

OVPP EVALUATION REPORT
ON THE
IDRC/SPRU TRAINING PROGRAM

Social Sciences Division
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CONSULTANTS

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The views expressed in this paper are those of the authors. They do not necessarily represent the views of the IDRC.

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PREFACE

Our work on the evaluation of the IDRC/SPRU Workshop programme commenced in the week of October 14-20, 1979. Dr. Girvan arrived in Sussex on October 15 and Dr. Clarke on the following day. During that week both Girvan and Clarke held discussions with Geoffrey Oldham and Andrew Barnett of IDRC/SPRU and with the Workshop organisers, Martin Bell and Kurt Hoffman; sat in on a number of workshop sessions taking place in Research Workshop No. 4, and held discussions with several participants. Dr. Clarke also interviewed IDS personnel for information on comparative costs; he returned to Glasgow at the end of that week.

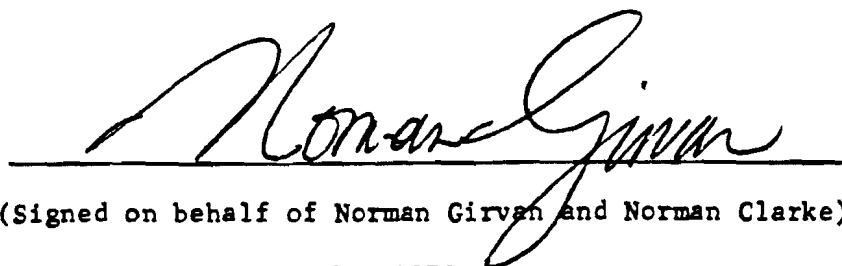
During the week of October 21-27 Dr. Girvan remained in Sussex where he continued working on a detailed analysis of the content and results of Research Workshops 1 through 4. He also held discussions with Mr. Doug Daniels who visited Sussex during that week. Over the following week - October 28 - November 3 - he visited Tanzania where he interviewed some nine leading members of the academic and Governmental community, including three former workshop participants.

Both Girvan and Clarke returned to Sussex for the fourth and final week of the basic work on the evaluation, November 4-10. (Dr. Clarke had also interviewed persons at the University of Glasgow, the Open University at Milton Keynes, and the Polytechnic of Central London for additional comparative cost data.) We were delighted to find that our approach, views and probable recommendations were so much in sympathy with each other's that we would have no difficulty in preparing a joint report to IDRC, which would in any case be more useful to the Centre. We reached agreement on the outline of this report and the broad nature of the findings and recommendations, including

preliminary drafts of some of the sections. It was decided that after doing some additional work on the material and interviewing of some of the participants in Research Workshop No. 4, Dr. Clarke would send the final drafts of his sections of the report to Dr. Girvan in Jamaica, who would in turn be responsible for putting the complete report together for despatch to the IDRC in Ottawa. This was done in the interests of time, so that the IDRC would receive the report before the Christmas holiday; and because of the wide measure of agreement reached. Both Dr. Clarke and Dr. Girvan left Sussex at the end of that week.

We wish to thank the many officials in the U.K. and Tanzanian institutions who agreed to be interviewed for the purpose of this evaluation. We also wish to express our appreciation for the friendly and open cooperation of IDRC/SPRU personnel at Sussex in assisting us in our task - Geoff Oldham, Andrew Barnet, Martin Bell, Kurt Hoffman, and Sally Marjoram. Ms. Mary Heath was especially helpful and efficient in providing administrative supports to us both and this is also gratefully acknowledged.

Finally, we wish to thank the International Development Research Centre for the opportunity to participate in the evaluation of one of their programmes - an exercise which proved not only to be very stimulating, but also in a real sense to be a learning experience for us both.

A handwritten signature in cursive script, reading "Norman Girvan", written over a horizontal line.

(Signed on behalf of Norman Girvan and Norman Clarke)

December 31, 1979

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Summary of Conclusions and Recommendations

Paragraphs

1. The Research Workshop programme was aimed at exposing approximately 50 researchers to the techniques of technology policy research over a four-year period. It was also anticipated that some policy makers would need to be included among the participants. 1 - 5, 9

2. Altogether 54 persons participated in the Workshops of whom 49 received fellowships in the formal programme, two received scholarships for 'guided study' and three participated informally. A very reasonable balance of persons by background, qualification, and regional origin was achieved. 13 - 16

3. The scope of the workshops (except for Research Workshop No. 3) was restricted to industrial technology. The treatment evolved over the course of the workshop programme with increasing emphasis in the later workshops on the long-run aspects of the process and the development of domestic technological capabilities as compared with the short-run costs of technology transfer. We agree with this changing emphasis. However we think that any future workshop programme should consider the inclusion of agricultural and agro-industrial technology for rural communities as a problem area for policy research. 17 - 19

Paragraphs

4. The organisers paid great attention to teaching methods and the pedagogical aspects of the workshop programme in what was essentially a new area. Written evaluations by participants and terminal/evaluation reports were prepared at the end of each workshop, and this resulted in many useful changes being carried out over the life of the programme. The learning experience thereby accumulated should be considered one of the major benefits of the programme. 20 - 26
5. A massive amount of literature, together with a great deal of background notes, was distributed to participants in the form of Study Modules. The amount was far in excess of the absorbtive capacity of the participants during the workshop itself. But all participants endorsed the value of receiving the study modules, and there is evidence that considerable use is made of the material upon their return. 27 - 32
6. Various options for the publication of the material in the study modules were discussed. It is recommended that the organisers/authors consider preparation of a textbook on technology policy research, using the background notes. 33 - 35

Paragraphs

7. Research Workshop No. 3 was on a specialised subject, 35 - 39
that of Technology, Energy and Rural Development. The
participants perceived it more as a means of acquiring
information than of learning how to do research.
Appropriate use may be made of this experience.
8. The reaction of the participants to the Workshop pro- 40 - 41
gramme was overwhelmingly positive. There is evidence
that participants have used their workshop experience
extensively since their return, and a number have gone
on to engage in research. On the whole we judge the
workshop programme to have been more than acceptably
successful.
9. Cost evaluation should take into account the pioneering 42 - 53
nature of the programme, and certain caveats regarding its
comparability with other similar programmes. Compared
with IDS-Sussex Study Seminars, the cost per workshop
was roughly the same for an equivalent length of time.
The cost per participant was considerably higher; this
was due to the smaller number of participants in the
Research Workshop programme, arising out of its highly
specialised nature.

Paragraphs

10. Comparison with a more conventional form of training 54 - 57
- a nine-month postgraduate diploma course in Development Policy at Glasgow University - shows the latter costing approximately $1\frac{1}{2}$ times per student for a course more than three times as long. Against this must be put the more intensive teaching mode in the Research Workshop programme. When account is also taken of the higher subsistence costs per student for a nine-month course, there is no doubt that this form of training would have involved the IDRC in considerably greater expenditures.
11. To our knowledge no diploma or degree similar to the 58
- Workshop is offered at any institution of higher learning anywhere. Sponsorship of such a programme would be very costly and probably beyond the resources of the IDRC. Should any institution decide to offer such a programme, IDRC should consider offering limited assistance to it.
12. Production of the teaching materials must be 59 - 62
- counted as a major additional output of the course. Comparison with the cost of producing similar materials at the Open University in Britain suggests that its value can be estimated at around £150,000, or about the total cost of the Workshop programme excluding scholarships.

Paragraphs

13. We therefore judge the Workshop programme to have been 63 - 70
acceptably cost-effective. But there are several
reasons for believing that the 'marginal' costs
involved in/^afuture programme would be considerably
lower.
14. Several options for the location of a future Work- 72 - 80
shop programme were considered. A series of linked
Workshops in five specified sub-regions in the
developing countries is recommended. A four-year
programme comprising up to eight Workshops for up to
100 participants could be mounted at considerably
lower marginal costs per participant.
15. The content of a future programme should be limited to 81 - 83
two themes: the original subject of industrial
technology plus the additional theme of the
problems of generating and applying appropriate
technology in a rural/agricultural context. Each
Workshop would be concerned with one of these themes,
depending on the interests of the host institution
and the sub-region which forms the catchment area.

Paragraphs

16. The teaching mode would combine field trips and exposure to real research environments with the more conventional methods of lecture presentations and library work. 84
17. Such a programme could be organised out of a small office in IDRC/Ottawa, with a Coordinator based in that office working in close collaboration with appropriate host institutions in the designated sub-regions. Success will depend largely on the abilities of the person chosen to be Coordinator, as well as careful selection of the host institutions. It would be of cardinal importance to make the fullest use of the experience gained in the IDRC/SPRU programme, as well as that of the IDRC's Science and Technology Policy Programme over the past ten years. 78, 83 - 85

I

BACKGROUND AND OBJECTIVES

1. In 1976 the IDRC approved a grant of \$564,500 to the Science Policy Research Unit (SPRU) at the University of Sussex in the UK for the training of researchers from developing countries in technology policy research. The grant was for a four-year period, from September 1976 to September 1980; \$264,500 would go to finance SPRU inputs into the training programme and \$300,000 would finance fellowships for the developing country researchers. It was anticipated that between 40 and 50 Fellows would benefit from the programme (Project Summary d.d. 9/2/76 Appendix 1).

2. Up to that time the Science and Technology Policy Programme of IDRC had benefitted mainly South American researchers. In 1973, IDRC had sponsored a technology workshop at the University of Ife in Nigeria to acquaint African researchers and policy-makers with the South American experience, and in 1975 the Associate Director of the Programme had visited several Middle Eastern countries to acquaint them with the Programme. While interest of a general kind was increasingly being expressed from Africa, the Middle East and Asia, there was a scarcity of researchers sufficiently knowledgeable and capable to submit fundable projects. The Project was conceived as a means of helping develop in these regions a research capability in technology policy.

3. SPRU was the logical choice for the location of the Project for a number of reasons. Since its inception in 1966, it had become internationally recognised as a centre of excellence in the relatively new field of the relationship between science and technology and development. The names of Professor Chris Freeman, Director, Geoff Oldham, Deputy Director, and

Charles Cooper, a Senior Fellow, are prominent among those acknowledged as international leaders in the subject area. Moreover, SPRU, in conjunction with its sister institution IDS (the Institute of Development Studies at the University of Sussex) already had experience in exposing developing country researchers to this field. Two joint SPRU/IDS seminars on science, technology and development had been held and no less than "twelve of the leaders of the twenty-two Centre-supported teams working on technology policy problems" had been among those attending (Project Summary, p. 3). The role of SPRU as a training ground for IDRC-supported projects was already established.

4. The objectives of the Project were listed as:

- i) "... to permit the Science Policy Research Unit at the University of Sussex, in collaboration with the Centre, to design, organise and conduct a programme to train developing country researchers in the area of science and technology policy studies over a period of four years.
- ii) "The training programme would introduce the participants to the existing body of knowledge and most important literature on the topic of each course and the ways of conducting research on these topics" (Project Summary p. 4).

5. The main areas to be covered were identified as (a) choice of technique, (b) technology transfer, and (c) science and technology institutions and policy-making. It was envisaged that the average course would last for four months and involve 5 - 6 participants, and that two courses a year would be held, giving rise to a total of 40 - 50 beneficiaries. IDRC/SPRU would be jointly responsible for the organisation and design of the training programme, while a full-time Senior Fellow from SPRU would act as its co-ordinator and would be responsible for the SPRU involvement in its development, organisation and administration.

Table 1: Summary of Research Workshops

<u>NAME AND DATE</u>	<u>SHORT DESCRIPTION</u>	<u>PARTICIPANTS</u>
RW1 The Absorption and Diffusion of Imported Industrial Technology April 18 - June 24 1977.	Background lectures, guided reading, individual study and group activity to familiarise participants with conceptual and methodological issues and help them develop research proposals for IDRC-funded project.	12 of whom 10 nominated by their institutions involved in IDRC 'network' project. Variety of disciplinary backgrounds, relatively junior in status and experience. 11 Asia, 1 Latin America.
RW2 The Acquisition, Absorption and Diffusion of Imported Industrial Technology. October 17 - December 17 1977.	Study modules for guided reading, background lectures, individual study and group activity to acquaint participants with research methods in technology policy and stimulate them to develop possible research approaches.	13 selected from applications invited as a result of personal contacts made by Hoffman in Africa, and Bell in Asia. 7 from Universities/Research institutes; 2 from National Science Councils; 3 from Government Ministries; 8 from Africa, 3 from Asia; 1 from Middle East
RW3 Technology, Energy and Rural Development February 20 - April 21 1978	6 weeks of presentations, guided reading and small group sessions at SPRU, followed by 3 weeks at Imperial College London for intensive examination of certain energy technologies.	12 selected from 39 applicants, all from technical and scientific backgrounds, 4 from Universities, 4 from Government/Industrial Laboratories, 2 from National Energy Commissions, 6 from Africa, 5 from Middle East, 1 from Caribbean. Relatively senior persons more involved in policy-making rather than research as such.
RW4 Strategic Approaches to the Acquisition of Foreign Technology. September 24 - November 23 1979.	30 study modules for guided reading on policy issues and concepts, research methods and statistical techniques; presentations, specialised and background lectures, individual study and group activity; to acquaint participants with research methods and issues in technology policy and specific research techniques and stimulate them to develop research approaches.	14 selected from over 50 applicants, many resulting from personal contacts of Oldham, Bell and Hoffman. 6 from Universities, 3 from Science Councils, 5 from Governments/International Agencies. 8 from Africa, 5 from Middle East, 1 from Caribbean. Relatively senior and experienced people.

II

PROGRAMME RESULTS

6. Mr. Martin Bell, Senior Fellow at SPRU, was appointed as the coordinator of the programme with Mr. Kurt Hoffman, Junior Fellow, as his main assistant. Miss Sally Marjoram was appointed as Administrative Secretary. This core staff of three remained for the entire duration of the project, thereby providing a continuity which undoubtedly contributed to the quality of the training programme and the efficiency of its administration, factors which attracted favourable comment from a large number of the participants.

7. Four Research Workshops, involving 51* participants, were held between early 1977 and late 1979. A summary is provided in Table 1. The Workshops varied in the clientele catered for and the content. The method of training also evolved as the experience of the organisers developed. It is notable that the Workshop programme was a dynamic process - the participants evaluated each Workshop by filling out a questionnaire; based on this and on their own experiences the organisers prepared an Evaluation Report. The lessons learnt and the experience gained were used in the planning and design of the next Workshop. We had full access both to the Evaluation Reports and to the participants' own evaluations, and we have drawn heavily on them in this section. This was considerably supplemented by the results of personal interviews conducted with participants in the current workshop (No. 4) as well as previous workshops. (See Appendices 4, 5, 6, 7, and 8)

*Two of the participants in RW1 were there in a special capacity, their names do not appear on the formal list of participants.

8. RW1 catered specifically for certain Asian institutions involved in an IDRC-funded 'network' project; these institutions nominated the participants themselves. Certain shortcomings in the nature of the participants and in the training method became evident in RW1. These were addressed in RW2, which catered for researchers, research administrators and policy makers applying as individuals; and in which the results were much more positive. RW3 focussed specifically on Energy and Rural Development, and the participants were all from a technical or scientific background. The results were mixed, as many of the participants were more interested in acquiring specific information than learning how to conduct research. RW4 is a further developed version of RW2, with more pre-digestion of the literature, more attention to research techniques and a fairly experienced and senior group of researchers, administrators and policy makers.

9. The fact that technology policy and technology policy research were relatively new in Africa, Asia and the Middle East, and that the training programme was among the first of its kind, affected the form and content of the Research Workshops and the way in which they evolved in at least three identifiable ways. First, from the outset it was felt that participation in the Workshops should be broadened to include policy-makers and research administrators, as well as researchers proper. The rationale for this was that a climate of interest in and support for technology policy research could be developed in these countries, which would help provide the demand for the emerging research capabilities. The experience of the IDRC Associate Director, Science and Technology Policy Programme, had shown the importance of this. The Programme Director in her evaluation of the Project Proposal had also seen the project as aimed equally at policy-makers and Government advisors as at researchers (Project Summary p. 3). The Workshop coordinator

came to share this view as well, since he felt that within the Workshop setting there could be a mutually beneficial interaction between policy-makers and researchers. The end result was that about 40% of the participants came from policy-oriented and administrative organisations.

10. To some extent, this gave rise to teaching problems associated with the multiplicity of objectives and participants' backgrounds. How far such costs compare to the benefits of interaction and cross-fertilisation and the heightening of awareness among policy makers, it is difficult to assess. However, we feel that given the circumstances existing in Africa, the Middle East and Asia at that time, and given the fact that these were short 'familiarisation' workshops rather than formal postgraduate training courses, the strategy was probably necessary. We also feel that there may be good reasons for continuing this practice in any future Workshop Programme.

11. Second, the fact that the researchers themselves were not actually involved in a specific research project (except in the case of RW1) led to a somewhat diffuse character in their response to the presentations and literature, rather than one that was focussed and specific. The organisers addressed this problem by increasing the degree of pre-digestion of the literature, making greater use of case study material, and encouraging participants to develop their research proposals. It is notable that the mere fact of having participants who are involved in a research project does not guarantee success, as RW1 demonstrated: the participants must be sufficiently experienced and self-confident to display initiative. However this raises the question of the need for "issue-oriented" rather than "open-ended" Workshops in any future programme.

12. Third, the Workshop organisers had to make a major intellectual investment in the collection, review and 'processing' of the by now vast literature on technology and development. The experience of RW1 made it evident that orientation and background lectures merely accompanying the distribution of published material would not be sufficient for researchers who are unfamiliar with the field and moreover limited in research experience. The 'study module' method was therefore developed for RW2, and proved so successful that it was considerably expanded for RW4. (It could not be used extensively for RW3 because of the highly specialist nature of the subject matter.) The study module consists of a set of background notes which combine an evaluation/review of the literature contained in the module ('Attachments'), with an increasing proportion of original material from the conference organisers. In the paragraphs below we discuss the study modules at greater length and give reasons why we think that a published version of the background notes could take its place beside the actual training of the 51 participants as a valuable and lasting output of the Workshop series, and one with a considerable multiplier effect.

Participants

13. Details on the origins, background, discipline, qualifications and occupations of the participants are provided in the five Tables in Appendix 2. In general and subject to some minor qualifications we feel that the course organisers were remarkably successful in achieving a desirable mix of trainees in relation to different characteristics. It should be noted that the discussion which follows relates to the 49 participants receiving scholarships to the four major workshops; the two receiving scholarships for 'guided study' and three others who participated informally in some of the workshops, are excluded.

14. Nearly one-half(47%) of the participants came from Africa south of the Sahara, and nearly one-third (31%) from Asia. The remainder came mainly from the Arab world (14%) and the Caribbean (6%). This pattern reflects to some extent the direction of travel of programme staff and (partly as a result of this) the origin of suitable applicants. Thus RW4 has clearly attempted to increase the participation of delegates from Africa (especially W. Africa) and the Middle East, while the earlier workshops had a relatively greater proportion from Asia (particularly S. Asia). Given the relative needs of the different regions, we feel that the regional balance is about right, though a future programme may wish to give greater attention to applicants from Southeast and East Asia and from Francophone Africa, since these regions appear to have been somewhat under-represented in the existing programme.

15. For the programme as a whole some three-quarters of participants possessed at least a Masters degree (fully one-third had Ph.Ds) and therefore had experienced what is generally recognised as fundamental research training. This proportion is acceptable as given the "re-tooling" and "orientative" nature of the programme it was desirable that the bulk of participants should be able to understand, and be skilled in, the basics of research activity, while there should be some room to accommodate participants with less qualification but good potential. There was a 60%-40% split between scientists/engineers on the one hand and arts/social scientists on the other, with engineers accounting for one-half of the first category and economic and development studies dominating the second. The pattern is partially distorted by the exclusively scientific orientation of RW3; excluding this workshop

the split was 46% - 54%. The programme directors themselves hold the view that a long-run balance of equality between the two major categories is desirable, (Revised Progress Report 1977-78) and we ourselves can find no reason to dispute this.

16. There was a roughly equal division between participants engaged in academic/research occupations and those in executive/policy-making positions (40% each), with the balance consisting of the "consultancy" category. Given our previous comments on this question this again appears to be a reasonably well balanced mix.

Content

17. We have analysed and evaluated each Research Workshop according to the overall subject structure and timetable of the course, the method of dealing with each subject, and the nature of the written material distributed to participants. The main pedagogical difficulties encountered were those arising out of the mix of participants with different backgrounds and interests, the mix of objectives, and the short duration of the courses (nine weeks) in relation to the amount of material to be dealt with. From RW1 through RW4, the main responses to these difficulties were:

- i) An increasing emphasis on the issue of the long-run development of a technological capability as compared with that of the short-run costs of technology transfer.
- ii) Tightening of the organisation of lecture presentations with greater reliance on the course organisers for the core issues, and more careful and selective use of 'outside' lecturers for background or specialist issues.

- iii) Growing degree of 'pre-digestion' of material and preparation of background notes.
- iv) Greater use of case study material as teaching devices.
- v) Increased time made available for free individual study.

These developments are elaborated below.

Subject structure and timetable

18. The Workshops restricted the subject matter to industrial technology only. The rationale for this was the necessity to restrict the scope of the course, given the limited time available, the actual and/or potential importance of industry to most developing countries, and the more general applicability of the issues relating to industry to other sectors of the economy. While this decision is understandable it raises the question of the place of agriculture and rural development technology policy in any future training. Development policies in the Third World are returning to an emphasis on agriculture and rural development as a precondition for sustained industrial development and as an antidote to excessive and premature urbanisation. The adoption of improved technologies by agricultural producers and rural communities is being recognised as a complex, many-faceted process. While technology transfer in the industrial sector involves the interaction of urban technocrats as recipients with foreign agents as suppliers, for the agricultural sector it often involves the interaction of urban technocrats as suppliers (or at least intermediaries of foreign suppliers) and peasants as recipients. If in industry the main process is bargaining, in agriculture it is (or ought to be) creative interaction. We believe that this need should be addressed in any future training programme.

Table 2: Changes in subject structure, RW1 through RW4

	RW1	RW2	RW4
i) International Technology Transfer	One-half	Reduced to one-third	Reduced to one-sixth
ii) Absorption of foreign technology	One-half	Reduced to one-third	Merged with (v) below
iii) Diffusion of foreign technology	-	One-third	Merged with (v) below
iv) Introductory background issue	-	-	One-sixth
v) Long-run consequences of technology transfer and the development of technological capability	-	-	One-third
vi) Research methods/ Statistical techniques	-	-	One-third

Note: RW3 was a special workshop on Energy and Rural Development

19. As Table 2 shows, the emphasis in RW1 on the short-run costs of the technology transfer process was reduced in favour of the long-run consequences of the transfer process, and the development of technological capabilities, in RWs 2 and 4. RW4 also incorporated, for the first time, a significant section on research methods and statistical techniques. We agree with the increase in emphasis on long-run aspects of the process and technological capability as a desirable development in technology policy research, since research on the short-run aspects has probably reached the point of diminishing returns. We are not so sure about the effectiveness of the section on research methods and statistical techniques, as the time available for this section is short and RW4 is the first Workshop at which it is being tried. Indeed, interviews with participants in RW4 suggest that this section was less than fully successful.

20. The teaching method for RW1 was based on the assumption that the participants were experienced, seasoned researchers, capable of taking advantage of opportunities provided them for interaction with senior academics and exposure to literature. Accordingly the organisers restricted themselves to providing a limited number of orientation sessions, a fairly large number of background lectures from specialists, and a large quantity of literature. Participants were asked to work together in groups, and to produce a synthesis of the main issues involved in technology transfer based on Phase I of the course; to be followed by their preparation of a set of guideline methodological notes for the 'network' research project based on Phase 2 of the course.

21. This approach met with only limited success. The researchers who were less senior and experienced than anticipated (they were selected by their institutions and not by SPRU) expected more active 'teaching' and resisted working in group form. The evaluation carried out by the organisers was especially frank on this point:

A significant number of the participants clearly expected to be "taught" not only how to do research but even what research to do. There was therefore a very wide gap between their expectations and ours. Our own perspective on the exercise was that we would try to set up a framework within which they might work to find possible relevant answers to their questions on what to do and how to do it. They expected to absorb and not really to produce, create, criticise, evaluate, etc. As a group the participants never moved across this gap. Rather we both moved into a half-way position that was often mutually frustrating.

- With our "no-teaching" approach failing to fulfil their "absorptive" expectations, the participants turned very heavily to personal reading, note-taking, article-copying, etc.
- Lacking the confidence to sit back and wait and see what might come out of the other side of a vacuum, we were drawn in to far more involvement than we had expected.

We sensed a constant tension between our efforts to prod participants into constructive, critical, creative work and their desire to be left alone to read and take notes. Given the background of the participants, our expectations were perhaps unrealistic - what were they to be critical and constructive with without a very substantial purely absorbing phase? [Descriptive Report, RW1, p. 3/.

22. In succeeding Workshops great care was taken in the soliciting and selection of applicants, with an attempt to secure the participation of more senior and experienced people showing a willingness to take initiatives. To this end Bell visited Asia and the Middle East and Hoffman visited Africa to personally interview applicants; and this evidently had a positive effect on the quality of the intake for RWs 2 and 4.

23. In addition, the Workshop organisers recognised that with such a vast amount of material to cover in the relatively limited time available, a more intensive and tighter teaching mode was required. To effect this, a number of major changes were made in succeeding Workshops (Table 3). First, the course organisers undertook a greater proportion of the lectures/presentations - by RW4, Bell and Hoffman together were responsible for just over 50% of the presentations, compared to 26% in RW1; and the presentations themselves became more structured. We regard this as an appropriate response to the circumstances.

Table 3: Timetable Analysis, RW1 and RW4

	RW1		RW4	
	No.	%	No.	%
No. of Scheduled Sessions (Morning and Afternoon)	76	100	81	100
Of which scheduled for:-				
Presentations by Workshop Organisers	13	17	19	23
Presentations by other Lecturers	20	26	18	22
Presentations/discussions by Participants	19	25	3	4
Working Group sessions	9	12	-	-
Individual study	15	20	41	51

24. Second, the use of 'outside' lecturers underwent a change. In the participants' evaluation of RW1, the complaint was made that some outside lecturers had limited relevance for the course; some were unfocussed, others were ill-prepared. The organisers subsequently took care to select lecturers who were asked to make presentations of clear relevance to the issues the Workshop was grappling with, and who would be well-prepared. By RW4, of the 50% formal presentations by persons other than the Workshop organisers themselves, one-half were from other SPRU staff, and only the remainder (one-quarter of the total) from outside SPRU. We see no problem with this in principle, since what is important are the quality and relevance of the presentations, and the balance of sources appears acceptable.

25. Third, working group activity and presentations by participants were phased out: by RW4, these occupied virtually no part of the timetable. Partly this was due to an increase in the number of formal presentations by the Workshop organisers; but the significant change was in the time available for free individual study, which was allotted approximately one-half of the time on the timetable for RW4 compared to only 20% in RW1.

26. A fourth major response to the lessons of RW1 was to undertake processing and pre-digestion of the vast amount of material being provided. This leads us to the question of the study modules, which we wish to treat in its own right.

Study Modules

27. The use of study modules first appeared in RW2, when a total of 12 were provided. Each module consists of a set of articles on extracts from books, with accompanying background notes whose length and degree of detail varies from module to module. By RW4, no less than 30 study modules are listed. Only 16 of these were available at the time of our visit to Sussex; they already include 151 attachments with a total of more than 1,000 pages; and 11 sets of background notes with a total of 525 pages.

28. In order to carry out an evaluation of the study modules, each set of background notes was examined to determine the subject matter and the amount of space allotted to each theme. Scanning combined with random reading in parts was also done. The lists of attachments were noted, and the attachments themselves were thumbed through to get a feel of the amount and nature of the material. Table 4 gives basic information on the name of each module and the length of the accompanying notes and number of attachments.

Table 4: Study Modules in RW4

<u>Number and Name</u>	<u>Background Notes No. of pages</u>	<u>Attachments: ¹ No.</u>
1. Overview: Workshop Purposes Content & Process	64*	4
2. Technology Policy & Policy Research	7	11
3. Research Method I. Introduction to Basic Issues	23*	6
3A. Concepts and Terms: Science, Technology and Technique	13	11
4. Perspectives on the International Economy	-	11
5. Industrialisation Policy & Technology Policy	-	4
6. Aspects of the Transfer Process: Mechanisms	176*	13
7. Aspects of the Transfer Process: Packaging & Other Issues	77*	16
8. Technology Strategy: Basic Ideas & Problems	-	6
9. Short-run Costs of the Transfer Process	100*	15
9A. Choice of Technique	37*	14
10. Transfer Pricing: Methods of Assessment	-	-
11. Long Run Problems of Technology Transfer: Introduction	6	3
12. Industrialisation & Technology Policy Problem in Algeria	30	-
13. Technological Capability & the Levels & Trends of Enterprise Performance	8*	25
14. Technological Capability & the Structure of Costs	-	4
15. Technological Capability & the Structure of Local Production	-	8

<u>Number and Name</u>	<u>Background Notes No. of pages</u>	<u>Attachments:¹ No.</u>
16. Technological Capability & Exports, Ownership & the Perpetuation of Dependence	14	9
17. Technological Development in the Arab World	-	-
18. Technological Capability: Its Characteristics & Modes of Accumulation	n.a. ²	n.a. ²
19. Technological Capability: Processes of Accumulation: Training & Learning Process		
20. Critical Dimension of the Transfer Process		
21. Raphie Kaplinsky		
22. Synthesis: Steps Towards Strategy & Problems of Analysis		
23. Multi-Variate Analysis: Introduction to Methods (I) & Examples (I)		
24. Multi-Variate Analysis: Introduction to Methods (II) & Examples (II)		
25. Non-Economic Measures of Technical Change		
26. Measurement of Economic Performance at the Enterprise Level		
27. Production Functions & the Analysis of Economic Performance		
28. Issues in the Design of Case Study Research		
29. The Analysis of "Learning"		
30. Problems in the Design & Use of Questionnaire-Based Surveys		

Note: * Contains substantial original material

1. An "Attachment" normally consists of copy of a journal article or a section of a book
2. Study Modules 19-30 were not available at the time of our visit to Sussex.

29. While the time available did not allow a detailed content analysis of the vast amount of material, our examination led to some fairly definite conclusions about their probable usefulness in the past and their possible value in the future. First, the 'background notes' which started out as introductions to the issues and guided reading to the attachments, have developed to become substantial documents in their own right. As time went on, the content of the authors'/organisers' own original and innovative material increased. Of the 11 sets of background notes available, our examination concluded that seven of them, with a total of 485 pages, are documents with a fairly substantial original content, together with notes and comments for guided reading. The remaining four sets with 40 pages consist mainly of notes and comments only. The original material consists mainly of detailed systematisation and elaboration of the forms, processes, mechanisms and other aspects of technology transfer, their relationship to the costs of transfer, their relationship to the development of local capabilities, and the implications of all this for research. We believe that much of this material is sufficiently useful and interesting to warrant publication for a wider audience, and we take up below the issue of the form such publication might take.

30. The number of attachments in each module varies from as few as two to as many as 25, the average for the first 17 modules was nine attachments. Each attachment is normally a substantial document: a journal article, or a section of a book. The result is that the total material provided amounts to a small reference library on the subject of technology and development, technology policy and technology policy research. Examination of the attachments suggests that a tremendous amount of bibliographical research and background reading must have gone into their identification and selection.

31. There is no doubt that preparation and distribution of these study modules is one of the most solid and tangible achievements of the Workshop series. Participants in their evaluation reserved their most positive and enthusiastic comments for the vast amount of material provided as well as the large amount of work which had obviously gone into their preparation. The main drawback of course is that the issues covered and the material distributed may be far in excess of what participants can absorb in the time available. Some participants were frank enough to state that while thankful for the material provided they were certainly unable to deal with more than a fraction of it during the period of the Workshop itself. As one participant wrote: "I must confess, I will be the first to admit that I learnt more from the Workshop after the Workshop than during." (Letter Mlaw-Girvan, Appendix 7) This is probably not atypical. Moreover, although the time made available for free individual study was increased from one Workshop to the next, the amount of material provided also increased, and our contact with participants in RW4 suggests that only a small fraction of the material is actually read or consulted during the Workshop. (See for example Appendix 4).

32. This is not to suggest that the material should not have been provided, since participants unanimously declared that they found it valuable and intended to make use of it on their return. In the case of the participant quoted above, he has developed a Ph.D thesis research project out of his Workshop experience (Appendix 7); another participant in RW2 used the material to form a small library in the National Council for Science and Technology of Kenya, which is frequently used (Appendix 5). However, it raises the question of whether there are other modes which can result in

greater digestion and 'learning' from the material by the participants while they are actually at the Workshop and have the opportunity to interact with each other and with lecturers.

33. This question can best be addressed within the context of the form the Workshop/training programme might take in the future. As this is the subject of Section IV of our report, we will confine our comments here to the issue of publication of the module materials. Several approaches to publication were discussed between ourselves and in a general and informal way with Geoff Oldham, Andrew Barnett and Doug Daniels as well as with the Workshop organisers/authors themselves. The approaches include:

- i) A collection of readings in technology policy research with background notes.
- ii) An annotated bibliography on technology policy research.
- iii) A book with the authors' own material on technology policy research

34. The first approach seems unsuitable since the material for which the authors have prepared guideline notes is so vast that it could not, even with the most stringent selectivity, hold in a single collection of readings. Moreover, since the majority of this material has already been published, one has to consider whether the cost of republishing is necessary merely in order to give the background notes a point of reference. The second approach is a possibility, but it has the drawback that it does not do justice to the original material that the authors have themselves developed.

35. We feel therefore that it might be profitable to explore some version of the third approach. What we have in mind is the preparation of a basic textbook on technology policy research, aimed primarily at researchers in developing countries who are about to enter this field, with a sufficiently wide appeal to be of interest to policy-makers as well. This text would combine the best and most relevant of the authors' own material with ample reference to the literature, and supported by a full (but not necessarily an annotated) bibliography. This could be backed up by a retrieval and copying service for the material which could be located at SPRU, or at the IDRC, or both. It is recognised that any form of publication of the material will require considerable additional work by the authors: in the case of the one we are suggesting it would be necessary to go through the 'background notes' with a fine-toothcomb in one hand and Occam's razor in the other, the objective of producing a compact and coherent work.

Research Workshop 3

35. Special mention needs to be made of this Workshop, which was on the subject Technology, Energy and Rural Development. Its main concerns were -

- i) policy and decision problems;
- ii) policy making and decision making processes; and
- iii) research related to (i) in the context of (ii), which may be necessary in the area of Technology, Energy and Rural Development.

36. The subject matter was therefore more focussed than that of the other Workshops; other differences were in the nature of the participants and in the teaching mode. All of the 12 participants were from a natural sciences or engineering background, many were involved in senior decision-making positions in the energy sector of their countries, or in technical research on energy questions. The majority of the Workshop was, in effect, subcontracted out to scientists at SPRU and at the Imperial College London who are specialists in the areas covered. An assessment of this experience is important not only for the evaluation of the project, but also for the lessons it might suggest for the feasibility of future Workshops on specific sectoral issues of technology policy.

37. Two main problems were experienced with this Workshop. First the teaching mode proved less satisfactory in the sense that the use of lecturers with no previous experience in the Workshop programme was not always successful. For example, the 'schoolmasterly' attitude of one of the main lecturers was resented by participants. Some of the other lecturers appeared ill-prepared or unwilling to adjust the level of their presentations to that of the participants; and a few of them cancelled out of their presentations at short notice. This underscores the importance, evident from RW1, of exercising great care and selectivity in the use of outside 'expert' lecturers.

38. The second problem experienced was the almost total lack of interest in policy research on the part of the participants. It appears that they devoured greedily all the technical information made available in documentary form and from scientists at SPRU and Imperial College, and highly commended those aspects of the Workshop (in their evaluation, all 12 stated that attendance at the Workshop had been worth their while and that they would

recommend others from their country to attend future Workshops of its kind). However, they resisted suggestions that they should prepare written proposals or outlines on the directions of possible future research. The main reason appears to have been that the majority of the participants were involved either in the execution of policy or the conduct of technical research on energy technologies, rather than policy research itself. Thus "... with a few exceptions, the interests and institutional responsibilities of participants were such that they considered it inappropriate to take such steps towards the formulation of specific research work." (Terminal Report Research Workshop No. 3, page 14).

39. The lesson appears to be that careful personal briefing of applicants in advance and personal selection of participants is necessary if the 'right' type of person is to be selected. It is quite common for researchers in developing countries to confuse technology policy research with research on specific technologies (e.g. to confuse energy technology policy with biomass energy technology). Personal interviews with applicants had not been possible for RW3 (as in the case of RW1) - and it is notable that in the other two Workshops where personal interviewing was carried out, the results were markedly superior.

Effectiveness for Participants

40. As mentioned before a participant's evaluation was conducted at the end of each Workshop, and the comments and criticisms of the participants were used in improving the content and format of subsequent Workshops. Based on our perusal of the responses to the questionnaires, the participants gave

their opinions freely and frankly, and we have referred to these from time to time in this Section. In spite of criticisms on certain specific aspects of the Workshops and in some matters of detail, participants overwhelmingly indicated that they found the Workshops useful, valuable and well worth their time, and that they would make use of their experience upon their return.

41. There are no systematic records of what has been happening to participants since their attendance at the Workshops. However the results of personal interviews and contacts with participants in the Workshops are suggestive.

- RW1: The IDRC 'network project' proceeded as planned some of the studies, e.g. India, Bangladesh, Nepal, were of a high standard.
- RW2:
 - i) Miss Irene Kamau of Kenya, used her Workshop experience as a major input into the drafting of the Kenya national paper for UNCSTD. Her supervisors speak highly of her work and she has been promoted since her return. She has put the Workshop documents on deposit in her organisation, the Kenya National Science Council, where they are widely used (Appendix 5).
 - ii) Mr. Hassan Mlawa of Tanzania has used the Workshop material to develop a research project on the acquisition of industrial technology in the textiles industry of Tanzania (See Appendix 3). He is now actively involved in field research for this project. His director speaks highly of his work and intends to start a research programme in technology policy as soon as Mlawa is finished (Appendix 6 and 7).
 - iii) Mr. Paschol Mihyo of Tanzania, the Faculty of Law at the University, has been less fortunate in that he has been assigned to law teaching in fields totally unrelated to technology since his return. He claims a lack of institutional commitment providing a basis for him to engage in research (Appendix 6).
 - iv) Mr. Muthara Jabbar from Iraq has since his return shifted from the Ministry of Industry to head a small science and technology policy unit in the Ministry of Planning. He ascribes his successful efforts to have such a unit established to the knowledge and experience gained at the Workshop (Appendix 8).

- RW3: i) Mr. Simon Nkonoki of Tanzania, the IDS/University of Dar es Salaam has since his return (a) been appointed Chairman of the Energy Committee of the National Science Research Council, (b) won a Rockefeller award for research on energy from a number of international applicants, (c) won a SAREC travel fellowship to observe applications of solar technology in five African countries, (d) will attend a UNITAR seminar on Energy to be held in Montreal November 26 - December 7 1979 (Appendix 6).

 ii) Dr. Ghebru of Ethiopia has used the Workshop material extensively in his capacity as Executive Secretary of the Ethiopian Energy Committee which is drawing up a national energy plan for Ethiopia (Appendix 5).

 iii) Mr. Guhuki Muchiri of Kenya, of the Department of Agricultural Engineering, University of Nairobi, has used the Workshop material extensively in his work on Government committees concerned with planning and energy. He has been extensively involved in policy making by the Kenya National Council on Science and Technology (Appendix 5).
- RW4: Most of the participants interviewed stated that they find the Workshop experience and material very useful and will make great use of it in their research and policy making activities on their return.

III

PROGRAMME COSTS

42. Our terms of reference required us to assess the financial viability and effectiveness of the Workshop Programme. We have not taken this to mean a detailed accounting analysis of the various inputs into the Programme and the rationality of their deployment since given the quality of the data and the limited time available this would not have been meaningful. Rather, we have interpreted our brief to mean the provision to the IDRC of a basis for deciding whether or not future programmes of this kind can be viable, and if they can, to establish a set of guidelines on how best such programmes might be undertaken (with respect to location, timing, staffing, manner and type of training, etc.) at a cost which it is within the capacity of the IDRC to meet.

43. Of course, it is legitimate for the IDRC to wish to ascertain whether or not past expenditures have been "worthwhile" at a broad level. We have attempted to test this proposition roughly by enquiring how similar training programmes perform from a pure cost point of view. However, we would like to stress that in many respects the Science and Technology Policy Workshop Programme is the first of its kind. As such it has been a pioneering venture, so that the comparisons which we made can only give a very rough approximation to its real net benefit and hence must be interpreted with great care.

THE ANALYSIS AND ITS RELIABILITY

44. In our evaluation, we have compared the Workshop Programme first with a similar type of programme run on the basis of short intensive study periods for overseas delegate (the IDS Study Seminars) and secondly with a longer nine month "diploma" training offered as a typical specialised university-based course (the Department of International Economic Studies at Glasgow University, UK) (Appendix 3, Table 1). Finally, since one of the major 'outputs' of the programme (at least potentially) has been the development of a considerable volume of specialised teaching material we have tried to estimate very roughly (from Open University data) the order of resource costs required typically to develop specialist material of this kind (Appendix 3 Table 2). The first comparison provides a rough picture of how the Workshop Programme compares with a similar type of programme. The second comparison throws light on the potential for using the University system in a more conventional way to achieve similar ends (a possibility mentioned to us as being worth considering). The third comparison enables a fuller picture to be drawn of the true costs and benefits of the operation.

45. We had intended originally to make rough comparisons with training programmes in a developing country and in Canada, but unfortunately there was not enough time available to do this.

46. A number of further points should be made about our analysis and about the data used for it. First we have not accounted for certain costs of a "fixed" overhead nature (e.g. the availability of library facilities). The main reasons for adopting this approach are the difficulties involved in

making estimates which are at all accurate and the fact that normally such facilities are common to all institutions of higher education. Of course it is true that the quality of such inputs varies and the IDRC might care to bear in mind that access to the very specialised and diversified range of relevant facilities at the University of Sussex may not be feasible at other institutions. In practice, however, there are always "trade-offs" involved. One important trade-off which we discuss below is that between the resource advantages which location at a DC institution possesses on the one hand, and on the other hand the environmental and other cost advantages involved in locating workshops in appropriate LDC institutions. Second, we have not accounted directly for the "scholarship" component of comparative costs since presumably the IDRC would continue to provide scholarships wherever and in whatever form future Workshops were held. Again, presumably the IDRC would take any items of cost differential falling under this head into account when making its future plans and we have some points to make about this below when discussing future options. Finally, we should like to reiterate that the data used are inevitably "rough and ready" in terms of what they refer to and relative orders of magnitude. Where relevant we draw attention to data limitations but given the broad type of analysis to be undertaken we do not consider deficiencies in data quality to be a serious limitation. However, there is another important sense in which caution is advised in the interpretation of our analysis. As already mentioned we have had some difficulty acquiring meaningful data on "value to the user" and hence our view as to the "effectiveness" side has been determined very much by our own subjective opinions on the programme regarding its intrinsic merit and management. The IDRC should bear this limitation in mind.

STUDY SEMINARS AT THE IDS (INSTITUTE OF DEVELOPMENT STUDIES, UNIVERSITY OF SUSSEX)

47. In 1962, the Bridges Committee on Training in Public Administration for Overseas Countries recommended the establishment of a "special institution in Britain for top level training in administration (including development training) combined with research". The IDS, which became this institution, was required as one of its main functions "to organise courses of advanced study on the problems of overseas development... for senior administrators from overseas countries". The study seminar, which has become the main mechanism for fulfilling this mandate, provides short periods (4 - 6 weeks) of "intensive and highly selective study for groups of 20 - 25 people usually from 15 - 20 countries". The seminars are intended to provide/develop greater knowledge/insights into a wide range of development issues for which the IDS claims a certain expertise, but there is no specific intention to provide "research training" as such.

48. The IDS very kindly provided data for this 1978/79 budget year within which 43 weeks of guided study were scheduled. Since only 24 of these 43 weeks concerned five study seminars to be held within the UK at Sussex, we have scaled down the figures for recurrent expenditure accordingly (see Table and explanatory notes). Very roughly these data show a variable cost per study seminar of somewhat less than £5,000 and, since participation rates averaged 20 delegates per study seminar, a recurrent cost per delegate of around £250 is reached.

49. The above costings do not include the input of staff time which has been estimated in the following way: each study seminar is directed normally by two Senior Fellows who are responsible for organising and secretarial staff. We interviewed a number of Fellows and the responsible administrative officer. The overall view appeared to be that Fellows spend roughly as much time again in preparation for seminars as they do in actually running them (i.e. say 20% of their annual time in all those years when they perform this function). Administrative and secretarial input appears to amount to roughly 22 man/woman administrative weeks per study seminar (2 secretary weeks = 1 administrative week). Assuming a current senior academic salary of around £10,00 p.a. and an administrative salary of around £7,000 p.a., we arrived at a rough staff input of £7,000 per study seminar or £350 per delegate. Hence the total variable costs, ignoring overheads, works out at around £12,000 per study seminar or £600 per delegate.

50. How do these data compare with the SPRU/IDRC costing data? The (revised) Progress Report of March 1979 of the Workshop directors to the IDRC provides average estimated data for the four Workshops and one guided study programme over the period 1977-1980. The Workshops appear to have lasted from 9 - 10 weeks, around twice the length of the study seminars. The 'university' cost per Workshop comes out at approximately £26,000 and if we halve this figure to make it comparable to the study seminar data we arrive at a figure of £13,000 per workshop and £1,100 per participant for a comparable length of time.

51. Very roughly, then, our general costings analysis shows that the order of "in house" expense is comparable in the two cases. Although per seminar/workshop the SPRU/IDRC cost is higher than that of the IDS, when estimated for a comparable length of time the IDS cost becomes almost the same. The higher SPRU/IDRC costs per participant are due to the larger number of participants typically taking part in the IDS study seminars. Hence from the available information it would appear that the IDRC have incurred an expenditure in the past which is reasonable when compared with the IDS experience.

52. Nevertheless, there are important features of non-comparability. Besides differences in timing, numbers of participants etc., the IDS Study Seminars are much more broad-ranging covering most issues in development studies, whereas the Workshops have concentrated on a narrow area with a specific end in view (the stimulation of a more balanced world spread of research proposals). Besides the element of non-comparability as such, the specific nature and originality of the Workshop programme has meant undoubtedly that there has been an important element of "learning" on the part of the Workshop organisers with implications for future "marginal costs" which we discuss below.

53. With respect to the interpretation of the 'ex post' data, the IDS undoubtedly benefits from its size and experience and access to a wide range of facilities. Thus for example, one important 'economy of scale' concerns the advantage it possesses in participant identification. Large numbers of IDS Fellows travel regularly to all corners of the globe and close personal contacts have been built up with a variety of institutions in most developing countries. Apparently also assistance is received from British Council offices.

Although SPRU has had some contact of this kind, it is not nearly so extensive. Nor has the Workshop Programme been in operation long enough to generate the sorts of detailed knowhow available to the IDS (which has now held over 60 study seminars) on how to mount and organise training programmes of this kind. Both programme directors insisted during our interviews with them that they regarded participant identification as a very important aspect of their work (since their target group has been a precisely defined set of people and since they wished to avoid fellow-travellers) and have spent a considerable amount of time making contacts and vetting applicants. These are in a sense fixed costs and under this heading above, therefore, costs per participant must have been significantly higher than those for IDS.

LONGER PERIODS OF TRAINING

54. We were requested by the IDRC to examine the merits of more standard forms of training available at institutions of higher education from the viewpoint of attaining the objectives of the Workshop Programme. We interpreted this to mean the consideration of the somewhat more "longhaul" approach to technical training embodied in the specialist postgraduate course run over a full academic year at a typical British university.

55. The Department of International Economic Studies at the University of Glasgow was established in 1963 specifically to offer post-experience training programmes in economic policy administration for officials employed in various types of development planning offices in government institutions of developing countries. Although its orientation has changed somewhat over the last 15 years

or so (to include students who have just completed a first degree) it is still a good example of this type of technical training. We were able through the kind co-operation of the Glasgow University administration, to elicit data on recurrent costs per student over the typical 9-month period for the "Diploma in Development Policy". These work out at around £3,500 per student for the academic year 1978/79 - i.e. rather more than $1\frac{1}{2}$ times the Workshop figure and for a period rather more than 3 times as long (including vacation periods where the students are expected to prepare written work).

56. It is instructive to compare intensity of teaching in terms of "class contact hours" in the two cases. For the 9-month Diploma these average at around 7 hours per week if we omit the examination period in June. The average for the Workshops, we are informed, is around 14 hours per week - i.e. around twice as great. Admittedly the form of training is somewhat different since the Diploma students are required to do much more in terms of reading, essay writing, preparation of seminar papers etc., whereas the Workshop participants are involved much more in intensive classroom-based training.

57. Nevertheless, the evidence would appear to suggest that insofar as a comparison is possible the "real cost" inputs to the Workshop programme are again of the sort of order that one would expect, and that were the IDRC to consider funding training of the more standard type (even if it did not have to meet the full "economic cost"), it would probably become involved in rather greater expenditures per trainee on training account alone. Of course, it need hardly be pointed out that the much higher level of necessary scholarship costs to meet subsistence needs would place a much heavier burden on IDRC resources.

58. In fact we are not aware of any university or technical college which at the present time provides a training programme similar to that of the Workshops under consideration, but over a longer period. Most 9-month diplomas/degrees appear to concentrate upon a wider range of policy problems and for the student who does not have the same degree of research background. This is not to say, however, that a longer term diploma course could not be a useful form of training. Indeed we have come to the conclusion that the amount of teaching material produced over the course of the Workshop programme could very well provide the basis for a future specialist diploma degree of this kind. It should perhaps be emphasised that there are very few institutions which possess the necessary range and depth of skills required to mount such a programme (the University of Sussex would be one such institution). Moreover, it would probably be beyond the resources of the IDRC to sponsor it. However, we should like to go on record as stating that the notion of a 9-month specialist diploma is a good one that were any institute of higher education to consider setting one up, the IDRC might consider providing some limited assistance (e.g. the provision of some scholarships).

THE COSTS OF PRODUCING TEACHING MATERIALS

59. It is clear that one of the major problems facing the Workshop organisers has been the lack of suitable teaching materials which are necessary for the sort of concentrated in-depth study necessary. This has been due partly to the 'newness' of the area but probably a more important factor has been the need to organise a wide variety of material from disparate sources and to put it together in a logical and coherent form to fulfil the required educational objectives. We have discussed above the pedagogic merits of this

material but it is important to point out that it represents, at least potentially, a substantial spin-off benefit from the programme as a whole and would represent a key input in any future programme of a similar kind.

60. In order to obtain a picture of the comparative value of this benefit, we approached the "Open University" which awards degrees on the basis of a set of linked correspondence courses supplemented by radio and television programmes and (very limited) direct contact with tutors. The correspondence courses, however, represent by far the most important educational medium and most of the "lecturers'" time is spent on organising and preparing written teaching materials. Although again we recognised the likely element of non-comparability, we felt that some notion of the costs of module preparation would provide a useful reference point.

61. A half credit, small population, 2nd level course in the social science faculty of the Open University comprises 16 'units' of work for 150 - 200 students at a work intensity of up to 16 hours per week. Each 'unit' may contain around 25 pages of material covering the content of that week's work plus pedagogical notes and an annotated bibliography. As such it is broadly similar in quantity and type to the material produced over the course of this Workshop programme. Detailed discussion on Open University costings are provided in the Appendix and it may be seen that abstracting from publication, broadcasting and quality control the 1976 'academic' cost for an average 'full credit' course in the social sciences comes out at around £200,000. Normalising this figure to allow for $\frac{1}{2}$ credit status and inflation brings us to a final 1978/79 figure of around £150,000 and since we are informed that costs per course are largely independent of student population and academic level,

that figure provides at least an approximation to the opportunity costs of producing Workshop programme material. It is perhaps interesting also to note that direct manpower inputs (academic and administrative/secretarial) for the OU programme work out at around 8 man-years for the $\frac{1}{2}$ credit course which is somewhat less than the total Workshop input projected over the four years of its life.

62. We should finally like to stress, however, that this comparison is very rough and is intended only to provide a reference point for the overall evaluation. The point is that had the programme set out initially to develop only appropriate teaching material it would probably have been involved in expenses which are roughly of the order of the total likely costs of the programme taken as a whole. Clearly on this ground alone it would make sense to ensure that the materials under consideration are published in a form suitable for on-going use.

SOME GUIDELINES FOR THE FUTURE

63. Up to this point we have discussed the 'past costs' of the programme and have attempted to place these within a loose comparative perspective. Our main conclusion has been that of abstracting from 'scholarship costs' the training costs of the programme, while high, are not far out of line with what the experience of other forms of technical training would lead us to expect even if no account is taken of the preparation of specialist teaching materials. However, it has become clear in the course of our evaluation that the 'marginal costs' for future programmes of this nature might be substantially lower than those which have been incurred in the past.

64. Our main reason for this suggestion lies in the nature of the programme's initial organisation and its novel character, both of which appear to have led to quite substantial initial costs, which are effectively non-recurrent. As far as we can see, the programme has not been allowed to run its full course whereby many of these 'fixed costs' could have been spread over a larger number of participants. Nor are they likely to be incurred again to anything like the same extent.

65. More specifically, five factors may have a substantial influence:

- i) A considerable amount of time has been spent on administering the programme, probably more than was expected initially. This function may be classified under the following needs:
 - a) Identification of participants (including staff, travel, etc.);
 - b) Organising participants' travel to UK;
 - c) Administering accommodation (e.g. the 'house')
 - d) Preparation of (very detailed) progress reports and accounts for the IDRC;
 - e) Organising the Workshop itself (including securing guest speakers, local visits, library access, timetabling, etc.
- ii) Preparation of teaching materials, which has become quite a considerable volume of 'paper' - probably around 30 modules' for the technology transfer Workshops alone depending upon how much time is devoted to their completion before the end of the programme.
- iii) "Learning" about the "modus operandi" of workshops of this kind.
- iv) The relatively small number of workshops actually held.
- v) Future savings in scholarship costs.

66. Under many of these headings, it is likely that future 'costs' would be lower. On the administrative side, under (i)(a) the personal and institutional contacts already made should provide a springboard for much easier identification in the future. Under (i)(d) we are of the view that the amount of detail presented in the progress report should not be required for future programmes. To some extent the detail is understandable because of the geographical distance between Ottawa and Sussex, and because of the experimental nature of the project. Clearly the organisers wished to keep the IDRC very fully informed on developments, problems, future options and so on. Nevertheless we believe that the IDRC headquarters would wish in future for rather more succinct progress reports. On the 'accounting' side the knowledge acquired on how to formulate and present the accounts would presumably make this aspect of administration much more standard. A similar argument holds for the administrative tasks listed under (i)(e).

67. Under factor (ii) future costs would depend very much upon how much time is made available for processing the teaching materials between now and the completion of the programme. If this is given high priority, and we recommend strongly that it should be, then for any future programme the material may be used with a little updating, thereby reducing considerably future costs.

68. Under factor (iii) there has been clearly a lot of expertise gleaned by the programme organisers. Some of the likely cost savings relating to this 'learning' factor have been outlined already under (i) above. However, it has become evident from our interviews with the programme directors and from the progress reports that quite a considerable amount of time was spent on developing

an optimal pedagogy (i.e. methods of teaching, coverage and range of topics etc.) which (arguably) would not be required in the future to the same extent. We have discussed already, for example, the problems which arose from the 'deviation' to the 'energy' field. Although the directors were probably correct in attempting to diversify the programme into fields other than those connected with the transfer of technology, it is likely that this may have diverted resources from what might with hindsight be regarded as the most appropriate focus on the programme. However, there is another aspect of this factor which we should like to stress since it would have important cost implications for the future. That is that the organisers have developed substantial expertise over the lifetime of this programme. It is our view that in the event of similar future programmes being mounted, the IDRC should capitalise upon this knowledge by consulting the organisers in some detail about all aspects of Workshop management and content. It is likely that considerable savings are possible on this account.

69. We felt it necessary to include factor (iv) since it is clear that had there been more Workshops scheduled (as was initially the aim) the marginal costs for these additional Workshops would have been much lower. Indeed the holding of (say) an additional 3 Workshops accommodating (say) 30 - 36 participants would have increased the "throughput" of participants by upwards of 50% and might very well have reduced the 'training' costs per participant to something of the order of £1500, a figure which begins to look very reasonable indeed at current prices. The Workshop directors are probably right to suggest (see supplement to Progress Report 1977-78, SPRU, June 1979 p. 29) that by the time the processing of teaching materials had become a

recognised objective of the programme it conflicted with the objective of holding more Workshops in terms of the limited resources available, and that had the former objective been recognised earlier then both objectives could have been met, at least to some extent. However, we feel that it would not be correct to lay blame for this state of affairs at anyone's door, since it is not apparent to us that the possibility of a joint product was all that obvious at the time of the programme's inception. In fact the lessons to be learned are first that in this sort of project the preparation of specialist teaching materials may very well be necessary and second that sufficient time ought to be provided to allow programmes to be run at minimum average cost. However, in the case certainly of future technology transfer Workshops it is likely that for the reasons outlined the appropriate time period could be much shorter the next time around.

70. We have not been able to analyse costs under head (v) at all closely, but we feel it important to point out that savings are possible also here where future Workshops are to be held in LDC institutions. This is a factor which the IDRC might care to bear in mind when considering future options.

IV

RECOMMENDATIONS FOR THE FUTURE

71. Based upon our evaluative analysis in the preceding sections of this report, we now feel able to suggest certain guidelines on the direction which could be taken usefully by any future programme of this kind. We have split this final discussion into two broad sections: (1) a discussion of location and (2) a discussion of programme content and related questions.

Location

72. In practice it is difficult to separate questions of location from those of programme content. In particular it is our feeling that the more diversified any new programme becomes with respect to current experience the stronger become the arguments for location in a developed country. Leaving this aspect aside for the present, we have considered four possibilities:

- A) Maintaining a programme at Sussex University
- B) Transferring the existing programme to another DC institution (probably Canadian)
- C) Transferring the existing programme to an LDC institution
- D) Developing a series of linked Workshops held at a range of LDC institutions with co-ordination and back-up facilities provided by a DC institution.

73. Options A) and B) concern location in a developed country. The obvious advantage of option A) is the complement of relevant diversified skills and related resources which this university possesses. In our view there is no doubt that, given the specialised nature of the Workshops Programme, the IDRC made the correct choice in siting it at an institution which had access to a 'critical minimum size' of such facilities. On the other hand, now that this 'innovative phase' is coming to an end, with all its associated tangible and intangible benefits, the necessity for location at such an institution for any future Workshops is not nearly so pressing, unless of course radical changes in content are envisaged.

74. The main argument in favour of option B) is that since the IDRC is a Canadian agency, it would seem reasonable for any future Workshop Programme also to be located in a corresponding Canadian institution. However, since it is clear that the basic reason for programme location in any DC lies in terms of access to specialised resources, and since to our knowledge there is no institution in Canada which combines the necessary range of 'science policy' and 'development studies' resources, we should prefer that this option be rejected in favour of an LDC solution.

75. In fact we should like to recommend that a future Workshop Programme be located in the developing countries, for four broad reasons. First, such a procedure would enable programme organisers to call upon a large number of host country senior personnel from the government (including ministers) and from the productive sector, who could provide participants with a more direct feel for "bread and butter" policy and practical problems. A number of

participants from RW4 made the point that they would have liked to have had more direct interchange of this kind, mentioning how much in this connection they had enjoyed the lecture given by Dr. Djeflat, Director of the Institut des Sciences Economiques at the University of Oran, Algeria.

76. Secondly, our LDC location would give participants the opportunity to undertake small project work in the field as an integral part of a Workshop Programme (e.g. doing brief sectoral studies to identify techno-economic constraints on output). Either of these two factors would serve in our view to enrich the more conceptual discussion of the classroom. Thirdly, an LDC location may be more politically acceptable in some general sense - this feeling came through strongly in our interviews in Tanzania. Certainly it would be more in keeping with what we understand to be the philosophy of the IDRC. Fourthly, there may be distinct cost advantages to some form of LDC location, as we outlined below.

77. We reject the possibility of option C), mainly because we see no reason why one location should be chosen rather than any other. There may indeed arise political difficulties and other aspects of general sensitivity if one particular LDC location is selected. In addition, we understand that "south-south" air travel is rather expensive, which would add significantly to programme costs. Accordingly we feel that pursuing option D) in some form would best meet the objectives and spirit of any future programme at minimum cost to the IDRC.

78. How such a programme would function would depend, of course, very much upon the IDRC, but the following might serve as a useful set of suggestions:

- i) The programme would cover a number of sub-regions, for each of which a central institution would be designated (e.g. the IDS, Dar es Salaam for East Africa, the University of Ife for Anglophone West Africa, etc.).
- ii) Five sub-regions appear to us to need coverage in this way. These are East Africa, Anglophone West Africa, Francophone Africa, the Middle East, South East Asia.
- iii) It should be feasible to run two Workshops for 10 - 15 people each in any one year.
- iv) Programme personnel might consist of one 'itinerant' workshop organiser based in Ottawa, who would 'link' consecutively with a 'consultant' from each of the LDC institutions.
- v) For each Workshop, the organiser and the consultant would establish the teaching programme, identify participants from the sub-region and recruit special lecturers where required.
- vi) Administration could be handled jointly by the host institution and by (say) an IDRC officer based in Ottawa.
- vii) Workshop content should initially be based substantially on the materials (to be) developed by Bell and Hoffman. Diversification should take place gradually later and, as we have suggested above, should move into the area of technology and rural development.

79. Under a regime of this kind it should be feasible to mount a programme of (say) four years accommodating around 100 participants from the five designated sub-regions, and to do so at a cost which in real terms could be significantly less than has been incurred in the initial phase. The main cost savings would take place under the following heads:

- a) Scholarship costs: accommodation and other local costs are likely to be lower in an LDC.
- b) International travel: costs on sub-regional air travel should be substantially lower.
- c) Although personnel input costs may not be much lower, the fact that they would be spread over twice the number of participants would halve at least costs per participant.
- d) Other cost savings of the kinds discussed in Section III above.

80. Finally we should like to re-emphasise the importance of building upon the experience gained during the first Workshop Programme. This has been substantial and if capitalised upon properly, would certainly increase the efficiency with which future programmes could be operated. In particular it would be important to maintain links with SPRU at Sussex which might be able to fulfil a "back-up" role where necessary. And of course the special experience gained by the present Workshop organisers should certainly be used wherever possible.

Programme Content and Related Questions

81. Our contact with participants at RW4 as well as interviews with top officials and researchers in Tanzania gave rise to a number of ideas about the possible content of a future programme. Aside from insisting that workshops of this kind would be even more useful if held within the developing countries themselves, the persons interviewed frequently expressed the view that workshops should be "practical" "down-to-earth" and "problem-oriented" (See Appendix 6, for example). We took this to mean that more illustrative material, such as case studies, would be appreciated; and that exposure to real field-research situations deserved as much emphasis as exposure to the literature

on technology policy research. In addition, the Tanzanian interviewees almost unanimously declared that problems of the absorption and generation of appropriate technology in a rural/agricultural setting was as important to address as those of acquiring and generating foreign industrial technology, which were the subject matter of the IDRC/SPRU workshop programme.

82. We believe there is much merit in these views. At the same time we would warn vigorously against too much diversification out of the subject matter of the original workshop programme. One lesson from the experience is that it is much more difficult than is commonly believed to mount an effective workshop on a special problem area, and utilising the inputs of a number of "outside" lecturers, especially when the special area is outside of the immediate personal expertise of the workshop organisers. Moreover to the extent that any future programme diversifies out of the area of the original programme the benefits of capitalising on the investment will be lost, and it will be necessary to make further new "pioneering" investments. Moreover, the problems of industrial technology still remain one of the most important areas of research in the general field of technology policy.

83. With these considerations in mind we would recommend that the future programme be restricted to two only areas of technology policy research: the original area relating to industrial technology, and an additional area relating to the problems of developing and applying appropriate technology in the rural/agricultural sector. Moreover these could be conducted most effectively from the point of view of pedagogy and exposure to field-research situations if they could be linked to the interests and orientations of the host institutions of specific workshops and the sub-regions which form their catchment area. We believe for example that a workshop on appropriate rural

technology and located at IDS/Tanzania, would not only encounter an excellent host environment, but would also attract great interest from a vast sub-region bounded by Ethiopia in the north, Zambia and even Mozambique in the south, and Madagascar in the east. Similarly we assume that a workshop on industrial technology could easily be profitably hosted in any one of a number of Middle Eastern/North African countries and would draw on this entire catchment area. This principle implies that the subject matter of the workshop, the location and identity of the host institution, and the catchment area for the participants, would all be developed as a complete package rather than as separate and unrelated elements.

84. Within such a programme exposure to field-research situations would form, say, up to one-third of the content of any particular workshop. Participants would at first be exposed to the issues relating to the general problem area concerned, this would be followed by exposure to a specific problem policy research drawn from the host environment, and in the final section of the workshop this concrete experience would be used to help draw lessons of a more general applicability. The use of such a mode would underline the importance of securing a host institution that is committed to technology policy research, ideally with researchers already engaged in the area, so that the workshop would fit into their on-going programme and could act as a stimulus to local activity.

85. At the same time we do not wish to under-estimate the intellectual and logistical problems of designing, preparing and conducting such a series of linked workshops based on an administrative centre in Ottawa and carried out

in various parts of the developing world. In practice success will depend to a very large extent on the personal abilities and characteristics of the individual who is the organiser out of Ottawa. This person would need to be sufficiently knowledgeable in the broad field of technology policy research to participate in workshop design in the two areas (industry and agriculture) with the host institutions, sufficiently expert in at least one field to command a certain amount of intrinsic respect, have sufficient contacts to help select outside lecturers, be sufficiently sensitive to be able to accommodate to local needs and concerns and yet be sufficiently experienced to be able to gauge the capabilities of local institutions in an objective way - a rare and difficult combination indeed! For this reason it would be important to draw greatly on the experience of the organisers of the original workshop programme and - equally important - the considerable accumulation of expertise, experience and contacts generated by the IDRC's Science and Technology Policy programme in the past ten years or so, in the design of and planning for such a programme.



February 9, 1976

PROJECT SUMMARY APPENDIX 1

File 3-P-76-0005

Prepared By P. Young

Project Title	Division and Activity	Administration of Funds
IDRC/SPRU Training Program	Social Sciences and Human Resources Applied Social Sciences	External Contract(s) <input checked="" type="checkbox"/> Centre Partnership Grant <input type="checkbox"/> Centre Administered <input type="checkbox"/>

Recipient (Institutions, Name, Position, Address)	Project Leader (Name, Position, Address)
Professor C. Freeman, Director Science Policy Research Unit University of Sussex Falmer, Brighton SUSSEX BN1 9RF England	

Amount and Duration of Funding	Recipient Contribution	Other Contributing Agencies
\$264,500 over 4 years/SPRU \$300,000 over 4 years/Fellowships		

Recommendations

Program Director
RECOMMENDED

The President

The Executive Committee

The Board of Governors

There is ample evidence that there is a continuing and growing interest in the developing countries in the problems of science and technology policy. There is however, variation in the capacity to address these problems within the countries.

2. The Science and Technology Policy Program in the past has depended very substantially on the researchers in Latin America, who had been trained as part of the OAS program, or had been associated with the Science Policy Research Unit. With the exception of India, and to some extent Korea, Asia and Africa do not appear to have trained researchers available to undertake research, or deal with the problems as advisers to government.

3. Some investment needs now to be made in building this capacity where it doesn't exist. The Science Policy Research Unit at the University of Sussex in England is pre-eminent in the world for the scholarly contribution it has made in the field of Science and Technology Policy. Over the years it has had considerable experience in training at various levels. With limited additional resources, I believe SPRU has the capacity to develop training programs systematically which could train scholars and policy makers in the field of science and technology policy.

4. I am recommending that these resources be made available to SPRU for a four year period to enable it to train between 40 and 50 fellows. It is an investment in building capacity that should have considerable pay off in assisting the countries to approach the problems with greater understanding and skill.

5. I strongly endorse support for this project.

R. K. Zagorin

Background

1. The Science Policy Research Unit at the University of Sussex was established in 1966. The primary aim of the Unit is to contribute through its research to the advancement of knowledge of the complex social process of research, invention, development, innovation and diffusion of innovations. It is expected that this knowledge will contribute to a better understanding of policy for science and technology. The Unit's research is financed by grants from extramural sources including the Research Councils, Foundations, government agencies and private endowments. The Unit also undertakes some research under contract or consultancy arrangements to industry and government. The Science Policy Research Unit is an autonomous research and training institution located at the University of Sussex. A supervisory committee, drawn from the teaching staffs of the University and the Unit, provides overall direction and advice to the Unit's research and training program.
2. The Science Policy Research Unit has made a significant contribution to our understanding of the social, economic, political and technical relationships which influence the development, adaptation and diffusion of technology in developed and developing countries. It is recognized as one of the leading centres of research and teaching related to science and technology policy problems.
3. In past years, many of the Centre-supported research projects in the science and technology policy field have been undertaken by groups who have been associated with the Science Policy Research Unit (SPRU). To date, twelve of the leaders of the twenty-two Centre-supported teams working on technology policy problems have attended the SPRU/Institute of Development Studies joint study seminars on science, technology and development. (The Institute of Development Studies was established in 1966. About two-thirds of the Institute's finance is provided by a quinquennial grant from the British Ministry of Overseas Development. The aim of the IDS teaching and research program is to identify and study development problems, particularly those relating to poverty, employment and income distribution.) Two study seminars on science, technology and development have been held to date. The study seminar program introduces developing country researchers and policy-makers to the literature and research programs related to the implementation of science and technology policy in developing countries and the use of foreign sources of production technology. During the five week seminar, plenary sessions and working groups examine recent writings and research reports on the design and implementation of technology policies in developing countries.
4. During the past two years, an effort has been made to reduce the number of the Centre technology policy programs in Latin America where the majority of trained local people are. It has become clear that the pool of trained local researchers outside Latin America is not large or in some cases not sufficient. There have been several initiatives by the Centre to identify and assess the local research capacity to conduct work on technology policy problems. In November 1973, the Centre supported a workshop at the University of Ife in Nigeria to acquaint African researchers and policy-makers with research programs in Latin America on these problems. In mid-1975, the Associate Director for the Science and Technology Policy program visited several countries of the Middle East to discuss the Centre's program in this area. There has been evident and serious concern about technology policy problems by policy-makers and researchers in the developing countries. The greatest constraint to undertaking research in this field is the scarce local research capacity to conduct research on this topic.

5. This has led us to believe that there is an urgent need to expose developing country research workers to the field of science and technology policy. There is a need to promote training courses that will assist developing country researchers to acquire some of the research techniques needed for the successful conduct of research in the science and technology policy field. Training opportunities in the field of technology policy are limited and where no expertise exists, training within a project is limited. In part, this has been due to the fact that the training centres in technology policy do not exist and it has not been possible to identify the resource centres where the particular type of necessary training could be carried out. Thus, given the research and teaching experience of the Science Policy Research Unit and its international recognition as a centre of excellence in the technology policy field, SPRU has been identified as the most appropriate institutional base for a training program.

6. Over the past ten years, SPRU has accumulated a good deal of experience in conducting various forms of training courses in which participants from the developing countries (both as 'teachers' and 'students') have been involved. These include the study seminars described above, specialized seminars held at the Unit and visiting professors and research fellows. In addition, researchers from the developing countries can register for a one year masters degree or a three year D. Phil. degree at the University of Sussex with supervision provided by the Science Policy Research Unit. This experience leads us to believe that it is the short, focussed and intensive type of course which is most needed to provide an introduction to the particular problems of research on science and technology policy issues. An IDRC consultant from Chile has been working with SPRU Research Fellows to develop a set of training materials for use at SPRU and in the developing countries.

7. IDRC's Associate Director responsible for the Science and Technology Policy program is based at SPRU and is also the deputy director of SPRU.

Objectives

8. The principal objective of this proposal is to permit the Science Policy Research Unit at the University of Sussex in collaboration with the Centre, to design, organize and conduct a program to train developing country research workers in the area of science and technology policy studies over a period of four years.

9. The training program would introduce the participants to the existing body of knowledge and most important literature on the topic of each course and the ways of conducting research on these topics.

Organization

10. A part of the grant will meet the costs of teaching staff involved in the training program and the necessary support and administrative costs of conducting the training program. A second part of the grant will meet the costs of a stipend and the travel and support costs of approximately twelve study fellows per year over a four year period.

11. The organization and design of the training program will be the joint responsibility of IDRC and SPRU. It has been proposed that one course a year could be held outside SPRU in connection with a relevant institution in a developing country, for example in India or in Latin America, to mobilize existing capabilities in these countries. However, the cost of conducting a course in a developing country (approximately \$180,000) is not included in the budget for this project.

12. A full-time Senior Fellow at SPRU will act as coordinator for the training program. He will be responsible for the SPRU involvement in the development, organization and administration of the training program. In addition, it is expected that he will travel to various developing countries to meet potential study fellows.

13. The length of each course and the number of participants will vary according to need, but an average course will last four months and will consist of five or six participants. It is expected that two courses per year will be given (i.e. ten to twelve study fellows per year) so that during a four year period, some forty to fifty people will have benefited from the program.

14. The course topic will be chosen so as to be of greatest value to research workers in new Centre supported research projects. The courses would focus initially on the three main themes developed in previous SPRU/IDS study seminars, and for which teaching materials have been prepared by the Centre's consultant. The courses will cover the following areas: a) choice of techniques, b) technology transfer, and c) science and technology institutions and policy-making. The first topic will include a study of choice of techniques and choice of products as problems in political economy. Particular emphasis will be given to the economic and social obstacles to the use of more appropriate technologies and to opportunities which may exist to overcome these obstacles. The second topic will include studies of the main policy issues related to the international distribution of benefits from technology transferred to the developing countries by foreign firms and the effect of transfers of technology on the development of local technical skills. The third topic will assess the performance of national science councils and technology regulatory agencies through case studies and will study the constraints to the development of economically productive scientific research in the developing countries. The details of the course content will be developed in collaboration between IDRC and SPRU.

Proposed Budget

, 3-P-76-0005

15. Budget1. SPRU Training Costs

a) Salaries:

1 full-time Senior Fellow	\$19,000
1 full-time Junior Fellow	10,500
1/2 Senior Advisor's time	4,500
Secretarial work	7,000
Librarian (1/2 time)	4,000
Specialist Tutor's fees	<u>1,000</u>

\$ 46,000

b) Supplies

(Includes telephone, cables, xerox and teaching course supplies, eg. books)

\$ 4,000

c) Administrative Costs (15% of above)

\$ 7,500

ANNUAL COSTS

\$ 57,500

4 YEAR PROGRAM

\$230,000

Centre-Administered Contingency

\$ 34,500

TOTAL

\$264,5002. Support for Fellows

Each Study Fellow:

a) Fare - (average)	\$ 2,000
b) Living expenses (average 4 months) \$25/day	3,000
c) Stipend	1,000
d) Book allowance	<u>200</u>

\$ 6,200

12 Fellows/year

TOTAL ANNUAL COST

74,400

TOTAL OVER 4 YEARS

approximately

\$300,000

Table 1. BY REGION

DATA ON THE CHARACTERISTICS OF WORKSHOP PARTICIPANTS

	ASIA			AFRICA				MIDDLE EAST AND N. AFRICA	THE CARIBBEAN	OTHER	TOTAL
	S. Asia	S.E. and E. Asia	Total	E. and Central Africa	W. Africa	Franco- phone Africa	Total				
RW1	7	3	10	-	-	-	-	-	-	-	10
RW2	1	-	1	7	1	-	8	2	1	-	12
RW3	3	1	4	5	1	-	6	-	1	-	12
RW4	-	-	-	3	5	1	9	5	1	-	15
T No.	11	4	15	15	7	1	23	7	3	1	49
O T A % L	23	8	31	31	14	2	47	14	6	2	100

TABLE 2
BY LEVEL OF HIGHEST EDUCATIONAL QUALIFICATION

	Ph.D.	Masters	Bachelor Plus P/G Diploma	Bachelor	Other	Total
RW1	4	3	2	1	-	10
RW2	2	6	-	4	-	12
RW3	5	4	-	3	-	12
RW4	6	7	1	1	-	15
T No.	17	20	3	9	-	49
O T A %	33	42	6	19	-	100

TABLE 3
BY FIELD/DISCIPLINE

	SCIENCES/ENGINEERING					ARTS/SOCIAL SCIENCE				Total
	Natural Sciences	Mech. Chemical Electrical Eng.	Ind. Engin- eering/ Management	Agric. Science/ Eng.	Total	Economics/ Development Studies	Law	Other	Total	
RW1	1	2	4	-	7	3	-	-	3	10
RW2	1	3	1	-	5	4	2	1	7	12
RW3	2	7	-	3	12	-	-	-	-	12
RW4	3	1	1	1	5	9	-	-	9	15
T No. O T A % L	7 13	13 27	6 13	4 8	29 60	16 33	2 4	1 2	19 40	49 100

TABLE 4**BY TYPE OF EMPLOYING ORGANISATION**

	University	Technical Research Institution	Training/ Research/ Consultancy Organisation	Government S & T Policy Body/Research Council	Government Ministry Executive Body	Other	Total
RW1	2	-	7	1	-	-	10
RW2	4	-	-	3	4	1	12
RW3	5	2	2	1	2	-	12
RW4	5	2	-	3	3	2	15
T No.	16	4	9	8	9	3	49
O T A % L	33	8	18	16	18	6	100

TABLE 5

60.

LIST OF PARTICIPANTS

NAME	COUNTRY	FORMAL EDUCATION			EMPLOYING INST.	POSITION HELD
		HIGHEST LEVEL	LOCATION OF HIGHEST LEVEL	FIELD		
N.A.Aulaqi	Yemen	Ph. D.	U.S.A.	Agricultural Economics	Sanaa University and Ministry of Agriculture	Lecturer & Agricultural Adviser
O.O.Ewedemi	Nigeria	M.Sc.	U.S.A.	Economic Cyb.	University of Ife,	Fellow Research
Z.Fattah	Lebanon	D. Phil	U.K.	Economics	United Nations ECWA	Economic Affairs Officer
S.M.Salih	Iraq	Ph.D.	U.K.	Physics	University of Technology	Lecturer & Deputy Head of School of Technical Education
S.Swai	Tanzania	M.A.	U.S.A.	Economics	Ministry of Finance & Planning	Economist
A.A.Asem	Kuwait	M.Sc.	U.S.A	Electrical Engineering	Kuwait Institute for Scientific Research	Systems Engineer at Techno-Economic Division

TABLE 5

LIST OF PARTICIPANTS

NAME	COUNTRY	FORMAL EDUCATION			EMPLOYING INST.	POSITION HELD
		HIGHEST LEVEL	LOCATION OF HIGHEST LEVEL	FIELD		
G.N.Mudenda	Zambia	M.Soc.Sc.	U.K.	Development Studies	University of Zambia	Lecturer
D.K.Ayayee	Ghana	B.Sc	Ghana	Economics	Ministry of Economic Planning	Chief Economic Planning Officer
A.K.Malkawi	Jordan	Ph.D.	U.K.	Industrial Economics	Royal Scientific Soc.	Economic Researcher
J.Micah	Ghana	MSS	U.K.	Development Studies	Cape Coast University	Research Fellow
P.Manly-Spain	Sierra Leone	M.Sc.	U.K.	Economics	Ministry of Development and Economic Planning.	Director of Planning
T.S.Karumana	Ethiopia	B.Sc.	Kampala	Mathematics and Physics	United Nations Economic Commission for Africa	Economic Affairs Officer
A.Williams	Nigeria	M.Sc.	U.S.A.	Soil Science	National Science and Technology Dev. Agency.	Chief Scientific Officer

LIST OF PARTICIPANTS

NAME	COUNTRY	FORMAL EDUCATION			EMPLOYING INST.	POSITION HELD
		HIGHEST LEVEL	LOCATION OF HIGHEST LEVEL	FIELD		
P.A. Munroe	Guyana	Ph.D.	Rockefeller U.K.	Biochemistry	National Science Research Council	Secretary-General
I. Llunga	Zaire	Docteur	Zaire	Sciences Economiques	Faculty of Economics	Chef de travaux

APPENDIX 3

COMPARATIVE COST ESTIMATES

(1) IDS Costings

Table provides a breakdown of IDS cost estimates for the years 1978/1979. Cost estimates for the Workshop Programme itself and for the Glasgow University nine-month diploma course are included for the sake of comparison.

Table 1: ⁵£'s sterling)

	<u>IDS</u> ³	<u>G.U.</u>	<u>Workshop</u> ⁴
Honoraria ₁ , local expenses	13000	-	N/A
Admin + secretarial expenses ₂	11000	3000	N/A
Staff Input	35000	72000	N/A
Total internal variable costs (IVC) for 5 study seminars	59000	N/A	104000
IVC per study seminar	12000	N/A	26000
IVC per participant	600	3500	2200

1. Includes research assistance, hospitality, field trips and staff travel.
2. Materials, xeroxing, brochures and other internal expenses.
3. Each study seminar lasted from 4 - 6 weeks (average = 4.8 weeks). The average no. of participants was 20 per study seminar.
4. These last from 9 - 10 weeks, comprising 4 workshops with 51 participants in all.
5. The figures provided here are rounded off.

(2) Open University Course Costings

We interviewed Dr. R. Peacock of the Social Science Faculty (Social Statistics), the Open University, and Dr. L. Wagner, Head of the Social Studies Programme at the Central London Polytechnic and one-time lecturer in economics at the Open University. Dr. Wagner has published several papers on the Economics of the Open University and has been interested in the comparative net benefits of training/education programmes in the higher educational sector for a number of years. He very kindly allowed us to reproduce the table below which summarises "faculty" costs per full credit course by main "cost types" for the year 1976 and was drawn from original Open University financial data.

TABLE 2: Faculty costs for producing 1 new full credit course in 1976

	A	D	E	M	S	T
1. Academic costs per man year (Total Faculty Cost ÷ academic staff)	13,722	13,831	13,767	13,760	17,336	15,561
2. Man years required to produce 1 full credit course	12.8	13.9	20	20	22.9	22.9
3. Academic staff costs per man year (2x1)	175,641	192,250	275,340	275,200	396,994	356,347
4. I.E.T. (Total Budget equally spread across faculties)	23,000	23,000	23,000	23,000	23,000	23,000
5. Course Team Budgets (Assume spread across faculties)	50,200	50,200	50,200	50,200	50,200	50,200
6. Broadcasting allocation of direct costs of £5000 per TV and £500 per radio programme.						
A.D.E. - 16 TV & 24 radio	92,000	92,000	92,000	128,000	128,000	128,000
S.M.T. - 24 TV & 16 radio						
Total (3 + 4, + 5, + 6)	340,841	357,450	440,540	476,400	598,194	557,547

APPENDIX 4

INTERVIEWS WITH RW4 PARTICIPANTS

(Dr. N. Clarke, November 1979)

We were able to hold short interviews with three participants. One was an economist employed as a university teacher, the second was an industrial extension officer currently employed as a researcher in a university research unit, while the third was a civil servant employed in a planning university. We asked questions under four broad headings, viz:

- (i) What specific benefits did they feel they had had as a result of Workshop participation?
 - (ii) Did they have views on the quality/amount of written materials which they were given?
 - (iii) Did they have views on the question of Workshop location, and if so, what?
 - (iv) What specific criticisms did they have about any aspect of the Workshop Programme?
- (1) Two broad conclusions emerged from this first question. The first was that the Workshop had made the participants aware of specific social processes for the first time, and this was quite a revelation in at least one case (we had the impression here that the person concerned was still coming to terms with the subject and that participation had sown a seed which would bear fruit later). The second conclusion was that participants benefitted differentially according to their professional interests. The planning officer, for example, was quite clear that the main benefits lay in a greater capacity to deal more efficiently with foreign direct investment and with the formulation of national science policy. Conversely the university personnel stressed their (presumed) improved ability to identify suitable research projects and to prepare project proposals. There was also mention of incorporating some of the ideas into their own courses.
- (2) On this question it became clear that the sheer volume of material was too much for the participants to cope with. One interviewee said that he only ever managed to get through half of the prescribed reading at the most! There was, however, general appreciation for what the organizers had done since each participant intended to build up a small library on his return (cf. views of the participants interviewed by C.H.G. Oldham). In particular, stress was laid on the need to produce the work-

shop material in a more finished form which would enable participants to review and recall their experiences efficiently at some later date. As far as form of publication was concerned there was general agreement that what was minimally necessary was one textbook based upon the material "notes". This should contain an opening introductory section giving a "synopsis" of the field and should also contain a detailed (but not necessarily annotated) bibliography. The participant from Francophone Africa emphasised also the need to translate such a volume into French. It would also be useful, he felt, if the bibliography were to contain important reference works originally written in the French language.

- (3) On the question of location there was general agreement that despite the enormous advantages possessed by Sussex University in terms of resources, future workshops should take place in the third world. If held on a sub-regional basis, there would be advantages of closeness to the field and to personnel with practical experience of associated problems. The participants felt a slight lack of this side of things in the workshop. There was some disagreement on the question of local project work as an integral part of an LDC - located workshop. On the one hand there was the feeling that projects would be difficult to organize and would take too much of the participants time, given a ten week total time period. On the other hand the participants admitted to the pedagogic value of practical work. One of them made the interesting point that since there is a chronic lack of good case-study material from Africa, project work would be a good method of generating such material.
- (4) The most note-worthy general point which arose out of this question, was the positive feeling that the participants had towards RW4 and its organizers. All (the participants) felt they had benefitted greatly from the experience and would certainly recommend it to colleagues. More specific points of criticism were as follows:-
 - (a) Domestic - although the hotel was comfortable and freindly it was not a convenient place to study in (desk space privacy, etc.,) In addition, commuting time between the hotel and SPRU was found to be irksome. Accordingly it was suggested that in future more "purpose built" accommodation be provided if at all possible. (One way

of doing this would be to arrange for some workshops to take place during institutional vacations when hostel accommodation might be available). It was felt that the living expences provided were very fair.

- (b) Written Materials - See points made under (ii) above
- (c) Course Content - Aside from the points on "practicality" mentioned under (i) above there appeared to be three criticisms on this score. First, some slight dissatisfaction was felt regarding the more technical aspects of the workshop (section on statistical analysis) on the part of participants whose technical background was weak. Even though the purpose of including such aspects was informative rather than substantive, one individual felt that he needed more time than was available and that the organisers might have done better either to increase the time or to omit those parts altogether. Secondly, there was a feeling that more sub-regional case material would have helped participants understanding of issues, though it was recognized that there is a fundamental problem of availability. Finally, one participant felt that the "tone" of the workshop was not sufficiently "realistic". We took this to mean that the lecturers were rather too sanguine regarding what is possible in policy-making activity under current conditions. However, it is worth stating perhaps that this tendency did not come across to us in the workshop sessions which we attended.
- (d) Project Preparation - There was some feeling that a little more help was required on how to write project proposals, though it is only fair to say that this feeling was not a particularly strongly-held one.

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

CENTRE DE RECHERCHES POUR LE DEVELOPPEMENT INTERNATIONAL

MEMORANDUM

TO: File

FROM: C.H.G. Oldham

DATE: 25th September 1979

SUBJECT: Evaluation of SPRU/IDRC Research Workshops. 3-P-76-0005:
Interviews with past participants in Kenya and Ethiopia

During my visit to Kenya and Ethiopia in July and August 1979, I took the opportunity of interviewing three of the past participants in the Research Workshop Programme. All three were very similar, in that they claim to have found the Workshops very useful, but they have not so far themselves been directly involved in policy research. They have either moved into or continued their role as policy makers. In this capacity, they have been made much more aware of how to use the results of other people's policy research, and had found the written material which was provided for them in Sussex to be of great value indeed. They all claimed to have written detailed evaluation comments at the end of their stay in Sussex, and suggested that when they made those comments their impressions and views were much fresher in their minds than when I interviewed them.

1. Miss Irene Kamau at the National Council of Science and Technology, Nairobi

Miss Kamau was on leave, but I discussed her participation with Professor Gacii. He said that she had been a good professional and now spends most of her time writing project documents for the Council. Her all-round performance has been very good. The Workshop helped her in a general fashion but not specifically. She has been involved in writing several chapters in the Science Policy of Kenya documents. She believed that the background which she had acquired by participating in the Sussex Workshop had been very beneficial for her in this activity.

However, the Secretariat itself is not geared to research. This is better done in a Research Institute such as the IDS at the University.

Miss Kamau's job now involves evaluating research proposals in the natural and physical sciences. Again, Gacii believes that the training she had received enabled her to do a better job in this, although it wasn't obvious why!

Dr. Gacii also mentioned Mr. Makau. Mr. Makau is an agricultural engineer and also has taken a PhD in Economics. He will be responsible for the Research Council's overall programme on research and will be Gacii's chief advisor.

Miss Kamau returned from leave while I was in Kenya, and I was able to meet her. This interview is described below.

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Interview with Miss Kamau, 28th July. Research Workshop No. 2 Participant

Miss Kamau had not been involved in policy research after her return to Kenya. She felt that this was due to a number of reasons. First of all, shortly after her return to Kenya, the break-up of the East African Community occurred. It was very difficult for anyone to do research in this environment. In the future, she hopes it will be possible to do some research. She found the Workshop material had helped her a great deal in drafting chapters for a report on the science policy of Kenya. For example, the work on patents drew heavily on the material she had been given in Sussex. It has not been easy to influence other people's way of thinking. Most people associated with the Council are scientists who have not thought about policy issues before. Miss Kamau is now very familiar with the issues and regularly reads the science policy literature.

I asked Miss Kamau for her evaluation of the Workshop according to the same headings as for my interview with Muchiri (below). Miss Kamau said that she had written an extensive evaluation report at the time of her visit and was not now so familiar with the details. However, she made the following points:

1. The participants were made to work hard and to prepare materials for group discussion. This made people think and the fact that they were obliged to work had been important. It was particularly useful to have had a large supply of reading material available to each of the participants. Not all of it could be read at the time, but since she had returned to Kenya she had found it especially useful. It had been deposited in the library and now other people on the Council made use of it.
2. The size of the group was just about right.
3. On the question of Workshops being held in developing countries, Miss Kamau thought it would be worth trying, although recognising the limitations of material. Also, there were more people available to make presentations in the UK than if it had been held in Kenya for example. In Nairobi, there were only one or two people in the field who could have helped.
4. She was particularly enthusiastic about the idea of modules being prepared for publication. She thought there would be several other people in the Council who would be likely to undertake a self study course if they were available.
5. Although the Workshop had been very valuable, she thought that more concrete examples would have helped the participants to understand some of the more abstract ideas.
6. Miss Kamau suggested that we refer to the evaluation reports which each of the participants wrote at the end of the Workshop. She felt that people had been honest in the preparation of these reports and that the evaluators would get as much from reading these as from travelling to the countries to visit the participants back in their home countries.

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7. Miss Kamau thought that the Institute of Kenyan Industrial Research and Development might be a suitable base for policy research on technology and industry in Kenya. Also, the Institute of Development Studies at the University of Nairobi is likely to become more important.

Subsequently, I learned in Vienna that Miss Kamau had been selected to be on the Kenyan delegation to UNCSTD and the Council had decided to give her a promotion.

2. Mr. Gichuki Muchiri, Department of Agricultural Engineering, University of Nairobi, PO Box 30197, Nairobi.

I began by explaining to Mr. Muchiri the nature of our evaluation study and asked him to address the following aspects of his participation:

- a) whether the objectives which he had for attending the Workshop were fulfilled;
- b) the content of Workshop material;
- c) the method of teaching;
- d) the value of the Workshop for his subsequent work and in particular his involvement in policy research.

Mr. Muchiri did not go to Sussex with a particular set of objectives. It was only six weeks before the start of the seminar that he made up his mind to attend, after being invited by the National Council on Science and Technology. Hence the timing was short, and in his opinion too short. He felt that it would have been better had there been sufficient time for the Workshop staff to have travelled and interviewed all the participants before they attended. As it happened, he considered that only about 50% of the people who had attended were really interested.

Mr. Muchiri said that he had learned an awful lot. The material was up-to-date, and the whole experience had opened his mind quite a bit. Because of this, he has been able to play a very active role in Government committees concerned with planning and energy. The Council now involves him in policy making in a very extensive way.

However, he thought that the Workshop could have been better organised. In the first place, the selection of candidates was weak. Secondly, once the group arrived in Sussex they were overloaded with material. Martin and Kurt tried to summarise but it seemed like second thoughts. He thought that the material for the first two weeks should have been sent ahead so that the participants could have got a flavour of what was coming.

He also thought that most of the participants still had a problem in knowing what policy research about technology really was. This was despite Martin's heroic efforts to explain but the concept still remained vague. This might

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have been more easily overcome had the more abstract aspects of policy research come later in the Workshop. It made people uneasy since they were all scientists and engineers and were not at home in these abstract concepts. Furthermore, it would have been better if Martin had given more examples.

Ashok Desai had done his homework very well. What he taught came out very clearly. However, he went into much too much detail for this particular group of participants. He also taught it in a way a professor would teach students and since many of the participants were more senior in status than the teachers, this tended to be resented.

Many of the other tutors, however, were very casual. The people who presented material on wind, waves and in particular rural electricity were very poor. The participants felt that the lecturers were improvising. The man who talked about mechanisation was hopeless! Many of the participants could have presented better papers. Furthermore, the mini research project/working paper was a fiasco. In part this was because Ashok Desai tried to get people to do things that they didn't want to do and the whole exercise backfired and the group refused to split into small working groups.

Despite these criticisms, he thought that the whole SPRU approach was remarkably honest for a developed country institution.

Another criticism was that Martin appeared to be under considerable pressure to get a tangible output from the group. It seemed that he was wanting a research design which might then be submitted to IDRC for funding. Although Martin denied this, the participants were not convinced, and there was some resentment on the part of the group to being pressurized.

3. Interview with Dr. Ghebru, Department of Mines, Energy and Water Resources, Addis Ababa, Thursday 9th August 1979

Dr. Ghebru had attended Research Workshop No. 3, and my interview with him was a part of the evaluation of the Research Workshop Programme. During the course of our conversation, Dr. Ghebru made a number of points. These were:

1. The length of time of the Workshop was not really appropriate. It was too short a period to enable the participants to go into great depth about issues, and too long to be a general overview.
2. On the other hand, Dr. Ghebru had gained a great deal from the meeting, and in fact the literature which was provided had been extremely valuable. He would not otherwise have been able to get access to this material, and it had proved to be of inestimable value to him on his return to Ethiopia. He had on his desk three of the reports which had been distributed at the Research Workshop and these were being used in the preparation of a project proposal to UNDP.
3. The participants at the Workshop had very diverse backgrounds. Although this was of some value in providing useful interchange between the different participants, it did mean that it was impossible to go into depth in any one issue. Some may have been comfortable going into depth in that issue, but most of them would not.

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4. Some of the guest speakers were OK, but several were very poor. More careful choice should be exercised in selecting speakers for future Workshops. The man from the World Bank had been particularly poor.
5. The Imperial College part was more or less OK.
6. At the Sussex end, the part which had been least successful was that given by Ashok Desai. He was not very knowledgeable on energy matters, and Ghebru had not got much out of his presentations. Furthermore, he had tended to treat people as students rather than as equals.
7. Dr. Ghebru did not think that the venue was all-important. It didn't very much matter whether the meeting happened in Sussex or Addis. However, he did recognise that access to library materials was important and this clearly meant a benefit from having the meeting in Sussex. Also, a Sussex based seminar meant it was possible to get a wider selection of people than would have been possible had the meeting been held in a developing country.
8. On the whole, he thought that the programme was too crowded. There should have been more time for individual study, and although some of the participants may not have used that to their own advantages, this was their problem and not that of the organisers.
9. The financial allowance was hardly adequate. This had created some problem for Ghebru, who had dietary problems and would have wished to eat out in a restaurant where he could have chosen the food, rather than have to eat what was provided.
10. On his return to Addis Ababa, Dr. Ghebru had been able to make extensive use of the material which he had collected in Sussex. In fact the information gathered was worth two months spent away from Addis on its own. However, although the material had been of direct value to him, this had not been the case for the other Ethiopian who was from the electric power company.
11. Dr. Ghebru's duties include that of being Executive Secretary of the Ethiopian Energy Committee. He is responsible for setting up working groups which will ultimately lead to the formulation of an energy policy for Ethiopia. His work includes an energy survey of the country, together with a study of biogas and biomass. There is also a household energy survey being conducted in Addis Ababa under his direction, although the work is being done by the Central Statistics Office. They are surveying 500 households and two surveys will be made, one now in the winter and another later in the summer. All of these studies and working groups benefit from the knowledge which Dr. Ghebru gained when he was at Sussex. He has not been directly involved in the formulation of research projects, although he claimed that much of the survey type work was as much research as anything else.

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12. He made the point that there were two dimensions of energy needs: one was energy for survival, the other was energy for development. Firewood may be necessary for survival, but it is not going to provide the wherewithal for development. Energy is required for workshops, for lighting, for pumps amongst many other things, and there must be a concern for how to generate the energy for all of these purposes.

Finally, we talked about the possibility of Ethiopia being involved in some rural energy study which might be launched with IDRC help. Dr. Ghebru expressed interest in this, but also explained that there was a tremendous shortage of trained manpower and it might not be possible to find the people to do the study. However, he would like to know more about the proposed project and I said I would get Andrew to send him material and also to consider the possibility of inviting him to send someone to the Rural Energy Project meeting in November.

APPENDIX 6

Interviews with Officials and Past Participants from Tanzania by
(Dr. N. Girvan, November 1979)

Dr. Simon Nkonoki, Fellow, Institute of Development Studies, University of
Dar Es Salaam, October 31, 1979

Dr. Nkonoki was very impressive. Since attending RW3 he has -

- 1) Submitted a research proposal to Rockefeller successfully.
- 2) Become Chairman of the Energy Committee of the Tanzania National Science Research Council.
- 3) Won a SAREC travel fellowship to visit application of solar technology to five African countries, - Nigeria, Mali, Upper Volta, Senegal and Sudan - for about four weeks. It was very successful.
- 4) Will attend a UNITAR seminar on Energy in Montreal, November 26 - December 7.

RW3 was extremely useful. Some of the lectures were not well prepared.

He feels very strongly that future Workshops should be held in Developing Countries because they will be -

- a) able to observe problems on the spot. He mentioned TNRC/US Naval Research 2-week workshop on Rural Energy Technology which visited villages. It was very effective;
- b) involve local lecturers and develop local expertise;
- c) give more publicity to Technology Policy so that Government officials and policy makers can be exposed;
- d) promote cross fertilisation between developing countries. He feels that Workshops should travel rather than stick to one country, should be continent-wide with a small number of extra-continentals, and should be flexible as between general and specific themes. About one-fifth graduate course in Dultisbe was devoted to Technology and Development. He says the Medical Research Council formed, also the Tanzania Development Research Organisation, tending to whittle away power of TNSRC.

Professor Ibrahim Kaduma, Vice-Chancellor, University of Dar es Salaam
November 1, 1979

Dr. Kaduma feels it would be a pity if the Workshop Training programme were to stop altogether. There were many applications to go to RW4. Both the Ministry of Industries and the Small Industries Development Organisation - SIDO - are very keen on the Workshop (this turned out to be mistaken where SIDO is concerned). Hassan Mlawa benefitted from RW2 and is now undertaking research for his Ph.D thesis on technology transfer.

Dr. Kaduma however made the point that workshops should be tailored to the specific needs of individual developing countries. He felt that some kind of survey should be undertaken to determine more precisely what countries feel they need and a programme designed specifically for this.

Dr. Kaduma was very supportive of my contacting the Small Industries Development Organisation - SIDO - to find out about the work of the Appropriate Technology Unit at Arusha. He felt they were doing good work and would be a good organisation to work with. He arranged an appointment for me to see Mr. Mramba, the Head of SIDO, later that morning.

Mr. B. P. Mramba, Director-General, Small Industries Development Organisation
November 1, 1979

SIDO has been in existence since 1973 and is responsible for the promotion of small industries development in urban and rural areas. Mr. Mramba was frankly sceptical about the value of the RW series. He had not sent any of his staff to the Workshops. His basic theme was that what is needed is not people who will "sit around in offices and write academic papers" but rather people "who will get out there (in the field) and do things".

Despite the somewhat inauspicious start to the interview, Mr. Mramba turned out to be a flexible, imaginative and subtle thinker. What he means by "people who will get out there and do things" are people who will reside in the rural areas, interact with the peasants, and develop new village technologies with them through a process of experimental development. He was sceptical of IDRC projects at first but now has a more positive attitude because IDRC has helped to solve one of the basic technical problems faced at the village level: the need for a simple batch-process for the processing of Sorghum. The process had been developed with IDRC help in Botswana and was now being applied with modification in Tanzania. Mr. Mramba mentioned small-scale cement plants and small-scale hydro power plants as problems requiring solution too.

He made the point that appropriate technology requires sociological research as it must fit into the customs and culture of the people. Indian artisans had been imported to teach hand processing of cashew nuts in Tanzania but it had not taken on because the local women did not want to adopt the cross-legged sitting posture used for the work, nor did they seem to have the manual dexterity needed for the work. Now the work is being done by sophisticated machines. The lesson however is not that appropriate technology is inappropriate, but that prior sociological work is often necessary.

Mr. Mramba gave two models of developing a technology policy. One, the 'macro', feeds down from the Government and Ministry level; the other the 'micro' feeds up from individual decisions and the development of new technologies. The second way can sometimes be more important in bringing about policy changes in a developing country.

In discussion it became evident that Mr. Mramba is not opposed to research as such; what he wants is applied research in the solution of specific technical problems. He agreed that there could be a relevant and useful policy research if it is related to applied field research, eg. what are the conditions of success in securing technical change in agriculture.

Mr. Mramba's interview raises three questions about future workshops: (1) should they concentrate on industrial technologies only, or include rural/agricultural technology; (2) should they be restricted to the acquisition from abroad or include local transmission; (3) shouldn't they be linked to real life problems encountered in developing countries.

Mr. Paschal Mihyo, Lecturer, Faculty of Law, University of Dar es Salaam
November 1, 1979

Mr. Mihyo is a senior lecturer in the Faculty of Law who attended RW2. His is a story of frustration. His main interest at that time was on legal aspects of the patent system and the bargaining process. RW2 had opened his eyes to other aspects of the subject, especially technological capability. As a result he developed a research proposal that was discussed with Martin Bell and which he hoped to undertake on his return. However on his return his request for a transfer to the Department of Political Science to facilitate this research was turned down, due to staff shortages in the Law Faculty. He was given three new courses to teach in Law, all unrelated to technology.

His next efforts were in the direction of having a unit for the study of technology transfer established in the University. He saw the Vice Chancellor about this, who suggested he discussed it with the Economics Department. The Head of the Economics Department took the position that this was outside the portfolio of the department. He then tried the Political Science Department, who accepted it, only to have it turned down by the Board of the Faculty of Arts who felt that the Political Science Department already has "too much on its plate". He then took

it to the Director of the Economic Research Bureau who would like to incorporate it into the programme for the study of public enterprises, but who is not in a position to formalise this. The best bet now appears to be the Institute of Development Studies. The Director feels that once Mlawa has finished his Ph.D the IDS may be in a position to start such a unit, presumably with Mlawa's help/direction.

In the meantime Mihyo has been collecting technology transfer contracts from Tanzanian enterprises. I suggested that he should continue doing so, and try to prepare a research paper on contractual technology transfer, and perhaps the patent system, in Tanzania, since this could properly be regarded as being within the scope of the Law Faculty.

Mr. Msambichake, Acting Director, Economic Research Bureau, University of Dar es Salaam

The Economic Research Bureau has 13 full-time members of staff. Economic Research includes (i) the public sector, including the role of incentives, the scope for worker participation; (ii) export promotion in chashew nuts; (iii) road transport; (iv) integrated rural development; (v) fishing industry. Generally interested in technology but not really in a position to speak authoritatively about Economic Research Bureau.

Mr. G. F. Mbowe, Chairman and Managing Director, Tanzania Development Bank
November 2, 1979

The Tanzanian Development Bank is the largest loan and development financing company in Tanzania and one of the largest in Africa South of the Sahara. Its investment portfolio is now worth 1,800 million Tanzanian shillings, and in 1978 it financed about thrity-five (35) projects worth 350 million Tanzanian shillings. It funnels both multilateral and bilateral funds from abroad to Tanzanian industries.

Mr. Mbowe sees the need for technology policy research for a number of reasons: Tanzania's Third National Development Plan emphasises certain critical industries such as engineering, metals, chemicals and agro-industry, which have backward and forward linkages. As a development bank, his institution needs to know that choices of technology for these activities are most appropriate for Tanzanian conditions. He sees the need for a general statement of policy guidelines on technology which could be used to guide their lending policies.

After identifying the technological options, Tanzanian industries need to be in a position to negotiate the best terms for the desired technology. He sees the need for a referral/information centre of technological information. This would assist the bank in making appraisals of loan proposals as well as to advise their clients on sources of information and effective bargaining. UNIDO and UNCTAD could both be of help in this regard - he supports the idea of establishing a UNIDO centre on technical information and a registry of technological agreements, as well as UNCTAD's work on a model code for the transfer of technology.

Mr. Mbowe said he was willing to involve research workshop participants in observing actual projects of the Tanzania Investment Bank. He emphasised the importance of the proposed establishment by the Economic Commission for Africa (ECA) of a Regional Technological Centre which will operate workshops in Dakar and Ibadan, together with a consultant and management centre. He also mentioned the African Industry Development Fund which was established to finance the establishment of certain critical industries requiring more than one national market, viz., chemical, forest-based, agro-industry and building material industries, including cement, gypsum, kaolin, sand, sisal, and wood. This will also require training in technology policy and any future activities by IDRC should take this into account.

Professor H. Y. Kayumbo, Director-General, Tanzania National Scientific Research Council, November 2, 1979

The TNRC is a policy organisation responsible to co-ordinate studies in the area of science and technology and also to provide financing for research. Professor Kayumbo states that 50% of the resources of the organisation is used for studies in the areas of nutrition and child care, solar energy, traditional medicine, natural products and small stock. He mentioned for example, a major rabbit expansion programme being undertaken in Kilimanjaro district through the regional administration.

Professor Kayumbo displayed a strong bias against what he called "theoretical policy studies". The most urgent need of developing countries is for massive training programmes for middle-grade technicians in such areas as metal work and woodwork. Money should be used for exchange visits within the Third World rather than travelling to the developed countries. He did concede however, that research might be needed to establish what types and forms of middle-level training might be needed, which is another aspect of technology policy research.

Mr. Hassan Mlawa, Fellow, Institute of Development Studies, University of Dar es Salaam, November 2, 1979

Mr. Mlawa has written a long letter containing his views on the research workshop programme which is reproduced as Appendix 7. Additional information provided was on the nature of his research for his Ph.D which he has started since attending the workshop. Originally, he had intended to study "The Sources and Nature of Technical Technology in the Tanzanian Textile Industry"; because of lack of material he decided to change the subject to "Acquisition of Imported Technology" in that industry and the "Subsequent Processes". He is in the process of conducting a survey of four textile firms using an 18-page questionnaire. He has the full backing of the Institute of Development Studies where he works.

Dr. Justin Maeda, Director, Institute of Development Studies, University of Dar es Salaam, November 2, 1979

Dr. Maeda is a very interesting and stimulating person. He emphasised that what developing countries need is technical knowledge rather than machines. He feels that it is absolutely essential for training workshops to be held within developing countries. To begin with, this would be less costly for local and regional participants. He mentioned East/South Africa as a natural catchment area, including the countries of Sudan, Somalia, Ethiopia, Kenya, Uganda, Tanzania, Zambia, Malawi, Botswana, Lesotho, Madagascar and The Seychelles. The second reason for local workshops is that the participants could go out in the field and observe problems in their real setting. For example, he mentioned the interesting work on the Appropriate Technology Unit at Arusha.

Dr. Maeda also felt strongly that the subject of rural development and rural industry should be addressed in any workshop programme.

The IDS would be willing to host such a workshop in Tanzania. They have already played such a role for an ILO Seminar held in Tanzania earlier in 1979. The programme involved a combination of theoretical discussions with field observation and it proved to be very successful. The IDS may mount a technology research programme as soon as they have a developed staff capability in this area. Hassan Mlawa and Simon Nkonoki would provide an obvious basis.

APPENDIX 7

16/10/79

Dr. Norman Girvan,
New Africa Hotel,
P.O. Box 9314,
DAR ES SALAAM

Dear Dr. Girvan:

I have received a cable and a letter both dated 29/9 from Mr. W. D. Daniels, (Associate Director, Planning) of IDRC Canada notifying me of your proposed visit to Dar between 31st October to 4th November; and that in your visit, you would like to see me for a discussion on IDRC/SPRU Training/Workshop programme.

I very much appreciate the spirit behind this move, as well as your trip to Dar. Unfortunately however, during the dates indicated, I am not likely to be within Dar. I will be up-country - (Arusha and Mwanza) doing field research in connection with my further Graduate Studies for which I am registered at Sussex University. I very much regret my absence.

Since I may not be around in person for a discussion with you during your visit I thought useful to leave behind a note giving my own personal impressions on the IDRC/SPRU Workshop/Training programme, of which I had the privilege of attending one of them.

I must say very frankly Dr. Girvan that I do not know precisely the sorts of issues of the Workshop programme that you are interested in. However, what I will do is to throw some ideas, rather randomly, on what I consider to be some of the significant issues on the IDRC/SPRU Workshop programme that I had myself attended.

Workshop attended:

The workshop that I attended was Workshop No. 2. It was centred on the Assimilation, Absorption and diffusion of Imported Industrial Technologies in the third world. It was held at SPRU-Sussex during the period 17th October - 16th December, 1977 (i.e. eight weeks). R. Martin Bell and Kurt Hoffman organised and directed the programme.

/...

Organisation of the programme

The organisation of the programme together with its daily administration was splendid. All of us, the participants, received the necessary instructions, course guidelines, some basic literature, prepaid return tickets, etc. 'in good time to arrange for our travels.' Upon our arrival at Sussex, we found everything properly arranged and well organised for a comfortable stay and serious training eg. Accommodation was arranged, seasonal train tickets bought for us etc. Credit for all this goes to the team of organisers that handled this job very competently; most particularly Martin Bell, Kurt Hoffman and Sally Marjoram have done, undoubtedly, an incredibly marvellous job.

Composition of Workshop participants

The Workshop was attended by about a dozen participants - all of us drawn from developing countries. About half of the participants came from Africa (Tanzania, Kenya, Nigeria, Botswana, Zambia, Sudan, and Ethiopia). The remaining participants came from West Indies, Iraq, and Bangladesh. So much, as far as the origin of the countries goes of the cross-section of the participants. As it can be seen, it is a cross-section, diverse enough to allow the participants compare and contrast the experiences of their countries in different dimensions of technology policies. This element (comparative study) proved very useful in a good deal of the discussions that ensued in the Workshop Sessions.

The other aspect about the composition of the participants which is worth mentioning is the broad orientation (in terms of work) of the individual participants.

The individual members in the group of participants can be said to fall into one of these two broad orientations:-

- a) Policy-making (e.g. those coming from Scientific Research Councils (Kenya & Sudan); Ministry of Planning (Botswana and Trinidad, Ruling Party (Zambia and Iraq).
- b) Policy Researchers - Those from University and other academic institutions (eg. Tanzania, Nigeria, Ethiopia, and Bangladesh). Again, this element of diversity of orientation proved very useful in the discussions in the Workshop Sessions, largely as a major source of comparing varying experiences amongst the participants.

Course Content:

The content of this workshop was rather diverse. It ranged from Industrial Strategies, definitions of Science, and Technology, Technology policy research methods to discussions on findings of selected technology policy projects carried out by some researchers in different areas within the large subject area of Technology policy (eg. Charles Coopers' work on Mechanism of Technology Transfer,

R. Martin Bell's work in Thailand, N. Girvan's work in Jamaica, Jorge Katz's work on Ducillo Rayon Plant, Vaito's work in Latin America, Robin Murray's work in Ethiopia, etc.).

Undoubtedly the amount of effort put into lectures by the workshop directors (Kurt and Martin) is immense. They gave formal lectures as well as prepared basic reading materials in the form of study modules highlighting the main points in selected major areas covered during the workshop. In total during the workshop we had received not less than a dozen study modules. Each of these was really bulky and pretty substantive.

Guest speakers from within Sussex and elsewhere were also invited by the Organisers to come and give lectures in their areas of specialisation. Of the many guest speakers the following I remember, almost off head:- Charles Cooper, Constantine Vaitos, and Robin Murray from within Sussex; Jorge Katz, N. Girvan, Subramayan, and Boon from outside Sussex.

Materials: The organisers furnished us with writing pads, pens, pencils, etc. We were also furnished with books, and other important xeroxed materials from books, journals and other publications. We were allowed to keep these materials for our own future uses and/or references.

On the whole then the organisation of the workshop and its daily running was really admirable - there was very good preparation and very smooth conduct during the course. The least I can say, is that there was a really ideal climate for Serious Learning and fruitful academic work.

That said, does not mean to say that everything in the Workshop reached such a level of perfection as to require no further improvement at all. This is not the case. I observed the following inadequacies in the Workshop which might require attention:

1. It appeared to me that the substance of the Workshop course was far too much to be adequately covered over the time specified (i.e. 8 weeks). I may be wrong, but I suspect that, this has been so in part because the Workshop Directors may have wanted to cover material that would be relevant to (a) Participants with policy-making bias; (b) Participants with (policy) research bias. To attempt to do this within a period of 8 weeks (actually effective period of Workshop training was about 6 - 6½ weeks) is to attempt to do too much. As a result of this rather tight teaching schedule, the following emerged:

- 1) Formal lectures (presumably in effort to cover the material at hand) tended to dominate open discussions amongst participants.

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- ii) I suspect that most participants would agree with me that not very much was learnt during the 8 weeks workshop. This has nothing to do with the content of the workshop material or the lecturers/speakers. Both the content and speakers were splendid. But somehow, things were done rather in a rush, during the sessions, most probably to cover the material at hand during the Sessions. Granted more time, at ease after the workshop, one can get a lot more from the materials and lecture notes taken during the Sessions. I must confess, I will be the first to admit that I learnt more from the Workshop after the Workshop than during.

- 2. The second point concerns the group of participants. It seemed to me, at least in some of the Sessions, that the interests and possibly orientations of the two broad categories of the participants (researchers and policy-makers) were far apart. Of course this was not always the case in all the Sessions, but it was there now and again.

What I am saying here is not to create an arbitrary division between policy researchers and policy-makers. Perhaps, these two need each other for fruitful policy-making and/or policy research. What I am pointing to is the fact that the balance between the two is not easily achievable, however desirable such kind of balance in real life may appear.

In sum then, I am inclined to conclude that despite these minor inadequacies which can be rectified, Workshop No. 2 was very well organised and run. It has sharpened my insights into the larger subject area - Science, Technology and Development. The research I am carrying out now and perhaps the one carried out by the Bangladesh participant, has been conceived, and greatly influenced by the useful lectures and discussions during the workshop. Indeed the Workshop training programme can prove a veritable basis for developing the kind of policy makers and researchers in the area of Science and Technology, who are badly needed in many of the developing countries. I am quite sure that jointly IDRC and SPRU can do this. They have the relevant capabilities for doing so.

I have a few suggestions as to the possible directions along which such workshop training programmes in future may fruitfully be continued:

- i) Until now, nearly all, if not all the workshops run have been conducted at Sussex. Of course, Sussex is an ideal place for running a workshop on such topics - Science, Technology and Development. The existence of SPRU, IDS with the workshop Directors sharing their fellowships with SPRU and IDS is a remarkable advantage. Further, some individual members in both SPRU and IDS have conducted very useful studies on the area. These individual researchers and their publications are easily accessible within Sussex. But, that these workshops are nearly always conducted in these countries also bears with it some disadvantages:-

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- a) Because of the heavy expenses (e.g. travels, accommodation and maintenance) only a small number of participants (around twelve or so) are accepted for admission in the workshop. Often, one participant from one country. The implications of the possible impact of such a low representation of the participant as far as policy, planning, and research in the individual developing countries is immense. In short, the impact of one individual participant in a workshop lasting 8 weeks to his own country in matters of technology, policy, planning, and research is bound to be minimal. I doubt whether I am overstating this point.

In view of this point, what may be more promising, in future workshop training programmes of this kind, IDRC and SPRU might consider more seriously the possibility of organising and running workshops in some developing countries. The obvious advantages of such moves are: (i) the possibility of drawing more participants dealing with different areas within Science, Technology and Development; (ii) many governments and politicians are likely to lend more support to such moves involving larger groups of their policy makers and researchers.

The disadvantages of the move are equally obvious:

- a) None of the developing countries do have the type of facilities that compare with those at Sussex (Library, photo-copy machines, and of course people with good research experience in the area).
- b) Costs (financial and time) are likely to be very high.
- c) That the workshop Directors are not working full-time with the programme. They are also fellows of SPRU and as such are also required to do some work with SPRU. This means that it will not be an easy thing for them to be away from SPRU for say 3 - 4 months organising and running a workshop somewhere in Ethiopia, Sudan, Kuwait or Tanzania for that matter. As for problems (a) and (c) as above, no simple solutions can be found easily. But as far as problem (b) as above, minimize the heavy financial burden that is likely to be on IDRC/SPRU, the recipient developing countries could be requested to meet some of the local expenses. I am sure many developing countries well aware of the gains that are likely to be derived from such workshop would accept such requests. Of course this will depend a lot on the economic position of the country in question.

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I mentioned earlier on that the material to be covered in the workshop was a bit too much to be competently handled over the period specified. Perhaps, it was also rather unfocussed in the sense that the material was meant to cater for the interest of both the policy maker and policy researcher. While it is not my purpose to create a gap where there should not be one between policy and research, I have one proposition to make. That, it well might prove more fruitful in future to organise workshops around sharply defined areas within the general area of science, technology and development. And that selection of areas that might be more relevant and/or interesting to policy-makers should be distinguished from those that might be more relevant and/or interesting to the policy-researcher. That is to say, future workshops need to be distinguishable as between those intended for policy-makers and those for researchers. This is desirable. Although there should be no water tight distinction between policy-research and policy-making. I gather that there is some validity in the argument that the skills required for the efficient carrying out of policy research are not necessarily the same as those needed for competent policy-making. Thus, the articulation of much finer areas for training in the IDRC/SPRU workshop programme is likely to increase the efficacy of the programme (in terms of raising participants' interests, and skills developed).

Let me close by thanking you so much for the trouble you have taken to come all the way to Dar for an evaluation exercise of the IDRC/SPRU Workshop. I deeply regret that I have been unable to avail myself for a discussion. I hope, nonetheless, that I have touched on some of the issues that you might be interested in.

Finally, kindly convey my most sincere thanks to IDRC officials for having made it possible for me to attend Research Workshop No. 2 at Sussex. Also kindly convey my gratitude to the workshop organisers at Sussex - most particularly - R. Martin Bell, Kurt Hoffman, Sally Marjoram and of course Geoff Oldham, Andrew Barnett, and Mary Heath.

Yours sincerely,

H. Mlawa
IDS - University of Dar es Salaam

THE UNIVERSITY OF SUSSEX

MEMORANDUM

To: Martin Bell, Geoff Oldham, Norman Girvan,
Norman Clark, Andrew Barnett

Date: 6th November 1979

From: Kurt Hoffman

Subject: Recent Attendance at Expert Group Meeting on Technology Transfer
at the International Centre for Public Enterprises in Developing
Countries; Ljubljana, Yugoslavia, 22-26 October, 1979

My participation in the above meeting raised a number of very interesting points in relation to the Workshop Programme which I thought might be useful in the current evaluation.

1. The meeting was attended by 12 "experts" from developed and developing countries, plus various UN agency representatives and the staff of ICPE. Three of the people attending had some prior connection with the Workshop Programme, and a number of others were at least aware of its existence.
2. The participants from Kuwait, Mr. Samir Kotob, Kuwait Institute of Science and Technology, and from Nigeria, Dr. D. Babatunde Thomas, University of Ife, both had colleagues currently attending the 4th Workshop. Dr. Thomas was not present when I was around, but I did have the chance to discuss with Mr. Kotob. He said his institution placed a very high value on the Workshop and the current participation of Mr. Asem and was looking forward very much to Mr. Asem's return. He emphasised that the training given to Asem would allow his institution to undertake research on technology transfer which they had been unable to do before because of lack of trained staff. He very much urged the holding of Workshops in the Middle East.
3. The third participant connected with the Workshop Programme, was Mr. Muthana Jabbar, from the Ministry of Planning, Iraq. Mr. Jabbar had participated in the second Workshop. At that time, he was in the Ministry of Industry, working in the energy sector. However, he indicated then that he wished to move into S & T policy research, that there was some support within his Ministry, and that the Workshop was ideally suited to assist this "shift" into a new field.
4. His present position is now as head of a small S & T Policy Unit within the Ministry of Planning. He managed after his return from the Workshop to gather enough support for this new unit and is now gradually moving it onto a firmer base. He plans that the unit will draw on research (its own or contracted) to provide advice on and emphasise the importance of an explicit consideration of S & T at the planning level. He has rejected pressure to formulate a natural S & T plan and prefers instead to try and ensure that S & T factors are considered by every Ministry as an integral part of the planning and development process.

5. He felt very strongly that the Workshop was crucial in allowing him to make this shift as it provided a frame of reference and a starting place for the development of his thoughts and approaches to the subject. Although he is not carrying out full time S & T policy research, he feels he is slowly building up the awareness of its importance within government. Only after this is accomplished, after the "demand" is created, will he be able to fully develop what is now a small research programme. The Workshop approach and material continue to be important in this process.
6. During the Expert Group discussion, I was able to introduce quite a bit of our conceptual approach to the technology transfer problem with particular emphasis on capability accumulation. Many of the participants felt that the approach was very valuable - so much so that I had to stay up until 4 a.m. two nights in a row to write most of the Group report!
7. One purpose of the meeting was to consider what ICPE should be doing in relation to its own programme of research on TT and public enterprises. A number of the contributions I made on the basis of the Workshop approach to policy research were considered valuable and included in the report. Of particular interest is the fact that ICPE looks set to try and set up collaboration with LDC policy researchers (I offered to provide the names and institutions of those we were aware of - many more than they knew existed). In addition, they will consider the possibility (a) of building up an in-house research capacity composed of Third World researchers, (b) generating a series of guidelines on how public enterprises should undertake the transfer of technology with particular reference to capability accumulation, (c) run these prepared guidelines "through" a Workshop composed of public enterprise managers and government policy makers in order to ensure their (the guidelines) practical value before wider dissemination, (d) set up a more permanent series of Workshops on this issue in developing countries as an additional method of getting the points across, instead of the traditional "paper-bound" exercises that may have little effect.
8. Finally, ICPE, and the various UN agencies were generally impressed by the IDRC/SPRU Workshop Programme when I outlined it to them and commended IDRC and SPRU for the "foresight to invest in such an innovative programme" (UN/ICPE Consultant Praxy Fernandes). They wish to consult more specifically with IDRC S & T Programmes and SPRU on the future plans for ICPE's efforts in this area.

TRAINING WORKSHOPS ON ASPECTS OF
TECHNOLOGY POLICY ISSUES
(PRELIMINARY OUTLINE FOREIGN AFRICAN REGIONAL PROJECT PROPOSAL)

Theo Karumuna
 Dan Ayayee

BACKGROUND

The proposal to mount training workshops on aspects of technology policy issues in Africa stems from several concerns regarding what is currently going on in Africa and in the world as a whole

- a) the subject of science and technology and their role in the acceleration of economic and social development of third world countries has received increased attention at the international level. Debates at the North-South Dialogue and recently at UNCSTD are such examples. Such level of concern however appears not to have emerged at the level of individual nations (a few excepted) and at the region as a whole. This concern and subsequent interaction and exchange of ideas on technology issues within and amongst African countries is an important element in the concept of collective self reliance.
- b) the emphasis given to some of the issues at the global fora has given an impression that technology is available in an international pool as opposed to the monopolistic nature of the technology market and what its real implications are
- c) on the question of acquisition of technology by third world countries too much emphasis is given to certain issues relating to transfer of technology from developed to developing countries rather than to the development of technology within the third world countries. This points to the need to emphasize the development of strategic approaches for initiating an endogenous process of change in African countries.
- d) Available evidence suggests that African countries (most of them at least) have low levels of local technological capability which acts as a major constraint in their effort to acquire technology through the transfer process or to develop their own technology. Deliberate steps require to be taken for ensuring the development and accumulation of local capabilities in technology and its appropriate utilization.
- e) there is increasing concern about the paucity of data and publications on African technology issues and on the inadequacy of R and D activity, data collection and analysis, information gathering and dissemination. Fresh initiatives are required to get more action underway in these important areas.

OBJECTIVES

The proposed workshops are planned for senior personnel who are involved in

technology policy and planning in their respective countries. The workshops would aim to guide them toward a fresh and broad understanding of what technology is and its significance in national development and to provide ideas on what policy actions might be taken to bring about an endogenous process of technical change in the African countries.

Specifically the workshops will have the following objectives:

- 1) to examine the definitions, concepts and issues surrounding the transfer of technology
- 2) to consider the significance of technology within the operation of the world economy as well as national economies - hence the importance of national strategies/policies/plans to guide the exploitation of the technological resources
- 3) to develop a new approach towards technology which would enable African countries not only to derive more benefits from imported technology but also to establish a sound basis for the development and utilization of their own technologies
- 4) to highlight the strategic importance of the accumulation of local capabilities for handling technology issues, since such accumulation of capabilities is the basis for endogenous process of technical change
- 5) to underscore the paucity of data, and the necessity for information and research results to back the technology policy formulation in Africa, and stimulate interest in the undertaking of policy - oriented research activities in African countries,
- 6) to provide an opportunity for an exchange of ideas and experience on technology issues in the various African countries.

ORGANISATION OF THE WORKSHOPS

The following considerations should be taken into account in the organization of the workshops programme.

- a) The desirability of involving a critical mass of persons per country (a maximum of three persons per country)
- b) Limiting the size of participants per workshop to around twenty-five (i.e. eight countries per workshop and six workshops to cover forty-nine African countries)
- c) While it is undesirable to perpetuate the division of the region into English and French speaking Africa, effective participation and interactions among participants is likely when a workshop consists of participants from one language group,
- d) In addition to observing language differences, account should be taken of the various levels of development attained by the different countries.

- e) Use of African case studies should be emphasized. Such case studies must illustrate what is happening in Africa and must emphasize the key issues being tackled in the workshops.
- f) The execution of the workshop programme is envisaged to take place in three phases:-
 - 1) A Preparatory Phase - consisting of a detailed planning of the workshops series and selection of background documents and case studies for the workshops. It may be necessary to generate specific material about Africa and the commissioning of experts to undertake this task is envisaged.
 - 2) The organisation of the workshops
 - 3) An evaluation of the workshops programme to be undertaken at the completion of the series.

INSTITUTIONAL BASE

The workshops should be organized by the U.N. Economic Commission for Africa in collaboration with other regional organizations such as the OAU, the African Regional Centre for Technology, CODESTRIA, IDED and other relevant regional or national institutions.

FINANCIAL RESOURCES

Financial resources sought under this project would cover the cost of

- 1) The preparatory phase including the convening of the Planning Group, and commissioning of special papers
- 2) Preparation of reading materials for the workshops
- 3) Consultants/experts invited to assist with the actual running of the workshops
- 4) Fellowships for the participants (cost of international air travel plus daily subsistence allowance)
- 5) Undertaking an evaluation of the workshops programme.

TIMING AND DURATION

The workshops are planned to take place as early as practicable in the 1980's to take advantage of what appears to be a favourable climate following UNCSTD. The exact timing would depend of how soon the project formulation is completed and its funding secured.

The project envisages a series of workshops each lasting approximately two to three weeks.

PARTICIPANTS

Characteristics of participants: Participants for the workshops should be officials holding senior positions in policy making and/or planning. They should be drawn from:

Ministries of Economic Planning/Finance/Industry

Ministries or Councils of Science and Technology Universities

Major state or private enterprises.

PROGRAMME OF WORK

This will be centred on:

- 1) Examination of issues on technology concepts
- 2) Issues about the international economic system and their implications for the African countries
- 3) Issues about the mechanisms for the transfer of technology and the consequences for the African countries
- 4) Capabilities for endogenous technological development
- 5) Methodology and techniques - in research, its organization and the provision of appropriate information base for the policy maker.

OUTPUT

The following outputs are expected.

- 1) A report containing conclusions and recommendations from the workshops
- 2) Proposals for follow-up activities at national, sub-regional and regional level
- 3) Research materials produced for the workshops
- 4) A review report
- 5) Interest generated in participants about relevant technology issues as well as the knowledge hopefully acquired.

APPENDIX 10

Persons Interviewed in the Course of the Evaluation by
N. Clarke and N. Girvan

1. Ms. Margaret Clyne - Administrator	}	Institute of Development Studies, University of Sussex
2. Professor Charles Cooper - Fellow		
3. Dr. Robin Luckham - Fellow		
4. Dr. Michael Howes - Fellow		
5. Dr. Roy Turner - Fellow	}	Science Policy Research Unit, University of Sussex
6. Mr. Martin Bell - Fellow		
7. Mr. Kurt Hoffman - Fellow		
8. Dr. Geoffrey Oldham - Deputy Director		
9. Mr. Andrew Barnett - IDRC Officer	}	Participants at RW4
10. Mr. Sanyo Ewedemi (Nigeria)		
11. Dr. I. Ilunga (Zaire)		
12. Mr. K. K. Ayayee (Ghana)		
13. Dr. Z. Fattah (Iraq)		
14. Mr. S. Swai (Tanzania)		The University of Glasgow
15. Mrs. S. Hodges - Administrator		
16. Dr. Robert Peacock - Lecturer		
17. Dr. Leslie Wagner - Principal Lecturer		The Open University
		The Polytechnic of Central London

Tanzania

1. Dr. Simon Nkonoki, Fellow, Institute of Development Studies,
University of Dar Es Salaam
2. Professor Ibrahim Kaduma, Vice-Chancellor, University of Dar Es Salaam
3. Mr. Paschal Mhoyo, Lecturer, Faculty of Law, University of Dar Es Salaam
4. Dr. Justin Maeda, Director, Institute of Development Studies,
University of Dar Es Salaam.
5. Mr. Hassan Mlawa, Fellow, Institute of Development Studies,
University of Dar Es Salaam
6. Mr. Msambichake, Acting Director, Economic Research Bureau,
University of Dar Es Salaam
7. Mr. B. P. Mramba, Director-General, Small Industries Development
Organisation
8. Mr. G. F. Mbowe, Chairman and Managing Director, Tanzania Development
Bank
9. Professor H. Y. Kayumbo, Director General, Tanzania National Scientific
Research Council