

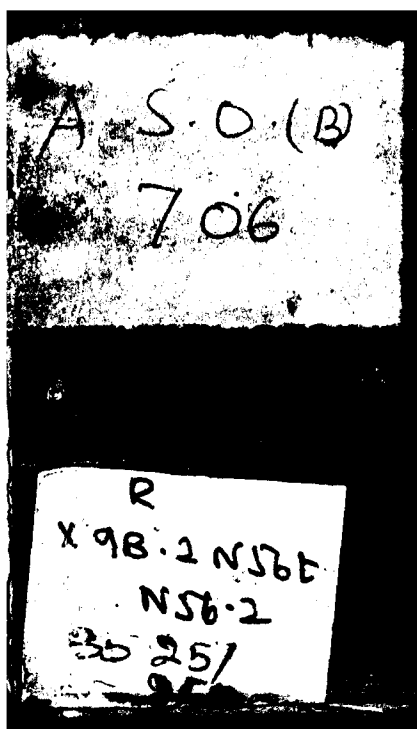
REPORT ON POSSIBILITIES FOR

IMPROVEMENTS IN INDIA'S

SMALL SCALE INDUSTRIES



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Technical Expert's Report No. 2.

**REPORT ON POSSIBILITIES FOR
IMPROVEMENTS IN INDIA'S
SMALL SCALE INDUSTRIES**

**Findings and Recommendations by a Team of
Experts from Western Germany during
their visit to India from 24th March to
14th May 1956**



232
**Development Commissioner (Small Scale Industries)
Ministry of Commerce and Consumer Industries
Government of India
New Delhi**

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To

THE DEVELOPMENT COMMISSIONER,
SMALL SCALE INDUSTRIES,
114, SUNDER NAGAR,
New Delhi.

DEAR SIR,

[SUBJECT.—*Possibilities for Improvement in India's Small Scale Industries.*]

Upon conclusion of our studies we have the honour to enclose herewith our report.

Following your request to concern ourselves particularly with the metal working enterprises in small scale industry, and here especially with the units producing machine tools, we have been concentrating much of our time on investigation in that direction.

Our first impression had been that machine-tools, as turned out by most of the small scale industry enterprises visited by us, do not meet even lowest acceptable standards of quality and accuracy, and that perhaps quicker and more satisfactory results in the production of machine tools should be obtainable by leaving this field to the larger industrial firms already engaged in the manufacture of graded machine tools in India.

However, further study of the situation of small scale industry in India has allowed us to concur with your view that small scale industry must be made fit to produce by own effort the simpler type of machines they need.

In fact, as a result of our investigations we are now convinced that small scale industry, if given thorough reorganisation up from the bottom, should come up to satisfactory production standards within the next two to five years. The setting up of a Small Scale Industry Prototype Laboratory and Workshop, as planned by you, may prove a wise step towards initiative satisfactory serial production within small scale industry of simple and low priced machines of acceptable quality and accuracy.

We repeat, once again, the assurance given you at our last meeting that we are prepared to give you full co-operation also after our return to Germany.

We shall appreciate your courtesy in communicating our thanks to many officers of your Small Scale Industry Organisation who have given us the benefit of their time and experience.

With our kindest regards,

Dear Sir, we remain,

Yours faithfully,
H. RIFFA,
H. VOLLRATH.

NEW DELHI,
14th May 1956.

CONTENTS

	PAGE
PREFACE	v
INTRODUCTION	vii
I. General Observations—	
Workshop Facilities	1
Production Equipment	1
Raw Materials	1
Workers' Skill	2
Technical and Business Background	2
Atomization of Resources	3
Cut-throat Competition	4
Conclusions	4
Manufacturing licences	5
Model enterprises	5
Registration of brands	5
Drying up of Weakest Units—	
Specialised Production Programmes	5
Creation of employment	5
Room for private enterprise	5
Workshop Equipment	6
Training-cum-Production—	
Top priority for re-equipment and re-tooling in small scale industry.	6
Training and employment for high school graduates.	7
II. Establishment of "Model" Enterprises in India's Small Scale Industry	7
Moulding and Casting	8
Machining	8
Surface Treating and Finishing	9
Quality Control	9
Organisation of Government Aids	9
Governmental Aid to Small Scale Industries	9
Government Workshops	11
III. Central Workshop for the Development of Prototype Machines for Small Scale Industry.	11
IV. Conclusions	15

PREFACE

In fulfilment of a promise given to the Government of India by Dr. Franz Blucher, Vice-Chancellor of the German Federal Republic, at the time of his official visit to India towards the end of 1955, a delegation of three German experts was sent to India in March 1956 by the Bonn Government under the latter's technical assistance programme.

The delegation consisted of the following members selected with a view to their qualification as competent, neutral and unbiassed experts in their respective fields :—

(i) Mr. Gustav A. Etter, Adviser in textile mill management.

(ii) Mr. Herbert Riffa, M.E., Consulting Engineer.

(iii) Mr. Helmuth Vollrath, Economic Adviser, V.D.M.A. (Association of German Machinery Builders).

The delegation was led by Mr. H. Vollrath, who has been in India on several previous occasions and who has had contact with the German Ministry of Economics regarding the question of technical assistance to India's Small Scale Industries ever since this subject first came up for discussion, about the end of 1954, following suggestions made by Mr. Wolfgang Kaupisch, then Commercial Attache to the German Embassy in New Delhi.

Mr. Riffa, who took his diploma in mechanical engineering from the Technical University of Berlin-Charlottenburg, has had 30 years of experience in metal-working and machine-building industries. He has had special experience in the setting up and operating of industrial units in Brazil where, for instance, he has been production manager of Messrs. Philips X-Ray Apparatus Factory at Sao Paulo from 1944 to 1952.

Mr. Etter, expert in rationalisation to textile mill operation, possesses wide experience in his field from extensive studies both on the Continent and abroad; shortly after his arrival in India he has been placed at the disposal of the Textile Commissioner, Bombay. Mr. Etter, therefore, may be expected to file a separate report upon conclusion of his work in India.

* * * *

The report, herewith presented, is the outcome of observations and studies made by Messrs. Riffa and Vollrath in visiting Small Scale Industrial Enterprises in Delhi and adjacent areas such as at Modinagar, Faridabad, Meerut, Ludhiana, Batala, Amritsar, Agra, Kanpur, Lucknow, Howrah, Calcutta and Madras.

In addition, a number of larger plants were also visited both in the private and in the State sector as, for instance, at Batala, New Delhi, Kanpur, Lucknow, Calcutta, Madras and Bangalore.

A number of special meetings with Industrial Associations and regional Chambers of Commerce were held at Ludhiana, Batala, Agra, Calcutta and Madras.

In short, investigations were carried out into the present set-up of small scale industries in the regions visited and have covered on the spot studies as to working processes, supply of raw material, workshop facilities, tools and equipment, qualification of labour, engineering and managing background of owners; furthermore, questions and wishes have been both received and dealt with on the spot or registered for further action, from individual owners of enterprises, State officials, Associations and Chambers of Commerce.

In the light of experience thus gathered, a number of topical addresses were delivered to interested bodies at Batala, Calcutta and Madras.

The members of the delegation working under the immediate direction of Mr. Sagar Chand, Director of Small Industries Corporation, thus have endeavoured not only to acquaint themselves with the present set-up of small scale industries in India but also to arrive at an independent judgment as to future possibilities by appraising the proper needs of small scale industry on the one hand, and by exploring the possibilities and the readiness of the existing larger industries, on the other hand, to lean on small scale industry as an ancillary industry if and as soon as the latter will have become properly organised, equipped and managed.

* * *

Upon conclusion of their work the members of the delegation desire to put on record their deep appreciation of the help and encouragement extended to them by Government officials both at the Centre and in the States visited, as well as by field officers, small scale entrepreneurs, industrialists, engineers and by various organisations with whom contacts were established.

It is the sincere hope of the delegation—however small its own contribution may be in view of limitations of time and of travel in the hot season—that the findings and recommendations arrived at and laid down in this report may provide yet another stepping stone on the road towards an early and successful assumption, by small scale industries of their proper functions within the general economic pattern of India.

INTRODUCTION

The term "Small Scale Industries" in the opinion of this delegation deserves of further definition; of course, there is—for working purposes—the official definition of Small Industries in India ruling that under this term shall fall units

- (i) with assets worth up to 5,00,000 rupees;
- (ii) employing up to 50 persons—if using power;
- (iii) employing up to 100 persons—if not using power

However, in actual practice, this definition can serve its purpose perhaps only as a general guide to appraise which enterprises shall come within the scope of aid—be it financial or in the way of training and instruction to the owners and to their workmen respectively—to be extended by the Central and State Governments.

Following established Continental practice, of the huge number of small-scale enterprises in India—not counting, of course, the so-called village and cottage industries altogether—only a very few would be classified as "industrial" units. Thus, the majority of India's "small scale industries" is made up of enterprises of the *artisan type**

For the true evaluation of possibilities it is very important to look at the advantage any country, still possessing a wealth of artisan enterprises, enjoys. India, on the threshold of large scale industrialisation, can congratulate herself for so valuable a possession because here is the root from which generations of semi-skilled and skilled workmen, of workshop masters and of qualified factory superintendents can be raised *if one allows for an all-out measure of training*. The latter, of course, is imperative if the abundant number of genuinely gifted workmen shall be turned into an equal number of qualified workmen for India's already existing industries and for her new enterprises yet to be established.

India, owing to reasons beyond her own making, has been late in entering the industrial era. Confronted with the needs and with

* NOTE.—Artisans enterprises, for instance, in Western Germany, are business enterprises, owned by qualified master artisans. The latter are entitled by law to give training to apprentices under apprenticeship contract. Independent master artisans are bearing full responsibility as to technical operations and as to the quality of their goods both in material and workmanship. They bear like wise all risks inherent in the business conducted by them.

the widespread poverty of her quickly growing population, the Government of India is courageously planning the economic future of the country and is emphasizing the need for quick industrialisation.

Industrialization is to secure the independence of the nation, and to ensure a comparatively quick increase in the standard of living of the population.

Strictly controlled deficit spending, as taken in consideration under the Second Five-Year Plan, is tantamount to regulated inflation. There must be wage increases followed by price increases and *vice versa*. A larger volume of money, in the hands of workmen not susceptible to income-tax, will bring forth an increasing demand for consumer goods, to meet which additional enterprises will have to be set up, thus, creating a further demand for manpower and industrial equipment.

It is only logical that India shall look at her own resources in trying to meet her growing demand both as regards skilled labour and experienced factory management, and also as regards the manufacture of industrial equipment. In fact with a colossal expenditure of foreign exchange being necessitated by the import of heavy capital goods in the course of the Second Five-Year Plan the availability of supplies in simple but sturdy and accurate machinery for India's small light and medium industries—to fulfil the rising demands for consumer goods—will depend upon the setting up of an adequately equipped light engineering industry.

Likewise, no amount of theoretical training will produce skill and experience in India's legions of unskilled and untrained workers. Skill and experience stem from severe training and from practical work under close and competent supervision. Training-cum-production, therefore, very rightly has been proclaimed India's crying need of the day.

Small scale industry, now and for the first time in Indian history becoming the subject of Governmental aid of first order, has before it a unique chance of filling the gap, opened up by forced and sudden multi-level industrialization, viz., the gap between India's immediate demands for (a) trained manpower, and (b) light industrial equipment, and India's so far but insufficiently developed resources in either field.

In the opinion of this delegation there is a very good chance of filling the said gap by proper assessment and use of all available resources. In a measure, it should be recognized that an emergency situation already exists, or is bound to develop, and that such situations in every case can be coped with adequate measures only. Much can be accomplished in the Small Scale Industries Sector during the Second Five-Year Plan. However, it would not be wise to assume that the matter can be left to rest at that. On the contrary, the dynamics unleashed by the Central and State Governments' programmes of spending will in turn lead to ever new problems and tasks. Reorganization of existing small scale industries, and the setting up of new units within this field, is likely to become a long-range task. Priority, then, should be given, within the span of the next two to five years, to the solution of but the most pressing problems.

Much may be said, in fact, about the insufficient engineering background and about the lack of adequate production equipment at present so evident in India's Small-Scale Industry. However, this delegation is convinced that the competent quarters in India have taken full cognizance of existing shortcomings. To bear this out one need refer only to official publications regarding the activities of the Ford Foundation, to the Karve Committee Report and to the recommendation submitted to the Government of India by the Planning Commission of the Second Five-Year Plan, as well as to the final text of the said Plan to be released officially within the next few days.

This delegation has found it necessary, however, to include in its report references to a number of weaknesses as now exist in India's Small Scale Industries. The only point for so doing is that such tabulation of defects may assist the Small Industries Service Institutes in their difficult task of effecting speedy reorganising and re-equipping of small scale enterprises throughout India, of establishing common service workshops when unavoidable, and, of providing adequate training facilities to workmen and proper guidance to owners of small scale units.

The development of small scale industries being as much a political as an economical issue in India, there can be no doubt about the need to employ every possible means for bringing about quick and thorough results and for making small scale industries ready to assume their proper function within India's economy as a whole. Such means will be the provision of extensive training.

the effecting of radical improvements in workshop layout and manufacturing facilities and the securing of satisfactory raw materials for small scale industries.

This delegation has observed with deep interest and appreciation the constructive aid being given to small scale industries by the Ford Foundation in their training programmes, also the many steps already taken by the Central and State Governments of India towards improving the generally still very backward situation of this branch of Indian industry.

Finally, this delegation appreciates the heavy responsibilities the Central and State Governments of India are taking upon themselves in sponsoring their Development Programmes for small scale industries.

REPORT ON POSSIBILITIES FOR IMPROVEMENTS IN INDIA'S SMALL SCALE INDUSTRIES.

I. GENERAL OBSERVATIONS.

WORKSHOP FACILITIES.

At present, Indian Small Scale Industries are suffering, as to their workshop facilities, from a variety of shortcomings which tend to endanger the health of workmen and at the same time curb their rate of productivity.

Shortcomings generally observed in the majority of small scale industry workshop visited may be listed as under—

- (a) inadequate working space,
- (b) poor lighting at workplaces,
- (c) poor ventilation of premises,
- (d) lack of measures for dust control, and
- (e) lack of sanitary and safety measures.

The said shortcomings will be overcome to a certain extent if and as Central and State Governments inaugurate up-to-date workshop facilities with modern conveniences (power, lighting, water, sanitation), i.e., within newly set up Industrial Colonies and Estates.

PRODUCTION EQUIPMENT.

In the majority of cases observed, small scale industry enterprises are badly in need of reliable and accurate production equipment. Generally, it is felt that small scale industry entrepreneurs do not realize that to produce graded goods, the first essentials are accurate—

- (a) production machines,
- (b) tools, jigs and dies, and
- (c) checking and testing instruments, all of which must be properly maintained.

The intention of the Development Commissioner to set up a central workshop to produce a range of prototype machinery for a variety of manufacturing purposes—if soon and successfully realized—holds out the hope that the actual production of such machinery in itself will give a vigorous impetus to the reorganisation of Indian small scale industry, provided that manufacture of the required components is spread over as large a number as possible of suitable and efficaciously supervised enterprises, and is concentrated, as to final assembly operations, upon a limited number of adequately managed enterprises under strict surveillance by State Inspectors.

RAW MATERIALS.

There is, of course, the problem of raw materials. Here again, it appears small scale operators are either unable or not willing to procure the correct grades of materials incidental to the establishment and maintenance of quality in their finished products.

If and as far as graded goods are to be produced, supplies of raw materials must be made available to small scale industry in accordance with requirements as to their nature, quantity and quality. If supplies from indigenous sources are not available at any given time, there should be no hesitation in taking imports from abroad rather than methods of improvisation. At this transitory stage of Indian industrialization, improvisations run the danger of establishing themselves as standards. They should be avoided, therefore, if for no other reason than to maintain a rigid standard in quality both as to materials and workmanship, such as alone will be found compatible with the present drive for all-out training in improved manufacturing techniques.

WORKERS' SKILL.

There exists, within the ranks of Indian artisans, an abundance of hitherto undeveloped practical skills and of dormant technical abilities.

Intensive training on an extensive scale is likely to produce remarkable results within the span of but a few years.

TECHNICAL AND BUSINESS BACKGROUND.

Owners of small scale industry enterprises, in the majority of cases investigated, were found to be sadly lacking in—

- (a) marketing experience,
- (b) technical training,
- (c) engineering background, and
- (d) cost of accounting practices.

In consequence, there exists a general absence of—

- (a) market research,
- (b) testing of raw materials,
- (c) use of workshop drawings and specifications,
- (d) control of working processes,
- (e) understanding for the "why" of individual workshop processes and of finishing operations, and
- (f) practice in cost and sales accounting.

Numerous improvement schemes already taken in hand and planned by competent authorities both on the Central and State levels promise to bring about gradual betterment.

Efforts at organisation on co-operative basis, under present conditions, are felt to offer chances of success. On the whole, re-organisation and education will have to be worked out over a long period.

ATOMIZATION OF RESOURCES.

There appears to be a widespread lack of concentration in small scale industry enterprises.

In the majority of cases investigated, owners of such enterprises seem to accept any work offered to them at ruinous prices, regardless of whether they are qualified for its satisfactory execution or not.

This is especially the case in small scale industry engineering enterprises. It appears to be the exception rather than the rule if the individual small scale industry enterprise limits its activities to a specialised phase of work, well planned, well supervised and well done.

There is not only far too large a range of products taken in production by enterprises poorly staffed, inexperienced and ill-equipped for the job. There is a startling tendency, at that, to perform far too many different operations in one and the same enterprise, as, for instance, moulding, casting, machining and finishing. Further, many a small scale industry enterprise is a consuming time, energy and finance in producing single purpose machines solely for its own need instead of employing the help of qualified engineering firms in the development and for the supply of such machinery. In all these cases it has been argued that a substantial saving of money is arrived at by such methods. The fact, however, is completely ignored that time, material and efforts, spent on individual trials—accompanied by occasional failures—in the development of machinery for monopolistic use, could produce far greater economic growth of the enterprise if spent upon improvements generally and upon carrying out rigorous checks and tests.

There is a dire need, thus, in Indian small scale industry for specialisation of production in agreement with modern practice as established in Western countries as well as in Japanese small scale industry.

The smaller the enterprise or its financial and engineering resources and its staff of skilled workers, the more important it becomes that most economical use is made of its resources, as for instance by limiting its activities to but a few specialized operations.

In fact, larger industrial companies—whilst in principle often agreeable to pass to small scale industry work and orders for component parts—still fear being let down both as regards delivery time and quality of such components. There is, indeed, a vicious circle in that every larger industrial enterprise, for lack of adequate ancillary industries up to the present, still tries to remain on safe ground by setting up, on its own premises, a number of only temporarily employed operational units altogether not in keeping with its

normal requirements. Evidently, many component parts could be bought cheaper from smaller enterprises if the latter would only concentrate and specialise thereon.

CUT-THROAT COMPETITION.

There exists, among Indian small scale industries in certain fields, a cut-throat competition in sales—prices are brought down to a level where workshop operation not only ceases to be remunerative to the owner of the firm but where the setting up of reserve funds towards depreciation of equipment and plant and, thus, towards the cost of necessary modernisation and re-tooling, cannot be considered at all. In these cases the ruinous price policy borders on economic suicide. However, such a price policy is being continued on and on. It ends in a gradual decrease of quality resulting from the use of inadequate production equipment, of non-descript scrap as raw material, and of insufficiently seasoned castings, as for instance, in machine tools (lathes, drilling machines, shaping and planning machines), the excuse being invariably that shortage of capital does not allow of timely improvements.

For the building up of a strong small scale industry in India, it is of paramount importance that, aside from improvements in the manufacturing set-up, there should be introduced proper methods of cost accounting and of sales price calculations.

The fact should be brought home to small-scale industry operators that, even with Indian Governments (Central and State) ready to spend huge sums on improving conditions in this industry, the building up of sound business is a task to be tackled by each individual enterprise in such manner as to pay for necessary future improvements out of funds actually earned by the enterprise.

As it is, funds earmarked for aid to small-scale industry units under the Second Five-Year Plan, will not suffice for a substantial hand-out to each unit in this industry regardless of its financial and technical standing. It is hoped, therefore, that aid will be given only to such enterprises as will use the said aid for reorganizing themselves and qualifying by effective specialization.

CONCLUSIONS.

In a planned economy, bare economic necessities dictate most measures. Therefore, even though democratic ideals in India may still permit every citizen to establish himself in business or in industrial production as he pleases and may require only that he gets himself registered with the competent authorities, it is felt that in certain fields of manufacture some more definite qualifications should be insisted upon by making it imperative for the applicant to obtain a manufacturing licence from the authorities.

Manufacturing licences.

This holds good especially for the manufacture of machine-tools. In this field, even larger enterprises are encountering difficulties in the starting phase. It would appear a wise measure, therefore, if through the small-scale industries institutes certain leading and *bona fide* enterprises could be selected and turned into "model" enterprises with Government aid.

Model enterprises.

These units, then, should submit a strict supervision of their production methods and of their quality standards by competent Government inspectors. In turn, they should receive the necessary manufacturing licences for a limited range of products.

Furthermore, they should be given Government guarantees as to the supply of essential raw materials of prescribed quality.

Registration of brands.

Finally, they should be given the right to sell their finished products—as far as these satisfy prescribed test formulas—under specific brands registered with the Government.

Drying up of Weakest Units.

Specialised Production Programmes.

By adopting such measures Government will not be forced to engage in the closing down of inefficient enterprises some of the latter, may dry up in the process of eliminating the weakest units; as for the rest, the majority may still continue in business by restricting it to specialised production programmes within narrowly defined limits.

Creation of employment.

There need be no fear of unemployment resulting from the measures here advocated. On the contrary, the workmen from dried-up units will easily be absorbed by the model enterprises previously mentioned. Workmen, set free, should be given short courses of re-training (with pay) at governmental training-cum-production workshops. Specialisation, as recommended here in fact is bound to create additional employment.

Model enterprises must, of course, comply with the demand for setting up their own training-cum-production facilities. The latter, again, should conform to standard rules worked out by responsible Government agencies.

Room for private enterprise.

The hope is expressed that, in order to encourage civil enterprise, all measures taken by Government agencies in regard to small-scale industry should leave ample room for the development of private enterprise.

As regards cost accounting, the same set of rules should be worked out, so as to apply to all kinds of enterprises in small-scale industry, viz., to

- (a) Private Units,
- (b) Co-operative units and
- (c) Government-owned workshops.

Costs in each instance should be calculated in accordance with established modern practice and should comprise—

- (a) actual payment of wages,
- (b) actual cost of materials, and
- (c) general overheads according to modern cost accounting practice.

It is felt that only by a fair deal, based on equal starting conditions for all types of enterprises in small-scale industry, clashes of interest can be avoided with all their fateful consequences such as waste of productive time and energy.

WORKSHOP EQUIPMENT.

No time should be lost in procuring sufficient quantities of workshop equipment as are necessary for the setting up of Model Enterprises. According to the Development Commissioner's Plan, until certain workshop facilities become available for the turning out of *Prototype* machines, and until, production of the latter can be entrusted to small scale industry "Model Units", it may still be advisable to procure erstwhile supplies of such machines from abroad so as to arrive quickly at an increased productivity within India's small industries.

Such imports, however, should be considered for a brief transitory period only.

In fact, demand to be anticipated from small industries for adequate production tools and plant of simple yet accurate design and execution, will be for such quantities as to rule out the meeting of such demand by sustained imports from abroad, especially considering the foreign exchange requirements that would be involved thereby and could not be met by the country.

TRAINING-cum-PRODUCTION.

Top priority for re-equipment and re-tooling in small scale industry.

It is essential also to bear in mind, in this connection, the important part to be played by small scale industry in the training of workmen and of supervisory staff for future employment, not only within small scale industry proper but also within larger industrial enterprises, both in the private and in the public sector. The speedy development of indigenous sources of supply for the required re-equipment and tooling up of small scale industry, therefore, constitutes a major task and will require *top priority* for its execution.

In the long run, provision of first-class training facilities within India—on as large a scale as might be realized in small industry—cannot but save the country much time and expense.

Training and employment for high school graduates.

Finally, training-cum-production in India's small scale industry is an answer also to the problem of getting work for the excessive number of high school graduates whom, in recent years, the administration had been unable to absorb. These graduates, thanks to their educational background, should become ideal trainees for skilled work if the expectation is held out to them that they may later on qualify for the jobs of foreman, master-artisan, workshop supervisor and the like.

II. ESTABLISHMENT OF "MODEL" ENTERPRISES IN INDIA'S SMALL SCALE INDUSTRY.

A scheme for the establishment of "Model" Enterprises in India's small scale industry is bound to be linked up very closely with the problem of specialisation in production.

In the opinion of this delegation "Model" enterprises should be established wherever industrial estates, colonies and the like come into being with Government aid. Only then will it be possible to place a certain curb on small scale industry operators to bring about a specialisation of their production programmes.

Three major complexes of work are to be discerned in India's metal-working industry, viz.—

- (1) Foundry Shops,
- (2) Mechanical Workshops, and
- (3) Surface treatment and finishing Shops.

As a general rule almost everyone of these complexes is more or less taken care of at present within each individual small unit engaged in the metal-working industry. This delegation suggests that the continuance of such practice in most enterprises is responsible for—

- (a) uneconomical use of capital,
- (b) only part-time work in certain departments of these units,
- (c) a dissipation of managerial energies on far too many production problems at a time,
- (d) insufficient training of labour,
- (e) inadequate supervision of individual working processes, and
- (f) failure to accumulate sufficient experience for each individual operation.

Therefore, considerable improvement should be achievable in small scale industry in each field of production if in the setting up

of "model" enterprises the latter were limited in their activity to one of the three complexes of work indicated further above. Then, each operator would have a chance of mastering the technique in his respective field of work in the foundry or in the mechanical workshop or in the surface treating and finishing shop.

Moreover, it is felt that there should be a limit as well to the range of products turned out by each individual foundry, mechanical workshop or finishing plant.

Capital requirements alone should dictate prudence in working out production programmes.

MOULDING AND CASTING.

Thus, individual "model" units in small scale industry should not indulge in the practice of doing their own moulding and casting. On the other hand, in each region and district there will be one or a few "model" foundries, to begin with, say, one such unit for the larger castings such as lathe and planer beds, columns for drilling machines, frames and supports for power presses, band saws and so on. Other units may do mouldings and castings of medium size and weight, such as headstocks, gear and transmission boxes, large transmission wheels, etc. Yet other units may specialise in various groups of small castings such as are required for instance for lathe and drill chucks, bearings and bushings, gears, tools, sewing machines, bicycles, etc.

Foundries, for specialised work such as indicated above, must develop of course, a more improved technique of work in moulding as well as in casting operations than will be found in any of the small-scale workshops at present. This remark refers especially to the necessity of procuring better sand for moulding purposes, of proper sand processing, of the use of proper and graded chemical compounds in place of the now used cow-dung and molasses. It refers also to the proper seasoning of castings for stress relief. It refers finally, to the introduction of sand-blasting equipment for smoothing surfaces.

A set-up of this nature accompanied by improvements all round, will enable Governmental institutes to carry out a close control on the quality of raw materials and of semi-finished products. Quality control on castings, thus, could include storage of the latter in the open for proper seasoning (stress relief) under Government financing.

MACHINING.

Likewise, operators/owners of "model" small-scale mechanical workshops should not engage in the production of complete machine tools as a general rule. On the contrary, they should leave the assembling of complete machine tools, to competent workshops to be set up for that purpose, and they should restrict themselves to

the machining of certain standard components, such as lathe beds, planer beds, shaper beds, drill columns, head stocks, riding stocks, supports, leading screws, lathe chucks, drill chucks, spindles, transmission shafts and gears, bearings and bushings, cam-shafts, sprocket wheels, hand wheels, tool posts, tools, tool boxes, machine screws, bolts and nuts, and the like.

Restriction of production in each unit to but one or a few of these components would result in bringing down individual capital requirement; it would go far in improving production technique and workshop routine, and it would help to equip each unit with all the gauging and testing instruments and tools as are indispensable for accurate and efficient production of a given number of components for such products as machine tools, precision tools, woodworking machinery, sewing machines, oil engines, pumping sets and the like.

SURFACE TREATING AND FINISHING.

In the field of surface treating and finishing processes there should be discerned several separate groups of work, viz.,

- (a) Heat Treating,
- (b) Precision Grinding,
- (c) Electro-plating and Galvanising, and
- (d) Lacquering/Enamelling and Baking.

Here again, to ensure efficiency of operation, any of the above processes might conceivably be carried out in several separate small—"model" enterprises, possibly combining several such enterprises under one roof or within one compound.

A separation of operations according to the working processes required, each of the latter well executed, is bound to produce beneficial results as to standards of quality and workmanship. They will be the fruits of a better concentration of efforts and financial means, and of accumulation of experiences in each specified field.

QUALITY CONTROL.

Of course, there is an inter-dependence between the different working processes but Government could abstain from taking a hand in too many actual small industry manufacturing processes—as far as avoidable after considering all circumstances in each region, place and case—and yet exercise through its Small Industries Service—Institutes or other bodies a close control over workshop practices.

ORGANISATION OF GOVERNMENT AIDS.

Government aid to small industry is required now, and for some time to come yet, at various levels as may be seen from the chart hereunder :—

Governmental Aids to Small Scale Industries.

- | | |
|---|--------------------------------|
| 1. Establishment and Operation of Training Centres. | } Under Second Five-Year Plan. |
| | |

2. Establishment and Operation of Industrial Colonies and Estates offering facilities, such as—

- (a) Premises, power, lighting, ventilation, water, sanitation, first-aid station, fire and police protection and a number of social amenities like canteens, showers, etc.

- (b) Common services like procurement, financing and stocking of—
(i) Production Equipment
(ii) Tools and Precision Tools
(iii) Testing and Gauging Instruments
(iv) Raw Materials

- (c) Supervision of workshops and of manufacturing methods/practice by government Field Officers

- (d) Testing and inspecting, storing (eventually financing)

- (e) Issue of semi-finished products to

- (f) Testing, inspecting, storing, displaying (eventually, financing and selling)

for—

- I. Foundries.
II. Mech. workshops.
III. Surface Treating and Finishing Shops.
IV. Assembling Workshops.

for issue to
I—IV as above (on a cash or credit basis).

for I—IV as above.

of semi-finished products *ex* I—III.

IV as above (cash or credit basis).

of finished products *ex* IV.

The pattern of small-scale industry operational set-up, as lined out above, may appear to leave too little freedom of movement to the small-scale industry owner in the choice of sources of supply, etc. However, it must be borne in mind that only within a rigid frame of both supervision and testing at all levels of production, beginning with the arrival of raw materials—as well as of production plant and tools and ending with the crating and the despatch of the finished products, can acceptable results be ensured in so wide and complex a field as Indian small scale industries, results which the need for acceleration in the development of India's industry and general economy now demands, imperatively. Besides, only by such measures as here indicated, will it be possible to establish a good name for Indian industrial products and to give full protection to the interests of the buyer of such products.

Once individual owners within small industry have qualified themselves and registered their products under specific Government brands, they may sooner or later outgrow the small industry set-up and may then enter the field of regular light and medium industries.

Inasmuch as there will be no direct pressure exercised as regards converting small enterprises into "Model" units, it should be left to the business acumen and decision of small enterprises whether they make the most advantageous use of the aid and facilities opened up to them by the Central and State Governments.

GOVERNMENT WORKSHOPS

Even though, Government must take the lead for the time being in setting up training-cum-production workshops, it is felt by this delegation that pride of ownership in an enterprise within Indian small scale industries will remain a highly stabilizing factor, and as such should not be eliminated.

To maintain a spirit of resourcefulness and self-help in small scale industries, Government should shoulder no burden as cannot be shouldered by entrepreneurs on their own. Even then, the tasks still falling upon the Government—such as training, testing, supervising, advising, financing, etc.—are heavy and not easily mastered in view of the acute shortage of suitable personnel.

III. CENTRAL WORKSHOP FOR THE DEVELOPMENT OF PROTOTYPE MACHINES FOR SMALL SCALE INDUSTRY.

Small Scale Industries in India require comparatively simple non-automatic machines. These must meet the following requirements:—

- (a) Rugged and Fool-proof Design,
(b) Accuracy in Operation,
(c) Small Power Consumption,
(d) Satisfactory Output,
(e) Interchangeability of Parts,
(f) Ready Availability of Service and Parts,
(g) Low Cost of Maintenance, and
(h) Low Purchase Price.

Machines needed in Indian small scale industries are as follows:—

A. Metal Working Machinery—

Centre Lathes
Drilling Machines
Milling Machines
Shaping Machines
Planing Machines
Slotting Machines
Shearing Machines
Hand Presses
Foot Presses
Power Presses

Light types.

Engraving Machines
Wire Drawing Machines
Small Drop Forge Hammer
Cold Saws
Pedestal type Grinders
Tube Bending Machines
Bicycle Tube Drawing and Welding Machines
Paper Pin Making Machines
Gem Clip Making Machines
Small Nuts Making Machines

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Wood Screw Making Machines
Shoe Tacks Making Machines
Can Making Machines

B. Woodworking Machinery—

Log Saws
Circular Saws
Band Saws

C. Fibre-working Machinery—

Cotton Ginning Machines
Coir Combing Machines
Coir Brushing Machines
Coir Rope Making Machines
Straw Rope Making Machines
Hemp Rope Making Machines
Sisal Rope Making Machines

D. Paper-working Machinery—

Corrugated Paper Machines
Paper Bag Making Machines

E. Printing Machinery—

Platen Presses
Tin Printing Machines

F. Miscellaneous Machinery—

Cotton Baling Presses
Laundry Machines
Button Making Machines
Shoe Making Machines
Toothbrush Making Machines
Tablet Making Machines
Oil Burners
Oil Expellers
Separators (cream)
Icecream Freezers

Engraving Making Machines
Nail Making Machines
Small Bolts Making Machines, etc.

Matches-making Machines
Bamboo processing Machines
Thickness Planers, etc.

Straw Softening Machines
Straw Mat Making Machines
Reeling Machines
Knitting Machines
Braiding Machines
Hosiery Machines
Twine Making Machines.
Small Spinning Machines
Small Power Looms, etc.

Taper Box Machines
Paper Cutters, etc.

Embossing Machines
Small Printing Presses; etc.

Ice-Making Machines
Bamboo Mat-Making Machines
Kerosene Engines
Oil Engines
Charcoal Gas Engines
Charcoal Gas Producers
Brick-Making Machines
Cement Mixers
Filter Presses, etc.

Of the machines at present produced by Indian small scale industry, especially as regards Machine-tools, very few come near the requirements as listed further above.

There are, of course, a number of larger industrial firms in India producing machine tools, such as :—

Britannia Engineering Company
Cooper Engineering Company
Garlick Engineering Company
Godrej Engineering Company
Hindustan Machine Tools (Private), Limited
India Machinery Company, Limited
Investa Machine Tools and Engineering Company, Limited
Maya Engineering
New Standard Engineering
The Mysore Kirloskar, Limited
The Praga Tools Corporation, Limited
Richardson and Cruddas

Total indigenous Machine Tool Production, according to a press notice in the "Hindustan Times" of 23 April 1956 has been :—

						RS.
1954	1,500	Complete Units	..	..	..	47.1 lakhs.
1955	2,800	Complete Units	..	..	..	67.9 lakhs.

whereas indigenous Production of Machine Tools Accessories has reached

						RS.
1954	..	..	..	..	..	2,89,237
1955	..	..	..	..	..	6,51,937

It must be clearly recognised that there are, in India, two distinct levels of demand for machine-tools and for other machinery, viz.—

(A) Demand for high class, modern, semi—or fully automatic machinery :

from end users such as Railway administrations, highway transport administrations, transportation companies, modern industrial enterprises, etc.

NOTE.—This demand is met partly by imports from abroad and partly by supplies from the indigenous firms previously mentioned (machine-tools and numerous others, e.g., in the field of Diesel engines, textile machinery and like productions).

(B) Demand for low priced, simple, non-automatic machinery, not necessarily of the latest design :

from Small Scale Industries Enterprises in a large variety of applications.

NOTE.—Demand on this level, now already substantial, is bound to reach much higher figures if and as small scale industries get reorganised.

Practically, it would mean robbing small scale industry of a one-time chance of proper organisation and development if it was denied the right to produce within its ranks the necessary components from which to assemble the simple types of machines required by it.

In fact, it is the considered opinion of the delegation that improvements in small scale industry, as to engineering background and production set-up, depend for their realisation upon the implementation of a programme for the specialised production of components and for the assembling of simple and low priced, yet sturdy and accurate machinery.

With a view to obtaining a satisfactory degree of accuracy—in conformity with practical requirements—the Development Commissioner, SSI, is working out plans for the establishment of a central workshop for the development of prototypes of machines as described further above in this chapter. Such machines shall later be taken in serial production within the small scale industry.

The delegation has been requested to assist in the working out of plans and in the procuring of drawings for a large range of machines. It is, however, realised that the development of Prototypes, and even the preparation of complete lists of materials as well as of job directions for this purpose, may become a tedious and lengthy task. For that reason the delegation has suggested that acquisition from abroad of suitable workshop drawings, etc., possibly also of patterns of complete working samples, together with corresponding manufacturing licences.

To tune up at once for later development of prototypes, it is suggested here that work should begin soon with the designing of standard types of simple items for serial production by specialised small industry-units, items for which quite a large future demand must be anticipated, as for instance,

Prototypes of : Workbenches,
Vices,
Hand tools,
Tool Boxes,
Tool Cupboards,
Tanks for Air Compressors,
Spray-painting Booths,
Sand-blasting Cabins,
Cupola Furnaces, etc.

Developing prototypes of such items as suggested above, employing Indian engineers, draftsmen and workers in the task, is likely to be a valuable preparation for the future task of developing more complicated prototypes.

IV. CONCLUSIONS.

The members of this delegation appreciate the gaining of first hand impressions of Indian small industry units as a very valuable experience.

They feel that their work does not end with the completion of their visits in India. In fact, much work can and will be done by them after their return to Western Germany.

It cannot be a question of freezing Indian small scale industry at its present low level of productivity, merely making isolated attempts at improving the quality of work and of creating additional employment. Rather, it is a question of raising artisanship throughout small industries up to more modern standards and of reforming the organisational and production set-up of small scale industry from the bottom. Thus there can be developed a *genuine* small scale industry all over India.

An exemplary pattern for the development of an up-to-date small scale industry has been pointed out to India's Prime Minister, Mr. Jawaharlal Nehru, by Dr. Seiffritz and Prof. Lebmenn, President and Manager, respectively, of the German-Indo Study Society of Stuttgart, when these two called on Mr. Nehru at Fuschl-Castle in Austria, last summer, explaining to India's Premier the set-up of small scale industry in South Western Germany (Baden-Wuerttemberg). There, a mixed agricultural-industrial economy exists in the sense that people, working part of their time on their own little farm-steads, or helping farming work during agricultural peak seasons, are finding in the other months of the year, employment in a large number of small scale industry enterprises, and even in larger factories. Small scale manufacturers in that region are fitting their production schedules smoothly to the possibility of finding labour at certain times of the year only. Yet, by building up stocks of their products when labour is offered in plenty, they manage to carry on business and effect shipments of their products from stock when most workmen take leave to do farming work. The region as a result of this establishment of close ties over generations between the working people and the owners of small scale industry enterprises, has become known as being stable in economy and employment, also as the mainstay of democratic ideals even at times when there has been reigning in other, heavily industrialised regions, much economic depression and much unemployment. Thus, then, indeed is an ideal pattern after which to re-model Indian small scale industries.

Upon their return to Germany, the delegation will recommend that efforts shall be made to offer to the Government of India the services of :—

(a) One expert on Foundry layout and operation, and

(b) A team of Experts to assist in the development of prototypes of machines needed in Indian small scale industries.

The members of the delegation, of course, hold themselves at the disposal of interested parties, both official and private, who desire further information in elaboration of the report.

A corresponding report will be submitted by the delegation to the Ministry of Economics of the German Federal Republic, at Bonn.



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