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**APPROPRIATE TECHNOLOGY
FOR LIGHT ENGINEERING INDUSTRIES
AND RURAL WORKSHOPS**

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STARTING A BLACKSMITH AND AGRICULTURAL IMPLEMENTS UNIT
IN RURAL AREAS

Background Paper

STARTING A BLACKSMITH AND AGRICULTURAL IMPLEMENTS
UNIT IN RURAL AREAS

by

The Appropriate Technology Development Association*
(ATDA), Lucknow

* This paper was prepared by R. N. Kapoor on behalf of ATDA.

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I N T R O D U C T I O N

Village artisans have sustained the village economy for ages. The blacksmiths, potters, shoe-makers, etc., have not only catered to the needs of the countryside for centuries, but have also produced surplus which was exported to towns and cities and even outside the country. But somehow now-a-days they are not able to produce new kinds of products required by the present-day society. They are not able to stand in competition with the modern workshops and their technology and methodology of production and organisation. This phenomenon has endangered their very existence and has resulted in large-scale unemployment in the countryside. It would be a sad day, indeed, for the country, if all these ancient village craft and industry goes into oblivion. It would be difficult to revive and rehabilitate them in rural areas if these skilled and professional people become extinct due to the onslaught of modern industries. This trend may be due to lack of proper technology available to these craftsmen and also due to the absence of an infrastructure, which are important prerequisites for any industrial production now-a-days. These shortcomings can be overcome in two ways. Firstly, by providing a centralised work-place where proper technology and organisational pattern with machines, equipments, tools, and facilities for the design of products and marketing, etc. are built up and artisans are made to work on piece-rate wages to produce articles of required market acceptability in these centres. The infrastructure like building, equipment, etc. will have to be provided by the agencies building the centralised work places. The second method could be to extend the appropriate technology with minimum essential equipment directly to the cottages of the artisans to enable them to work in their own

homes and build up their workshop. The infrastructure in this case will have to be provided initially by some development agencies and later on a local entrepreneur can take it up.

The Allahabad Polytechnic has done commendable work as far as the first method is concerned. For the last few years, they have established a central work-place within their own premises and gave opportunity to the artisans to work there. In actual field conditions, this experiment has proved successful. Now Allahabad Polytechnic are extending this experiment directly to the rural areas installing central work-place with infrastructure facilities to some of the villages near Allahabad. This study is based on their experience and has been named as 'rural artisan complex'.

The Appropriate Technology Development Association prefers the second method for taking the improved workshop to the cottage of the artisans concerned because it makes them more independent. However, the Association also have a great appreciation for the work done by Allahabad Polytechnic to revive these crafts in their own premises and villages. To introduce the second method requires much more hard work and more inputs are needed to make it successful. The Association has, therefore, decided to support the experiment of the Allahabad Polytechnic in the initial stages and to help in establishment of the Central Workshop in the villages near Allahabad to make a success of this experiment. Subsequently, the Association will take up the work to select suitable products and design of new products for cottage production in close collaboration with the Allahabad Polytechnic.

In the last few centuries benefits of science and Technology have been experienced largely in urban areas and the traditional crafts in villages have little impact of scientific progress. On the other hand, they experienced a set back and the traditional artisans gradually left their trades and passed on to either new occupations or became partially or fully unemployed.

BACKGROUND AND NEED : Iron-mongery or Black Smithy is a fairly old craft of our land; it was rather a symbol of progressive civilisation. It catered to the wide ranging needs like domestic, agricultural, transport and buildings etc. Among metals, iron and steel have been at the first place in terms of quantum of use. The craft of blacksmithy was found in every village community. Village blacksmiths provided household utensils and wares, fittings for buildings and tools for agriculture. Furthermore, the rural community were and are still an agrarian society - hence the need of diverse type of implements and tools for agriculture has always existed. Well trained blacksmiths have therefore an important place in the rural society. But unfortunately with the advancement of science and technology, this trade instead of being suitably strengthened, has undergone such a decline that it is now on the verge of being extinct from the rural areas. This has been done due to the fact large industries progressing much faster and innovative means of mechanised production have flooded the market with a wide range of articles, whether it is domestic iron & steel utensil or agricultural implement. The blacksmith's position in the village market has been almost wiped out forcing him either to take up other vocations or to migrate to urban areas to get job in the industries. Such industries being capital intensive have created problem of large scale unemployment and withering of this village craft. This has put the village community

to be developed. It is also necessary to provide an urban market for an export no facilities for repair of basic agricultural implements. It is therefore the need of the hour to revitalize the village craft of blacksmithy so valuable for our agriculturalists in addition to its other utilities. The skill of blacksmith's technology should be suitably updated to meet the modern needs and the trade be given appropriate organizational and financial support so that it may multiply fast and strengthen the village economy.

Measures Proposed:

Since skilled, semi-skilled and unskilled manpower is in abundance in villages effort should be made to start centralised village blacksmithy & Agricultural Implements units to serve as nucleus for development of this trade. These units, given some reasonable techno-economic base, will become self-supporting preferably on cooperative basis, and can be made to diffuse the skills and know-how to artisans living in the adjoining hinterland. In the second stage these centres can take-up the work of starting a chain of smaller decentralised units of production serving the rural population over a larger area. Central Units will have following objectives.

- Ist Phase:
1. To serve as a central pilot unit in rural area.
 2. To take up design, development and production of articles of iron & steel for rural requirements.
 3. To serve as a basic organisation for trade and technology.

- IIInd Phase:
1. In addition to the above, to provide training of to young entrepreneurs selected from the adjoining villages belonging preferably from families of blacksmiths.
 2. To provide a seed money of Rs. 1,000/- to each of the trained entrepreneur so that he may buy the basic hand tools and equipments and renovate his work place for starting a cottage level blacksmithy cum- Agricultural Implements unit in his villages.
 3. To provide raw materials to the trained entrepreneurs and buy their finished goods for marketing.
 4. To provide follow-up facilities for the entrepreneurs particularly regarding technical know-how and product design-improvement etc.

A CASE HISTORY:

In the context of the foregoing the case History growth of a blacksmithy & sheetmetal section in the Production-Cum-Training Centre of Allahabad Polytechnic and its subsequent diversification merits a detailed reference. It started in 1971-72 with polytechnics growing requirement for door & window frames No. of Trusses etc. in wake of its continuing Pazo building construction programmes

and steel fabrication was considered expedient, easier to maintain & economical in longer run. Similarly the need of institutional furniture was too large and it was assessed the procurement from market, on the whole, will not be satisfactory from cost, quality and time considerations. As such fabrication of steel furniture was taken up and it was an immediate success. The institutional offices, class room were quickly furnished with good quality furniture. Many other institution government offices, and departments and industries come forward with large-scale job-orders. Even high specification industrial furniture was fabricated for big industries like the Indian Telephone Industry, Maini, Allahabad. Since then the Steel Furniture making emerged as a distinct and specialised activity. In all these pursuits provision of high grade training to produce quality craftsman was always maintained. Further owing to the persistent demands from the agriculturists of the nearby Villages, fabrication of agricultural implements was also taken up. The response of the consumers was highly encouraging. One product after the other was added leading ultimately to the establishment of a separate unit known as 'Apolo Farm Equipment' which specialises in over 2 dozen Agricultural implements. Meeting to rural energy needs this section now manufactures die-gas plants and takes up its installation too in rural areas. Over 200 such plants have been fabricated and installed in the nearby regions.

In order to transfer the fruits of these technologies for the benefit of rural communities, the concept of starting a chain of small decentralised Craft units in Villages is philosophically in agreement with the of thinking of the Appropriate Technology Development Association of India also and the latter have agreed to join hands in such a venture. An Extension Centre of this unit has been started in the Sewath Village near Allahabad as a part of the larger programme of "15 Village Integrated Area Development Plan" of Allahabad Polytechnic. This centre has been a boon to the Villagers as they have not to run to city shops for buying their agricultural implements and getting the implements repaired when needed. The next programme of this centre will be to provide training to young entrepreneurs selected preferably from family of traditional blacksmiths and help them establish their own cottage industries in their respective villages. Market disposal of finished goods and procurement of raw materials for their industries will be done by the Extension Centre.

The attached Scheme gives the details of such a scheme.

FINANCIAL OUTLAYS

1. Working Capital	-	Rs. 7,36,000/-
2. Fixed Assets	-	Rs. 2,88,000/-
3- Revolving Fund forced money to entrepreneurs.	-	Rs. 1,00,000/-
		<hr/>
	Total	Rs. 5,24,000/-

MINOR CAPITAL EXPENDITURES:

A.	<u>Buildings</u> (including land etc.)	<u>Amount in Rs.</u>
	1. Land 1 acre	10,000/-
	2. Building shed type 30' x 60' size (including water & power installations)	60,000/-
	Total:	Rs. 70,000/-

B. MACHINERY AND EQUIPMENT:

S.No.	Items	Nos.	Unit Cost Rs.	Total Cost Rs.
1.	Harihar/Kirlockar Lathe, 6 ft. Length, Bore 2" O.	1	6,000/-	6,000/-
2.	Pedestal Grinder	1	4,000/-	4,000/-
3.	Power Hacksaw 12"	1	5,000/-	5,000/-
4.	Millar Drill Machine, 1/4" capacity	1	4,000/-	4,000/-
5.	Miller Drill Machine, 1/2" - 3/4"	1	5,000/-	5,000/-
6.	Power Press, 100 ton, Geared fly wheel type, vertical	1	60,000/-	60,000/-
7.	Hand Press, Polar type.	1	2,000/-	2,000/-
8.	Welding Transformer 15 K.V. Three phase with accessories.	1	5,000/-	5,000/-
9.	Guillotine shear for cutting 6 mm plate.	1	60,000/-	60,000/-
10.	Rolling machine	1	5,000/-	5,000/-
11.	Hand Bending machine	1	5,000/-	5,000/-
12.	Line Bending machine	1	1,000/-	1,000/-
13.	Seam Welding machine	1	4,000/-	4,000/-
14.	Smith Forge	5	1,000/-	5,000/-
15.	Hand shearing machine	1	400/-	400/-
16.	Welding set torch	1 set.	2,500/-	2,500/-
17.	Air Blower	1	5,000/-	5,000/-
18.	Portable Grinder	2	800/-	1,600/-
19.	Portable Drill Machine.	2	800/-	1,600/-
20.	Circular Cutting Machine.	1	2,000/-	2,000/-
21.	<u>Hand Tool:</u> Hammer, Anvil, Pail, Chisels, Hand Hacksaw, V. Block, Hand Shear shouldering. Iron, File, Die-sets, Tap sets, Drill Bits, Tool Bits Screen, Wrench, Screw driver, Wrenchset, surface, blank plate etc.		6,000/-	6,000/-
22.	<u>Measuring Instruments:</u> Steel scale, try square, Bevel, Protractor, steel tape, Vernier caliper, inside and outside Micrometer, Height Gauges, Dial Gauges etc.		5,000/-	5,000/-
	Total:			Rs. 2,03,100/-
			Say:	Rs. 2,03,000/-

	<u>Amount in Rs.</u>
C. OFFICE EQUIPMENTS	
1. Cupboards, racks, storage cabinets etc.	5,000/-
2. Typewriters, tables, chairs etc.	<u>10,000/-</u>
Total:	15,000/-
D. RAW MATERIALS (per month)	
1. Raw-materials like M.S. rods, Angles, pipes, M.S. sheets, G.I. Sheets etc.	30,000/-
E. CONTINGENCIES: (per month)	
1. Telephone, postage, conveyance, stationery etc.	1,000/-
2. Water and Power charges.	<u>3,000/-</u>
Total:	4,000/-
F. SALARIES & WAGES: (per month)	
1. Manager, One @ Rs.1000/- p.m.	1,000/-
2. Foreman, One @ Rs. 800/- p.m.	800/-
3. Supervisor, Two @ Rs.600/- p.m.	1,200/-
4. Accountant-Cum-Cashier, One @ Rs.500/- p.m.	500/-
5. Store-keeper, One @ Rs.400/- p.m.	400/-
6. Office-Assistant, two at Rs.300/- p.m.	600/-
7. Peon, one @ Rs.200/- p.m.	200/-
8. Watchman, two @ Rs.200/- p.m.	400/-
9. Skilled workers, 15 nos. @ Rs.12/- p.day(av.)	4,500/-
10. Helpers, 10 nos. @ Rs.7/- p.day (av.)	<u>1,750/-</u>
Total: Rs.11,950/-	
Say: Rs.11,400/-	
G. WORKING CAPITAL: (for 3 months)	
1. Raw materials	90,000/-
2. Contingencies	12,000/-
3. Salaries and Wages	<u>34,200/-</u>
Total: Rs.1,36,200/-	
Say: Rs.1,36,200/-	
H. CAPITAL INVESTMENT:	<u>Amount in Rs.</u>
1. Fixed Assets	2,88,000/-
2. Working Capital	<u>1,36,000/-</u>
Total:	Rs.4,24,000/-

Amount in Rs.

I. PROFITABILITY ANALYSIS: (on Annual Basis)

Cost of Production:

1. Raw Materials	3,60,000/-
2. Contingencies	48,000/-
3. Salaries and Wages	1,36,800/-
4. Interest on Capital Investment @ 10% per annum.	42,400/-
5. Depreciation of Buildings at 50% per annum.	3,000/-
6. Depreciation on Machinery and Equipments at 10% per annum.	21,800/-
Total:	Rs. 6,12,000/-

Taking on an average profit of 20% on the various products (like threshers, cultivators, law owners, bio-gas plants etc., whose actual numbers will vary upon demand position), the annual profit will be Rs. 1,22,000/--

J. NUMBER OF WORKERS/STAFF:

Male	:	34
Female	:	2
Total:		36

LIST OF SUPPLIERS OF MACHINERY AND EQUIPMENT REQUIRED
FOR MANUFACTURE OF AGRICULTURAL IMPLEMENTS.

1. Indian Oxygen Ltd.,
F-134, Taratolla Road,
CALCUTTA-53.

2. Production Cum-Training Centre,
Allahabad Polytechnic,
ALLAHABAD.

3. Rallis India Ltd.,
Rallis House,
Rawlins Street,
BOMBAY - 1.

4. Testing Machine Corporation,
104, Kakad Chambers,
132, Dr. Annie Besant Road,
Worli,
BOMBAY - 400018.

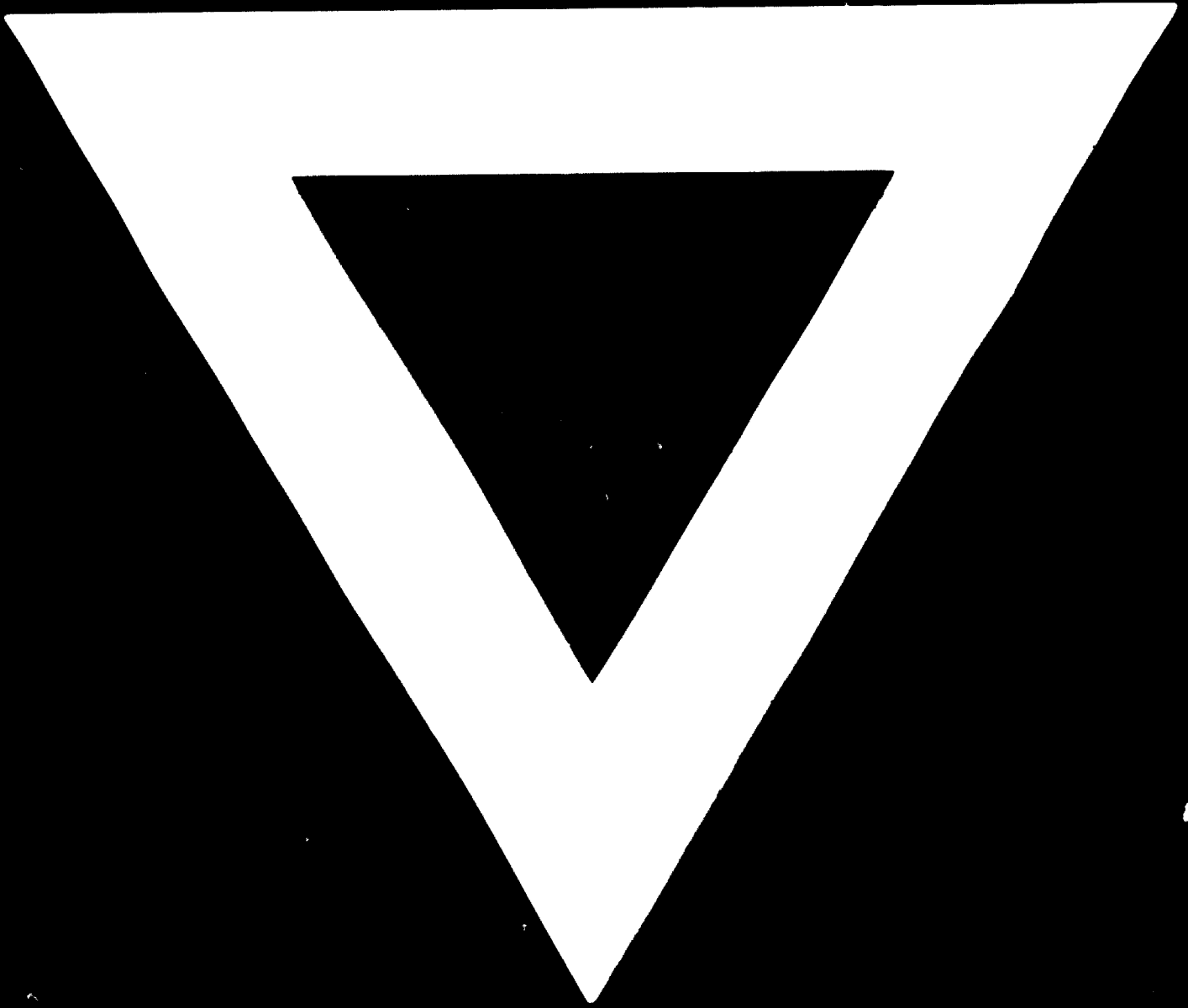
5. Metro Steel Industry,
Iarni Wollen Mills East Hoines Road,
BOMBAY - 1.

6. Precision Tools and Appliances,
BOMBAY.

7. Kirloskar Brothers Ltd.,
Kirloskar Wadi,
SATARA (Maharashtra)



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