Strengthening Networking on Biomass Research and Biowaste Conversion - Biotechnology for Europe - India Integration

"SAHYOG"

SEVENTH FRAMEWORK PROGRAMME

SAHYOG

Department of Biotechnology
Ministry of Science & Technology
Govt. of India

Main activities of the SAHYOG

- ✓ Inventories for biomass and biowaste resources
- ✓ Research projects and programmes
- ✓ Short-term exchanges of researchers
- ✓ Summer schools
- ✓ Stakeholder workshops
- ✓ Strategic Research Agenda (SRA)
- ✓ Project twinning
- ❖ Development of roadmaps
- ❖ Facilitate concerted planning of future EU-India research
- ❖ initiatives in the area of biomass and biowaste

Strategic Research Agenda supporting the roadmap from Indian prospective

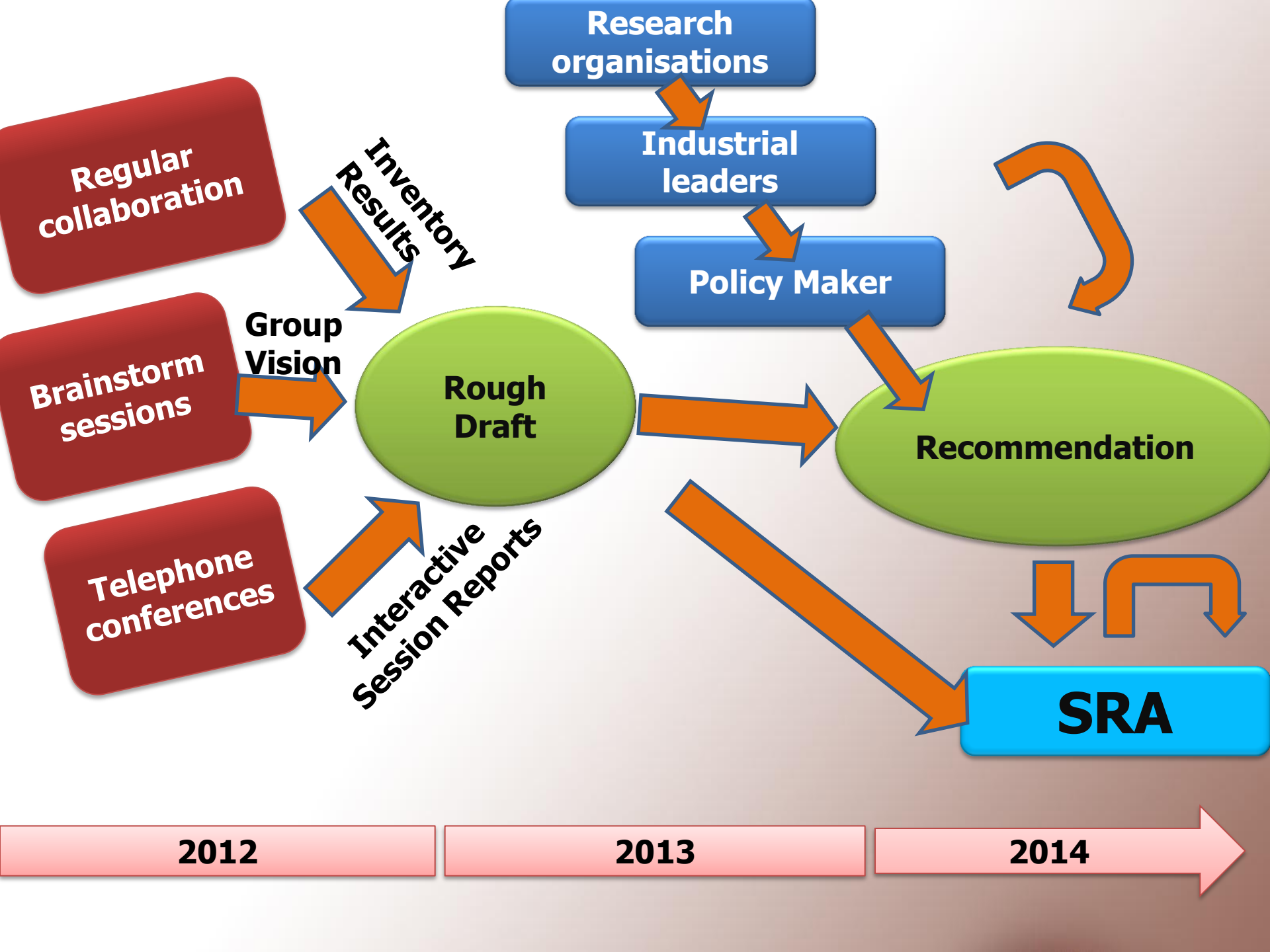
Dr. Reeta Goel
Professor & Head
Deptt. Of Microbiology
G.B.P.U.A.T. Pantnagar
E-mail: rg55@rediffmail.com

Strategic Research Agenda

- **Will be available at:**
  http://www.sahyog-europa-india.eu/

- **Prepared in close cooperation with representatives from leading research organisations, policy makers and the industry leaders from both India and the EU**

- **To achieve a realistic agenda**


Research organisations
Industrial leaders
Policy Maker
Regular collaboration
Inventory Results
Brainstorm sessions
Group Vision
Rough Draft
Recommendation
Telephone conferences
Interactive Session Reports
SRA
2012
2013
2014

SRA

Compiled:

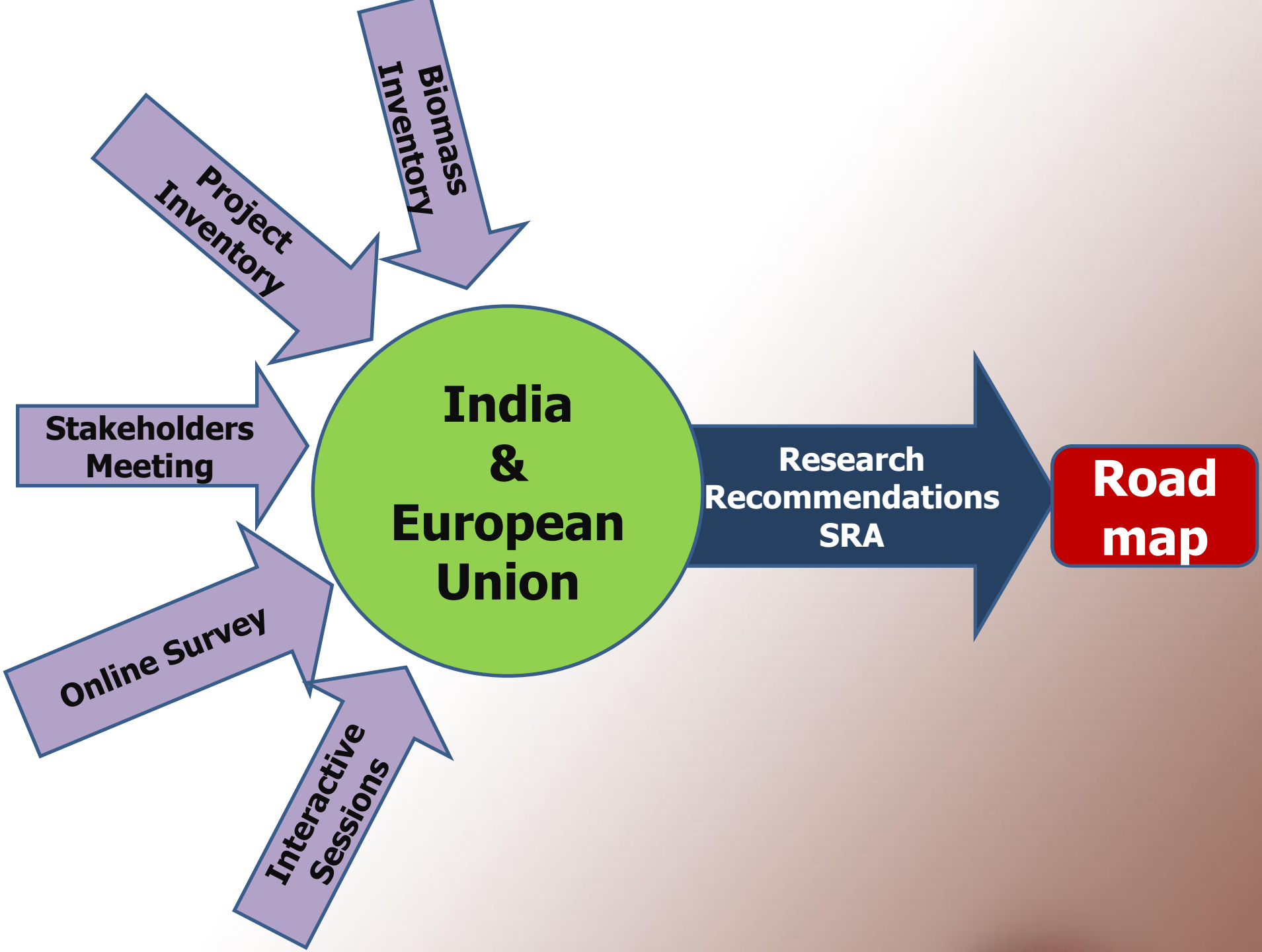
- **Shared vision for the EU and India on the latest developments in the bio-based economy**
- **Research needs developments in the bio-based economy**
- **Specific needs and possible ways to enhance the bio-based economy**
- **Scientific expertise, research tools needed and the size of demonstration and pilot plants**

STRUCTURE OF SRA

All the chapters deal with

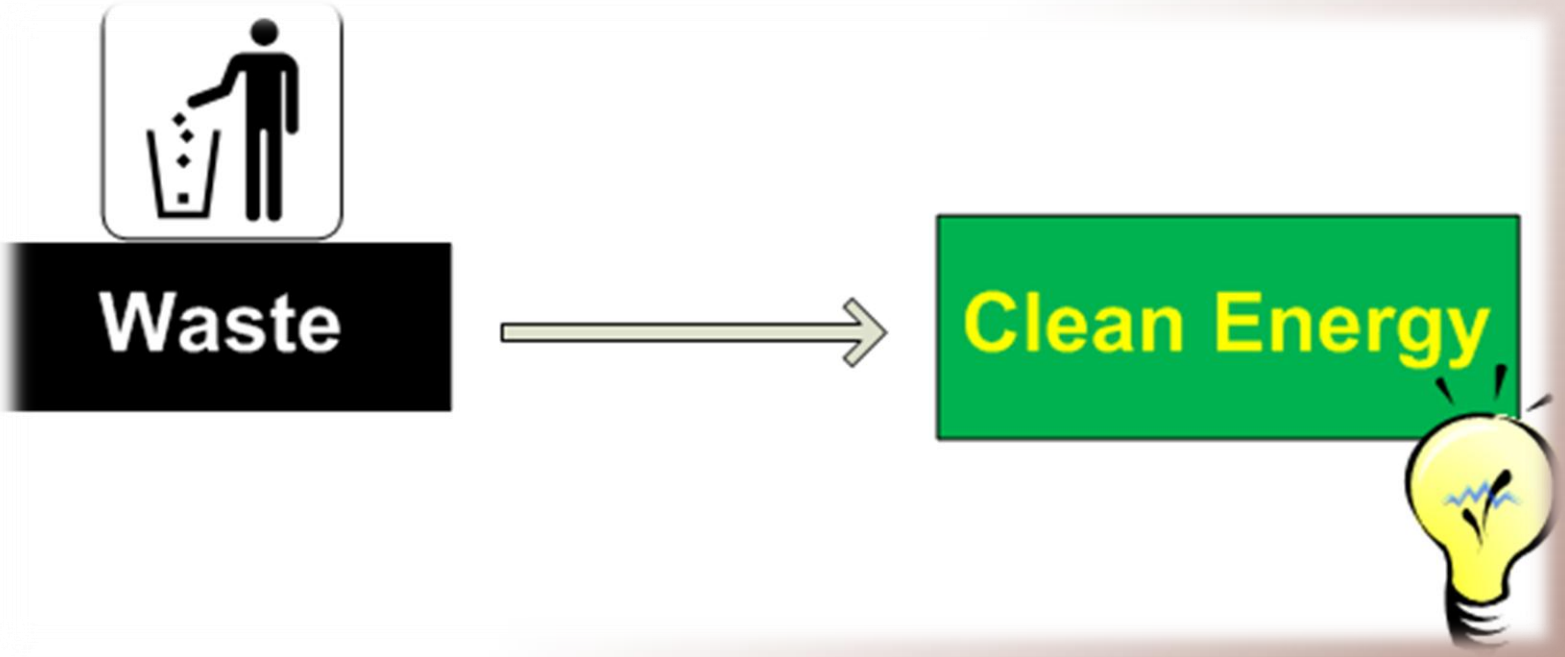
- **Description of the vision**
- **Current status (state of the art & problems & challenges)**
- **Strategy and the recommendations for R&D**

- **Chapter 3 focuses on feedstock including biomass and waste production**
- **Chapter 4 on bio-refineries (or alternatively biomass/waste valorisation and technologies)**
- **Chapter 5 on products, markets and policies**
- **Describing the present status and strategic research needs for collaboration between Europe and India in specific domains**


Biomass Inventory
Project Inventory
Stakeholders Meeting
India & European Union
Online Survey
Interactive Sessions
Research Recommendations SRA
Road map

RESEARCH ROADMAP OBJECTIVE

Today's Waste…….Tomorrow's Energy



- ✓ **Zero Waste**
- ✓ **Resource efficiency**
- ✓ **New bio-products for tomorrow**
- ✓ **Environmental sustainability**

ROADMAP- PRESENT SCENERIO

The Roadmap provides research recommendations* in following categories:

(1) **Biomass production /Feedstock**

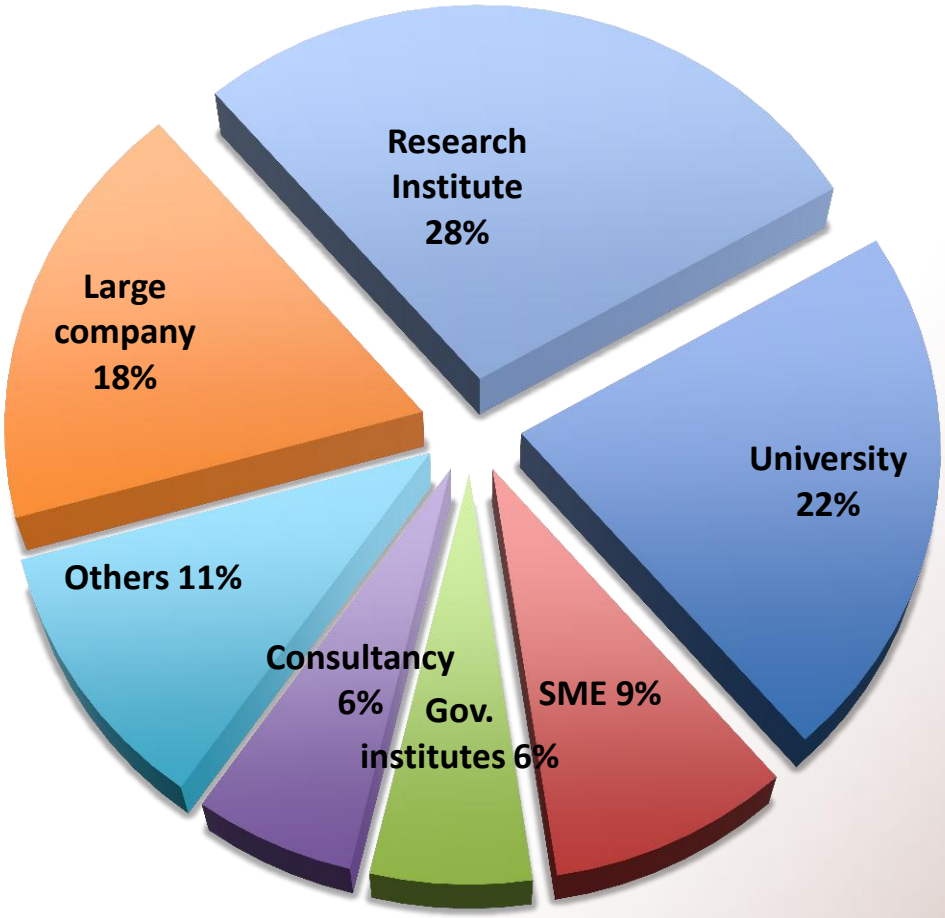
(2) **By-products/waste**

(3) **Biorefineries**

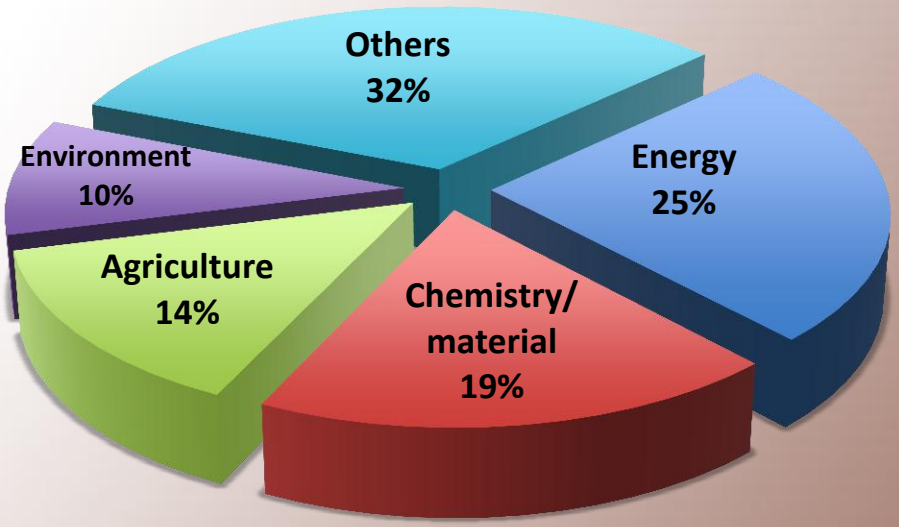
(4) **Policy, market, products**

- * based on survey response
- received 191 responses (~160 completed the enquiry)

Survey Response

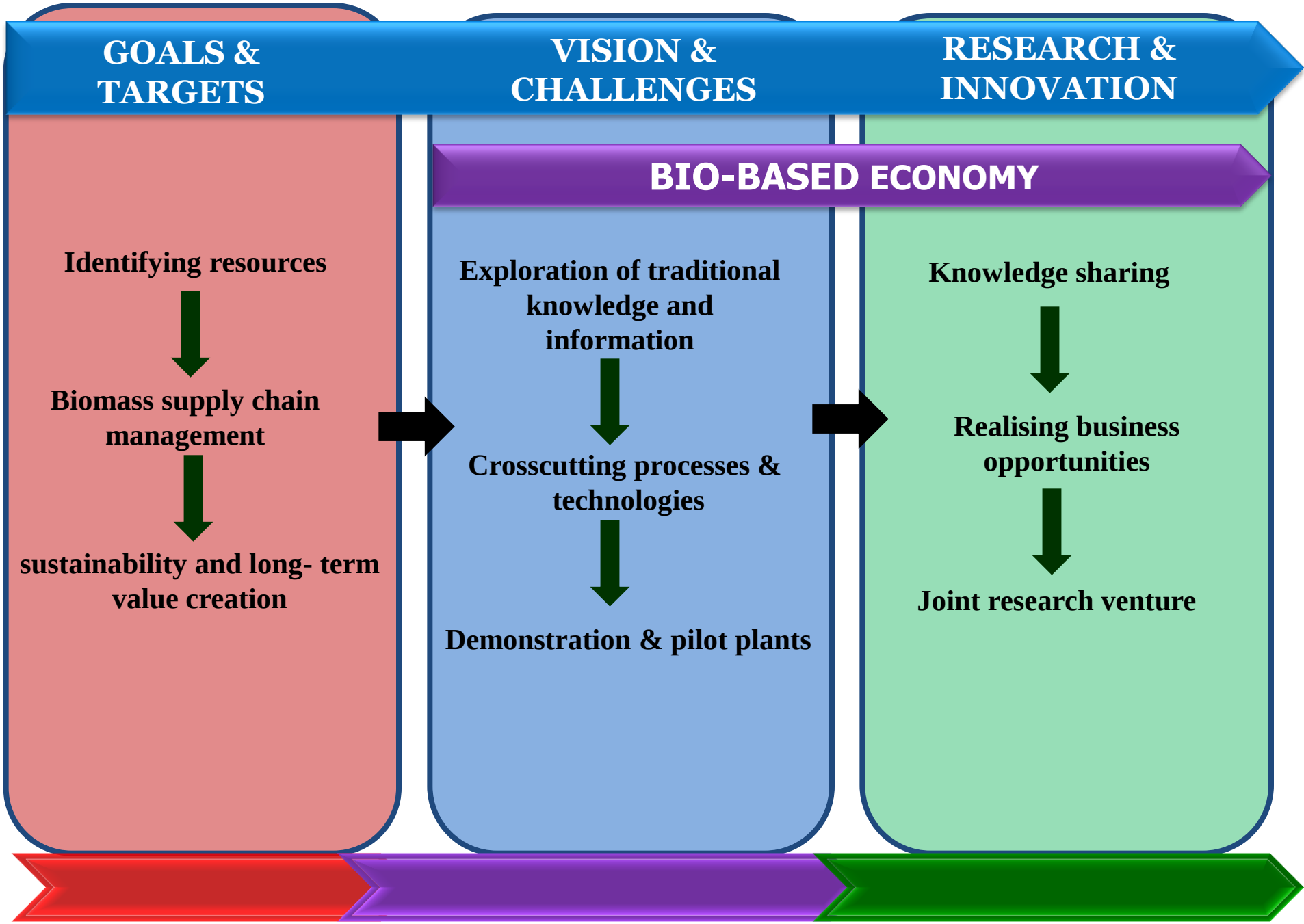


(A) Contributors Category



(B) Contributors Sectors

RESEARCH ROADMAP



Feedstock

- **Research on the phenotyping of plants to obtain improved crop performance including marginal lands, resource use efficiency, resilience, biomass composition, multi-purpose use potential. (42%)**

- **Development of high yielding dedicated bioenergy crops via optimized agriculture technologies with minimum inputs in terms of nutrients, water and energy consumption for the set-aside and marginal lands. (19%)**

- **Research on the exploiting the full potential of micro-algae in a biorefinery strategy. (17%)**

Conti….

- **Pilot demonstration and assessment of the economical sustainability of improved micro- and macro algae production processes. (17%)**

- **Development of algae production systems for the sustainable production of renewable energy. (33%)**

- **Development of algae-based waste water systems. (19%)**

Waste

- **Development of technologies/methods to harvest, collect and use agricultural by-products, including the assessment of the limits of biomass that can be removed from the fields. (44%)**

- **Set up of a survey of the generation and available agricultural and processing by-products and wastes available for energy and biochemicals production. (29%)**

- **Development of technological routes to apply on diverse types of waste for bioenergy or biobased products. (27% agro-forestry; 29% municipal)**

- **Development of new processes converting CO2 in bioenergy or biobased products (26%)**

Biorefinery

- **Set up of integrated demo biorefinery systems (ethanol, sugar, power, …). (24%)**

- **Development of strategies for multi-feedstock anaerobic digestion of various types of waste, including waste water, municipal solid waste, agricultural waste and industrial waste. (28%)**

- **Development of biorefinery systems based on fast growing and/or easily available biomass resources (bamboo, short rotation coppice, dedicated energy crops, …). (20%)**

Policy

- **Assessment of the present agricultural and biological waste categories that can be declassified (as waste) and to be used as a resource. (52%)**

- **Agreement on the sustainable production and the use of biomass for the bioeconomy (fuels, biochemical, materials). (34%)**

PRIORITY RESEARCH AREAS FOR EU & INDIA

1. **Development of uniform databases for potential available biomass resources**

2. **Biomass production intensification with minimum and sustainable inputs of biofertilizers, biopesticides, water and selection of crops adapted to specific soil and climatic conditions**

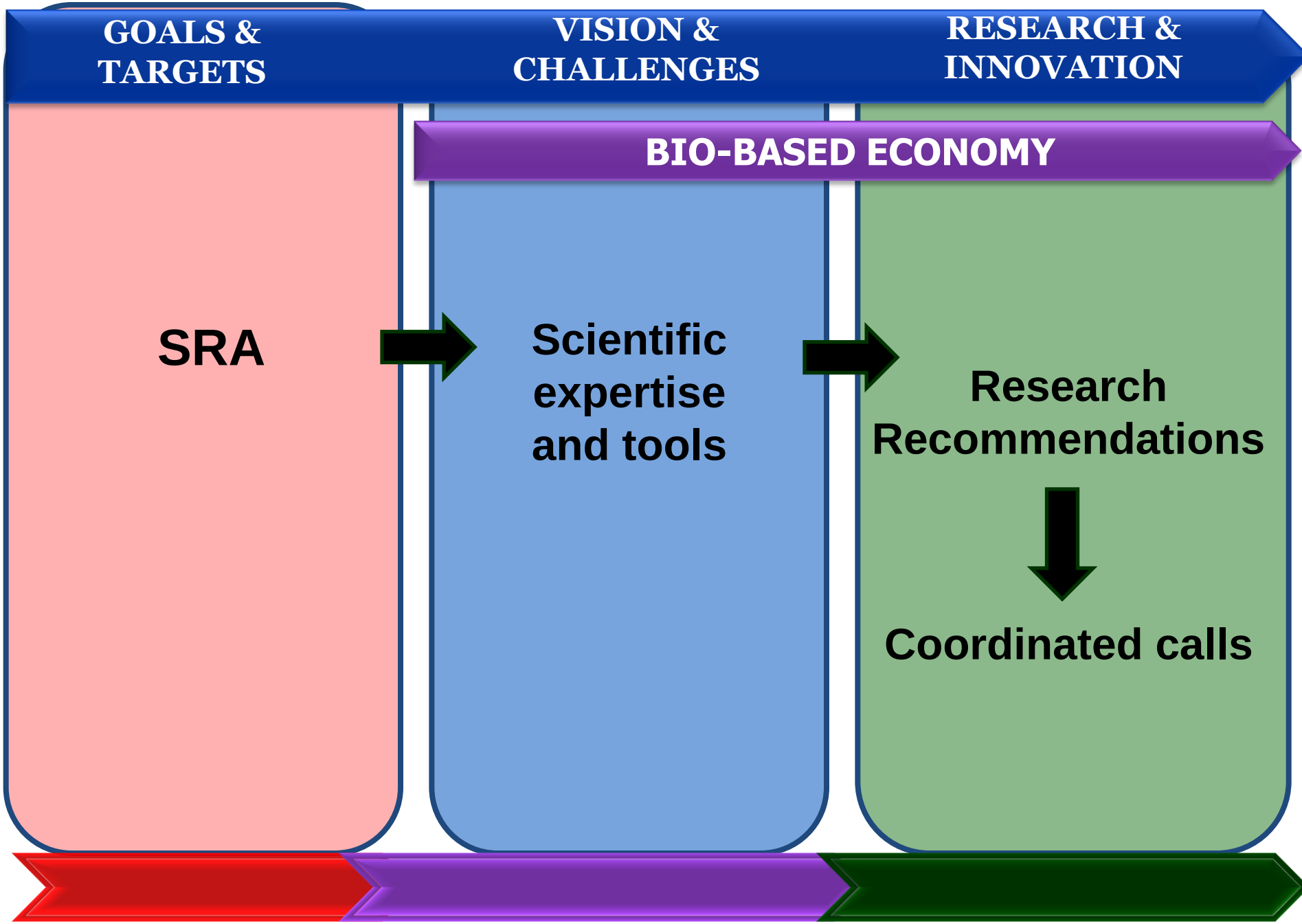
3. **Optimization of crop harvesting and collection of agricultural wastes to reduce losses**

4. Reduction of MSW land filling through recycling of wastes

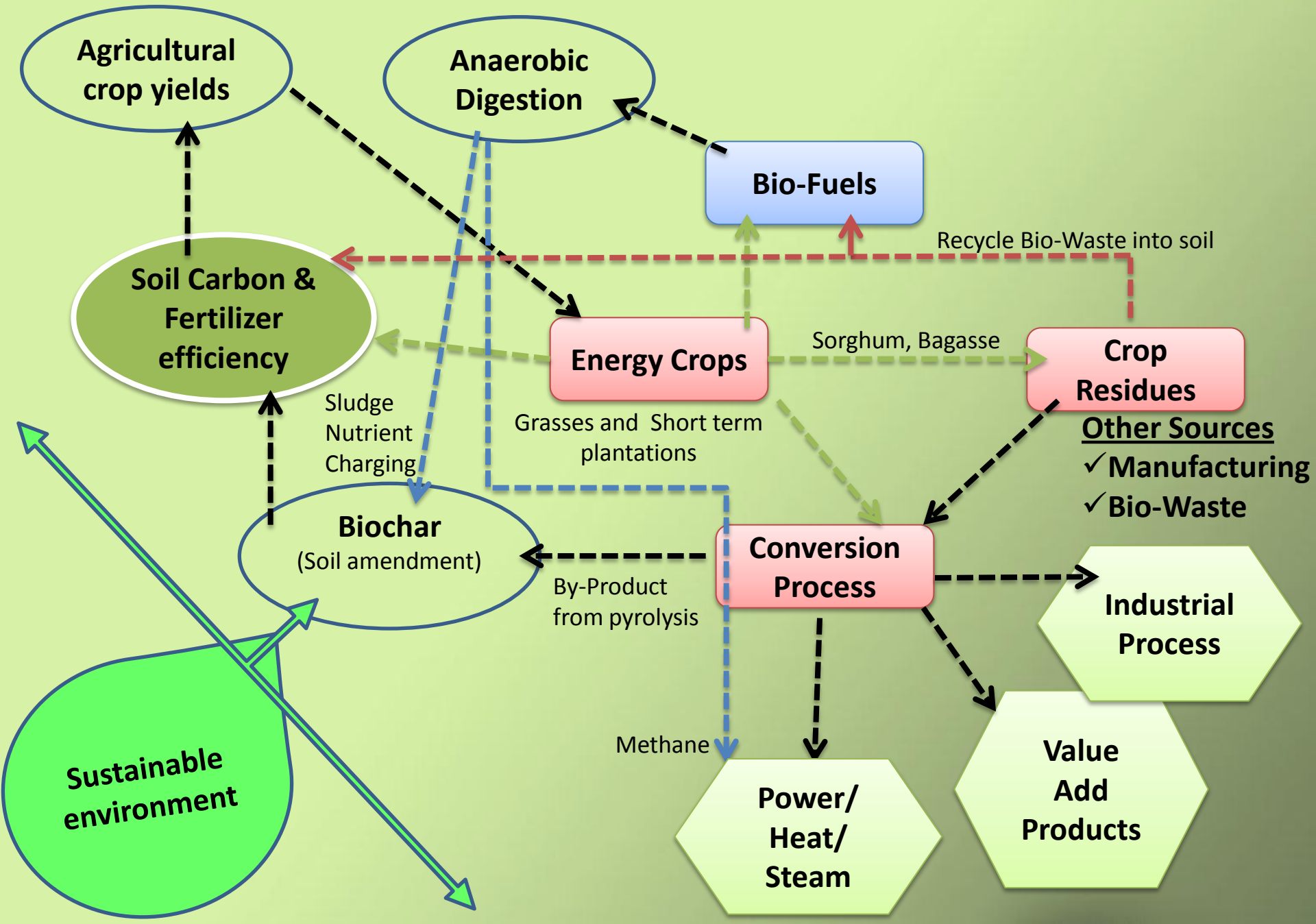
5. Development of efficient methodologies for waste collection, separation and treatment

6. Research and development of sustainable algae production systems for the production of renewable energy, wastewater treatment and for other uses

RESEARCH ROADMAP



Renewable Biomass Energy Integration




Thank You