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**INTER-REGIONAL SYMPOSIUM ON TECHNICAL  
SERVICES AND FACILITIES FOR  
SMALL-SCALE INDUSTRIES**

**Vedbaek, Denmark  
26 June to 8 July 1967**

**Agenda Item 4**

**TRAINING OF SMALL INDUSTRY EXTENSION WORKERS**

**Presented by Yap Kie Han**

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.

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**TRAINING OF SMALL INDUSTRY EXTENSION WORKERS**

by YAP Ho-Kun

**SUMMARY**

Specialized international training for small industry extension work was commenced upon the author's initiative twelve years ago. In the subsequent years several other international training facilities were established in different parts of the world. Such training is also organized in various forms on a regional, bilateral and national scale. For the further development of these training activities it would be desirable if a common conceptual basis could be established internationally regarding the training objectives, selection requirements, professional standards and other related matters. Such a framework is suggested in the paper, which describes the career development possibilities for small industry extension workers, their professional qualifications, the contents of the training, and the programme structure and training methods for personnel at various levels of seniority.

In the professional ranks four levels are distinguished:

- chief persons responsible for institutional co-ordination, as the highest level;
- general advisory officers, senior specialists and chief training officers as the next senior level;
- an intermediate level of field officers and training officers with full professional qualifications for undertaking small industry extension work in specialised fields;
- a primary level of field officers and training officers proficient in the use of analytical techniques and in executing pre-defined small industry extension work tasks.

The paper analyses possible career patterns in following personal development opportunities and requirements from secondary professional education towards primary level extension work functions and subsequently to higher ones. Then, the stream is followed from professional university education towards intermediate-level and higher functions. In both instances it is desirable that candidates possess several years of industrial experience prior to joining the small industry extension work. Also, possibilities are considered of persons joining extension work at more advanced points in the career streams.

From the point of view of professional backgrounds the following main types are distinguished: technology, economics and cost accounting, and humanities. The career streams should provide both for advancement opportunities in the same field of professional specialisation as well as for advancement through a broadening and integration of the original specialisation with other fields of professional disciplines.

The task of the primary level field officer is closely related to specific operational activities undertaken by the small enterprise. A gradual broadening of the small enterprise's activities towards production, sales or administrative control and relevant institutional relationships is one of the extension work tasks entrusted to intermediate level field officers. Capability to deal with the small enterprise as a whole and close involvement in institutional and macro-economic development aspects characterise the task at the level of the general advisory officer.

The structure, operational activities and control of the small enterprise, the extension work techniques, institutional measures and development policies are major subjects for the contents of training programmes. Establishment of new industries is also included as a major group of subjects, because of its special importance to developing countries. This group also includes the subjects of industrial estate development and of establishment of common production facilities.

In the duties of the training officers a similar pattern of concentric task-broadening is distinguishable. In the widest sense of the word training encompasses all forms of transfer of knowledge, including on-the-job counselling and instructions of the field officers to the small industry plant personnel. Training methods and

communication techniques are therefore considered as one of the basic extension work techniques together with tools for diagnosis of plant problems, implementation of solutions and progress evaluation. In addition the extension officer should, to the appropriate degree relevant to his duties, be conversant with the more specialized extension work tools in the field of product and manufacturing technology, plant facilities, marketing and export promotion, financial assistance and co-operative measures between enterprises.

As main types of training programmes it is suggested to distinguish the following types :

- basic training in small industry extension work to prepare suitable candidates with a secondary professional background for primary level functions. Several variations are distinguished;
- basic training in small industry extension work techniques for university graduates and persons with equivalent scholastic qualifications;
- intermediate career development training aimed at developing fully qualified intermediate level officers;
- advanced training aimed at preparing suitable candidates for general advisory, senior specialist and institutional co-ordination functions.

The above-mentioned courses are characterized by a heavy element of practical professional instruction and are aimed at supporting the described career development efforts. They are therefore referred to as career development courses, as distinct from the so-called refresher-training. The latter comprises training courses of short duration providing additional opportunities for the small industry extension workers to remain professionally up-to-date.

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Chapter I  
INTRODUCTION AND SUMMARY

Specialized international training for small industry extensionwork was commenced upon the author's initiative twelve years ago. In the subsequent years several other international training facilities were established in different parts of the world. Such training is also organized in various forms on a regional, bilateral and national scale. For the further development of these training activities it would be desirable if a common conceptual basis could be established internationally regarding the training objectives, selection requirements, professional standards and other related matters. Such a framework is suggested in this paper, which attempts to describe in the second chapter the careerdevelopment possibilities for small industry extensionworkers. Also the basic requirements from a personnel point of view are considered. Subsequently, chapter three outlines the contents of the training, whereas the fourth and last chapter is devoted to the programme-structure and training-methods, which may be considered for training at various levels of seniority.

In the professional ranks four levels are distinguished:

- senior persons responsible for institutional coordination, as the highest level,
- general advisory officers, senior specialists and chief training officers as the next senior level,
- an intermediate level of field-officers and training-officers with full professional qualifications for undertaking small industry extensionwork in specialized fields,
- a primary level of field-officers and training-officers proficient in the use of analytical techniques and in executing predefined small industry extensionwork tasks.

In the analysis of possible careerpatterns the personal development opportunities and requirements are in the first place followed extending from secondary professional education towards primary level extensionwork functions and subsequently to higher ones. Secondly, the stream is followed extending from professional university education towards intermediate level and higher functions. In both instances it would be desirable if the candidates possess several years of industrial experience prior to joining the small industry extensionwork. Also the possibilities are considered of persons joining this extensionwork at more advanced points in the career streams.

From the point of view of professional backgrounds the following main types will be distinguished: technological, economics and cost-accounting, and humanities. The career streams should provide both for advancement opportunities in the same field of professional specialization as well as for advancement through a broadening and integration of the original specialization with other fields of professional disciplines.

The task of the primary level field-officer is closely related to specific operational activities undertaken by the small enterprise. A gradual broadening towards coverage of a major sector of the small enterprise's activities (production, sales and administrative control) and its relevant institutional relationships is to be noted in the extensionwork tasks entrusted to intermediate level field-officers. Capability to deal with the small enterprise as a whole and close involvement in institutional and macro-economic development aspects characterize the task at the level of the general advisory officer. The structure, operational activities and control of the small enterprise, the extensionwork techniques, institutional measures and development policies are from above mentioned tasks identifiable as major subjects for the contents of training programmes. Establishment of new industries has also been considered as such a major group of subjects, because of its special importance to level-upping countries. This group also includes the subjects of industrial estate development and of establishment of common production facilities.

In the duties of the training-officers a similar pattern of concentric task-broadening is distinguishable. In the widest sense of the work training may be seen as to encompass all forms of transfer of knowledge, including the on-the-job counseling and instructions of the field-officers to the small industry plant personnel. Training-methods and communication-techniques have therefore been considered as one of the basic extensionwork techniques together with tools for diagnosis of plant problems, implementation of solutions and progress-evaluation. In addition the extension-officer should, to the appropriate degree relevant to his duties, be conversant with the more specialized extensionwork tools in the field of product- and manufacturing-technology, plant-facilities, marketing and export-promotion, financial assistance and cooperative measures between enterprises.

As main types of training programmes it is suggested to distinguish the following types:

- . basic training in small industry extensionwork to prepare suitable candidates with a secondary professional background for primary level functions. Several variations are distinguished (for short referred to as BP-course-series),
- . basic training in small industry extensionwork techniques for university graduates and persons with equivalent scholastic qualifications. Training in this category is for short referred to as the BU-course-series,
- . intermediate careerdevelopment training aimed at the development towards fully qualified intermediate level-officers (IC-course),
- . advanced training aimed at preparing suitable candidates for general advisory, senior specialist and institutional coordination functions (AD-course).

Above mentioned courses are characterized by a heavy element of practical professional instruction and are aimed at supporting the described careerdevelopment efforts. They will therefore be referred to as careerdevelopment courses, as distinct from the so-called refresher training. The latter comprises generally training courses of short duration and provides additional opportunities for the small industry extensionworkers to remain professionally up-to-date.

**SELECTION, CAREER DEVELOPMENT AND TRAINING OBJECTIVES**

**2.1 Some general considerations.**

**2.11. Task description.**

The main function of the small industry extensionworkers is to render professional services for the improvement and expansion of existing small industries, and for the establishment of new enterprises which will have to become new nuclei stimulating the country's growth. The extensionworker is also expected to contribute, directly or indirectly, to the creation of a favourable development climate and the provision of institutional facilities necessary for the stimulation and support of entrepreneurship. The duties of the more senior extension officers may often also include advice on national development policies relevant to the small enterprise-sector.

**2.12. General qualifications.**

The performance of extension services for existing small enterprises requires an intimate knowledge of the conditions under which small industry operates. It is therefore necessary that extensionworkers have an adequate degree of industrial experience previous to their work with the small industry extension institute. The establishment of new enterprises requires that a broad and comprehensive range of activities are to be performed. Besides professional and industrial experience, good organisational and executive abilities are needed for undertaking extensionwork in this field.

As small industry can only afford a very limited professional specialisation within its own organisation, it must to a large extent rely on the extensionworkers to act as the professionally specialised staff common to a number of enterprises. This aspect logically links up with the earlier mentioned duties of extensionworkers for developing suitable environmental conditions facilitating small industry development. The extensionworker, and especially those in more senior functions, must therefore not only be able to solve specific plant problems but must have also the interest and ability to institute collective improvements.

From the above description it will be clear that except for professional qualifications and industrial experience, the extensionworker must also possess specific personality-requirements. These aspects are considered in sections 2.2 and 2.3.

**2.13. Possible contributions of training.**

In the developing countries, where a general shortage of trained and industrially experienced personnel prevails, a large discrepancy may often be observed between the actual capabilities of the extension-officers and the tasks designated to the small industry extension or development institute. In order to meet the assigned tasks, more often than not, unqualified personnel is engaged. As a

consequence the effectiveness of the extension work is seriously impaired; in certain instances even to the degree that the usefulness of the small industry institute as a whole may be taken in doubt. It is therefore desirable to limit as much as possible the scope of extension activities to those functions only, for which the institute's staff can bear a reasonable degree of professional responsibility. Only under such conditions training of the extension-workers may be expected to contribute effectively to the improvement and expansion of the institute's activities. In other words, training should not be considered as a cure for structural inadequacies in the institute's set-up, but as a means for improvement of existing skills and for accelerating the development of potential capabilities.

Training may also be applied for reorientation of the staff of an existing institute to meet evolutionary changes, which can be foreseen in the institute's task. This type of reorientation-training should constitute part of the normal activities of the small industries extension institutes itself.

Through special courses the forming of new small industry extension-workers may be accelerated thus providing some relief to the basic shortage for experienced personnel. These courses should however be of such a nature that professional skills and practical experience can be imparted in an effective manner.

## **2.2 Professional qualifications and career development.**

### **2.21. Professional background and qualifications.**

From the point of view of professional backgrounds three major streams may be distinguished: i. e. extensionworkers with (a) a technological education and experience (b) a background in economics or cost-accounting and (c) a previous education and experience in the field of humanities. In each stream three types of formal educational qualifications may occur. The first type relates to academically qualified persons. The second type concerns persons with secondary scholastic qualifications. As third type the autodidact (or selfmade man) may be recognised. The latter may often develop himself to a level comparable with the secondary scholastic or academic qualifications. Personal abilities rather than formal educational awards should therefore be used as a guide for the selection of extensionworkers.

### **2.22. Major types of professional functions.**

In the organisational structure of relatively large institutes up to four levels of seniority can generally be distinguished. The first level will be called the primary level. It relates to the field-officer who is engaged in the analysis and day-to-day assistance to the supervisory plant-personnel of small industry and to the training instructor. These officers will generally have secondary scholastic qualifications or may be autodidacts with comparable experience and professional abilities. The second level of seniority would be the intermediate field-officer, who may be a person with academic qualifications and several years of industrial experience. This level also includes the more senior training-officers. The third level is

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the general advisory-officer who must be an experienced senior person capable of directing activities covering various fields of professional specialization. Senior specialists and chief training officers may also be ranked at this level. As the most senior type the persons responsible for institutional coordination may be distinguished.

In the annex a detailed specification is contained of the functions mentioned above and also of the possible team-formations; services rendered and other aspects related to activities and organization of small industry institutes in the developing countries.

### **2.23. Professional development during career.**

The distinction of seniority levels is to a large extent interwoven with the pattern of professional specialities. In the primary level the largest differentiation into specific techniques and skills occurs. In the development towards more senior levels two major directions can generally be distinguished. The first direction is the broadening of the original specialization to cover other fields of professional disciplines. This direction may extend up to the level of institutional coordinator. The second direction follows more strictly the path of the original professional occupation extending towards higher levels of expertise in the same field. These functions ultimately lead to the post of senior specialist. The individual characteristics of the extensionworker, and the manner in which his personality evolves in the course of years is the major factor for determining in which of the two directions he may develop himself best. If, through courses and also by on-the-job experience, training can be logically geared to the natural evolution of these career-streams, it can make the largest possible contributions.

## **2.3 Personality of the extensionworker.**

### **2.31. Interest for small industry development.**

The small industry extensionworker in developing countries must have a basic belief in the positive contributions of small industry towards the development of his country's economic progress. This belief must be founded on a clear recognition of the specific functions and comparative advantages of small industry in a developing economy. One of the main aspects is, for instance, the creation of a wide basis of many small nuclei from which, as evidenced by the industrial history of other countries, important future industries may develop. Small industry moreover may provide an important contribution towards developing a national cadre of industrial entrepreneurs. These are only some of the many aspects which give significance to the role of small industry in the industrialization of developing countries.

### **2.32. Intellectual abilities.**

The extension activities for small industry in developing countries require a high degree of inventiveness of the extensionworker, a capability to diagnose rather rapidly the situations and problems encountered and to develop solutions with the often very limited means of the small enterprise concerned. The extensionworker must

have a pragmatic outlook and the organizational ability, interest, tact and sense of responsibility to carry through his solutions. Intellectually, the extensionworker should be well above average. Furthermore a systematic manner of approach, proper manner and power of expression are important personal assets to the extensionworker.

**2.33. Character and disposition.**

The extensionworker must meet high standards of integrity in character in order to be able to gain and maintain the confidence and respect of the small industries assisted by them. Objectivity in judgement, emotional stability and perseverance are other essential characteristics. He must possess a good amount of initiative and yet also the restraint to confine such initiatives to objects with practical usefulness to the enterprise concerned. Furthermore it will prove to be advantageous to the extensionworker if he has an above average pace of work.

**2.34. Health and physical condition.**

Physically, the extensionworker must be able to withstand itinerant work often coupled with long working days. For assisting small industries in rural and sometimes rather inaccessible locations, the extensionworker must be able to adapt himself and live under relatively primitive conditions. Good health and physical fitness are therefore essential.

### Chapter III

## CONTENTS OF TRAINING PROGRAMMES

### 3.1 Scope.

The structure and operational activities of the small industrial enterprise, the extensionwork techniques both for assisting small industries as well as establishment of new ones, and the relevant institutional services and development planning aspects are the major elements which constitute the contents of training programmes for small industry extensionworkers. The training objectives pursued will determine the contents of specific course-programmes, the emphasis, extent and manner of presentation, and also whether practical fieldwork training is to be incorporated. These aspects of the course programming are elaborated in a separate chapter. The following sections deal chiefly with a description of the course-contents.

### 3.2 The small industrial enterprise.

#### 3.21. Its structure, product- and -services-programme.

Small industry +) performs a number of specific functions in the economy of developing countries. In the first place it provides for a broad range of consumer goods, whose manufacture is not, or not yet, feasible in larger scale due to shortage of certain production-factors or to restricted market demand. Relatively low levels of purchasing power and difficulties in transportation and communication are some of the factors causing market restrictions, which may be gradually removed as the country's economy progresses. Simultaneously this progress provides to the small industry the opportunities to grow into larger undertakings. In this manner small industry performs a vital role in the construction of a sound industrial structure. It provides, more than any other sector, the possibilities to initiate industries under conditions where market opportunities are limited and risk capital, industrial skills and managerial talents are scarce. In this connection its significance is also to be recognised as a training ground for developing a national corps of industrial leaders.

The same considerations apply to small industries manufacturing products for industrial use, such as packaging materials, tools, specialised equipment and other types of industrial supplies. The manufacture of components, either as a standard product or on a subcontracting basis, is another important function which small

+ ) Note: Small industry is considered here as an industrial sector distinct from handicrafts (where the patron participates in the productive work) and cottage- or household-industries (with workshop at home and not in a special industrial location). Compared with medium-sized and larger enterprises small industry has a simple line-organization structure.



industry performs. The subcontracting function may also relate to the performance of specialized manufacturing operations, which could under the prevailing conditions otherwise not be undertaken. Small industries thus provide also a certain contribution to the advancement of technological specialization in the national industrial structure.

The undertaking of repair services is another typical function undertaken by small industries. Often these repair services and some of the subcontracting and industrial supply undertakings are an out-growth of traditional craftsmanship. This is in certain instances also the case with small industries in the consumer products sector, such as garments and bakeries. Many of the latter consumer product industries have however developed as a back-integration from the sector of trade and commerce.

The technical or commercial origin is a major factor dominating the structure and overall business practices of the small industrial enterprise. The limited scope of the undertaking causes that individual capacities and shortcomings of the persons owning and guiding the enterprise are fully decisive for the development potential and success of the small enterprise. This factor also indicates the importance of management training in the small industrial sector, and of overall guidance by the extensionworker on matters of business policy and enterprise-structure. As the small enterprise often represents the full possessions of the owners and, frequently through informal arrangements, also important financial contributions entrusted by relatives and friends, the counseling on these overall matters are of vital importance and involve a very heavy responsibility for the extensionworkers. This type of plant-extension activities should therefore only be entrusted to highly experienced persons of the general advisory level (see section 2. 22. and annex).

### **3. 22. Its operational activities.**

In the operational activities of the small industries three major fields will be distinguished (a) the design and development of products and services, (b) the manufacturing activities and (c) the sales activities and customer-contacts. The aspects of managerial cost- and administrative control which concern the small enterprise as a whole will be considered in a separate section (see section 3. 3).

#### **(a) The design and development of products and services -**

The capabilities of the enterprise find expression in the quality and costs of the products or services rendered. To the small industry with its very limited staff resources care for these aspects will to a large extent rest with the owner himself (or the technical manager in case of a multi-person direction of the enterprise). Fostering of the technical ingenuity and inventiveness within the enterprise's organization is a major task which is to be rendered in the extensionwork. It not only involves the design and/or specification of the products and services, but generally also the development of appropriate production-techniques. Availability to the extensionworker of prototype design and workshop facilities will often be advantageous. Such facilities will also be desirable when assistance is given in developing for the local market products under a foreign licence.

- (b) The manufacturing technology and production activities -  
 Under this heading the agglomeration of activities is considered concerned with the purchase and supply of raw materials, its stocking, its transformation to end-products during different stages of the manufacturing process until it is ready for delivery to the customer (In case of services rendered, it concerns a similar series of activities). Choice of manufacturing technology and of the related equipment, its maintenance and upkeep, the provision of tools and other supplies required for the production, and also its appropriate utilization are aspects of the supervisor or manager in charge. Compared with the situation in industrially advanced countries the production supervisor has to take into consideration that material and equipment costs are relatively more costly, skilled labour in shorter supply and unforeseen shortages, power breakdowns and similar disturbances occur with a larger frequency. These problems will have to be solved within the relatively limited means of the small enterprise. Good costing is especially under the described conditions one of the most important tools for the production manager, who must further have an intimate knowledge of the essential production operations in the small workshop and the correct personality to direct and obtain the best contributions of his personnel. Furthermore methods-improvement and ability to embody such improved methods in self-made tools and auxiliary equipment are important.
- (c) The sales-activities and customer-contacts -  
 In small industries manufacturing for the industrial market and service-industries, a direct contact with the end-users exists. In the consumer goods sector sales will generally have to be made through wholesalers and retailchannels. The enterprise-enduser-relationship is therefore mostly an indirect one and the sales and distribution activities relatively more complex. Pricing and development of distribution-channels are key-elements for the improvement of the sales activities. Cooperative efforts may provide a further strengthening and may be also especially important in the export field.

The overall guidance of above mentioned operational activities will generally constitute the major task of the small industry manager. The major tools applicable for control are considered in the next section.

### 3.23. Its cost and managerial control.

Appropriate cost control takes such an important place for the managerial guidance of the small enterprise, that it deserves special consideration. At the same time it should be recognised, that it is in the developing countries one of the most difficult extensionwork fields. The obstacles are not only of a technical nature, but very much concern the basic confidence relationship between small industrialists and extensionworkers. Moreover environmental conditions are often such that the professional function of the extensionworker has not yet been fully recognised. Nevertheless, much useful work can be undertaken. This concerns, for instance, the development of

suitable standard cost-control schemes and their promotion through training and, possibly, through plant level assistance during initial installation. Order-costing and liquidity-control are some other important elements in the field of financial controls. In the case of supervision of credit facilities cost-controls may further be instituted as a necessary prerequisite.

The managerial controls further include personnel aspects of which recruitment, discharge and good working conditions are the most essential. Programmed instruction may open new possibilities to solve training problems in view of the rather limited numbers of personnel in the small enterprise.

### **3.3 Basic small industry extensionwork techniques.**

#### **3.31. General task requirements.**

Knowledge about the small industry and professional subjects alone do not suffice. The extensionworker must, moreover, be proficient in special extensionwork techniques. These techniques concern his special responsibilities to diagnose problems, present the solution and provide the necessary instructions for follow-up. Furthermore training and communication techniques are important.

The execution of the extensionwork also requires a special attitude, which will have to be developed (after the candidates have been selected and found to have adequate potential qualities). This attitude should be based on a genuine interest and constructive problem-solving approach. It should inspire confidence and generate informal authority from professional competence without trespassing, consciously or inadvertently, the prerogatives of the company's personnel. The extensionworker should moreover have an openminded disposition so that a maximum degree of objectivity can be attained. Yet, the extensionworker must be able to express his recommendations, quite specifically, so that they can be implemented, once the management has given its accord. It is evident that the development of abovedescribed attitude requires, except for training, also a molding and enrichment through years of actual practice.

#### **3.32. Tools for quantitative diagnosis of plant-problems.**

The diagnoses of plant-problems are to be based on quantitative data, which may be obtained partly from the administrative records of the enterprise and partly by direct observation or by interviews. The methods of data collection, their sampling, analysis and interpretation are basic proficiencies which each extensionworker must possess. In small industries where administrative records are relatively simple the necessary data will have largely to be obtained from direct observation and interviews. This disadvantage is counter-balanced by the compactness of the small enterprise, which enables the extensionworker to obtain a comprehensive picture of the situation in a relatively short period of time.

By major field of enterprise-activities the most important quantitative tools for diagnosis of plant-problems are:

- . sales and distribution: analysis of sales records,

- customer-contacts and distribution channels - forecasting,
- . product design and development: productwise profit-  
and -cost analysis, value engineering,
- . manufacture: workstudy - quality control - production  
planning - maintenance,
- . managerials controls: accounting and bookkeeping -  
cost analysis and liquidity control - analysis of  
personnel-capabilities.

In addition special methods have in the course of the years been developed for overall plant-diagnosis of small enterprises.

Basically, the problem-solving approach should lead the extension-worker to the development of alternative solutions, which should be within the means of the small enterprise and should each be assessed on their cost-benefit aspects. To facilitate the decision by the company's management the presentation of possible solutions should include a clear priority rating to those solutions which are expected to yield the maximum results.

**3.33. Implementation of solutions and progress-evaluation.**

Transfer of knowledge and guidance during the implementation of solutions require special skills of the extensionworker. For adequate transfer of knowledge the extensionworker must be adept in round-table discussion methods and job-instruction techniques. The former concerns the transfer of conceptual ideas, whereas in the job-instructions the specific tasks of the plant personnel for the implementation of solutions are elaborated. The job-instructions also require that the extensionworker is able to foresee major obstacles in the context of the work of the persons concerned and that he has consequently provided for an appropriate manner to overcome these difficulties. Furthermore scheduling of the implementation and periodic evaluation of the obtained progress is essential. All these aspects cause temporarily a larger degree of personal involvement of the extensionworker in the day-to-day activities of the enterprise. Its successful undertaking furthermore requires a large amount of tact and persuasive skills.

**3.34. Training-methods and communication-techniques.**

Besides the job-instruction and communication-methods described in the preceding section (3.33.) the small industry extensionworker should also be acquainted with group training methods, visual aids and mass communication techniques. These techniques are themselves a field of specialisation for the training-officers, but should also be common knowledge to all extension-officers, as they may often be called upon to provide instruction in training programmes. Moreover, the small industry extensionworkers in developing countries will often have to operate on their own or in small teams in rather remote or isolated locations. Besides plant consultations, public speaking will at such duty-tours frequently be an element of their work. When this is done to an audience with relatively little formal education the use of good visual aids may much contribute to the effectiveness of these extension-efforts.

### 3.4 Establishment of new small enterprises.

#### 3.41. Feasibility analysis and industrial location studies.

The establishment of new industries in developing countries a major task, at least equivalent in its importance to the improvement of existing enterprises. The work involved calls for additional extensionwork-techniques than mentioned above, and which may be grouped under two major headings, i. e. feasibility analysis and industrial location studies (to be considered in this section) and plant design and construction (see section 3.42.). Furthermore as collective assistance to a group of small enterprises the establishment of industrial estates (see section 3.43.) and of common production services (see section 3.44.) will be considered.

The feasibility studies and industrial location studies are to identify opportunities for establishment of new industries in the small-scale sector, to determine its product for service-programme, its scope of initial activities, the most suitable plant location, the required investments and personnel, and also its development potential. Often the extensionworker is to consider the availability of financial support or other facilities, which are available to the small entrepreneur. The comprehensive nature of these studies generally requires the execution by a team with interdisciplinary structure rather than by an individual extensionworker.

#### 3.42. Plant design and construction.

This heading is meant to comprise the whole range of activities from design of the new plant, the arrangements and supervision for its construction (building and machinery) as well as the assistance during the initial operation of the enterprise. These duties are, as mentioned elsewhere in this paper, preferably to be entrusted to a special extension-group. The matter should however also be considered as part of the basic orientation-training of all plantlevel extensionworkers.

The main subjects to be covered in the training are design of plant layout and arrangement of production-facilities, construction plans for standard industrial buildings suitable for small industries, related costing aspects and scheduling of plantconstruction (e. g. application of network analysis). Furthermore it may be important to study the development and use of well-prepared "model-schemes" to promote establishment of new industries.

#### 3.43. Industrial estates.

Economics in the provision of infrastructure facilities for smaller industries and other advantages can be obtained by the establishment of industrial estates (i. e. areas specially developed for locating industrial plants, and providing road- and other transport-facilities, electric power- and water-supply, waste disposal and other facilities). The construction of ready-made workshop buildings on the estate may be inducive to entrepreneurs planning to start a small industry. Such workshop buildings may, moreover, be given in rent, thus reducing for the small entrepreneur the required amount of initial capital investment. To assist the small entrepreneurs an extension-unit may be established on the estate and common production facilities (see section 3.44.).

The estates may furthermore perform an important function in the overall physical planning of the area and may in this manner be considered as a tool related to the more macro-economic responsibilities of the small industry extensionwork. Whenever adequate housing of workers and similar social aspects are to be considered it would be desirable to extend the industrial estate project to an industrial community plan. Also other combinations of functions are possible, such as the establishment of industrial export processing zones.

**3.44. Common production facilities.**

Efficient common production facilities may constitute an important instrument for the development of a geographical concentration of technologically affiliated small industries. A galvanizing plant or a heavy forge shop may, for instance, be such a common production facility to metal industries. Similarly a wood treatment plant or a dye-plant are examples of common facilities for the timber industry or the textile industry. These common-production-facilities may make introduction of specialized technological skills possible under conditions where the individual small industry cannot yet afford to do so, but which may be economically justifiable on a collective basis. Initial investment and initial operation risks are often to some extent born by public funds available to the small industry extension-institute. It is however, often highly desirable that as soon as possible the common production facility should be made into a self-supporting and even profitable venture.

**3.5 Specialized institutional services.**

**3.51. Technical information, troubleshooting design and manufacturing of prototype products.**

In addition to the above mentioned extension-activities with a direct plantlevel nature, the promotion of small industry requires a certain amount of institutionalized services. It should however be recognized that these services often cause considerable overhead burdens and should preferably only be instituted when their costs can be adequately underwritten by contribution and subscription fees from industry.

In the technical field it may be considered to provide for a competent technical troubleshooting, inquiry- and answer-service, and also the capability of designing and manufacturing prototype (possibly linked with licensing arrangements for foreign products). These technical extension-services for small industries should preferably also consider the undertaking of effective liaison between the individual enterprises and (external) technological research institutes as a major task.

**3.52. Marketing and export promotion.**

The institutional services to small industry in the field of industrial commerce may include one or more of the following tasks: detailed market information, as well as providing specific detailed information on public tenders, export opportunities and other types of trade-information. In addition the services may include the undertaking of

market survey and more specific market research for certain types of products. As often important differences exist between the product-quality appreciation between domestic and export markets, it would be to institute an effective quality-inspection on exported goods (it would usually be desirable to establish such an inspection-facility as an organizational entity separate from though closely in collaboration with the small-industry extension-institute).

**3.53. Management and technical training.**

As has been indicated earlier training is to be considered as a major task of the small-industry extension-institute. It may involve management and supervisory training and mobile demonstrations of certain product designs, manufacturing-techniques, plant-safety practices and other matters which can be physically displayed. Vocational training requires a rather extensive outlay of machinery and it may generally be considered as to be undertaken by separate vocational training schools with whom the small industry extension-institute should maintain close liaison and, preferably, develop cooperative programmes. The extension-institute may itself also undertake other technical courses, e.g. concerning blueprint reading, packaging techniques, and similar subjects.

**3.54. Financial assistance and hire-purchase-schemes.**

Inadequate financial resources and insufficient understanding of industrial investment and costing matters are serious difficulties hampering the progress of small industries. To meet their financial credit needs special institutional arrangements are necessary, because of the relatively high cost of handling small loans, and of the necessity to investigate credit applications and to supervise the use of loans. The latter field may, as mentioned in section 3.2, be part of the responsibilities of the small industry development institute.

The shortage of adequate collateral has furthermore lead to the establishment of hire-purchase-schemes for productive machinery. Such schemes are in particular also important when the machinery purchase involves foreign exchange.

**3.55. Cooperative measures between industries.**

The extensionwork to small industries in developing countries often entails the undertaking of organizational measures to advance the cooperation between enterprises. Such cooperation may, for example, concern the establishment of a common production facility (see section 3.44.) as a joint enterprise, or the establishment of a cooperative purchasing agency or export promotion organization. In rural areas the establishment of industrial enterprises on a cooperative basis (e.g. dairy product-plants, cardboard factory using agricultural waste-materials, etc.) may further constitute an important element of the small industry extensionwork.

**3.6 Development planning.**

**3.61. The macrophase of small industry development planning.**

The macrophase includes the consideration of the functions and possible contributions of small industry to the national income, its total

investment requirements, consumption, imports and exports and other characteristics. Various alternative courses of action are to be evaluated and, at the government level, decisions must be taken on the volume of resources and type of facilities which will be apportioned to the small industry sector. A further detailing of the macrophase in branchwise and regional plans is generally necessary.

**3.62. The branchwise planning phase.**

This phase involves the breakdown of the macro-economic factors into branchwise figures. It implies the allocation of priority to certain branches, which during the planning period concerned are expected to render the major contributions to the national economy. It may also involve the stimulation of a specific development within a certain branch, e.g. the adoption of labour-intensive methods, the increased use of locally available raw materials and components, the stimulation of suitable export products or similar factors.

**3.63. Regional development planning aspects.**

As small industry has a distinct local function to perform, it is desirable that the macro and branchwise considerations are integrated with regional development targets. These may be expressed in terms of number of new enterprises, new employment opportunities created, etc. and also in the establishment of physical and institutional facilities, such as industrial estates, common production facilities and specialised institutional services. These regional targets will allow also the future evaluation of the impact and contributions which small industry has made to the local economy.



Chapter IV  
PROGRAMMES AND METHODS OF TRAINING

**4.1 Main types of training-courses.**

Interlinked with the career development patterns of small industry extension-officers and, preferably programmed at least one phase ahead of actual promotion, a series of training courses can be projected. These courses will be referred to as career development courses. The pattern of interrelationships between courses and extensionwork functions is shown in attached diagram. Distinguished are:

- basic training in small industry extensionwork to prepare primary level-officers (reference in diagram BP-course-series, subdivided into plant extensionwork and training, see also section 4.2),
- basic training in small industry extensionwork for university graduates (reference in diagram BU-course-series, see also section 4.3),
- intermediate careerdevelopment training (reference in diagram IC-courses, see also section 4.4),
- advanced training (reference in diagram AD-course-series, see also section 4.5).

It should be noted that the main contribution of training is the development of potential or latent skills and talents. Training cannot replace the necessity for selection. Though geared to careerdevelopment, the training should neither be considered as the only and sufficient requirement to qualify for promotion. The latter may also depend upon the number of actual posts available. A more or less balanced situation between trained candidates and available posts within the foreseeable future is obviously desirable in order not to create undue expectations.

The careerdevelopment courses will also have to take the possibility into account that persons from other sectors of the society may join the small industry extensionwork at intermediate and even advanced points in the career-stream. Furthermore, in addition to the careerdevelopment courses the small industry extensionwork also requires support from a refresher training (see section 4.6). This refresher training may take the form of short duration courses, or of a programme of periodic meetings conducted at the small industry extension-institute itself.

The training is also applicable to government officers or other persons (e. g. special officers of research institutes) engaged in small industry development.

**4.2 Basic extensionwork training for primary level field-officers and training-officers.**

**4.21. Types of training programmes and premises.**

These training programmes are aimed at developing suitable candi-

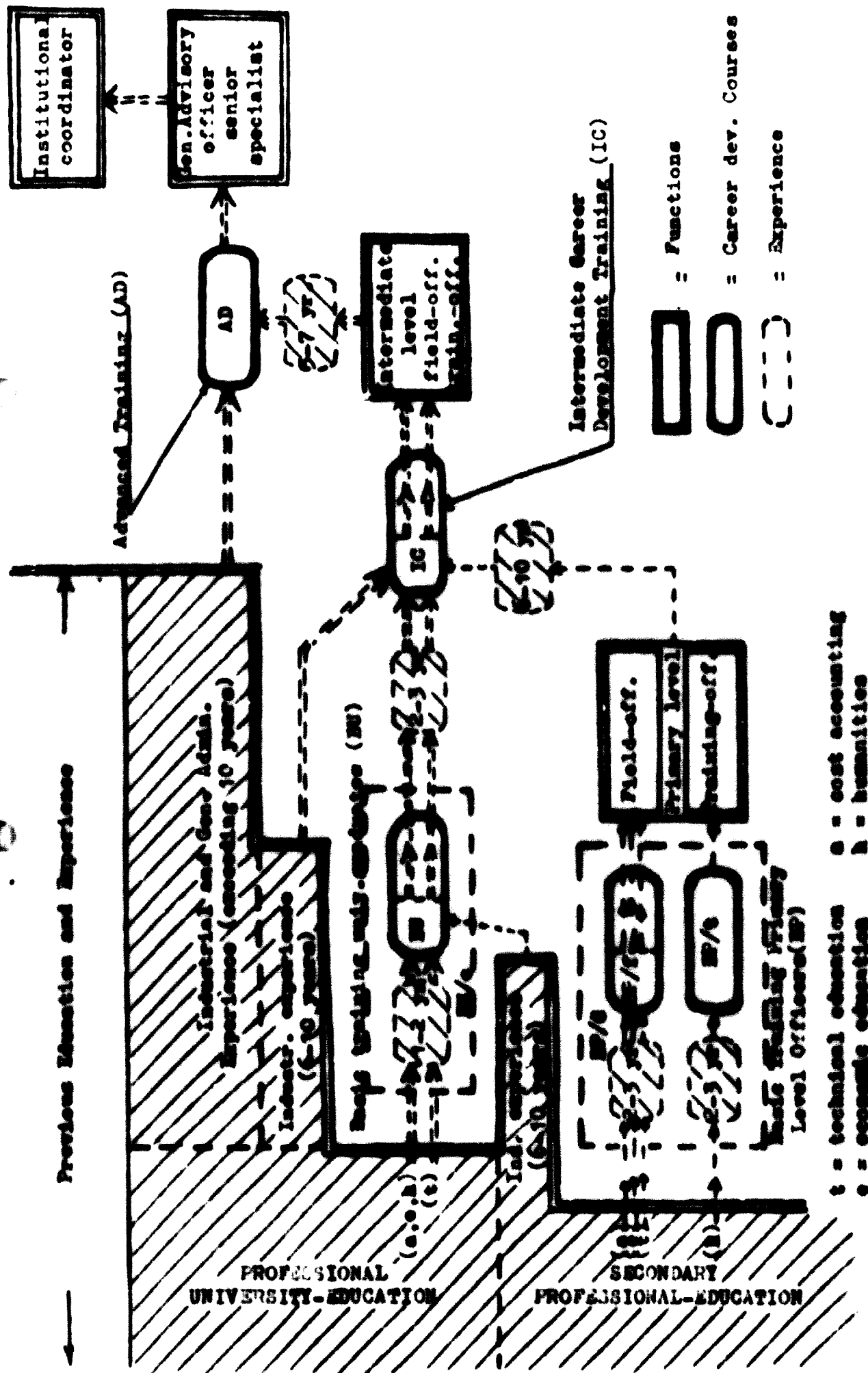


DIAGRAM - CAREER DEVELOPMENT COURSES  
SMALL BUSINESS FINANCE OFFICERS

dates with a secondary professional education into primary level extensionwork officers. The secondary professional level may, in general terms, be defined as about 12 years beyond the entrance to primary school, including at least 3 years of full-time professional education or its equivalent. As a certain degree of personal maturity and of professional and industrial experience is required, the candidates should be at least 22 years of age and should have worked in industry for a minimum period of 2 to 3 years. These are minimum requirements. Preferably the candidates should be more experienced persons up to 35 years (including also persons who have gained an equivalent general knowledge through self-education).

For the field workers three types of professional backgrounds are of main interest, i. e. technical (leading to primary field-officers engaged in matters of manufacturing operations, production-organisation and/or product design) cost-accountancy (mainly bookkeeping and cost-control matters) and economics (mainly for matters in the field of sales). In addition suitable candidates with a general secondary education and a pronounced professional interest for the field of humanities may be considered for development into training- and personnel-officers.

Basically, two major training programmes can be distinguished for the above described persons:

- basic training in field-extensionwork for small industries (see section 4.22.),
- basic training in personnel development and training-methodologies suitable for small industries (see section 4.23.).

Furthermore some considerations are given (in section 4.24.) to the situation where professionally qualified personnel is extremely scarce.

#### **4.22. Basic training for primary level small industry field extensionwork (2 1/2-course).**

To develop adequate competence in the extensionwork skills required on the primary level, a training period of 12 to 15 months is required. At least half of this time is to be devoted to practical instruction in industry, with the other half reserved for theoretical instruction and related practical exercises at the training establishment.

The core of the training (for instance 70 to 75% of the whole period) should be directed to the development of professional skills immediately related to the field in which the extension-workers are expected to devote their efforts (i. e. manufacture, production-organisation or product design for the technical stream, costs for the cost-accountancy stream, and sales for the economics-stream). Above mentioned practical instruction-in-industry should be integrated with this major part of the training. The training is to lead to proficiency in the application of the relevant analytical tools (see section 3.32.), progress-evaluation and job-instruction-techniques (see section 3.33.).

The extensionworker trained in a particular stream should also gain a general appreciation of the fields of work of the other two streams. In addition a general insight is required of the structure of small industry, its specific problems and a general understanding of the infrastructure requirements, institutional measures and other development policies and efforts.

- 4.23. Basic programme for primary level training officers (BP/t-course). Instruction towards proficiency in group-communication- and personnel-development techniques characterizes the structure of these programmes. Special emphasis is to be given to these techniques and fields of application (e.g. visual-aids, mobile demonstration, etc.) which are important to small industry development. A total training-period is envisaged of 6 to 8 months, of which at least half is to be devoted to practical instruction in the field. In addition this training is to include a good understanding of both the small industry itself as well as the institutional and development efforts which are undertaken by the small industry extension-institute. Furthermore a general appreciation of small industry development policies is desirable.

- 4.24. Combination-programme for professional and small industry extensionwork training (primary level officers, BP/c-course).

The abovedescribed types of specialized extensionwork training may be directly applicable in larger countries, which have a relatively developed educational system. In smaller countries or in the younger countries, where the educational system is still in an early stage of construction, it may be necessary to develop the basic training for primary level small industry extension-officers on a somewhat different basis. In these instances, a programme can be envisaged of somewhat longer duration and composed of three major parts.

The first part would be a general part, common to all candidates and would aim at developing a general occupational orientation by providing a comprehensive general understanding of small industry (see section 3.2 for description). When the candidates have no previous industrial experience this part should also include a substantial period (e.g. 4 to 6 months) of trainee-employment in an industry.

The second part would aim at developing a certain degree of professional specialization according to the various streams mentioned earlier, and comprise a somewhat accelerated instruction in those subjects which would otherwise have been provided by the secondary professional education.

The third part would be chiefly directed towards extensionwork practices and the integration of the previous two parts into field extension or training activities for small industries. The specific subjects concerning extension activities need, of course, not be exclusively reserved to this third part. It would on the contrary be desirable if an understanding about the role of the extensionworker and the activities of the small industry extension-institute can be imparted from the beginning and that the last part can be heavily concentrated on practical proficiency in the extensionwork techniques.

A more exact analysis of the development conditions is required for specifying the programme for such a training, which might for smaller countries also be undertaken on a regional basis. In most cases a minimum duration of two and half to three years (including the periods of practical experience in industry), may be necessary.

#### **4.3 Basic small industry extensionwork training for university graduates.**

##### **4.31. Premises.**

The main objective of this training programme is to impart basic extensionwork techniques to persons with a university education and several years of industrial experience. Also well qualified persons with a secondary professional background and extensive industrial experience (e. g. 8 to 10 years or more) may be considered for this training.

The main structure of the training-programme is described in the next section (4.32.). In order to provide for situations where the supply of candidates is chiefly restricted to fresh university-graduates, some annotations are made in section 4.33. concerning the possibility of instituting special programmes to meet such limitations.

##### **4.32. Basic training programme (intermediate level officers, BU-course).**

When the candidates have previously acquired sufficient industrial experience their basic training into intermediate level extension-officers can generally be undertaken in a period of 6 to 8 months. In the structure of this programme two interlinking concepts may generally be distinguished.

The first conceptual element concerns the development of insight and understanding of small industry and of proficiency in those matters logically related to the candidates' professional background. Development into three or four major specializations can in this connection be foreseen, namely manufacturing technology and production-organisation (possibly also product-development) for those with an engineering background, cost control and economics for those with an economic background and training and personnel development for those with a special aptitude for these matters. Throughout above-described instruction and also as separate subjects of training, the specific extensionwork skills should be imparted. For this purpose the programme should provide in a substantial way for periods of practical exercises as well as practical instruction in industry (possibly as much as 15 to 20 and 50 to 60 per cent, totalling 65 to 70 per cent of the available time).

The nature of the subjects have been described in the previous chapter. The programme is to emphasize in particular the extensionwork techniques (see section 3.3) and their application to relevant sectors of the operational and control activities of the small enterprise (section 3.22. and 3.23.). Furthermore a general appreciation is needed of the structure of the small enterprise (section 3.21.) and the role of the extensionworker in the overall small industry development process. Furthermore all university level extensionworkers should be conversant with the group-training, - communi-

cation and personnel development matters (These have constituted a separate specialization for persons with a secondary educational background).

The practical training in industry should be structured in such a way that the candidate has experienced the full cycle of analyzing a certain problem, developing possible solutions, implementation of the solution and (periodic) evaluation of the results achieved.

**4.33. Combination-programmes (for fresh university graduates, BU/c-course).**

When the supply of candidates with adequate industrial experience is limited, it will be necessary to provide for a training programme with a longer duration. The programme should include at least a practical period of 8 to 12 months covering different types of industrial experience, such as a trainee-employeeship in a technical as well as non-technical function in preferably more than one industrial enterprise in addition to abovedescribed practical in-industry-instruction in extensionwork. Whenever desired, the whole training-programme may be structured as a sandwich-course with alternate periods of theoretical instruction plus practical exercises on the one hand and of in-industry-work on the other hand. The total duration may for such programmes vary between 15 and 18 months.

**4.4 Intermediate careerdevelopment training.**

**4.41. Premises.**

The intermediate level training is aimed at the development towards fully qualified intermediate level field- or training-officer. University graduates which have undergone the abovedescribed basic training (see section 4.3) and have gained 2 to 3 years of extensionwork experience will have to find in this intermediate level training the possibility to gain full professional qualifications in the technical, economic or training aspects of the extensionwork. This should include the capability for diagnosis of company-problems related to the field of specialisation concerned. According to the pattern assumed in the previous section this level could for university-graduates be reached at about 30 years of age.

To this intermediate level training also other persons may be admissible, e. g. university-graduates with 6 to 10 years of experience and who have gained in industry a responsible function. They must obviously possess the specific personal qualifications required for extensionwork and described in chapter 2. The intermediate level training may also provide the possibility for competent and experienced (e. g. 5 to 10 years) primary level officers to qualify for promotion towards the intermediate level.

**4.42. Structure of the programme (IC-course).**

The intermediate level training is envisaged as to have a duration of 4 to 6 months.

The programme is to cover in particular the subjects classified

under the headings the small industrial enterprise (section 3.2.), the extensionwork techniques (section 3.3) as well as the establishment of new small enterprises (section 3.4) and institutional measures (section 3.5). A general appreciation of the whole field is needed, and also an understanding of small industry development policies (section 3.6). In its structure, the programme should however particularly aim at intensive specialized instruction along the major types of professional activities at the intermediate level as described earlier. The engineer must, for example, find provision for specialized study of product design and production matters, related extensionwork techniques, technical aspects concerning the establishment of new industries and industrial estates, the role of technological research, information and other institutional measures. Similarly, the economist must find provision for concentrated study of costs, sales and financing problems of small industry, the economic aspects of feasibility studies and related institutional matters in the fields of special credit facilities, market- and export-promotion. These studies along specialized lines should be geared to the analysis of case-studies and practical plant problems.

The practical fieldwork should also contain as a major element the methods for effective guidance of small extensionwork-teams in order to prepare the intermediate level officer for supervisory responsibilities in his collaboration with primary level extensionworkers. In the field of training the design of training- and demonstration-programmes may be a particular subject to emphasize.

**4.43. Suitability for regional action.**

The intermediate level extensionwork-training requires a relatively high calibre of instructional facilities. Except in a few very large countries it may therefore be particularly suitable for establishment on a regional basis. In view of the practical instruction requirements, such regional training activities should preferably be located in areas where national small industry development programmes are actively under way.

**4.5 Advanced training.**

**4.51.** The advanced training is aimed at preparing suitable candidates for the general advisory, senior specialist and institutional coordination functions. These functions are the final series of steps in the careerdevelopment pattern described in chapter 2. The functions generally extend 5 to 7 years beyond the intermediate level.

Candidates with other backgrounds, e.g. general managers of industrial enterprises and senior government officials with equivalent standing but no experience in extensionwork, may through this advanced training also be prepared for these senior extensionwork functions (possibly after a special preparatory orientation).

**4.52. Programme-structure (AD-course).**

The training is to be basically structured as a training-course of, for instance, 6 to 8 weeks. It may be composed of, firstly, a refresher on small-industry problems (section 3.2), extensionwork

techniques (section 3.3) and establishment of new enterprises (section 3.4) and, secondly, of a thorough analysis and treatment of subjects directly related to business policies (section 3.21, and also overall diagnostic tools of company-problems), comprehensive feasibility analysis (section 3.41.), role of the extensionworker (section 3.31.), and general development planning (section 3.6).

Much attention should further be given to the guidance of extensionwork teams, the design and evaluation of promotion programmes as well as matters of an institutional nature (i. e. internal administration of the work of the small industry extension-institute and coordination of its varied external relationships).

The programme should be deliberately focussed on fostering broad mature judgements. To this end an international environment may provide important indirect contributions. These types of advanced small industry development courses are therefore particularly suitable to be undertaken regionally and internationally.

#### **4.6 Refresher-training and internal training at small industry development institutes.**

Supplementary to abovedescribed careerdevelopment training, the rapid changes affecting industry will pose on the extensionworker a distinct requirement to keep himself up-to-date, or rather ahead of the actual situation. These training-requirements can be partly fulfilled by individual reading. In these needs may also be provided throughspecialized and refresher courses of short duration (e. g. ranging from a few days to a few weeks).

The refresher courses are basically subject-oriented (in contrast with the extensionwork orientations in the careerdevelopment courses). Suitable subjects for refresher courses to small industry extensionworkers are, for instance, the technological developments in a particular branch of industry, export marketing of certain products, the institution of a new type of small industry credit, etc. Because of its subject orientation these refresher courses may, as far as appropriate, be attended by persons of primary, intermediate as well as more senior levels.

The refresher-training may, in small industry development institutes of medium and large size, also be organized as periodic meetings, e. g. on a weekly basis. In this way they could meet both the needs for individual reading as well as a continuous intellectual replenishment, which is indispensable and essential to successful extensionwork.



THE PROFESSIONAL PERSONNEL STRUCTURE  
OF SMALL INDUSTRY DEVELOPMENT INSTITUTES

1. Introduction.

In this annex a brief description is contained of the major types of professional functions, possible teamformations, services rendered and other aspects of the activities and organization of small industry institutes in developing countries. The description is not exhaustive and is meant only as a general background frame of reference against which the training aspects of extension officers for small industry may be considered.

2. Major types of professional extensionworkers.

The following major types of professional extension-functions can be distinguished in the field of small industry:

- primary field-officer - analysis and day-to-day assistance on the supervisory level of the plants (e.g. technicians, or equivalent administrative, bookkeeping, and commercial analysts and instructors);
- intermediate field-officer - industrially experienced person with specialized professional competence to analyze and solve small industry problems in the technical field, or commercial, financial and managerial field and who has received adequate training and experience in small industry extensionwork. He should also be capable of assisting the small plant in developing and maintaining specialized institutional relations with banks, research institutes, etc.
- general advisory-officer - experienced extensionworker with professional competence covering the technological, economical as well as managerial fields, also capable of guiding teams of intermediate and primary field-officers and advising the management of the small enterprises on overall business policy and planning.
- senior specialist - highly qualified extensionworker, functionally specialized (technology or industrial economics) and capable of undertaking research work with broad significance to small industry (Note: The senior specialist has equal seniority as the general advisory-officer).
- training officers - persons specialized in training methods, in instruction of technical and managerial subjects (equivalent to primary and intermediate field-officers with the chief training officer possibly ranking on seniority equal to the general advisory-officer). The professional specialization is related to group-training, visual aids, programmed instruction and mass-communication methods.

- institutional coordinator - highly qualified persons with broad experience in small industry extensionwork, capable of guiding, developing and administering the institute's activities congruent with national development aims (most senior of the functions mentioned above).

The duties of the primary field-officer, the intermediate field-officer and the general advisory-officer are fully directed towards plant-level problems. The senior specialist is engaged in plant-level problems as well as matters of general interest to small industry. Though the training officers are professionally specialized in training methods, training (i. e. instruction in special subjects) may often also constitute a part of the responsibilities of the various other officers mentioned above. In the process of their plant-level extensionwork these officers also undertake on-the-job training of enterprise personnel. The institutional coordinator is chiefly responsible for directing the institute's activities (operational and/or administrative).

### ( 3. Possible team formations for field work.

For the small industry extensionwork on the plant-level the following types of teams can be distinguished:

- Branchwise-specialized teams of extensionworkers - These teams are expected to render specialized development services directed towards the needs of small industry in certain branches of industry. The teams are mostly techno-economically oriented, and may, for instance, consist of an intermediate field-officer who can act as teamleader and has special experience in the branch of industry concerned. The team may further consist of several primary field-officers (e. g. for technically oriented teams some technicians and an assistant for cost-analysis and bookkeeping). The team may also include one or more additional intermediate field-officers. Some of the most important types of branchwise teams to assist small industry in developing countries are: metalworking-industry-teams, process-industry-teams (e. g. covering food-, plastic-products, etc.) teams for printing- and service-enterprises (incl. repair), etc. This specialisation is to be determined according to the specific needs of the small industry agglomeration to be assisted.
- Functionally-specialized teams of extensionworkers - Such teams are to be composed of persons with the same field of professional specialisation (intermediate and primary levels). These functionally specialized teams are to be guided by the ranking intermediate field officer. For small industry extensionwork in developing countries the most important types of functionally specialized teams are in the field of marketing and distribution, export-promotion (on enterprise-level), cost control procedures, safety-engineering, industrial engineering and similar activities.
- General-purpose teams of extensionworkers - The general advisory-officer is the key-person for the formation of an extensionworkers-team, which can provide a broad range of extension activities covering comprehensively the needs of the smaller enterprise for external assistance. The composition of the general purpose team is not only a mixture of the branchwise and functionally specialized ones

but provides in addition the rendering of general counsel on overall business policies and planning. The team may be small and constitute of a few intermediate field-officers only with technological and economic backgrounds. The team may, as required, also be expanded to a larger group consisting of several units, each composed of an intermediate field-officer and several primary field-officers. It may, also include special units for business-diagnosis, for supervising the provision of credit facilities by banks, etc.

- New industry development team - As the industrialization needs in the developing countries are to a large extent directed towards the establishment of new viable small industries, it may be desirable to constitute special teams for this purpose. The team should be composed of at least two units, one unit capable of undertaking feasibility studies (pre-investment) and one plant design and construction unit whose responsibility may extend to the turn-key phase and possibly during further initial operations. The teams are to be guided by a general advisory officer and the units by intermediate field-officers. The feasibility study unit should have a techno-economical composition. The plant design and construction unit should include civil, mechanical and electrical engineering as well as managerial expertise. The effectiveness of these activities may often be facilitated if well prepared "model-schemes" can be utilized for the promotion of new small industries.

As indicated in the descriptions all the above teams work on the plant-level in the field. Training, research, and the development of industrial estates, common facilities, etc. are considered separately in the next paragraph.

#### 4. Training, development of common facilities and surveys.

The major objective of the activities listed below is to stimulate small industry through groupwise activities rather than by activities directed to a particular enterprise. The most important of these activities are:

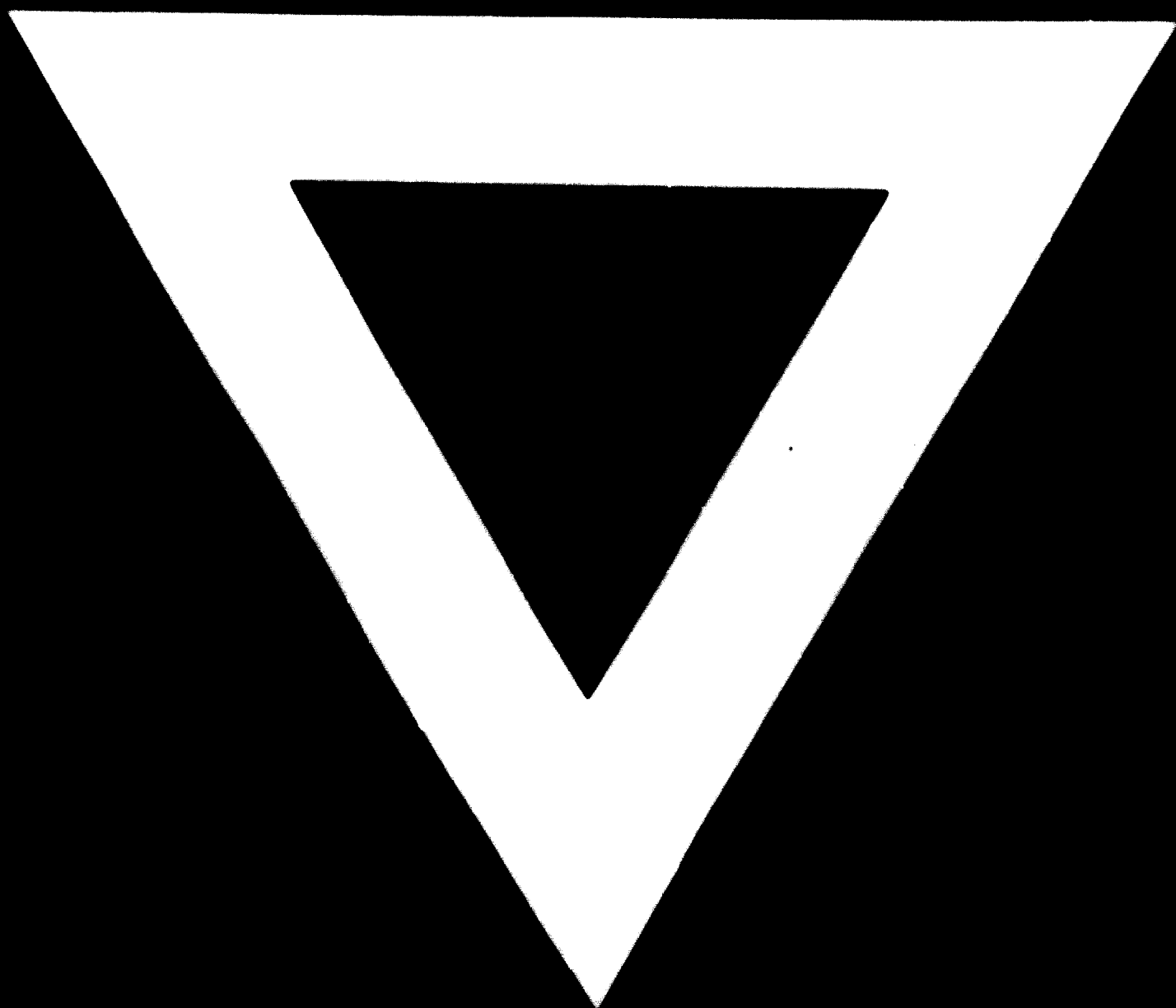
- training, either undertaken as group-training or through mobile demonstration-units
- development of common facilities, such as industrial estates, common laboratory testing services and also the development of specialized production-units (e. g. a common galvanising plant for small metal product manufacturers)
- survey and research work, either of a branchwise, functional or regional nature, which is of importance for small industry development.

The training and survey work are often undertaken as ad-hoc cooperations between training officers (or research specialists) and the other extension-workers. Regarding the common facility projects it would often be desirable to follow a practice by which the extensionworkers are undertaking the initial stage of development only and evolving the project as soon as possible into a regular self-supporting and autonomously operatable venture.

5. Composition of the small industry development institute.

The organization of the small industry extension-institute is to be derived from the specific development needs of the small industry agglomeration to be assisted, the country's economy and the contributions which small industry can make to its progress, the specific means and personnel available. The institute can structurally be composed of an appropriate mixture of abovedescribed fieldwork teams, training and common services functions.





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