CARBON sequestration OPTIONS

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SCIENTIST AND
HEAD, PLANNING, RRL, TRIVANDRUM,
CSIR
BROAD TYPES OF CARBON SEQUESTRATION

• BIOLOGICAL SEQUESTRATION
• GEOLOGICAL SEQUESTRATION—INJECTING CARBON DIOXIDE INTO GEOLOGICAL FORMATIONS
• OCEAN SEQUESTRATION—OCEAN IS A NATURAL SINK
• OCEAN FERTILISATION BY SEEDING TO PROMOTE GROWTH OF CARBON FIXING PLANKTON AFFECTS OCEAN BIOTA

• IDEA OF MASSIVE FLOATING SEA-WEED FARMS AND MACROCYSTS OR CALCAREOUS ALGAE HEAVILY RESEARCHED
DISADVANTAGES OF KELP FARMS

• EXPENSIVE AND INEFFICIENT
• FERTILISATION BY NUTRIENTS AFFECT SPECIES BIODIVERSITY
• MARINE COMMUNITY STRUCTURE WILL BE AFFECTED
• HARVESTING OF ALGAE PRESENTS PROBLEMS
• UPTAKE DUE TO MACROALGAE LESS THAN 0.5GtCyr⁻¹
Carbon Dioxide Bioremediation

- Land use and forestry schemes for emission reduction offsets as per Kyoto protocol
- Biomass from macro algae is an economically feasible alternative
- Macro algae have high productivity and do not compete for farm land
- But technology needs to be more fully developed
• BIOLOGICAL CARBON SEQUESTRATION THROUGH ENGINEERED PHOTOSYNTHESIS SYSTEMS OFFERS ADVANTAGES AS A Viable SOLUTION FOR REDUCED CARBON EMISSIONS IN THE ENERGY SECTOR

• SUCH SYSTEMS PROVIDE OPTIONS OTHER THAN OCEAN SEQUESTRATION
BIO FUELS

- BIOMASS FROM MACROALGAE IN ENGINEERED SYSTEMS FIND USE AS BIOFUELS THROUGH BIO AND CHEMICAL PROCESSES
- MICROALGAE WITH GENETIC MODIFICATION TO YIELD HIGHER LIPIDS FOR USE AS BIODIESEL
- IDEAL FOR CARBON DIOXIDE SEPERATED FROM FLUE GAS FOR MICROALGAL GROWTH THROUGH FLOW KINETICS