

PUNJAB

- (1) Lahore – Chunian Axis.
Centre: Bhai Pheru.
- (2) Lahore – Sheikhupura Axis
Centre: Sheikhupura.
- (3) Gujranwala – Sialkot Axis.
Centre: Sialkot.
- (4) Rawalpindi – Mianwali Axis.
Centre: Mianwali.
- (5) Bahawalpur – Bahawalnagar Axis.
Centre: Bahawalnagar.

NWFP

- (1) Haripur – Abbotabad Axis and Haripur-Havelian Axis.
Centre: Haripur.
- (2) Islamabad – Nowshera – Peshawar Axis.
Centre: Peshawar.
- (3) Peshawar-Kohat Axis. Centre: Kohat.

BALUCHISTAN

- (1) Lesbela – Quetta Axis.
Centre: Lesbela
- (2) Lesbela – Mekran Axis.
Centre: Mekran.

SIND

- (1) Hyderabad – Nawabshah Axis.
Centre: Nawabshah.
- (2) Nawabshah – Sanghar Axis.
Centre; Sanghar
- (3) Nawabshah – Larkana Axis.
Centre: Larkana.
- (4) Larkana – Sukkur Axis.
Centre: Sukkur

Table I
Quantitative projections of employment

	<u>Estimated</u> <u>July 1988</u>	<u>Estimated</u> <u>July 1993</u>
Population	105.4	122.8
Domestic Labour Force	31.0	36.1
Net returnees	-	0.4
Total Labour Force	31.0	36.5
Unemployment	1.1	2.4
Employment	29.9	34.1
Unemployment rate (% of Labour Force)	3.5	6.6

Note: Estimates are based on crude activity rate of 29.4 percent as given in the LFS of 1986-87.

Source: Seventh Five-Year Plan. Planning Commission, Government of Pakistan. Islamabad.

Table 2
Estimated changes in labour absorption in crop production
during 1988-2000

	<u>Policy 1</u>	<u>Policy 2</u>
1. Increase in Labour Demand (Man days per year)	292.291M	361.987M
2. Man days of production Labour required to sustain one Farm household	225.11	225.11
3. Increase in absorption of Farm Households	1.297 M	1.604M
4. Increase in absorption of Farm Population.	8.431 M	10.426 M

Note: (1) Estimates mine.

- Sources: i) Wapda XAES data on Coefficients (Unpublished)
 ii) Pakistan Census of Agriculture, 1972, 1980.
 iii) Report of the Farm Mechanization Committee, Ministry of Agriculture and Works, Government of Pakistan, 1970.
 iv) Pakistan Census of Agriculture Machinery.

Note: (2) Policy I

- (a) Growth of tractors and size of tractors in the period 1988-2000 remains the same as in the period 1968-1975.
- (b) Introduction of Mechanized harvesting does not cover more than 10 percent of the total cultivated area.
- (c) Increase in delivery and application efficiencies of irrigation resulting in a growth rate of crop production of 3.7 percent per year, with associated increases in cropping intensities.

(2) Policy 2

- (a) Growth rate of tractors during 1988-2000, slows down half the rate observed in the period 1968-1975.
- (b) Same as in Policy I
- (c) Same as in Policy I

Table 2
Estimated changes in labour absorption in crop production
during 1988-2000

	<u>Policy 1</u>	<u>Policy 2</u>
1. Increase in Labour Demand (Man days per year)	292.291M	361.987M
2. Increase in Labour Demand for NON- FARM activity (Man days/year)	66.642M	82.328M
3. Increase in absorption of Non-Farm Households in Agriculture Sector	0.296 M	0.366M
4. Increase in non-farm Population absorption in Agriculture Sector.	1.835M	2.296M

Note: (1) Estimates mine.

- Sources: i) Wapda XAES data on Coefficients (Unpublished)
v) Pakistan Census of Agriculture, 1972, 1980.
vi) Report of the Farm Mechanization Committee,
Ministry of Agriculture and Works, Government of
Pakistan, 1970.
vii) Pakistan Census of Agriculture Machinery.

ESTIMATES I
Man Days Requirement (MDR)for irrigated crop
acreage without tractors

	<u>C.A.*</u>		<u>MDR/ACRE**</u>	
Wheat	9.483	x	16.4	= 156.47 Million
Rice	1.928	x	29.8	= 54.50 Million
Cotton	4.388	x	27.9	= 121.03 Million
Sugarcane	0.839	x	48.9	= 41.02 Million
Maize	0.757	x	22.5	= 17.03 Million
Oil Seeds	0.547	x	11.9	= 6.51 Million
Pulses	0.550	x	8.8	= 4.84 Million
Fodders	4.979	x	17.3	= 86.14 Million
Total Man-Days Requirements				= 187.54 Million
Total Irrigated Cropped Acreage				= 23.32 Million..(i)
Total Man-Days Requirement				= 487.54 Million..(ii)
MDR per year, per irrigated acre				= 487.54/23.32=20.91

- Sources:
- i) WAPDA data for Labour coefficient
 - ii) Pakistan Census of agriculture for Estimates of Cropped Acreage (irrigated) for each crop.
- * Cropped Acreage.
** Man days per acre.

ESTIMATES 2
Man Days Requirement (MDR)
for irrigated crop acreage without tractors

	<u>C.A.*</u>		<u>MDR/ACRE**</u>	
Wheat	2.28	x	11.5	= 26.22 Million
Cotton	0.051	x	19.4	= 0.989Million
Sugarcane	0.015	x	34.1	= 0.512 Million
Maize	0.143	x	15.7	= 2.045 Million
Oil Seeds	0.250	x	8.3	= 2.075 Million
Pulses	2.097	x	7.8	= 16.356Million
Fodders	0.792	x	9.6	= 7.603Million

Total Man-Days Requirements = 55.49 Million
Total Irrigated Cropped Acreage = 5.63 Million
MDR per year, per irrigated acre = 55.49/5.63=9.63

- Sources:
- i) WAPDA data for Labour coefficient
 - iii) Pakistan Census of agriculture for Estimates of Cropped Acreage (irrigated) for each crop.
 - * Cropped Acreage.
 - ** Man days per acre.

ESTIMATES 3**Man-Days Requirement (MDR)
for irrigated and unirrigated cropped acreage with tractors****(PAKISTAN)**

Assuming that average MDR/year for irrigated acreage and UNIRRIGATED acreage respectively, in Punjab and Pakistan as a whole are the same, MDR for Pakistan, taking account of differences in cropping intensities between Punjab and Pakistan, can be estimated as follows:

Total irrigated cropped acreage in Pakistan	=37.24 Million
MDR per year per irrigated acre (Estimate 1)	=20.91
(i) Total MDR per year in Pakistan crop sector (Irrigated)	=37.24x20.91 =778.69 Million
Total unirrigated cropped acreage in Pakistan	=10.53 Million
MDR. per year per unirrigated acre (Estimate 2)	= 9.86
(ii) Total MDR per year in Pakistan Crop Sector (Unirrigated)	10.53x9.86 103.83 Million
(iii) Total MDR/Year in Pakistan crop sector (without tractors) = (i) + (ii)	= 778.69+103.83 =882.52 Million

ESTIMATES 4

**Man-days per acre per year requirement (Pakistan)
in the year 2000
(without tractors and with tractors)**

A. YEAR 1988	
MDR/Year without tractors (Estimate 3 (iii))	= 882.52 Million
Total cropped acreage (Irrigated + Unirrigated)	= 37.24 + 10.53 = 47.77 Million
Man days/year/acre for Pakistan crop sector	= 882.52/47.77 = 18.47
B. YEAR 2000	
(i) Assuming 3.7 percent per annum growth of output over the period 1988-2000 and a proportionate increase in labour demand, i.e. constant labour productivity, MDR/year/acre in year 2000	= 27.51
(ii) Labour demand in crop sector in year 2000, without tractor	= 27.51 x 47.7 = 1312.23 Million MDR
C. CHANGE IN LABOUR DEMAND DURING 1988-2000 (WITHOUT TRACTORS)	
(i) Labour demand in crop sector (without tractors) in year 2000	= 1312.23 Million MDR
(ii) Labour demand in crop sector (without tractors) in year 1988 (Estimate 3 (iii))	= 882.52 Million
Change during 1988-2000	= 1312.23-882.52 = 429.71 Million MDR

D. CHANGE IN LABOUR 1988-2000 WITH TRACTORS	
(i) Change in Labour Demand between 1988-2000 if tractorization continues at the same pace as between 1968-75, but without any change in yield	= -137.64 Million
(ii) Change in Labour Demand between 1988-2000 if tractorization continues at the same pace and also with a 3.7 percent annual growth of output	= 292.29 Million

ESTIMATES 5

Increase in absorption of households and population in Pakistan's crop sector 1988-2000

- i) Man days of employment required to sustain one farm household, at wage rates prevailing in 1975, and just at the poverty line, (using 1975 consumer price index), comes out to be = 225.11 man days
(See A. Hussain: Rural Population Estimates, PEPAC NHS Report, Appendix 2)
- ii) Increase in Labour Demand between 1988-2000, if tractorization continues at the same pace and also with a 3.7 percent annual output growth (Estimates 4 D (ii) = 292.29 Million
- iii) Total increase in Absorption of Households in the Crop Sector in Pakistan over the period 1988-2000 $292.29/225.11 = 1.3$ Million
- iv) Total increase in Population Absorption in the Crop Sector (using national average household size of 6.5) = 8.45 Million persons.

**TECHNICAL AND FINANCIAL REQUIREMENTS FOR
INDUSTRIAL SUPPORT CENTRES
MATERIALS TESTING LABORATORY¹⁵**

Function: Checking incoming raw materials, determine mechanical properties of materials, verification of results of heat treatment.

- Equipment:**
- A. Microstructural analysis of metals**
 1. Cut-off sawing machine
 2. Laboratory press
 3. Grinding and polishing equipment
 4. Various equipment for cleaning, storage, etc., of specimen.
 5. Etching facilities, including basic set of chemicals.
 6. Metallurgical microscope
 - B. Mechanical Testing**
 1. Hardness testing equipment, according to:
 - Rockwell
 - Brinell
 - Vickers
 2. Testing equipment for:
 - Tensile Test
 - Compression Test
 - Bending Test
 3. Impact Tester
 4. Various small testers and tools
 - C. Steel Composition Analysis**
 1. Set of equipment and analytical instruments for determination of alloy elements and carbon contents.

Budget: Rs.6.984 Million

FOUNDRY**Equipment and Budget Estimate**

Function: Production of ferrous and non-ferrous castings.

Equipment: Machinery and tools for:

1. Melting and pouring
2. Mould production
3. Sand preparation
4. Core making
5. Finishing and fettling
6. Quality Control
7. Pattern making and storage

Budget: **Rs. 24.25 Million**

**SURFACE TREATMENT UNIT
Equipment and Budget Estimate**

A. HOT-DIP GALVANIZING UNIT

Function: Hot-dip galvanizing, zinc, nickel and chrome, of relatively small, handy steel production. The process is comprehensive, in this way meant for application as well as demonstration purposes.

Equipment:

1. – 8.	Pre-treatment bathes
9. – 16.	Nickel/chrome bathes
17. – 22.	Zinc bathes, design sizes:
	- Active bath: 1200* 1100* 1000/1050 mm Construction: steel, internal and external coated with rubber.
	- Two barrels for nickel and zinc galvanizing included.
23.	Centrifuge
24.	Six (6) rectifiers, incl. Copper strip 25 m
25.	Work bench
26.	Blower and pipe system
27.	Four (4) filter pumps
28.	Titanium baskets
29.	Chemicals
30.	Lead anodes
31.	Nickel, 1000 kg
32.	Zinc, 1000 kg
33.	Accessory tools

Budget: Rs.6.79 Million

SURFACE TREATMENT UNIT
Equipment and Budget Estimate

B. PAINT SPRAY INSTALLATION

Function: Universal spray painting unit, equipped with a blasting unit, a muffle-furnace and testing facilities.

- Equipment:
1. Pre-treatment, Blasting Unit
 - I semi-portable compressor
 - I air-cooled air dryer
 - I after cooler
 - I vertical pressure tank
 - I blasting set
 2. Storage: racks for workplace materials, products and tools.
 3. Paint spray equipment
 - 4 complete airless cold spray sets
 - viscosity meter alu
 - speed coupler for air hose
 - air hose 9mm internal
 4. Pain application room
 - 4A. -2 dry spray painting bays 3000* 1970 mm 4B. -filter framers, 10m 2
 5. Workbench
 6. Racks, for drying and transportation purposes
 7. Muffle furnace
 - Size: Interior: 3150*1400*1980 m
 - Exterior: 3400*2000*2030mm
 8. Testing devices
 - Layer thickness meter
 - Porosity tester
 - Sulphur dioxide tester
 9. Accessory tools

Budget: Rs. 2.62 Million

WELDING SHOP

Equipment & Budget Estimate

Function: Application and demonstration of the various kinds of welding techniques used in modern metal industry.

- Equipment:**
- A. Storage**
 - 1. Cupboards shelves, racks, electrode cabinets for welding materials.
 - 2. Racks and Shelves for work piece materials.
 - B. General**
 - 1. Sawing machine.
 - 2. Set hand tools.
 - 3. Measuring tools.
 - 4. Welding tables
 - 5. Fume extraction equipment
 - 6. Protective clothing
 - 7. Shower
 - 8. First aid kit
 - 9. Grinding machinery
 - 10. Testing equipment
 - 11. Equipment to manufacturer welding jigs.
 - 12. Welding curtains
 - 13. Workbenches.
 - 14. Preheating equipment
 - C. Electric arc welding**
 - 1. 5 Welding transformers AC.
 - 2. 3 Welding rectifiers DC.
 - 3. 3 MIG welding machines.
 - 4. 1 TIG welding machine.
 - 5. 1 Power deck welding machine.
 - 6. 2 Portable welding transformers.
 - 7. 1 Plasma welding set.
 - D. Oxygen/acetylene welding/soldering**
 - 1. 5 Oxy-acetylene welding/soldering set.
 - 2. 1 Acetylene generator.
 - E. Electric resistance welding**
 - 1. 1 Pedestal spot welding machine.
 - 2. Handheld spot welding gun.
 - 3. 1 seam welder.

Budget: Rs. 4.365 Million

THIN SHEET METAL AND TUBE BENDING UNIT

Equipment and Budget Estimate

Function: The ability to perform various operations on thin metal sheets, like folding, bending, punching and deep-drawing, and on tubes.

Equipment: **A. Thin metal sheet unit (0-3 mm)**

1. Guillotine shear.
2. Hand lever operated shear
3. Roller Machine
4. Folding machine
5. Plate bending tools
6. Circular shears
7. Notcher
8. Bordering machine
9. Punching machine
10. Press, deep drawing
11. Metal band saw
12. Hand electric sheet metal working tools.
13. Accessories and spare parts

B. Tube bending unit

1. Machinery for thin-wall pipe 2"
2. Circular Saw
3. Angle bender
4. Threading machinery
5. Hand tools
6. Accessories and spare parts.
7. Work benches

Budget: **Rs. 5.626 Million**

**SHEET METAL UNIT FOR THICK
METAL SHEETS (3MM)****Equipment and Budget Estimate**

Function: The ability to perform various operations on thick metal sheets, like shearing, bending, press braking.

Equipment:

1. Guillotine shear
2. Plate bending rolls.
3. Fusion edge milling machine
4. Press brake
5. Hand tools
6. Accessories and spare parts.
7. Work benches.

Budget: Rs. 4.850 Million.

HEAT TREATMENT UNIT**Equipment and Budget Estimate**

Function: Hardening of metal parts and components.

- Equipment:
1. Shaft furnace
 - for retorts.
 - Including a controlling device
 2. Annealing furnace
 3. Carbonating retort
 4. Nitrating retort
 5. Hoisting mechanism
 6. Oil bath, including CO₂-fire extinguisher.
 7. Water bath
 8. Gas control for N₂, H₂, methanol, ammonia.

Budget: Rs. 2.425 Million

TOOLS AND DIE-MAKING SHOP**Equipment and Budget Estimate**

Function: The manufacturing of tools and dies for pressing works.

Equipment:

1. Copy-milling machine
2. Milling machine.
3. Tool Room lathe.
4. Pillar drilling machine.
5. Band sawing machine
6. Horizontal grinding machine
7. Tool and cutter grinder.
8. Pedestal grinder.
9. Hand tools and measuring tools.
10. Work benches, lockers, etc.
11. Spark erosion machine.
12. Wire erosion machine.

Budget: Rs. 14.841 Million

AUTOMOTIVE WORKSHOP/GARAGE
Equipment and Budget Estimate

Function: Maintenance and repair of motor vehicles passenger cars, vans and trucks.

Equipment:

1. Hoisting equipment: car lift, jacks, and workshop crane.
2. General equipment: sets hand tools, workbenches, parts cleaning.
3. Storage: cupboard, racks for spare parts and tools.
4. Diagnoses equipment for petrol and diesel engines, electric equipment.
5. Tune-up equipment for petrol and diesel engines.
6. Lubrication equipment: oil filling, greasing.
7. Brake service equipment.
8. Tyre service equipment.
9. Body working equipment: panel beating, welding, body alignments et.
10. Wheel alignment set.
11. Paint spray booth and equipment.
12. Electric system tools and testers, battery service.

Budget: **Rs. 5.335 Million**

REFERENCES

1. Pakistan Environmental Planning and Architectural Consultants (PEPAC). National Human Settlements Policy Study for the Ministry of Environment and Urban Affairs 1983.
2. Ayub Qutub: Walking Lightly. Paper in IUCN/CIDA: towards a National Conservation Strategy for Pakistan ed. Ayub Qutub Lahore, 1987.
3. Report of the National Commission on Agriculture, Ministry of Food and Agriculture, Government of Pakistan, March 1988. p. 392.
4. Ibid., p. 393.
5. Seventh Five Year Plan 1988-93, Planning Commission, government of Pakistan. Chapter 12. pp. 89-97.
6. Ibid.
7. WAPDA/XALES data. Unpublished. Used in my study titled: Rural Population Estimates. PEPAC March 1983.
8. John P. Melnerney and Graham F. Donaldson: The Consequences of Farm Tractors in Pakistan: World Bank Staff Working Paper Number 210, February 1975, p. 52.
9. A. Hussain: Impact of Agricultural Growth on Changes in the Agrarian Structure of Pakistan. D. Phil Thesis, Sussex 1980. Summary results published in: Technical Change and Social Polarization in Rural Punjab, Chapter in book: Akmal Hussain: Strategic Issues in Pakistan's Economic Policy. Progressive Publishers, Lahore, 1988.
10. Sayyed Engineers 1987. Survey of Hungry and homeless Lahore.
11. Noman Majid: Labour Markets and Systems of Production Organization in Sind N.D.F.C.
12. Ibid., p. 57.
13. Ibid., p. 65
14. Ibid., p. 73
15. The lists of machines in this section are obtained from Akaml Hussain, Henk Thomas, O.A. Khan and
16. L.T omeson: PHMP Phase 2

Poverty Alleviation in Pakistan

This book attempts to combine macro-level data with extensive experience in community mobilization and discussions at the grassroots level. It provides a fresh insight into the nature of “poverty problems” and a workable strategy for overcoming them.

The study proposes that the conventional approach to poverty alleviation conceives the people as objects who passively receive goods and services delivered by paternalistic governments or donors. Such approaches have not worked in Pakistan. Given the financial and administrative constraints to reaching the “largest population”, it is therefore time for an alternative strategy for participatory development. This book articulates the principle and methods of such an approach alongwith an operational programme to overcome poverty in Pakistan.

The book starts by providing a new perspective on the nature of poverty; it then examines the mechanism of poverty in the country in terms of five dimensions: rural / urban poverty, the nature of regional disparity, the problem of poverty and child labour, the impoverishment of women and the linkage between poverty and environmental degradation.

The methodologies underlying alternative paradigms of poverty alleviation are critically examined and the analysis is illustrated by reference to innovative experiences in Pakistan and S. Asia.

AKMAL HUSSAIN, Ph.D., specializes in action research on development. He has been chairman of the prime minister’s Task Force on Poverty Alleviation in 1993 and has also served on the prime minister’s consultative committee on economic policy, apart from working on national budget advisory committees. He has also worked as a social mobiliser in two village clusters to enable local communities to acquire basic services. He is a member of several distinguished international forums, including the Independent Group for South Asia Cooperation and the Society for International Development.

Dr. Hussain has lectured at the University of California, Riverside, USA, and at the Public Administration Department of Punjab University. He has authored/co-authored/contributed chapters to eight books, 29 publications in major journals and contributed scores of articles to newspapers.

Dr. Hussain has presented papers at International conferences around the world, including at Harvard University, the Chinese Academy of Social Sciences, Peace Research Institute (Oslo), world Conference on Development (Rome) and the United Nations (Geneva)

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