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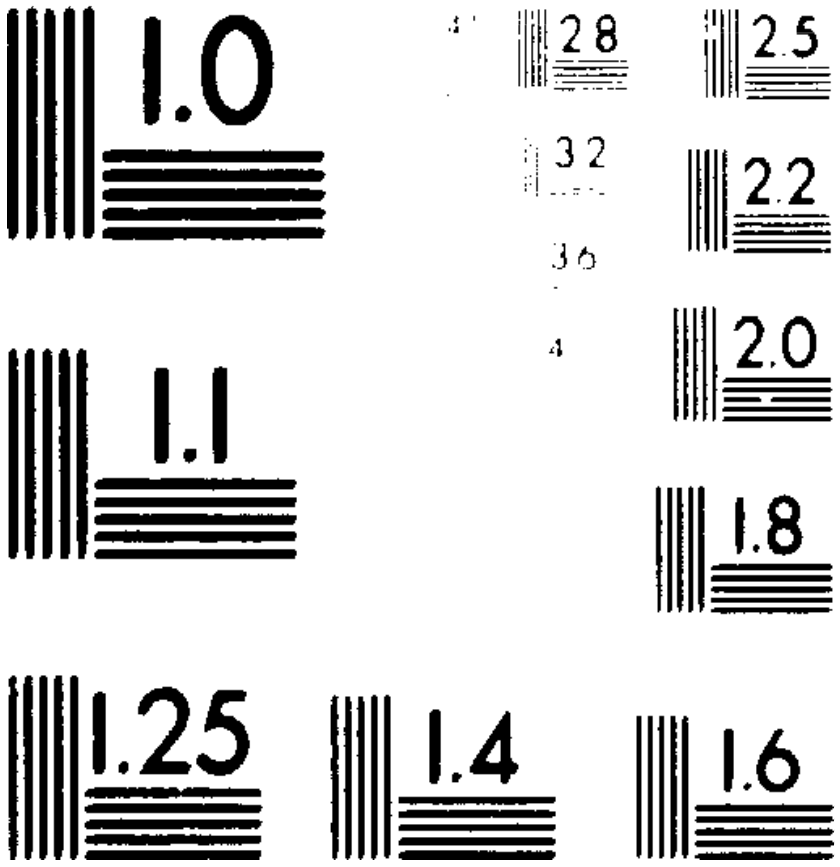

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RECOMMENDATIONS ON THE ESTABLISHMENT OF A TECHNOLOGICAL SERVICES DELIVERY SYSTEM FOR PERUVIAN SMALL SCALE INDUSTRIES

TSDS

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I. Background Information

A. On Peruvian Small Scale Industries

1. The Government of Peru has recently placed more emphasis on the promotion and development of small scale industries (SSI) considering primarily the high employment generation, economic decentralization and regional development potential of SSIs.

2. In Peru, a small scale industry is defined as firm which has a net annual sales after taxes not exceeding 720 minimum annual salaries. In May 1984, the minimum monthly salary is S/.100,000 (US$1.00 = S/.3130). A small industry is thus defined as firm which net sales after taxes does not exceed S/.864,000,000 or US$274,286.00.

3. Based on 1980 statistics compiled by the Division of Statistics, Ministry of Industry, Tourism and Integration, there are 8768 SSI establishments existing throughout Peru. This figure does not include those firms having four (4) or less workers. The SSI sector represents ninety one percent (91%) of the total establishments in the industrial sector, employing 96,819 workers or thirty five (35%) percent of the total employment in the industrial sector. Aggregate value of production generated by the SSI sector was thirteen percent (13%) of the total value generated by the industrial sector..

4. 1980 statistics also indicate that there are 9,631 industrial enterprises registered throughout Peru having five (5) or more workers. Industrial activity is

concentrated in Metropolitan Lima and in the neighboring City of Callao. Of the 9,631 enterprises registered, 67.65% were located in Metropolitan Lima and Callao. Industries in these two areas combined employed 72.3% of the total industrial work force.

Area	No. of Firms	%	No. of Employees	%
Metropolitan Lima	5,981	62.25	166,979	62.70
Callao	521	5.40	25,607	9.59
Other areas	3,129	32.35	74,296	27.71
	9,631	100.00%	266,882	100.00%

5. There exists a Sociedad de Industrias which has a total membership of 6,800 firms. The largest subdivision of the Sociedad is the Committee for Small Scale Industries (CSSI) which represents around 2,700 small scale member firms located in the Lima area and around 300 firms in the provinces outside Lima. In order to cater to the needs of each distinct industry subsector, the CSSI is divided into sixty four (64) sub-committees.

The Committee provides various types of services to its member firms. Some of such services are as follows:

a) advisory services on accounting matters;
b) legal services; preparation of legal documents;
c) provision of information on taxes;
d) market analysis for several product lines;
e) facilitation of subcontracting arrangements.

B. <u>On Peruvian Institutions Providing Services to SSI</u>

6. It appears that a coordinated system for the provision

of technological assistance to the Peruvian SSIs still does not exist. There are, however, institutions and organizations existing in Lima and in the provinces which may be tapped to provide services and assistance to SSIs. A partial listing of such institutions and organizations together with descriptions of services offered has been compiled and published under the title: "Guia de Servicios para la Pequeña Empresa Industrial 1984-85". This project was undertaken by the Ministry of Industry, Tourism and Promotion in its efforts to enhance the awareness of SSI sector on the availability of various types of services.

7. The Ministry of Industry, Tourism and Promotion has field offices in all the provinces of Peru. The Ministry particularly the Department of Industrial Promotion is actively engaged in planning and implementation of developmental projects for the SSI sector. Among its main concerns are the implementation of projects related to the provision of technological assistance to the SSIs in Lima and to those in the provinces and projects geared toward the decentralization of industries. The Department of Industrial Promotion is at present preparing information packages on processes, investment requirements, etc. for industries to be promoted in areas outside Lima.

8. There exist in Lima two institutions which at present appear to be in a good position to spearhead developmental projects with the objective of developing a system for the provision of technological services for the SSI. These institutions are the following:

a) Instituto de Apoyo Nacional y Promocion a la Pequeña Empresa Industrial or IDANPEI;

b) Instituto de InvestigacionTechnclogica Industrial y de Normas Technicas or ITINTEC.

9. Both IDANPEI and ITINTEC have field offices in areas outside Lima. ITINTEC has field offices in Arequipa, Trujillo and Cuzco while IDANPEI has regional offices in Chiclayo, Trujillo and Arequipa.

10. IDANPEI is a branch of the Servicio Nacional de Adiestramiento en Trabajo Industrial (SENATI) which is the National Industrial Training Institute. IDANPEI is dedicated specifically to the formation and development of small scale industries through promotion, diagnostic, training, advisory activities and through the provision of special services.

11. IDANPEI offers the following services to small scale industries:

a) identification of needs for training, technical consultancy and/or special services.

b) managerial consultancy services and implementation of training courses in the areas of business administration, financial management and marketing management.

c) technical consultancy services and training courses in areas directly related to production.

d) design and preparation of technical drawings for products, molds, tools, etc.

e) fabrication of prototypes.

f) quality control services.

12. ITINTEC has five departments and these are as follows:

a) Standards and Quality Certification Department

b) Industrial Property (Patents) Department

c) Metrology Department

d) Technology Department

e) Technical Information, Extension and Technology Transfer Department.

The last two departments of ITINTEC are envisaged to play major role in the provision of technological services to SSIs.

13. The present activities of ITINTEC's Technology Department are as follows:

a) Assists industries to identify their needs for technological research. This is accomplished by studying the factory and its problems and by analyzing technological and economic information pertinent to the plant. As a result of such studies, profiles are prepared and alternative solutions which may involve R & D for the production unit, are presented to the firm.

b) Advises industries on how research projects should be conducted.

c) Offers to enterprises and other institutions all the knowledge and experience, designs and any other results obtained from research projects conducted; provide technical assistance and other types of services required to apply the technology.

d) Conducts seminars and workshops to disseminate information on technologies developed with a view to provide guidance on how to set such projects.

e) Provides laboratory analysis services.

ITINTECT's Technology Department has five research laboratories and these are as folllows:

a) Biotechnology Research Laboratory
b) Electronics Research Laboratory
c) Energy Research Laboratory
d) Anti-Corrosion Research Technology
e) Non-Metallic Minerals Research Laboratory.

14. The present activities of ITINTEC's Technical Information, Extension and Technology Transfer Department are as follows:

a) Provides technical advise, particularly to small scale firms on the solution of technical problems.

b) Provides Information Analysis Services, by explaining contents of technical papers to entrepreneurs of existing firms as well as to entrepreneurs planning to establish industries. It also provides other services such as identification of equipment/raw material suppliers, labor requirements, etc.

c) Provides copies of abstracts of available technical information.

d) Assists users in obtaining full copies of technical papers from foreign sources.

e) Assists industries in establishing linkages with other equipment suppliers, raw material supplies and other sources of technology such as research institutions, universities, specialized libraries, professional associations, etc.

f) Provides upon request biblicgraphies pertaining to certain topics; publishes bibliographic bulletins regularly.

II. Outline of Proposed Methodology for the Establishment of a Peruvian TSDS for SSI

15. The establishment of a system for the delivery of technological services to Peruvian SSI may be started by a project which may be implemented in two Phases. These project phases are outlined as follows:

Phase I

Phase I is essentially a study of the following:

a) the programs, capabilities and potentials of existing insitutions;

b) the characteristics of SSI subsectors.

Phase I must be implemented for the Lima Callao area and the provinces simultaneously but at different levels and with different approaches.

Towards the later stages of Phase I, several SSI subsectors will be selected based on tentative plans drawn for pilot program implementation in Phase II. For these subsectors, short-term foreign industry experts will be invited to provide advice on the following:

a) opportunities for the development of the subsectors;

b) thrusts of internal transfer of technology programs;

c) acquisition of foreign technology;

d) thrusts of R & D programs.

Phase II

Phase II should consist of the following types of activities:

a) Establishment of inter-institution linkages related to the implementation of specific projects addresssed to selected industry sectors;

b) Implementation of technological and techno-managerial assistance programs for SSI groups and individual firms on a pilot scale;

c) Monitoring the results of pilot program implementation;

d) Re-formulation of sub-programs based on the results of monitoring and evaluation activities for selected industry sectors;

e) Formulation of programs for other industry sectors.

In this phase, there are two types of pilot programs which should be implemented:

a) technical information dissemination and techno-managerial consultancy through group training activities;

b) techno-managerial consultancy services addressed to individual firms.

III - Phase I Activities

III - A. Organization of Project Team

16. To implement such a project, a full time Project Team should immediately be organized to work in close coordination with institutions which can contribute to SSI development. Such an organization may be formed by drawing senior staff members from ITINTEC and IDANPEI. This organization must be

headed by a National Project Director reporting to a Governing Board which may be composed of the following:

a) The Director General of Industrial Promotion, Ministry of Industry, Tourism and Integration;

b) The President of the Committee for Small Scale Industries, Sociedad de Industries;

c) The Director General of ITINTEC;

d) The Director General of IDANPEI.

III - B. Initial Phase I Activities for the Lima-Callao Area

17. For the Lima-Callao area, the initial stages of Phase I should consist of the following activites implemented simultaneously.

a) A study of other technological resource institutions as well as other institutions which may contribute to SSI developmnt; the programs and capabilities of such institutions have to be understood.

b) Whenever feasible, a questionaire survey should be implemented through the CSSI and SSI members of the CSSI which are located in the Lima-Callao area, Ideally, distinct questionaires should be designed and distributed for each of the 64 SSI sub-

sectors with a view of obtaining more relevant information on production capabilties and requirements for technical services.

18. The study of institutions in the Lima-Callao area should be viewed as a pre-requisite for the in-depth analysis of the requirements of SSIs for technological assistance and other types of assistance. In the implementation of detailed studies on the needs of selected SSI sectors, it is important for researchers to have first an understanding of the programs and capabilities of resource institutions. Needs identification may be done more efficiently if researchers will have prior knowledge of institutional programs and capabilities. Also, the specifics of tehnical assistance programs may be formulated while conducting detailed industry studies. Aside from technology resource institutions, other institutions providing services to SSI must be studied. Since having limited resources in a general characteristic of SSIs, the delivery of technological services to SSIs must be viewed to be an integral part of an integrated assistance program wherein the other essential components are financing assistance, market information assistance and management consultancy assistance. Thus specialized financing programs for SSIs have to be studied and sources of market information have to be identified. Furthermore, it is necessary to study institutions which may offer managerial advice to entrepreneurs particularly in the evaluation of the feasibility of technological alternatives especially in cases where substantial investment is involved.

19. The questionaire survey for the SSIs in the Lima-Callao area should also be viewed as follows:

a) They will be very useful in providing a data base for in-depth studies which will be conducted by the project team members and by the short term industry experts.

b) For SSI sub-sectors not selected for pilot program implementation, they will serve as a good basis for planning and implementation of internal transfer of technology programs. Data from such questionaires may be used in identifying the thrusts of group technical training programs since the questionaires will reveal common characteristics of the industries.

Thus, whenever feasible, SSI sub-sector specific questionaires should be designed to capture data especially on the following:

a) types of equipment utilized
b) production capacities
c) production volumes
d) instrumentation used by the firm
e) capacity utilization
f) product lines
g) manpower
h) technical problems perceived by the entrepreneur, if any; type of technical service required.

20. After the results of the questionaire survey have been analyzed, the following activities must be implemented:

    a) dicussions between project team members and CSSI sub-committee representatives on the perceived needs of SSI subsectors for technical assistance and technological services;

    b) selection of target SSI sub-sectors based on a set of criteria which must be established by the Governing Board. In the selection of target SSI sub-sectors, it is important to consider the availability of local capabilities for the eventual implementation of internal transfer of technology programs. For SSI sub-sectors seelected, short term foreign industry experts must be invited to provide advice to the Governing Board on matters pertinent to the development of the SSI sub-sectors selected.

21. For SSI sub-sectors selected as target sectors, plant visits and discussions with entrepreneurs must be scheduled and implemented by members of the Project Team prior to the arrival of foreign expert. The objective of these plant visits are as follows:

    a) to study in detail the processes employed by the plant, technical problems and difficulties, process limitations, etc.

b) to identify areas where technological assistance is needed.

c) to study the inter-relationships among the needs for managerial consultancy services, marketing assistance, financing assistance and technological assistance.

d) to formulate plans and strategies for pilot program implementation based on information gathered from the plant visits and based on the studies made on resource institutions.

III - C. Initial Phase I Activities for the Areas Outside Lima

22. For the provinces, the initial Phase I activities are characterized by the gathering of data on industries and institutions by persons stationed in those provinces based on a framework for studies formulated by the Project Team. This should be done in preparation for the fielding of Project Team members to those provinces for the purpose of undertaking detailed studies.

23. Such initial studies may be done by provincial personnel of the Ministry of Industry, Tourism and Integration which has field offices in all provinces. They may be assisted by the ITINTEC field of offices Arequipa, Trujillo and Cuzco and the IDANPEI field offices in Trujillo, Chiclayo and Arequipa.

24. Industry studies should be done in close coordination with the local governments in the provinces for the purpose of finding more easily the location of the SSIs and to gain the cooperation of the SSI entrepreneurs during data gathering activities. For the provincial SSIs data on the following must be gathered.

a) product lines
b) number of workers; types of workers
c) historical sales data
d) raw materials used; sources of raw materials
e) markets
f) equipment used.

25. The study of provincial institutions must be implemented based on a model of a technological services delivery system for provincial SSI. What must be identified in the provinces are institutions which may act as sources and/or channels for the delivery of technological services to SSI as well as other institutions which may be tapped as sources of other types of assistance. Examples of such are managerial consultancy services or market information services. In order to guide researchers in effectively gathering data on institutional capabilities and potentials, it is essential to desc first the various ways in which an institution may serve as a resource, a channel, or as managerial consultancy or market information support institutions.

26. Data generated as a result of provincial studies on SSI characteristics and institutional capabilities and

and potentials will be used for the following:

a) For each province, planning of group assistance programs for provincial SSIs. Based on the analysis of industry data generated, the existence of industry groups per province will be detected. For such SSIs belonging to a distinct subsector which are utilizing similar processes and existing in significant numbers, a technological assistance program may be formulated. Such program formulation activities must take into consideration the existing resources in Lima and capabilities and potentials of institutions in the province.

b) For each province, identification ofthe nature of inter institution linkages which must be initiated and established among the Lima-based institutions which may provide assistance to the SSIs in the particular province. The formulation of different approaches for each province is necessary considering the delivery in the capabilities and potentials of provincial institutions and the nature of SSI in the provinces.

c) Planning the visit of the foreign experts and project team members to the provinces in order to identify opportunities for the development of SSI and to identify thrusts of internal transfer of technology programs and/or acquisition of foreign technology.

III-D. Participation of Short-Term Industry Experts in Phase I Activities

27. Together with project Team members and CSSI representatives, the experts will first review data previously gathered on industries and institutions in the Lima-Callao area. The experts will be informed of the experience gained in the plant visits and discussions with entrepreneurs during the earlier stages of Phase I.

28. The experts will conduct visits to gain a clearer picture of the industry subsector and the institutions to be studied in order to be able to provide advice on the following areas:

a) Opportunities for the development of the SSI sector,. Such may be in the form of new product lines which may be produced by SSI for domestic and export markets especially those which may be produced utilizing existing equipment. The expert will also provide advice on requirements of export markets, methods to improve quality and productivity performance, cost reduction measures, utilization of local raw materials substitutes, etc.

b) Thrusts of internal transfer of technology programs including the training requirements for personnel who will be involved in such programs.

c) Acquisition of foreign technology which may have the potential for accelerating the development of Peruvian SSI; the applicability of such technologies must be studies extensively by key institutions for possible introduction to SSI.

d) Thrusts of local research and development programs considering institutional capabilities and perceived requirements of SSI.

29. Considering time limitations, the experts should visit selected provinces for the principal purpose of identifying opportunities for the development of SSI in these areas. The selection of provinces to be visited will depend on the data gathered on provincial SSI.

30. Whenever feasible, the expert should conduct lectures or seminars attended by entrepreneurs belonging to the particular industry subsector. Such discussions should be held in the Lima-Callao area and in the provinces. The purpose of such discussions is to increase the level of awareness of the entrepreneurs on the following:

a) The experts findings on the industry, its weak points and its strong points.

b) Common technical problems perceived as well as other types of common problems.

c) Perceived opportunities for the development of the industry sector.

The implementation of such types of activities may be considered to be very helpful creating an atmosphere conducive to the launching of pilot programs.

IV. Phase II Activities

VI. A General Description of Phase II Activities

31. The activities which should be carried out for the initial stages of Phase II are as follows:

a) For industry sub-sectors selected for pilot program implementation, specific plans for pilot programs should be prepared considering industry needs identified, selected thrusts of internal transfer of technology programs and institutional capabilities.

b) For pilot programs which will require the participation of more than one institution the formalization of agreements on the responsibilities of each institution considering the requirements of pilot program implementation.

c) Pilot program implementation and monitoring of results of pilot program implementation.

d) For other industry subsectors not selected for pilot program implementation, the implementation of an information program on the services offered by institutions; data generated during discussions with entrepreneurs seeking service may serve as basis for the formulation of strategies for the implementation of pilot programs.

IV-B. Types of Pilot Programs Proposed to be Implemented and Proposed Strategies for Implementation

32. The types of pilot programs which should be implemented are as follows:

a) Technical information dissemination and techno-managerial consultancy during group training activities; such may be implemented in the form of seminar workshops attended by entrepreneurs belonging to the same industry sub-sector.

b) Techno-managerial consultancy services addressed to individual firms. The pilot implementation of such projects is important especially for SSIs in the provinces wherein the required technological resources does not exist but may be provided by an institution located in Lima.

33. The provision of technological consultancy services to the average SSI entrepreneur should be accompanied by managerial consultancy services. Technological

consultancy, either through group training or through specific technical consultancy cases for individual firms, present options for evaluation by the SSI entrepreneur. In many cases, the average SSI entrepreneur may not have the proper educational background nor posses the managerial expertise to evaluate the technological options. The decision of an entrepreneur to accept technological recommendations depends primarily on the expected profitability or return on investment resulting from the acceptance of a technological option and not only on better product quality, productivity, etc. More often than not the entrepreneur needs managerial advice in formulating a framework for analyzing technological options.

34. As a major strategy, the technological awareness of SSI entrepreneurs should be enhanced. In this regard, group training activities for entrepreneurs belonging to the same industry sub-sector should be pilot-imple mented for selected industry sectors. Generally, such approaches may be employed since entrepreneurs belonging to the same industry sub-sector, utilize similar processes, produce similar products, share the same types of problems and generally have the same interests. Such group training programs may be considered as vehicles for the dissemination of available technical information considered to be relevant to the industry sub-sector. The design of such group training programs should therefore be based on the industry studies already conducted. Such programs should also present through lectures and if possible by demonstration, quality ad productivity improvement concepts and techniques deemed

applicable to the industry subsector and which do not require substantial investment. Discussions on these have to be accompanied by indications of profitability or cost savings in order to stimulate interest on the part of SSI entrepreneurs.

35. The objective of these group training program is to create a bigger market for techno-managerial consultancy assistance. By increasing the technological awareness level of a group of entrepreneurs any or all the following events may be expected to occur:

a) Some of the members of the group may choose to adopt on their own the concepts and techniques learned especially if such do not require substantial investment.

b) Some entrepreneurs may be more "improvement conscious" especially in the areas of product quality and productivity and identify, on their own, methods suitable to their operations.

c) Some entrepreneurs may go further to take a much closer look at their businesses and study opportunities for the advancement of their businesses considering information on domestic markets, export markets and available financial assistance. Such entrepreneurs may eventually request for a very specific form of techno-managerial consultancy or request for research assistance.

36. Considering the above, the implementation of group training programs may be viewed as a strategy for transferring the responsibility of identifying the technological services which should be provided to the entrepreneur to the entrepreneur himself. Generally, an SSI entrepreneur provided with "general information" related to possible opportunities for improvement is placed in a much better position to take a closer look at his business and seek for "more specific information". Such an approach has its advantages over directly marketing techno-managerial consultancy services without the support of promotional activities such as group training. An SSI entrepreneur who had no access to information or opportunities for improvement and who at the same time does not have serious problems on profitability may not be able to describe what his technical problems are nor identify his needs for technological or managerial consultancy services.

IV-C. Establishment of Province-Based Channels for the Delivery of technological Services

37. There are no major problems perceived for pilot implementing projects dealing the provision of techno-managerial consultancy services for individual firms in the Lima-Callao area and for those SSI in areas near Lima. The SSI in the Lima-Callao area will have easy access to the institution in Lima providing technological and managerial consultancy services.. But for the SSI in the provinces, especially those far from Lima, various arrangements

have to be made before the pilot implementation of techno-managerial consultancy projects may commence.

38. Although there may be institutions existing in the provinces which may act as technological resource institutions, it must be expected that the SSI in the provinces will also be relying on the technological resources available in Lima. In such cases, the services which will be required by provincial SSI from Lima-based institutions will range from the provision of written technical information based on specific inquiries to long term techno-managerial consultancy services for new projects. In order to achieve efficiency and to reduce costs in the provision of such services, it is necessary to have "channels" which are based in the provinces and which will serve as links between the province based SSI and resource institution(s). Such channels may be the province based technology resource institutions themselves, universities, field offices of Lima-based institutions or the field offices of the Ministry of Industry, Tourism and Integration. The determination of which province based organization should act as channels will depend on the Phase I studies on provincial industries and studies on provincial institutions which will indicate the capabilities and potentials of the institutions studied.

39. The essential functions of personnel belonging to a channel organization are as follows:

a) whenever a request for technological assistance is made by an entrepreneur, to provide advice to the entrepreneur

based on his knowledge of the various services offered by institutions in the province and those of Lima-based institutions. Such personnel must therefore possess knowledge of institutional capabilities more than what is contained in disseminated write-ups on services offered by institutions.

b) whenever necessary, to assist the SSI entrepreneur in documenting facts pertinent to his operations in order to transmit sufficient data to enable Lima-based institutions to provide appropriate action.

c) to assist the entrepreneur in formulating requests for follow-up technical information services or technical consultancy services based on earlier feedback provided by technological resource institutions.

d) whenever possible, to provide managerial consultancy services to SSI entrepreneurs with regard to the evaluation of technological options presented by technology resource institutions. If such is not possible, to assist the entrepreneur in identifying sources of such type of assistance within the province.

e) to organize group training activities and to assist in the identification of thrusts of group training activities.

f) to provide regular feedback to Lima-based technology resource institutions on the results of technical assistance activities.

40. Considering the above, it is therefore necessary for personnel of channel organizations to undergo specialized training so that they may eventually perform their functions. It is necessary for them to visit the Lima-based institutions for them to visualize the various types of activities being undertaken at the institutions. Such training programs for personnel of channel organizations must be implemented first before pilot implementation of techno-managerial consultancy projects for individual SSI may be started.

41. Due to staff training requirements and the advantages which may be derived by enhancing the technological awareness level of SSI entrepreneurs, initial Phase II pilot program activities for provincial SSI should be of the group training type. The selection of provinces where group training for the selected industry sub-sectors should be based on Phase I data on provincial industries. Whenever feasible, the implementation of such group training activities should be followed by individual consultancy visits based on actual needs and problems experienced by entrepreneur-participants interested in availing of technical consultancy services. Such consultancy services provided during plant visits should be provided for free. Follow-up technical consultancy services or technical information services should be treated on a case to case basis. One pre-requisite, however, for planning the implementation of group training activities is an ocular survey of the target industry sub-sector which must be implemented by the resource persons themselves.

IV-D. Involvement of Industry Associations in Phase II Activities

42. During the pilot implementation of group training activities for provincial SSI, Project Team members should study the possibility of encouraging entrepreneurs belonging to the same industry sub-sector to form industry organiziations. There are many advantages which may be derived from the existence of functional industry associations and some of these are as follows:

a) follow-up group training activities may be implemented through the provincial industry association in order to achieve efficiency in organizing such activities.

b) with regard to financing group training activities, it is easier to enter into cost sharing arrangements or full costing arrangements when a functional industry organization exists. In such arrangements, the industry organization may be expected to undertake the responsibility of encouraging more of its members to participate in such group training activities in an effort to cut costs to be shared by each participant.

c) there are various types of common service facilities which must be made available to accelerate SSI development. Such are facilities which usually require substantial investment and/or large capacity utilization requirements which a single SSI may not be

able to handle by itself. Examples of such projects are common processing facilities common testing facilities. Such are usually more effectively establish as common service facilities. In the establishment of such facilities, techno-managerial consultancy services may also be needed.

IV-C. Monitoring and Evaluation Activites/Program Expansion

43. The results of pilot program implemented for the selected SSI subsectors must be monitored and evaluated regularly with a view to:

a) reformulate plans for program implementation for such SSI subsectors;

b) to formulate programs for other industry subsectors for which programs were not pilot implemented inPhase II.

44. The key areas which must be monitored and evaluated are the following:

a) the effectiveness of training programs conducted for the personnel of the channel organization. The capability of the field personnel to handle inquiries for technical information and to organize group training programs must be assessed.

b) the effectiveness of group training programs in increasing the level of technological awareness of entrepreneur participants and in increasing the number of requests for additional technical information or technical consultancy.

c) the effectiveness of methods used in selecting appropriate topics for group training programs.

d) the effectiveness of providing follow-up managerial consultancy services by the channel organization or by other institutions existing in the provinces.

45. In view of the above, the implementation of group training programs for entrepreneurs and the implementation of specialized training programs for personnel of channel organizations may be expanded to other provinces for the same industry sub-sectors selected as pilot sectors in Phase II.

46. In the same manner, similar programs may be planned and implemented for other industry subsectors using as basis, the experience gained during the implementation of Phase II.

47. The reformulation of programs based on the monitoring and evaluation of pilot programs is expected to incorporate revisions in the responsibilities of of institutions particularly those involved in the provision of technological assistance to provincial SSIs. Such modifications are expected since at the start of pilot program implementation, it is difficult for the initial arrangements between institutions to take into account the various possibilities arising during the implementation of the programs itself. Such was the case in the

Philippine experience in establishing the TSDS. At the start of the implementation of the pilot programs, there existed only very general agreements between the Metro-Manila Technology Resource Institutions (TRIs) and the region-based Small Business Advisory Centers (SBACs) which acted as the channel organization for the Philippine TSDS. During the implementation of pilot programs for selected industry subsectors, monitoring and evaluation meetings were held regularly for the purpose of replanning the mechanics of implementation of succeeding pilot programs and for defining more clearly the responsibilities of the TRIs and SBACs in project implementation.

48. In the same manner, monitoring and evaluation activities may be used as basis for the following:

a) identify the thrusts of research and development programs of technology resource institutions;

b) identify the thrusts of information dissemination activities of technology resource institutions;

c) identify the emphasis of internal human resource development programs being carried by technology resource institutions.

V. The Philippine Experience on Pilot Program Implementation

49. Most of the recommendations on pilot program implementation have their basis on the experience

of the Philippines in establishing a technology services delivery system for small and medium scale industries (SMIs). In the Philippine experience, special attention was directed toward the following areas.

a) strengthening of region-based channels for the delivery of technical assistance;

b) implementation of techno-managerial consultancy activities for industry groups;

c) formation of regional industry associations.

50. In the Philippine TSDS experience, the channels for delivery of technological services were the Small Business Advisory Centers (SBAC) of the Ministry of Trade and Industry. SBACs exist in each of the twelve (12) regions of the Philippines. At the time the TSDS project was being implemented, each SBAC was staffed by around ten (10) business consultants who advise SMI clients on marketing, finance, accounting systems, production management, etc.

In order for the SBACs to effectively act as the link between region-based SMIs and Metro-Manila based technology resource institutions (TRIs), a series of training programs were implemented for the SBAC staff. Each SBAC sent two staff members to Manila to specialize in a particular industry sector and to undergo training programs which were implemented by the TRIs themselves. The training

consisted of lectures, observations on activities being carried out by TRIs and case studies based on actual needs for technological assistance identified during plant visits which were conducted jointly by SBAC and TRI staff.

51. The first types of regional technological assistance activities organized were in the form of group training activities. The general characteristics of such group training activities were as follows:

a) These were organized jointly by SBAC staff and leaders of industry organizations (associations).

b) Resource persons were TRI personnel working closely with SBAC staff; prior to the implementation of group training programs, TRI personnel, together with SBAC staff, visit the production facilities of entrepreneur participants to observe equipment and processes used and to identify areas of improvement.

c) Group training involved primarily lectures, and demonstration of techniques on quality and productivity improvement, cost reduction, etc.

d) Such group training activities generally lasted between two to four days only since the entrepreneurs cannot stay away from their businesses for a long period of time.

e) Group training activities were followed by individual consultations requested by entrepreneur participants. Such consultation activities were done jointly by TRI personnel and SBAC staff members. Some individual consultations required the sending of additional technical information from Manila.

f) Industry associations took the initiative in requesting for follow-up group training projects after the first project has been implemented. Such requests were coursed through the SBACs which then "packaged" the request for group training together with the necessary background inforation.

g) Initial group training activites were heavily subsidized by the Philippine Government with minimal cost sharing on the part of entrepreneur participants. Follow-up group training activities saw substantial increases in the levels of cost sharing by entrepreneur participants.

52. The implementation of group training activities stimulated the increase in the number of inquiries for technical information and technical consultancy handled through the SBAC offices. For technological information services which did not involve the dispatch of TRI personnel to the field, the technical information service was generally provided for free. For technical consultancy cases which required the presence of TRI personnel in the regions, the entrepreneur requesting for the service was generally

required to shoulder only the full cost of transportation and accomodations of TRI personnel. No consultancy fees were charged.

53. Considering the success in working with industry associations, the formation of industry associations was initiated by SBACs in regions where such associations did not exist. Such activities were done jointly by TRI and SBAC personnel using subsidized group training as an entry point. Small groups of entrepreneurs were motivated to form larger groups to avail of pre-described subsidized group training programs.

54. In many cases, the industry associations embarked on the planning and implementation of association based projects. Examples of such projects are common service facilities, joint domestic and export marketing schemes and common raw material purchasing shemes. In the planning and implementation of such projects the SBAC were always involved; in some cases, especially those projects dealing with the establishment of common service facilities, TRI personnel were involved. For common service facility projects, TRI personnel presented alternatives during specialized group training activities. For projects which were established, TRI personnel assisted in the training of personnel to man the facility.