OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

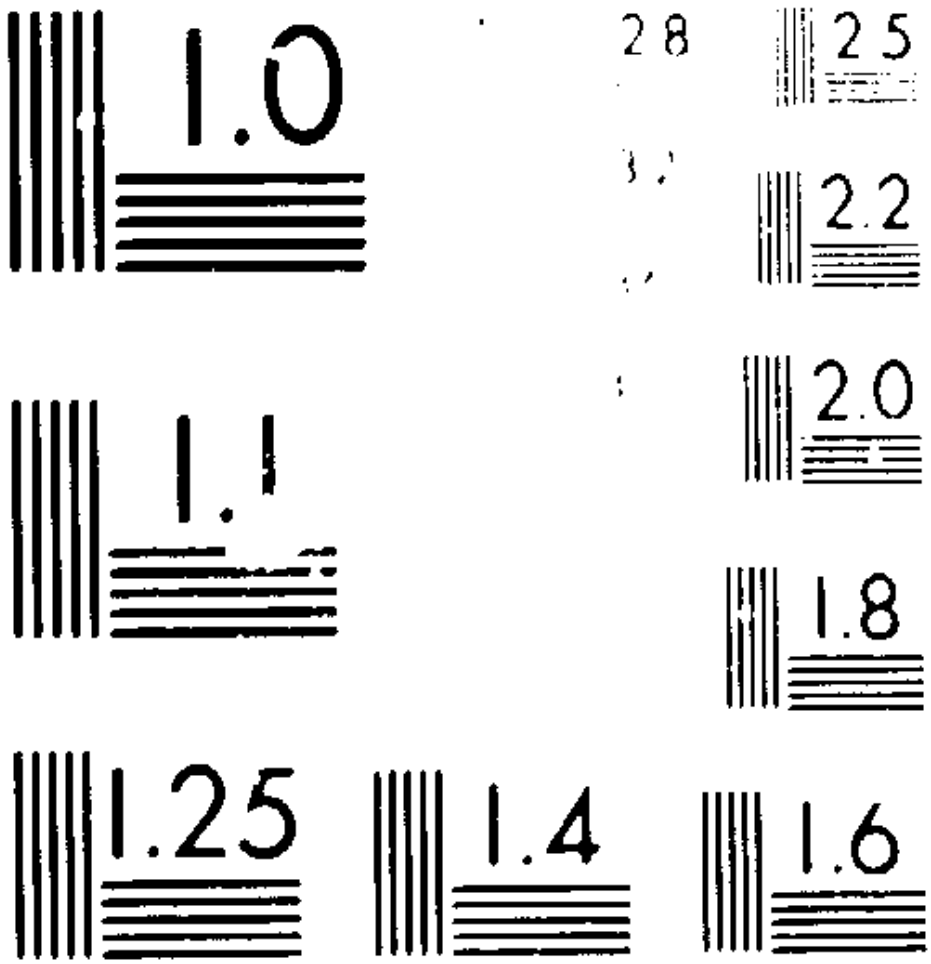
FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org


1.0
2.8
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6

09648

Distr.
LIMITED

UNIDO/EX.[illegible]
21 May 1980

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

ENGLISH

UNDP/UNIDO STAFF WORKSHOP

on

INDUSTRIAL RESEARCH AND SERVICE INSTITUTES

2 - 4 June 1980, Vienna

Raising the Performance of IRSIs through Improved Planning and Administration *

A paper prepared by

RICH H. WESTERGAARD

Chief Engineer, Central Institute for Industrial Research

Oslo, Norway

* This document has been reproduced without formal editing. The views expressed are those of the author and do not necessarily reflect those of the UNDP or UNIDO.

1. To establish a successful IRSI in a developing country is quite difficult. We have for some time known that there is often considerable discrepancy between the reality and the expectations one had when the plans for most IRSIs were conceived. The UNDP/UNIDO evaluation exercise has confirmed the modest success of IRSIs in developing countries and at least qualitatively identified the reasons.

2. The ultimate purpose of a UNDP/UNIDO project is, of course, to do something to improve IRSI performance and the assistance provided by UNDP and UNIDO. The three most critical conditions for success are:

a) There must be a need for the services to be given. The IRSI needs an industry to serve. It does not create industry.

b) If an IRSI is set up to solve certain problems, e.g., related to use of some natural resource, it must be ascertained that there is a fair chance of finding solutions which are technically and economically feasible. Too often wishful thinking is involved.

c) Unless the IRSI has secured the necessary resources, i.e., money people and facilities etc., it cannot function.

3. It should be born in mind that few people know much about which role IRSIs can, and cannot, play in the process of industrial development. The politicians, bureaucrats and university affiliated people in developing countries who are usually responsible for planning an IRSI, with or without UN assistance, are likely to make many mistakes, such as:

- underestimating the time and cost it takes to build an IRSI and make it work well;

- overestimating the capacity and capability of an IRSI to solve the problems of industrial under-development;

- poor planning of buildings, equipment, personnel policy and administration.

4. Our ambition is to produce a planning tool which can help the developing countries' governments decide on what kind of an institution they need so that it will be a cost/effective use of resources which are scarce, such as people with higher skills and education and foreign exchange. It is important to pinpoint all the conditions which have to be met in order to succeed. If for some reason it seems unlikely that these conditions can be met, the plans must be changed or given up.

5. Before starting a costly project, a feasibility study should be compulsory. The need for proper planning is, of course, well recognized. But few know how to do this. We therefore see a need to provide manuals which can facilitate the task. The guidelines contained in them should be based on experience: compiled by the IRSI evaluation; experts from the field; and in UNIDO/UNDP headquarters. The guidelines should be equally useful for the UN and for the developing countries.

/....

6. Because of the complexity of the UNIDO bureaucracy and the fast turnover and movement of staff, accumulation and dissemination of IRSI experience has been difficult and unsystematic in the past. It is difficult to recruit project managers who are competent to plan and execute IRSI projects. In the receiving country the understanding of the role of IRSIs is most often vague and unrealistic.

7. Although IRSIs vary a good deal with respect to services to be given, etc., we have found that it is possible to define a limited number of building blocks - we have called it activity modules - which reoccur very often. In the design of institution-building projects, these modules would correspond to project outputs stated in terms of increased capacities to meet a given demand level. One means of facilitating planning is to produce manuals giving information about each of the more important or frequently used modules. Examples of such common modules are laboratories for: chemical analysis, materials testing, food processing, microbiology, metallography and metrology; units for library functions and technical information service, engineering, techno-economic feasibility studies. Also important are branch-oriented laboratories, e.g., for testing of textiles or leather, and bench-level labs and pilot plants for such branches as ceramics, textiles and beneficiation of ore. Often when IRSIs are established, the need to have an effective administration with proper routines, etc., is grossly underestimated. A manual covering administration is badly needed. It should cover all aspects of office management, IRSI-client relationships, personnel questions such as contracts, insurance, pension, staff association, salary scales,etc. It should contain examples of all forms needed: client contracts, reporting, procedures and administration, and deal with IRSI board and government relationships, cooperation with universities, and with institute autonomy.

8. To produce manuals covering various IRSI modules should not be too difficult. A good deal of relevant literature exists, some is produced by UNIDO, some as independently published books and articles. Compiling a reference list could be the first start. It should be given to the experts advising on the planning and execution of IRSI establishments. Gradually, experts from the field and specially hired consultants can produce more comprehensive and systematic manuals which address the problems encountered in the process of planning specific activity modules. The manuals can give examples of equipment lists, discuss the usefulness of various pieces of equipment and elaborate on all the needs of the module such as space, small equipment, spare parts, qualifications of the staff; who are the most likely customers, etc. The format of manuals may vary a good deal, and they must certainly be revised and expanded from time to time.

9. I believe it will be useful to tell you about some of the negative experiences we have had with IRSIs. I shall, in addition to information developed in the evaluation study, include examples from the so-called "Joint Consultation" mission to IRSIs in which I have participated.

10. In Pakistan they have several quite large research institutes. After they had existed for some time the government decided their work was too academic and had been of very little use in the effort to industrialize the country. So the institutes were told to be more applied. To meet this demand, the institutes started to invent new products - import substitutes and use of indigenous agricultural, mineral and other resources. For each process and product reports were prepared and industry was invited to use the inventions. Industry and commercial people were very skeptical (and not without reason). Those who had the skills and financial resources found that they could make a better profit by producing conventional things, cooperate on a license basis with foreign companies or by importing goods. In a country where a seller's market R + D is not strong, only hard competition can cause industry to take the trouble and risk of going into R + D.

11. What to do now? Pilot plant has became the new slogan. The institutes built general purpose pilot plants and special pilot plant factories to prove that the inventions will work and to test the market. This cost a lot of money. The academics became amateur engineers, pipe fitters and plant operators, but very few commercial successes were achieved. The latest I know is that Pakistan decided to shift from general purpose IRSIs towards branch institutes. I think this was a wise move. The mistake they had made was to invent things nobody wanted, rather than helping industry with their real problems. In a mono-branch institute, placed in the heart of industrial environments, IRSIs and industry can more easily adapt to one another.

12. One very important constraint which has killed more IRSIs than any other single cause, is to offer the staff low government salaries. Researchers must have qualifications and salaries in line with similar people in industry; if not, recruiting and keeping qualified staff is impossible. But this is a big headache for the government. If they give the researchers high salaries and other privileges many other government institutions will want the same. It cannot be defended that IRSIs are so important that they should have special privileges. But the hard fact is that an IRSI must be part of the industrial community - not of the government bureaucracy. If the government cannot - or will not solve this problem, they simply should not attempt to set up any IRSI for R + D but be content with government testing and standardization institutions and leave R + D to industry - or use services from abroad. Many (most?) IRSIs have because of this never been able to build up and retain qualified staff of engineers and scientific researchers. Again and again we found that staff trained by UNIDO experts and fellowships left the IRSI as soon as they had acquired skill which industry needed. In Turkey, a cement institute after seven years has virtually no stable national technical staff. The training given came to use in industry - O.K., but the IRSI project is a flop up to now.

13. In many countries in Asia there is an overproduction of university graduates so their IRSIs don't suffer as much by paying low salaries. In the Philippines, e.g., the solution has been to use women as researchers and even directors. Women are underpaid in general and accept and stay in

IRSI jobs! It has been argued that high IRSI salaries will drain government and other institutions of staff which, at least in the short term, are more useful where they are. On the other hand, high salaries and other privileges can attract national and expatriates from abroad, which is very desirable. If the unavailability of scientists and engineers is a severe constraint, I think it is better to postpone building an IRSI with ambitious objectives. A modest start doing materials testing, some vocational training and extension service may be more appropriate, particularly in the least developed countries.

14. The problems are very pronounced in Africa and in the Middle East. Syria is a shocking example of how totally an IRSI can fail. There, the staff was even refused the right to resign. One staff member for two years did all kinds of mischievous things and pretended to be mentally ill before he was finally released, but soon recovered his mental health and started work for private industry! All the staff had very low salaries - and to survive they all had other jobs. Some had proper academic qualifications but were not at all dedicated to their work and did nothing to attract projects. One of the few who worked with dedication was the librarian, responsible for information services. She produced abstracts of articles etc. believed to be of interest to the staff and to industry. But the effect and response were negligible, one reason being that so few could read English. Private industry did not want to use a government IRSI and also claimed they had no skills to offer. Government did not want to use them, e.g., for feasibility studies which was supposed to be a major activity. The government people did not want to expose their inadequacies but they wanted to do the travelling abroad, etc. The institute has very good buildings and beautiful equipment, most of it has never been used! The latest addition was a costly pilot plant with a spray dryer and some odd pieces of unmounted equipment which probably will never be used. The institute had virtually no administration, only a director with no power. He could not hire or fire people or influence salaries. Apart from doing some work on standardization, he mainly dealt with petty things - like signing requisitions for buying one book or the use of the vehicle. The whole atmosphere was one of frustration and depression.

15. One problem we have often met is unrealistic research objectives. Examples are to think that a small IRSI can develop substitutes for importing foreign technology. It can, and should do so on a modest scale, but to create heavy industry takes skills a hundred times more complex and specialized than an IRSI can provide. It has even been proposed to set up an IRSI to develop petroleum technology so that one could become independent of the USA. This was in the Philippines and they were sensible enough to take our advice not to go on with the idea.

16. There is a group of more or less hopeless research objectives which always pop up, such as: inventing processes for using gypsum waste from fertilizer production; making all kinds of things from agricultural waste (totally overlooking, e.g., the logistics of collecting the waste); doing R + D to upgrade inferior iron ore and establish a steel industry based on this ore.

17. On the other end of the scale, one has the idea of extension work and helping the cottage industry. Often such plans are totally unrealistic. The cottage industry does not need the help of Ph. D. people. They need vocational training, soft loans, proper organization, sales outlets etc. A handful people from a IRSI cannot overcome the fact that thousands of people have not received a proper education. The idealistic desire to help the poor (small is beautiful) etc. is often approved and advocated by the UN, but idealism without realism is of little help!

18. One big problem for IRSIs in the poorer countries is lack of foreign exchange. With multi or bilateral help, equipment, books, etc., are received when the IRSI is started, but every year thereafter spare parts, new equipment, electronic components, chemicals, books, periodicals, etc. need to be purchased, and practically all of it must be paid with hard currency or be given under some aid program. Too often we have seen equipment standing useless because it lacks some spare part, or research projects coming to a standstill because components, etc., cannot be imported. Most libraries lack important journals and books. In a country like Turkey, where the exchange problem is so acute, it is very difficult to convince the authorities that an IRSI should have foreign currency when everybody else is refused. R + D, after all, is not the most important thing - at least not in the short term.

19. I shall stop here. I have not told you about these IRSI failures in order to discredit the idea of setting up IRSIs in developing countries but only to convince you that there is a strong need for better methods of planning and analysis of needs and means. In a paper prepared last year, I proposed a planning method which has checklists showing the conditions which must be met. The system would force the planner to see as many as possible of the problems in advance, and to give the government a fair picture of what it will cost them to establish and operate an IRSI and what kind of return they can expect on their investment in the short and the long term.

20. Provided the proposed method is judged to have good potential, one could perhaps hope that money will be made available by UNDP to develop and implement our ideas. I think UNDP will, if they are convinced that the proposals are feasible. But what about UNIDO and the developing countries? I am afraid introduction of more rigorous methods will meet considerable resistance, for several reasons:

a) It will reveal that many proposed projects are unsound. Most of the people involved want these projects. There is keen competition for UNDP funds. This may be cynical, and I believe most of the time people are sincere, but they cling to their projects as their brain-child.

b) Even when the feasibility study and the plans show that an IRSI is justified and has a fair chance of success, it is a shock to be faced with the real magnitude of the commitment. It is often possible to lure people one step at the time, but faced with a goal far away and a hard way to go they tend to give up.

/....

c) To produce a detailed plan containing answers to many difficult questions etc. is a serious commitment. It can be held against the planners if anything goes wrong. This can be most unpleasant, and therefore a less rigorous investigation and vague plan is more pleasant to live with. Our method requires some extra work, and continual review, but most people will realize that it is most useful to expend this effort.

21. It is my hope that UNIDO will produce the manuals for establishing the modules and branch laboratories and the guidelines for IRSI feasibility studies and planning. Once this has started, the material can be made available to UNIDO staff and experts in the field, Res. Reps., SIDFAs, planning departments in developing countries, IRSI managers and sponsors, etc. I think some will use the planning procedure and the manuals on a voluntary basis. But so many books etc. have already been written about all kinds of things that I am afraid the material we produce will soon drown in the paper flood!

22. The other possibility is that the methods and manuals are refined to a high standard and their use made a pre-condition for assistance. All the UNDP project missions must then apply it. No government will obtain approval of IRSI projects unless they are analysed and planned in reasonable conformance to the guidelines. Only if this is done, can a radical improvement be expected. I feel that the requirement to use the system must come from UNDP. If so, UNIDO has to accept it.

23. But it remains to be seen how the developing countries themselves will react. They may well feel that asking so many questions is impertinent. They don't want to be examined. If they want an IRSI, they may want to decide its mission and organization without interference. Politicians do not always like straight talk. They may well prefer to be less explicit than we would wish. Well - I don't know how many developing countries we can persuade to use the system and whether it is wise to press them hard to do so. But within the UN it should be possible to at least encourage its use. Before making it compulsory it must be further developed and be used on a limited voluntary basis, to gain experience and to de-bug it.