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# APPLYING PROJECT IMPLEMENTATION MONITORING AND ACCELERATED LEARNING SYSTEMS CONCEPTS TO IMPROVE THE ON-FARM WATER MANAGEMENT PROGRAM:

## A DISCUSSION PAPER FOR USAID/PAKISTAN

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# preface

The Development Project Management Center (DPMC) was established by AID within USDA to promote management development and performance improvement on development projects. This paper is sponsored by DPMC as part of its action research program. It is based on discussions between USAID/Pakistan and DPMC and is written by Terry Schmidt who has worked with DPMC on management development and implementation systems for development projects.(1)

DPMC believes that there are extremely promising prospects for substantially improving management and performance on development projects. The On-Farm Water Management Program and the Irrigation System Rehabilitation Project in Pakistan provide an exceptional opportunity for the combined use of the following approaches:

* systems development based upon defined functional needs and technical needs of projects and programs;
* team-building among operational and management persons at various project/program levels;
* accelerated learning methods and techniques for the upgrading of technical and management skills;
* management information systems development encompassing planning, implementation, monitoring and replanning; and
* action-training and organizational development for the project/program technical and management teams of the implementing organizations.

Other DPMC papers which influence this paper include:

M. Kettering and T. Schmidt, Improving Project Monitoring and and Implementation Systems, (for USAID/Thailand), December, 1981.

M. Solomon, Suggested Framework for Training in Developing Countries, June, 1980.

M. Solomon, A Suggested Framework for Training for the Senegal Valley, March, 1980.

M. Woolman, Cultural Synergism in LDC Projects, August, 1979.

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## OVERVIEW

USAID/Pakistan's Office of Agriculture and Rural Development (O/ARD) faces the complex challenge of managing a growing project portfolio with limited direct hire staff and extensive use of intermediaries for implementation. This requires practical methods by which USAID staff can efficiently monitor project implementation, and strategic mechanisms within each project for achieving maximum development impact.

This discussion paper describes two related methodologies suited to these needs: project monitoring and implementation (PMIS) concepts to manage the portfolio, and accelerated learning methods to enhance the developmental impact of the On-Farm Water Management (OFWM) program. Water management and irrigation projects are the central components of O/ARD's development assistance program.

PMIS concepts comprise methods for project management and control, tailored to meet the special requirements of development projects. Accelerated learning concepts encompass innovative training methodologies specially suited to large scale manpower development and drawn from a number of sources. These concepts merit careful consideration by USAID, and have high potential for achieving the OFWM program objectives of upgrading in-service OFWM field team effectiveness and building an institutional training capacity.

This discussion paper is consistent with the nature of technical assistance proposed for the OFWM program, and may serve as a useful starting point for USAID/P program management, the technical assistance team,[1] and GOP officials.

Part One briefly introduces PMIS concepts; Part Two briefly summarizes OFWM needs; and Part Three applies accelerated learning approaches to these needs.

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[1] See "A Strategy for On-Farm Water Management Program Training and Technical Assistance," March 1982, prepared for USAID/Pakistan by Terry Schmidt, Ramchand Oad, and Tom Armor, consultants from USDA's Development Project Management Center and Development Alternatives, Inc.

## PART ONE:

## MANAGING THE O/ARD PROGRAM: PROJECT MONITORING AND IMPLEMENTATION CONCEPTS

### THE MANAGEMENT CHALLENGE

O/ARD must manage a large, complex program portfolio with limited direct hire staff. While USAID missions worldwide are affected by staff limitations, USAID/Pakistan faces the additional challenges of rebuilding its portfolio, after a 1979 hiatus in U.S. technical assistance, to a significantly higher funding level.

Project design will be a continued O/ARD priority in future months. But in addition, greater attention must be placed on implementation, as newly-designed projects come on-line. As the portfolio grows, O/ARD could be responsible for coordinating a dozen or more separate project teams comprised of contractor and host country personnel.

Historically, AID has emphasized project/program design; less attention has been given to managing implementation. Whatever systems and methods are in use have come through the initiative of individual project officers.

To address the need for useful implementation tool, AID/W's Asia Bureau funded development of a prototype monitoring and implementation control system for USAID/Thailand in the Fall of 1981. This system, developed by consultants from USDA's Development Project Management Center, was designed to:

- equip implementing teams with a solid basis for successfully implementing the project

- reduce the project control time burdens on overworked USAID staff
- delegate greater implementation responsibility while providing USAID with sufficient checks to ensure that problems are identified and reported early
- generate reliable project status reports to USAID staff, for their own use and for meeting reporting requirements of the mission director and AID/W
- provide information on individual project components in a way that enables USAID decision-makers to synthesize project information into a broader program perspective
- simplify periodic process and impact evaluations.

O/ARD needs are similar to these, and application of PMIS to key projects provides the basis for the increasingly important implementation of USAID/P projects.

KEY USERS OF PMIS

The first question facing PMIS designers is: Who are its users and what are its intended uses? The answer to this question determines the system design, and its ultimate utility.

Many PMIS-type systems are seen strictly as a tool for USAID mission control, problem-identification, and intervention. They are designed to first serve the mission director; second, the USAID project officer; and third, if at all, the implementing team (host country, contractors, and other intermediaries) Such systems eventually collapse, for they fail to start with the project itself. Valid information for decision-making is lacking.

We believe that these user priorities are backwards. USAID project experience has repeatedly shown that the problems which cause implementation and disbursement delays originate from the inability of the project team to implement the project, for lack of realistic project teams, mutually shared objectives, clear roles, and so forth. Concentrating the PMIS development effort at the project level reduces subsequent problems by systematically planning for project success.

Our recommendation to USAID/Pakistan is to build PMIS "bottom-up," beginning at the project level. The project implementation team should be viewed as the primary user and beneficiary of PMIS. By first building a solid PMIS at the project level, the USAID project officer's monitoring/control/reporting needs can be best met.

## CORE ELEMENTS OF PMIS

PMIS design can take various forms, depending on the number and nature of projects, the preferences of management, and so forth. But whatever the specific design, a reliable system for project management and control must include three related elements.

A solid implementation/operations plan is the most critical element. Such plans clarify project objectives, strategy, responsibilities, budgets, milestones, procurement, operational procedures, team organization, decision latitudes, reporting relationships, activities, schedules, and related issues essential to project design. These plans are used for actual implementation, and are ideally developed by the project team at the beginning of the project.

Creating this plan is necessary for a smooth hand-off from project design to implementation. Implementation plans from the Project Paper are not adequate for actual implementation -- such plans must be "re-created" by those responsible

for running the project. The ideal timing is during the 90-120 day "window" between signing of project agreements and arrival of the implementing team and project start-up. Inattention to thorough planning at this stage virtually guarantees later problems and project delay. Developing these plans transfers project ownership to the implementing agents, and establishes the basis for ongoing operations and reporting.

This front-end planning process identifies key project milestones of a financial, technical, and organizational nature. Such milestones constitute major points for reviewing and reporting project progress. Milestones for each project can be conveniently displayed and monitored by USAID project officers using simple tools (such as magnetic boards or PERT/CPM microcomputer programs).

Agreed-to reporting formats from the implementing team to USAID and GOP officials enable decision-makers to monitor project progress and take actions as needed. Useful reporting formats emphasize analytic rather than descriptive information, and typically include progress achieved during the reporting period, problems encountered, changes to schedule/cost/performance baselines, actions requested of others, and status of problems previously reported. The users of such reports are the project team itself, GOP back-up ministries, and USAID. By building in reporting as an ongoing function of project management (rather than an USAID-imposed administrative requirement), the utility and reliability of reports is increased.

## THE PROCESS IS ESSENTIAL

The above three items describe minimum "products" of the PMIS. But experience has shown that the process by which products are developed and used is more important than the products themselves. The most detailed, complete and sophisticated project plans are of little value unless those

persons responsible for the project participate in developing them. While jointly preparing such plans, team members develop a personal commitment to the project, agree on roles and working procedures, and forge personal bonds of understanding that are vital to subsequent implementation success. This process also yields insights and learning for project redesign throughout the project.

The recommended PMIS development process uses an experienced PMIS consultant to guide the project teams in developing a flexible yet complete implementation/operations plan. Such technical assistance is best provided early in the project, shortly after the implementing team arrives and begins work, with periodic updates at subsequent points.

PMIS consultants who assist the project teams should be thoroughly experienced in system design and "action training" methods. Such individuals would initially be drawn from outside Pakistan. But their charter should include developing an indigenous capability to provide similar assistance in the future. We recommend that qualified individuals be selected to work with the PMIS consultant from local management consulting and training firms, the Pakistan Academy for Rural Development, and other suitable sources. By participating in two or three PMIS development sessions, selected Pakistanis can acquire the skills to provide follow-up sessions and guide future project teams without external assistance. This creates a local pool of "quick-call" resources for USAID.

## PART TWO:

## ON-FARM WATER MANAGEMENT TECHNICAL ASSISTANCE NEEDS

### PROGRAM BACKGROUND

The On-Farm Water Management (OFWM) Program is one of Pakistan's most popular rural development efforts. Since USAID's pioneering work with this program a decade ago, the program has gained popularity among both farmers and government officials, and has recently spawned similar efforts by other donors.

Pakistan has some 89,000 "watercourses," each covering up to 300 acres and serving up to 50 farmers. But, with time, watercourses decay because of rodent activity, plant growth, animal damage, and farmer cutting of the banks. Decay results in leakage, inefficient water usage, water "theft," and farmer disputes.

The key objective of the OFWM program is to reconstruct decaying watercourses and improve water management at the farm level. Reconstruction and improvement activities entail redesigning the layout for better flow, rebuilding and compacting the earthen banks, lining the channels, installing distribution outlets, and equipping the farmers to maintain the system.

Responsibility for these activities rests with four On-Farm Management Directorates, one in each province. The work is done by OFWM field teams of 7 to 12 persons. Nationwide, some 1,000 field team members are organized into 100 field teams. The teams are responsible for watercourse design and supervision; farmers and water association users contribute labor.

TRAINING AND SKILLS DEFICIENCY

The lack of adequate technical skills among field team members is a major constraint to program effectiveness. Because civil engineers are difficult to recruit, few field team members have necessary backgrounds to undertake watercourse design and construction activities. While some agricultural engineers are hired, their education does not include irrigation practices. Engineers recruited to the program are likely to have mechanical or electrical engineering backgrounds.

Newly hired field team members attend a provincial training program before assignment to a field team. The 12-week training program covers watercourse design and improvement, precision land leveling, and water management extension.

But training program deficiencies are numerous. Trainers are not equipped to teach; some have no background or experience in the subject they teach. Training facilities are primitive (except in the Punjab province). The curriculum is dated and incomplete (entirely neglecting drainage, for example). Training methods are obsolete, frequently consisting of the instructor writing lectures on the blackboard for trainee copying. Students are not evaluated and competency is not measured. There is no follow-up in-service training, nor mechanisms for upgrading the curriculum based on feedback from the field.

The result of inadequate training shows up in the field as poorly designed watercourses. Watercourses are frequently "overdesigned," with resulting seepage and percolation losses. Most watercourses lack proper engineering designs and documentation, and the lack of documentation has led to past conflicts concerning donor reimbursement for work completed. There is little effort or ability to control quality of topographic surveys, analysis of water surface profiles, and channel construction.

## OFWM TRAINING AND TECHNICAL ASSISTANCE NEEDS

Effectiveness of Pakistan's OFWM program can be upgraded by three interrelated training thrusts recommended by the consultants' report cited earlier: (1) improving the technical skills of in-service field team members; (2) strengthening the staff and institutional capabilities of the provincial training directorates; and (3) upgrading the current pre-service training program.

The most immediate need is for field level in-service training in all provinces. While training priorities vary somewhat between provinces and between teams, watercourse design, construction and documentation needs are common to all provinces. The target audience are the 1,000 OFWM employees currently working in the field. The training objective is to ensure that each team has the requisite technical and social skills to do their jobs.

Strengthening of the preservice training also need strengthening. The target audience is future-hires, individuals hired to fill vacancies and expand the number of field teams. The training objective is to teach practical field skills and ensure that newly-organized field team members have the technical competence and confidence to do high-quality work.

A related requirement is to strengthen the provincial training institutes' capabilities. The target audience are the designated trainers, many of whom are trainers in name only. The objective is to institutionalize high-quality training capability at each provincial training institute by upgrading staff skills, and ensure that future training can be provided with minimal external support.

These three requirements are interdependent. The optimum training strategy should simultaneously address all three requirements.

TECHNICAL ASSISTANCE TEAM

USAID/Pakistan has tentatively decided on a technical assistance approach comprised of:

- Field technical advisors -- practically-oriented, "mud on the boots" individuals assigned to each province to sharpen technical skills of the in-service teams. These advisors would work short term (three to six months), with one or two per province.
- Institute training advisors -- training practitioners who concentrate on strengthening institutional capabilities. These advisors would work medium term (12 to 18 months). Two advisors would be physically based in the Ponjab, with responsibility to travel to support the other three provinces as well.

The composition of the team is logical. However, given the large number of people to be trained, and the typical inefficiencies of technical advisory efforts, it is essential that the team use methods for not only getting the immediate job done, but for also creating a process for continued effectiveness and improvement after the advisors depart.

We can safely assume that the individuals selected for the team will be technically skilled in their fields. However, we believe special attention is needed by the technical advisory team to accomplish their ambitious objectives. Many technical assistance efforts fall short of expectations because insufficient attention was placed on organizing and efficiently utilizing a large number of geographically-dispersed short term advisors.

The requirements are two-fold: to ensure the team minimizes their start-up time and becomes immediately productive, and to ensure that their methodologies contribute to the total program requirements. The following

pages suggest an approach to meet these requirements. They are based on two elements we view as required for project success:

- Use of integrated project management procedures to organize the work plan and implement the project.
- Use of accelerated learning techniques to "leverage" advisor resources in achieving the intended training objectives.

The concepts which follow are intended to be illustrative, rather than definitive. While we believe they are sound, we have not attempted to develop a comprehens plan nor address all the important issues the team will face. To do so would violate a concept essential for project success -- detailed plans must be created by those responsible for carrying out the project. USAID, GOP OFWM staff, and the technical assistance staff may find these useful starting points, to which they add their own experience and perceptions in shaping a realistic, effective strategy and implementation plan.

While strengthened training is necessary, not all the OFWM problems can be corrected by training. Administrative, policy, and procedural improvements are also required in a number of areas (such as creating career ladders which attract civil engineers, integrating Irrigation and Agriculture Department functions). Strengthened training is necessary for OFWP program success, but training alone is not sufficient.

## PART THREE:

## APPLYING ACCELERATED LEARNING SYSTEMS AND APPROACHES TO ON-FARM WATER MANAGEMENT

### OVERVIEW

A host of new training methodologies have been developed during the past twenty years which reduce the time and cost of training, build continuing indigenous capability to provide training, and make it practical to rapidly develop managerial and technical skills. These methodologies go by various names, originate from many different sources, and have been applied to diverse environments. For purposes of this paper, we define "accelerated learning systems" as the synthesis and application of techniques for rapidly building manpower skills to support development projects. While many of the techniques are not new, their synthesis makes it possible to tackle such complex endeavors as Pakistan's On-Farm Water Management Program in an innovative way.

The U.S. Department of Defense has pioneered many of these methodologies. Without accelerated approaches, it would be impossible to train the large number of people of modest educational backgrounds needed to operate and service the complex high-technology weapons systems used by the air, sea, and ground forces. In addition to DOD's work, significant contributions have been made by other branches of the U.S. government, USAID, individual practitioners throughout the world, development country project teams, private corporations, and USDA's Development Project Management Center.

TWO VIEWS OF TECHNICAL ASSISTANCE

There are two ways to provide expatriate technical assistance, summarized in Figure 3-1. The traditional expatriate model concentrates on direct delivery of services by "experts." Under this model, the job of OFWM technical advisors would be to provide one-on-one training to field team members in watercourse design, construction, and quality control.

A key shortcoming of most technical experts is that they are technical experts. And an expert is someone who knows his job so well that he is the one to "show them how to do it." But this traditional view is inappropriate for the OFWM program. Consider the numbers involved: the technical assistance plan envisions 2 to 4 man-years of field advisors; the target group is some 1,000 people. Even assuming 100% time efficiency of the technical advisors, advisor resources are sufficient to provide only between a half-day to a day of assistance per person -- not nearly enough to achieve the competency expected.

The indigenous model gives an alternative view. The technical advisors' role here is to concentrate on creating the capacity by which the OFWM staff is equipped to deliver technical services after the advisors depart. The indigenous model regards host country resources -- the OFWM Directorate trainers and key field team personnel -- as integral to success.

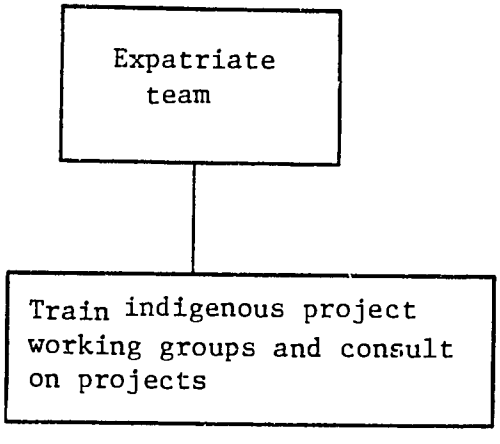
To optimize the use of scarce technical resources, the field advisors must adopt alternative #2 and regard themselves as change agents. They must "leverage" their skills by concentrating on first transferring their knowledge to indigenous personnel (field supervisors, staff trainers, and "natural" trainers), then guide this group in training the 1,000 field team members. Advisors affiliated with the training centers must likewise view

FIGURE 3-1:

TWO MODELS FOR TECHNICAL ASSISTANCE

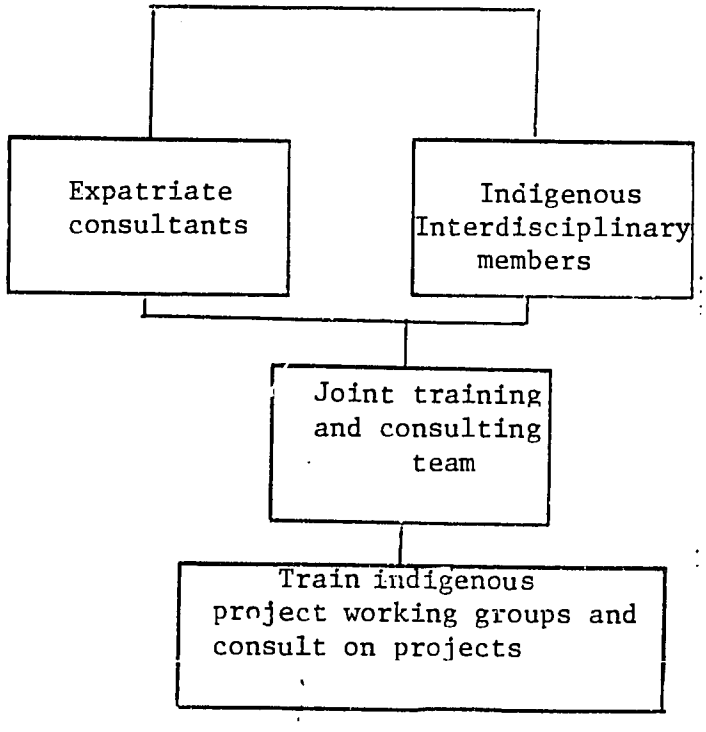
ALTERNATIVE #1:

EXPATRIATE MODEL




ALTERNATIVE # 2:

INDIGENOUS MODEL




From "AN ACTION TRAINING STRATEGY FOR PROJECT MANAGEMENT",

by Morris J. Solomon, Flemming Heegard, and Kenneth Kornher, DPMC Publication

themselves as change agents, hired not to do the training, but to train trainers and to manage the curriculum modification, case development, and related activities in a way that builds the skills of indigenous training staff.

Unless they understand the importance of doing otherwise, the typical field advisor will adopt alternative #1. Clarifying the appropriate role should be part of the "front-end" operations planning described in Part 1 of this paper.

## TECHNICAL ASSISTANCE APPROACH

The approach outlined below draws on key concepts of accelerating learning and PMIS. It is illustrative rather than comprehensive and definitive, but suggests elements that should be included in the OFWM technical assistance strategy.

## CLARIFY PROGRAM OBJECTIVES

Clarifying program objectives should take place as soon as the core technical assistance team arrives. It should include the technical advisors in each region, the USAID project officer, and the GOP OFWM personnel -- the provincial directors, the assistant directors for training, and key field supervisors, guided by an experienced workshop facilitator and PMIS expert.[2]

Clarifying program objectives has several practical purposes. It begins the team building process, and mutual definition of roles, It provides orientation for both the advisors and their counterparts: the advisors learn the program history and context, personalities, and interests of their

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[2]Clarifying objectives is one part of a more comprehensive methodology for team start-up. For a description of the comprehensive methodology, see "Improving Project Monitoring and Implementation Systems" by Merlyn Kettering and Terry Schmidt (December 1981, DPMC).

counterparts; the counterparts "take measure" of the advisors and learn their ideas, capabilities, and style.

Objectives clarification might begin with the general OFWM objectives in each province (and their recent shift from water provision to utilization), follow with the objectives of various OFWM field entities (supervisors, directors, etc.), and conclude with objectives of all project team members (GOP as well as advisors).[3]

Objectives clarification is not complete until there is a jointly developed, measurable, and mutually agreed to set of OFWM improvement objectives expected in each province.

Illustrative objectives at the provincial level may include:

- ___ watercourses constructed according to standard engineering practices in FY 198_.
- Percentage of watercourses for which there are engineering designs increases from ___% to ___% in 6 months.
- Reduction by 5% in the percolation and seepage losses of watercourses designed by field teams.

Sample objectives for the field team might include:

- Turnover of experienced team personnel does not exceed ___% annually.
- Each team completes at least 90% of assigned watercourse improvements within schedule and budget targets.
- Each field team has at least 2 individuals able to properly use a theodolite for surveying and designing watercourses.

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[3] Setting objectives is not always a straight-forward process. Conflicting objectives of various entities, complicated causality, political realities, and differing value systems affect objectives-setting. For an interesting discussion of this, see "Elements of Project Management," DPMC, June 1979.

Typical objectives for the training centers could include:

- All designated staff instructors understand and demonstrate ability to use concepts of andragogy in their training techniques.
- Two case studies based on actual regional field programs developed and used in training programs.
- Curriculum modified and improved, and reflected in rewritten training manuals, student guides and instructional aids.

The key point of these sessions is developing a consensus on project objectives, functions, strategy, procedures, and roles.

Setting measurable objectives for field performance implies the need for data to monitor progress. The joint objectives-setting process creates an understanding of the importance of information and can reduce the apparent resistance to monitoring. By first defining team objectives, fractions, and outputs, the need for data collection and monitoring becomes apparent, and paves the way to specifying data elements and collection methods.

## ANALYZE FIELD TEAM AND PROVINCIAL FUNCTIONS

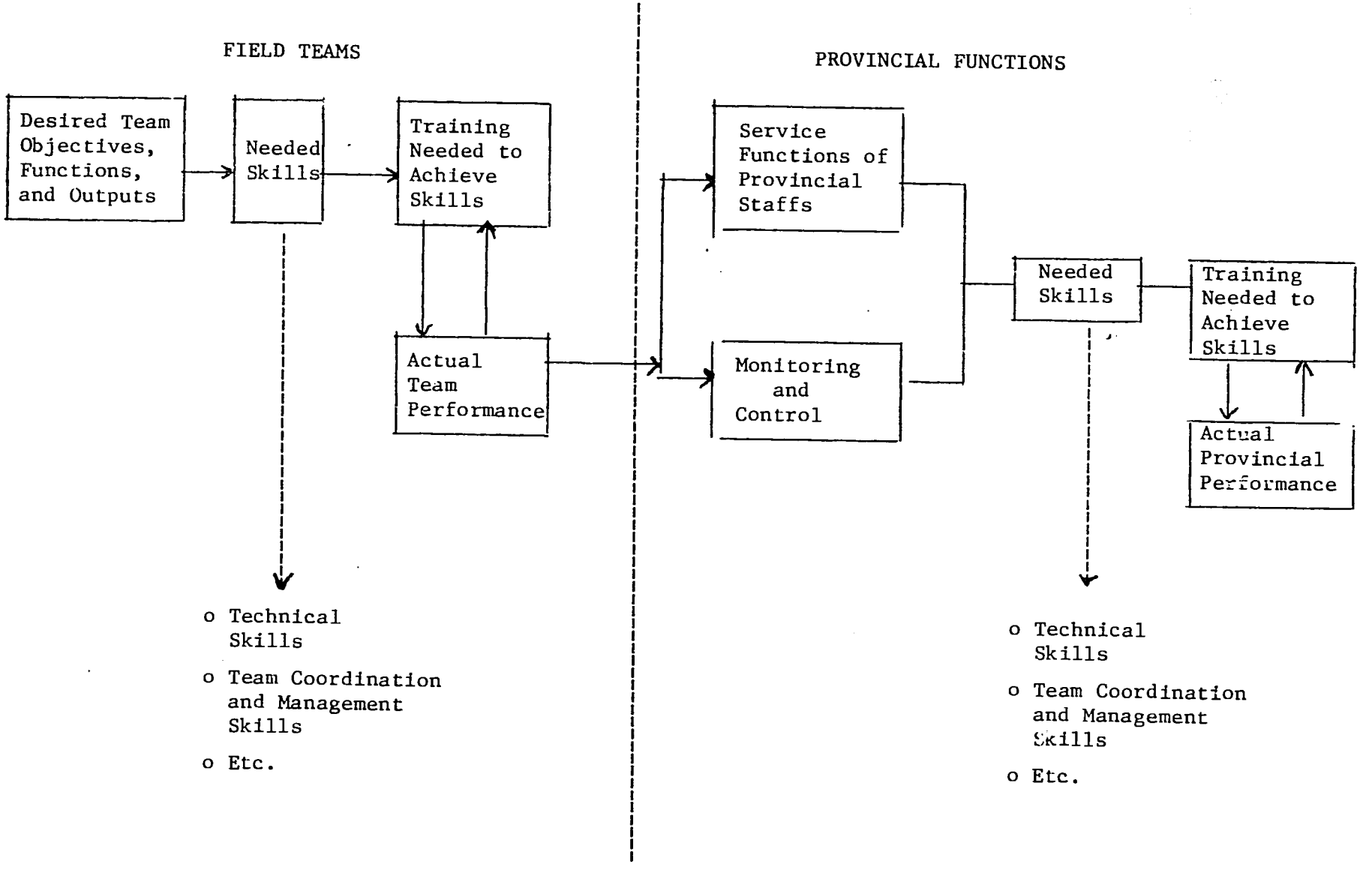
Figure 3-2 summarizes a logical analytic approach to achieve the OFWM training-related objectives.

It begins at the field level by clarifying the objectives, functions, and outputs required by the field teams. From this, needed technical, management, and coordination skills needed at the field level can be defined, with training designed to achieve these skills.

Provincial service functions and monitoring systems should be designed to alert provincial management of actual (versus planned) team performance. Figure 3-2 shows that provincial skill needs and training requirements derive from the field team objectives and functions.

FIGURE 3-2

FUNCTIONS OF FIELD TEAMS AND PROVINCIAL FUNCTIONS



This analytic task warrants a significant investment of GOP and technical advisory staff resources to define, in detail, watercourse improvement tasks.

The benefits are threefold. First, upgrading field team performance must start by documenting tasks field teams should perform to identify skill deficiencies. Second, a comprehensive task analysis forms the basis for a field operations workbook to guide the team in carrying out their work (the present workbook is incomplete). Third, task definition is necessary to refocus the training center curriculum on essential tasks.

There are two different approaches to task clarification: the work breakdown structure methodology and the competence assessment method. Each is briefly described below.

## Work Breakdown Structure

The Work Breakdown Structure (WBS) methodology originated with the Defense Department and NASA hardware programs. Briefly, the WBS successively breaks down complex undertakings into their components, logically breaking objectives down into sub-objectives, tasks, and activities. The completed WBS denotes all of the tasks that must be performed to carry out watercourse improvements.

Assume, for illustration purposes, that watercourse development entails three major tasks: (1) organize farmers, (2) design the watercourse, and (3) build the watercourse. Each major task can be broken down into subordinate activities. For example, design the watercourse could be expanded as follows:

2. Design the Watercourse

2.1 Survey the watercourse command areas

2.2 Stake the field

2.3 Make engineering calculations

With greater detail, activity 2.3 can be described as:

2.3 Make engineering calculations

2.3.1 Calculate elevation and head

2.3.2 Determine cut and fill requirements

2.3.3 Make earth work calculations

2.3.4 Compute optimum waterchannel slope

The completed WBS yields several products which support training and development. Assuming the extensive activity list is listed vertically, one could develop a matrix and horizontally display:

- typical manpower, equipment, and material resources for each activity -- useful for clarifying standard procedures and approaches
- individual responsibilities for doing each -- helpful for assigning field team members specific tasks to increase team efficiency
- knowledge and skill requirements necessary for each activity -- necessary to pinpoint training needs.

The approach recommended to develop the WBS is to convene technical advisors, training center staff, and OFWM field team supervisors engaged in

constructing the watercourse. Guided by an experienced workshop practitioner, an 8-10 person group could complete the activity in 2-3 days.[4]

Competence Assessment Approach

The competence assessment approach, pioneered by Harvard psychologist David McClelland, has been successfully applied to develop staff skills in the U.S. Information Agency, and has been adopted by the U.S. Army and Navy for developing their officer cadre.[5]

This methodology is based on a simple premise: the best way to improve staff performance is to first understand what the most competent staff members actually do, then train other personnel to emulate them.

One can hypothesize that the OFWM teams which perform best do some things different than less effective teams. If you want to train good watercourse teams, according to this logic, observe carefully what the most effective ones actually do, then build the training to reinforce these competencies.

A competency study would isolate the critical features that distinguish the most effective teams. It may turn out, for example, that the most effective teams are those with good supervisors. Or perhaps the superior teams may spend more time listening to the farmers and relying on farmer experience

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[4]The WBS approach is normally used in tackling large, complex projects which involve new undertakings and uncertainty. But the OFWM program involves repeatedly undertaking smaller projects with little uncertainty. For developing standard operational procedures, the WBS approach can be usefully supplemented by PERT/CPM type networks which illustrate the timing and interrelationships of various project activities.

[5]For a summary of this approach, see "The New Competency Tests: Matching the Right People to the Right Jobs," by Daniel Goleman, Psychology Today, January 1981.

to lay out the watercourse. Alternatively, the superior teams may be those with more of certain engineering skills. Or it could be that the best teams are those whose team members come from farm families.

To carry out the study, a team would carefully observe the OFWM teams designated as most effective to thoroughly document their on-the-job behaviors and activities. The distinctive competencies which distinguish superior teams could be determined from field observation data. Having identified such competencies, both in-service and pre-service training would emphasize them. These results are also useful for modifying the OFWM new personnel selection criteria.

The competence measurement approach should be considered a complement to, rather than a substitute for, the WBS approach to task definition. While the WBS approach can easily be performed by GOP and USAID technical advisors, the competence measurement approach requires outside assistance and extensive empirical data collection and analysis.

## IDENTIFY SKILL REQUIREMENTS AND DEFICIENCIES

Skill, knowledge, and abilities (KSA's) required for effective field team performance can be identified from the completed task definition. Having defined KSA's, the next step is to measure skill deficiencies in the field teams. One approach is to sample a number of completed watercourses to identify design and construction deficiencies, then relate watercourse deficiencies to KSA gaps. A second approach is for the advisors to spend sufficient time with the field teams to observe what they do and don't do well.

Identified skill deficiencies become the focus of the field team advisors' efforts, as well as key areas for curriculum improvement by the training advisors.

Design Standard Procedures and Techniques

From the task definition and observation of field performance, the technical assistance team can develop standardized procedures and techniques to perform these tasks, taking into account the nature of the tasks and the circumstances under which they will be performed. Where decisions are contingent on complex relationships among variables (such as those involved in farmer organizing), these procedures and techniques are more complex and require standard frameworks within which decisions are made. The frameworks developed would be the basis for pre-service training.

Thus an accelerated learning system necessarily involves a redesign or reconsideration of how things are done. Such design reflects the training and experience that will be available to the trainees and vice versa.

DESIGN/DELIVER TRAINING

The training strategy has two objectives: rapid improvement in the practical skills of in-service training personnel, and development of OFWM training institute capabilities.

Currently, there is no linkage between pre-service training and field operations. Newly hired trainees complete the 12-week program and are then assigned to a field team. There is no in-service or refresher training.

Training and field operations should be more closely integrated. Such increased integration would:

- Provide timely feedback to training staff on curriculum changes needed to support field operations,
- Provide opportunity for training staff to inform field staff of new developments and teachings resulting from research, and

- Provide training staff a more comprehensive understanding of how supervision, monitoring and administrative procedures can be made part of training.

It might be more useful to conceptualize pre-service training as taking place over a longer period (e.g. 6 to 9 months) with active involvement of the trainees with field teams during this period. This would:

- Get new people into the field much sooner (in a limited capacity),
- Involve the senior field staff in a training role,
- Initiate ongoing contact between training staff and senior field staff as they jointly review trainees' skills and needs, and
- Give trainees an early understanding of how their training will be used, thus motivating them for the classroom aspect of their training.

One model of such a training program is that after an initial 4 weeks of training at the provincial institute, trainees would then serve 4 weeks with a field team, return for 4 weeks of institute training, serve another 4 weeks in the field, then complete the final 4 weeks of institute training before permanent assignment to a field team. Trainees would be assigned (perhaps in groups of two or three) to field teams currently working in subject areas covered in the most recent 4 week module at Lahore. In addition, these 4 week modules could also be attended by other field staff as in-service or refresher courses.

## Logical Delivery of Training

Dr. Myron Woolman has pioneered in the development of accelerated skill training systems.[6] His methods have been successfully used in diverse settings,

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[6] See "Manpower Training: The Tool Station Skill Development System," National Development, September 1978.

from teaching construction skills to semi-literate Africans to teaching U.S. military enlistees to operate sophisticated weaponry.

Training design and delivery is based on a logical array and sequencing of "learning elements." Training begins with mastery of simple concepts, which are then combined to form higher level concepts.

Figure 3-3 summarizes this conceptual approach, showing an example in which advanced concepts of electricity are taught by first teaching the lower level and subordinate skill areas. Such an approach has high potential for restructuring the basic training curriculum of the OFWM training institute.

Building Team Capability

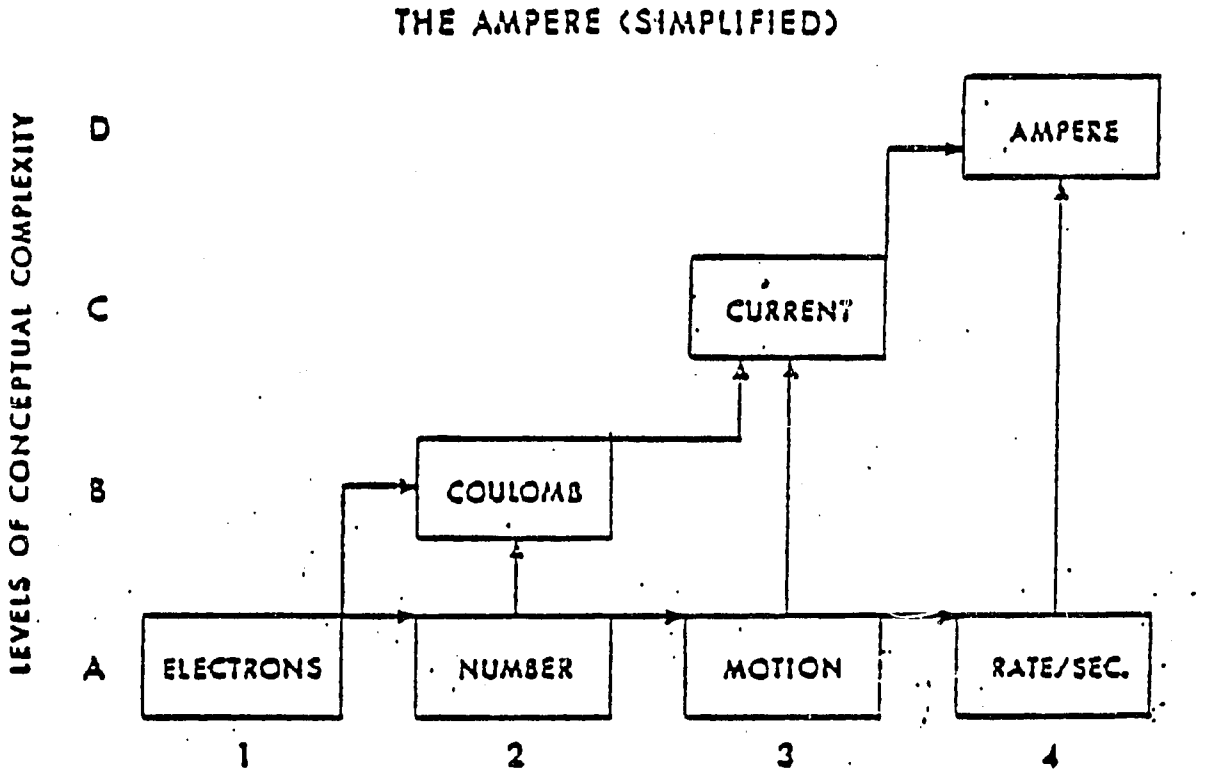
The training focus should be on the 7-12 person field team to ensure the required skills are sufficiently represented among team members. It is not necessary (nor cost-effective) that each team member be equally adept at performing all the tasks required for watercourse improvement.

For example, some members on each team must be skilled in watercourse design calculations, but not all team members need be able to manipulate Manning's formula -- it may be sufficient that the rest are able to take accurate land measurements. Also, it is important that one or two individuals on each team have the ability to help farmers organize water user associations, but it is not necessary that all team members have these skills. For the remainder, an ability to accurately describe the purpose of the watercourse improvement programs to farmers may suffice.

The training should not attempt to make all team members proficient at each task, but should encourage a greater degree of internal specialization based on skills and interests.

FIGURE 3-3

BREAKING COMPLEX CONCEPTS INTO LESS COMPLEX
LEARNING ELEMENTS (EXAMPLE)




From "CULTURAL SYNERGISM IN LDC PROJECTS" by Myron Woolman, Ph.D., DPMC Publication, August 31, 1979

## SOME ADDITIONAL TRAINING PERSPECTIVES

We noted that OFWM training staff view training as a highly conventional teacher-learner pedagogic process. We believe this reflects their own learning experiences in Pakistani institutions, and the lack of exposure to alternative models.

We also noted a strong willingness for the training staff to learn from the expatriate training advisors and upgrade their capabilities. The training strategy should incorporate the following approaches.

### Exemplary Field Team Staff as Trainers

Training effectiveness can be improved immediately by using exemplary field staff as adjunct instructors. Outstanding field team members could make presentations and lead group discussions of how the job should really be done. We believe that field team members would be flattered to participate, trainees would benefit from the "real-life" field perspectives, and staff trainers could learn by observing. Model water user groups could also be invited to participate in discussions with trainees.

### Trainers in the Field

We noted a tendency for trainers to stay at the training center and seldom venture into the field. Trainer training should have institute trainers spend several weeks with the field technical advisors who work with in-service teams. OFWM staff would rapidly increase their awareness of existing field problems (an awareness now lacking). The expatriate advisors should orient the staff trainers on how to identify performance problems, and equip them to function as in-field consultants as well as training center trainers.

## Principles of Andragogy

Andragogy is a learning system pioneered by Malcolm Knowles which recognizes that adults learn best under conditions different than the traditional classroom approach.[7] Emphasis is placed on drawing from the life experience of participants. Unlike the traditional teacher-learner model, in which the trainer is the "expert" who dispenses wisdom to eager trainees, the andragogous trainer concentrates on setting a climate for learning, and designing/implementing learning activities. These principles apply to both in-service and pre-service training.

## Build on Participants' Previous Experience, Feelings, and Values

We are all familiar with participants who "learn" skills and techniques, but who do not "internalize" them. Their inclination to make use of the skills is weak or non-existent.

An important tenet of modern adult learning is that adults internalize new knowledge and skills when they themselves relate these new skills and knowledge to their initial feelings, perceptions and values.[8]

In the OFWM setting, exploration of values and feelings is especially important, given the ethnic mix of farmers and the generally higher social class of OFWM personnel. Sensitivity to farmer values, interests, needs, and goals should be stressed, and methods of conflict resolution and group decision making taught.

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[7] See "A Trainer's Guide to Andragogy," by John D. Ingalls, U.S. Department of Health, Education and Welfare.

[8] Tae Sohn, "How Adult Participants Learn," Seminar on Teaching Project Analysis, Readings for "Training Trainers," Economic Development Institute, World Bank, Washington, D.C., 3rd ed., October 1960.

## Merging of Learning with Doing

In accelerated training, learning and performance on the job is tightly linked to reduce the slippage between training and job assignment. The content of learning is immediately followed by opportunities to apply the learning to real problems or closely simulated situations. One way to accomplish this is to envision pre-service training not as a continuous 12 week block, but as shorter periods interspersed by serving with an actual field team.

## Follow-Up on Actual Job Performance

Feedback on the actual performance of trained individuals is absent. Systematic follow-up of trainee performance in the field is needed to continually refine the training approach. The operational checklists developed through the WBS methodology can serve as a tool for monitoring actual performance.