Securing Future Food: a summary of the IAASTD findings and their implementation… or not !

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International agricultural assessment urges radical change to secure future food, equity and planetary health

"Business as usual is not an option…. continuing to focus on production alone will undermine our agricultural capital and leave us with an increasingly degraded and divided planet."
Prof Bob Watson, Director IAASTD and former Chief Scientist, World Bank, March 2008

The first ever International Assessment of Agricultural knowledge, Science and Technology for Development (IAASTD) was co-sponsored by FAO, GEF, UNDP, UNEP, UNESCO, WHO and the World Bank. It was approved by 58 governments in 2008.

IAASTD concludes that **unless agriculture, and the way society engages with food, agriculture, livestock production and fisheries, is fundamentally changed, it will not be possible to feed the projected 9 billion world population, ensure equity and sustain the planet.**

The levels of existing and projected degradation and availability of healthy soils and usable water and agricultural biodiversity, to mention but three productive resources under threat, is alarming. Governments will need to make root and branch reforms of agricultural development and related policies if needed changes identified by this scientific assessment are to be realised. But the evidence so far is that they will not.

As IAASTD points out, in many parts of the world natural resources have been exploited as though unlimited and completely resilient to human activities. This unsustainable use has been exacerbated by both conflicting agricultural demands on the environment and exploitative commercial enterprises. "*The consequences include: land degradation (about 2,000 million ha of land worldwide) affecting 38% of the world's cropland; reduced water and nutrient availability (quality and access). Agriculture already consumes 70% of all global freshwater extracted worldwide and has depleted soil nutrients, resulting in N, P and K deficiencies covering 59%, 85%, and 90% of harvested area respectively in the year 2000 coupled with a 1,136 million Mg yr^{-1} loss of total global production. Additionally, salinisation affects about 10% of the world's irrigated land, while the loss of biodiversity and its associated agroecological functions (estimated to provide economic benefits of US$ 1,542 billion per year) adversely affect productivity especially in environmentally sensitive lands in sub-Saharan Africa and Latin America. Increasing pollution also contributes to water quality problems affecting rivers and streams: about 70% in the USA. There have also been negative impacts of pesticide and fertilizer use on soil, air and water resources throughout the world*." (IAASTD, 2008b)

Reversing Environmental Damage
"When Agricultural Knowledge, Science and Technology is developed and used creatively with active participation among various stakeholders across multiple scales, the misuse of natural capital can be reversed… A powerful tool for meeting development and sustainability goals resides in empowering farmers to innovatively manage soils, water, biological resources, pests, disease vectors, genetic diversity, and conserve natural resources in a culturally appropriate manner."
IAASTD, 2008a

Options for sustainable productivity
"*…include improving nutrient, energy, water and land use efficiency; improving the understanding of soil-plant-water dynamics; increasing farm diversification; supporting agroecological systems, and enhancing biodiversity conservation and use at both field and landscape scales; promoting the sustainable management of livestock, forest and fisheries; improving understanding of the agroecological functioning of mosaics of crop production areas and natural habitats; countering the effects of agriculture on climate change and mitigating the negative impacts of climate change on agriculture."*
IAASTD, 2008b

Recognising these threats and analysing future options to sustain production, IAASTD confirms that biologically diverse, agroecological farming and grazing methods, especially those practiced sustainably by small-scale food producers, in particular women, makes agriculture more resilient, adaptive and capable of eliminating hunger and rural poverty in the long-term.

Multifunctionality
"The term multifunctionality is used [in IAASTD] *solely to express the inescapable interconnectedness of agriculture's different roles and functions. The concept of multifunctionality recognizes agriculture as a multi-output activity producing not only commodities (food, feed, fibres, agrofuels, medicinal products and ornamentals), but also non-commodity outputs such as environmental services, landscape amenities and cultural heritages."*

IAASTD, 2008a

IAASTD emphasises the importance of agricultural knowledge, science and technology to the multifunctionality of agriculture and its intersection with other local to global concerns, including loss of agricultural biodiversity and agroecosystem functions, increasing resilience to climate change and the concentration of ownership of land and water resources and of the food chain.

IAASTD found that an increase and strengthening of agricultural knowledge, science and technology towards agroecological sciences will contribute to addressing environmental issues while maintaining and increasing productivity. On GM crops, IAASTD found that yield impacts are highly variable, often with increased use of agrochemicals and reduced yields per unit area. It does not rule out further work on biotechnologies but it recognises that genetic modification, using proprietary genes and technologies, in particular, has done nothing so far to avert hunger and poverty and it is speculative to assert it will in the future.

*"**An increase and strengthening of agricultural knowledge, science and technology** **[AKST]** **towards agroecological sciences will contribute to addressing environmental issues while maintaining and increasing productivity**. Formal, traditional and community-based AKST need to respond to increasing pressures on natural resources, such as reduced availability and worsening quality of water, degraded soils and landscapes, loss of biodiversity and agroecosystem function, degradation and loss of forest cover and degraded marine and inshore fisheries."*

Key Finding #7, IAASTD, 2008a

A book on IAASTD's findings published in 2009, Hope not Hype takes a hard look at genetic engineering and agroecological technologies and, based on the findings of IAASTD, describes them in terms of their ability to provide food without undermining the capacity to make more food. (Heinemann, 2009)

IAASTD also confirms policy and institutional failure has limited use of sustainable practices and has allowed concentration of power in the food system and speculation of food commodities. It could be argued that this is the fundamental underlying reason why people are malnourished, farmers are poor and the price of food is rising. In particular, unfair trade agreements are identified as causes of current economic problems, especially for small-scale farmers.

Do not disconnect!

One aspect highlighted by the findings of IAASTD is the current status of agriculture. This can be characterized by a number of disconnects both in the developed and developing world. They need to be addressed urgently: reconnections must be made.

- Disconnects between agriculture and the environment (affecting: water availability, energy use, biodiversity loss, soil erosion, productivity and sustainability of production, ecosystem services and multifunctionality).
- Disconnects between consumers and food providers (affecting: availability of local food markets, fluctuating food prices and remuneration to producers, costly externalities e.g. health and pollution, loss of trust in food quality, food safety and environmental security).
- Disconnects between land, water resources and cities (affecting: need for stronger planning regulations to stem uncontrolled urban sprawl on productive land).
- Disconnects between policies and expectations (affecting: investments in research and education in a food system that sustains people and the planet, pro-poor investments including infrastructure that support poor people, trade agreements and incentives that should be fair and positive).

Diverse Voices
Achieving sustainability and development goals will involve creating space for diverse voices and perspectives and a multiplicity of scientifically well-founded options, through, for example, the inclusion of social scientists in policy and practice of Agricultural Knowledge, Science and Technology.

Key Finding #22, IAASTD, 2008a

These conclusions are, of course, not new. Any smallholder farmer organisation or movement, for example La Vía Campesina – the international peasant movement, will say that these have been their messages for

decades; but their voices have been marginalised. What is new is that following four years of rigorous evidence gathering and analysis by scientists, IAASTD has confirmed the views of small-scale food providers and their organisations.

What was the IAASTD process?

400 natural and social scientists, biologists and economists, biotechnologists and anthropologists from all regions of the world worked on IAASTD. Their report was peer reviewed twice. Furthermore, IAASTD was overseen by a 60 member Bureau made up of 30 governments, and the same number of public research bodies, the private sector and NGOs (including Practical Action).

The Bureau set the rules for the methodology, analysis and how to deal with any conflicts of interpretation of the evidence – which proved an important safeguard in the process of adopting the report – ensuring the authors' views prevailed.

Key Issues summarised in IAASTD Synthesis Report

- *Bioenergy*
- *Biotechnology*
- *Climate change*
- *Human health*
- *Natural resource management*
- *Trade and markets*
- *Traditional and local knowledge and community-based innovation*
- *Women in agriculture*

IAASTD, 2008b

The final result is a report of over 2,000 pages which builds up to summaries, intensely negotiated line by line, of 22 Key Findings covering all aspects of food and agriculture policy, rural development and scientific research; and a Synthesis Report focusing on eight key themes ranging from bioenergy, trade and markets to traditional and local knowledge and community-based innovation, especially by women.

While 58 governments approved the report, a few disagreed with specific wording in particular paragraphs and recorded their reservations. Australia, Canada and USA did not adopt all the conclusions nor the summary reports, variously citing concerns about IAASTD's findings on trade, transgenics and the imperative for fundamental change.

The process has been fully described in a paper by Shelley Feldman and Stephen Biggs in which they highlight "the disputes and disruptions that characterize the project and various attempts to marginalise its findings." (Feldman and Biggs, 2010). Further insights are to be found in other papers published in 2009 (Feldman, Biggs and Raina, 2009; Scoones, 2009)

What next?

IAASTD provided the evidence that donors, UN organisations, intergovernmental processes, research institutions, NGOs and others can use to back up views about why it is essential to transform agriculture, policy and institutions in order to realise vital social and sustainability goals concerning hunger, poverty, equity and the environment. It will also help them with arguments about how to do this through increasing support for smallholder farmers producing affordable food, in ways that are environmentally sustainable, while protecting small-scale food providers from the corporate-controlled, industrial food system. Organisations, institutions and governments could have ensured IAASTD's findings are turned into binding commitments for change, citing the reports and research that underpin the assessment. They could have called for the wholesale transformation of agriculture towards ecological food provision methods. They did not.

Civil Society Organisations, including the international peasant movement La Via Campesina met in Rome in parallel to the FAO food summit in November 2009. They supported the findings of IAASTD, something that was notably absent in the official summit in which world leaders were mostly calling for more of the same policies and technical solutions (e.g. more fertilisers, pesticides and genetically-uniform seeds) that lie at the root of the social and ecological crisis that caused the food crisis.

At the Forum for People's Food Sovereignty Now! in November 2009 CSOs repeated their commitment to provide the world's food and resolved to:

- strengthen and promote their ecological model of food provision in the framework of food sovereignty;
- call for a reframing of research, using participatory methods, that will support their ecological model of food provision;

- strengthen their interconnecting rural - urban food webs, building alliances within a *Complex Alimentarius* that will link small-scale food providers, processors, scientists, institutions and consumers.

The need for this more enlightened and nuanced approach to agriculture and food provision is long overdue, in order to deal with both the increasing numbers of hungry people as well as the simultaneous challenges of climate change, depletion of fossil fuels, water shortages, rising obesity, increasing population and more, which affect us all and have special devastating impacts in sub-Saharan Africa.

The international community recognises these challenges and has committed to tackling them. However, despite the accumulated evidence of the failures of industrialised approaches and the contrasting positive practices of small-scale food providers supported by those of IAASTD that chart a different, sustainable and equitable way forward, institutions and governments continue to invest in and roll out industrialized approaches, at all scales, promoting the proprietary technologies they depend on.

The scientific challenge now is to move away from this reductionist approach and towards ecological food provision, one that embraces complexity and diversity, sustainably using technologies that are freely available for the majority of food providers.

The political challenge is for governments to regulate and reduce the negative impacts of industrial food systems and defend, support and promote ecological food provision, using natural wealth that may not be commodified, though there are increasing attempts to privatise it, and adopting policies within the food sovereignty framework in order to safeguard the world's food supply. (UKFG, 2010)

CSOs recognise IAASTD as a way forward to overcoming what is in fact a long-term emergency requiring long-term solutions of which knowledge, science and technology are only a part. They are promoting alternatives that will feed people now and in the future and will never compromise the Right to Food. These alternatives will strengthen local markets and biodiverse, ecological and local food provision that is more resilient to climate and price shocks.

Beyond knowledge, science and technology *per se,* CSOs are urging governments to make related institutional changes and, among other things, to re-establish publicly-controlled strategic grain reserves and supply management policies that will beat speculation; to stop industrial agrofuel production, which uses land that should be feeding people; and to implement comprehensive agrarian reforms that will ensure small-scale food providers can control the land and other resources they need to ensure sustainable food production for local communities. In short, Civil Society is calling for locally-controlled food sovereignty that would avert future food crises and ensure a healthy and productive planet (IPC, 2008).

IAASTD supports these approaches. Its wise findings are derived from a comprehensive scientific examination of the evidence concerning the long-term state of food and agriculture and the knowledge, science and technology needed. IAASTD was approved in the thick of the food crisis and it would be a foolish (or distracted) decision maker, development worker or scientist who would now prioritise production at any cost, ignoring the findings IAASTD, and fail to implement the long-term, radical, technical and institutional actions required to secure future food supplies and conserve the biosphere. But that is what has happened – a deafening silence from power holders. Why? Because it does not prioritise proprietary technologies that will pay rent to the agrochemical corporations that own and market them. It calls for radical changes in research, development and production priorities towards more ecological, resilient and local food provision systems managed more collectively and defending the commons of land, soil, water and seeds.

A present threat to future food supplies, though is the commodification of these commons, through: market-based land reform; commodification of soil carbon so that they can benefit from climate change carbon credits; privatisation of water resources; and the patenting and plant variety protection of seeds.

In contrast, ecological food provision in the framework of food sovereignty would truly implement the findings of IAASTD and secure future food.

For more details about the assessment, its reports and its findings, see: www.agassessment.org, www.agassessment-watch.org, www.panna.org/jt/agAssessment,

"Agriculture at a Crossroads" - the Reports of IAASTD **:** Available at: www.agassessment.org .

"Agricultural Knowledge, Science and Technology for Development". Summary of IAASTD Synthesis Report. Alan Spedding. Arthur Rank Centre. Briefing 622. Available at: www.arthurrankcentre.org.uk/projects/rusource_briefings/rus08/622.pdf

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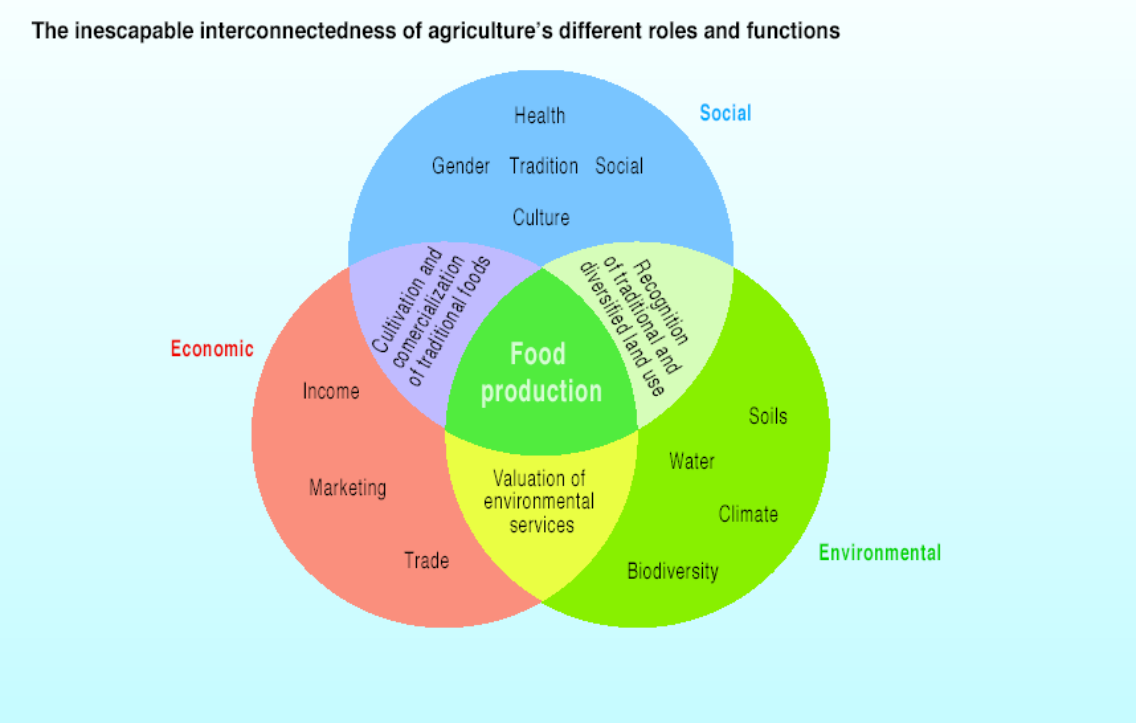
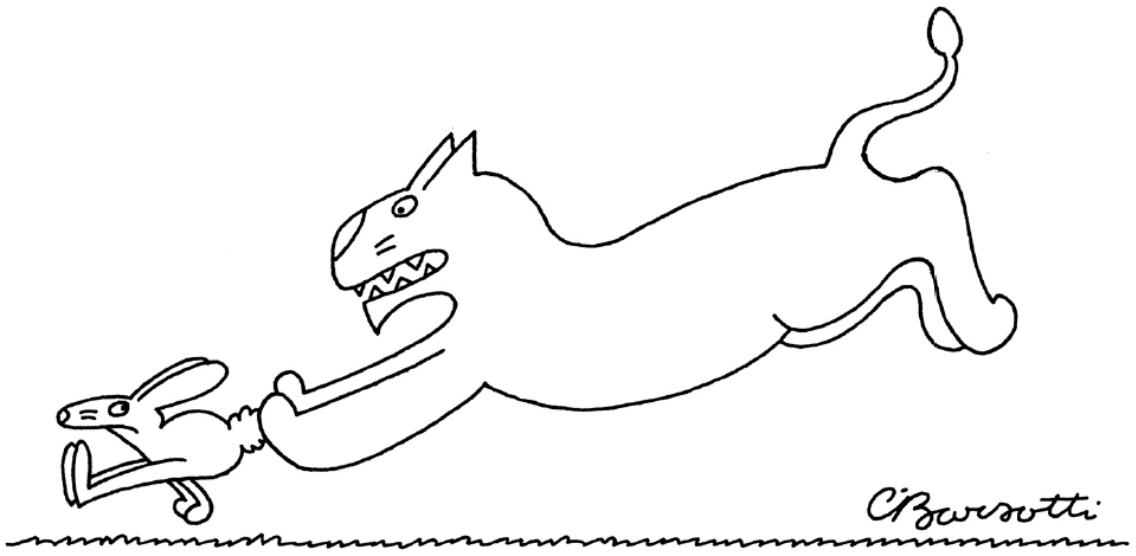


"**Agriculture operates within complex systems and is multifunctional in its nature**. *A multifunctional approach to implementing AKST will enhance its impact on hunger and poverty, improving human nutrition and livelihoods in an equitable, environmentally, socially and economically sustainable manner*."

Key Finding #6, IAASTD, 2008a.



"What are you complaining about? It's a level playing field."

"Opening national agricultural markets to international competition can offer economic benefits, but can lead to long term negative effects on poverty alleviation, food security and the environment without basic national institutions and infrastructure being in place."

Key Finding #17, IAASTD, 2008a.

22 KEY FINDINGS OF IAASTD – at a glance

1. PRODUCTION INCREASES: Agricultural Knowledge, Science and Technology (AKST) has contributed to substantial increases in agricultural production over time, contributing to food security.

2. UNEVEN BENEFITS: People have benefited unevenly from these yield increases

3. NEGATIVE CONSEQUENCES: Emphasis on increasing yields and productivity has in some cases had negative consequences on environmental sustainability.

4. ENVIRONMENTAL DEGRADATION: The environmental shortcomings of agricultural practice [is] increasing deforestation and overall degradation.

5. INCREASED DEMAND EXPECTED: Global cereal demand is projected to increase by 75% between 2000 and 2050 and global meat demand is expected to double.

6. MULTIFUNCTIONALITY OF AGRICULTURE: Agriculture operates within complex systems and is multifunctional in its nature.

7. STRENGTHEN AGROECOLOGICAL SCIENCES: An increase and strengthening of AKST towards agroecological sciences will contribute to addressing environmental issues while maintaining and increasing productivity.

8. REDIRECT AKST: Strengthening and redirecting the generation and delivery of AKST will contribute to addressing a range of persistent socioeconomic inequities,

9. INVOLVE WOMEN: Greater and more effective involvement of women and use of their knowledge, skills and experience will advance progress towards sustainability and development goals and a strengthening and redirection of AKST to address gender issues will help achieve this.

10. BUILD ON EXISITING KNOWLEDGE: [using] more innovative and integrated applications of existing knowledge, science and technology (formal, traditional and community-based).

11. USE NEW AKST APPROPRIATELY: Some challenges will be resolved primarily by development and appropriate application of new and emerging AKST.

12. RESEARCH FOCUS ON SMALL-SCALE: Targeting small-scale agricultural systems helps realize *existing* opportunities.

13. CREATE OPPORTUNITIES FOR POOR FARMERS: Significant pro-poor progress requires creating opportunities for innovation and entrepreneurship, which explicitly target resource poor farmers and rural labourers.

14. DIFFICULT POLICY CHOICES: Decisions around small-scale farm sustainability pose difficult policy choices.

15. PUBLIC POLICY AND REGULATION CRITICAL: Public policy, regulatory frameworks and international agreements are critical to implementing more sustainable agricultural practices.

16. NEW INSTITUTIONAL ARRANGEMENTS REQUIRED: Innovative institutional arrangements are essential to the successful design and adoption of ecologically and socially sustainable agricultural systems.

17. NEGATIVE IMPACT OF INTERNATIONAL TRADE: Opening national agricultural markets to international competition can lead to long term negative effects on poverty alleviation, food security and the environment.

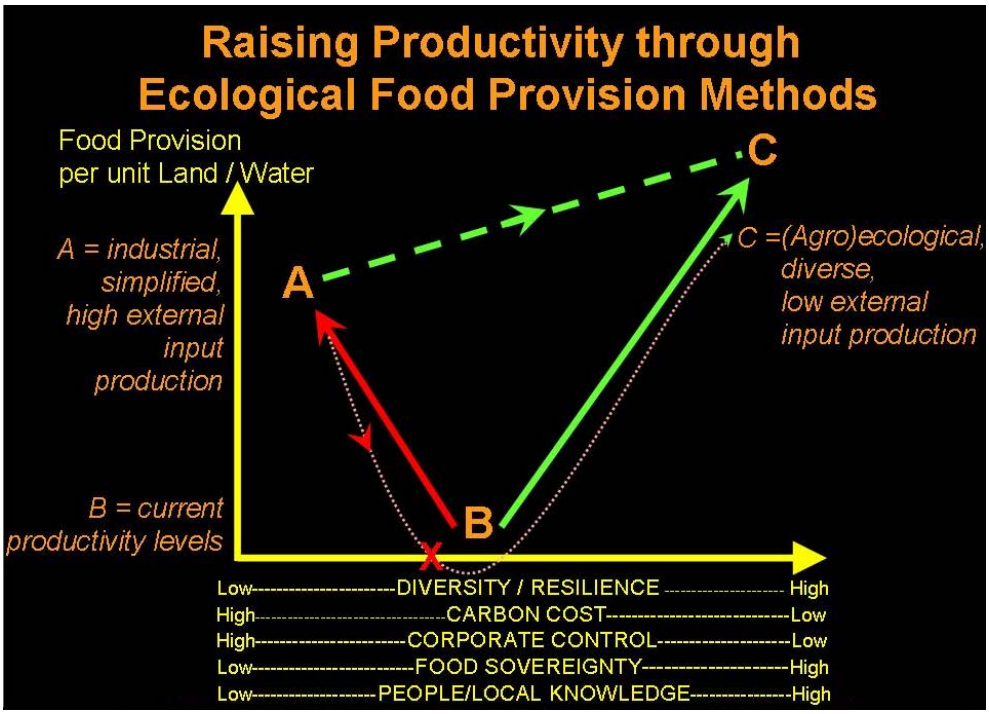
18. EXPORT AGRICULTURE UNSUSTAINABLE: Intensive export oriented agriculture [often] has adverse consequences such as exportation of soil nutrients and water, unsustainable soil or water management, or exploitative labour conditions.

19. CRUCIAL CHOICES: The choice of relevant approaches to adoption and implementation of agricultural innovation is crucial for achieving development and sustainability goals.

20. MORE INVESTMENT IN MULTIFUNCTIONALITY: More and better-targeted AKST investments, explicitly taking into account the multifunctionality of agriculture.

21. CODES OF CONDUCT NEEDED: Codes of conduct by universities and research institutes can help avoid conflicts of interest and maintain focus when private funding complements public sector funds.

22. MULTIDISCIPLINARY APPROACHES REQUIRED: using diverse voices and perspectives and a multiplicity of scientifically well-founded options, through, for example, the inclusion of social scientists in policy and practice of AKST.



"An increase and strengthening of AKST towards agroecological sciences will contribute to addressing environmental issues while maintaining and increasing productivity. *Formal, traditional and community-based AKST [Agricultural Knowledge, Science and Technology] need to respond to increasing pressures on natural resources, such as reduced availability and worsening quality of water, degraded soils and landscapes, loss of biodiversity and agroecosystem function, degradation and loss of forest cover and degraded marine and inshore fisheries. Agricultural strategies will also need to include limiting emission of greenhouse gases and adapting to human-induced climate change and increased variability".* ***(IAASTD Finding #7; see*** *www.iaastd.net****)***

Point B represents current productivity levels of food per unit land and/or water.

Point A represents increases in production that use more carbon and high inputs and result in the simplification of production systems, reducing diversity and resilience. These systems depend on commercial and proprietary industrial technologies (including GM seeds and livestock, pesticides and fertilizers) that are patentable and are controlled by agribusiness corporations.

Point C represents increases in production and productivity per unit area and/or per unit of water that, at especially smaller scales, can be higher than those achieved by the high input, carbon intensive practices represented by point A.

The technologies used to achieve Point C incorporate more diversity in more complex and resilient agroecological systems that can have lower, zero or negative carbon costs and use non-appropriable technologies – those technologies that cannot be privatized and which provide maximum benefit to local food providers, who develop and use the technologies, and support the realization of food sovereignty. These technologies require more people for their implementation – should not be an insurmountable problem in the medium term in a world with a significantly increasing population.

There is a need to invest more in implementing known AKST and the necessary institutional arrangements that will assist with the move from point B to point C, building on the findings of IAASTD. There is a further urgent challenge to prevent the commodification and corporate control over people's collective rights to the commons that are needed for the realization of productivity at Point C.

The significant scientific challenge is not the simplification of systems but how to move from point A to point C, the conversion of degraded simplified production systems to diverse, agroecological, resilient, low carbon systems. And to achieve this without losing productivity in the process as represented by the dotted line marked with an X. This shows how productivity could even fall to levels below the unchanged production system represented by point B, if external inputs are suddenly removed, and it will take time before beginning to recover and build productivity again.

However, dominant R&D funding is not for open access agroecological research (*i.e.* from point B to point C) but increased funding for research and production systems using proprietary fertilizer and pesticide inputs and (mainly protected) plant and animal breeding (*i.e.* from point B to point A).

The political challenge is therefore whether to allow or support 'business as usual' - the move towards or maintaining productivity at point A - or heavily regulate such developments and production systems in favour of supporting radical changes in research, development and production priorities towards more ecological, resilient and local food provision systems, (point C) as found necessary by IAASTD. A danger is the commodification of these commons.