WEL COME TO ARERTI TVET COLLEGE VALUECHAIN ANALYISIS TRAINING

ጥቅምት 2008ዓ.ም

ARERTI TVET COLLEGE
VALUECHAIN ANALYISIS OF METAL MANUFACTURING

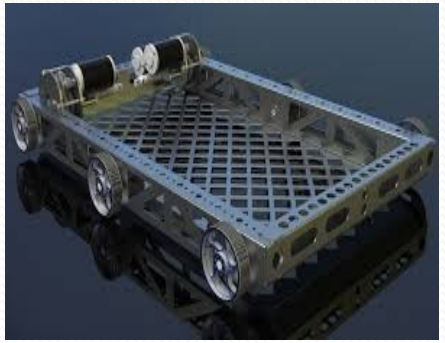
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Metal Products VALUE CHAIN ANALYSIS





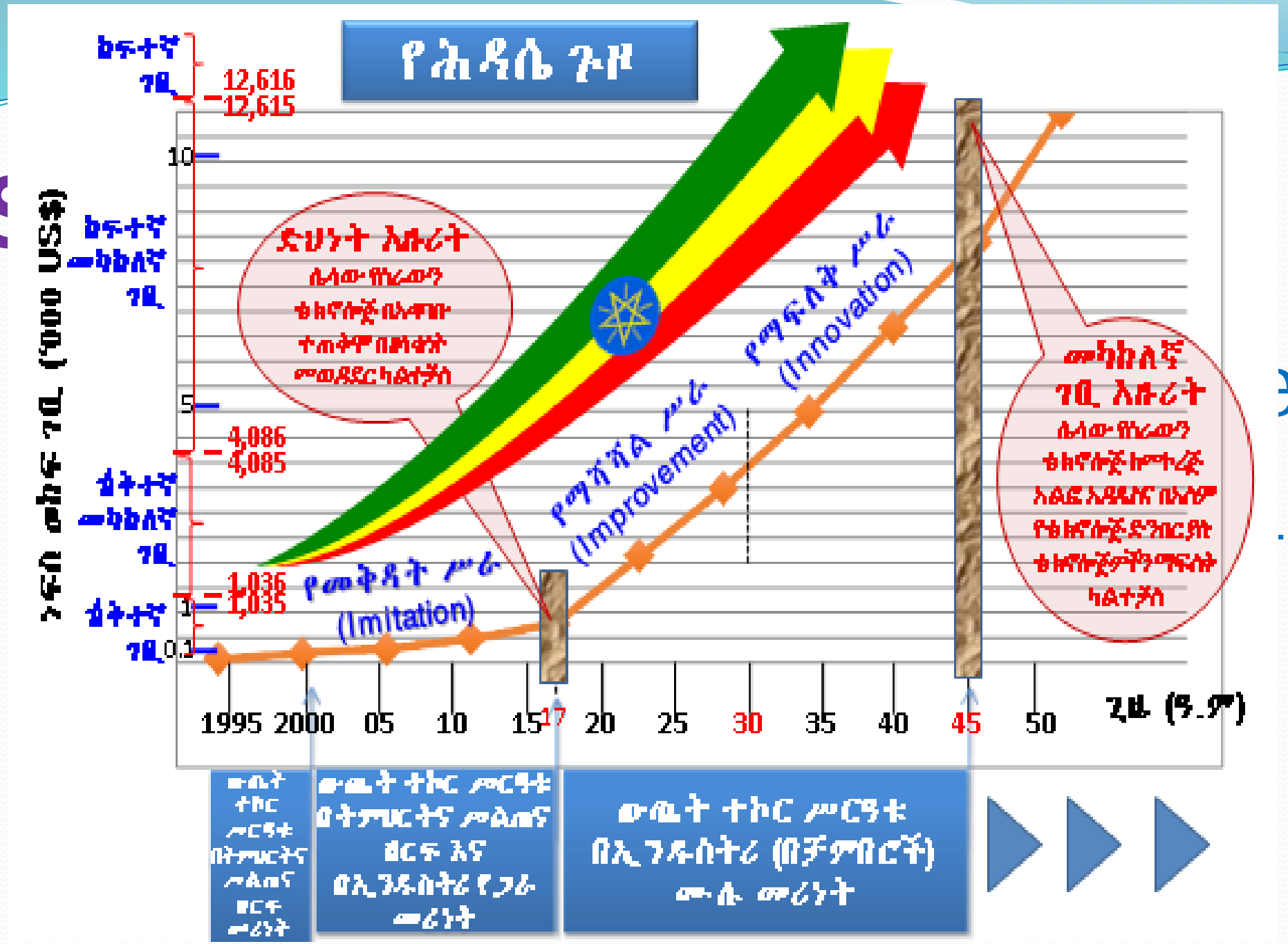











የሕዳሴ ጉዞ
ከፍተኛ ገቢ
12,616
12,615
10
ከፍተኛ መካከለኛ ገቢ
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4,085
ዝቅተኛ መካከለኛ ገቢ
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የመቅዳት ሥራ (Imitation)
የማሻሻል ሥራ (Improvement)
የማፍለቅ ሥራ (Innovation)
መካከለኛ ገቢ እስራት ሊሰሙ የሚገውን ቴክኖሎጅ ኮሞኮሩ አልፎ አጻጸሸ በአቀዝ የቴክኖሎጅ ድንበርነት ቴክኖሎጅዎችን ማፍለቅ ካልተቻለ
1995 2000 05 10 15 17 20 25 30 35 40 45 50
ጊዜ (ዓ.ም)
ሙሉ ተኮር ሥርዓቱ በትምህርትና ሥልጠና ዘርፍ መሪነት
ሙሉ ተኮር ሥርዓቱ ወትምህርትና ሥልጠና ዘርፍ እና በኢንፉስትሪ የጋራ መሪነት
ሙሉ ተኮር ሥርዓቱ በኢንፉስትሪ (በቻምበርች) ሙሉ መሪነት

የዕድገትና ትራንስፎርሜሽን ዕቅድ ዘርፎች

1.1	ሰብል ልማትና ጥበቃ
1.2	እንስሳት ሀብት ልማት
1.3	የተፈጥሮ ሀብት ልማትና ጥበቃ
2	**ኢንዱስትሪ ልማት**
2.1	ጨርቃ ጨርቅና አልባሳት
2.2	ቆዳና የቆዳ ውጤቶች
2.3	ስኳርና ተጓዳኝ ምርቶች
2.4	ሲሚንቶ
2.5	ብረታ ብረትና ኢንጂነሪንግ
2.6	ኬሚካል (ፋርማሲቲዩካል፣ ሀትመት፣.....)
2.7	አግሮ ኘሮሰሲንግ
3	ማዕድን
4	ኢኮኖሚ መሠረተ-ልማት
4.1	መንገድ ግንባታ
4.2	ባቡር ትራንስፖርት
4.3	መንገድ ትራንስፖርት
4.4	ባህር ትራንስፖርት
4.5	አየር ትራንስፖርት
4.6	ኢነርጂ
4.7	ውሃና መስኖ
4.8	ቴሌኮሙኒኬሽንና አይሲቲ
4.9	ከተማ ልማ ትና ህንፃ ኮ/ን **SUB SECTOR OFOUR PROJECT (HOSPITAL BULIDING CONSTRUCTION)**
5	ንግድ
6	ጤና
7	ባህል፤ ቱሪዝምና ስፖርት
8	ማህበራዊ

Introduction

- Metal working is the process of working with metal to create individual parts , assembling or large Scale structures.
- The term cover avoided range of work from large shapes to prices engine parts and delicate jewelry. It therefore includes a correspondingly wide range of skills ,process and tools.
- Metal working is a size, art, hobby industry and trade its historical roots span culture, civilization and millennia.
- Metal working has evolved from the discovery of something various ores producing malleable and ductile metal useful tools and adornment. Modern metal working process though diverse and specialized can be categorized as forming, cutting or joining process.
- Today's machine shop includes a number of machine tools capable of creating a prices useful workplace.

OBJECTIVE

Generally, the study was conducted to determine the present manufacturing process practices in metal production in Amhara region, Arerti District.

Specifically, this aims to:

- Discuss the present metal products manufacturing process practices in metal production for light manufacturing.
- Identify the Value Chain (AS IS) in Arerti SE metal production.
- Compare the Value Chain (AS IS) to that of the Benchmark IN Small industries.
- Identify the gaps and constraints in attaining high productivity.
- Identify and recommend technologies that will improve light manufacturers practice & increase product quality and productivity.

Fact and Figure

No	Country	Annual metal production	Quantity	Benchmark
1	China	❖ Crud steel production ❖ Total export ❖ Steal use	✓ 626 .7 m metric tones ✓ 24 m metric tones ✓ 576 m metric tones	
2	Japan	❖ Crud steel production ❖ Total export ❖ Steal use	✓ 109.6 m metric tones ✓ 33.3 m metric tones ✓ 63.8 m metric tones	
3	USA	❖ Crud steel production ❖ Total export ❖ Steal use	✓ 80.1m metric tones ✓ 8.5 m metric tones ✓ 9.2 m metric tones	

Benchmark

Metal Products Value Chain (As is)



Raw materials

Design
-Free Hand Sketch
-Use photo

Measuring
- Tape rule
- Try Square
- Tracing

Process

Laying out process
- Make lay out by hack saw blade, nail
- Manual
- 2-3times lay outing

Cutting
- Cutting materials using hand hack saw.
- Local Hand shear
- Grinder

Bending
- Using Hands
- Using Hammer
- Using Vice
- Using angle iron

Scrolling
- Scroll by hand and hammer

Twisting
- Using vice.
- Using pliers

Drilling
- Using welding
- Using Scriber/nails

Welding
- Local welding machine
- Using Sheet metal fillers

Mechanical assembly
- Screw
- bolts and nuts

Riveting
- Using rivet gun
- Using hammer

Grinding

Body filler
- Using metal stucco, ,

Sanding
- Using hand by sand paper

Painting
- Using brush
- Using compressor

- Put the finished products on the working area. And storeroom

Delivery
- Transport using
- Labor

Direct sale
- Ordered by customers

Metal Production Value Chain (Bench mark in china)

Input

Research & Development

Design
- Auto CAD
- Solid Work
- CATIA

Material Selection
- Material testing

Preparation

Measuring
- Precision measuring tools

Laying out process
- Standard marking tools

Cutting
- Standard cutting tools & machines

Shaping

Bending
- Standard Bending m/c

Scrolling
- Standard Curling m/c

Twisting
- Standard Twisting m/c

Drilling
- Standard Drilling m/c

Assembling

Welding
- Standard Welding m/c

Mechanical assembly
- Screw
- Bolts and Nuts

Riveting
- Different Rivet gun
- Different Rivets

Finishing

Grinding
- Standard Grinding m/c

Body filler
- Using metal stucco

Sanding
- Using d/f number of sanding paper
- Using Sanding machine

Painting
- Using spray
- Using compressor

Quality control

Inspection & Testing

Packaging & Storage
- **Packed finished products**
- **Store in appropriate area**

Transportation

Delivery
- Transport using
  - Car
  - Train
  - Air plain

Marketing

Retailing
- Proper packaging (labels)
- Proper Display with price tag & variety

Wholesale
- Proper packaging (labels)

After sell service
- **Service, repairing & training centers on domestic markets appearing**

Metal Production Value Chain (GAP)



Research & Development

Design
- Auto CAD
- Solid Work
- CATIA

Material Selection
- Material testing

Measuring
- Precision measuring tools

Laying out process
- Standard marking tools

Cutting
- Standard cutting tools & machines

Bending
- Standard Bending m/c

Scrolling
- Standard Curling m/c

Twisting
- Standard Twisting m/c

Drilling
- Standard Drilling m/c

Welding
- Standard Welding m/c

Mechanical assembly
- Screw
- Bolts and Nuts

Grinding
- Standard Grinding m/c

Body filler
- Using metal stucco

Sanding
- Using d/f number of sanding paper

Painting
- Using spray
- Using compressor

Inspection & Testing

Packed finished products

Store in appropriate area

Delivery
- Transport using
  - Car
  - Train
  - Air plain

Retailing
- Proper packaging (labels)
- Proper Display with price tag & variety

Wholesale
- Proper packaging (labels)

Service, repairing & training centers on domestic markets appearing

Main Activity Gap

Sub-Value Chain Gap

Critical mismanaged approach

Main Value Chain

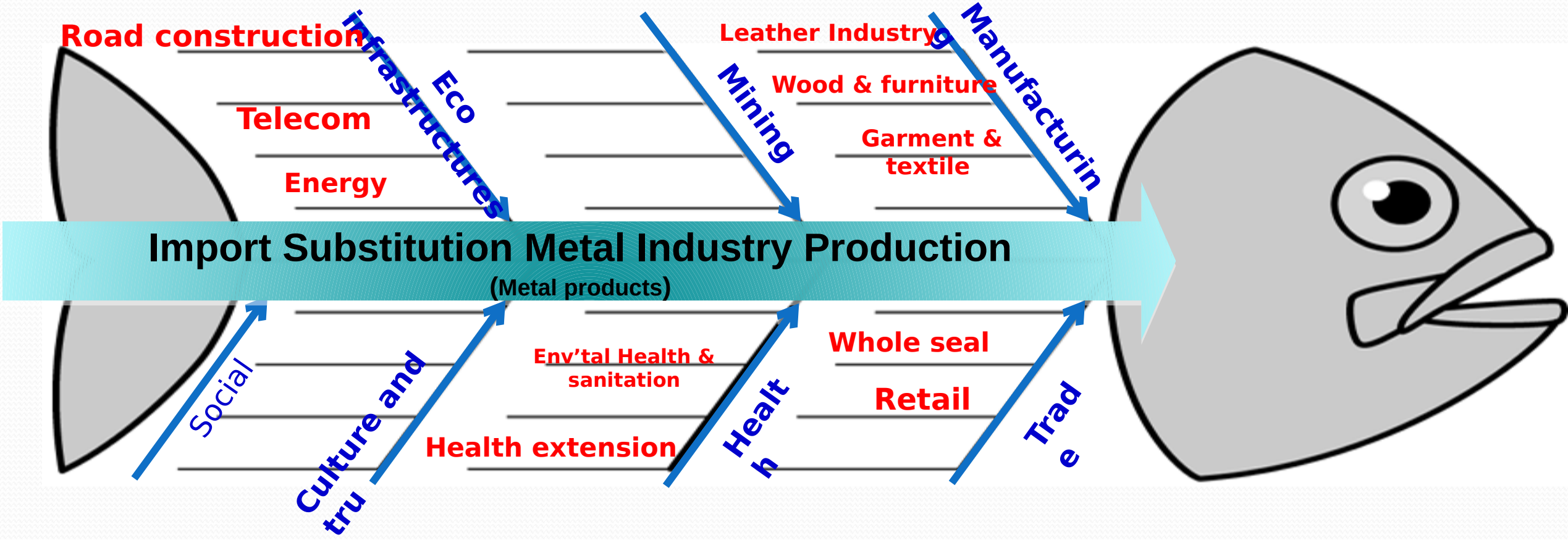
TECHNOLOGY

Technology Identified (80)				
TECHNOWARE (24)		HUMANWARE(23)	INFOWARE(20)	ORGAWARE(13)
Raw Material Selection	1. Material testing machine	Units of competence - Machine operation skill.	• Material selection method manual.	• Standard material store should be organized.
Design	2. Drawing instruments Soft wares like Auto Cad, Solid work and Catia.	Competence on: - Interpreting working drawing - Prepare basic engineering - Perform advance engineering drawing.	• Drawing manuals • Drawing soft ware guides(help)	• Prepare drawing center
Measuring	3. Measuring tools like calipers, micrometers , tap rule	• Measuring and reading skills	• Prepare measuring instruments manual. • Measuring and reading techniques manual.	• Arranging tools room and shelf.
Lay out	4. Laying out tools like scriber, try square	• Skills on interpreting working lay out.	• Principles and techniques of work piece lay out manual.	• Prepare standard work shop lay out.
Cutting	5. . Hand Shear. . Foot shear. . Hydraulic shear. . Circular shear. . Cut off machine. . Power hack saw.	• Competence on: - Cutting sheet metal. - Operation of metal cutting machines.	• Operation of metal cutting machine manual.	. TVET colleges train SMEs.
Bending	6. Folding machine. . Three roller bending machine. . Seaming machine. . Metal art machine.	• Skill on operating different types of bending, seaming and metal art machine.	• Operational procedures and techniques of bending, seaming and metal art manual.	• TVET Colleges and Metal industries to manufacture bending, seaming metal art machines.
Drilling	7. Hand drill . Bench drill. . Floor drill. . Radial drill	• Operating drilling machines skill	• Drilling work piece and techniques manual. • Machine operation manual.	• TVET Colleges and Metal industries to manufacture bending, seaming metal art machines
Welding	8. Single phase welding machine. Three phase welding machine. Welding safety equipments.	• Competence on: ➢ Operating welding machine. ➢ Performing oxy acetylene welding.	• Operation and techniques of welding machine manual.	• Industries can manufacture welding machines.

TECHNOWARE		HUMANWARE	INFOWARE	ORGAWARE
Assembling	9.	• Skill on assembling procedure.	• Assembling techniques methods manual.	• Prepare assembling area
Grinding	10. . Hand grinder . Bench grinder. . Surface grinder. . Grinding safety equipment.,	Competence on: - Performing bench work. - Operation of grinding machine skill.	• Perform bench work manual. • Operating grinding manual.	• TVET colleges and SMEs manufacture grinding machines.
Painting	11. Compressor, brush	• Painting products skill	• Prepare painting manual.	• Arranging finishing.
Quality control	12. Different inspection & testing machine	• Product quality control skill.	. Product quality control techniques manual.	
Storage	13. Shelf Raw material store	• Skills on material handling system. • Kaizen training	• Material handling manual	•Prepare materials and hand tools store. • Finished products store.
Marketing		• Entrepreneurship training	• Internet	
After sell service		• Maintenance training	• Maintenance manual	

linkage of value chains in relation to different priority sector

Industry Developments



Metal Engineering: Value chain for Metal Products.

The changes that come from bench marking

R.N	Indicators	Measurements	Bench Marks	As Is
1	High metal production	Number of products	High	Low
2	High customers need to buy metal products.	Strength	High Durability	Less Durable
3	Increase skills for the person	Ability	Skill full ability	Unskilled man power
4	Save product cost & increase production	Time	Less	High
5	Quality of metal products	Quality	High quality	Less Quality

The Results that come from bench marking

R.N	Outputs	Outcomes	Impact
1	Increased metal products	Higher market needs	Increase market linkages
2	Produced attractive designs	Attractive designs	
3	Higher job opportunity	Create new job	Reduced jobless powers
4	Quality finishing	Attract customers	Increase market linkages

Evaluation of the value chain analysis

- Ethiopia is good for metal production.
- poor in metal production in international market
- Least in metal manufacturing process.

Constraints contributing to these facts are:

- In adequate technological inputs.
- Lack of skills on metal product manufacturing technique.
- Poor quality of products.
- Poor marketing network.

Planning

- **Acquire technology**
  - **Copy from already imported or From internet.**
  - **Prepare drawing, specification and produce**

(prepare drawings at TVET, produce prototype in TVET. Initiate joint action plan)

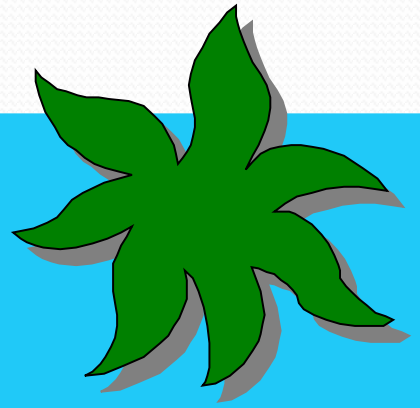
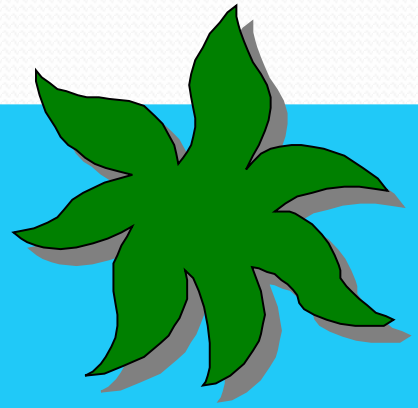
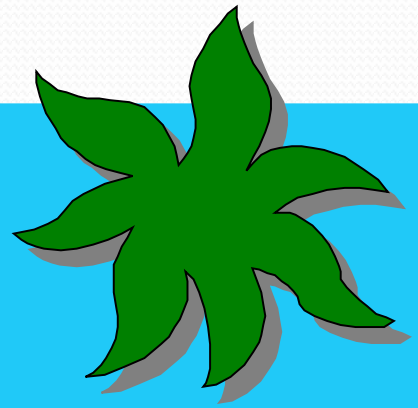
. Marketing plan

  - **preparing brochures**
  - **client satisfaction**

OTHER TECHNOLOGIES

- TECHNOLOGIES

New TECHNOLOGIES

TANK YOU FOR YOUR ATANTION