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# RESOURCE MANAGEMENT FOR RURAL DEVELOPMENT PROJECT

MICROCOMPUTER TRAINING FOR  
THE GOVERNMENT OF KENYA: THE  
CASE OF THE KENYA INSTITUTE OF  
ADMINISTRATION

Stephen B. Peterson

Discussion Paper No. 11

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**ABSTRACT \***

Enduser computing is rapidly growing in the Kenya Government due to the large number of microcomputers provided by donor organizations. In 1986, the Kenya Institute of Administration (KIA) established a microcomputer training program for government officers and secretaries to develop skills in wordprocessing, spreadsheets, database management, and statistics. This article analyzes prospects for institutionalizing KIA's microcomputer training program by reviewing its initial evolution, present status, and future directions. The article concludes that intensive residential training geared to enduser computing can greatly facilitate access to this technology by government staff and improve government productivity.

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In mid-1986 the Government of Kenya faced a critical stage in its computerization program. Microcomputers had been successfully introduced into several important tasks (e.g. the national budget, import monitoring, expenditure monitoring in key ministries) and it was now time to move from introduction to institutionalization.<sup>1</sup> The government was also faced with a growing inventory of microcomputers, most provided by donor supported technical assistance projects. A survey of computer hardware conducted by the Government Computer Services Centre (GCSC) in mid-1986 found that there were 155 computers in operation and more were arriving with each new project agreement.<sup>2</sup> The government was rapidly computerizing largely on the basis of inexpensive microcomputers yet there were no established government training facilities.<sup>3</sup>

At this juncture the Ministry of Planning and National Development (MPND) approved the Resource Management for Rural Development (RMRD) Project which, as part of its terms of reference, focussed on improving management information systems (MIS) in the Ministry. The Project provided an advisor, computer equipment, and employed Kenyan computer programmers and trainers to assist the MPND in computerizing information systems.<sup>4</sup> An earlier project (the Rural Planning II Project) had initiated a variety of computer initiatives extending far beyond the Ministry of Planning including computerization of the following: the national budget, budgets of the five largest sectoral ministries, district

plans, and administration in three provincial capitals.<sup>5</sup> The focus of the RMRD MIS program was to consolidate these diverse computer initiatives. Training was an essential component of the RMRD Project's strategy for institutionalizing the technology.<sup>6</sup>

As the RMRD Project got underway and prepared to install sixty new microcomputers, the lack of an adequate government training program and limited space to conduct computer training within the cramped Treasury building quickly became apparent. The only available training facility was a small room in the Treasury building shared with the budget officer for the MPND. Conflicts over the use of this room made an in-house training program untenable. Thus the MIS advisor approached the Research Department of the Kenya Institute of Administration (KIA) in November 1986 and suggested a collaborative arrangement using MPND personnel and hardware and KIA training facilities to create a microcomputer training program.<sup>7</sup>

#### **KIA'S MANDATE AND THE ROLE OF MICROCOMPUTERS**

As the principal institution for training government officers and with its close proximity to the central ministries in Nairobi, the selection of KIA for a microcomputer training facility was appropriate. KIA was founded in 1961 to facilitate indigenization of the civil service and by 1964 had established a training program to promote "effectiveness and efficiency" within the public

service.<sup>8</sup> The Institute's emphasis shifted in 1978 to training senior public managers, based on the innovative and farsighted findings of the Wamalwa Commission.<sup>9</sup> Although many of the Commission's recommendations were not implemented, one finding was accepted--that KIA should train senior public managers and that such training should have an impact on National Development. However, poor leadership within the Institute and limited resources delayed implementation of this recommendation until the appointment of a new and more capable principal in 1985.

The timing of RMRD's computer initiative in 1986 was opportune. First, it coincided with a reappraisal of KIA's objectives by the new leadership.<sup>10</sup> A major question was how KIA could develop training programs that had a timely impact on public organizations and on national development.<sup>11</sup> In an internal evaluation, the Head of the Research Department succinctly stated that the crucial issue facing the Institute was "the impact of the training programs on either organizational management issues or development strategies."<sup>12</sup> A microcomputer training program for government officers at KIA fit well with these aims. Second, the computer initiative was also timely because in 1986 KIA was just emerging from a moribund state and the initiation of such an innovative and visibly modern program demonstrated that the Institute was committed to reform.

Finally, KIA's reassessment of its impact on national development in 1986 also coincided with increasing recognition by donors that weak public sector management was a critical constraint to Africa's development.<sup>13</sup> This concern is reflected in components of structural adjustment policies, particularly those promoted by the World Bank, that emphasize a smaller and more efficient public sector.<sup>14</sup> Steps for more efficient use of scarce public resources are set out in the Kenya Government's budget rationalization policy, which embodies the public sector management component of the structural adjustment program.<sup>15</sup> Microcomputer's are viewed as an integral part of more effective public sector management and KIA has adapted its training program accordingly.<sup>16</sup>

#### OVERVIEW OF THE PROGRAM

The program got underway in February 1987 and by October 1, 1989, a total of 228 participants were trained in the following: 5 courses in Data Management involving 83 officers and 13 lecturers from KIA; 2 courses in Statistical Analysis involving 27 officers and 2 lecturers from KIA; and 6 courses in Office Management involving 103 secretaries and clerks. The participating officers typically are junior and middle level while the lecturers and secretaries vary in seniority. The training courses started as residential courses, however, this shifted to non-residential training in June of 1989 when the University of Nairobi took over KIA facilities.

Since accepting its first students in February 1987, the training program has steadily improved. Today, the curriculum is polished, the continuity and professionalism of the trainers is established, and the program's courses are listed in the yearly training calender of the Directorate of Personnel Management (DPM--the agency in the Office of the President to which KIA reports). The acceptance and the success of the program are illustrated by the oversubscription of courses and even by favorable press reports.<sup>17</sup> Demand comes from virtually every ministry in the government as well as parastatals and local government.

#### CHALLENGES IN THE INITIAL DEVELOPMENT OF THE PROGRAM

The initial design of KIA's microcomputer program was modest and experimental.<sup>18</sup> The Management Information Section (MIS) of the MPND provided two computers and one trainer to KIA on a trial basis. An evaluation was planned at the end of five months to assess the program. If successful, additional computer resources would be seconded to the Institute on a long-term basis and a follow-on project proposal would be developed for additional support to expand the program.

The initial experimental phase had three objectives.<sup>19</sup> First, the program would train KIA lecturers teaching three key courses (Project Development and Management, Middle Financial Management, and Certified Public Accounting III) in microcomputer applications which were appropriate for their

courses (e.g. spreadsheets, database management, and wordprocessing). Upon completion of their training, it was expected that these lecturers would develop computer-based training materials for their courses. Second, once the lecturers were trained, they would train their students in basic software packages which would enable them to run the computer-based course materials. Third, the program would train the clerical staff of senior KIA officials to ease administrative burdens and to demonstrate the technology's productivity to the Institute's leadership.

The initial phase of the program lasted six months and had five characteristics. First, it proceeded slowly to ensure that the training was of high quality and that the trainer learned how to train. Second, it included only KIA staff so that the program was able to experiment without the pressure of outside scrutiny. Third, only two computers and one printer were provided which slowed the program down, but allowed the trainer to easily manage and thus develop the program. Fourth, during the start-up phase, there was close and effective consultation between KIA and the MPND which quickly addressed any problems that emerged. Finally, there was a commitment to quality rather than quantity. The initial class took six months to complete the course rather than the five weeks originally envisioned. This was partly due to the shortage of machines but principally due to the emphasis on quality.

Based on the experience of the initial phase, the program slowly expanded during the next year: hardware increased from 2 to 8 computers; staff increased from 1 to 2; new facilities were made available; and trainees from outside of KIA (from the MPND) were included.

In the process of establishing the KIA program five challenges emerged that may be instructive to other institutions considering the creation of such a program.

#### 1. Design Changes

In the original program design, KIA lecturers were to teach computer applications in the context of ongoing management courses. However, given the heavy demand for training in microcomputer software packages by various levels of government staff (officers and secretaries), it soon became apparent that separate microcomputer courses could better meet this demand. Not everyone would benefit from the management courses. Moreover, separate courses would allow high quality training by seasoned computer experts rather than by the newly trained lecturers. The course organizers decided that in the short run this was the best way for KIA to develop high quality training, better meet the immediate demand, and establish its reputation in the computer training field. Flexibility to incorporate design changes has been an important factor in the program's success.

## 2. Maintaining an Appropriate Timetable

The initial design had an ambitious timetable for expansion which was soon abandoned as the program proved to take longer than anticipated. Trainers learned along with the trainees about what to teach and how to teach it. It took time to build training experience. It also took time to build the self-confidence of trainers to teach a course that would withstand outside scrutiny. The program has demonstrated the value of building solid foundations to ensure effectiveness. There were, and still are, considerable pressures to expand the program more rapidly to meet the intense demand for microcomputer skills. However, the program has maintained a slow yet effective pace of growth.

## 3. Resistance

Resistance to establishing the facility was encountered within both KIA and the MPND. Resistance within KIA came from some lecturers who were encouraged to be trained in computers but declined because they either feared the technology, or lacked initiative (the initial staff computer course was in addition to the lecturing staff's normal duties). Past recruitment practices had saddled KIA with some incompetent staff<sup>20</sup> and, coming at a time of institutional reappraisal, the introduction of a demanding computer course for lecturers made the less competent members of staff anxious about their position within the Institute. At the same time, those lecturers who did participate demonstrated both initiative and

a willingness to upgrade their professional skills. This enthusiasm by respected staff members enhanced the "staff development" component of KIA's revitalization effort and helped to overcome the pockets of resistance.<sup>21</sup> The follow-on training of KIA secretaries who quickly embraced the technology, the foresight of the Institute's Principal, the determination of the Head of the Research Department, and the need for KIA to demonstrate tangible reforms further helped to quell resistance within the Institute. The KIA case illustrates that introducing a microcomputer training program can initiate or reinforce a program of staff development within a management training facility.

Resistance within the MPND, which provided the hardware and training personnel, also affected the program. Some officers felt that such scarce resources should be retained within the Ministry and that microcomputers provided by the RMRD Project should be used for operations rather than training. The technology was scarce, the demand was growing rapidly, and there were strong claims on each new computer that arrived. This resistance was overcome by accelerating the RMRD Project's timetable for installing microcomputers in the Ministry. Forty of the budgeted sixty microcomputers were procured and installed within the first year and one-half of this project. Thus the microcomputers allocated to KIA were less missed.

There was also resistance among Ministry staff who did not see any reason for training outside the Ministry. It took time to convince them that an in-house training program was not feasible (principally due to lack of space) and that an intensive residential program away from the Ministry would be more effective (because of fewer distractions and fuller immersion in the training). Resistance within the MPND further declined when KIA started training MPND personnel.

#### 4. Diversion of Resources

As noted above, there is a strong tendency to divert scarce information technology from training to operations. This pressure occurred even within KIA as Department Heads sought to have the microcomputers moved from the training room to their departments for clerical work. These demands were resisted effectively by both the Principal and the Head of the Research Department, as well as the RMRD funded MIS advisor from the MPND. Since the computer equipment was on loan from the MPND, it was made clear to KIA that diversion of computers to non-training applications was unacceptable, since MPND was sacrificing its own operational needs for these computers.

However, some diversion of computers is inevitable and can be productive if well-planned. The initial design allocated one microcomputer and printer to the Principal's office and that computer did more to convince the Institute's senior leadership of the value of the technology than all of the microcomputers in the training room. It enabled the

Principal to experience first hand the dramatic improvement of productivity in his own office.

The Principal's computer also attracted support for the program from an even higher policy level. Soon after his secretary started wordprocessing with the microcomputer, the Principal sent a letter to the Directorate of Personnel Management (DPM) which was printed with the characteristic style of a dot matrix printer. Noting that the Principal's letter was produced by a computer, a senior officer in DPM phoned the Principal and enquired how he produced the letter. DPM at this point had no computers though it was desperately trying to acquire them. The Principal informed him of his office's recent acquisition as well as the new training program. Surprised at this development, the officer from DPM simply stated that it should have been done "years ago" and was pleased that KIA had started to "go computer."<sup>22</sup> This computer printed letter visibly demonstrated to the heretofore skeptical and critical DPM that KIA had finally logged onto the computer revolution.

## 5. Staffing

The program's first trainer was very experienced having trained much of the staff in one of the provincial microcomputer facilities. Despite his experience with microcomputers, this trainer was only a clerk in the government service and left after seven months for the more remunerative private sector. He was replaced by one of the

RMRD Project's contract hire programmer/trainers who, after four months, was joined by an additional contract programmer/trainer. This disruption in staffing initially did weaken the program but the two contract trainers quickly learned the job and have now been with the program for nearly two years. Their experience and continuity has been critical to the effectiveness of the program.

## PEDAGOGIC ISSUES

### 1. Training Philosophy

The underlying pedagogy of the training program is the value of microcomputer-based enduser rather than systems computing.<sup>23</sup> Enduser computing which is the use of microcomputers by non-computer specialists is made possible by the advent of powerful yet user-friendly software. Systems computing, in contrast, concerns the development of complex programmes by computer specialists (e.g. system analysts and programmers). The significance of enduser computing is that it is growing faster than systems computing (five times fast in developed countries) due to the growing backlog of applications awaiting systems development and the feasibility of non-computer specialists developing their own applications.<sup>24</sup>

A commitment to enduser computing is also a commitment to institutionalizing microcomputer technology for it promotes the use of the technology by various levels of government staff rather than reserving the technology for computer

specialists. The Kenya Government is hard-pressed to retain qualified computer staff given the relatively unattractive terms of service, thus any commitment to systems rather than enduser computing is a commitment to high-cost non-government computer staff. Experience in Kenya has shown that, as "endusers," government staff who are well trained in microcomputer based software can make significant cost-effective contributions.<sup>25</sup>

## 2. Residential Training

The residence requirement has been important because it provides the trainees an intense exposure to computers and removes them from the distractions of daily office routines.<sup>26</sup> The computer facility is open weekdays from 8:00 A.M. to 10:00 P.M., and Saturdays from 8 A.M. to 12 P.M. Its location near the trainee's dormitories makes its very accessible.

## 3. Course Offerings

The present facility offers three standard courses aimed at three levels of user.<sup>27</sup> "Computer Applications for Office Management" is a four week course for secretaries and clerical staff. While the focus of the course is wordprocessing (WordPerfect Version 4.2), the course also introduces the DOS operating system (Version 3.3), spreadsheets (Lotus 1-2-3 Version 2), and a limited amount of data base management (dBase III Plus).

"Computer Applications for Data Management," a six week course for officers, is the core course of the program.

Trainees are taught the following: introduction to microcomputers, an operating system (DOS Version 3.3), spreadsheets (Lotus 1-2-3 Version 2), and data base management (dBase III Plus). Nearly half of the course is devoted to mastering the Lotus financial, statistical, and graphic functions.

In addition to these topics, the core course is enriched by the use of outside resource personnel. In one such session, the RMRD computer engineer opens up a microcomputer and shows trainees the physical components of how a computer works. In another session, the Ministry of Planning's Statistical Data Processing Advisor and the MIS Advisor lecture on data processing and management issues of this technology. The expertise of outside resource persons augments the course by providing diversity in the training. Such resource persons have extensive experience with the operating environments in which the trainees will use the technology and thus their presentations provide a healthy realism to the instruction.

The third course, "Computer Applications for Statistical Analysis," is a six week course for officers who have had an introductory course (such as above) or have experience with microcomputers. The course uses the Statsgraphics (Version 2.6) software and trainees are taught the following: sources of survey data, review of statistical concepts, overview of Statsgraphics, file preparation, data entry, statistical

procedures, and report preparation. This course has been attended by both planning officers from various departments of MPND (including the Central Bureau of Statistics) and lecturers and researchers from the University of Nairobi.

The courses now have a standardized format, however, every course is regularly evaluated and modified. One issue that consistently surfaces in the evaluations is the demand by officers for training in dBase III Plus programming. To date, the training program has not accommodated this request (it only teaches officers rudimentary dBase III Plus commands) for several reasons. The first reason is pedagogical. The training program is committed to enduser computing and while rudimentary programming skills may be needed for the advanced "power" enduser, it is felt that most trainees do not require such skills. Rather than invest time in teaching a small group of trainees programming, the program offers training to a larger group in powerful user-friendly software which do not require programming skills. Many critical applications within the government can be computerized with standard software by a knowledgeable user and do not require sophisticated programming. The KIA program is aimed at creating such a knowledgeable user.

The second reason is that training in programming would primarily benefit the private sector since the government lacks an adequate career ladder (what is termed the "scheme of service") for computer personnel. The inadequacy of the

current scheme of service prevents the government from retaining capable computer programmers. Without an adequate scheme of service which allows government to compete with the private sector in retaining scarce programmers, a course in computer programming at KIA would simply serve the private sector.

#### 4. Standardization of Software

An important pedagogic issue concerns standardization on particular software packages and, as new versions enter the market, whether to upgrade to these versions or change to new software packages altogether. Standardization is essential to manage a training program. It is not practical to teach two or more different spreadsheet packages in a short course because trainers must know each package thoroughly, time is limited, and training materials and examinations must be well integrated. As noted above, the program has standardized on the following packages: DOS Version 3.3 for the operating system, Wordperfect Version 4.2 for wordprocessing, Lotus 1-2-3 Version 2 for spreadsheets, dBase III Plus for data base management, and Statsgraphics Version 2.6 for statistics. Except for the Statsgraphics software, the software listed above are virtually world-wide standards and are among the most popular software for that particular application.

Upgrading to a new version of software is generally easier than switching to a new package altogether. Still,

the training program has not adopted the recently released upgrades of the software listed above principally because of the cost, and also because the trainers have not had time to learn the upgrades. While there are no in-depth research findings, it is clear that the "average user" does not use all of the available functions of a software application. Thus there are more advantages in using an existing software which the trainer is comfortable with, than in spending time on the learning curve of a new version which has new features the trainees may not even need.<sup>28</sup> After the trainers are conversant with the upgrades, the cost comes down, and the bugs are worked out, then perhaps it will make sense to adopt these new programmes. In the meantime, if well versed, the trainees can teach themselves the upgrades.

Switching to a new software package is more difficult than upgrading and has broader implications. It is difficult because trainers have to spend time learning the new package and developing new materials. It is also expensive and undermines the standardization process.

More important, software standardization in training influences government-wide standardization. When the trainees return to their ministries they will want to use the software brands used in training and encourage their ministries to procure these brands. The value in standardizing software, at least in the initial phases of computerization in a government, is that it creates a cadre of users who can easily

communicate and train each other. The expansion of such a cadre of knowledgeable government users ultimately ensures the institutionalization of microcomputer technology. As microcomputers become integral to this cadre's work, they will expect and demand access to the technology.

Standardizing software also makes sense in terms of economies of scale in procuring software and training materials. The benefits of switching to a different software are far outweighed by the costs and loss of efficiency due to a new learning curve. Finally, it should be noted that standardizing software in a training program does not preclude use of other packages--it just means they will not be taught in the training program.

#### 5. Instructional Format

The format of instruction is a formal presentation in the morning by the trainers and hands-on practice, and instruction in the afternoon on the material covered that morning. To ensure effective supervision, the course design has established a maximum ratio of two trainees per machine and a maximum of twenty-four trainees per course. Experience has shown that two trainees per machine encourages peer learning, and reduces the anxiety of using the computer, which commonly occurs in the early stages of training. Working in pairs, one student can enter commands while the other consults the blackboard or training manual. The two to one ratio is less optimal towards the end of the course when students are

required to prepare a project. At this stage there is considerable competition for computers. KIA envisions that a computer lab, in addition to the classroom, will be established in the future to cope with these demands.

#### 6. Course requirements

To earn a certificate of completion, trainees are required to pass a written exam and produce an individual project based on one of the software packages. The examination is comprehensive and tests the trainees on all of the topics covered. The project, however, has proved to be an even more effective learning device because it is here that trainees apply a software application to a significant task they face at work. Through these projects participants gain in-depth knowledge of a software package they will use in their work; learn how to apply a software package to a realistic problem; and develop confidence in using the computer on their own. Some of the projects have been surprisingly ambitious and useful.<sup>29</sup> For example, a KIA secretary with only two weeks of data base training developed a data base programme for producing the Institute's annual budget. The significance of some of the projects produced by trainees within one month of first using a computer reaffirms the feasibility and value of an enduser strategy.

#### 7. Certification

The certificate of completion has been a significant feature of the program. Course requirements are rigorous and

not all students qualify for the certificates. The certificates are highly desired as a testimony to the acquisition of a scarce skill. Although no data are available, the certificates also most likely serve as a means of securing employment in the private sector. (Trained computer operators are very scarce in Nairobi, particularly in wordprocessing, and the cost of alternative short training courses in the private sector is very high). It is still too early to assess whether the KIA training improves career prospects within the government.

### **8. The Role of Typing Skills**

The program involves principally two types of trainees-- secretaries and officers. Whether typing skills are an obstacle to learning the computer is not an issue for the first group since they have typing skills, whereas the second group generally cannot type. Oral evaluations conducted at the end of the core course found that officers do not feel typing is an obstacle to learning the computer and the majority did not favor the use of a computer-based typing tutor programme to develop their keyboard skills. Indeed, most officers expressed a strong sentiment that they did not want to "become secretaries" thus affirming the status distinction between officers and secretaries and the common belief that typing is "secretarial work." Indeed, asked if they wanted more than the three days of instruction in wordprocessing, most officers argued that three days was more

than sufficient. While the officers may not want to admit that their poor typing skills limit their ability to use the computer, it is clear that basic keyboard skills facilitate computer learning.

#### 9. Training Material

Another troublesome training issue is the development and provision of course materials. The trainers have developed brief manuals for WordPerfect, Lotus 1-2-3, and dBase III Plus but these are only introductions. Recognizing that only a limited coverage of a particular application is possible in a short course, it would be preferable for each trainee when they return to their ministry to have access to readable reference books (not just the manufacturers' software manuals which are often poorly written). The program organizers hope that when ministries acquire microcomputers in the future, they will procure adequate numbers of reference guides to facilitate ongoing learning and experimentation with the hardware and software.

### ADMINISTRATIVE ISSUES

#### 1. Supervision

From the beginning there has been a close collaboration between the Head of KIA's Research Department who manages the facility and the MIS advisor of the MPND who manages the RMRD Project's computer resources. Together, they have worked on every facet of the program, from strategy to logistics. The Head of the Research Department has been particularly

effective in taking quick corrective actions where necessary to ensure the program's success. Supervision by government staff means that government "owns" this program and understands its direction. This collaborative evolution will greatly facilitate the institutionalization of the program's management.

## 2. Staffing

The program is staffed by two contract employees of the RMRD Project. These trainers have proved to be very effective because they have a strong computer background (indeed they were first hired as programmers) as well as extensive teaching experience (both trainers were accomplished teachers before they began a second career in computers). In addition to their substantive computer knowledge and their teaching abilities, the trainers are effective because they understand the underlying concepts of the training program. The two trainers have been integral to the evolution of the program and have been involved in all meetings concerning the program's management and direction. Close involvement between the program's trainers and managers have ensured that its direction has benefited from the insights of the classroom.

## 3. Hardware

The RMRD Project has provided KIA with 13 IBM compatible XT clone microcomputers, 1 Compaq Deskpro (XT equivalent), 1 IBM XT, 1 IBM compatible AT clone, and 9 printers distributed as follows: 12 XT clones and 5 printers for training, 1 XT

clone, 1 Compaq, and 1 printer for the trainer's office, 1 IBM XT and 1 printer for the Principal's office, and 1 AT clone and one printer for the Head of the Research Department. Except for one IBM XT and one Compaq XT, reliable IBM compatible clones are used because they are much cheaper than brand name equipment (on average, they are less than half the price). Moreover, they are the same models which the MPND uses which facilitates support. Training computers are subject to hard use and it is important that they are reliable and easy to maintain. Further, trainees do not need sophisticated or fast computers because they are beginners. In any case, they are most likely to use standard XT computers when they return to their ministries. The XT clones in use have the following specifications: 640 kilobytes of random access memory, a 20 megabyte hardisk, a 360 kilobyte floppy drive and a monochrome monitor. A hardisk microcomputer is important because trainees need to understand hardisk file management.

Several brands of printers have been used and two lessons have emerged concerning the requirements of printers for training programs. First, reliable high speed printers are necessary because printers are shared between two and three computers. Print speed in draft mode is far more important than having a letter quality mode. Second, printer sharing devices lessen the wear on the computer video cards and speed up printing.

Uninterruptible Power Supplies (UPS's) have been effectively used in this program. Dirty power is a common problem in developing countries and the KIA at times experiences severe problems with unstable power. The program has an established policy that no computer can be operated without a UPS. This practice has ensured the reliability of the computer equipment and has minimized down time due to repairs.

The most recent hardware addition to the training program is a ViewFrame projector which projects a computer screen on a wall. The ViewFrame greatly simplifies the trainer's work for they do not have to write the commands on a blackboard. With the ViewFrame, students see exactly what the trainer is doing and what their computer screens should look like. While it has only been used for one class, preliminary assessment of the ViewFrame indicates that it speeds up the training process and increases the productivity of the trainers.

#### **4. Maintenance**

Computer maintenance for the facility is provided by the RMRD Project's maintenance engineer. Routine maintenance is done before and after each training course to ensure the reliability of the equipment. Equipment failures are handled by replacing components down to the level of chips. To facilitate institutionalization of the facility, the RMRD engineer has trained a KIA clerk in basic preventive maintenance so that the equipment is routinely serviced.

The principal maintenance problem has been the breakdown of UPS equipment due to the dirty power at the site. This problem has been corrected by rewiring the computer room. New equipment has replaced the damaged UPS's which are awaiting repair. The other principal maintenance problem has been damage to the computer video cards caused by unplugging printer cables and sharing them between computers. To correct this problem printer sharing devices have been installed which allow three computers to share one printer.

#### 5. Cost Recovery

Virtually all of the program costs were initially covered by the RMRD Project. As the program expanded to include officers from other ministries, it was essential to introduce cost sharing because the MPND would not subsidize the training of staff from other ministries. Cost sharing was introduced in 1989 and entailed a 500 Kenya Shilling (approximately \$20) charge for each trainee for microcomputer supplies (e.g. diskettes, ribbons, paper). While only a modest charge, the principal of cost sharing is now well-established and the charges will be increased to reflect the full cost of locally procured computer consumables.<sup>30</sup> Full cost recovery has not been implemented for the RMRD Project still funds the following: equipment depreciation, maintenance, and salaries (for the trainers, maintenance engineer, and MIS Advisor).

## PROBLEMS ENCOUNTERED

### 1. Staffing

The training staff is provided by the RMRD Project and KIA has not provided any full-time staff to counterpart and take over the training responsibility. The Research Department of KIA, which manages the microcomputer facility, is seriously understaffed. While the Research Department has been promised funds for hiring a lecturer to teach in the computer program, such funds have not been forthcoming.

There are several difficulties in replacing the RMRD trainers with KIA staff. First and most significant, is the level of remuneration. Given the large salary difference between what the present computer trainers earn and what a KIA lecturer on government terms of service could earn, it is unlikely that KIA will be able to recruit, much less retain, qualified personnel. The continuity of staffing is particularly important in such an innovative training program because past lessons must be understood and incorporated in refining the program. Another constraint to retention of qualified staff is the heavy demands of the program. The program requires long hours and work on weekends--a substantial commitment of effort which government staff may not be willing to do given their limited incentives.

Another staffing issue which confronts the present program is the motivation of the trainers. The two trainers are highly skilled programmers yet their training duties

rarely require them to use these skills. The lack of an opportunity to use their programming skills concerns them, for programming skills are in greater demand than training skills in the Kenya market. Repetitively teaching the same introductory course in computer software can become boring. While the problem has not been wholly solved, the trainers have been motivated by their extensive involvement in developing the program and the publically acknowledged success of the program. Course routine is also varied by the trainee's projects which are unique and allow the trainer's to engage in a variety of topics.

One solution to the problem of trainer motivation would be to rotate them back and forth between programming and training, although this would weaken the continuity of the program. Another solution would be to develop a consulting role for the training facility at KIA (discussed below).

Finally, the continuity of KIA's Head of the Research Department who presently manages the program has been critical to the success of the program. No other staff members have been closely associated with the management of this program and the departure of this individual would seriously weaken the program. However, given his heavy workload, KIA should consider hiring an able assistant to the Department Head who could help to manage the Department and this program.

## 2. Institutional Crisis

Perhaps the most significant testament to the program's importance has been its role in ensuring the autonomy of KIA itself. In April of 1988 it was announced that the University of Nairobi would double its intake of students effective September 1988. To accommodate the increase, the University took over many of KIA's facilities.<sup>31</sup> At that time the government proposed to integrate KIA within the University making it the "Institute of Development Administration and Management (IDAM)". The significance of this proposal was that KIA would lose much of its autonomy by becoming accountable to the Chancellor of the University rather than the Directorate of Personnel Management. More seriously, its training program would be directed to the needs of undergraduates rather than government officers. KIA's status was in limbo for nine months until December 1988 when the government reversed its decision and affirmed the autonomy of KIA. It took an additional five months for KIA to reprogram its activities and return to its normal training schedule. During the year in which integration was being considered, KIA produced several documents stressing the need for an independent institution to provide training for government officers.<sup>32</sup> One of the most compelling arguments for KIA's autonomy was that KIA offered courses which the University could not duplicate and which were essential to government performance. The computer courses were listed as the type of

critical course which needed to be continued. The computer initiative was therefore significant in assisting KIA to demonstrate its value to government service thereby preserving its autonomy.

### 3. Facilities

Even though KIA remained autonomous from the University, the University kept most of KIA's facilities. By June 1988, the Institute had virtually no classroom or dormitory space. The computer facility was drastically reduced in size from two large rooms to one very small and old room. Space limitations forced the program to reduce the size of its courses from 12 computers and 24 students to 8 computers and 16 students. Today, the most urgent need is the construction of suitable classrooms and dormitories to house the program's equipment and the trainees. A serious problem within the facilities is the very unstable power. When the University annexed most of KIA's facilities, they brought in new equipment and expanded the number of resident students without expanding and upgrading the electrical system. The overloaded power system wrought havoc in the computer facility and caused considerable damage to the sturdy UPS's. Rewiring has greatly ameliorated the problem of dirty power but the lack of stable power is still a concern. The experience of KIA demonstrates that one cannot assume that the installation of UPS's "solves" the problem of dirty power. These expensive units can be damaged just as well as computers if power is highly unstable.

#### 4. Ministry Selection of Trainees

The success of the KIA program is determined in large part by the selection of trainees which is done by ministerial training committees. Ministry selection is necessary for political purposes (to avoid misuse of this discretionary resource). However, a serious shortcoming of this process is that KIA loses control and cannot ensure that the most appropriate and qualified people participate. KIA requests that ministries select staff who will have access to a microcomputer at the conclusion of their training and who will be assigned work requiring the use of a computer. This allows trainees to put their new computer skills promptly into practice, and retain their learning. Yet, preliminary findings from a study currently underway to assess the impact of the KIA computer training has found that lack of access to computers is a serious problem for program graduates.

Another problem has been the selection of trainees who do not have the requisite computer background for the advanced course in statistical methods. The first course in statistical methods was greatly disrupted by this problem and trainers had to work overtime to tutor those who did not have suitable backgrounds.

While the current selection process has its limitations, there is a clear advantage in separating the management of the program from the very sensitive political process of selecting trainees. By limiting its involvement in the selection

process, KIA has avoided politicization of the program which could weaken the program's credibility. KIA does veto some ministry selections which are clearly inappropriate, but the process is generally in the hands of the ministerial training committees. To ensure that the ministries choose wisely, KIA has had to educate the training committees on the purpose and requirements of microcomputer training. While progress has been made by KIA in this area, much more needs to be done.

#### 5. Officers versus Secretaries

Government is increasingly dependent upon secretaries for wordprocessing critical national documents and easing the administrative burdens of senior officers. At present wordprocessing is one of the most widely used microcomputer applications and it has dramatically improved government efficiency.<sup>33</sup> As illustrated by the anecdote of the KIA Principal's computer letter, wordprocessing has a significant and immediate impact in improving efficiency. Especially for overburdened senior staff who often do not delegate responsibility, the technology provides a welcome relief.<sup>34</sup> Beyond routine office administration, wordprocessing is critical to the prompt production of major national documents such as Presidential briefs, the National and District Plans, donor presentations, and budget circulars.<sup>35</sup>

Despite this growing dependence, KIA is the only government-wide facility which trains secretaries in microcomputers. KIA's mandate, though, is to provide "high

level training in public management and administration" and not to train secretaries.<sup>36</sup> While there are training programs at the Government Training Institutes of Maseno and Mombasa for lower level officers and clerks, government secretaries lost their secretarial college in 1988 to the rapidly expanding University of Nairobi. Even when the secretarial college existed, it did not have a computer training program.

From the beginning, the KIA program has addressed this training need by scheduling secretarial computer courses during term breaks. Six secretaries and one accountant were part of the first training contingent in February of 1987 and since then, more have participated in the training. The demand for secretarial computer training has been phenomenal, partly due to limited training facilities in government, partly due to its content (an in-depth wordprocessing course and an introductory course in spreadsheets), and partly because it provides certificates which are useful in securing private sector employment.

Despite fulfilling a critical government need for computer trained secretaries, such training should properly be done at another institution, preferably a government secretarial college. The secretarial courses do take resources away from the training of officers yet, due to intense demand, the Institute is unable to phase-out secretarial training. The Institute is also reluctant to

phase-out such courses for they generate enormous goodwill for the Institute. At the present stage of computerization in the government, it would be difficult to argue that training junior and middle grade officers has a greater payoff than training secretaries particularly, those attached to senior officers. For that reason, the secretarial training will most likely continue.

#### 6. Access to Microcomputers at Work

The initial findings of an extensive evaluation of the impact of KIA microcomputer training found that trainees, particularly officers, have difficulty gaining access to computers once they return to their work. Ironically, the problem of access to microcomputers by officers at the end of their training program is partly due to secretaries having better access (especially secretaries serving senior officers). KIA's requirement that trainees have access to computers when they return to their work was not adhered to in the early stages of the program. While this problem appears to be declining, it is still a serious issue.

Clearly, the impact of the program would be enhanced if every trainee was assured access to a microcomputer when they return to their ministries. One possible solution is to follow the example set by the MPND and establish a microcomputer room with several computers which increases access to users. This MPND computer laboratory has six microcomputers and three printers manned by a full-time

consultant. The lab is available to all ministry staff on a first come basis and is well-used and provides users both access to equipment and technical assistance. The alternative of placing microcomputers in specific offices causes underutilization because the technology is jealously guarded and not easily shared. Unfortunately, the bureaucratic culture and mode of operation often works against the creation of shared facilities such as wordprocessing pools and computer labs even though they avail the technology to more staff. Indeed, the MIS has had to resist strong pressures to keep the equipment in the lab. The principal argument used for protecting the lab is the need for an in-house computer training facility and a consultancy facility.

#### IMPACT OF THE TRAINING PROGRAM

At the conclusion of every course, the Head of the Research Department and the MIS Advisor of the MPND meet with the trainees to evaluate the course. These exchanges have been frank and fruitful. Many of the suggestions have been implemented, often in time for the next course. Other suggestions, (e.g. better accommodation and recreational facilities), are beyond the present resources of the Institute. For the most part, course evaluations have been very favorable about the content of the program. Trainees have found the courses to be serious, well-designed and well-taught. They also feel that the training will have an immediate and significant impact on their work.

At present there is an extensive study underway by the KIA and the MPND to determine the impact of the program on individual performance as well as on ministry operations. This study surveys not only the trainees, but also their supervisors and senior officers in their ministries. While not complete, the initial findings of the study are very positive about the role of KIA's program in providing productive computer literate staff.

Whether this program accelerates the exit of government personnel to the private sector is an important issue, although not highly sensitive. As in many other developing countries, government training programs in Kenya are viewed as serving national development whether or not the individual trainee remains in the public sector. It could be argued that government should provide computer training for the private sector since the opportunity costs of using private sector computers for training is much greater than for using government computers. Because of the small size of the Kenyan market and the high duties imposed, private sector computers cost two to three times more than the low cost duty-free equipment provided to government by donors. Virtually all of the microcomputers used by the government have been provided by donors. While accurate statistics are not available, secretaries trained in wordprocessing by the program are more likely to leave than are officers. Compared to officers, secretaries are poorly paid and have little chance of

advancement. Thus their tendency to exit to the private sector is due not only to their new skills, but also to their poor job prospects in government service. The reputation of the KIA training facility is very good and those graduating with certificates, particularly the secretaries, are finding lucrative employment in the private sector.

## FUTURE DIRECTIONS

### 1. Courses

The initial conception of the program was to train officers to use computers in the context of existing courses at KIA. KIA plans to integrate computers into two management courses (Project Development Management (PDM) and Middle Financial Management (MFM)) by mid-1990. Integration, however, is far more difficult than instruction in software packages which are relatively self-contained. It requires a computer literate instructor who is willing and able to blend computer techniques and exercises into his/her course. Integration also requires access to computers which at present are unavailable due to the heavy demand for the short courses.

In early January 1990 KIA will introduce a new course in management information systems for senior government officers to assist them in managing this burgeoning technology. This three week intensive course will teach management techniques in the morning and provide "hands on" computer experience in the afternoon. A case study using the critical import license system developed for the Ministry of Commerce will be used to

demonstrate the course topics. The officers responsible for managing that computer system will serve as resource persons for the training program as resource persons. By training senior government officers, this course will greatly facilitate the institutionalization of the government's management of microcomputer technology which up to now has been managed largely by technical assistance personnel.<sup>37</sup>

In addition to the two new initiatives described above, several modifications in the existing courses are planned. First, the core course for officers will be lengthened from six to eight weeks. The additional two weeks will be used for greater coverage of graphics, introduction of Norton Utilities, and for the trainees' projects. Including Norton Utilities in a basic computer course should go a long way in reducing the inevitable "disasters" that inexperienced computer users cause due to poor file management.

## 2. Consultancy

Finally, and much further down the road, KIA has discussed the need to provide computer consulting outreach to the government.<sup>38</sup> As the trainees return to their ministries and begin to apply computer techniques, they are likely to encounter tasks that they do not have the skills to computerize. Liaison with KIA's computer staff who do have the requisite skills could provide a rapid and low-cost means of meeting many of the ministries' evolving computer needs. Following the training with short-term consultancies would

also enhance the impact of the program by increasing the types of applications within ministries that could be managed by the trainees. As envisioned, these applications would principally entail enduser computing rather than extensive systems development, though the latter would be possible.

Because of the trainer's heavy workloads, the obvious payoff for such consultancies would be to develop enduser applications which the trainees could independently manage. At present, consultancies are not possible because the trainer's are fully committed in the classroom. However, if the program was expanded to four trainers, such outreach would become possible. This could greatly enhance the productivity of government's microcomputers and lessen dependence on high cost technical assistance.

In addition to improving the impact of the training program on operating ministries, such consultancy also strengthens the training program for it provides trainers with an understanding of the tasks ministries are involved with. Understanding the work environment their trainees return to, will assist trainers to better tailor course presentation.

### **3. Hardware**

In early 1990, the program will upgrade the IBM-compatible XT clones used for training to include math co-processors and more RAM so that they can better accommodate the demands of the advanced statistical course. The organizers also hope to double the number of XT's (from 12 to

24) and use the additional computers to equip a laboratory. This lab will complement the training program and provide KIA staff and trainees not involved in a computer course access to computers. Hardware expansion, however, will have to wait until adequate space is made available.

#### **4. Facilities**

A high priority for KIA is to build new facilities to make up for those lost to the University of Nairobi in 1988. In June of 1989, the government demarcated land for KIA and has provided funds for construction of classrooms and dormitories. Construction is quickly moving ahead--several classrooms have already been built and dormitories are expected to be ready by January of 1990. New dormitories will allow the facility to resume residential training which was halted in mid-1989 due to the lack of accommodation.

With new classrooms, the computer facility will have a training room and an adjacent laboratory as well as an office for trainers. It is envisioned that the training room and lab will each accommodate 12 computers (for a total of 24). Since there is a maximum of 24 trainees per course, this arrangement will allow each trainee full-time access to a computer during examinations and project preparation.

#### **5. Staffing**

So far, KIA has yet to provide a full-time lecturer who can counterpart with the RMRD supported trainers and take over both the management and instruction of the program. At

various times, KIA has provided capable lecturers part-time to teach in the program but this support has been ad hoc. The Directorate of Personnel Management has promised funds for KIA to secure one lecturer for the computer program. Despite this encouraging development, KIA will still be hard pressed to retain, much less recruit, a skilled individual. And as noted above, in order to expand its course offerings and provide enduser consultancy outreach, KIA will require at least four full-time staff.

#### 6. Donor support

The RMRD Project currently covers virtually all of the costs of the program. A third phase of this Project, RMRD III, has been approved and funded from June 1990 until June 1992. One of key justifications for this third phase was the need for continued support of the MPND's microcomputer initiatives (including KIA). Phase III of the RMRD Project will continue the present level of staffing, maintenance, and consumable support for the KIA program. Given the limited budget of Phase III, though, KIA will have to consider alternative funding sources for expanding the program. Given the burgeoning interest among donors in strengthening African management training institutes, funding should be forthcoming.<sup>39</sup>

#### CONCLUSION: PROSPECTS FOR INSTITUTIONALIZATION

The KIA program has existed for over two and one-half years and is now well-established. The courses have

standardized formats, are registered in the government's annual training program, and are offered on a regular basis. All of the courses are oversubscribed and the program has acquired a reputation for excellence. KIA is successfully fulfilling a critical and growing need of government. The leadership of KIA understand the significance of the program and is committed to it. The program is well-managed by Institute staff yet they also maintain a productive and collaborative relationship with the RMRD technical assistance project.

In terms of demand, commitment, and leadership, the program is institutionalized. A gap, however, is that the program is not financially self-sustaining. In the wake of the University take-over of its facilities, KIA does not have the resources to maintain the program, much less expand it. Although the program has made some progress in terms of cost sharing and recruitment of personnel, KIA will depend on donor assistance to maintain this program in the foreseeable future. However, given extensive donor involvement in computerizing the government, it makes sense that they should also support this government training facility to reinforce their investment.

Indeed, experience in the MPND suggests a rule of thumb of one computer allocated to training for every five computers in operation. Given the strong tendency for operational demands to rob computer training resources, this one to five

rule of thumb would help to guarantee resources for training. The government (through the Directorate of Personnel Management) could require that all donor projects providing microcomputers earmark a portion of their resources to KIA for training government staff involved in their projects.

One danger of donor funding is that KIA could become a hostage to multiple donor technical assistance contractors. KIA is approaching a stage where it knows where it wants the computer program to go and how to manage it. KIA needs the financial assistance of donors to achieve those goals but not the "guidance" of technical assistance contractors on what goals to pursue. To institutionalize the program, donors must be willing to "buy into" KIA's own agenda. A persistent problem with technical assistance projects providing computer technology is that computerization becomes supply driven (what the contractor wants to provide) rather than demand driven (what the government requires).<sup>40</sup>

Introduced largely by donors, government is highly dependent upon microcomputer technology and the contractors who provide it. However, if this technology is to be institutionalized, it is essential that government institutions begin to manage it. KIA's success in developing and managing the training program is impressive and an important step in this direction. Government ownership of computer training will go a long way in limiting dependence upon high cost technical assistance and ensuring that the

technology is applied to relevant and sustainable government applications.

## ENDNOTES

1. One theory of institutionalizing microcomputers in a development bureaucracy is developed by Peterson (1989).
2. Ministry of Finance (1986). In 1989 alone, the Ministry of Planning and National Development added 150 microcomputers (120 of them for the National Census) providing the Ministry with a total of 271 microcomputers. It is the most computerized ministry in the government.
3. The Food Studies Group (1987) notes that the lack of a microcomputer training facilities is a problem that confronts many countries in Eastern and Southern Africa.
4. The RMRD Project is a four year follow-up of the Rural Planning I and Rural Planning II Projects and has as one of its objectives the improvement of management information systems in the Ministry of Planning and National Development. To improve management information systems in the Ministry, the RMRD Project employs one full-time expatriate advisor and nine contract-hire Kenyan computer specialists who provide programming, training and maintenance support. This staff is attached to the Microcomputer Unit (MU) of the Management Information Section of the Ministry. In addition to this contract staff, the MIS has assigned to it six planning officers and one clerk. The contractor for the Rural Planning I and II Projects and the RMRD Project is the Harvard Institute for International Development. For a discussion of the Rural Planning I and Rural Planning II Projects see, Rural Planning Project II (1986); and for the RMRD Project see, Resource Management for Rural Development Project (1986, 1987, 1987a, 1988, 1989).
5. On the experience of computerizing provincial administration see, Ministry of Finance and Planning (1985).
6. Peterson (1986).
7. Peterson (1986a).
8. The Adu Commission in 1964 defined KIA's role as promoting effectiveness and efficiency of public service see, Republic of Kenya (1964). See also, Kenya Institute of Administration (1986), p. 5.
9. For the Wamalawa Commission see, Republic of Kenya (1978). On the history of the Institute see, Republic of Kenya (1978), pp. 7-13; and Kenya Institute of Administration (1988), pp. 1-2.

10. Kenya Institute of Administration (1986).
11. Ibid.
12. Rono (1989), p. 28.
13. World Bank (1981); World Bank (1987); and United States Agency for International Development (1984). See also, Kerrigan and Luke (1987), pp. 3-16
14. On the impact of structural adjustment in Africa see, World Bank (1989); and Humphreys and Jaeger (1989).
15. The Budget Rationalization Programme was announced in Treasury Circular No. 3 of 1986 see, Ministry of Finance (1986c). Budget Rationalization entails four components for improving budgetary allocation: allocating resources based on national priorities, improvement of planning and budgeting processes, increasing budgetary resources through user fees, and improvement of the terms of donor assistance. At the core of Budget Rationalization are the policies and processes of improving budget allocation. Ministry of Finance (1986a, 1986b).
16. Kenya Institute of Administration (1986, 1988a, 1988b).
17. Kenya Times (1989), pp. 1, 20.
18. Peterson (1986a).
19. Ibid.
20. Republic of Kenya (1978), pp. 54-56.
21. Kenya Institute of Administration (1986), pp. 15-16.
22. Personal communication with J.D. Kimura, Principal, Kenya Institute of Administration.
23. On the distinction between enduser and systems computing see, Couger (1986); and Sprague and McNurlin (1986) pp. 285-310. For a discussion on enduser computing see, Danziger and Kraemer (1986); Nolan, Norton & Co. (1988). Endusers can be usefully divided into three categories: indirect users who use computers through other people, intermediate users who specify information requirements for reports they ultimately receive, direct users who actually use terminals for their own needs. Codasyl End User Facilities Committee (1979), quoted from Danziger and Kraemer (1986), p. 249. The Government of Kenya's commitment to enduser computing is outlined in the draft "Policy on Microcomputers," see, Ministry of Planning and National Development (1987).

24. Sprague and McNurlin (1986), pp. 286-289. See also, Kettinger (1986), p. 35; and Lederer and Sethi (1986), p. 25. Enduser computing will also increase relative to systems in developing bureaucracies because of the scarcity of skilled programmers and systems analysts and the growing backlog of applications. The significance of enduser computing is underscored by a study of private sector firms in the United States which found that firms which were advanced in the use of personal computing reaped a ten-fold return on investment compared with firms that were only average in their management of the technology and achieved only a ten percent return. See, Nolan & Norton, Co. (1988), p. iv.
25. Peterson (1989).
26. Studies show that "classroom training is the most comprehensive and immediate approach to learning" how to use a personal computer, Lockwood (1988), p. 148.
27. Kenya Institute of Administration (1989). Details of computer course offerings can be acquired from the Head of the Research Department, Kenya Institute of Administration, Box 23030, Lower Kabete, Kenya.
28. See, Landry (1989); Jacobson (1988); and Sherman (1989).
29. The following are some of the projects that have been completed in the program: a programme for determining the money supply of Kenya see, Obuon (1989); a personnel information programme see, Mwangi (1989); a programme on leakage a waste water control see, Gichimu (1989); a water distribution analysis programme see, Njonjo (1989); a programme to register births and deaths in Kenya see, Jarabi (1989); and a programme on consumption functions for the Kenya economy see, Nyamiobo (1989).
30. The present charges assessed by KIA are based on the duty-free price of the computer consumables which the RMRD Project pays.
31. Financial Review (1988), p. 31.
32. Kenya Institute of Administration (1988a, 1988b).
33. The National Celebrations Secretariat was confronted with an enormous wordprocessing task due to its role in coordinating two national celebrations, the 10th Anniversary of the Nyayo Era and the 25th Anniversary of Independence. On the value of microcomputers to the National Celebrations Secretariat see, Office of the President (1989), p. 4.

34. Moris (1977) notes the tendency of senior African officials to not delegate work to subordinates.
35. On the significance of wordprocessing to developing bureaucracies see, Peterson (1989), pp. 12-25.
36. Republic of Kenya (1978), p. 70.
37. In their study of computers in complex organizations, Kraemer, King, Dunkle and Lane (1989) found that management was the key factor in determining the success of computer technology (p. xii).
38. Several studies on the improvement of African management training institutes have stressed the need to improve the link between training facilities and operating ministries through consultancy outreach. A consultancy relationship helps make a training institute's curriculum relevant to government needs and also provides a means for the training institute to have a significant impact on government performance. See, World Bank (1987); Salem (1987); Rono and Muketha (1987); and Rono and Peterson (1988). It should be noted that the Wamalwa Commission in 1978 recommended that KIA's training be more closely linked to government operations see, Republic of Kenya (1978), pp. 61-62.
39. See, World Bank (1987); and Special Action Programme in Administration and Management for Africa (SAPAM) (1989,1989a).
40. Peterson (1989), p. 58.

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