ECONOMIC INSTRUMENTS for GREEN GROWTH and GREEN AGRICULTURE

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Definition

• “Green jobs” are defined as jobs that reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable. (ILO, UNEP, WB)

• This definition covers work in agriculture, industry, services and administration that contributes to preserving or restoring the quality of the environment while also meeting the criteria for decent work – adequate wages, safe conditions, workers’ rights, social dialogue and social protection.
**Environmental dimension of green jobs**

The range of green job profiles include:

- delivering improvements in energy and resource efficiency, particularly in the building sector, industry and transport;
- renewable energy (including biofuels and renewable technologies);
- sustainable mobility (i.e. mass transportation);
- waste management and recycling of raw materials;
- eco-industries related to pollution control (air, water, waste, site decontamination, noise);
- “eco-friendly” services (conservation, ecotourism, etc.)
- sustainable use of natural resources, including agriculture, forestry and fisheries;
- activities relating GHG mitigation and adaptation to climate change

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**Social dimension of green jobs (the “decent work "criterion")**

- Employment opportunities
- Unforced paid work
- Adequate earnings and productive work
- Fair and equal treatment in employment, gender equality
- Decent working hours
- Safe work environment
- Social protection
- Social dialogue and workplace relations
**Green jobs drivers:**

- Changes in the natural or built environments
- Government policy and regulation
- Technology and innovation (endogenous driver)
- Markets for green industries and new consumer habits.

**Obstacles:**

- Market imperfections and externalities
- Low skills and insufficient capacities
- “Traditional” thinking (behavioral biases)
- Vested interests of “brown economy”, including trade unions
Green growth

- Green growth is an outcome of green economy
- Green growth is about making growth processes resource-efficient, cleaner and more resilient without necessarily slowing them (The World Bank)
- Green economy/growth definitions are context-specific, country-specific, and time-specific phenomena.

Green policies as a source of growth

Environmental policies can increase economic output (GDP) if they:
- Increase the effective quantity of inputs
- Create productivity gains by correcting market failures by affecting the environmental sphere and enhancing efficiency of resource use
- Shifting the production frontier by accelerating innovation development and dissemination, and creating knowledge spillover in the entire economy.
Green policies as a source of growth

However, Environmental policies may have adverse effects on the economic output (GDP) if they:

• **reduce productivity**, by causing producers to use more expensive or less productive technologies (e.g. renewable energy sources that are more costly than coal).

• **result in the early retirement of physical capital** if the capital is based on polluting technologies.

• **increase prices of some goods and services**, and alter relative prices. Demand may decrease in some sectors that have a high production capacity (e.g., tourism in distant places) and increase in other sectors that have a more limited production capacity (e.g., public transportation).

Green Agriculture

The greening of agriculture refers to the increasing use of farming practices and technologies that simultaneously:

• maintain and increase farm productivity and profitability while ensuring the provision of food on a sustainable basis;

• reduce negative externalities and gradually lead to positive ones;

• rebuild ecological resources (i.e. soil, water, air and biodiversity “natural capital” assets) by reducing pollution and using resources more efficiently.

The essence of “green” agriculture is in reduction or elimination of negative externalities caused by the conventional agriculture. Good Agricultural Practices (GAP), Organic/Biodynamic Agriculture, Ecological Agriculture, Conservation Agriculture, including food supply protocols exemplify the essence of “green” agriculture.
**Conventional agriculture externalities**

- Agricultural operations, excluding land-use changes, produce approximately **14 per cent of anthropogenic GHG emissions**. This includes CO2 emitted by the production and use of inorganic fertilizers; agrochemical pesticides and herbicides; and fossil-fuel energy inputs.
- Agriculture also produces about **58 per cent of global nitrous oxide emissions** and about **47 per cent of global methane emissions**.
- Methane emissions from global livestock are projected to increase by **60 per cent by 2030 under current practices and consumption patterns** (Steinfeld et al. 2006).
- The expansion of agricultural land at the expense of forests has been estimated to represent an **additional 18 percent of total global anthropogenic GHG emissions**.
- During the last half-century, the **phosphorus content in freshwater systems** has increased by at least **75 %**, and the **flow of phosphorus to the oceans** has risen to approximately **10 million tones annually**.
- **Conventional agriculture causes millions of cases of pesticide poisoning per year**, resulting in over **40,000 deaths** (FAO-ILO, 2009).

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**Global GHG emissions by sector (IPCC2007a)**

![Global GHG emissions by sector](image)
GHG mitigation potential of the most important sectors at the global level

Agricultural water consumption
Farming practices and technologies that are instrumental in greening agriculture include:

- **restoring and enhancing soil fertility** through the increased use of naturally and sustainably produced nutrient inputs; diversified crop rotations; and livestock and crop integration;
- **reducing soil erosion** and improving the efficiency of water use by applying minimum tillage and cover crop cultivation techniques;
- **reducing chemical pesticide and herbicide use** by implementing integrated biological pest and weed management practices;
- **reducing food spoilage and loss** by expanding the use of post-harvest storage and processing facilities.

According to the recent studies green agriculture is capable of nourishing a growing and more demanding world population at higher nutritional levels out to 2050.

- An increase from today’s 2,800 Kcal availability per person per day to around 3,200 Kcal by 2050 is possible with the use of green agricultural practices and technologies.
- It is possible to gain significant nutritional improvements from increased quantity and diversity of food (especially non-cereal) products.
- During the transition to green agriculture, food production in high-input industrial farming may experience a modest decline while triggering positive responses in the more traditional systems (which account for nearly 70% of global agricultural production). Therefore public, private and civil initiatives for food security and social equity will be needed for an efficient transition.
Green agriculture is expected to reduce poverty

• There are approximately 2.6 billion people who depend on agriculture for livelihood, a vast majority of them living on small farms and rural areas on less than US$1 per day (FAO).
• Increasing farm yields and return on labor, while improving ecosystem services – on which the poor depend most directly for food and livelihoods – is expected to be the key.
• For every 10% increase in farm yields, there has been a 7% reduction in poverty in Africa; and more than 5% in Asia. (Irz et al. 2009)
• Evidence suggests that the application of green farming practices has increased yields, especially on small farms, 54% - 179%.

Reducing waste and inefficiency is an important part of the “green agriculture”

• Crop losses to pests and hazards, and losses in storage, distribution, marketing and at household level together account for nearly 50% of the human edible calories that are produced nowadays.
• Currently, total production is around 4,600 Kcal/person/day but what is available for human consumption is around 2,000 Kcal/person/day.
• FAO suggests that a 50% reduction of losses and wastage in the production and consumption chain is a necessary and achievable goal.
• Addressing some of these inefficiencies – especially crop and storage losses – offers opportunities requiring small investments in simple technology on small farms where it makes the most material difference to poor farmers.
Agriculture losses and wasted production

The next revolution will be the SUSTAINABILITY REVOLUTION
Greening agriculture requires investment, research and capacity building....

- .....in the following key areas: soil fertility management, sustainable water use, crop and livestock diversification, biological plant and animal health management, appropriate level of mechanization and building upstream and downstream supply chains for businesses and trade.
- The cost of transition for farmers in Africa to move from conventional agricultural practices to organic practices, including the cost of certification, was approximately US$77-170 per farmer for an average farm size of 1 hectare.
- Capacity building efforts include expanding green agricultural extension services and facilitating improved market access for smallholder farmers and cooperatives. Training costs were estimated at US$6-14/farmer.

Additional investments are needed, which will deliver exceptional economic and social returns

- The aggregate global cost of investments and policy interventions required for the transition towards green agriculture is estimated to be US$198 billion per year from now to 2050.
- Studies suggest that “Return on investments in agricultural knowledge, science and technology across commodities, countries and regions on average are high (40-50 %) and have not declined over time.”
Green agriculture has the potential to be a net creator of jobs...

- ...that provides higher return on labor inputs than conventional agriculture.
- Modeled scenarios (UNEP 2011) suggest that investments aimed at greening agriculture could create 47 million additional jobs compared with the BAU scenario in the next 40 years.

A transition to green agriculture has significant environmental benefits

- Green agriculture has the potential to rebuild natural capital by restoring and maintaining soil fertility; reducing soil erosion and inorganic agro-chemical pollution; increasing water use efficiency; decreasing deforestation, biodiversity loss and other land use impacts; and significantly reducing agricultural GHG emissions.
- Greening agriculture could transform agriculture from being a major emitter of greenhouse gasses to one that is net neutral and possibly even be a GHG sink, while reducing deforestation by 55% and freshwater use by 35%.
How to make the right thing happen (green policy instruments)

It is essential:

• to conduct the right price policy or “pricing the externality” (taxing the damages and/or subsidizing a reduction in damages, introducing tradable emission permits, and creating of property right markets)
• to introduce the right policy mix
• to promote innovation and pro-active industrial policies

What are the policy problems?

• it is often difficult to change prices to more appropriate values, including all externalities involved (political and social acceptability).
• it is difficult to assess the correct price levels (non-market valuation problems).
• many market imperfections exist (low price elasticity, inertia in behavior, missing markets, high transaction costs, missing or nonfunctional institutions).
What are the policy problems?

- Economies of scale, concentration externalities, coordination failures, information asymmetry, capital market imperfections, and technological lock-in effects are such that price incentives would need to be uneconomically high to stimulate the needed investments.

- Current prices may be ineffective to stimulate investments with long term pay-offs, justifying the use of multiple instruments, especially targeting long-lived capital.

- Activist industrial policies create risks from capture and rent-seeking behaviors that need to be considered.

Global policies

- Elimination of export subsidies and liberalizing trade in agricultural products Changes in trade policies that increase access of “green” agricultural exports originating in developing countries to markets in high income countries are required along with reforms of trade distorting production and export subsidies.

- Tackling market power asymmetry. Leading firms are predominantly located in industrialized countries and maintain significant control over the food system standards and regulatory processes at all stages of the supply chain (Gereffi et al. 2005).

- Food safety standards Improving capacity to develop and implement sanitary and food safety standards that can ensure compliance with international requirements can increase prospects for small farmer communities to supply international markets. It is particularly important to support international efforts to “harmonize” the variety of sustainable and organic certification protocols and standards. Today’s fragmented certification procedures impose high transaction and reporting costs on farmers and limit their access to international markets.

- Intellectual property regimes green agri-technology should be more affordable and available to the developing world
National policies

- Shifting away from production-linked support (cutting off oil and fertilizer subsidies);
- Imposing taxes on fossil-fuel inputs and pesticide and herbicide use;
- Establishing penalties for air emissions and water pollution caused by harmful farming practice;
- Introducing tax exemptions for investments in bio-control integrated pest management products;
- Public procurement of “green” produced food;
- Supporting research and development, information, and technical assistance, food inspection services, biodiversity, flood and drought control, sinks for greenhouse gases and carbon storage;
- Introducing of Payments for environmental services (PES);
- Supporting multi-functional uses of agricultural land.

Green agriculture will require national and international policy reforms

- Policy changes should focus particularly on reforming “environmentally harmful” subsidies that artificially lower the costs of some agricultural inputs and lead to their inefficient and excessive use; and promoting policy measures that reward farmers for using environmental friendly agricultural inputs and farming practices and for creating positive externalities such as improved ecosystem services.
National policy recommendations

• Task for each national policy authority is to create a specific green policy mix.

• An optimal set of economic instruments largely depends on a country specific circumstances (resources, constraints, local problems, international obligations etc.)

• WE HAVE TO BE INVENTIVE and INNOVATIVE in green policy making, but WE HAVE TO BE AWARE OF THE LOCAL SPECIFITIES

• Low chance of rewriting and “copy-paste” approach, particularly in institutional setting issues!

• We should start with making of a clear statistical framework for green jobs monitoring

• And we should start with making simple, transparent and uniform set of indicators in order to be comparable with the others.
References

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- UNEP 2011 “Towards a Green Economy – Agriculture” advance copy online release