&M staff and funds in the larger systems. At any rate, the turnover of all systems below 150 ha is a very large process to manage if it is to be done nation-wide. Hence, it appears now that the government plans to conduct the turnover of systems in 2 phases, first those below 150 ha and then those below 500 ha (each phase lasting 6 years, nation-wide).

But the next question is, "Should factors other than size be considered as criteria for selecting systems suitable for turnover to farmers?" Both central and section-level officials of DPU have expressed concern that other factors should be taken into account, such as the level of technical complexity or government investment in systems or the level of maintenance investment required, as determined by the nature of system water sources, the amount of sediment load in the water supply or the organizational capacity of the water users. I would add to this list the need to know the will of the users to have total O&M responsibility and/or ownership of their system turned over to them. Turning over systems to farmers without their consent or interest will not help to instill either a sense of ownership or a concern for system sustainability.

For example, a section head in West Java reported that he **has** one system which is **87** ha in size. He said that he would not recommend that O&M be turned over to the farmers, because it is a technical system with cross regulators and an adjustable offtake gate. The gates need frequent adjusting and greasing. Furthermore, the river embankment immediately upstream from the weir frequently collapses. He estimated the annual maintenance cost of the system to be over Rp. 20,000/ha (US$12.13),[4] which he thought **was** *too* much of an additional burden on farmers. In this **case** the farmers were very well organized **and** had their own water fee.

However, he also mentioned that there were other systems over 400 ha in size that he would recommend be turned over to farmers. These were semi-technical systems with simpler offtake structures and much lower O&M requirements. Certainly both farmer and government budgetary capacities have to be considered. However, if current DHJ O&M spending priorities already are directed toward the larger, technical systems (with smaller, **less** technical systems receiving little, if any, actual O&M support), then the turnover process may not actually save the government much money **anyway.** It may only make the existing reality of the lack of O&M support for smaller, less technical systems become official policy.

Some have expressed concern that the provincial irrigation service of DPU may feel threatened by the prospect of having a significant proportion of their systems turned over to farmers -- out of the fear that provisional or section-level O&M budgets may be cut, due to the decreasing area requiring DFU O&M support. However, national-level DFU officials have stressed that O&M budgets will not be cut even though their service area decreases. Furthermore, they have indicated that O&M budgets in the future will be based on the total length of DFU channels and not on the number of hectares. Undoubtedly, this will help to adjust for topographical variations and be a truer estimate of actual maintenance requirements. Also it would be a less sensitive measure to changes in the number of HJ systems in a given area, partly because of the 50-meter jurisdictional rule.

Nevertheless, if the provincial and section DPU O&M budgets are not going to be reduced as a result of turnovers, then the benefit to the government of turnovers will not be to save total actual O&M outlays, but to permit more intensive use of funds on larger, more technical DFU systems. Presumably, this would decrease the need for rapid cycles of rehabilitation and perhaps improve the long-term productivity **and** sustainability of the larger systems.

The implications of the turnover of systems for DHJ field and office staff will have to be considered. DPU officials have expressed concern about the difficulty of relocating field staff away from systems which have been turned over to farmers. This is especially awkward where such staff have been assigned to government housing, own and/or farm land, or have sideline employment. IIMI research is showing that most sampled weir and gate keepers and irrigation inspectors, given their low salaries, tend to have sideline income-earning activities.

Furthermore, the nature of work for field staff at the subsection (**pengamatan**) level seems to be relatively more regular and stable than that of office staff at the section and higher levels. At the section level, the work tends to be more cyclical, with periods of little or no work for a large part of the staff being followed by spurts of more intense activity by most or all of the staff, as periodic reports become due. DPU staff usually see the lifestyle of the section office as preferable to that of the subsection field staff. This is due to the advantages of the cyclical versus regular work schedules and the greater sideline income opportunities in the city. Therefore, personnel tend to be quite willing to transfer from the subsection to the section levels but not the reverse. The subsection level seems to be more understaffed than the section level, and yet the subsection (or field operations) level tends to be where O&M performance is most determined. Hence, transferring field staff out of areas where turnovers occur probably would mean assigning them to other field locations still at the subsection level. In a time of declining government budgets and resources, this could mean more uncertainty at the section levels and proportionately increasing resources and job security at the subsection levels.

THE PROCESS OF TURNING OVER GOVERNMENT SYSTEMS TO FARMERS

It is possible to implement the turnover of irrigation systems according to three basic models. One is the blanket approach, where a key selection criterion (such as size) is used for an otherwise indiscriminate and rapid turnover of large numbers of systems. The emphasis is on quick and inexpensive turnover of systems, with little information-gathering (other than size) and little or no physical and organizational improvements. Proponents of this approach might assume that when faced with the hard realities of an abrupt detachment of farmers from a dependent relationship with the government, fanners will learn to act collectively to ensure the sustainability of their systems as long as it is in their long-term interest to do so. However, social scientists have often shown that the existence of a collective interest is not by itself a sufficient condition for prompting individual action for the group's benefit.5

A second model is the diagnostic approach, where more intensive information is obtained by experts about hypothesized multiple factors affecting systems appropriate for turnover and their needs in preparation for turnover. The information useful for the selection and needs identification stages is assumed to be known in advance. The diagnostic approach places greater emphasis than the blanket approach on preparation for long-term sustainability. Nevertheless, essentially it is a top-down process which hinders the emergence of a learning process (Bagadion and Korten 1985; Korten 1980).

A third model is the dialogue approach. It includes much of the same information-gathering process as the diagnostic approach but does so in a more interactive way. It encourages a process of farmer group self-selection for turnover, mutual DPU/farmer identification of system improvement and management needs, and a process of dialogue and mutual adjustment both prior to and following the turnover. The latter model seems to have more potential for cultivating attitudes of self-reliance and for establishing the kind of relationship that should exist between farmers and DPU in the future. This relationship will not be one of total detachment, but rather a combination of local initiative, coordination with DPU and other fanner-managed systems, and occasional farmer petitioning for assistance from DPU. The following is a description of a dialogue approach to the process of turning over irrigation systems to fanners.

A Scenario for the Turnover Process

The following description is of the most intensive kind of turnover preparation (involving both physical improvements and substantial new management roles). *Many* locations, especially off Java and Bali (where most systems below 150 ha in size have brush and stone free intakes) may require much less intensive turnover preparation activities.

Stage One -- project preparation. Immediately before the turnover process begins within the section, introductory meetings and visits are held, recruiting of community organizers (COs) and other staff begins and the river course irrigation inventory and socio-technical profile instruments are prepared and field tested. Estimated time required: 1.5 months.

Stage Two -- conducting a river course irrigation inventorp. An inventory of all systems along a given river course is first conducted in order to obtain basic information about all diversions along a river course. This might include overlaying onto existing maps the locations of all irrigation diversions and respective command areas along the length, or part of the length, of a river course. Assembling the buku pintar (documents describing the basic physical parameters of DPU systems) would provide information on the size of command area and the nature of physical structures in the systems, such as the type and size of weir, water measurement structures and channels. It also serves to classify systems according to their level of technical complexity. Additional information could be gathered about administrative boundaries of the systems, nature of all water sources, mount of sedimentation, topographical setting and the existence of a water users association.

Information gathered during the inventory stage would enable a section-level Turnover Support Group (TSG)[6] to make preliminary selection of a large set of systems which seem to qualify for turnover according to a generally-agreed-upon set of basic criteria. The TSG would then better understand the implications of turnover for the river course management as a whole.

Eligible systems would then be grouped into at least three categories: a) those which were incorporated into the DPU inventory of systems via administrative reclassification alone (i.e., from farmer-managed to DPU-managed), b) those which require mostly management training and shifting of roles but little physical construction and design work, and c) those which have a history of heavy DPU investment (such as major rehabilitation or daily DPU staff

management) or which require major physical upgrading prior to turnover. The turnover process would be quite different for each of these three types of systems. It *can* be hypothesized that prior levels of DRI investment in the systems directly determine the level of preparation needed to turn systems over to the local resources of the water users.

During the inventory process, recruitment of COs could begin. Preference should be given to recruiting COs from among the more capable or motivated of DRI staff itself, either at the section or subsection levels. The CO assignment could be considered temporary, providing valuable experience in innovative water management approaches and leading to later job advancement. COs recruited in such a manner generally would be without university degrees **and** would require both prior and on-the-job training. But the cost would be much less than that of recruiting university-trained **COs** from outside DRI. And this use of DKJ personnel would be invaluable in building DKJ capacity to **manage** water through a dialogue approach with farmers.

After the set of potential systems hav[illegible] been selected, community organizers could be chosen since the general are[illegible] of the systems to be turned over would then be **known.** Or if the COs were [illegible]ected **from** a section-wide pool, their selection and training could begin [illegible]n earlier. Training of COs might be done partly under the direction of a provincial-level specialist (perhaps together with a consulting counterpart) **an**d would continue into the profile preparation stage. The role of the unive-sity-trained Advisory CO would be to help train and supervise COs, and to b directly responsible for the turnover of at least one system. This will provide the Advisory CO with more direct experience and credibility.

It is unlikely that the turnover process, when it becomes a national program, will have the resources to permit the assignment of one **CO** per **system**. It is more likely that one CO would have to be responsible for several systems along a river course. Therefore, COs should work closely with irrigation inspectors and obtain their assistance in the following stages of turnover. Training of COs could begin immediately after their selection. This might involve a six-week intensive training course, followed by on-the-job training in preparation of the socio-technical profile ***(see*** below). The irrigation inspectors should receive ***sane*** training to enable them not only to understand the turnover process but to assist the **CO** regularly as an important actor at the inter-system level. Estimated time for Stage Two: two months for inventory and intensive training of COs.

<u>Stage Three -- **making** socio-technical profiles</u>. During this stage, the regular COs would be guided by the Advisory CO and **TSG** members, and would be assisted by the irrigation inspector, **along** with weir keepers perhaps and ***some*** technical assessment assistance from the section-level technical division staff (<u>bagian teknis</u>). **A** socio-technical profile of each of the prospective systems would be prepared, with the expectation that about four out of five of the systems profiled would be turned over.

The purpose of profile-making would be mainly to assess the systems' needs in preparation for turnover, rather than for use in an involved **and** unnecessarily discriminating **procedure** for selecting the most appropriate systems for turnover from a large **pool** of candidate systems selected in the inventory stage. Given the current and likely future budgetary and policy climate, large numbers of small systems are likely to be turned over. Hence, more priority should be given for preparing for turnover than for deciding in a thorough way which systems (below a specified size) are ideally suited for being turned over. It is assumed that enough information can be obtained in the inventory stage to enable selection, on the average, of five systems, of which four will finally be selected.

Profile-making would cover gathering more specific information about the actual physical condition of structures, a sketch map of the system itself, and identification of physical improvement requirements prior to turnover (distinguishing between improvements by fanners and those requiring DFU assistance). It would also specify new tasks after the physical improvements and turnover, and a final assessment of the farmer organizational capacity available and of areas which need strengthening. The CO and the farmers together should identify physical and organizational needs and tasks *so* that the profile is a joint product conveying both the assessment of the CO as well as the wishes, intents and local knowledge of the farmers. Estimated time for Stage Three: 2.5 months.

Stage Four -- selecting systems. The final selection of a set of systems would be done concurrently with the latter part of Stage Three. At this point the regular COs, the Advisory CO, the TSO, and the section head would evaluate the profiles and select not only which systems should be turned over, but the time-table for each system, on a case-by-case basis. Some staggering of turnover implementation will undoubtedly be necessary along a given river course. Estimated time for Stage Four: one month, concurrent with Stage Three.

Stage Five -- preparing for turnover of O&M control. During this stage, the required physical improvements are carried out while organizing and training fanners. Physical improvements should not be made in the conventional way, but at the request and advice of the farmers, mobilizing fanners for all unskilled labor and perhaps to raise funds for improvements. COs would assist the farmers in preparing their own collective version of a design for system improvement. DFU design work should begin just before the farmer-version design is completed and then proceed in dialogue with the fanners.

If possible, the technical design work should be done by DFU staff. Construction should be carried out by the farmers themselves. Contracting out the design and construction work to private contractors may seriously hinder opportunities for farmer participation in system improvements -- an essential element in the emergence of both farmer conceptions of system ownership and a dialogue relationship between farmers and DFU.

The organizing of fanners should not be done as a separate activity, but as a part of the process of identifying and implementing new tasks created by the physical improvements and the new O&M roles related to turnover. Only in this way will the organizing be based on real needs and personal experiences. The CO would be the key person to assist the farmers in this stage of preparation for turnover and in ensuring that a climate of dialogue develops between the farmers and the irrigation inspector, weir keeper, and technical staff of the section office which assists in a monitoring and consultative capacity regarding physical improvements of the TSG. COs would report to the TSG periodically about the farmers' progress and management performance.

Also during this stage, the weir keeper or irrigation inspector's O&M functions to be turned over would be gradually carried out by a water user representative selected by the users' group. He would be assisted and supervised by the irrigation inspector, the CO and perhaps a member of the TSG. Preparations would be made to alter the job assignments of the weir keeper or irrigation inspector. This might involve the reassigning of a weir or gate keeper to another location in a larger system or else to a broader, coordinating role along the river course. Estimated time for Stage Five: 12 months.

Stage Six -- the turnover of O&M control. The actual date of official turnover may be contingent upon the completion of physical improvements and the progress of organizational preparations. The TSG should not use standards that are too high since the systems will need time to more fully adjust to the changes in a long-term mode of operation. An official turnover ceremony should be conducted, perhaps with the attendance of the district-level government head (camat) and the D W section and subsection heads. At this time it may be useful also to turn over necessary forms, advice, and approvals to start an administrative process for fanners to petition for the later turnover of systems assets. Affected weir or gate keepers would be officially assigned to other jobs and/or locations. Estimated time for Stage Six: two weeks, done concurrently with the latter part of Stage Five.

Stage Seven -- preparation for turnover of assets and for a role at the river course level. This is the time when the CO assists the water users in moving forward their petition for turnover of assets. The CO, perhaps assisted by a sort of extension person from the Department of Internal Affairs (Department Dalan Negeri), would help train the water users' group in the legal aspects of becoming a corporate body which can obtain loans and enter into contracts. The CO would perform a liaison function between the water users and the various offices, which would include the Department of Internal Affairs, DW, the Finance Department, the camat, the district head, and so on. During this period the CO would continue to monitor the management performance of the system both from the perspective of the farmers and the irrigation inspector or other operational field staff. Differences in criteria and perceptions of management performance would be communicated between farmers and the DW, further enhancing the process of dialogue. The CO also would facilitate further organizational changes as needed. *Also* this would be a time when the water users would need some assistance in possibly taking on an expanded role in a federation of fanner and DPU-managed systems along the river course. The CO would also be involved in this process, together with the irrigation inspector.

Furthermore, this may be a time when fanners from other systems which were not originally selected may petition for turnover as they observe what is happening. It is hoped that the early systems selected for turnover would provide a positive example to farmers in other small systems so that they would later seek entry into the turnover program. Especially where small systems along river courses are turned over, what is needed for the future is not the abrupt and complete detachment of DFU from the water users, but a new kind of dialogue based on greater local control. Farmers should be able to petition for turnover. This could help simplify the selection process and reduce the need for extensive information gathering by outsiders. Selection should be a two-way process, perhaps with self-selection being preferable to diagnostic survey selection. The TSC should encourage such petitions and provide general information abut system turnover to WUA or village heads in their areas of jurisdiction.

During this stage, the CO may begin to transfer some of his or her communication and monitoring functions to the irrigation inspector. Eventually the CO's involvement will become less intensive in the systems and he or she may begin to take on other systems or may change status (perhaps becoming an irrigation inspector or a section-level TSC member-assuming the COs were recruited from the section-level DFU itself). Estimated time for Stage Seven: six mnths.

Stage Eight -- the turnover of assets. The actual time required to obtain legal ownership of system assets will be highly variable and often lengthy. It will not be feasible for a CO to continue to regularly assist the water users until they achieve legal ownership. However, section-level Advisory COs may be trained to provide occasional legal guidance to WA representatives after Stage Seven, when the COs are no longer regularly involved in their system.

Table 1 is a summary of the proposed time schedule for the turnover of O&M control and systems assets.

Table 1. Time schedule (in months) for turnover of a system.

Stage		Subtotal	Cumulative total
One	Project preparation	1.5	1.5
Two	Inventory	2.0	3.5
Three	Profile	2.5	6.0
Four	Selection*		6.0
Five	O&M turnover preparation	12.0	18.0
Six	Turnover of O&M*		18.0
Seven	Assets turnover preparation	6.0	24.0
Eight	Assets turnover	**	

*Concurrent with previous stage; **cannot be specified.

Section-level Time Schedule and Institutional Assumptions

Figure 1 is a time schedule for implementing, at the section level, the turnover of systems below either 150 or 500 ha (or possibly components of larger systems, such as secondary canals). This example is for an above average-sized process with at least 41 systems eligible for turnover.

Figure 1. Time schedule for turnover of 47 systems at the section level.

```
Set    Year 1    Year 2    Year 3    Year 4    Year 5    Year 6      Total
----.---------.---------.---------.---------.---------.---------.----------
       5 systems
1    I--------------I                                                  5
                     14 systems
2                   I--------------I                                  19
                                     14 systems
3                                  I--------------I                   33
                                                    14 systems
4                                                 I--------------I    47
---------------------------------------------------------------------------
```

The above time schedule for section-level turnover activities is based on the following set of assumptions about how the process would be organized.

1. Most COs would be recruited from DFU wherever possible. Thus most COs would have only high school degrees (STM or SMA), but would have a long-term interest in DFU and be less inclined to switch to other jobs.

2. The Advisory CO should be a non-DFU recruit with a bachelors degree (<u>sarjana</u>), probably in one of the social sciences.

3. The Advisory CO would have only one or two systems of his or her own at a time so that he or she can provide advice and support to the other COs.

4. Four regular COs and one Advisory CO per section is probably the maximum number which can be monitored and supported by the section-level TSG.

5. One regular CO *can* manage one system turnover during the first set of turnovers and three during the second through fourth sets (first learning how to be effective, then more efficient).

6. By the third and fourth sets of turnovers, an experienced regular CO working in three systems (being in each system one or two full days per week) would be able to perform the necessary functions of building local capacity for new system improvement and O&M roles.

7. The Advisory CO would manage one system during the first set and two systems during each of the remaining sets, enabling him or her to assist the other COs as needed.

8. There would be a section-level TSG of two to three section-level staff assigned half-time (possibly with one assigned full time) to turnovers.

9. There would be a province-level TSG with three or four part-time and one full-time DFU staff assigned to turnovers. The full-time person would work at the section level during the first set of turnovers in the first section scheduled for turnovers.

10. **One** or two full-time consultant CO trainers at the provincial office would train and monitor COs, provincial and section-level TSO members and activities and assist in planning turnover implementation at province and section levels.

11. A consulting group and a national-level TSO **from** the Directorate General of Water Resources Development (DGWRD), each with part and full-time staff have been assigned to plan, monitor and supervise recruitment, training, pilot project testing and general implementation of the turnover process.

12. In the evolution of the turnover process, exponential growth in the number of systems being turned over is not likely beyond what four regular and one Advisory W and TSO *can* manage (a maximum of 14 systems at a time per section).

A Pilot Project

A pilot project should be conducted as the first phase of a nation-wide program for turning over government systems to farmers. Only two provinces should be selected, one on and one off Java. *As* a real pilot project, its implementation should enable replication on a national scale. In pilot projects there is a tendency to conduct the development activity far **more** intensively (with more DPU staff, COs, resources, **and** training) than could realistically be done on a national level.

However, the monitoring and research component of the pilot project should be more careful and detailed than in a normal turnover process, because the main purpose of the pilot project is the learning process. But to the extent to which the pilot system gets more program support than is realistic to expect under a normal, nationwide process, it inhibits our learning about its nationwide applicability. The most important questions regarding the turnover of systems to farmers, where research plays an important role, are not pre-implementation policy questions, such as "What kinds of systems should be turned over?" or "What roles should be turned over?" **They** are questions on how systems should be turned over while implementing the turnover program.[3] Consideration should be given to the following approaches to conducting a pilot study of turnover:

- Implementing a turnover process which is thought to be both advisable and broadly applicable (an approximation of what would be likely to be implemented on a national scale).

- Within a given province, selecting three or four systems along a river course which would be turned over while analyzing the process in all three (though perhaps not with the same level of intensity).

- Comparing systems within a province which vary in levels of intensity of program support and training.

- Assigning one regular CO at first to one, then three systems, on the average.

- Comparing three or four systems which differ according to: upper or lower location along the river course, the need for physical improvements and/or current organizational capacity,

NOTES

1. The views expressed herein are those of the author and are not necessarily those of IIMI or the Public Works Department of Indonesia.

2. See Spencer (1974) and Coward and Levine (1986) for comparative analyses of these processes.

3. For example, see Syaikhu Usman and Boochari Rachman (1984) and Siy (1986).

4. Indonesian Rupiah 1,648 = US$1.00 (November 1986).

5. See Axelrod (1984), Margolis (1984), Heath (1976), and Olson (1971).

6. Initially, this committee might be section-level DPU staff, assigned part or full-time to turnovers. They would be assisted by a consulting group from the provincial DPU office and by a trained provincial-level TSG.

7. Once the process begins to expand, it is possible that CO selection and training for subsequent locations could begin before the inventory stage.

8. See Korten (1986) for a discussion about action research on the process of implementing irrigation development program.

REFERENCES

Axelrod, Robert. 1984. The evolution of cooperation. New York, USA: Basic Books, Inc.

Bagadion, Benjamin U. and Frances F. Korten. 1985. Developing irrigators' organizations: A learning process approach. In Michael Cernea (ed), Putting people first: Sociological variables in rural development. New York, USA: Oxford University press for the World Bank.

Coward, E. Walter Jr. 1985. State and locality in Asian irrigation development: The property factor. In K.C. Nobe and R.K. Sampath (eds), Irrigation management in developing countries: Current issues and approaches. Boulder, USA: Westview press.

Coward, E. Walter Jr. and Gilbert Levine. 1986. Studies of farmer-managed irrigation systems: Ten years of cumulative knowledge and changing research priorities. Keynote paper prepared for workshop on public intervention in farmer-managed irrigation systems. Kathmandu, Nepal: International Irrigation Management Institute.

Direktorat Jeneral Pengairan, Pemerintah Republik Indonesia, Sub-proyek pekalen **sampean** dan fakultas teknologi pertanian, Universitas Gajah Mada. **1985.** Penelitian inventarisasi potensi fisik pengembangan lahan irigasi di sungai sampean. February.

Hafid, **Anwar** and Yujiro Hayami. **1979.** Mobilizing local resources for irrigation development: The <u>subsidi desa</u> case of Indonesia. In D.C. Taylor and T.H. Wickham (eds), Irrigation policy and the management of irrigation systems in Southeast Asia. Bangkok, Thailand: Agricultural Development Council, Inc.

Heath, Anthony. **1976.** Rational choice **and** social exchange: **A** critique of exchange theory. Cambridge, UK: Cambridge University press.

Korten, David C. **1980.** Community organization **and** rural development: **A** learning process approach. Public administration review **(September/October).**

Korten, Frances F. **1986,** Making research relevant to action: **A** social learning perspective. **Paper** prepared for the workshop on public intervention in farmer-managed irrigation systems. Kathmandu, Nepal: International Irrigation Management Institute.

Margolis, Howard. **1984.** Selfishness, altruism **and** rationality: ***A*** theory of social choice. Chicago, USA: University of Chicago press.

Olson, Mancur. **1971.** The logic of collective action: Public goods and the theory of groups. Cambridge, **USA**: Harvard University press.

Siy, Robert. **1987.** Averting the bureaucratization of a community-managed resource: The case of the Zanjeras. In David C. Korten (ed), Community management: Asian experiences and perspectives. Hartford, USA: Kumarian press.

Spencer, J.E. **1974.** Water control in terraced rice-field agriculture in southeastern Asia. In Theodore E. Downing and McGuire Gibson (eds), Irrigation's impact on society. Tucson, USA: University of Arizona press.

Syaikhu Usman and Bochari Rachman. **1984.** Pattern and impact of government aid on the organization of traditional irrigation. Paper presented at the workshop on government aid to traditional irrigation systems. Bukittinggi, Indonesia.