OBJECTIVE 5
Develop Standards & Certification Protocols

Task-1: Analyze existing biofuel standards & certification
Task-2: Develop practical and custom design standards & certification protocols for biofuel and bio-products of this project

Sample Size
Gujarat- 415 households from 9 villages of three districts (Aravali, Bhavnagar, Surendranagar) from semi-arid regions.
Madhya Pradesh- 333 households from 10 villages of five districts (Gwalior, Morena, Bhind, Dewas and Khargone)

Base Line Survey Objectives
1. To evaluate past and current practices for the landowners and harvesters.
2. Evaluation with the indicators developed for biofuel production from high biomass yielding sorghum, pearl millet and bamboo from Gujarat and Madhya Pradesh.

Base Line Survey Findings

% of farmers

Gujarat
MP

Feeding as major occupation
Soil quality (Average and bad)
Awareness of biofuel

OBJECTIVE 6
Energy, Emissions & Economic Analysis

Task-1: Energy and emissions sensitivity report for different feedstock base biofuel production systems
Task-2: Assess economic feasibility of bio-fuels and bio-products
Task-3: Identify cost-effective strategies for long-term market growth for bio-fuels
Task-4: Assess drivers and barriers for non-food based biofuel adoption
Task-5: Assess private production model for advanced bio fuel feed stocks in India

Feedstock Production

Conversion Technology

Pre-treatment
Hydrolysis
Saccarification
Chemical Treatment

Distillation/Purification
Fermentation
Liquefaction

Biobtanol

Transportation
Blanding
Transportation
End-Use

Habitat, Soil and Air quality
Feedstock replacement & Management
CO2, CH4, and N2O emissions
Continuous supply
Crop yield or tons per hectare
Maintenance
Water Requirement

Conversion Technology

Optimization of NPV (Net Present Value) as an indicator for capital budgeting.

\[
NPV = \sum_{m=1}^{T_L} \left( \frac{R_m}{1 + i} \right)
\]

Where, \( R_m \) = annual cash flow; \( T_L \) = life time of the project;
\( i \) = discount rate (or annual rate of return of a competing investment)

The system description would be used for
2. Energy ratio and emission analysis for environmental load using SimaPro

OBJECTIVE 7
Supply Chain Management Analysis

Task-1: Analysis of supply chain aspects affecting the production and sustainability of bio-fuels
Task-2: Identification of drivers and barriers impacting the marketability and distribution of nonfood biomass based bio-fuels

Focused Group Discussions

• Objectives
 1. Validate baseline survey.
 2. Assess current agricultural practices.
 3. Common issues faced by farmers.
 4. Assess willingness for feedstock cultivation.

• Key Findings
 1. Variation in seed input rate for Sorghum cultivation in Gujarat.
 2. Scarce resource availability (Irrigation water, fertile land).
 3. Farm security and stray animal invasion.
 4. Labor shortage in surveyed region.

Land Use
Growing Season
Weather conditions
Equipments
Fertilizer
Irrigation
No of Harvests per year
Manpower
Electricity
Diesel

Feedstock

Transportation to the storage site/bioethanol plant

Crop yield or tons per hectare
Maintenance
Water Requirement

Conversion Technology

Optimization of NPV (Net Present Value) as an indicator for capital budgeting.

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