World Agroforestry Centre

Biofuels:
Facilitating an evidence based discussion of their potential

Ravi Prabhu *(drawing also on notes from Carlos Sere)*

Here's the question …

Can the demand for Biofuels

- contribute to economic growth
- attract new investments into rural areas,
- provide additional incomes with their multiplier effects in the local economy and thus
- boost broad based, equitable development?

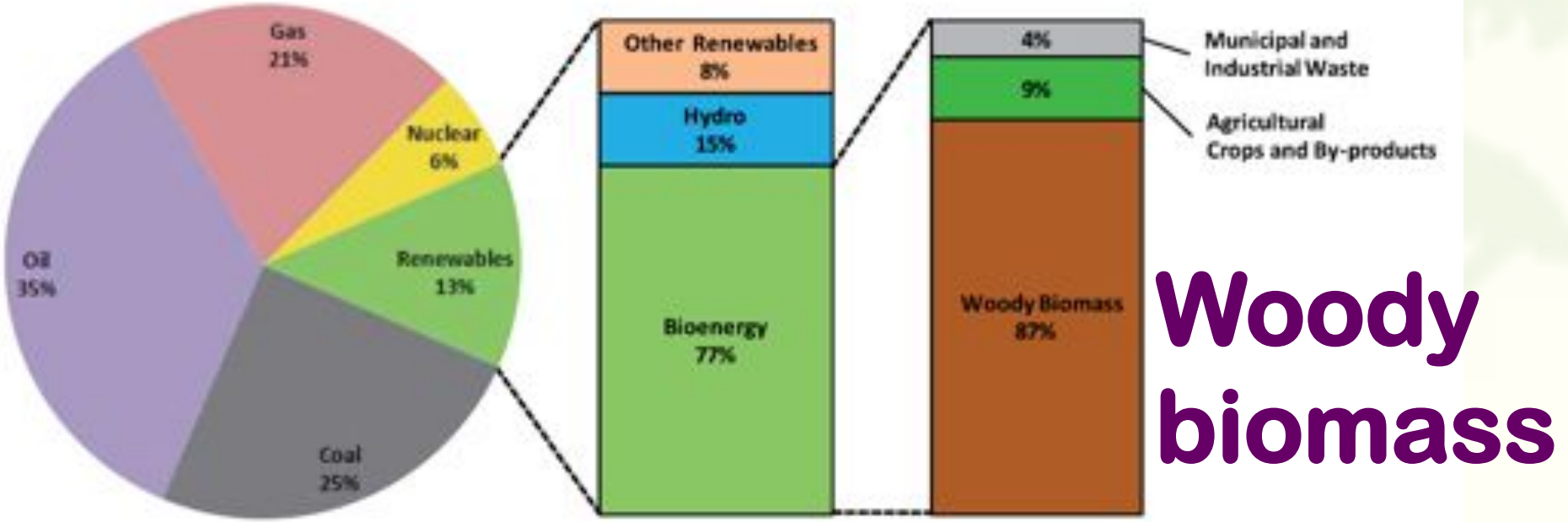
Biofuels should be

Providing affordable, sustainable energy while

- **Feeding a growing population**
  - 1 billion hungry, 2 billion with malnutrition
  - 9 billion by 2050
- **Lifting people out of poverty**
  - Securing livelihoods, especially when small-holder agriculture is the only option for most
- **Reversing land degradation and securing ecosystem services**
  - Mitigating greenhouse gases
  - Securing water, nutrients and other services

World's greatest renewable

but are we expecting too much?



Woody biomass

Source: IEA Bioenergy 2009

Sketching the opportunity

- **A 1% p.a. increase in agriculture growth leads to a 2.7% increase in income** of the lowest 3 income deciles in developing countries (WDR 2007)
- **Agriculture is 2.5 to 3 times more effective in increasing income** of the poor than is non-agriculture investment (WDR 2007)
- **Agriculture growth**, as opposed to growth in general, is typically found to be the **primary source of poverty reduction** (IFPRI, 2007)

Sketching the opportunity 2

- **Need diversified sources of income** and employment in rural areas, and for this, **investment – including in energy – appears to be a critical driver**
- **Rural areas are starved for energy**, and without energy, growth is always going to be very difficult

Challenges

- **Transform smallholder agriculture into successful agribusiness**
  - The provision of energy is an important part of this effort
  - Corporate private sector investment is key to achieve this along the value chain.
- **Ensuring good business models**
  - Inclusive & equitable
  - Out grower models?
  - Fairness in sharing risks and rewards along the value chain

Challenges 2

Need to

- Avoid compromising of food security,
- Conserve the environment,
- Reduce deforestation and
- Maintain biodiversity;
- Minimize water usage in biofuel production (by using water efficient crops)
- Understand and use the ‘swing potential’ for benefit

Challenges 3

- **Understand complex relationships between biofuels production and the rest of the functions of the ecosystem**
  - competition and complementarity,
  - short and long term.
- **Policy environment to maximise societal benefits**
  - winners and losers:
  - understand who they are
  - how they are affected
  - how equitable solutions can be developed

E.g. Aviation biofuels

- Aviation industry about **2 percent of manmade CO2 emissions** but air transport is set to grow at 5 percent annual rate in the coming 20 years[1]
- Airlines **must use liquid fuel**.
- Fuel is also the **highest operating cost**
- Little alternative but to switch to an extensive **use** of **sustainable bio-fuels**.
  - non-food crops, requiring small landmasses and proportionally less fertilizer, water and energy.
  - present an economically viable opportunity to sustainably power the world's commercial aircraft fleet.
  - bottom-line implications of second-generation bio-fuel are increasingly promising.

From conclusions of Boeing representative at IFAD biofuels meeting, Nov. 2012

E.g. Aviation biofuels 2

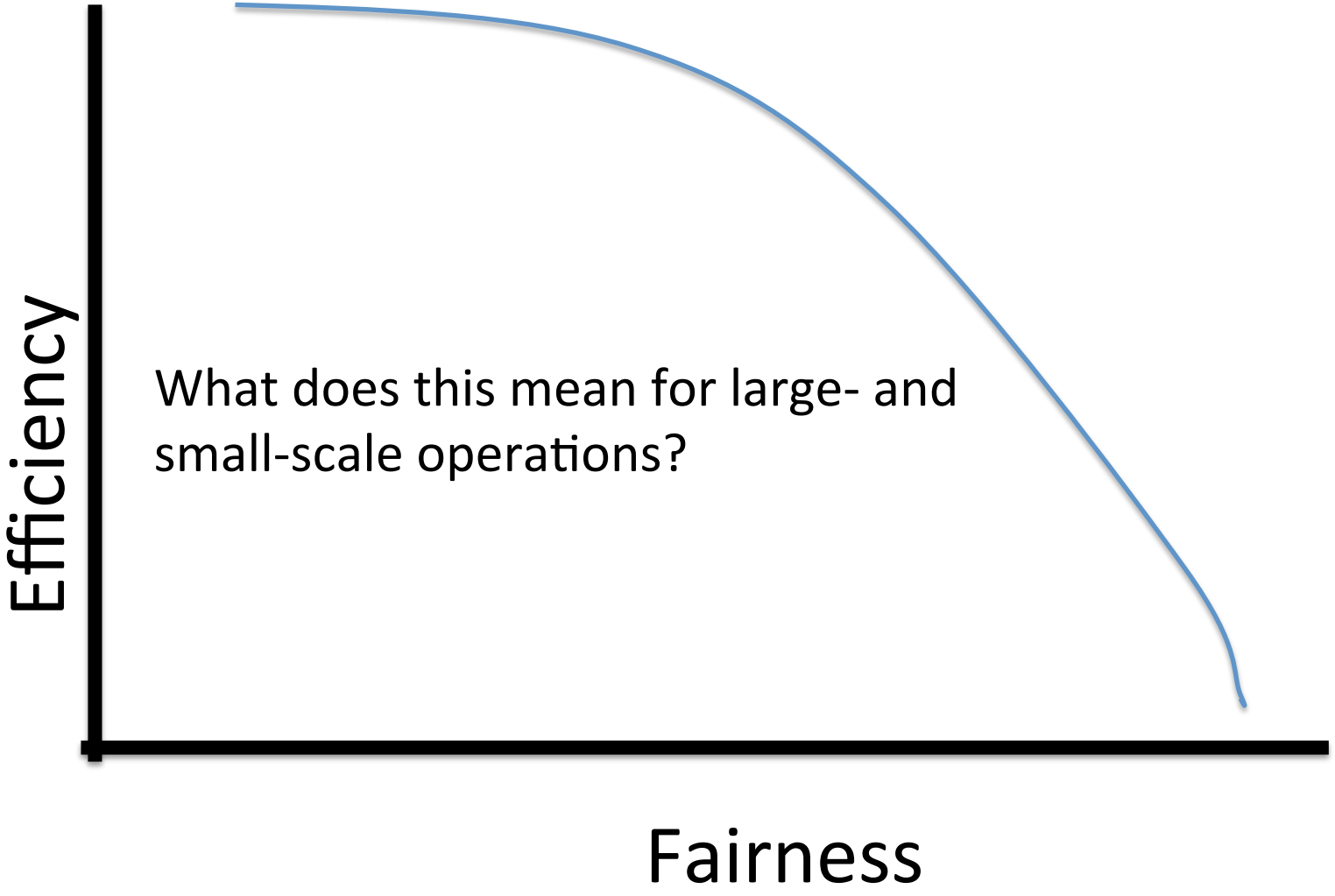
- Important to **expand the portfolio of potential feedstocks** and work on their **agronomics to increase** their **energy yields**.
- Sound, sound and timely regulatory **policies are critically important**
- **Existing policy** mechanisms are **insufficient** to support the development of aviation biojet,
  - some are providing a disincentive for producers to invest in biojet production.
- Huge **potential** can be **unlocked by working together** with industry, users, governments, NGOs with positive implications that will benefit the entire value chain.

From conclusions of Boeing representative at IFAD biofuels meeting, Nov. 2012

Take home messages

- **Opportunity to generate incomes and energy for poor rural people**
- **Number of challenges**
  - technology, resources used, impacts on land tenure, impact on food security,
- **Processes to get to decisions has to be very inclusive**
- **Farmers need to play a key role in this**
  - their livelihoods that are often the most directly affected
- **Need significant resources**
  - to rapidly learn about these new technologies, new crops, new investment opportunities, new social and environmental sustainability challenges.

Trade-offs and/or synergies between efficiency and fairness



The Evening Agenda

- **Hugo Lucas**, Director of Policy Advice and Capacity Building, International Renewable Energy Agency (State of energy needs related to climate change)
- **Kuntoro Mangkusubroto**, Head of Indonesian President's Delivery Unit for Development Monitoring and Oversight (Indonesia's vision on biofuel development)
- **Jason Funk**, Environmental Defense Fund (impacts of scaling up small holder biogas efforts)
- **Facilitated Participant Interactions**
- **Discussant Insights**:
  - **Marja Liisa Tapio-Bistrom**, Senior Officer Climate Change (FAO) Integrated Food and Energy Systems
  - **Rodrigo CA Lima**, General Manager, Institute for International Trade Negotiations (Business Sector Approaches)
- **Plenary Discussion**
- **Closing**

Thank You!

3RD WORLD CONGRESS OF AGROFORESTRY

10-14 February 2014
New Delhi, India

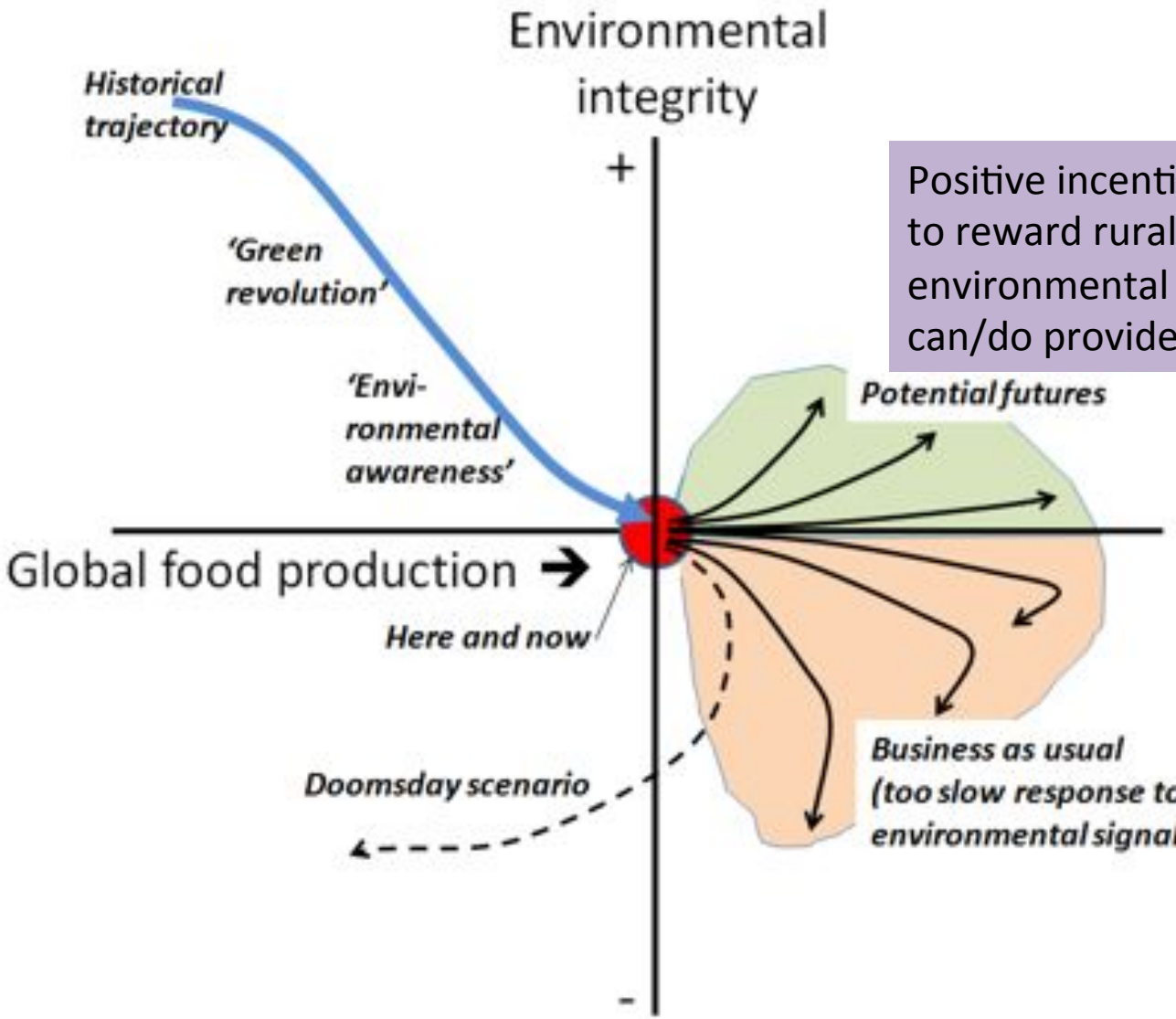
Mark the date!

E.g. Integrated Food Energy Systems

- Type 1
  - Energy crops and food crops grown together with synergies
    - Reduced erosion, storm protection (climate change adaptation)
    - Increased yields of food crops
    - E.g. Agroforestry

- **Type 2**
  - **Cascading use of biomass with nutrient recycling**
    - **'Closed Loop' systems**
    - **E.g. Coconut, gliricidia, paddy straw – food +biofuel – animal feed – biogas – fertiliser**

Redirect development pathways towards environmental integrity, with benefits for people



Positive incentives are needed to reward rural poor for the environmental services they can/do provide

How?

Tree cover on farms

Nearly half of agricultural land has more that 10% tree cover