Collaborative Engineering Design for Local Production of Low Lift, High Volume Water Pumps in Bangladesh

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Intro: CSISA-MI

- CSISA-MI seeks to transform agriculture in southern Bangladesh by unlocking the potential productivity of the region’s farmers during the dry season through surface water irrigation, efficient agricultural machinery and local service provision.

- CIMMYT
  - Generating Publications
  - Capacity Building

- Axial Flow Pumps
  - Imported from Thailand
  - Approx. 300 $USD
  - High Flow, Low Head
Axial Flow Pumps

Components:

• Bearing Housing
• Discharge Casing
• Delivery Pipe
• Stator/Bushing
• Impeller
• Intake Bell
Problem Definition

Background Research

Technical Specification

Alternatives Analysis

Operational Analysis under ideal and field conditions

Assessment for improved manufacturability, efficiency, reliability, and versatility.

Operational Assumptions

Process design to bring product to market

Production model 1.0

Streamlining to reduce time, labor, and risk.

Requirement of lifespan, expected load, operating and maintenance conditions

Fabricate prototype based on availability and cost of materials, labor, expertise

Procure necessary fabricated and off-the-shelf components
Axial Flow Pumping Characteristics

Need to Measure:
Flowrate
Pressure Head
Fuel Consumption
Old Test Bed at BARI
Outsource Research
Improved Test Bed at BARI
Conclusion

Capacity Building for Product Prototyping

Improving Standards

◦ Governmental Organizations
  ◦ More precise testing
  ◦ Faster protocols

◦ Private Organizations
  ◦ Ability to read technical drawings
  ◦ Understanding of material limitations

Outsourcing the Details

◦ Cheaper, faster, and more precise verification through rapid prototyping
Thank You

Q&A