



Challenges, drivers, and trends in technical textiles

A Technical Webinar
17 October 2022



UNITED NATIONS
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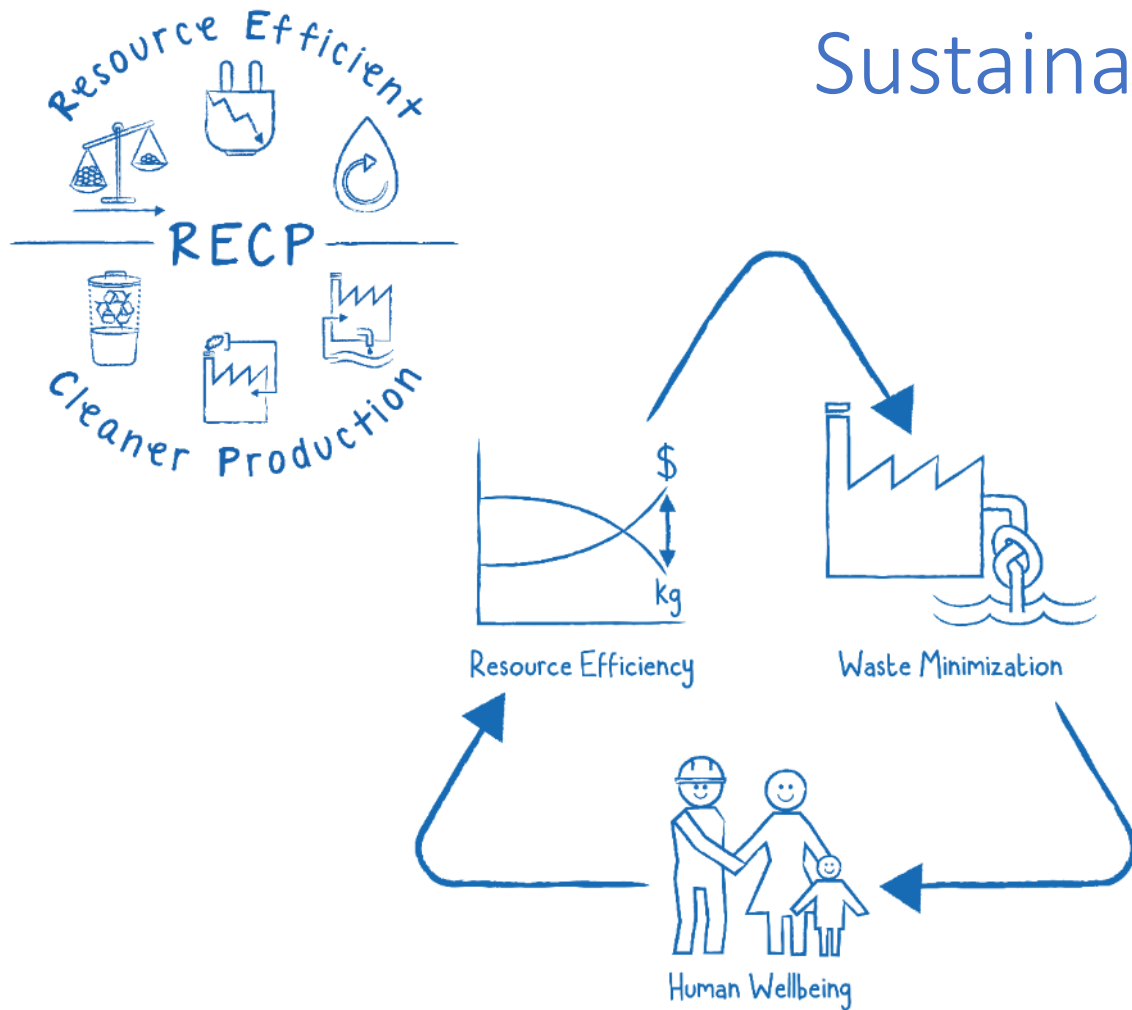
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Towards Sustainable and Circular – *Technical* – Textiles Industry in Asia

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Sustainable Production



→ **Virtuous cycle**

- Finding and implementing ways to
 - Improve productive use of materials, water and energy
 - Thereby
 - Reduce the generation of waste, effluent and emission
 - Thereby
 - Improve well being of employees, consumers and community

Thereby

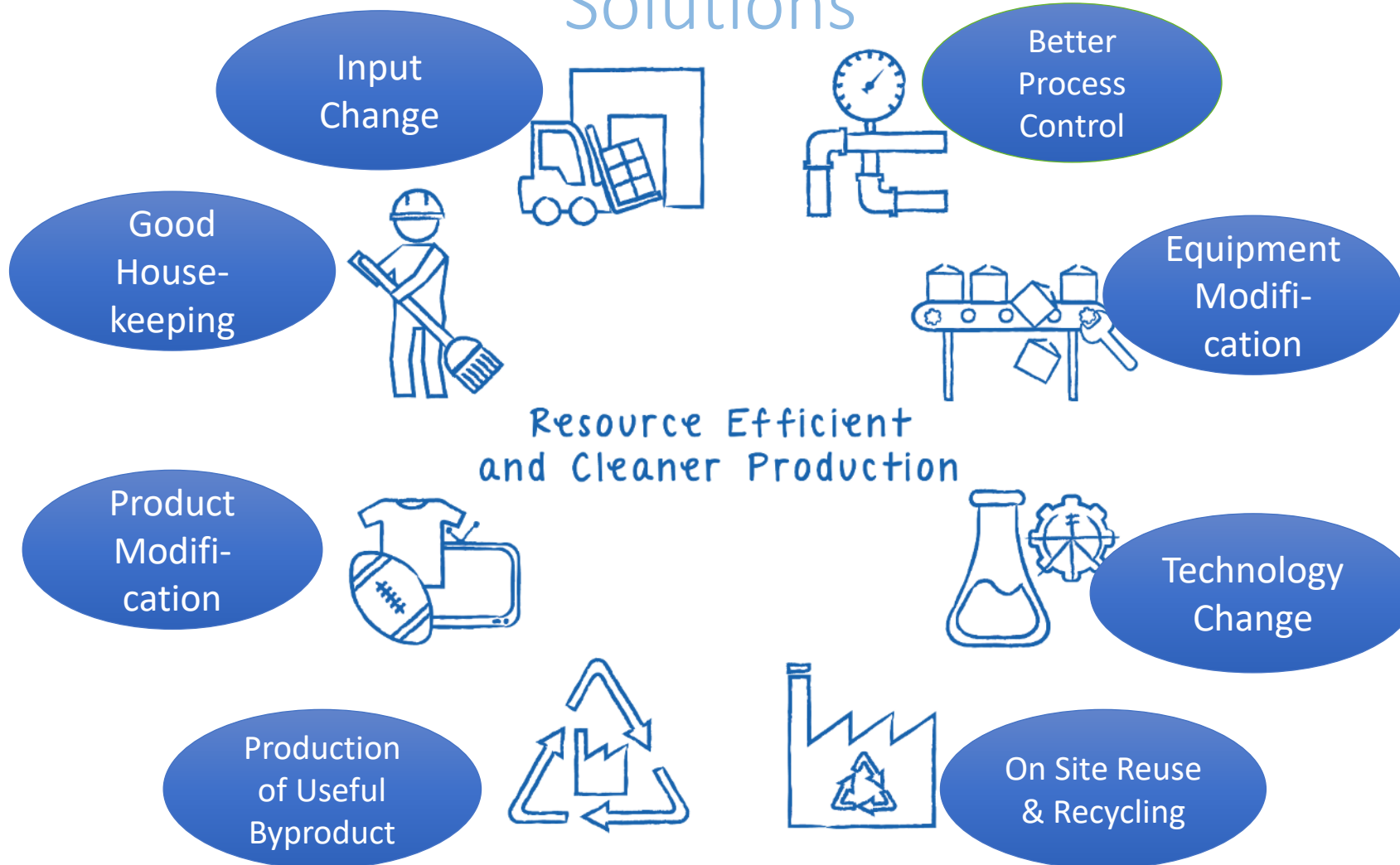
- Improve resource efficiency
- Minimize waste
- Improve human wellbeing

Targets



| INCREASE Resource Productivity Through | | DECREASE Pollution Intensity Through | |
|--|---|--|---|
| Material Productivity | Selection and efficient use of materials, including chemicals | Waste Intensity | Reduction and environmentally sound recovery, treatment and disposal of waste |
| Water Productivity | Selection of sustainable sources for and efficient use of water | Waste Water Intensity | Reduction and environmentally sound treatment and disposal of waste water |
| Energy Productivity | Selection of sources for and efficient use of energy | Emission Intensity | Reduction and environmentally sound discharge of air emissions |

Solutions



| RECP Practice | Description | Common Water-Related Example |
|---|---|---|
| Good Housekeeping | Maintain a clean, organized and productive ('neat') workplace to eliminate avoidable 'wastage' | <ul style="list-style-type: none"> • Switch off what is not in use (e.g. taps) • Repair what is broken or leaking (e.g. pipes) • Remove dry-debris before factory wash down |
| Input Change | Choose inputs that are efficient, effective and/or pose minimum harm to the environment and health | <ul style="list-style-type: none"> • Use secondary, recovered water • Use less harmful chemical substances (dyes, detergents, etc.) • Enzyme-enhanced bleaching, scouring |
| Better Process Control | Monitor and control processes and equipment so that they always run at highest efficiency and with lowest wastage | <ul style="list-style-type: none"> • Establish and follow Standard Operating Procedures (SOP) • Sub-meter use of water • Install automatic shut-off and overflow prevention valves |
| Equipment Modification | Make existing equipment more efficient and less wasteful | <ul style="list-style-type: none"> • Align and debottleneck production line • Close, hot and cold, process equipment |
| Technology Change | Change over to new technology that is more efficient or produces less waste | <ul style="list-style-type: none"> • Waterless dyeing • Additive, 3D printing |
| On-Site Reuse & Recycling | Use previous 'waste' for similar or alternative purpose in company | <ul style="list-style-type: none"> • Counter-current or cascaded use of water • Condensate recovery |
| Production of Usefull By-Product | Convert a previous 'waste' for a useful use elsewhere | <ul style="list-style-type: none"> • Provide used cooling water for external heating or cooling purposes |
| Product Modification | Redesign product to reduce its environmental impact during production, use and/or disposal | <ul style="list-style-type: none"> • Produce easy care textiles that require minimal water by consumers |

Van Berkel, 2017

RECP Textile & Garment Sector in Indonesia

| Indicator | Superbtex (spinning mill) | Argo Pantes (integrated mill) | Saudarutex (garment factory) | Tiara Utama (garment laundry) |
|----------------------------------|------------------------------|----------------------------------|---------------------------------|----------------------------------|
| Specific Energy Consumption | -4% | -42% | Power -20% Coal -25% | Power -9% Coal -43% |
| Specific Water Consumption | n/a | -6% | -24% | -39% |
| Specific Pollution/Effluent Load | n/a | -33% | -24% | -39% |
| Chemical Consumption | n/a | -23% | n/a | n/a |
| GHG emissions | -4% | -9% | -25% | -42% |
| Annual cost savings | USD 47,000 | USD 1.08 million | USD 538,000 | USD143,00 |



www.recpindonesia.org

SMART Chemicals Management

Pilot in Sri Lanka's textile, apparel, rubber and tourism sectors



Chemical Consumption
Average reduction : 40%

Energy Consumption
Average reduction : 30%

Waste Generation
Solid Waste - Average reduction : 20%
Hazardous waste - Average reduction : 40%

Industrial Accidents
Average Reduction : 90%

Water Consumption
Average Reduction : 30%



SAICM, 2018



Energy Efficiency and Renewable Energy

Concentrated Solar Thermal (CST) for Process Heating & Cooling

Silk reeling unit at Uttarakhand Cooperative Resham Federation (Dehradun)

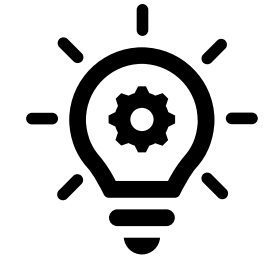
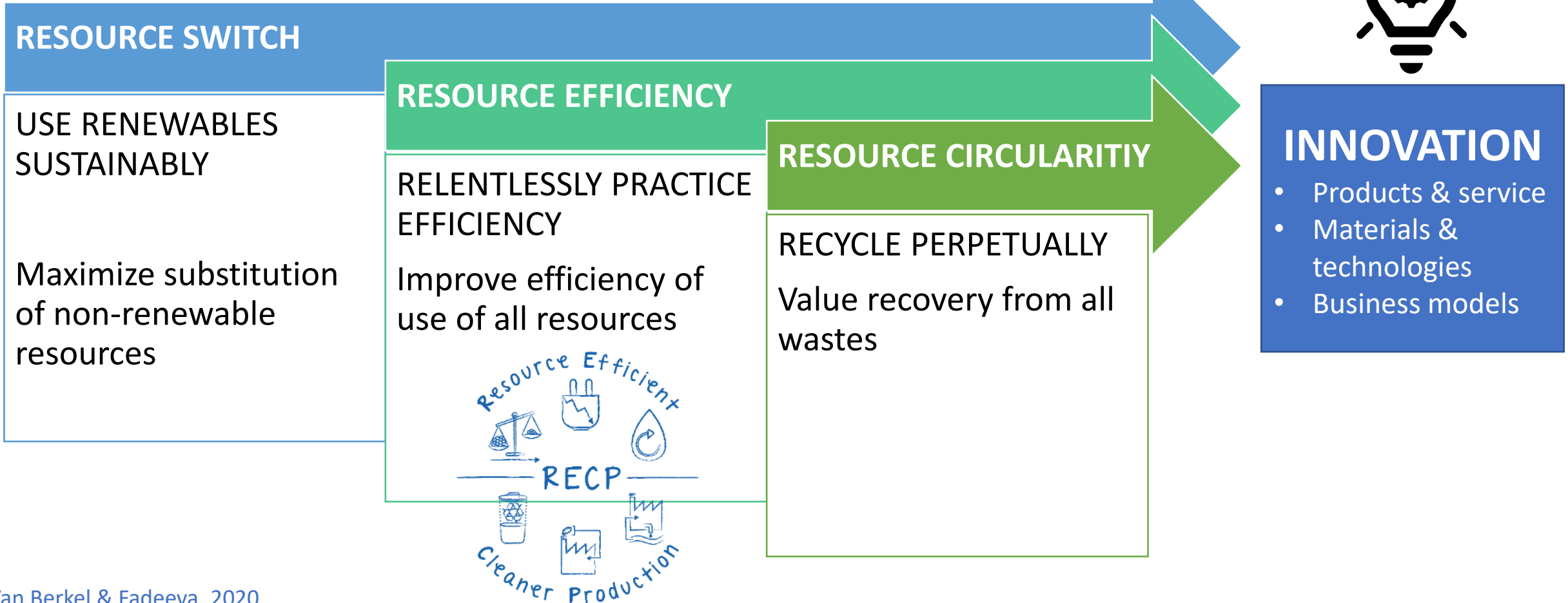


90 Compound Parabolic Concentrators with 290.50 m²
Saves 417 kg firewood use daily
Investment 62.3 lakhs
Payback 4.5 yrs (with FA)/8.3 yrs

Market transformation for energy efficient technologies in MSMEs

| Technology | Features | | |
|---|-------------------------|--------------|-------------------------|
| | Average Investment kUSD | % SEC saving | Simple pay back (years) |
| Surat (textile) | | | |
| 1. Energy efficient screw compressor | 15.0 | 20-25% | 1.50 |
| 2. 100% flash steam & condensate recovery | 12.5 | 20-25% | 1.43 |
| 3. PLC based automation and control of jet dyeing machine | 2.1 | 15-20% | 1.39 |
| 4. Automation and control system for boiler | 15.0 | 15-20% | 1.09 |
| 5. Micro-turbine for power generation | 43.8 | 15-20% | 1.54 |
| Varanasi (carpet) | | | |
| 1. Combustion control system | 15 | 10-15% | 1.01 |
| 2. Low grade waste heat recovery | 10 | 15-20% | 2.5 |
| 3. Automation of carrier and jet dyeing | 30 | 20-25% | 1 |

Towards Circularity

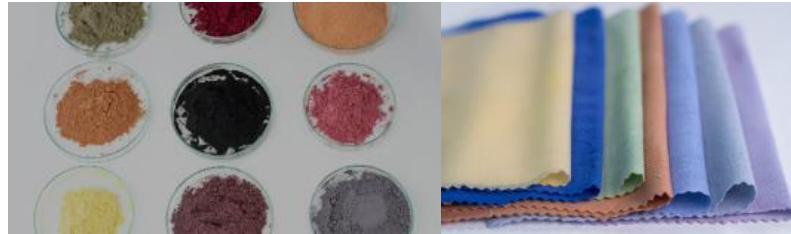


Through Innovation

Biodegradable sanitary pads made from waste banana fibre



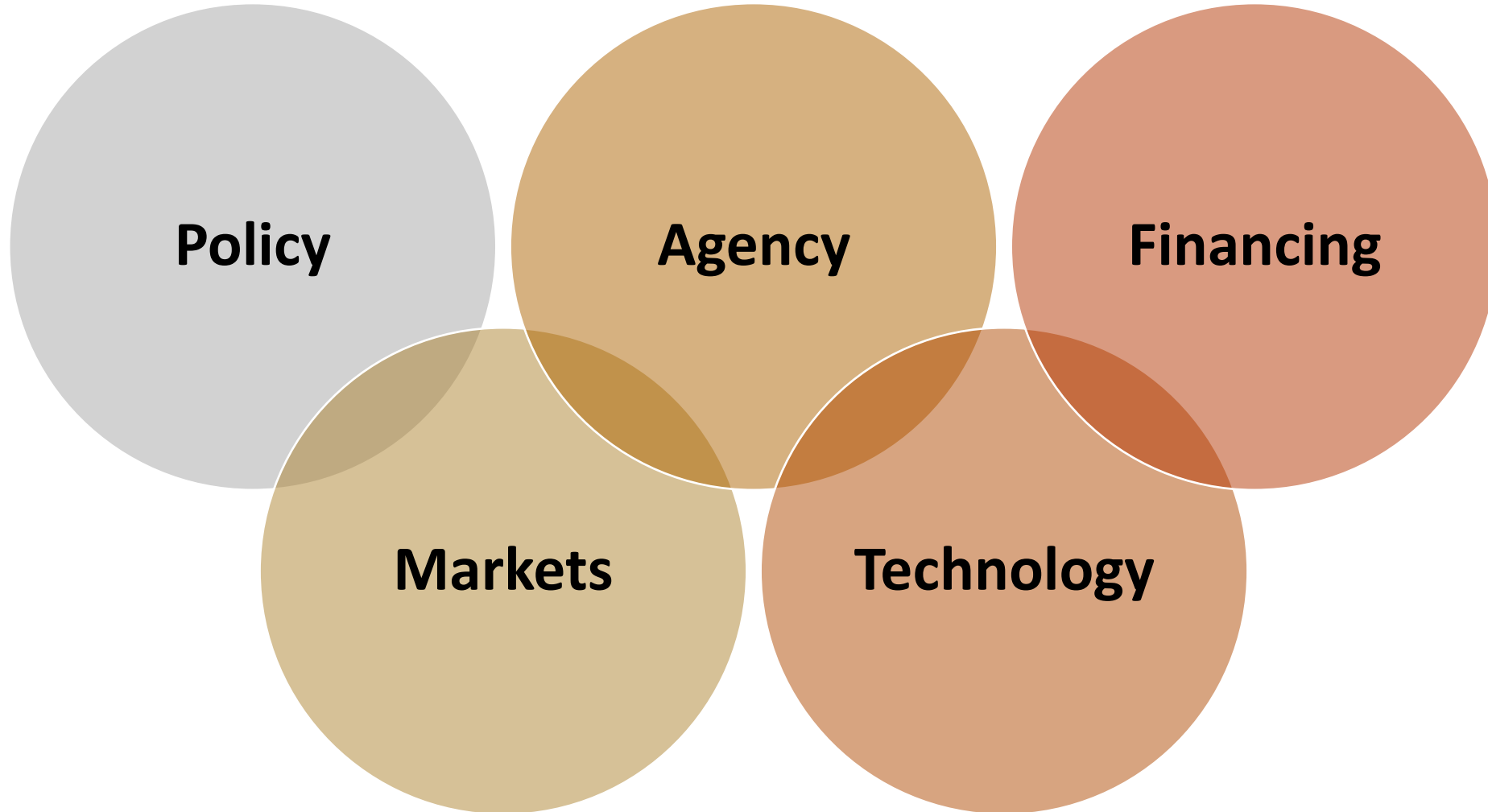
Manufacturing natural bio-colours extracted from vast biodiversity of India



Cypermethrin co-extrusion in PE filament for Long Lasting Insecticidal Nets



Scaling Up





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www.greenchemistry-toolkit.org