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The views in this paper, however, are not necessarily theirs, nor do they necessarily represent those of the Overseas Development Institute or GIZ.

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Agricultural development policy: a contemporary agenda

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Overseas Development Institute

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Foreword

Agriculture feeds the world. At the same time, agriculture is often the most important economic sector in rural areas. If agricultural development is promoted, it can provide employment and income for people living in rural areas and thus, provide good future prospects for rural areas. However, in many parts of the world agriculture also causes deforestation, biodiversity loss, overuse of water resources and a serious reduction of soil fertility. Therefore, agriculture will only be able to feed future generations of a growing world population, when the production base is used sustainably and more resource conserving than today. In addition, agricultural production must adapt to climate change.

Agriculture provides enormous potential for combating poverty and hunger. This potential is still underutilised in many countries. At the same time, agriculture must respect planetary boundaries. So what does it mean for development policy to aim for an agricultural sector that is "people-centred" and at the same time "planet-sensitive"? Which advice can we give to donors, implementing agencies and partner governments, so that they reach this aim?

The background paper "Agricultural Development Policy: a contemporary agenda ", which was first written in May 2013 by Steve Wiggins and his team from the Overseas Development Institute, triggered surprisingly lively debates at various presentations. Old and new positions on the content were reflected, and new perspectives were gained. The range of new insights gained during the various discussions of the paper called for a second edition of the agricultural policy background paper. I thank the authors for their efforts and am pleased to now present this second edition.

For the development of sustainable agriculture there are no blueprints. Each country has its own potential and is facing specific challenges. Regardless that each country has to define its own pathway of rural development and food and nutrition security, there are some key issues which every country has to face. Rural transformation processes, the development of markets, the importance of technology, the role of women in agriculture and the challenge of resource conservation and climate change: these are fundamental questions that affect every single country – but no "one-size-fits-all" approach exists. The debate about these issues is characterised by professional uncertainty and politically divergent views. But above all these, there exist key messages of consensus, which are supported by a broad number of experts. Agriculture is key to achieve food and nutrition security. To enable agriculture to fulfil this function, governments have to create favourable conditions for private investments in rural areas. In addition, governments themselves have to provide rural public goods - especially physical infrastructure, water and sanitation, education and health, agricultural research and extension.

This study highlights controversial issues but also presents areas of broad agreement and consensus. It provides an informative basis for both the continuation of professional and political debates as well as for concrete implementation of development cooperation via capacity development. Both are necessary in order to meet some of the main future tasks for humankind: a world without hunger, sustainable agriculture and long-term prospects for rural areas.

Dr. Stefan Schmitz

Director,
Commissioner for the "One World – No Hunger" Initiative

German Federal Ministry for Economic Cooperation and Development BMZ

Abbreviations

ADB	Asian Development Bank
AFDB	African Development Bank
AGRA	Alliance for a Green Revolution in Africa
BDS	Business development services
BMZ	Bundesministerium für wirtschafliche Zusammenarbeit und Endwicklung (German Federal Ministry for Economic Cooperation and Development)
CAADP	The Comprehensive Africa Agriculture Development Programme
CBD	United Nations Convention on Biological Diversity
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CDC	Center for Disease Control and Prevention
CDKN	The Climate Development Knowledge Network
CFS	The United Nations Committee on World Food Security
CGE	Computable General Equilibrium (usually describing a model)
CGIAR	Consultative Group of International Agricultural Research
CIDA	Canadian International Development Agency
CPAN	Chronic Poverty Advisory Network
CPRC	Chronic Poverty Research Centre
CSO	Civil society organisation
DFID	Department for International Development, UK government
EC	European Commission
EITI	Extractive Industry Transparency Initiative
EU	European Union
FAO	Food and Agricultural Organisation of the United Nations
G20	Group of Twenty
G8	Group of Eight
GATT	General Agreement on Tariffs and Trade
GCARD	Global Conference on Agricultural Research for Development
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Co-operation)
GAP	Good Agricultural Practice
GMO	Genetically modified organism
HLPE	The High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security
HLTF	The UN Secretary's General High-Level Taskforce on the Global Food Security Crisis
HYV	High Yielding Variety

IAASTD	International Assessment of Agricultural Knowledge, Science and Technology
IFAD	International Fund for Agricultural Development
IFI	International financial institutions
IFPRI	International Food Policy Research Institute
IIED	International Institute for Environment and Development
ILO	International Labour Organisation
IMF	International Monetary Fund
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
IR	Inverse Ratio
LEIT	Low External Input Technology
MCC	Millennium Challenge Corporation
MEA	Millennium Ecosystem Assessment
MVP	Millennium Village Programme
NCHS	National Center for Health Statistics
NRA	Net Rate of Assistance
NGO	Non-governmental organisation
ODA	Official development assistance
ODI	Overseas Development Institute
OECD	Organisation for Economic Cooperation and Development
PES	Payments for environmental services
RNFE	Rural non-farm economy
RSPO	Roundtable on Sustainable Palm Oil
RTRS	Round Table on Responsible Soy Association
SAM	Social Accounting Matrix
SF	Small-scale farmer, small farmer, smallholder
SIDA	Swedish International Development Cooperation Agency
SUN	Scaling Up Nutrition
TEEB	The Economics of Ecosystems and Biodiversity
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	The United Nations Children's Fund
UNSCN	United Nations Standing Committee on Nutrition
US	United States of America
WDR	World Development Report
WHO	World Health Organisation
WFP	World Food Programme

Executive summary

Ideas about the role and importance of agriculture in development have changed in line with prevailing circumstances and ideas. In the 1950s industry was seen as leading economic development, the role of agriculture being to release labour and capital to fuel industrialisation. By the mid-1960s, however, fears that food production could not keep pace with the rapid population growth seen at that time in the developing world brought agriculture into the spotlight with technical advances and equally impressive public investments greatly increasing yields per hectare of grains. With the menace of food shortages fading as cereals production surged, the 1980s saw very different priorities for development, focusing on structural adjustment and economic liberalisation with the expectation that these would accelerate agricultural growth — with little need for additional attention to the sector.

Since 2000, however, there has been a growing sense that agriculture has been unduly neglected, especially in Africa. Agriculture gained further attention when cereals prices spiked on world markets in 2007–08 to a degree not seen since 1973–74. A world that had subsequently grown accustomed to ever-cheaper staples on international markets — prices in real terms had declined by 60% since the 1960s — was shocked *(→see "section 1.2, Background", p.14, for a full overview of the history).*

It is now 30 years since the Washington Consensus came to dominate development thinking. Lessons have been learned and circumstances have changed — of which the following can be singled out:

- ***The grip of the Washington Consensus as orthodoxy has weakened***. Analysis of Asian experiences of economic growth and development has demonstrated the role of heterodox policies tailored to country contexts, rather than the rigid prescriptions of the Consensus.
- ***The environmental costs of agricultural development may no longer be bearable, while climate change threatens.*** Since the start of the green revolution agriculture has been able to grow while overdrawing on groundwater aquifers, polluting soils and water, and converting forests and other habitats rich in biodiversity to new fields. Water scarcity and the rising value of ecosystem services mean these options cannot continue, especially as climates are seemingly ever less reliable and erratic.
- ***Agriculture may be moving from limited demand to limited supply***. Today, emerging economies in Asia, the Near East and Latin America, increasingly urbanised with growing incomes, are seeing relatively rapid increases in demand for higher value foodstuffs, the price of which has risen significantly in the new century. Furthermore, ***cheap oil may be coming to an end, meaning*** costs of production would increase as well as stimulating demand for biofuels.

Not surprisingly, the revival of interest in agriculture in the last few years has led international agencies and bilateral donors to reassess the aims and instruments for agricultural and rural development, food and nutrition security; and the management of renewable natural resources.

In light of this new thinking, a contemporary agricultural policy agenda must address three sets of challenges: reducing poverty and hunger; mitigate recent price volatility for staple foods on international markets; and promote both environmental sustainability along with adaptation to, and mitigation of, climate change ('climate-smart agriculture').

CONSENSUS VS. DEBATES AND UNCERTAINTIES

Much debate and uncertainty surrounds some aspects of agricultural development, but the sound and fury that results should not obscure the consensus reached on two fundamental, if not sufficient, elements for agricultural development. The first is an ***enabling rural investment climate***, consisting of peace and order; macro-economic stability with inflation contained and a competitive exchange rate; predictable, modest and broad-based taxation, with revenues reinvested in public goods; and basic institutions such as property rights respected. The second is that governments need to supply reliably ***rural public goods***, including physical infrastructure (e.g. rural roads, electricity, etc.); services for human development (e.g. education, water and sanitation, health); and agricultural research and extension.

Agriculture's role in delivering ***food and nutrition security*** is another area where considerable agreement exists – for instance, nutrition- and gender-sensitive approaches as well as the fortification of staples with added minerals and vitamins, such as Vitamin A, through plant-breeding.[1]

Yet many details related to agricultural policy are still subject to debates and uncertainties. Particularly prominent issues include:

- agricultural and rural transitions *(→see p.33)*
- rural market development *(→see p.42)*
- the use of agricultural technology *(→see p.53)*
- the role of gender *(→see p.58)*, and
- environmental sustainability and climate change *(→see p.64)*.

It is one thing to analyse technical and economic dimensions of the challenges of agricultural development, and another to make policy and implement it effectively and equitably. Agriculture intersects with an unusually large and growing range of public concerns and actors as well as often being hampered by weak or unfocused political direction and policy administration. Discussions over priorities and trade-offs can thus be long and difficult to resolve.

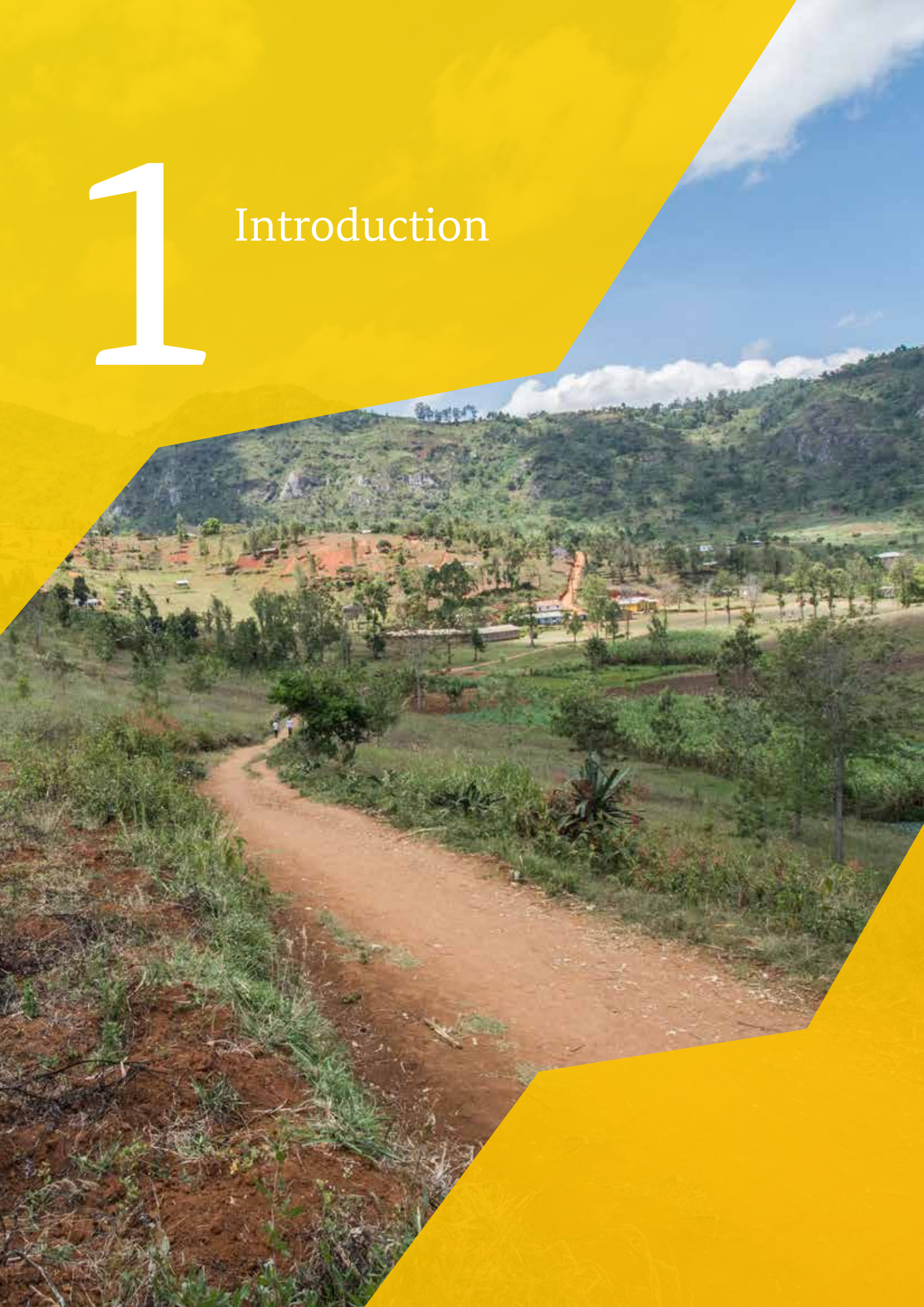
Moreover, policy-making is rarely determined by ideas and evidence alone. Interest groups seek to benefit from policy choices and, therefore, to influence them. Smallholders are rarely well organised politically and, almost by definition, have relatively few resources to invest in lobbying activity. Thus, the interests of less numerous, more powerful and less poor actors often trump those of smallholders within the processes of policy design and/or implementation.

Combine these factors and agricultural policy-making can be difficult. Indeed, agriculture can be seen as the 'awkward sector'. That, however, does not mean that policy cannot be highly effective — witness the green revolution. One lesson is clear: politics matter, and attempts to devise optimal policies for agriculture that ignore political calculations are unlikely to succeed. Applying this practically has led increasingly away from the search for 'best practice' and towards an interest in 'best fit' and, more radically, towards 'good enough' conditions for governance. This implies identifying those conditions that are necessary for progress, even if they are not sufficient in themselves; and how they can be created, even if in imperfect forms.

Policy coherence, co-ordination and effective aid are also key — that is, ensuring that policies do not contradict or undermine one another, and that they are complementary and create synergies wherever possible. The wider point is to understand policy processes; above all the ways that debates are framed, evidence is used, and conclusions are drawn; the different actors and agencies who are engaged; and of sequences and timing, recognising windows of opportunity *(→see "Appendix A", p.92, for a more thorough outline of the key competencies for an agricultural policy advisor).*

1 Food and incomes alone are not sufficient for better nutrition. Care of children, health services, clean water and sanitation are equally important.

1 Introduction



1.1 AIMS

This report aims to assess and summarise the current state of thinking about policy for agricultural development in developing countries, recognising that ideas have developed rapidly in recent years, as will be explained in the next section. It has been drafted to help GIZ think about its future work in agricultural development, especially what kind of policy advice might be needed both for GIZ and the governments with whom it partners.

Specific objectives are to:

A ***Assess the role of the public sector in delivering a contemporary agricultural development policy, including a review of past mistakes,;***

B ***Review the main areas of agricultural development policy and differentiate between those areas where general consensus exists versus those where there is still debate or uncertainties. Reasons for differences of opinion and the evidence typically cited will be documented;***

C ***Set out thinking about policy choices ('political economy'), co-ordination and coherence of agricultural development.***

A first version of this report was published in 2013 with the additional intention of explicitly setting out the specific expertise that agricultural development policy advisors should understand. Appendix A presents these considerations.

The report was discussed within BMZ, presented to the Global Donor Platform, debated in a half-day seminar with 30 staff of the EU DG DEVCO and finally deliberated at the EU Heads of Agriculture and Rural Development (HARDs) Meeting in December 2013. At the same time, the paper inspired the editors of Rural 21 to produce the issue "Agricultural Policies – finding the right approach" Rural 21 Vol. 47 4/2013. In 2014, the GIZ Sector Network Rural Development (SNRD Africa) hosted a three-day agricultural policy learning event in Accra, Ghana, which used the paper as its basis and the main author as prime input provider into this excellent capacity development activity. At all these occasions, two topics received outstanding interest and triggered highly interesting debates: the consensus on investing in rural public goods and the process of rural transformation. Thus, we decided to ask the author to work on a second edition of the paper that would expand on these two sections. Furthermore, gender in agriculture didn't receive adequate attention in the first version and was more adequately considered in this second edition. Finally, the highly relevant discussion spurred by Colin Poulton from the School of Oriental and African Studies (SOAS, London) during the Agricultural Policy Learning Event in Ghana on Policy Choices and the Political Economy of African Agriculture lead to an overhaul of that section, too.

This second edition should serve as reference base for our policy advisory work in agriculture and shall serve as capacity development material for forthcoming Learning Events on agricultural policy – in Anglophone and in Francophone Africa, since this second version is also available in French.

1.2 BACKGROUND

CHANGING IDEAS ABOUT AGRICULTURAL DEVELOPMENT

Since 1950, ideas about how to develop agriculture in the developing world have gone through several iterations (see Ellis & Biggs, 2001; Staatz & Eicher, 1986; and Wiggins et al., 2010 for more detail).

In the 1950s development was seen first and foremost as industrialisation, urbanisation and modernisation. Little attention was paid to agriculture: for the most part it was seen as a 'traditional' sector of low productivity, with many smallholdings operated by farmers who were conservative and ignorant of modern technologies. It was a sector that would release labour for manufacturing industry, growing in response to demand from the emerging cities and factories. Productivity would be raised rapidly through agricultural extension that would bring technical innovations and better management to those remaining on the land.

These ideas about the secondary nature of agriculture were challenged in the 1960s, both by experience and new thinking. Agricultural growth was not as fast as had been hoped: innovations designed for farmers in Europe and North America often proved inappropriate in the developing world. It became clear that farmers faced structural obstacles, such as inequitable land tenure; that markets functioned less well than expected; and that infrastructure in rural areas was insufficient to support growth.

Moreover, the transformations expected in development were slower than expected. Industrialisation in the 1950s and 1960s rarely generated enough jobs for underemployed rural labour. It was increasingly evident that slow-growing agriculture threatened to undermine development, as food became scarce at national level while rural populations remained in poverty. Nowhere were these concerns more evident than in India where two consecutive poor monsoons in 1965 and 1966 led to harvest failures and a crisis of rising food prices, urban riots and emergency imports of US cereals. Alarm bells rang in the West as rural unrest in the developing world fuelled rebellions that brought socialist and pro-Soviet regimes to power, most notably in Cuba in 1959.

At the same time, analysis of farm surveys by US agricultural economists concluded that, contrary to previous opinion, small farmers were efficient users of resources: an insight summarised by Schultz's (1964) observation that small farmers were 'efficient, but poor'. Smallholder development schemes of the 1950s confirmed the potential of small farms, as seen in the burgeoning production of coffee and tea from small farms in Kenya, and the rapid increases in agricultural production from smallholdings created by land reforms in Korea and Taiwan (World Bank, 1975). This prompted a reassessment of agriculture. Far from being a follower of industrialisation, it could and should play a central in development based on its potential functions as a supplier of food and raw materials, an earner of foreign exchange, a domestic market for the produce of other sectors, and a source of capital and surplus labour for the growth of manufacturing and services (Johnston and Mellor, 1961).

For Schultz the resolution of the paradox of efficient smallholders who were nevertheless poor lay in technical improvements. Coincidentally the early 1960s saw the first fruits of efforts to breed high-yielding, hybrid varieties of cereals that would form the technical core of the so-called 'Green Revolution'. Increased use of manufactured fertiliser, water control through irrigation and drainage, and crop protection needed to make full use of the new seeds were, at least in theory, scale neutral and thus eminently suitable for small farms. The harvest failures seen in India in the mid-1960s were seen as a Malthusian threat in developing countries that then had very fast population growth – the fear being that they would never be able to boost their agriculture to keep pace. Hence India and other countries invested heavily in the potential of the new seeds in a desperate bid to stave off disaster: roads and irrigation works were built; agricultural extension energetically promoted the new seeds in areas where they could thrive; fertiliser factories were constructed; banks were either nationalised or instructed to direct credit to farmers; and state agencies promised to buy up additional cereals produced at guaranteed prices.

When cereals prices spiked in 1973/74, it seemed that these Malthusian fears were being realised. Alarmed leaders redoubled efforts to develop agriculture, most notably through investing in the Green Revolution. Internationally, budgets were greatly increased to agricultural research centres in order to generate the improved seeds and practices that were at the agronomic core of this revolution.

The Green Revolution succeeded in boosting production. From the late 1960s onwards, agriculture grew faster in the developing world than in OECD countries. More importantly, the growth of cereals production comfortably exceeded population growth during the 1960s and 1970s – when population growth in Asia and other parts of the developing world reached what would prove to be an historically high rate.[2] Before the mid-1960s, plenty of observers did not think this feat was possible, yet the combined efforts of committed leaders and their policy advisors, crop breeders, and an army of workers in extension, fertiliser factories, warehousing, transport, and irrigation schemes, proved them wrong. This was largely a story from Asia and parts of Latin America, such as Mexico, but it also applied sporadically in Africa for maize, even if efforts in that continent were often not sustained.

Once the success of the Green Revolution was evident, it was clear not only that agricultural research could indeed produce near-miracles but also that public investment in irrigation and drainage, input supply, extension, provision of credit and guaranteeing prices to farmers — all features of the green revolution in Asia — could be highly effective.[3]

The early 1970s saw a high water mark of interest in agriculture. World Bank researchers (Chenery et al., 1976) rejected previous ideas that equity and economic growth would trade off; instead they proposed that investing in the small-scale enterprises of poor people would raise rates of economic growth, not depress them. By far the most numerous of such small enterprises were family farms.

Yet even as interest in agriculture peaked, it became clear that attention to matters of technology and micro-economics of smallholder development had led to neglect of the overall economic context and the incentives facing farmers. Lipton (1976) was to highlight urban bias, while others completed the detail by identifying the implicit taxation — 'negative protection' — of farming (Krueger et al., 1991). This was first and foremost seen in Africa, but bad examples could be found in Latin America and occasionally in Asia as well. Some taxes were explicit, above all taxes on export crops, but added to that were implicit levies in the charges and margins levied by monopsonistic public marketing boards, compulsory deliveries demanded of farmers in centrally planned economies, and in the effects of price controls on foodstuffs. In addition, the over-valuation of exchange rates when these were controlled, as was the case in most countries before the 1980s, and protection of domestic industry, turned the terms of trade against agriculture.

Overall rates of negative protection were often very high indeed, as a significant study of the extent of negative protection discovered, see Table 1.1. For the three African countries studied, the average rate was more than 50%. Export crops were much harder hit than importables, mainly food crops. Most of the disadvantage came indirectly through exchange rates and industrial protection, rather than through measures directly affecting farmers.

This implicit taxation, it was argued, reduced incentives to farmers that thereby depressed output, stymied agricultural growth, and impeded exports of agricultural products. If agricultural growth was disappointing, then remedying this — by 'getting the prices right' — would stimulate output.

The argument that problems of agricultural development stemmed largely from government failures became an important strand in the 'Washington Consensus' on development thinking that emerged in the late 1970s and early 1980s. This argued for the primacy of private enterprise as a motor of growth, with activity co-ordinated through markets: the state should be restricted to providing an enabling environment for investment including a stable macro-economy, and the supply of public goods and services that would not be provided privately. The Consensus emerged at a time when many developing countries in Africa and Latin America were experiencing high inflation, trade deficits and mounting public debt. Stabilising these macro-economies thus became the leading priority in the 1980s, with structural adjustment programmes as the means to do so.

2 Within a decade of the Green Revolution being launched as a response to a Malthusian trap, population growth began to slow, so that food production accelerated just as population decelerated, making an escape from the trap all the easier.

3 That is not to say efficient: but given the depth of crisis of Asian food production seen in the mid-1960s, an effective response was sought, no matter what the cost.

TABLE 1.1 DIRECT, INDIRECT, AND TOTAL NOMINAL PROTECTION RATES BY REGION, 1960–1984

Region	Indirect Protection	Direct Protection	Total	Direct Protection of Importables	Direct Protection of Exportables
Asia: Rep. Korea, Malaysia, Pakistan, Philippines, Sri Lanka & Thailand	– 22.9 (a)	– 2.5	– 25.2	22.4	– 14.6
Latin America: Argentina, Brazil, Chile, Colombia & Dominican Rep.	– 21.3	– 6.4	– 27.8	13.2	– 6.4
Mediterranean: Egypt, Morocco, Portugal & Turkey	– 18.9	– 6.4	– 25.2	3.2	– 11.8
Sub-Saharan Africa: Côte d'Ivoire, Ghana & Zambia	– 28.6	–23.0	– 51.6	17.6	–20.5

Source: Krueger et al., 1991
Note: The period covered is generally from 1960 to 1984, but varies for some countries.
(a) In South Asia (Pakistan, Sri Lanka), the indirect nominal protection rate was –32.1%, while in East Asia (Korea, Malaysia, Philippines, Thailand) it was –18.1%.

The Consensus had little to say about individual sectors. For agriculture, it was taken that adjustment and liberalisation would correct the high implicit taxation and lead to faster agricultural growth as incentives to invest were restored.

Interest in agriculture declined still further in the 1990s as issues such as poverty reduction, economic growth, the environment, gender, health and education took precedence in the development agenda (Eicher, 2003). Agricultural development was, furthermore, seen as difficult and problematic, tarnished by its association with ambitious integrated rural development programmes of the 1970s that produced disappointing outcomes. Donor funding to agriculture diminished accordingly: agriculture received only half as much in real terms in 2005 as in 1980, while its share of funding fell from 17% in the early 1980s to 3% in 2005 (Cabral, 2007, quoting OECD statistics).

REVIVAL OF INTEREST IN AGRICULTURE

Since 2000, however, there has been a growing sense that agriculture has been unduly neglected. With the first Millennium Development Goal being set at halving poverty and hunger, attention was directed to where the poor and hungry live: overwhelmingly in rural areas where agriculture is usually the largest source of livelihoods and jobs. This realisation was strong in Africa. When African agriculture ministers met in Maputo in 2003, they produced a declaration that they would strive for 6% annual growth of agriculture and would devote 10% of government budgets to that end. That led to adoption of the Comprehensive Africa Agriculture Development Programme (CAADP) by the African Union.

Internationally, donors reassessed their support for agriculture, declaring their intention to devote more effort and resources to the sector. The *World Development Report for 2008* (World Bank, 2007) reflects this thinking. It states the case for investing in agriculture to reduce poverty, while recognising the diversity of contexts and the consequent various pathways — such as intensification of agriculture, diversification and out-migration — that rural households may take to escape poverty. Some private foundations, most notably the Bill & Melinda Gates Foundation have also taken interest.

These and other initiatives were made all the more urgent and visible when cereals prices unexpectedly spiked on world markets in 2007–08, to a degree not seen since 1973–74. A world that had grown accustomed to being able to buy in staples from international markets at prices that in real terms had declined by 60% since the 1960s was shocked.

At the same time, concern has steadily mounted over environmental degradation, resource depletion and climate change – the fear being that agricultural growth may slow still further as environmental limits and costs, long lags in natural systems, have to be faced.

CURRENT CONCERNS IN AGRICULTURAL DEVELOPMENT

The history of development is one where current wisdoms are periodically reassessed in the light of emerging evidence and shocks, usually resulting in substantial modifications to those wisdoms. It is now more than 30 years since the Washington Consensus came to dominate development thinking, so what evidence is there to support or challenge that set of ideas as applied to agriculture? Most of the leading development agencies have made some statement on agricultural policy since 2008, of which the World Development Report for 2008 (World Bank, 2007) is the outstanding example. For this report, policy documents published since the early 2000s by leading donors and international organisations were reviewed, 24 in all. Details of them can be found in Appendix B. Although these cover a plethora of topics, four sets of issues stand out, as follows.

One, the ***grip of the Washington Consensus as inviolable orthodoxy has weakened*** (for a general review see Kanbur 2008 on the emergence of the 'Washington Confusion'). Analysis of Asian experiences of economic growth and development has demonstrated the role of heterodox policies tailored to country contexts, rather than rigid prescriptions (see for example, Chang, 2003, 2009). In Africa, for example, the idea that subsidies to inputs such as fertiliser should not be contemplated has been qualified by Dorward's (2009) argument that they may be justified in particular circumstances — when fertiliser is used on food crops in countries that are cut off from world markets and where food makes up a major share of budgets for low income households.

For agriculture, the belief that liberalisation and macro-economic stability would stimulate growth has been shaken by the evidence that smallholders, above all in Africa, are using very few purchased inputs and in some countries may even be using less than they did a quarter century ago, even when more productive technologies in the form of improved seeds and fertiliser are available. Some blame this on limited access to credit, owing to high transactions costs between formal banks and smallholders — a form of market failure. Others point to monopolies and imperfect competition, or to lack of land titles as contributory factors — again, forms of market failure. Still others see the problems as those of erratic public policy, or simply the underlying economics that apply when transport costs are high. The analyses are in debate *(→see "Failings in rural markets", p.42).*

Two, agriculture may be moving ***from limited demand to limited supply***. From the mid-1980s until the mid-2000s agriculture across the world had been limited by effective demand. Significant increases in output could only be sold by accepting lower prices. Most OECD countries reacted by supporting farm incomes. Today, emerging economies in Asia, the Near East and Latin America, increasingly urbanised with growing incomes, are seeing relatively rapid increases in their demand for higher value foodstuffs, including vegetable oils, sugar, fruit, vegetables, fish, dairy and meat. Prices of these commodities have risen significantly in the new century. Developing world farmers, so long limited by lack of domestic and regional demand for increased marketed surplus, now increasingly have large and growing markets to supply. For those remaining on the land, demand for what they can produce seems stronger than at any time since the beginning of the Green Revolution in the mid-1960s.

Three, ***some key costs of agricultural production have changed***. From the early 1980s to the mid-2000s agriculture was able to grow by using cheap fossil fuels and fertiliser derived from them (HLPE, 2011). Since then oil prices have risen strongly then fallen back in 2014/15, but still remain well above those seen in the early 2000s. Higher oil prices not only raise costs of agricultural production, but also stimulate demand for biofuels. Several tropical feedstocks such as sugar cane, oil palm, cassava and sweet sorghum can compete with fossil fuels when crude oil prices exceed US$60 a barrel. Rural wages in Asia are rising so that farm labour is no longer abundant and cheap (Wiggins and Keats, 2014). As costs of producing staples in Asia rises, opportunities for exporting to Asia from countries rich in land are increasing.

Four, the ***environmental costs of agricultural development may no longer be bearable, while climate change threatens.*** Since the start of the Green Revolution agriculture has been able to grow while overdrawing on groundwater aquifers, polluting soils and water, and converting forests and other habitats rich in biodiversity to new fields (HLPE, 2011). Water scarcity and the rising value of ecosystem services mean these options cannot continue. Farming will have to become environmentally sustainable. Meanwhile, climates are seemingly ever less reliable and erratic, probably the first signs of global warming affecting the weather. The search is on for effective ways that agriculture can use to adapt to changing and more variable climate, and to reduce its own emissions of greenhouse gases. So far, international climate negotiations have been slow to acknowledge that agriculture – which currently contributes 30% or more of greenhouse gas emissions when land conversion to fields is – is perhaps the only economic activity that can realistically aim for zero net emissions — owing to its ability to store carbon in soils and plants.

Hence current concerns for agricultural development include the longstanding aims of reducing poverty and hunger. While some notable national successes have been seen, especially in East and Southeast Asia, current levels of poverty and food insecurity in much of the rest of the developing world, still mainly in rural areas, mean there is still much to be done. Two other elements have, however, been added.

One stems from higher oil costs and rising demand for food in fast-growing economies, the combination of which has contributed to recent volatility on international markets for staple foods and may well lead to higher food prices, in real terms, over the medium term. This is generating demands for policy options to address these issues.

The other is the longer-term challenge of making agriculture environmentally sustainable — farming without depleting aquifers, eroding and degrading soils, converting valued habitats to fields, and polluting soils and water —as well as compatible with climate change, by adapting to the probably more erratic climate of a warmer world and by helping limit warming by cutting emissions from farming and capturing carbon within farming systems ('climate-smart agriculture').

Agricultural policy thus has to address a wider set of issues than in the past, and take on some formidable challenges.

GUIDE TO WHAT FOLLOWS

The rest of this report consists of a review of the topics identified, ordered by consensus and points in debate and uncertainty. Questions of policy choice and coherence follow in chapter 3. The report concludes with some brief reflections.

1.3 APPROACH AND STRUCTURE OF REPORT

A FRAMEWORK FOR ORGANISING IDEAS

Contemporary debates on agricultural development can be difficult to grasp for those not regularly engaged with them. Lively discussions take place over some issues, debates that tend to capture attention, especially when they turn on judgments about values. Similarly there are issues, often some of the most prominent such as climate change, where considerable uncertainty surrounds processes and hence technical options. Debates can, however, obscure some important points on which most researchers and analysts largely agree.

Hence this review has organised the topics by dividing them into points on which there is a broad consensus, and issues on which substantial debates arise owing to uncertainty, lack of evidence, differing interpretations of evidence and different values. The selection of topics had to weigh the number selected and corresponding coverage of the field, against thve desire to focus on the seemingly more important issues. One topic in debate was however omitted: agricultural trade policy, since another review had been commissioned by GIZ into this area.[4] Table 1.2 lists the topics covered by consensus and debates.

TABLE 1.2 CONSENSUS VS. DEBATE AND UNCERTAINTY IN THE KEY FUNCTIONS OF THE STATE

CONSENSUS	***A rural investment climate or enabling environment:*** peace and order; macro-economic stability; basic institutions
	Provision of rural public goods: roads, power, other physical infrastructure; education, health, water, sanitation; agricultural research and extension
	Food security and nutrition — while there is widespread agreement on policies, not all agricultural specialists are aware of this thinking and its implications
DEBATE AND UNCERTAINTY	***Agricultural and rural transitions:*** the relative decline of agriculture with economic growth, scale of farming and the viability of smallholdings, rural transitions and the fate of marginal farms, and appropriate land policy
	Developing rural markets: competing views on the difficulties smallholders face in accessing inputs, finance and debates over responses; how smallholders can link to emerging supply chains; whether it is worth governments, regional or global bodies trying to stabilise markets.
	Agricultural technology: in particular biotechnology and high external input use versus low external input and agro-ecological approaches
	Gender and agricultural development: overcoming gender gaps in agricultural productivity and wider issues of rural women and their empowerment.
	Environmental sustainability and climate change: meeting the challenge of correcting environmental harm — soil degradation, overuse of water, loss biodiversity and forests — while adapting to climate change and mitigating agriculture's contribution to emissions of greenhouse gases.

4 See GIZ Sector Project Agricultural Trade and Value Chains (2013): Agricultural trade policy for rural development and food security.

2 Policies for agricultural development: consensus vs. debate and uncertainty

2.1 BROAD CONSENSUS ON THE BASIS OF AGRICULTURAL DEVELOPMENT: AN ENABLING ENVIRONMENT AND RURAL PUBLIC GOODS

SUMMARY:

Two powerful lessons can be seen from history: how urban bias and implicit heavy taxation of farmers can deter investment and innovation; and how public investments can stimulate agricultural development. From these come two commonly agreed necessary conditions for agricultural development.

One is a favourable climate for investment for investment in rural areas, including peace, economic stability and basic economic institutions such as land rights. The investment climate does not have to be perfect: the key is to remove major disincentives to investment and innovation.

The other is investment by the state in rural public goods —those that will not be adequately supplied by the private sector. These include the physical infrastructure of roads and power, investing in people through education, health and clean water, and providing more technical knowledge through agricultural research and extension. Returns to public spending on these have often been high.

A FAVOURABLE CLIMATE FOR RURAL INVESTMENT

An investment climate in rural areas that favours investment and innovation may not in itself be enough to stimulate production, but it is a necessary condition: agriculture grows more slowly when it is effectively heavily taxed ('negative protection'). The elements of an enabling climate are well-known: peace and order; macro-economic stability with inflation contained and a competitive exchange rate; property rights respected; and, predictable, modest and broad-based taxation, with revenues reinvested in public goods (Poulton et al., 2008).

Few would disagree with the importance of the overall proposition, but in practice, the question is how good does the climate have to be to stimulate investment; or, put otherwise, how bad can it be before investors are deterred? Often a conducive investment climate is defined as much by what it avoids as what it provides. Hence it is about avoiding gross economic distortions as seen with negative protection, it is about lifting the fear of expropriation and predatory taxation from innovators and investors, and it about stable public policy that allows longer-term investments to be made without fear of radical reversals in strategies and policies.[5]

The investment climate does not have to be perfect, but rather it needs to avoid gross mistakes and distortions. China is a notable example. When China introduced reforms from 1978 onwards, the measures taken for agriculture were significant — for instance, the introduction of household responsibility for production and the freedom to sell a part of produce on markets — but they were far from comprehensive. The investment climate was far from perfect. On the contrary, remaining controls on markets and restrictions on renting land meant it was still a relatively poor investment climate, but compared to what it was before the reforms, it was greatly improved (Rodrik, 2003). The changes stimulated a remarkable acceleration of agricultural growth, well ahead of population growth, that allowed China to industrialise.

China may be seen as a special case. But it is not the only one. Ghana's reforms of 1983 saw hyperinflation tamed, devaluation of the Cedi to a competitive level, and reform of the cocoa marketing board to cut the margins between prices paid to farmers and those received by the board. This led to a remarkable acceleration of agricultural growth. For much of the decade before 1983 agricultural growth was slow or negative: after reforms, agriculture grew at an average rate of around 5% a year for 25 years, one of the fastest of any farm sector in the world (Leturque & Wiggins, 2011).

Hence debate centres on 'good enough governance' (Grindle, 2004, 2007) and the minimal conditions for progress (Moore & Schmitz, 2009), largely inspired by East Asian examples where heavy investment and rapid economic growth have been achieved despite clear imperfections in the investment climate and governance. The key is not perfection, but avoiding gross mistakes and distortions. This is encouraging. Developing and especially low-income countries rarely have the administrative capacity, and perhaps also the political ability, to get an ideal investment climate. But if they can correct the worst failings, then they should be rewarded.

5 This does not prevent government from undertaking radical changes, so long as they respect the trajectory of published strategies. Problems arise when sudden U-turns are made, as for example when bans on imports or exports are imposed, or industries nationalised.

SUPPLYING RURAL PUBLIC GOODS FOR FARMERS

Agriculture needs public goods: that is, goods and services that private firms will not provide in adequate quantity because they cannot readily exclude non-payers from the benefits. These include physical infrastructure such as rural roads, electricity, perhaps large-scale irrigation and drainage where applicable; human development such as education, water and sanitation, health[6]; and public knowledge through agricultural research and extension.

Spending on public goods in rural areas pays off: that can be seen from studies of returns during the Green Revolution. For example, Fan et al. (2000) report the following estimates of returns to public spending on agriculture in India during the time the Green Revolution was being rolled out:

TABLE 2.1 RETURNS TO SPENDING ON AGRICULTURE IN INDIA, 1970 TO 1993

	Sector Returns in Rupee per Rupee Spending	Numbers of Poor Reduced per Million Rupees
Research & development	13.45	84.5
Roads	5.31	123.8
Education	1.39	41.0
Irrigation	1.36	9.7
Anti-poverty programmes	1.09	17.8
Soil & water conservation	0.96	22.6
Health	0.84	25.5
Power	0.26	3.8

Source: Fan et al. 2000 data, presented in Fan et al. 2007

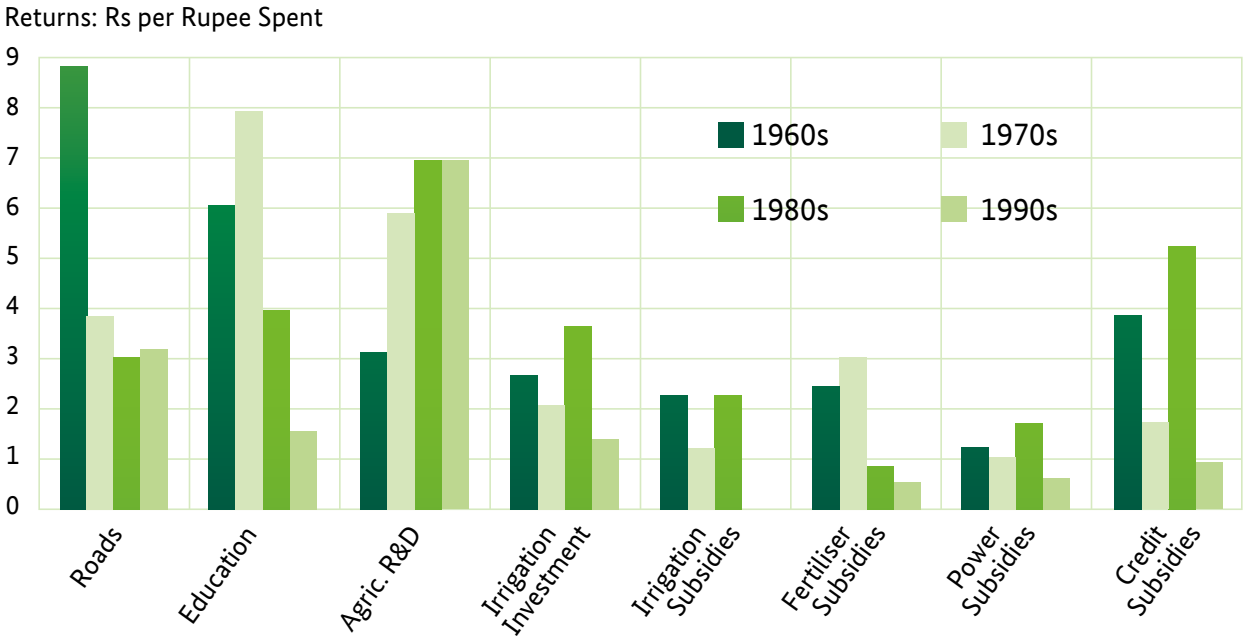
6 Strictly speaking some of these investments in people are not public goods, since a private provider can exclude those not paying for the services. They are better seen as merit goods: those where private perceptions of the benefits may be lower than public perceptions and left to the market, would see underuse of these services — to the medium and long-term detriment of society.

As this table shows, there were very high returns to agricultural research and roads, and good returns to education and irrigation. India was not exceptional. Similar analyses for China, Vietnam, Thailand and Uganda (Fan et al., 2007) show similar trends, albeit with some differences in returns to different public goods across the countries. They conclude:

> *Agricultural research, education, and rural infrastructure are the three most effective types of public spending for promoting agricultural growth and reducing poverty.*
> *(Fan et al., 2007)*

Similar studies estimating returns to public spending arrive at another striking conclusion: while spending on public goods usually pays off, spending on private goods generally does not (Fan & Rao, 2003). In Latin America, de Ferranti et al. (2005) complain that between 1985 and 2000, for nine countries in the region, more than 54% of public spending in rural areas was on private goods and transfers. At the margin, a 1% increase in share of rural spending on public goods led to a 0.23% increase in farm output, compared to just 0.06% return to 1% more total spending with no change in composition. Great gains it seems can be had from switching funding from private to public goods in rural Latin America.

FIGURE 2.2 CHANGING RETURNS TO GOVERNMENT SPENDING IN INDIA



Source: Dorward et al. 2004, using data provided by Fan

Although these findings may be generally applicable, exceptions may exist. In the early stages of development, subsidising inputs may be a way to overcome the combination of farmers' lack of capital and failures in credit markets that can make inputs unaffordable. These returns, however, may be short-lived, as Indian experience shows (see Figure 2.2). During the 1960s subsidies on irrigation, credit and fertiliser had appreciable impacts on rural poverty while those on power had notably lower returns. However, the former's benefits fell over time and by the 1990s they also had little impact.

Further reading:

Fan, Shenggen, Joanna Brzeska & Ghada Shields, 2007, 'Investment Priorities for Economic Growth and Poverty Reduction', 2020 Focus Brief on the World's Poor and Hungry People. Washington, DC: IFPRI

Leturque, Henri & Steve Wiggins, 2011, Ghana's sustained agricultural growth: Putting underused resources to work, Report, London: Overseas Development Institute

2.2 FURTHER CONSENSUS: FOOD SECURITY AND NUTRITION

Food insecurity and malnutrition remain major problems in the developing world. Some 795 million persons in the developing world, 15% of the total, are estimated to be undernourished[7] as of 2014–16 (FAO, 2015). Amongst children under five years old, 29% are stunted[8] and 18% are underweight[9] (UNICEF, 2012). Micro-nutrient deficiencies are even more widespread, with perhaps as many as two billion persons affected, primarily suffering from a lack of vitamin A, iodine, iron and zinc (UN SCN, 2004).

SUMMARY:

Food and nutrition insecurity are major problems in the developing world: almost 800 million people are undernourished, 29% of children under five years are stunted, and as many as two billion people suffer from deficiencies of vitamins and minerals.

Progress on reducing undernutrition has been slow, but the remedies being broadly clear: reducing poverty, investing in public health, water and sanitation, schooling for girls through secondary level, education in better child feeding, provision of micronutrients and therapeutic feeding.

Agricultural development can play a key role, through producing food at lower cost and price; by providing rising incomes to farmers and labourers; and through its multipliers that help create more jobs and incomes in the local rural economy. Diverse farming can be even more effective at improving nutrition, by encouraging more fruits, vegetables and small livestock to be produced — often on home gardens. Giving special attention to women farmers can help correct gendered disadvantages and put food and incomes in the hands of the prime carers and feeders of children. Advances in plant breeding can fortify common staples such as cassava and rice with additional vitamin A.

A new nutritional problem, that of overweight and obesity, is however rising rapidly in the developing world. Less is known about how to respond to this, although encouraging diets rich in fruits and vegetables, with limited intakes of fat, sugar and salt is part of the answer.

Progress on reducing these problems has been slow. The first Millennium Development Goal includes the target of halving the incidence of hunger between 1990 and 2015. Progress on reducing undernourishment and child malnutrition has fallen behind this target.[10] Moreover, progress has been uneven: most of the developing world reductions in prevalence of undernourishment come from Asia and Latin America, with much less improvement in Africa and the Near East. By 2008 barely one third of the progress needed in reducing the prevalence of children underweight between 1990 and 2015 had been achieved. East Asia and Latin America have either achieved or are likely to hit their targets; Southern Asia and sub-Saharan Africa are well behind their schedules.

7 Undernourishment implies individuals not getting enough energy in their diet sufficient to lead a healthy and active life.
8 Defined by height for age: children who are two standard deviations or more below the median for their age are considered stunted.
9 Defined by weight for age: children who are two standard deviations or more below the median for their age are considered underweight.
10 The World Food Summit of 1996 set a more ambitious target, that of halving the numbers of undernourished by 2015. As can be seen, progress towards this target has been very slow and there is no chance that it will be hit by 2015.

FOOD INSECURITY AND MALNUTRITION: SIMILAR BUT DISTINCT CONCERNS

Food insecurity relates to not having enough food to live normally; or as a widely-accepted definition adopted at the World Food Summit in 1996 more formally states:

> *Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. (FAO, 1996)*

Food security thus concerns the welfare of individuals; rather than national self-sufficiency in food production.

Undernutrition[11] also applies to individuals: it exists when an individual's physical and mental development and functioning are impaired owing to lack of nutrients, or the ability to make use of them, or both.

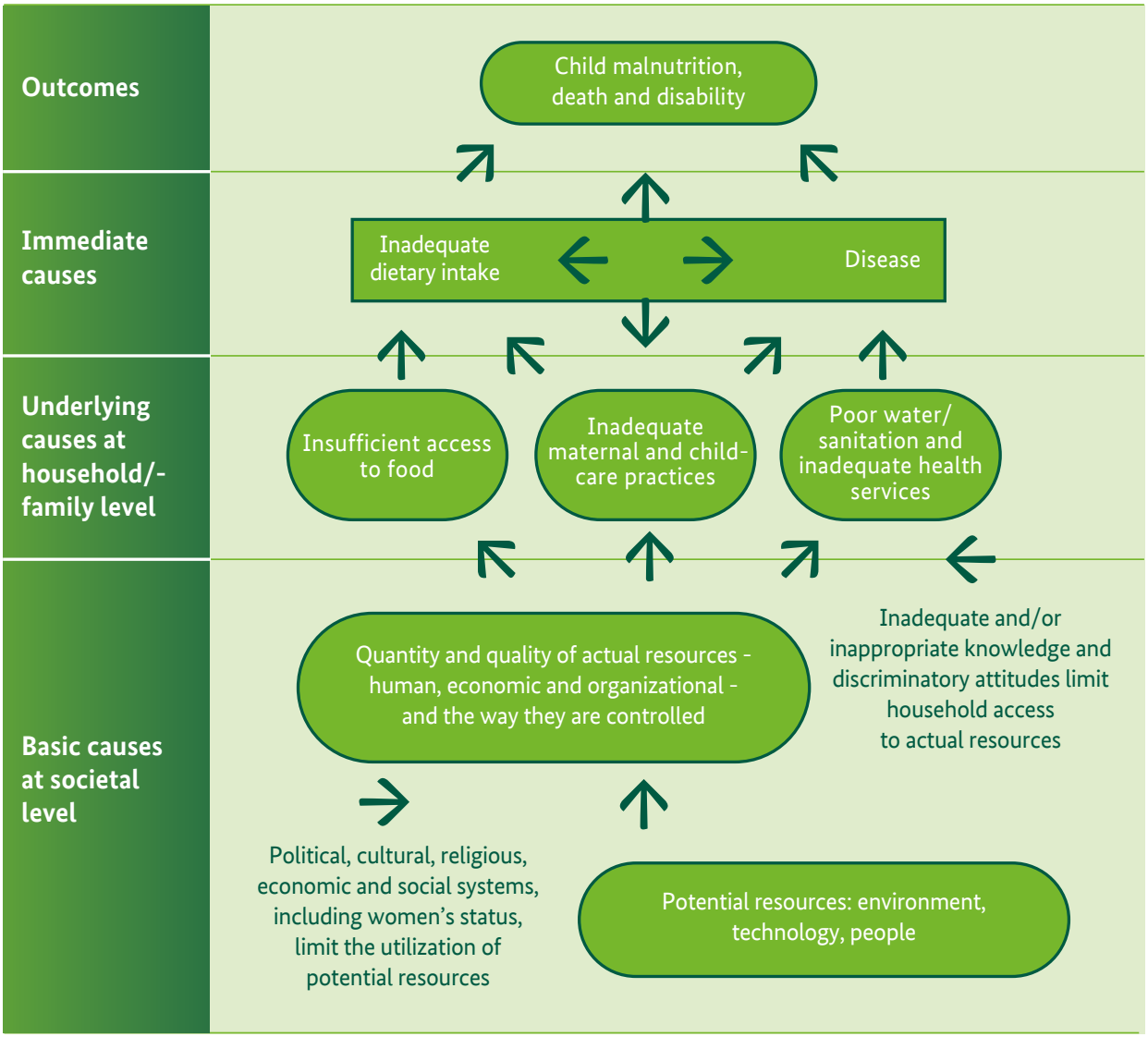
> *Undernutrition is defined as the outcome of insufficient food intake and repeated infectious diseases. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition). (UNICEF website)*

While these conditions often overlap, there are differences. People who are food secure can be undernourished, since despite having access to sufficient food they are unable to make use of this, largely owing to ill health, as will be explained. It is also possible to be food insecure without being hungry: some of those who suffer from deficiencies in micro-nutrients may not be hungry.

Two frameworks are commonly used to guide thinking about malnutrition and food insecurity. UNICEF devised a much-used schema to explain the causes of child malnutrition, mortality and disability, see Figure 3.1. This identifies two immediate determinants of child malnutrition: inadequate diet and disease. These in turn originate from three underlying factors: insufficient access to food; inadequate care; and poor water, sanitation and health services. Nutrition is thus the outcome of multiple factors interacting in complex systems. The key point here is that food insecurity is only one of the factors leading to undernutrition.

11 Malnutrition is commonly used but has wider implications than undernutrition: while the latter refers to conditions that result from too little intake of nutrients, malnutrition can include problems of excess consumption and consequent overweight, obesity and diet-related diseases such as heart attacks, strokes and some forms of diabetes. Obesity and its consequences are rapidly becoming more common in the developing world, especially in middle-income countries. These countries thus face a 'double burden of malnutrition'. This topic has not been discussed here, partly since there is to date little to report on policy; effective ways to address the problems are not known.

FIGURE 2.3 CAUSES OF CHILD MALNUTRITION



Source: The State of the World's Children, reproduced in Pelletier 2002

The other commonly used framework comes from ***FAO*** (2008) to explain the causes of food insecurity. This proposes that people will only be food secure when: sufficient food is **available**; people have **access** to it; it is well **utilised**; and when availability and access are **reliable**. Availability is influenced by the production of food, modified by movement and trade. Access results from the combination of the price of staple food compared to incomes, including implicit incomes from own production, and other entitlements such as gifts, loans and transfers from government.

Food utilisation comprises those factors that intervene between having food and this translating into adequate nutrition: it includes the way that food is distributed within households, how it is prepared, care of infants and their feeding, and the health of those consuming it. By adding this dimension, the FAO framework captures the additional factors that lead to undernutrition in the UNICEF framework.

The 2007–08 spike in cereals prices on world markets was feared to have set back the food security and nutrition of vulnerable people in the developing world by reducing their access to food. This has given more urgency to efforts to combat hunger. A prominent example is the 2010 ***Scaling up Nutrition initiative*** signed by 95 international agencies, bilateral donors, NGOs and research organisations, plus seven private enterprises. This aims to accelerate investments to reduce malnutrition, with im-

mediate priorities to scale up thirteen direct interventions to address malnutrition that are known to be effective and which offer high returns — including infant feeding and hygiene, increasing intake of vitamins and minerals, and therapeutic feeding for malnourished children with special foods.

These measures largely focus on behavioural change communications and medical interventions to alleviate directly malnutrition, especially from deficiencies of micro-nutrients. The initiative admits the need for wider action across sectors, including agriculture, health, social protection, education, water and sanitation; however, it suggests that it may take time to see these underlying factors improve nutrition. This may be unduly pessimistic: a recent evaluation of a wide-ranging nutrition programme in rural Bangladesh suggests that significant progress on the fundamental causes of malnutrition can be made in the short run (Smith et al., 2011).

Agriculture's role in reducing hunger

Agricultural development can contribute strongly to better food security and nutrition, through the following pathways:[12]

- Agriculture makes food available. Increased food supplies will at some point push down the prices of food, thereby improving the entitlement and access to food by people with limited incomes;
- Agriculture provides incomes to farmers and those working the land as labourers. These incomes may be taken directly in food produced on farm or also allow access to food in markets; and,
- Agriculture generates links to other activities, such as those in the supply chain where increases in farm output generate additional activity, jobs and incomes for workers. Similarly, as farmers and labourers spend incomes earned from farming, those providing goods and services for rural communities also see additional activity, jobs and incomes. Hence the access to food of others outside of farming may also increase as agriculture grows.

Other connections may be significant in given circumstances, including:

- The extent to which income from agriculture is spent on food, especially higher-value foods, rich in vitamins and minerals, as well as on health, water and sanitation — all factors that may affect the nutrition of household members and especially infants;
- Impacts of agriculture on women's status within the household and the ability of mothers and carers to allocate income to food and care;
- Demands of farming on women's time and hence on the time they have to feed and care for their children;
- The impact of farm work on energy of field workers: hard labour may create high demands for energy that cannot be met from limited access to food; and,
- Agriculture's impact on health, both on field workers who may be exposed to hazards such as crop chemicals, and to others whose environment may be impaired by agriculture — as, for example, when irrigation canals become habitats for disease vectors such as mosquitoes and worms.

All told, agriculture has a key role to play in improving nutrition. In broad terms, when agricultural growth exceeds population growth, nutrition tends to improve — largely, it is thought, through rising incomes and downward pressure on food prices. But as the UNICEF framework shows, agriculture is only one determinant of three major influences: if nutrition is to improve, then progress also needs to be made on those factors affecting care and health. Although difficult to produce a precise estimate, cross-country econometric studies suggest that agriculture has contributed about one third of reductions to child stunting seen since 1970 (Smith & Haddad, 2014). Other important factors included clean water and sanitation, female schooling and improved health of females.

12 This draws partly on Gillespie et al. 2012 who set out seven ways that agriculture can affect nutrition in India.

Rising concern over obesity

While undernutrition in the developing world is (slowly) diminishing, the problem of overweight and obese people[13] is rapidly increasing, despite previously being seen mainly in high-income countries. Between 1980 and 2008, the numbers of those overweight in the developing world more than tripled, from 250 million to 904 million, with overall prevalence rising from 15% to 27% of adults (Stevens et al., 2012). In 2014 it was estimated that more than one billion adults in the developing world were overweight: close to twice the numbers in high-income countries (Wiggins & Keats, 2014).

The health implications for the developing world are alarming. Overweight and obese people are more susceptible to cardiovascular disease, diabetes type two, and some cancers (WHO, 2013). Excess weight is rising as a risk factor for health across the world: in 1990 the leading risk was childhood underweight, mainly seen in the developing world, yet by 2010 this had fallen to the eighth highest. In contrast, raised body mass index (BMI) rose from tenth to sixth most serious risk factor (Lim et al., 2012). In some developing regions — including southern and central Latin America, the Caribbean, the Middle East and North Africa and Oceania — raised BMI has become the first or second highest risk factor.

Across the world the prevalence of people overweight and obese has been rising for decades. In no country has the trend been arrested. This threatens a heavy burden to individuals in illness, disability and early death, as well as economic costs in lost production and increased healthcare.

The causes of overweight and obesity in the developing world are the same as those seen in high-income countries (Kearney, 2010; Hawkes; 2006, 2007; Lang & Rayner, 2007; Mazzocchi et al., 2012; Swinburn et al., 2011). Rising incomes and urbanisation have led to more sedentary lives. Diets previously based heavily on starchy staples have changed to more diverse diets with increasing consumption of foods rich in energy, fats, sugar and salt (Popkin, 2003). The falling real cost of food and especially of many processed foods, the increasing availability of snack and fast foods, advertising of energy-dense foods, and aspirations to consume these conveyed by film, TV and other media have all contributed.

POLICY ISSUES: HOW CAN AGRICULTURE MAKE A CONTRIBUTION?

How can agriculture most contribute to reducing hunger? One way is by ensuring that the positive links in generating incomes, and producing more food and pushing down prices, seen in the pathways above, work strongly. For this, ***broad-based agricultural development*** is indicated: growth in which most small-scale farmers can participate. This means combinations of the following conditions:

- Technical innovations that are sparing in their need for capital, but demand labour and skilful application to local circumstances;
- Access to inputs, technical advice, credit and insurance for small farmers on terms similar to those enjoyed by larger-scale operations;
- Ready physical access for small farmers to facilities necessary for marketing, for example processing plants, cool stores and tanks, and storage; and,
- Road access that allows trucks to reach smallholder farms and communities at reasonable cost.

Meeting these conditions takes the discussion back to basic preconditions for agricultural development, above adequate investment in rural public goods. It also involves finding ways to overcome failings in rural markets for inputs and finance that restrict access for smallholders or drive up the costs *(→see "Failings in rural markets", p.42).*

The ***pattern of agricultural development can also be made more sensitive to nutrition***. Three things stand out. One is reducing female disadvantages in farming, such as in poor access to inputs, seasonal credit and technical assistance, thereby increasing women's returns from their farming, and through this giving them more opportunity to spend on the nutrition and care of their children — and themselves.

Second is to promote home gardens and livestock keeping on a small-scale to encourage more diverse diets and help tackle the alarmingly widespread occurrence of micro-nutrient deficiencies. Coupled with education and behaviour change communications about diet, care and hygiene, home gardens have proved their effectiveness in reducing malnutrition.

13 An adult is defined as overweight if their Body Mass Index of 25 or more, and obese if 30 or more.

Third is, where possible, to fortify staples with added minerals and vitamins such as Vitamin A through plant breeding. So far only one example has been replicated on any scale: the orange-fleshed sweet potato that has additional beta carotene, a precursor of Vitamin A. Golden rice, which also has enhanced beta carotene, may become an option in the near future.

Finally, those engaged in agricultural development should recognise the importance of care and health in improving nutrition. Agriculture alone will make limited inroads on the high burden of malnutrition: combined with complementary actions to empower women, encourage better care of children, primary health services and clean water and sanitation, much can be done. An evaluation of a programme to reduce malnutrition amongst the very poorest in rural Bangladesh (Smith et al., 2011) showed that while promotion of agriculture and fisheries, and of mother and child healthcare, each reduced the incidence of stunting amongst infants aged six to 24 months by 1.4 percentage points between 2006 and 2010, in combination they reduced stunting by 7.9 percentage points.

For the emerging problem of obesity, policies need to provide public education and information on diet and exercise, regulate advertising of unhealthy foods to children, and consider taxing unhealthy options while subsidising healthy options such as fruits and vegetables. That said, no country has yet proved a package of measures that has halted the increased prevalence of obesity. In part that may be because measures taken, mainly in high-income countries that have longer experience of the problem, have been few and rather timid. Political leaders have been reluctant to press consumers on their diets, or to alienate food manufacturers and retailers. That may change as the scale of the problem becomes apparent. Mexico, for example, has introduced since late 2013 a battery of measures to control a national epidemic of diabetes: bans on TV advertising of energy-rich food and drinks at family viewing time, plus taxes on sugary drinks and energy-dense food. Mexico's experience will be closely evaluated.

Further reading:

Haddad, Lawrence, Harold Alderman, Simon Appleton, Lina Song & Yisehac Yohannes, 2003, 'Reducing Child Malnutrition: How Far Does Income Growth Take Us?' **World Bank Economic Review**, 17 (1), 107–131

Smith, Lisa C., Faheem Kahn, Timothy R. Frankenberger & Abdul Wadud, 2011, 'Admissible Evidence in the Court of Development Evaluation? The Impact of CARE's SHOUHARDO Project on Child Stunting in Bangladesh', **IDS Working Paper 2011 (376)**, October 2011, Brighton: Institute of Development Studies

SUN, 2010, **Scaling Up Nutrition. A framework for action** http://scalingupnutrition.org/wp-content/uploads/pdf/SUN_Framework.pdf

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Wiggins, Steve and Sharada Keats, 2014, Future diets: Under- and over-nutrition in developing countries, in *Commonwealth Health Partnerships 2014,* London: Commonwealth Secretariat. http://www.commonwealthhealth.org/commonwealth-health-partnerships/commonwealth-health-partnerships-2014/

Wiggins, Steve & Sharada Keats with Euna Han, Satoru Shimokawa, Joel Alberto Vargas Hernández & Rafael Moreira Claro, 2015, The rising cost of a healthy diet. Changing relative prices of foods in high-income and emerging economies, **Report**, London: Overseas Development Institute

2.3 MAJOR DEBATES AND UNCERTAINTIES

Much of the detail of agricultural policy, however, is subject to debates and uncertainties. This report discusses a particularly prominent set of these issues: agricultural and rural transitions *(→see below)*; the prospects for small-scale farms *(→see p.37)*; land tenure and rights *(→see p.40)*; rural market development *(→see p.42)*; the use of agricultural technology *(→see p.53)*; the role of gender in agiculture *(→see p.58)*; and environmental sustainability and climate change *(→see p.64)*. While such a long list may suggest that much of agricultural policy is in doubt, that might overstate matters. In fact, experiences such as those of China and Ghana suggest that so long as basic elements are in place, agricultural growth is likely. Moreover, tricky as the debates and uncertainties may be when considering the wide range of developing countries, when looking at individual countries with their particular characteristics, some uncertainties may not apply so choices may be fewer and clearer.

AGRICULTURAL AND RURAL TRANSITIONS

Development involves major changes to the structures of economies as they move from being agrarian to industrial, as well as to the economic and social geography of countries as they become urbanised with most of the population and economic activity no longer being in rural areas, but in towns and cities. Agriculture thus goes through a transition, during which its relative importance declines and it (eventually) releases resources, above all labour, for employment in industry and services. Rural areas in general also see a transition during which first their share of population falls, then eventually their absolute population also falls.

This section outlines these changes and examines their implications for agriculture, including what they may imply for scale of farming and land tenure.

SUMMARY:

Low-income countries are in transition from agrarian and rural to urban societies, marked by urbanisation, the growth of the rural non-farm economy, and increasing migration out of rural households. Agriculture continues to grow, but sees its relative importance decline, while it releases resources, above all labour, for employment in industry and services. To do so, agricultural productivity has to rise considerably if it is to grow sufficiently, transfer resources, and provide a decent income to farm households – a demanding challenge.

In the past, small-scale farms have shown advantages over larger farms, but this may be changing given the increasing demands from supply chains for quality and certification of produce. This could lead to smallholders being excluded from markets for higher-value produce unless they can link to changing markets (→*see p.42*) and technology (→*see p.53*).

Even if smallholders can remain competitive, with time their numbers will fall as some move to better-paid work in manufacturing and services. ***Two very different transitions*** could emerge as a result: in one, land is rapidly concentrated in the hands of large-scale commercial farms; in the other, land concentrates, but much more slowly, and generally in the hands of family farms that accumulate land from neighbours who move to better-paid work in manufacturing and services and progressively lend, rent or sell their land.

Debates on ***land rights and tenure*** focus on the extent to which different forms of tenure protect rights, encourage investment and offer security in specific communities – ranging from long-standing collective tenure to more formal registration of rights, surveying and land demarcation for freehold tenure. Land redistribution may be favoured for equity, or sometimes for efficiency, but it is politically sensitive and administratively demanding and may achieve little if complementary support is not provided. Changes to land policy should be formulated with widespread participation and with stronger governance.

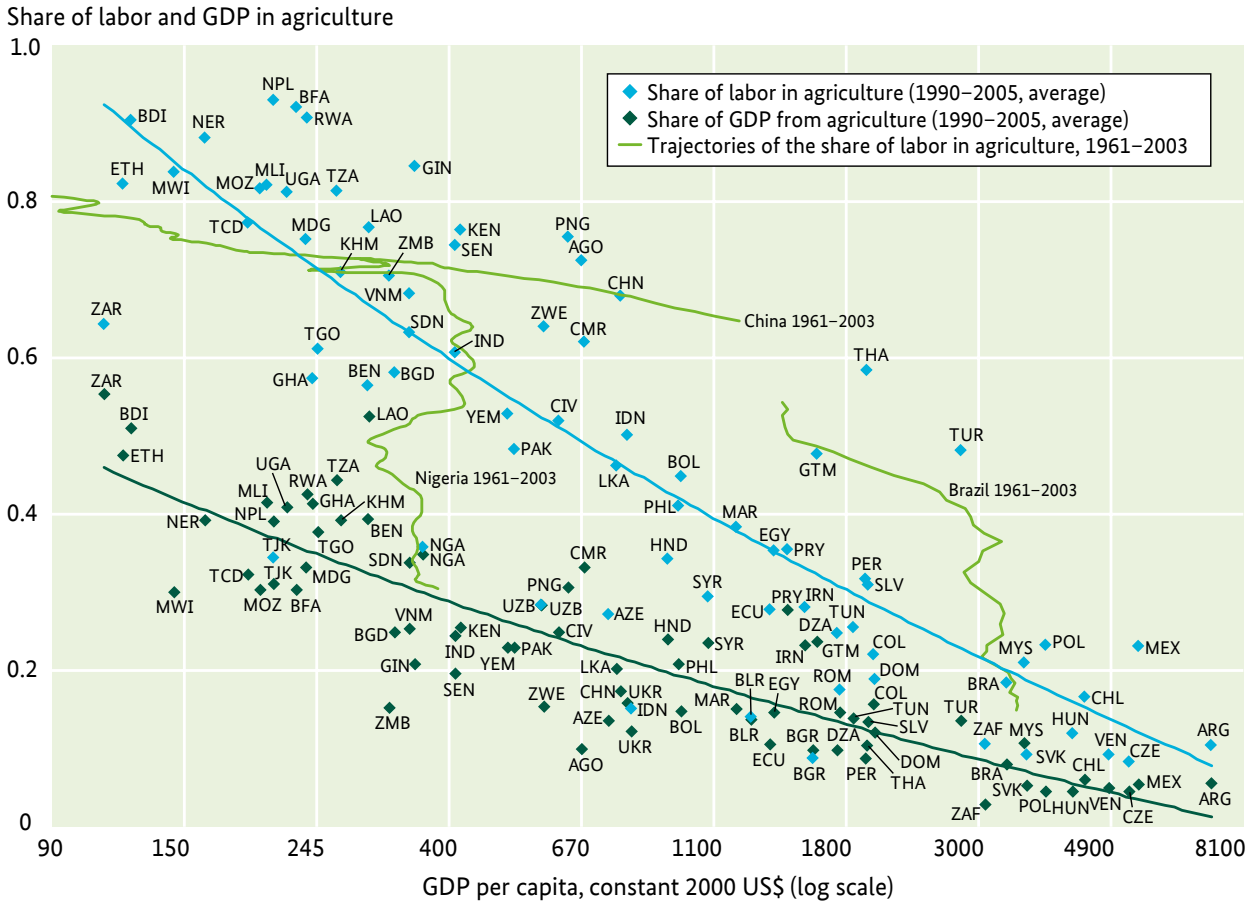
Development and transformations

As economies grow the shares contributed by economic sectors change, as does the location of activity (Breisinger et al., 2011; Herrendorf et al., 2013; Timmer, 2009). Typical patterns show that:

- Agriculture's share of output falls since manufacturing and services grow more quickly. That does not mean that agricultural output declines – on the contrary, it almost always grows, only not as rapidly as other sectors;
- Agriculture's share of labour also falls as employment in manufacturing and services rises rapidly. In the early stages of development total numbers working in agriculture continue to rise. Only when countries reach middle-income levels does the farm labour force decline absolutely; and,
- An increasing share of output, and employment, can be found in urban areas, since most manufacturing and services are located in towns and cities.

Cross-country comparisons confirm the relationship between economic growth and the declining relative importance of agricultural output and labour, see Figure 2.4.

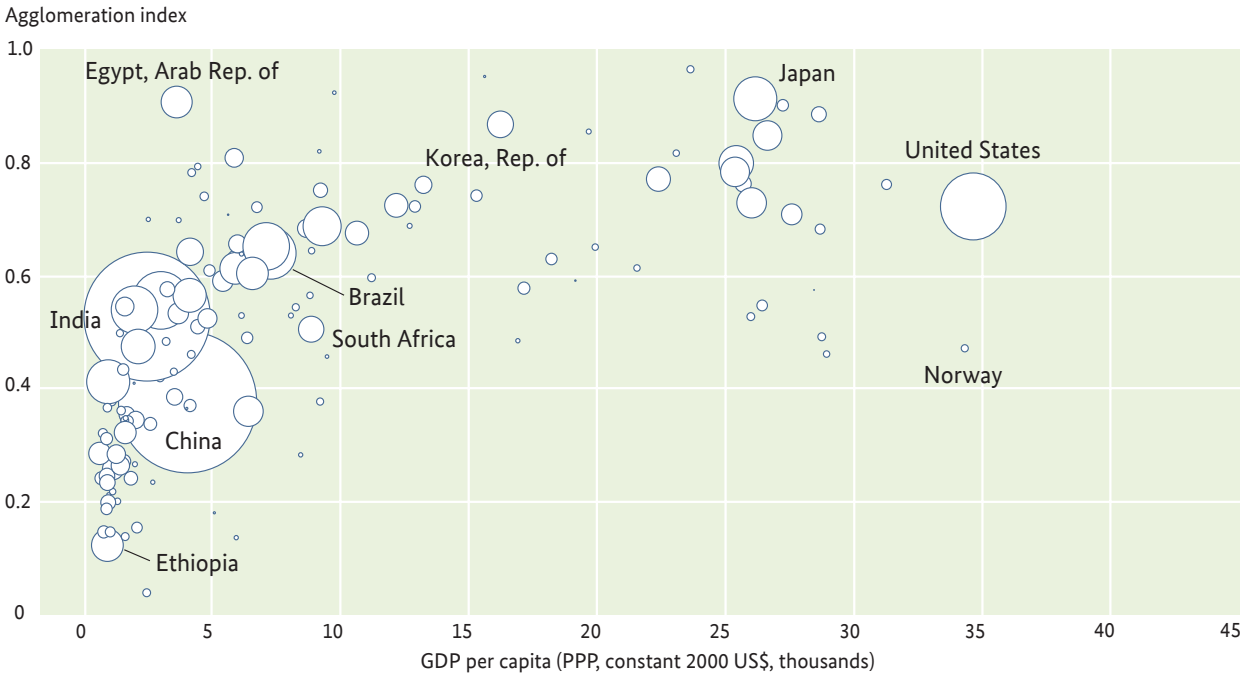
FIGURE 2.4 SHARES OF GDP AND LABOUR IN AGRICULTURE, 1990 TO 2005 AVERAGE



Source: Figure 1.2, World Bank 2007

Urbanisation increases with average incomes, with particularly rapid increases in early development, as incomes rise towards an average of US$5,000 a head, see Figure 2.5.

FIGURE 2.5 SHARE OF POPULATION LIVING IN URBAN AREAS



Source: Figure 1.7, World Bank 2009
Note: Sizes of circle represents population of country. PPP = purchasing power parity. Because definitions of urban vary by country, the WDR 2009 team created an agglomeration index that can be applied across all countries. The index defines a locality as urban if it has 50,000 or more inhabitants, or if it has a population density of 150 or more persons per square kilometre, and travel time to a settlement of 50,000 or more persons is less an hour.

Why do such shifts take place? Agriculture declines in relative importance because people spend proportionately less on food as they become better off: that is, the income elasticity of demand for most foods is relatively inelastic.[14] Hence demand for food and other farm produce expands more slowly than the growth of the economy, thereby tending to limit the growth of agriculture. The limit is not absolute, since farming may expand by producing for export, but in practice few countries have such large agricultural exports that they completely overcome the limits of the slow growth of domestic demand.

Urbanisation arises because most manufacturing plants and services are located in in urban areas, largely owing to economies of agglomeration (Henderson et al., 2001; Henderson, 2013; Quigley, 2008).[15] Partly these arise from lower transport costs among firms and between firms and their customers when they locate in the same place. But perhaps more important in making cities attractive to manufacturing and services are the external economies that arise when firms cluster, including:

- Suppliers of intermediate goods and services to factories and offices can ***specialise*** and reduce unit costs;
- ***Transactions costs fall and complementarities*** apply in factor markets. In labour markets, it is easier to match supply and demand in a large and diverse labour pool. Moreover, in large labour markets, workers have incentives to train and acquire skills, while employers have incentives to invest in machines and equipment to put such skills to use.[16] Markets for business premises and (used) machinery benefit from being larger in urban areas;
- ***Education, knowledge and mimicry.*** Both firms and workers tend to imitate and learn from one another when they locate in the same place and interact, both formally and informally. Hence innovations tend to spawn additional innovations, while learning by managers, technical specialists and workers leads to productivity gains; and,
- When many firms, employers and customers live close together the variability of supply and demand can be cushioned across ***large numbers***, allowing firms to stock lower inventories. (Quigley, 2008)

14 Some foods have lower income elasticity of demand than others. Staples typically have highly inelastic demand, while animal foods have slightly inelastic demand. This explains why, when consumer incomes increase, the composition of demand for food shifts from staples towards animal produce, fats, sugar, fruit and vegetables. Most of the growth of agricultural output thus comes increasingly from these higher value items.

15 Although the advantages of urban location for most industry has long been appreciated, since 2000 development studies have come to recognise the potential of cities to drive economic growth.

16 Since the level of worker skill does not always match the expectations of employers who have installed advanced equipment, some less skilled workers get to work with more capital than might be imagined.

External agglomeration economies have grown with technical progress. They not only help explain why manufacturing and service firms tend to choose urban locations, but also why firms in the same sector tend to cluster in cities and their surrounding regions, as seen in the information industries of Silicon Valley of California, automotive trade in Baden-Württemberg, and cycling industries of northern Italy.

The advantages of agglomeration for manufacturing and services are overwhelming. While cities can be congested and polluted, and space commands high rents, for many activities these costs are minor compared to the benefits. Agriculture and other primary activities are exceptions since they are tied to land, water and mineral deposits.

Agriculture's role in transformation

Agricultural development can help facilitate structural change. It does so primarily by producing food for urban consumers and raw materials for industries. It helps industry if agricultural productivity rises and the unit cost of food falls since this moderates demand for wages. When as often applies in low-income countries, agriculture is a key export sector, it assists by earning foreign exchange that allows nascent industry to import machinery and raw materials. A growing industrial and service economy needs workers, so while agriculture develops it also needs to release labour. Capital to begin industrial development may also come from agriculture, in the form of savings from farm households, or from some form of taxation of agriculture.

These functions, first set out by Johnston & Mellor in 1961, mean that agriculture has to raise productivity considerably if it is to grow sufficiently, transfer resources, and provide a decent income to farm households. That may look a difficult challenge, but given that productivity of both labour and land in agriculture is often very low in developing countries, and technical improvements are known, it is possible — as was seen in the Asian Green Revolution.[17]

Scale of production: small- or large-scale farming?

A key question, however, concerns scale of production: can agricultural productivity be increased, output raised and labour and capital released to other sectors when most farms are small? The overwhelming majority of farms in the developing world, fully 95% of them, are small-scale family farms operating less than five hectares (Lowder et al., 2014). Moreover, in most developing countries the average holding size still tends to fall with each decadal census.[18]

In the history of development, small-scale farms[19] (smallholdings) have figured prominently. Results of surveys of smallholdings by US agricultural economists such as David Hopper and Sol Tax in the 1950s and 1960s reported that their resource allocation was efficient. This ran contrary to received wisdom among some agriculturalists who saw smallholders as 'traditional', 'conservative' or 'backward'. The new insights were crystallised by T. W. Schultz (1964) in the highly influential ***'Transforming traditional agriculture'*** that argued that small-scale farmers were ***'efficient, but poor'.*** For Schultz, then, increasing the incomes of smallholders was not a matter of instructing conservative farmers to manage better their farms, but instead required improved technology. Similarly, a decade later World Bank economists argued that small farms, in common with other small-scale and often informal enterprises, should be the focus of public development efforts, since given the right conditions and support these would grow faster than larger-scale formal concerns – with the great added benefit that the distribution of gains would accrue to the poor. ***'Redistribution with Growth'*** (Chenery et al., 1974) set out this thinking.

17 When Johnston & Mellor set out their ideas in 1961, it was far from clear that these changes would be possible in the developing world of the time. Pessimism at the time was strongest about the prospects for Asia: then very poor, with fast growing populations adding to what were already seen as over-populated countries (Myrdal, 1968). The Green Revolution, however, answered those who harboured Malthusian doubts. By the 1970s it was clear that agriculture could grow and raise productivity to support Asia's industrialisation.

18 In marked contrast, in most high-income countries the average farm sizes have been rising for 50 or more years.

19 In what follows the terms small-scale farms, small farms, smallholdings and peasant farms are used interchangeably. Although a precise definition of a small farm is elusive, the concept is straightforward: the term refers to family-operated farms, where the majority of the labour used for most of the time comes from the household — at peak times, additional help will be recruited; and where the size of the holding expressed in area or numbers of stock kept, is small. For land, this might be 10 hectares or less of rainfed holding — but that area would shrink were it irrigated, and expand if the rainfed area were of marginal quality. FAO, however, compile their statistics on SF by taking a limit of just two hectares.

At the same time, another reason to favour small family farms emerged: politically, the revolutions in China (1949) and Cuba (1959), plus the failed insurrection in Indonesia (1965), were seen as rooted in the gross inequities of unequal agrarian societies where landlords monopolised the land and extracted rents from the peasantry. If radical communist revolutions were to be countered, then capitalism would have to reform land regimes to alleviate the rural discontent that fed them. Hence the USA more or less forced land redistribution in South Korea, Japan and Taiwan in the 1950s (Mennen, 2009), and encouraged — with variable success — countries in Latin America to redistribute land.

Theories were backed by practice. In the 1950s, the colonial government of Kenya decided to reverse their previous agricultural policies of treating areas left in the hands of indigenous African farmers as labour reserves for the large farms of the 'White Highlands', and instead to promote the development of the small African farms. The result was a remarkable expansion of small-scale cultivation of crops such as coffee and tea. Meanwhile, in the countries of East Asia where land had been reformed, considerable growth of farm output was seen.

Hence by the late 1960s, both theory and practice suggested that small-scale farming was not an obstacle to increased productivity and production. This coincided with the start of the Green Revolution. As the new seeds, with irrigation, fertiliser and supporting policies, were rolled out across the irrigated lands of Asia, and in some parts of Latin America, programmes were designed to reach smallholders. If they did not have access to inputs, credit, output markets, technical advice, then the state would arrange the necessary services to ensure that the technology could be taken up by small-scale farmers. By the end of the 1970s, these hopes had been realised: millions of smallholders in areas suitable for the new varieties had adopted the seed, plus the fertiliser and agrochemicals, and seen their yields rise. For instance, India, a country that some feared could never produce enough staples for its population, found itself buying up the additional output and storing tens of millions of tonnes of grain.

The efficiency of small-scale farms in land use: the inverse ratio of size and yields

The success of the Green Revolution suggested that economies of scale in cereals production were limited or absent. Repeated observations from surveys at the time showed an 'inverse ratio' between size of farm and yields per hectare (Cornia, 1985; Eastwood & Lipton, 2004): that is, the highest yields were seen on the smallest farms. The most common explanation is that small-scale farmers apply labour to their farms more intensively than larger farms, since their household labour is cheaper to employ, more diligent and harder-working than hired labour on larger farms. Household labour can be readily available, flexible in time and effort to suit the varying and unpredictable demands of the farm, as seen, for example, in planting times, control of pests and diseases, and harvesting. Household labour is self-supervising and motivated to carry out operations diligently, as well as to work long hours when needed. In contrast, larger farms depending mainly on hired labour incur (transaction) costs in recruiting and supervising labour to ensure that hired hands work carefully and for the time agreed.

Small-scale farming may have other advantages, since farmers operating small plots may have considerable detailed knowledge of their soils, topography, drainage, etc. allowing them to work the land appropriately.[20] Thus for unmechanised farming where labour is a key input, diseconomies of scale may apply: smallholders have benefited from their small scale.

Additional arguments in favour of smallholder development

Efficiency is not the only possible advantage of smallholder development. Being operated mainly by household labour, smallholders may be better able to resist temporary slumps in prices, since household labour may be prepared to accept lower implicit returns to their labour at times when a commercial farmer would simply go bankrupt. Small-scale family farms have historically often survived harsh economic conditions.

20 Only recently has this become possible on mechanised, large-scale scale farms, since robotics has allowed 'precision farming' where machinery varies its operations according to very small differences in fields.

For reducing poverty, developing small farms may be preferred to larger holdings. Most poverty is rural; most of the poor are engaged in farming, many of them on small farms either as operators or as occasional labourers. Promoting small farms should therefore mean additional earnings directly to the poor. Smallholders, moreover, tend to use more labour per hectare than larger farms, partly owing to the low transactions costs of using household labour, but also because when hiring in additional labour at peak times, transactions costs of recruiting extended family and neighbours can be low.[21] Hence focusing efforts on improving small-scale farming is expected to create more jobs, pushing up the rural unskilled wage rate to the benefit of the poor and landless. In addition, when smallholders spend additional agricultural incomes, they tend to spend much of this on locally produced goods and services: furniture, entertainment, house improvements, etc. Hence the multiplier effect on the local economy is expected to be higher than from incomes accruing to larger-scale and more wealthy farmers.

For all these reasons, by the 1980s the received wisdom and the general practice was that agricultural development should take place with smallholders as the principal subjects and actors.

Have changing circumstances switched advantages from small to large farms?

Many observers still see advantages in small-scale farming in low-income countries, see for example the 2008 World Development Report on *Agriculture in Development* (World Bank, 2007). Others, however, have their doubts about the advantages of small-scale farms. They argue that circumstances have changed from when the Green Revolution began, above all in the technical efficiency of large farms, access to technology and the demands of supply chain managers. They also wonder if it is possible to offer smallholders the support seen during the Asian Green Revolution and wonder whether there may not be better ways to reduce rural poverty than by smallholder development (see Ashley & Maxwell, 2001; Byerlee et al., 2009; Ellis, 2005).

In more detail, the sceptics' argument is that new technical advances such as precision farming mean that ***yields on large-scale farms can be higher than on small farms***. These technologies are not scale neutral: they require capital, as well as highly skilled technical specialists. Examples can be found in Brazil, Chile and Argentina. In the last named, farm pools — 'pools de siembra' — now see just 30 companies farming 2.44M ha. The pools involve companies leasing land, hiring in machinery, and recruiting good agronomists to undertake farming in blocks of 10,000 hectares of more. Landowners are happy to let the companies take over their land, since they reportedly earn more from this than by self-cultivation (Byerlee & Deininger, 2012).

Access to technology is changing. Forty years ago during the Green Revolution, the new seeds were developed by international and national research stations operated publicly. Today the bulk of the world's agricultural research budgets are in the hands of private companies, and it is in their laboratories and test plots that many advances in biotechnology take place. Small-scale farmers may not be able to afford the seeds and chemicals in which these advances are embodied, and may also lack knowledge and management capacity to make full use of them.

Perhaps the strongest argument of all lies in the increasing demands of ***modern agricultural supply chains***. Increasingly, the chains are organised by supermarkets — especially in middle-income and rapidly growing economies. Their demands for quality, uniformity, timely delivery and above all for certification and traceability threaten to exclude smallholders who cannot meet these standards, leaving them to sell their produce through secondary channels at lower prices (Reardon & Berdegué, 2002).

Indeed, this argument may be widened to one about transactions costs, since the lower transactions costs in labour hiring is one of the key explanations of the inverse ratio of yields to farm size. Hence while smallholders may have advantages in labour, in local knowledge and in self-provisioning, when it comes to interactions with markets for inputs, finance, technical assistance and marketing, larger farms have the edge, as the summary in Table 2.6 below from Poulton et al. (2010) outlines.

21 Many agrarian societies have forms of labour exchange to amass labour at peak times, and to reduce drudgery. Given their collective and reciprocal nature, such labour groups are self-supervising.

TABLE 2.6 TRANSACTIONS COST ADVANTAGES OF SMALL AND LARGE FARMS

Small-scale farmers have advantages in:	Large-scale farms have advantages in:
Unskilled labour supervision, motivation, etc.	Skilled labour
Local knowledge	Market knowledge
Food purchases & risk (subsistence)	Technical knowledge
	Inputs purchase
	Finance & capital
	Land
	Output markets
	Product traceability & quality assurance
	Risk management

Source: Adapted from Poulton et al. 2010

All told, these considerations have led some to argue that small family farms are simply not up the challenges of contemporary agricultural development. Considering Africa, Collier (2008) puts it as follows:

> *And reluctant peasants are right: their mode of production is ill suited to modern agricultural production, in which scale is helpful. In modern agriculture, technology is fast-evolving, investment is lumpy, the private provision of transportation infrastructure is necessary to counter the lack of its public provision, consumer food fashions are fast-changing and best met by integrated marketing chains, and regulatory standards are rising toward the holy grail of the traceability of produce back to its source.... Large organizations are better suited to cope with investment, marketing chains, and regulation. (Collier, 2008, p. 71-72).*

His ideas are shared by some investors. The land deals seen since 2008, in which companies look for land in Africa and Central and Southeast Asia to cultivate food crops to be exported back to the investing countries (von Braun and Meinzen-Dick, 2009), almost always contemplate production on very large-scale farms, rather than through contracting from small farms.

Sceptics also argue that the amount of ***public support offered by the state to smallholders*** at the time of the Green Revolution by many Asian states — including public distribution of inputs, subsidised interest rates through public banks, guaranteed purchase of marketed surplus at floor prices — is unthinkable today since liberal economic thinking came to prominence in the 1980s. That may not be so strong an argument: policy thinking and policies can change. Several African countries have defied conventional wisdom and the pressures of the IFIs to reintroduce fertiliser subsidies in the second half of the 2000s, most notably Malawi.

The final argument is one of the most through-provoking. Much of the sympathy for smallholder development stems from the expectation that the ***poverty impacts*** will be stronger than other forms of development. But is this necessarily so? From Senegal comes an account of the replacement of small by larger holdings as producers of export vegetables — a change that has come largely from the increasing demands for GLOBALG.A.P. (Good Agricultural Practice) certification by European supermarkets, a standard that few smallholders could attain and document. As estates have taken over the export market, fewer smallholders have been contracted to produce vegetables. But since the estates employ many hired labourers, an increasing

number of households now have jobs in the export supply chains, many of them poor households, so that the overall welfare effect seems highly positive: more jobs and more incomes mainly for poor rural households (Maertens & Swinnen, 2009). While this case turns on the high labour intensity of the export vegetable farms, they are not necessarily an isolated case: similar accounts of high use of labour come from export fruit farms in Chile.

Small versus large farms: policy

Much of the debate about smallholder development turns on the extent to which smallholders can link to changing markets and technology. Sceptics believe that the demands of new technology and the emerging supply chains will exclude most small farms. Optimists hope that institutional innovations — such as contract farming and collective action by smallholders can overcome these transactions costs so that at least some smallholders can stay competitive with larger farms. This will be addressed in the next major section, on developing rural markets.

Rural transitions: when will small-scale farms decline?

If in development agriculture contributes a smaller share of economic output, and reduces its share of labour, then many of those working in agriculture in the developing world today will not be doing so in the future. How, then, will they leave farming — and will this happen in the near or more distant future?

Two very different transitions are possible. In one, loosely based on the experience of England during the 18th century, land is rapidly concentrated in the hands of large-scale commercial farms that are able to make full use of their access to capital and knowledge. In the other, based loosely on the French experience of the 18th and 19th centuries, most smallholdings continue to farm with a gradual reduction in the area cultivated as some households gradually switch their labour from farming to non-farm enterprises and migration. Land does eventually concentrate, but much more slowly, and generally in the hands of family farms that accumulate land from neighbours who no longer farm their own land.

The English model has been highly influential since it was (one of[22]) the first modern agrarian revolutions, taking place (slightly) before the Industrial Revolution. It is has thus been easy to assume that radical agrarian change was necessary for the industrial counterpart, since without the assumed efficiency of the large farms created by enclosures, labour could not have been released for the new factories. It is far from clear that this was the case.

22 Flanders may have a better claim for being the first than England. As with skills in textiles and drainage, England was to profit from learning new technologies from the Low Countries.

Box 2.7 sets out some English and French history and compares this to the contemporary case of Thailand.

Box 2.7 Transformation and transition: England, France and Thailand

Early experiences of the transition from agrarian to industrial differ considerably in the speed with which labour left farming and agricultural land was consolidated into large holdings. The comparison between England and France is striking. In 1700, 55% of the English population were engaged in farming, similar to the 63% of the French population that were so engaged. But by 1850, the share had fallen sharply in England to 22%, while in France the reduction had been far less, falling to 55%.

England saw enclosures of common land and consolidation of holdings that led to the creation of larger farms and estates, while most small-scale farmers lost their rights to arable land and commons. Although some of the small farmers who lost their land found work in the expanding factories, not all did. Until the second half of the 19th century a landless rural population depended often precariously on paid labour on large farms and estates, living in poverty. Indeed, many emigrated to North America, Australia and New Zealand in search of land and livelihoods.

France, on the other hand, remained a land of small family farms. In 1880 only 4% of French farms were more than 40 hectares, occupying just 29% of French agricultural land: compared to 75% of agricultural land in the UK being in holdings of this size or larger. Small-scale farmers left the land in France over a much longer period than England.

The difference between England and France can be attributed in large part to land rights. From the 13th century onwards the peasantry of France became used to farming their own plots on their own account. They may have had to pay some dues to the local nobility and taxes to the King, but they were increasingly independent. After the Revolution, Napoleon's reforms saw their rights to land confirmed. They were never at risk of being expropriated.

Many farm households have diversified into non-farm jobs, although some farmers have specialised and intensified production, helping Thailand become a leading exporter in cassava chips, rubber, pineapple, and shrimp.

Rural poverty has fallen from more than 60% in the early 1960s to barely more than 10% in the new century. The benefits of agricultural growth have been widespread. Food prices have been halved, hunger has been much reduced, and child malnutrition has been cut.

England was different. From the Norman conquest onwards, the nobles considered themselves owners of the land. When, in Tudor times, raising sheep for their wool became highly profitable, landowners had little compunction in enclosing the medieval open fields where their serfs cultivated arable crops, and turning them into sheep pastures. The later triumph of Parliament, packed with landowners, over the monarchy led in the 18th and early 19th centuries to a further round of enclosures that saw commons and wastes taken in by landowners, to the disadvantage of any remaining small-scale farmers.

It became necessary in England to justify expropriation of the land by an appeal to modernity, efficiency and progress. Hence essays were soon written, from the early 17th century onwards, claiming that agricultural progress in England was down to the pioneering efforts of the landed gentry who experimented and perfected better farming that could be imitated by all. This was a considerable exaggeration. But it suited Britain's land-grabbers to create this account of history.[23]

Modern Asian experience shows a gentler transition than the English example. ***Thailand*** has since 1960 developed its agriculture to allow the transformation of a formerly agrarian to an urbanised economy based around manufacturing.

To support the industrialisation that began in the 1960s, agriculture had both to feed the cities as well as to earn foreign exchange through export of rice. It was able to do so during the 1960s and 1970s by putting underused land and labour to work. Subsequently, as manufacturing grew and the land frontier closed, farming began to shed labour. Yet agriculture continued to grow through greater use of capital with higher productivity of land and labour.

All this has been achieved while most of the land has remained in small-scale family farms. In 1960 the average size of holding was 3.5 hectares: by 2000 the average had fallen slightly to 3.2 hectares. Of 5.8 million holdings registered in the 2003 agricultural census, only 249,000 were more than 10 hectares: Thailand reported all its farms that year to be 'family farms'.

During the 2000s Thailand's rural population has started to fall, so farms will probably soon consolidate and grow larger. But the transition has been made, quite successfully so, without mass dispossession of smallholders. Thailand is far from alone in this: indeed, smallholdings have dominated the land in most countries of South, Southeast and East Asia throughout the Green and Industrial Revolutions seen.

Sources: England: Overton 2011, Allen 2009. France: O'Brien 1996. Thailand: Leturque & Wiggins 2011

23 In the late 19th and early 20th centuries, some British settlers were busy grabbing land in Africa and Southeast Asia, so this version of history could readily be used to justify seizing land from local users such as the Maasai of Kenya.

Rural social differences: the fate of marginal farmers

Even in relatively egalitarian rural societies, such as those seen in much of sub-Saharan Africa, marked differences still exist between households in access to land, livestock and other forms of wealth. Options to specialise in farming are not necessarily evenly distributed. What then happens to those households whose lack of assets, or their location on marginal land or remote from cities makes it difficult for them to get a decent living from agriculture?

Such farm households will not necessarily abandon their farms in the short run, even if they are insufficient in size, productivity or location to provide the household with a living. Most likely they will farm what little land they have, using most of it to grow staples, vegetables, perhaps produce some milk, eggs, and chicken — all largely for household consumption. As and when incomes rise from off-farm work, these households may progressively lend, rent and eventually sell their land to family and neighbours who are full-time farmers.

Since most of these farm households will continue to farm their land for their own subsistence, they need agricultural policies that will allow them to do this better, within their limited means. It may mean, for example, extension services to produce food crops with little labour and capital, producing at intermediate yields — not optimal, but that can make all the difference between producing staples sufficient for a quarter or half a year leaving a long hungry season, and producing enough to cover most or all months.

Policy for benign agricultural transitions

If agrarian transitions are to be gentle, where people voluntarily leave farming for better prospects rather than being forced off their land, then three things have to be in place.

One, smallholders who specialise in farming need to be able to raise production and productivity. They have to be able to obtain better inputs, technical knowledge, financial services and information about markets. Rural markets do not typically work well for smallholders in providing inputs and finance. Hence finding the institutional innovations that will overcome the failings of rural markets becomes a priority for agricultural (and rural) development *(→see "Developing rural markets", p.42).*

Two, land markets need to function for efficiency and equity. At issue are small-scale transfers of land between those smallholders specialising in farming and those who do not, being unable or unwilling to cultivate all their land. Such transfers are often likely to be of use rights rather than outright sale – through loans, share-cropping and rentals. Tenure policy needs to facilitate these exchanges by arrangements that give both parties confidence in the deal agreed, with legal recognition of the exchange. At the same time, the land rights of disadvantaged land users who may lose their land need to be recognised. More will be said about land policy later in this section.

Three, rural people need to be in condition to take up non-farm jobs. That means provision of schooling, healthcare and clean water so that young adults have the capabilities to take up jobs off the land, albeit perhaps with additional training for which schooling is a precondition.

Land Policy

Background

As economies are transformed and the transition from rural and agrarian to urban and industrial economies takes place, access to land ideally needs to be flexible enough to allow economic efficiency while at the same time being socially equitable. How to do this has long engaged attention in development thinking.

Development agency engagement with land reform and land policy has changed over time. Land redistribution was an integral part of deep agrarian reforms in the 1940s and 1950s in East Asia, and the 1960s and 1970s in Latin America. Although the main motivation was political, to head off rural revolt, economically it was expected that redistribution of land from landlords to tenants and farmworkers would lead to greater production, owing in large part to the higher intensity of farming seen on small plots *(→see "The efficiency of small-scale farms in land use", p.34).* However, the controversial political nature, administrative difficulties and disappointments — in Latin America rather than East Asia — with outcomes of such interventions has subsequently led to many governments and donors avoiding land redistribution. When, usually in cases where land is distributed very unequally, proposed mechanisms to redistribute land are recommended, they now usually try to work with land markets where land is publicly bought for redistribution.

More recently the focus of attention has switched to land tenure and security of rights to land. Secure land rights provide the incentive to invest, innovate and conserve the land. Clearly defined and predictable tenure should facilitate transfers of land to those who can use it most productively (Besley and Ghatak, 2009, 2010). Secure rights expressed by legal title allow title holders to use it as collateral when seeking credit (de Soto, 2000). Early attempts to establish secure tenure focused on formal surveying, mapping, registration and titling of plots. This has proved both costly and time-consuming, so that more recently the search has been for lower-cost and more rapid ways to improve security of tenure.

Policy issues

Land tenure and the role of land titling

The dominant discussion in land policy revolves around the different land tenure systems that best ensure security of tenure and the role of land titling within this. Previously there were quite marked differences in donor policy approaches and interventions in the land sector: the international finance institutions, particularly the World Bank, promoted individual property rights; while the UN 'family' and civil society organisations (CSOs) recognised that secure land rights could be achieved through other forms of tenure.

Currently the emphasis is increasingly on secure, equitable access to land under different legal systems and diverse national and local situations, looking at the legality and legitimacy of different institutional arrangements and the role of recorded rights and deeds (World Bank, 2003; EU, 2004; DFID, 2007; French Development Cooperation, 2008; FAO, 2007; SIDA, 2007). It is recognised that formal land titling may be neither necessary nor sufficient to ensure security of rights and their subsequent benefits, depending on how land rights are recognised and enforced in particular contexts (World Bank, 2003; EU, 2004; DFID, 2004; Rodrik, 2000). Informal land rights may be secure when locally recognised and enforced.

It is possible that land titling when economic conditions do not favour farming may "induce distress sales of land causing landlessness for many, land concentration and accumulation for few, resulting in increased poverty and inequality" (EU, 2004). Despite some risks, titling can be particularly useful when land markets become active with investors from outside the local community seeking land; when farming opportunities require substantial amounts of capital; and when urban encroachment on to farms in peri-urban areas is taking place. Land tenure may be important after conflict, when the ability to deal quickly with property claims can help recovery and reconstruction.

Where titling is pursued, several issues need to be borne in mind. One concerns the degree of formality of procedures. Land titling may be on the basis of formal mapping. This may involve use of remote sensing, backed up by on-the-ground surveying and the establishment of computerised geographical information and land information systems. This can pose technical challenges for developing countries where the resources and capacity to implement and maintain such systems usually do not exist. An alternative is to have local communities define plot boundaries, and to agree on who in the community has what rights to land within the locality. Drawing on local knowledge and legitimacy of community decisions can make for more rapid, lower-cost registration of rights. Ethiopia and Rwanda provide recent examples of this. That said, extending titling from individuals to communities can sometimes crystallise latent conflicts that have so far been negotiated and managed informally, so needs to be undertaken with care.

Administrative procedures and any fees for registration need to be commensurate with the means of smallholders. If they are too daunting, then informal land deals will prevail over formal deals.[24]

Gender is another important consideration. In the past title has often been awarded to a male household head. More recently programmes are likely to emphasise joint legal title between husband and wife and changes to inheritance laws to ensure transfer of full title to the wife if the husband dies. This reflects the recognition of women's role in agriculture *(→see "Key issues for women in agriculture", p.60)* but that women usually lack formal titles to the land they use, and furthermore often lose their rights if they become widowed or divorced (World Bank, 2003). Legislation, however, may not significantly alter the denial of women's land rights in practice as local social customs prevail (International Land Coalition, 2006). Attention needs to be given to working with local communities to build support for the defence of widow's rights to land.

24 The World Bank and the Millennium Challenge Corporation have proposed that registered land should be taxed, both to increase the financial resources of local authorities, as well as acting as an incentive for the more productive use of land.

Governing large-scale investment

The need for good governance in the land sector was raised in the EU's 2004 Land Policy Guidelines and has subsequently become an increasing interest (FAO, 2007; French Development Cooperation, 2008; Deininger and Selod, 2011). Discussion of land governance brings to the fore not only how institutions can title and register land, but also how they take decisions on land: who participates in land decisions and how different interests in competing social and economic functions of land are reconciled.

The surge in large-scale investors, both public and private, seeking land after the 2007/08 price spike has provoked interest in how to ensure that land allocated to investors is not expropriated from existing users without consultation or adequate compensation. Two sets of guides to good practice have been promoted internationally, namely:

- ***FAO Voluntary Guidelines.*** In May 2012, the UN Committee on World Food Security (CFS) endorsed the FAO Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security aimed largely at governments. These lay out the principles on which governments should operate, advising on the laws, procedures and tools available to ensure that land tenure reflects concerns over security and equitable distribution. Non-state actors (including business enterprises) are also deemed to have a responsibility to respect human rights and legitimate tenure rights; and,
- ***Principles of Responsible Agricultural Investment.*** Another initiative, spearheaded by the World Bank (World Bank et al., 2010), sets out principles for voluntary guidelines for investors in agricultural projects. These have not been endorsed by the CFS, and objections have been voiced by CSOs that the starting point of the guidelines is in favour of international investment in land rather than alternative mechanisms focusing more generally on smallholder productivity and food security.

An emerging issue in large-scale investment is the link between land and water rights, driven by concerns about increasing scarcity of water and implicit water acquisition within large-scale land deals. In large-scale land deals involving irrigation, investors usually try to secure long-term water rights as part of the deal. This may deprive other users of water, including smallholder farmers, pastoralists and fishermen, whose livelihoods depend on customary access to water (Skinner & Cotula, 2011).

Customary and formal water rights may conflict, with the legal system often weighted in favour of investors or government agencies. The characteristics of water, being 'mobile, fluid and fugitive' (Meinzen-Dick, 2000), raise particular challenges with squaring rights held in different forms and by different entities.

Further reading:

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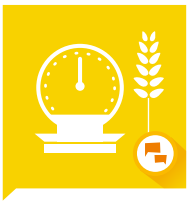
DEVELOPING RURAL MARKETS



In liberalised economies, markets play a critical role in co-ordinating economic activity, allocating resources, and facilitating investment and innovation by enterprises — whether they be small family farms or large private corporations. The neo-liberal ideal would be that markets work well without public interventions. In practice markets can fail and public action is needed. This section looks at how to remedy failings in rural markets and how to raise competitiveness in value chains. It also looks at stabilising international markets, given the interest prompted by the 2007/08 food price spike.

SUMMARY:

Markets play a critical role in co-ordinating economic activity, allocating resources, and facilitating investment and innovation by enterprises, but in practice ***some rural markets often require public intervention to work well – above all those for inputs, credit and other financial services*** – especially in rural Africa.

Improving rural markets can occur by replacing private supply with direct government provision to farmers; however, costs can be high and driven by political goals. The alternative is to promote collective and private institutional innovations (e.g. contracting, farmer associations, training input dealers backed by inventory credit) – promoted by agri-businesses and NGOs, and sometimes encouraged by some seed funding from governments and donors.

Increasingly some ***agricultural and food supply chains*** are coming to be dominated by supermarkets, processors and exporters who bring logistical expertise, but often demand more of farmers. Can smallholders be supported to participate in these complex yet lucrative chains, or whether they will be marginalised and excluded? Or should the priorities lie in better roads, communications, and storage instead to help the largely informal channels in which smallholders operate?

The 2007/8 spike in global cereals prices and subsequent higher volatility (at least until 2012) has seen the issue of ***stabilising international prices*** prioritised in policy discussions. However, views diverge on effective and necessary action: from market reform or greater government regulation all the way to more radical and far-reaching calls for fairer global systems of trade, governance and support to farmers.

Failings in rural markets

Background and introduction: a pervasive and significant problem

Rural markets, above all for inputs, credit and other financial services often do not work well, especially in rural Africa. Farmers often find external inputs such as improved seed and manufactured fertiliser either hard to find, or only on sale at high prices — higher than might be expected from costs of production and distribution. Moreover, most farmers have little chance of obtaining formal credit from banks to buy them, and hence can only buy to the limited extent that they have cash to hand. Consequently, external inputs that might raise yields and farm incomes are not applied to the degree that might be expected.

These failures may be so severe as to constitute poverty traps. If small farmers are too poor to afford to buy inputs needed to increase their production, and cannot obtain credit to overcome their lack of liquidity, then they cannot raise production, and hence remain poor, even when the technical means to produce and earn more are known (Sachs et al., 2004; CPRC, 2008). It is far from clear that such traps are common or widespread. Plenty of cases can be seen of small farmers who have managed to produce and sell more despite having little or no access to formal credit or insurance, where external inputs have been hard to obtain, and where traders enjoy some market power (see cases in Wiggins, 2000, for examples). That does not mean that farmers could not sometimes make good use of credit, insurance and inputs were they easier to obtain, but suggests that their limited supply may not be a severe or impossible obstacle.

Unfortunately these problems tend to apply most strongly to smallholders: larger farmers and formal private enterprises can often bypass local markets, obtaining formal credit and inputs in large cities where markets often work better.

Failures of markets, governments or underlying economics?

When rural markets work imperfectly, the causes are not always self-evident. Difficulties may result from the market failures that will be discussed shortly, or from government failures, or simply from the underlying economics of farming.

Frequent, abrupt and unexpected ***changes in government policy*** can make agricultural investments risky (Jayne et al., 2002), as can fears that profits may be expropriated by state officials or local political leaders if investments pay off. Looking at grain markets in eastern and southern Africa, Jayne et al. (2002) argue that lack of investment in grain production, transport and storage in the 1990s was the consequence of policy instability, as seen, for example, in export bans or the announcement of public imports of grain that are then delayed or much reduced from the quantities announced.

Underuse of inputs and finance by farmers or under-investment in supply chains may simply reflect ***the underlying economics of production and trading***. Some proposed improvements that involve investing in external inputs may not in fact be justified. Technical packages designed by agronomists for farmers may not be as appropriate to field conditions as agronomists believe, the economic returns may not justify the added investment, and the risks of a poor harvest owing to bad weather may be too high to chance investing in the package. Similarly, farmers may not use bank credit, not because they cannot obtain it, but simply because interest rates are too high — as may apply when treasury bills pay handsome returns to bank assets.

The underlying economics may result in low output prices as well. Post-harvest losses are reported to be high not just between field and farm, but also downstream in supply chains (World Bank et al., 2011). In some cases these losses may be 20% or more, so they would significantly lower prices offered to farmers. Prices offered to farmers will be lower when trading is costly, as it may be when charges are high for transport, storage, credit and payment of taxes formal and informal (bribes) when moving produce. Transport costs in some parts of Africa are notably higher than in other comparable areas of the world (Gollin & Rogerson, 2010; Livingston et al., 2011), in part owing to cartels amongst transport operators and informal costs of passing through border controls and internal barriers along highways. Similarly the risks that traders run when information is scarce can be underestimated: few notice when a trader makes a long but wasted journey to find produce that is not there, or when the (uncertain) price received in the central market turns out to be less than that paid in the village. Taking these factors into account, some studies show the margins earned by rural traders to be modest (see, for example, Fafchamps et al., 2003; Mutabazi et al., 2010).

Nevertheless some ***rural markets may fail owing largely to high transactions costs*** — the costs of getting reliable information on products and the other party to deals. For example, when input dealers lacking information can only guess at farmers' demand, when bankers or insurance companies know little of the competence and character of farmers seeking credit or insurance, then transactions costs rise; thereby inflating overall costs and leading to less use of inputs, credit and insurance and at higher prices than is optimal.

A further potential problem from lack of information may arise with investments in agricultural supply chains. Processors, wholesalers and retailers will only invest in processing plants and storage if they can be sure they can obtain supplies from farmers: farmers will only produce surpluses if they can be sure that these will be bought — with both parties needing additional reassurance that prices will not be turned against them as one side or other uses market power to extract a rent. Such assurances can be difficult to create when would-be investors know little about farmers, and when the farmers for their part know little about the potential investors. These ***co-ordination failures*** could thus significantly depress investment in agricultural supply chains (Kydd, 2002; Poulton et al., 2006).

Another frequently alleged market failure is that of ***monopoly power*** of local traders, input dealers and informal lenders able to extract rents from lack of competition in the market. Barrett (2008), for example, reviewing the participation of small farmers in markets in eastern and southern Africa found several reports of imperfect competition, including in rice trading in Madagascar. Evidence for monopoly power, however, is neither abundant nor uncontested. Other studies, such as Fafchamps et al. (2003) mentioned above report little monopoly power of traders.

Gender and market failings

When markets fail owing to high transactions costs and co-ordination failures, women farmers are likely to suffer more than men. Transactions costs tend to be higher for women since they usually have less education than men, and they have weaker social networks outside the village — and indeed, they may be unable to travel far from their homes. Hence women farmers often use even less improved seed, manufactured fertiliser and agrochemicals than male farmers — and consequently obtain lower yields *(→see "Failings in rural markets", p.42).*

Hence finding ways to improve the working of rural markets is likely to be disproportionately useful to women farmers.

Failings in markets: policy issues

Appropriate policy needs to respond to the particular problems seen in local circumstances. Where there are significant ***government failures***, the remedy lies in better governance, in ensuring an enabling rural investment climate. When the ***full cost and risks of farming and trading are high***, the solutions will lie in better information for farmers and traders, in technology generation that is better matched to farmers' circumstances, in better transport infrastructure and in reforms to transport regulations.

Where there are ***failures in markets arising from high transactions costs***, two very different potential responses arise. When markets fail, one option is to replace private provision through markets by direct provision by government to supply inputs, finance and marketing directly to farmers. Asian governments during the Green Revolution often intervened strongly in markets to ensure that farmers could get the inputs, credit, advice and marketing services that would allow them to take up the new technologies. So did many governments in Africa in the 1970s and early 1980s, through marketing boards and other public enterprises that typically organised supply for particular products. While such public measures can be effective — the grain marketing boards in Africa often succeeded in boosting greatly the production of maize — the costs were often high and often ruinously expensive in Africa. That led to marketing boards being closed down, or having their operations cut back and reformed in the 1980s and 1990s.

Despite the costs seen in the past, some countries in Africa are once again intervening to ensure that inputs reach farmers, most notably through fertiliser subsidies. The apparent success of the fertiliser subsidy in producing bumper harvests in Malawi since 2005 has encouraged this.

The alternative approach to remedying market failures is to look for institutional innovations to overcome the problems. These include contract farming where buyers provide farmers with inputs in advance and promise to collect surpluses; input dealer training backed by inventory credit; and collective action through farmer associations to obtain inputs, credit and marketing in bulk. While governments may back up such initiatives, and NGOs may foster them, these responses have the great virtue of having little or no public cost. They can also often be tried locally, at small scale. Consequently across Africa there are a plethora of such initiatives: some promoted by agri-businesses and processors seeking reliable supplies from farmers; others initiated by NGOs, trying to make sure that farmers on low incomes are linked to the markets they need; and yet others originating with groups of farmers themselves organising to make the links they need.

Competitiveness and supply chains

Background and introduction

Agricultural and food value chains[25] in developing countries have been changing significantly as increasing amounts of produce are delivered through supermarkets. Their customers want dependable supplies of good quality and safe produce, often in portions that are easy to prepare and cook — which usually means produce of standard size, weight and appearance. Some consumers, especially those in high-income countries to which some developing world smallholders export, also expect the supermarket to source food ethically, so that children are not employed in the food chain and workers and growers are paid a fair and living wage. Others want their food to be organic.

These demands, combined with advances in logistics, have seen food chains cover increasingly long distances with a considerable increase in international trade in fresh food. To ensure that any sourced produce lives up to the expectations of consumers, the supermarkets have increasingly adopted standards that are privately set and enforced. These cover not only characteristics that can be readily verified by inspection of produce, but also 'credence' characteristics — that cannot be observed in the produce itself — that include how the crop was grown or the animal raised. To ensure compliance with these latter characteristics, as well as to show due diligence, supermarkets have adopted standards, of which GLOBALG.A.P. is one of the most prominent, to ensure produce has the required characteristics and can be tracked from supermarket shelf through the chain to the original farmer. The search for control over quality and attributes of produce has tended to encourage vertical integration in the food chains, with fewer points at which title to produce changes hands. This includes the growth of contracting, with increasingly sophisticated contracts (Humphrey, 2009; Jaffee et al., 2011; Reardon et al., 2009).

While these requirements apply most strongly to exported produce, urban consumers in developing countries who shop in supermarkets still expect reasonable quality food of consistent standard and dependable supply. Hence suppliers of domestic supermarkets may not (yet) have to meet demands for certification and traceability, but they do have to be able to meet the standards expected and deliver to schedule.

Generally the greatest changes are seen in supply chains for high-value produce such as fresh fruit and vegetables, fish, meat and dairy. Given that consumers are prepared to pay well for such produce, then investments in these chains should pay off. The same may apply less when dealing with staple foods, where the priority may be to keep costs low in the value chains.

Debate: emerging value chains

Five sets of questions have been prompted by these developments, as follows:

- How far and how quickly will the new chains spread within the developing world? What are the conditions for their replication and expansion?
- What are the prospects for smallholders to supply these chains? Can they meet the stringent conditions set by those governing the chains, or will they be excluded?
- Should farmers and especially smallholders try to join these chains? Are there gains to farmers from participation, or are they being squeezed by the market power of the supermarkets and their agents?
- Can the logistics and processes of value chains for higher-value produce be useful for staple crops as well?
- How can socially responsible standards be achieved within the chains? What can be done to ensure that the changes represent a race to higher standards, the top, rather than to the bottom?

The evidence and issues surrounding these questions are discussed in the following pages.

25 The terms 'value chain' and 'supply chain' are often used interchangeably, although some distinguish between a supply chain as the chain of actors who supply a specific product to a particular retailer, while the value chain may refer to several similar supply chains dealing the same product with not only those who handle the product considered, but also those who supply services to the chain, and those who set regulations and policies that affect the chain.

Expansion of new chains

How quickly are supermarkets capturing the marketing chains, particularly large domestic channels that deliver food to households of modest means? Three waves of concentration have been seen: the first in South America, East Asia, Central Europe, Turkey, and South Africa where supermarkets now sell 40–60% of food marketed; the second, 5–10 years behind, includes Central America, Mexico, Southeast Asia, Southern Africa where supermarkets have a 20–40% share; and the third, in the rest of South Asia and Africa where they have under 20% of food sales. But even in the last category, the growth of supermarkets has sometimes been very rapid, as seen in China.

Some of the chains are global multinationals, others are regional multinationals (e.g. Shoprite in sub-Saharan Africa), and yet others are national food retailers. Joint ventures between these categories create other combinations.

Generally supermarkets begin with dry goods, groceries and the like, and make slower headway with fresh, perishable and wet goods where local stores and markets still attract consumers. They may first sell to the prosperous, but they move to serve ordinary consumers fairly quickly. Spatially they begin in capital cities, and then spread to secondary cities and even small rural centres (Reardon, 2007).

The process of expansion may, however, be somewhat uneven and unpredictable. For example, supermarket chains were established as major food retailers in Bogotá, Colombia in the early 1990s. Yet a recent survey finds that they supply predominantly middle- and upper-class households: they do not supply in the *barrios populares* where working-class, poor and vulnerable households live. Here food is sold in corner stores and open markets, the supermarket managers admitting that they cannot compete on price for these markets. These outlets are serviced by supply chains that look remarkably traditional with multiple intermediaries, wholesale markets, and original supplies sourced from small-scale farms (Guarin, forthcoming) — a chain that at first sight looks inefficient compared to the advanced logistics seen in some supermarket-controlled chains, but which apparently is unbeatable on price.

Factors favouring the rise of supermarkets include increased incomes, urbanisation and income inequality (Traill, 2006). The advance of supermarkets will probably thus continue to be rapid where they have gained a significant foothold: that is, in the industrialising and middle income countries of East and South-East Asia and Latin America. In other regions, and above all in Africa and South Asia, however, the advance may be quite slow and hence the implications for small-scale farms may be limited in the near future.

Smallholders' prospects

It is clear that the demands of some supermarkets, especially when the consumer lives in high-income countries, are difficult to meet for many small-scale farmers. Certification demanded when exporting to Europe, for example, can be costly for smallholders: meeting GlobalG.A.P. requirements for documentation that allows export to leading European supermarket chains can cost a farmer US$580 (Ashraf et al., 2008, for Kenya) — an enormous overhead for a small farm. Consequently since this requirement was introduced, increasingly vegetable exports from Kenya come from larger holdings who can afford this overhead. The same has been seen in Senegal, where vegetable exports once supplied by contracted small farmers are now grown by estates (Ashraf et al., 2008; Maertens & Swinnen, 2009).

Demands for quality can entail farmers having to make investments to meet the standards, for example, dairy farmers generally having to sell to supermarkets through a cold chain.

Even when certification is not necessary, as when provisioning domestic supermarket chains, transactions costs are higher for procurement managers dealing with smallholders. If they can source from larger farms in bulk lots, they will do so. But supermarkets will deal with small farmers where and when:

- farming is dominated by smallholders who are the only suppliers;
- there are risks in contracting large growers since they have other outlets for their produce — as might apply when the supermarket is domestic and large farms have the option to export their produce;
- the crop in question needs much labour and careful attention, so hand labour is needed to achieve high quality; and,
- when transactions costs are kept low by smallholders grouping together in associations or co-operatives to sell in bulk (Reardon et al., 2010).

Part of the answer, moreover, depends on what is meant by 'smallholder': within this category there can be great variations in access to land and other assets. Supermarkets will engage with small suppliers under the conditions mentioned, but they may not be the more marginal small farms: on the contrary, procurement managers will deal first and foremost with those smallholders who have the capacity and means to deliver reliably and to standard — and those are unlikely to be the marginal farmers (Shepherd, 2009).

Do smallholders gain from supplying to supermarkets?

Farmers who supply the emerging marketing chains may benefit from higher prices, owing to payments for higher quality and from access to markets for higher-value produce. They may also gain when procurement managers offer contracts that provide inputs in advance and technical assistance that allow farmers to invest, innovate and increase their production.

But do farmers gain? There is less evidence on this than might be imagined. Reports on contract farming schemes often report that farmers have indeed gained, see for example Warning & Key (2002) for the case of groundnut farmers from Senegal, but there are two reservations to the favourable reports. One is that failed contract farming schemes are rarely documented, while contracted farmers who left the scheme because there were insufficient net benefits may not be observed, so that there is a survivor bias to reviews. The other is that while contracted small farmers may have higher incomes than their neighbours, it is quite likely that they were always better off in that they had more assets or higher skills than their neighbours (Barrett et al., 2012).

A general answer to this question is thus elusive. Furthermore, there are concerns that incorporation in the emerging value chains may mean that farmers are exploited, either absolutely in that buyers have the market power to push down prices paid, or relatively in that most of the additional value created in the chain is captured by retailers and large wholesalers, and not by farmers — even when the last have to meet higher standards. In similar vein, there are fears that small farmers may lose autonomy as they become more closely integrated into the chains.

Evidence is partial: much of the argument relies on assumptions, either that modernisation must lead to gains or that globalisation expressed in the emerging agricultural value chains will treat the small, the weak and poor unfairly. More evidence, with adequate recognition of the need for careful controls when comparisons are made, is needed.

Can value chains for staples be upgraded to the advantage of farmers?

Much of the interest in value chains has looked at how smallholders can be linked to chains for high-value produce which have seen the most changes, not in chains for staple foods. Three ideas may explain the lack of attention to supply chains for staples.

One, some question how competitive small-scale farmers, especially in Africa, can be for staples. In the production of some cash crops African smallholders have advantages in access to near-ideal agro-ecological conditions that produce high yields or high-quality produce, as seen for tea and coffee. Small farms also have advantages in crops that require intensive use of labour, since mechanisation is costly, difficult or results in a lower-quality product, as applies with cotton (Poulton et al., 2006). When it comes to producing staples, African smallholders suffer from high costs of capital and transport, and from failings in rural markets that limit their access to inputs and the finance to buy them in sufficient quantity. This is why along the coasts of Africa local production often struggles to compete with imported grains.

Two, since staples are less differentiated by quality, and many domestic consumers look primarily at cost before quality, then it may difficult to recoup investments in supply chains for staples.

Three, some evidence suggests that margins in staples value chains are quite low (Fafchamps et al., 2003), suggesting that it may be difficult to improve on current arrangements.

But this may be pessimistic. Linking Local Learners is a programme started by Pride Africa to create new supply chains that links agents in the field with produce buyers in the main cities of East Africa, using mobile phones and computers. This potentially allows more effective arbitrage, with the buyer communicating more directly with producers their requirements and hence cutting out intermediaries. The programme has been running since 2008 with promising results to date (Lightfoot & Scheuermeier, 2012).

How can acceptable standards be set and maintained in agricultural value chains?

Concerns arise that in a globalised world competing supply chains will be tempted to cut costs to gain advantage, and that they may do so by driving down the costs of labour, by exploiting the environment and by avoiding taxes — thereby creating a 'race to the bottom'. To this may be added concerns over corruption and the appropriation of land and water, as seen in current concerns over land deals. So the question arises of how to prevent this, in other words how to establish minimum standards for treatment of labour, environmental sustainability and of contribution to the public domain.

Complete answers have yet to be found, but at least three lines of action seek to ensure that private enterprise acts within the limits that society expects. One is that individual developing countries set standards in law, or in strong regulations and codes of conduct that firms will be expected to follow.

Another is that OECD countries set criteria for imports from developing countries that are linked to incentives for importers. For example, the EU Renewable Energy Directive sets targets for renewable fuels that apply to biofuels: if imported biofuel is to contribute to the target, then it must be shown to have been produced in ways that respect environmental and social standards.

A third approach is thorugh voluntary, private initiatives whereby companies active in a particular value chain form voluntary roundtables to agree standards and to certify that that particular firms are complying with them. This is the approach adopted by the initiatives such as the Roundtable on Sustainable Palm Oil (RSPO), the Roundtable on Responsible Soy (RTRS) and Bonsucro (formerly Better Sugarcane Initiative). Voluntary certification has proved a practical and cost-effective way of delivering credible assurance that products come from sustainably managed sources even when supply chains are long and complex, as applies in the forest sector.

Competitiveness and value chains: policy issues

In some parts of the developing world the emergence of new supply chains has been rapid with potentially strong impacts on the livelihoods of farmers and above all small-scale farmers. Varying degrees of certainty attach to the evidence presented above in relation to five principal questions. Much of what takes place is specific to particular crops, ecosystems, and pre-existing agricultural structures above all land tenure. Hence patterns are likely to be diverse: understanding changes, the implications to small and poor farmers, and devising policy options will thus require detailed analysis of cases.

But at least one general point is clear: the fate of smallholders depends in large part on the ability to innovate institutionally so as to allow at least some small farms to overcome increased transactions costs from demanding standards, and to take advantage of the emerging supply chains. Forms of contracting and farmer co-operation will be central to such institutional innovation.

While some contracting will take place by private initiative, and some farmers will themselves form associations, it is likely that in many cases additional efforts may be needed by some broker to help organise grouping, to bring potential partners to meet supplier farmers, to help with information, and to facilitate negotiations. Some NGOs have long experience of this, such as TechnoServe and SNV. Donors can work with and through such NGOs to invest in forming better linkages. Government agencies may play a similar role, although this probably needs to be through special units if they are to have the flexibility of operations that regular line ministries rarely have. Challenge funds may be another way to encourage and prime private initiatives: funds to which enterprises can apply for funds to underwrite innovative and risky ventures.

A final reflection: the attraction of high value chains with their increasingly sophisticated logistics should not distract from the reality that the overwhelming amount of produce from smallholders passes through largely informal channels. Here the needs for improvement are often quite basic: better roads that are passable at harvest time, for example; more local storage (and perhaps warehouse receipts); and so on (Vorley et al., 2012).

Stabilising international markets

Background and introduction

Between 2007 and mid-2008 world wheat and maize prices more than doubled, while rice prices rose threefold. This unexpected shock, the strongest price spike seen since 1973/74, led to intense interest in what had happened, and how international markets could be stabilised. The result has been striking differences in views and proposals.

Different observers emphasise different factors among those commonly held to have caused the crisis, including drought among some major exporters, low global food stocks, increased production of biofuel crops, the rising cost of energy and agrochemicals, and the impacts of speculation in agricultural commodities markets. Higher food import costs are estimated to have brought hunger, malnutrition and poverty to an additional 100 million people (World Bank, 2008). These rapid price increases prompted emergency responses at international level, for example from the World Food Programme and NGOs, as well as from International Financial Institutions (IFIs) and both bilateral and multilateral aid programmes. These included the provision of food and funds to strengthen safety nets and reduce consumption deficits, but also the provision of seeds and fertiliser to boost production.

The crisis also prompted reactions from many developing country governments. Examples included increases in existing safety net provisions for the vulnerable; the release of existing buffer stocks; emergency purchase and redistribution of food crops; efforts to import grain and sell at subsidised prices; and bans on the export of food. Of 81 developing countries surveyed by the FAO, 43 reduced import taxes and 25 either banned exports or increased taxes on them. Forty-five developing countries implemented measures to provide relief to consumers in the face of greatly increased food prices (G20, 2011; para 37). In some cases, trade protection almost certainly exacerbated instability on international markets, harming countries that did keep their borders open.

Differing interpretations of the problem have led to different recommendations. Four sets of interpretations are presented below: first, the G20/G8 view which largely emphasises continuing reliance on market mechanisms; second, views generated largely within UN agencies and fora with stronger emphasis on the limitations of markets and on the need for intervention by the state; third, views expressed by NGOs such as Oxfam focusing on fairness and justice in access to food, and finally a set of views which highlight the conflicts – potential and real – among different agencies and the gap between rhetoric and reality.

Differing views and policy recommendations

Views from the G20

In an OECD publication prepared for the G20, Abbott (OECD, 2012, pp. 109-168) anticipated a return to stable, low international prices in major foods, such as applied between 1998 and 2005s. In most countries in most years, the main sources of price instability (such as the size of harvest) will be domestic. The solutions then lie in liberalised trade so that trade can be used to stabilise supplies, hedging in futures markets, crop insurance, as well as promoting efficient agriculture. Significant public interventions in markets, or in trade, are neither necessary nor desirable.

This view largely underpins the G20 recommendations of 2011[26] for:

(i) the promotion of a productive, efficient agriculture in developing countries, requiring investment in public goods, efforts to reduce market failure, and a reversal of recent declines in the share of public spending on agriculture;

(ii) steps to reduce measures within OECD countries which distort trade, including a reduction in import tariffs, export subsidies and other support which mean that transfers from government make up some 22% of farmers' gross receipts in these countries[27];

(iii) measures to reduce policy conflict between the use of crops for fuel and for food, with some easing of targets in the USA and EU for bioethanol and biodiesel production is needed. Currently these must be met even when the crops they rely on are in short supply, exacerbating the tight markets and higher prices faced by consumers requiring these crops for food;

26 These correspond also largely with the G8 (2009) L'Aquila statement

27 These have also been partly to blame for import surges in developing countries, which have proven de-stabilising to local production efforts. A FAO survey of 102 countries (cited in IFAD, 2011) indicated that they had undergone 7,000 surges in a 23-year period. Many other factors can also cause these, such as currency fluctuations, elimination of support to a sector, shortfalls in domestic production, and food aid, but the loss of markets for developing countries can be dramatic. For example, in Burkina Faso and Senegal very large increases in tomato paste imports in the 1990s (much of it from the European Union) led to 50% declines in local production; in Chile, a three-fold increase in vegetable oils resulted in a 50% decline in local production; in Jamaica a doubling of imports resulted in a two-third reduction in local production.

(iv) the establishment of small, strategically positioned emergency food resources under the WFP (although it is recognised that these will be difficult to manage), and the promotion of financial instruments (such as forward purchasing) so that WFP and other non-profit agencies can respond more fully to emergencies;

(v) support for the World Bank's Global World Food Crisis Response Programme and to the IMF's concessional lending to developing countries for short-term and emergency support;

(vi) measures for the management of volatility in the long run, including new forms of crop insurance based on weather indices, and warehouse receipts for those selling surplus grain; and

(vii) the establishment of an international Agricultural Market Information System.

The UN Agencies' view

The views contained in various reports by UN Agencies and fora (e.g. WFP, 2009; IFAD, 2011; CFS, 2011; FAO, 2011a) broadly coincide with those of the G20 and G8, but with subtle differences. More emphasis is put on public investment in promoting production of food in developing countries, and in public management of food stocks so as to be prepared for price spikes; with less emphasis on international trade as a means of accessing food, or on insurance to compensate for losses.

They see the 2007/08 price spike as the first of many, more frequent, spikes against a rising overall trend in prices. Against this background, CFS (2011) argued that periodic food crises (1950s, 1970s, and 2000s) have followed periods of low agricultural investment, after which a price spike then triggers a renewed round of higher investment. The same report believes rising prices may result from increasing shortage of resources (water, suitable land), so signalling the end of a long period of cheap food and increasing the likelihood of spikes.

On the controversial question of speculation in agricultural commodity markets, WFP (2009) weighs the varying evidence to conclude that speculation probably did not force prices up in 2007/08. CFS (2011) also recognises that the evidence of speculation is inconclusive, but notes risks of the formation of price bubbles, and of the exclusion of genuine commercial buyers from commodities markets who cannot compete with speculators. FAO therefore recommends greater transparency in transactions and tighter regulation, at least as a precautionary measure.

NGO views

NGOs also have their own views on the causes of the 2007/08 price spike. Oxfam's *Growing a Better Future* report (2011) sets out starkly the inequities it perceives: while annual subsidies to OECD farmers amount to almost US$250bn, with a further US$20bn of subsidies to biofuel, only US$10bn goes to official development assistance to agriculture (Oxfam, 2011, fig. 24). The result is a food system biased against developing countries so that they bear the brunt of price spikes. The report identifies three necessary steps to prevent food price spikes in future and to work toward 'food justice':

- a 'new global governance'28 (p. 5) must make the reduction of hunger a top priority for governments, supported by investment in jobs, climate adaptation and disaster risk reduction. Trade, food aid, financial markets and finance for climate change all need revised governance at the international level;
- future agriculture should be based on smallholder farming in developing countries and less on supporting production in the North; and,
- a new ecological future must mobilise investments, shift the behaviour of businesses and consumers and reach new global agreements for the equitable distribution of scarce resources.

28 Details of how such governance will be implemented are not provided

Oxfam believes that markets will not work adequately until the behaviour and power of large agro-industrial corporations are tamed. In the meantime, international markets for food are not to be relied upon to meet food shortages: biofuel[29] targets will work in favour of industrial farming but against the interests of low-income producers and consumers, and 'land-grabbing' by corporations in Africa and elsewhere will continue. Savings from reducing food wastage in the North should be used to help consumers in the South, while reduced subsidies for OECD agriculture should release funds to support small farmers in the South.[30]

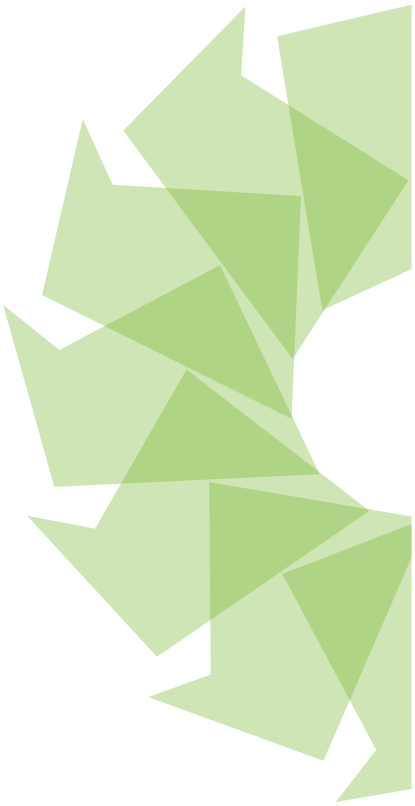
Other views

Wise and Murphy (2012) see in the 2007/08 price spike a paradigm shift, caused by the deepening integration of agricultural, energy and financial markets in a resource-constrained world made more vulnerable by climate change. They argue that powerful multinational firms dominate these markets, benefit from current policies, while heavily influencing national and global policies. Their influence leaves international institutions promoting market-friendly reforms but reluctant to impose the concomitant regulations required to ensure well-functioning food and agricultural markets.

Commenting on both the UN Agencies' and G20/G8 recommendations, Wise and Murphy (2012) see reactions to the 2007/08 food crisis as marking an important departure from liberalisation which had underpinned the economic reforms of the 1980s onwards. Liberalised markets have failed to deliver food security, leading to fresh recognition of the role of the state, not just in facilitating and regulating markets, but also in 'country-led' agricultural development programmes, and in providing and prioritising public investment.

They believe that G20/G8 responses have been lukewarm, citing lack of urgency on the funding side, since only US$6.1 billion of the G8's pledged US$22 billion over three years represents new money, pledges that were threatened by cutbacks owing to austerity measures. They also query the seriousness of G20 statements concerning reduction of support to OECD farmers.[31]

They recommend that the weaknesses of international markets be addressed and renewed attention be given to agricultural development with priority to the needs of small-scale farmers and women, as well as to environmental issues, including climate change. They worry that G20/G8 setting of production targets at the global level encourages an expansion in industrial agriculture and the consolidation of land holdings, including land grabs, and ignores environmental constraints and equity. They call for less biofuel production, limiting speculation on commodity markets to guard against future price surges, and determined measures to prevent land grabs by "financial speculation and land-banking by sovereign wealth funds."



29 Oxfam argues that carbon emissions are better controlled by reduced clearing of forest than by promoting 'bloated biofuel industries' (p. 7).
30 It is not clear how savings from food wastage will be transferred to producers and consumers in the South.
31 They also question the leadership of the G20 on food security, which has limited reforms proposed elsewhere in the international system by the UN Agencies. The UN Committee on World Food Security (CFS), established in 1974, is formally recognised as the appropriate body to co-ordinate the global response to food crises, because of its mandate and its inclusive, multi-stakeholder structure. Yet in practice the G20 has systematically constrained the reform agenda.

Conclusions

By 2015 radical proposals for increased public stocks and restrictions on trading on commodity markets had been resisted. International prices have come down considerably, almost to the levels in real terms seen before the spike, owing in large part to a strong increase in cereals production by farmers, not least in the developing world. Prices have also become less volatile since 2012. It seems that actions to encourage supply response have worked and that further intervention in markets was probably not necessary.

Getting rural markets, and especially those for inputs and finance, to work is central to developing smallholder agriculture. If that cannot be done, smallholders will be disadvantaged, unable to invest and innovate fully; thereby stymieing any hopes for broad-based agricultural development that strongly reduces rural poverty.

Remedying current failings may require renewed active public intervention through marketing boards, but given the likely costs, and the fear that this will inhibit the development of private providers of inputs, credit and services to farmers, this option is unattractive.

More promising are initiatives to develop innovations in institutions to overcome market failings. These usually involve closer links from smallholders to firms in the agricultural supply chains, either individually as contracted growers or as associations grouping smallholders for economies of scale in transactions with larger firms. Many such initiatives currently exist: the challenge is to learn from them, and then replicate successful models more widely.

After the shock of the price spike for cereals on world markets, much attention was paid to the functioning of global markets. Radical proposals for public intervention in markets were set aside. Instead this shock has led to renewed interest in agriculture, with more public investment. To judge by the strong supply response seen since 2008, these investments have probably paid off. With the focus no longer on international markets, more attention can be directed to improving the functioning of rural markets within developing countries.

Further reading:

On rural markets:

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On stabilising international markets:

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AGRICULTURAL TECHNOLOGY

Background and introduction

For millennia, farmers' selection of better-performing plant varieties and animal species determined how much food could be produced, and how large a human population could be supported. The institutionalisation of agricultural research in the last 150 years increased the pace of innovation. Major advances in developing countries since the 1960s undoubtedly prevented famine. Innovation has become even more rapid with advances in genetic technology. Genetic 'markers' have permitted much faster progress in conventional plant breeding, but also the creation of Genetically Modified Organisms (GMOs – also known as transgenics). These products, and many genetic processes, are patentable, and private companies have come to dominate this branch of research.

SUMMARY:

Improvements to ***agricultural technology*** have been a powerful driver of growth, however not without debate. Some argue that it will be necessary to use high-yield varieties, manufactured and other external inputs and transgenic varieties (especially in areas currently marginal for farming) to achieve sufficient production for future populations. Others insist that low external input (LEI) approaches will be needed if farming is to stay within environmental limits and that further research of the potential risks of transgenics is needed.

In some farming systems there may well be scope for combining approaches from biotechnology and agro-ecology to achieve complementary effects. For example, better management of soil and water will make high-yielding varieties and fertiliser more effective. Much will depend on the specific needs of particular farming systems in their localities; however, a broad range of technical options is likely to be needed in a future world of changing and more uncertain climate (→*see Meeting the challenges of environmental sustainability and climate change, p. 64*).

The pace, opportunities, and concerns surrounding these new forms of research differ substantially from what has gone before. This, against a background of rapidly rising population and increased pressure on natural resources and the environment, creates new policy challenges.

Strongly held values concerning technology options have also emerged. These started with concerns over the environmental impact of pesticides in the 1960s, and more recently include positions on the environment more broadly, climate change, energy, transgenics, patenting, and the respective roles of high-yielding versus low external input approaches.

Factors influencing the choice of technology

Developing countries face four sets of factors in their future technology choices. One, by 2050 global population will rise to about nine billion people from 7.3 billion in 2011. This, plus higher incomes, will increase the demand for food by 70–100% by 2050. Technologies will have to be developed to allow 0.3bn fewer rural people to feed much expanded cities (IFPRI, 2011).

Two, technologies will have to mitigate some of the effects of likely climate change, including changes in rainfall, temperature and sea level, implying changed incidence of pests and diseases.

Three, technology will have to be safer, more humane, resource-sparing and less polluting.

Four, technology will need to meet the expectations that people have, with some conflict between those seeing it as instrumental in responding to specific imperatives, and others seeing technical choices as also being central to major societal decisions on welfare and equity.

A challenge for the future is to assess the likely trade-offs involved in new technology and identify what needs to be done to minimise any potential negatives.

The Green Revolution: for and against

This term was first used to describe the high-yielding rice and wheat varieties resulting from research funded by the Rockefeller and Ford foundations in the 1960s. These were fertiliser-responsive, with short, stiff straw capable of supporting the heavier heads. Similar high-yielding varieties (HYVs) have since been developed for other major food crops, including sorghum, millet, maize, cassava and beans, principally under the Future Harvest Centres that make up the CGIAR Consortium of International Agricultural Research Centres.

The Green Revolution has boosted production of cereals. By 1970, about 20% of the wheat area and 30% of the rice area in Asia were planted to HYVs, rising to around 70% by 1990. Average yields of rice and wheat virtually doubled. Instead of predicted famine, cereal and calorie availability per person increased by nearly 30% between 1970 and 1995, and wheat and rice became cheaper, making agriculture the engine of significant poverty reduction in Asia (Hazell, 2009). Latin America also experienced significant gains, but in sub-Saharan Africa, poor infrastructure, high transport costs, limited scope for irrigation, and adverse pricing policies have caused results to be limited.

Against production gains, can be set environmental degradation, higher income inequality, and inequitable asset distribution that have all been associated with the Green Revolution.

Environmental damage: Apart from the loss of biodiversity following the adoption of HYVs, inappropriate use of fertilisers and pesticides has polluted waterways, poisoned agricultural workers, and killed beneficial insects and wildlife. Poor irrigation has led to salt build-up in some areas and, in others, a lowering of aquifers which may take decades to replenish. Policy reforms and improved practices and technologies, such as pest-resistant varieties, biological pest control, precision farming and crop diversification are helping to rectify these problems. On the other hand, Asian cereal production doubled between 1970 and 1995, yet land under cereals increased by only 4%, thereby sparing forest and environmentally fragile lands from the plough.

Inequalities attributable to farm size: Large farms were the main adopters because of their better access to water, fertilisers, seeds and credit. Small farmers were harmed where landlords tried to increase rents or where mechanisation was promoted unnecessarily. Small farmers did eventually adopt HYVs and enjoyed many of the benefits.

Inequalities attributable to resource endowments: The Green Revolution spread only in irrigated and high-potential rainfed areas, and many villages or regions without access to sufficient water were left out, though these benefited from job opportunities and cheaper food.

Lessons from the Green Revolution indicate the conditions that must be in place for future technology change to maximise positives and minimise negatives: (1) technology should ideally be scale-neutral; (2) land ownership and tenancy rights must be secure; (3) input, credit, and product markets need to be efficient; and (4) policies must encourage equity (no subsidies on mechanisation) and sustainability (strict controls on pumping). These conditions go well beyond the technology itself, and have to be addressed through wider government policy.

Low external input technologies

Many of those seeking societal change that goes beyond increased yields, to embrace for example social capital, equity and sustainability, favour low external input technologies (LEIT). Tripp (2006) draws on an extensive review of literature and on the results of three field studies that examined farmers' practices in areas where major, successful LEIT projects had been carried out: soil and water conservation and fertility management in Honduras; micro-catchment management in Kenya, and Integrated Pest Management in Sri Lanka. Four questions are addressed, as follows:

Who uses the technology? Far from being small farmers, in all three field studies, farmers taking up LEIT were predominantly from the higher-income strata. Many poorer rural households earn a minority of their incomes from agricultural activities and have neither the labour to devote to careful crop management nor the time to learn new techniques.

How much labour does LEIT use? Many technologies require too much labour to warrant farmer interest (e.g. alley cropping in 1980s Africa). But for some, high initial labour requirements are an investment which allows later labour inputs to be reduced, as with farmers in Sri Lanka taking on Integrated Pest Management. Nor does this demonstrate that LEIT will appeal more to households having only family labour: in all three country cases, more than half the labour requirement was hired for key tasks.

How do LEIT technologies spread? LEIT is supposed to be a product of local innovation relying on local resources, and so should spread easily among neighbouring farmers. However, evidence of uptake of the technologies by non-project farmers was very limited. LEIT did not generally lower the use of external inputs. In fact, it appears to provide an environment in which a profitable fertiliser response is more assured, and sample farmers were more likely to use it.

Does LEIT help to build human and social capital? The evidence from the long-term consequences of LEIT projects shows little evidence of this. Even with the emphasis on experimentation in Honduras, only one-fifth of the participants experimented post-project.

There seems to be little evidence that LEIT and associated participatory processes so far can form the basis for robust farmer organisation, or, more generally, for rural poverty reduction. Instead, a range of technologies should be promoted, based on: a better understanding of what (locally) influences the adoption of technologies; improving information to farmers on technologies; and, above all, strengthening farmers' organisations to make demands on technology systems.

On the other hand, LEIT have to date received less attention from public agricultural research than higher input technologies, and almost no attention from private research. As seems likely in the future that the cost of external inputs based on scarcer fossil fuels and minerals rises, and as the need to avoid pollution similarly increases, it may be that more research seeks lower external input technologies than in the past.

Towards 'greening' of agriculture?

The spread of agriculture has led to clearance of forest and wetland, soil erosion and degradation. Certain types of intensification have resulted in salination and drawdown of groundwater, pollution from chemical runoff, and loss of biodiversity. Policies are needed to redress such harm, to meet the challenges of a changing climate, and to mitigate agriculture's considerable contribution to global warming.

Improved methods exist, but need local adaptation, and getting farmers to adopt them will be challenging. Policy options for conservation and climate adaptation and mitigation include ***regulation, incentives, information and education.***

The following are on the policy agenda: stiffer regulation on conversion of valued habitats; tighter restrictions on groundwater pumping; incentives to internalise external costs and benefits, including taxes on greenhouse gas emissions and charges for water; but also, payments for environment services such as conservation of forest, biodiversity and for carbon capture, and tax breaks on the development of renewable energy sources. In some cases, there may be scope for markets in carbon and water, although this can easily be overplayed.

Improved agricultural practices can help, such as root zone irrigation, optimal timing and placing of fertiliser, conservation tillage to minimise soil disturbance and agro-forestry to capture carbon and recycle nutrients. But major policy steps will also be needed, for instance to reduce unsustainable depletion of groundwater in some parts of Asia.

However, new policy will not be adequately defined by applying blueprints: long-term experience with agriculture suggests that promoting learning and adaptation is the key to sustainability. On farms the world over, techniques are modified, often by incremental changes. These arise partly from scientific and industrial innovations that open new possibilities; partly from responses to changes in local soil conditions and climate; but also in reaction to changing availability of labour, access to credit, and demand from buyers in the supply chain. Consequently few farmers today farm the way their grandparents did. Reviewing a century or more of farming in Victoria, Australia — 'a brown land of long dry spells' — Cary (1992) shows how farmers have learned from experience, as have the agricultural researchers and advisors who work with them, so that recommended ways to cultivate have changed substantially several times. He comments that "we are never likely to have a single management system for cropping that endures forever".

GMOs and the future

Genetic modification occurs naturally as species evolve, and, through varietal selection, is an approach used by farmers to improve their crops and livestock since the dawn of agriculture. Scientific advances allow genetic manipulation within species, but also the transfer of genes across species – producing 'transgenics' or genetically modified organisms (GMOs). Transgenics are patentable, causing private sector crop research investment to outstrip public research and development.

The attraction of GMOs lies in their capacity for higher yields, drought tolerance or resistance to pests and diseases, but many see in them as dangers to health and to the environment through, for example, their escape into wild relatives. Nevertheless, around 10% of global crop areas were under transgenics by 2010, principally in the USA and Latin America.

The only transgenic widely adopted by smallholders in developing countries has been Bt32 cotton for insect resistance, with 7.3 million hectares planted in 2006, mainly in India and China. Yields were higher and pesticide use lower than with conventional varieties, though some farmers in India initially experienced a loss (associated with highly-publicised farmer suicides), largely because of the use of poorly adapted varieties.

Transgenic food crops have advanced more slowly, but almost 50% of the white maize grown in South Africa (mainly by large-scale farmers) is now under transgenics, and China allows cultivation and use of publicly developed transgenic vegetables. Transgenic rice, eggplant, mustard, cassava, banana, sweet potato, lentil, and lupin have been approved for field-testing in one or more countries. Types of 'Golden' rice, with enhanced beta carotene content for vitamin A, but also high pest and disease resistance, and salt and flood tolerance are under advanced field testing in China.

Africa has benefited the least from genetic modification, in part because locally important food crops such as sorghum and cassava have attracted little attention from commercial biotechnology firms. However, it has the potential to reduce the impact of intractable problems such as *Striga* (a devastating parasitic weed).

Apart from lack of commercial interest, four other reasons contribute to slow progress in developing transgenic food staples. **Risks** – continuing concerns about possible food safety and environmental risks – have slowed release in many countries. More evidence is needed, as are efforts to inform the public, so that perceptions of risks are not excessively negative. **Weak regulatory capacity** slows approval processes and encourages unofficial introduction of unauthorised varieties, and so can fuel public distrust. **Limited access to patented technologies** due to the cost of accessing materials and processes now makes them unaffordable for many in the public sector. Added to this is a perception that farmer-selected varieties should not be appropriated and patented commercially. **Complexity of trade** in transgenics: the costs of segregating the storage

32 Cotton genetically engineered to produce Bacillus thuringiensis toxins which are effective against certain insect pests.

and shipments of transgenics from conventional varieties, and obtaining shipping clearance for transgenics, are likely to slow their uptake.

Development agencies should consider funding the development of safe transgenics with pro-poor traits and underwriting the high initial costs for their testing and release.

Technology generation and dissemination: policy issues and conclusions

Given the projected increases in global population and demand for food, higher will be needed for the future. Advances in genetics will speed up plant and livestock breeding, and, although regulatory processes need to be strengthened, and there remains a pressing need for further evidence on potential risks, it seems likely that transgenics will have a role to play, spreading to less-favoured areas according to the pace of publicly funded research.

At the same time demands for environmentally sustainable agriculture that economises on the use of external inputs to avoid exacerbating resource scarcity and that avoids pollution, is likely to see development of lower external input agriculture using principles of agro-ecology to sustain and enhance yields.

Although some may object on ecological principles, in some farming systems there may well be scope for combining approaches from biotechnology and agro-ecology to achieve complementary effects. For example, better management of soil and water will make high-yielding varieties and fertiliser more effective. Much will depend on the specific needs of particular farming systems in their localities. A broad range of technical options is likely to be needed in a future world of changing and more uncertain climate.

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GENDER AND AGRICULTURAL DEVELOPMENT

Background and introduction

Interest in gender and agricultural development is longstanding, dating back at least as far as 1970 when Esther Boserup published '*Woman's Role in Economic Development*'. Subsequently interest has grown, marked by a series of UN World Conferences on Women – starting in Mexico in 1975, then Copenhagen 1980, Nairobi 1985 and Beijing 1995 – since when there have been meetings every five years to review progress on the agreed Beijing Declaration and the Platform for Action. When in 2000 the Millennium Development Goals were set for 2015, the third Goal was "to promote gender equality and empower women', with the target to 'Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education, no later than 2015."[33]

SUMMARY:

Many women in developing countries engage in agriculture and food supply chains as farmers, labourers, traders and processors. Women, however, are often at a disadvantage compared to men: typically having less access to land and water, less education and formal skills, less time to farm owing to domestic duties, fewer contacts with the world beyond the village, and less influence over use of household resources. Consequently women are likely to produce less from their plots and livestock, not because they are worse farmers, but because they lack inputs and technical knowledge.

Women may also be disadvantaged when dealing with buyers in supply chains. They are often paid less than men as farm labourers, offered lower paid jobs and suffer worse treatment.

Closing gender gaps in agriculture requires: strengthening women's rights to land; giving them better access to inputs, equipment, technical knowledge through appropriate extension, and market information; raising their education and skills; and providing care centres for children. Rural women also have a strong interest in access to services such as education, health, water and sanitation as well as improved living conditions.

Practical steps exist to address this gap, although gender empowerment can be more elusive and over-simplified gender analysis should be avoided.

Many women in developing countries are engaged in agriculture — see Box 2.8 — and associated supply chains: tilling their own and household plots, raising livestock, trading produce, or working as labourers on farms, estates, packing sheds and processing plants. Their role and the policy questions it raises have thus become increasingly important, especially since the early 2000s when interest in agricultural development, above all in Africa, has revived.

33 Indicators for this target have been specified as:
- Ratio of girls to boys in primary, secondary and tertiary education
- Ratio of literate females to males 15–24 years old
- Share of women in wage employment in the non-agricultural sector
- Proportion of seats held by women in national parliament

They not only include indicators of education, but also desired consequences of more female education.

Box 2.8 Women's contribution to agricultural production

It is common to read that women in developing countries, and especially in Africa, produce most of the food. For example:

Women produce between 60 and 80 percent of the food in most developing countries and are responsible for half of the world's food production. (FAO, 1997)

In truth, it is difficult to know how accurate these estimates are. Not only are reliable data lacking on production from women's plots; but also, and more importantly, much farm output results from joint male and female effort, so that to attribute the share to one or other sex is difficult.

But getting the exact figure right perhaps does not matter: the point is that women are heavily engaged in agriculture in many developing countries, as estimates of use of their labour indicate:

Of those women in the least developed countries who report being economically active, 79% of them report agriculture as their primary economic activity. Overall, 48% of the economically active women in the world report that their primary activity is agriculture. (Doss, 2011, drawing on FAOSTAT statistics)

As Doss (2011) argues, what matters is not so much to establish the precise female contribution to farming, as to understand the limitations they face as farmers and, indeed, to understand gender roles and relations in agriculture.

Source: Doss, 2011

Most women as farmers differ from most men in several significant aspects, since compared to men often they have:

- Less access to land and water, while their rights to such resources are often informal and less secure than men's rights, leaving most women farmers more vulnerable to expropriation of their land;
- Less education, lower levels of literacy and numeracy, and sometimes less knowledge of national languages than men;
- Fewer contacts with the world beyond the village, in particular with input suppliers, banks and other financial institutions, providers of technical services, traders, processors and retailers;
- Less influence on decisions over use of household labour, choice of crops on collective fields, and spending of cash incomes. They are also likely to have less access to farm inputs such as manure and fertiliser, equipment, and draught animal power that the household possesses; and,
- Less time to farm since most women are expected to clean, cook, fetch water and fuel, and care for children.

The consequences are clear: where women farm on their own account, they are disadvantaged in access to land, inputs and labour. They are less likely to obtain new technical ideas through formal channels of extension or input dealer advice, and are less likely to have the literacy and numeracy that may be needed to apply new techniques. Hence women are likely to produce less from their plots and livestock, not because they are worse farmers, but because they lack inputs and technical knowledge.

They may also be disadvantaged when dealing with buyers in supply chains, especially the more formal buyers found in the higher-value chains.

Moreover, women as farm labourers are often paid less than men for the same work, or only offered lower paid jobs while men take up positions as skilled workers or supervisors. They may also suffer worse treatment at work and may be more vulnerable to abuse.

In sum, women in agriculture are likely to earn less than men do, either because their own production is limited, or because they cannot sell into high-value chains, or because they are paid less as labourers.

This in itself would be cause for concern, but it matters especially given women's roles as mothers. They are the prime feeders of children and have a major influence on the nutrition of infants during their early years. When women have more income or have more say over the spending of household income, they tend to spend disproportionately on their children who consequently eat, grow and develop better (see, for example, Alkire et al., 2012; CGIAR, 2013).

Key issues for women in agriculture

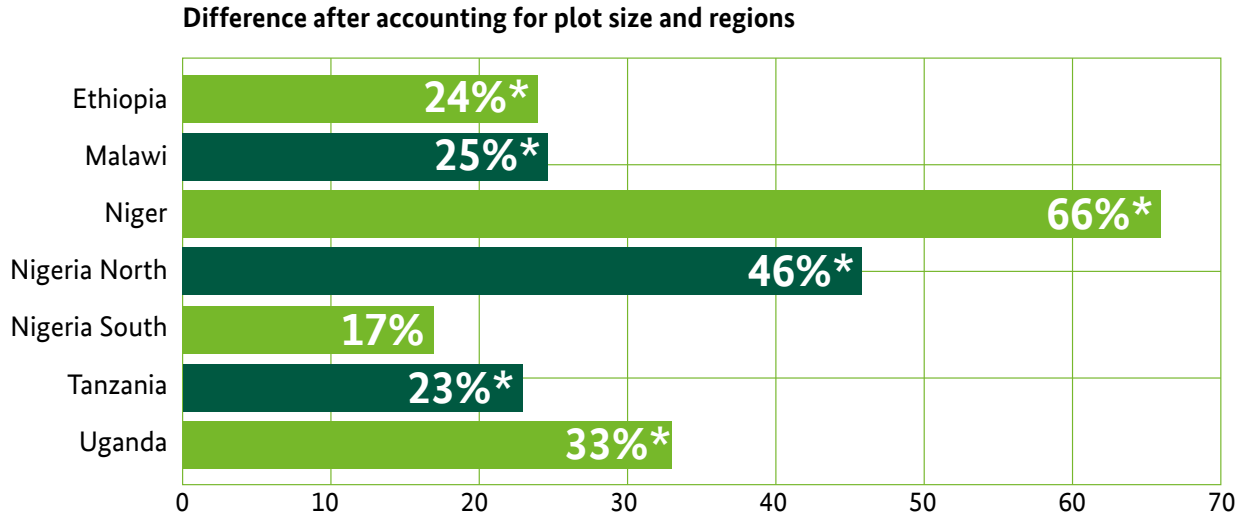
Closing gender gaps in rights to land and water, livestock, access to inputs and credit, agricultural extension

Studies consistently show how women are disadvantaged compared to men in access to natural resources, inputs, finance and technical knowledge (Doss et al., 2013; FAO, 2011; World Bank and ONE, 2014). The consequences are stark differences in the productivity of fields managed by women compared to those managed by men. For example, emerging findings from the Integrated Surveys on Agriculture (ISA) modules now recorded in Living Standards Measurement Studies (LSMS) for six countries in Africa, shows how women obtain between 17% (southern Nigeria) and 66% (Niger) less than men from comparable plots.

Hence, if women had equal access to the means to farm, yields on women's plots should rise by 20% to 30% according to one estimate, an increase sufficient to reduce the number of hungry people worldwide by 150 million (USAID, 2012).

Closing this gender gap requires actions across a wide range of fields, summarised in Table 2.10 (World Bank and ONE 2014). While some options are relatively straightforward, given the political will and associated funding, and hence have been tested and proved, others are potential actions for which tested models do not yet exist. Several of the latter proposals concern providing women with access to credit. As discussed in Section 2.3 *(→see "Developing rural markets", p. 42)*, failings in rural markets are especially severe for financial services, so that closing this gender gap requires progress on a challenging agenda. It also shows, however, that addressing some of these issues will benefit men as well as women.

FIGURE 2.9 GENDER GAPS IN AGRICULTURAL PRODUCTIVITY, AFTER ACCOUNTING FOR PLOT SIZE AND REGIONS



Source: World Bank and ONE, 2014, Figure 1
Note: * denotes statistical significance at the 1% level.

TABLE 2.10 TEN POLICY PRIORITIES FOR NARROWING THE GENDER GAP IN AFRICAN AGRICULTURE

Key Driver	Policy Priority	Policy Option — untested, emerging options in italics
Land	1. Strengthen women's land rights.	Formalise land rights through registration to increase women's tenure security. Expand co-titling and individual titling for women. *Reform family and inheritance law to protect women's rights.*
Labour	2. Improve women's access to hired labour.	Offer women farmers financing to hire farm labour. Task agents with helping women farmers to find labour.
	3. Enhance women's use of tools and equipment that reduce the amount of labour they require on the farm.	Provide women farmers with financing or discounts for hiring or purchasing machinery.
	4. Provide community-based child-care centres.	Provide community-based child-care centres.
Non-Labour Inputs	5. Encourage women farmers to use more, and higher-quality, fertiliser.	Provide women farmers with financing or price discounts aligned with their cash flow to encourage the purchase of fertiliser. *Certify small bags of fertiliser for use by women.*
	6. Increase women's use of improved seeds.	Provide flexible financing for seeds. Help women better identify and obtain good-quality seed.
Information	7. Tailor extension services to women's needs, and leverage social networks to spread agricultural knowledge.	Train extension agents to target female farmers and be more responsive to their agricultural information needs. Bring agricultural training and advice to women's doorsteps through farmer field schools and mobile phone applications. Identify female volunteer farm advisors to spread information within women's social networks.
Access to Markets	8. Promote women's cultivation of high-value/cash crops.	Promote women's cultivation of high-value/cash crops.
	9. Facilitate women's access to and effective participation in markets.	Provide market services through information and communications technologies (ICT). *Channel existing groups to access market opportunities.*
Human Capital	10. Raise education levels of adult female farmers.	Raise education levels of adult female farmers.

Source: World Bank and ONE, 2014, Table 1

The same report argues for creating challenge funds to pilot programmes to support women farmers, as well as to collect data that breaks down statistics by gender so that impacts can be more readily measured.

The wider picture: living conditions for rural women and empowerment

Agriculture is only one dimension affecting the lives of rural women. Rural women have a strong interest in access to services such as education, health, water and sanitation and in their quality. This is partly because most rural women lag behind men in formal education, and partly because better health in the family particularly benefits women as mothers and carers. Electricity and clean stoves might be added, given their potential to save time and improve living conditions for women and girls as housekeepers. Indeed, a 2014 flagship report from UN Women (2014), ***Gender Equality & Sustainable Development,*** stresses that simple, practical advances in access to water, sanitation, electricity and clean stoves could make big differences to the lives of many rural women and girls.

Provision of better rural services is relatively straightforward given political will and funds because proven models exist. Since 1990 some improvements have been seen. More children are going to school, and the differences between girls and boys have narrowed. For example, the ratio of girls to boys enrolled in secondary school — an important indicator of change, given that secondary schooling affects women's marriage, health, fertility and status — increased from 84% to 97% from 1990 to 2012 across the developing world (World Development Indicators, World Bank). Access to safe water and to improved sanitation has increased since 1990, although plenty remains to be done before all have safe drinking water and a decent toilet. As an overall measure of improved living conditions and better health services, in low-income countries the under-five mortality rate has been cut from 166 per 1,000 live births to 1990 to 81 per 1,000 in 2012 (UN, 2014).

Whether such advances amount to significantly greater empowerment is, however, more difficult to determine, as Okali and Keats (2015) observe:

> *Although ... some women, somewhere might have benefitted from the changes identified, it is not possible to say whether any progress identified now will be sustainable, or, possibly more important, 'transformatory' for women and gender relations. ... In searching for evidence of 'good practices', 'economic empowerment', or 'successful interventions', neither the terms nor the criteria to assess them are straightforward. (Okali and Keats, 2015)*

Changes in relations within households are difficult to observe. A Women's Empowerment in Agriculture Index has been devised, but only recently (piloted in 2011) and then only in selected regions of three countries (Alkire et al., 2012). So neither baselines nor trends exist.

Instrumentalist views of gender equity may obscure the goal of deeper change in gender relations:

> *...a privileging of instrumentalist meanings of empowerment associated with efficiency and growth are crowding out more socially transformative meanings associated with rights and collective action... (Eyben and Napier-Moore, 2009)*

They may also divert effort away from political mobilisation for change:

> *In contrast to indigenous notions of empowerment that promised transformation through mobilization and collective action, this alien 'empowerment' is individualist, instrumental, neo-liberal. It peddles in gender myths that sustain an image of the 'good woman' as the deserving object of development assistance. (Cornwall and Anyidoho, 2010)*

The dangers of too narrow a view of gender can be seen in overly simplified gendered analysis where, for example, programmes for gender equality target female-headed households and unwittingly give less attention to the many more rural women who live in male-headed households. The idea of the unitary household where members interact fairly and selflessly has long been recognised as obscuring potential conflicts within the household (for example, Hunt, 1991). But in this realisation lies the opposite danger of assuming that joint ownership and decision-making between men and women will always privilege men and leave women at a disadvantage. This, for example, has spawned the notion that micro-credits for women will often be captured by the men with whom they live, leaving the women with debt and no benefit. Reality, of course, is a great deal more varied (Kabeer, 2001). In addition, an exclusive focus on women can overlook the importance of changes in male roles and their implications for gender relations (Chant, 2003).

Policy issues and conclusions

The disadvantages that women face as farmers are both inefficient and unfair. The responses proposed in Table 2.10 do not require dramatic changes in gender relations: they are more a matter of taking women seriously as farmers capable of raising their productivity given appropriate support. Several of the measures form part of the agenda of making rural markets work better for smallholders *(→see "Rural transitions: when will small-scale farms decline?", p.37).* Reducing the obstacles faced in getting access to inputs, credit, technical knowledge and output markets benefits not just women but also male farmers who lack resources, contacts and capacity. Other measures, such as community childcare, are specific to women. As is the practical agenda put forward by UN Women for water, sanitation, electricity and clean stoves.

These practical steps include both straightforward measures that require little more than political will and funding (e.g. electrification) as well as challenges where finding replicable models will require trials, with careful monitoring of the results — as applies to overcoming failings in rural markets, above all rural finance.

Debates over whether gender equality and empowerment are achieved by incremental measures to improve women's lives, or whether more direct action is needed to transform gender relations, remain intriguing but unresolved.

Further reading:

FAO, 2011, Women in agriculture. Closing the gender gap for development, in The state of food and agriculture 2010/11., Rome: Food and Agriculture Organization of the United Nations

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MEETING THE CHALLENGES OF ENVIRONMENTAL SUSTAINABILITY AND CLIMATE CHANGE

Background: unsustainable agriculture and a changing climate

Remarkable success has been seen since the late 1960s in some parts of the developing world, most notably Asia, in raising agricultural production ahead of population growth. Yet this has been achieved at a cost to the environment. Intensive cultivation typical of the Green Revolution has seen overuse of fertiliser and agrochemicals leading to polluting run-off into watercourses. Irrigation water has been overused and misused: the proliferation of tubewells has drawn down groundwater levels, while some large-scale irrigation schemes have suffered from salination owing to poor drainage. Monocultures of improved cereals, using just a few specialised varieties of maize, rice and wheat, have reduced agricultural biodiversity.

SUMMARY:

Intensification of agriculture over the last fifty more years may have raised production ahead of population growth, but it has come at a cost to the environment. Moreover, continuing greenhouse gas emissions means that the climate is warming and will continue to do so for most of this century. Rising temperatures will also cause more extreme and variable weather patterns, change incidence of pests and diseases, and threaten low-lying coastal lands due to sea level rises.

In some cases, it is in the interests of farmers to adopt new practices to address the costs of environmental damage. In others, needed responses raise trickier questions of collective action, externalities, and lengthy time horizons, made more acute by uncertainty over processes that play out in complex natural systems.

Given uncertainty, some advocate the precautionary principle, but others see this as unduly limiting. Climate change poses special challenges for agricultural policy. While technically agricultural emissions can be reduced, it is more difficult to find ways to reward farmers for doing so, while monitoring and verifying that they continue to mitigate emissions.

'Climate-smart' agriculture in future may see more diverse uses of landscapes not just for economic, but also for social and ecological benefits. More research is needed on processes within both local and global ecosystems. The many current experiments undertaken by NGOs and farmers to change practices need documenting and evaluating..Ways must also be found to monitor, report and verify changed practices of small-scale farmers so that incentives can be paid to them and assistance be provided to those most vulnerable to climate change.

Although intensification of staples production in Green Revolution areas may have limited land expansion, agriculture has expanded in parts of Southeast Asia with abundant tropical forest and in much of Africa and Latin America at the expense of valuable habitats such as tropical forest, peat and wetlands. Reduced fallowing with inadequate soil management has encouraged soil erosion and degradation as nutrients are lost and soil structures worsen (European Report on Development, 2012; MEA, 2005; Rosegrant et al., 2007; TEEB, 2009; UN ADB, 2012).

The effects of environmental harm caused by agriculture can be seen at three levels: those that affect farming itself directly and in the short run; those externalities that affect other sectors, in some cases with processes that take time to feed through environmental systems; and those that deplete stocks of resources for future use, see Table 2.11.

> *Business as usual in our globally interconnected food system will not bring us food security and environmental sustainability. Several converging threats — from climate change, population growth and unsustainable use of resources — are steadily intensifying pressure on humanity and world governments to transform the way food is produced, distributed and consumed. – Commission on Sustainable Agriculture and Climate Change (Beddington et al., 2011, p.3)*

TABLE 2.11 KEY ENVIRONMENTAL ISSUES IN AGRICULTURE

	Water use and management	Soil and nutrient management	Biodiversity, land use change and ecosystem functions
Effect on agriculture	Depletion of water stocks though over-extraction, seen in lower aquifer levels and reduced surface flows Salination of soils from poor drainage	Loss of soil, organic matter and nutrients through erosion and leaching	Loss of agro-ecosystem resilience to disease and pests, and changing climate Reduced nutrient cycling, soil formation when plant biodiversity is reduced
Externalities		Siltation of water through soil erosion Eutrophication due to excessive fertiliser use Reduced quality of groundwater and surface water harms aquatic life, drinking water for humans and animals	Loss of key ecosystems such as tropical forest Loss of livelihoods for forest dwellers Harmed functioning of regional and global eco- systems
Scarcity	Large water withdrawals leading to scarcity for other users, both human use in cities and for industry, as well as in downstream ecosystems	Shrinking global stock of high potential land Reduced reserves of natural gas and minerals used in fertiliser production	Loss of ecosystem services such as nutrient recycling, local and regional climates Loss of amenity, cultural heritage Loss of potential services from lost species

Environmental harm cannot continue unabated and especially if agricultural production has to increase by 70% to meet demand for food by 9 billion expected in 2050 (FAO projection), and if agriculture is to be a prime pathway out of poverty in low income countries (IFAD, 2011). Irrigation water will have to be used more efficiently, both to allow greater areas to be watered as well as to release water for use by industry and cities. If water is to be used by humans, pollution of water courses needs to be reduced. If ecosystem services are to be maintained, most of the remaining tropical forest, peat and wetlands need to be conserved. Agricultural biodiversity needs to be encouraged, not reduced, if agriculture is to be resilient to pests, diseases and changing climate. If most additional increases in agricultural output are to come from higher yields, then soils must be improved rather than degraded.

Moreover, continuing greenhouse gas emissions (GHG) means that the climate is warming and will continue to do so for most of this century.

> *The climate dice are now loaded to a degree that the perceptive person (old enough to remember the climate of 1951–1980) should be able to recognize the existence of climate change. (Hansen et al., 2011, p. 11)*

Warming will not only raise temperatures, but also change rainfall patterns and the incidence of pests and diseases. For agriculture, the main impacts of global warming (modified from Hoffman, 2011) include:

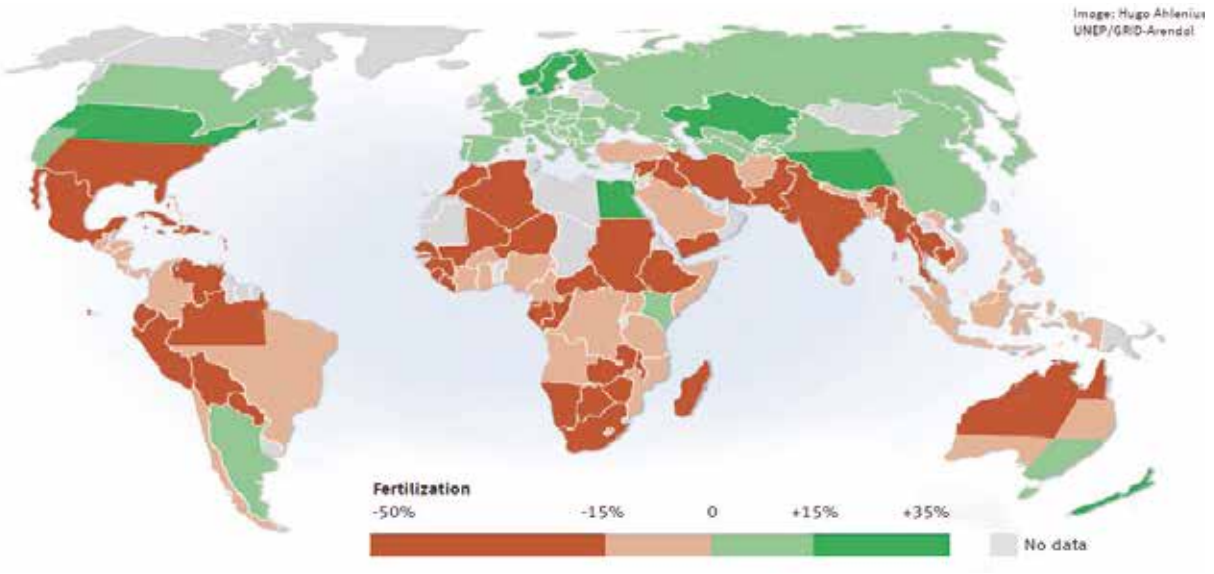
- Higher temperatures affecting the growth and health of plants, animals and farmers;
- Changed rainfall that will reduce the potential of some currently high production areas and irrigation systems, while raising that of other areas;
- Increased variability of weather with longer spells of high heat, dry weather and more frequent storms;
- Changed distribution of pests and diseases exposing crops, livestock and farmers to greater hazards;
- Rise in sea levels leading to more damage from coastal storms and saltwater incursions into low-lying coastal areas including aquaculture ponds; and,
- Higher concentrations of carbon dioxide that may raise productivity of some crops for a time.

Climate change will probably lead both to changes that take place slowly, in some cases with possible and unknown thresholds that may be passed, as well as more frequent extreme events (CDKN, 2012). Although predicting change is difficult, given the complexity of the physical processes underway, global agricultural yields in 2050 could decrease by 20–30% overall, even if some parts of the temperate world could see yield increases. Variability in yields will harm tropical regions and developing countries (see Figure 2.12). In Africa alone, climate change could expose between 75 and 250 million more people to increased water stress by 2020 (World Bank, 2009).

Agriculture is not just a subject of climate change; it also contributes to global warming through farming-related greenhouse gas emissions. Indeed, agriculture accounts for about 13–15% of GHG emissions mainly from nitrogen oxide from fertiliser and methane expelled from ruminant livestock and flooded paddy fields. This figure increases to 30% or more if deforestation and other land use changes associated with agriculture are taken into account.

Hence, faced by a changing climate, agriculture needs both to adapt to such changes as well as to mitigate emissions arising from agriculture. This, of course, needs to be done while at the same time making agriculture environmentally sustainable.

FIGURE 2.12 PROJECTED CHANGES IN AGRICULTURAL PRODUCTION IN 2080 DUE TO CLIMATE CHANGE



Source: Beddington et al., 2011

Policy options

In some cases most environmental harm affects those farmers responsible for causing it, so that it is in their own interests to adopt better practices. Public policy in such cases may be largely provision of information on the problems and responses, as may apply when farmers use more fertiliser and pesticides than they need (IFAD, 2011; FAO, 2012).

But many of the issues associated with both environmental harm and climate change raise trickier policy questions. Collective action is one. Farmers on irrigation schemes can suffer heavy losses to salination, but getting all scheme users to agree to invest in adequate drainage and to use irrigation water carefully can be difficult. Externalities are another problem: the farmer who installs a tubewell may help lower the aquifer raising costs to many other users, but gains net benefit. Climate change is the biggest externality of all, where the actions of millions across the world impose costs on others. Perhaps even more important with climate are the time horizons involved: actions today will create costs in the future, leading to difficult choices between immediate benefits and future costs. Finally, to complicate matters still further, the full cost of climate and environmental change are often uncertain. This tempts policy-makers, citizens and farmers to discount potential future costs.

These complications mean that governments need to act both individually and in agreement with each other to deal current and future environmental issues, above all climate change, which transcend national boundaries and very probably will affect future generations. Potential responses include regulation, economic incentives and the creation of new markets.

Regulation

Regulations on use of resources have the advantage of making it clear to all what is prohibited and where the limits lie. They may also have low public costs. They are particularly indicated where thresholds may be crossed when economic incentives are used, as users unwittingly push natural systems too far. Thresholds may see systems switch to new states getting out of which is difficult, costly or even impossible.

The chief problem is policing and enforcing regulations, especially where the causes arise from the actions of many actors spread over the landscape — as often applies with agriculture. For example, it is one thing to regulate the use of groundwater, but another to check and enforce compliance by the thousands of farmers who may be abstracting water from an aquifer.

Economic incentives

Some inputs or resources may be subsidised, leading farmers to use them excessively, resulting in waste and high pollution. Subsidised irrigation, energy and fertilisers are examples. Increasing prices to reflect market values can lead to lower use and subsequently less waste, and also tilt practices towards diversified cropping systems which require fewer inputs (World Bank, 2007).

An ideal corrective for externalities, taxes and subsidies may be used to ensure that individual actors pay for any harm they do to others through taxes — or where they generate benefits for others, they receive a subsidy. Payments for Environmental Services are a prominent example of the latter. Farmers are paid to manage their land to supply ecosystem services such as clean water and biodiversity. Such schemes include payments for afforestation and forest conservation in developing countries such as China, Costa Rica and Mexico, as well as soil conservation in the USA.

Incentives are attractive since they do not involve compulsion, and allow producers to respond flexibly and efficiently to the incentives. Setting values for ecosystem services can be difficult, however. Assessing responses to taxes and subsidies is not easy either. Some schemes, such as paying for environmental services, may be difficult to monitor, report and verify compliance (Power, 2010)

Creating markets

Where externalities apply, assigning property rights can lead to a market being created where different parties can then bargain to arrive at an optimal outcome. A prime example is carbon emissions. If all potential emitters are given a quota for emissions, the quotas summing to a sustainable level of emissions, then carbon can be traded: bought in by those with heavy emissions, sold by those with low emissions, with offsets entering the markets from those with forests and other assets where carbon is stored. When those emitting are large industries, located at just a few observable points — think large power stations — such schemes may work: when emitters and storers are many and scattered across the land, then monitoring, reporting and verifying emissions and storage can be difficult.

Some object fundamentally to the use of economic incentives and markets. They fear that largely public goods become private commodities that will then be traded to the advantage of the rich at the expense of the poor, in which the rich do not have to modify their behaviour while the poor do. Concern has been most vocal for water — access to which is often seen as a right — and carbon, where initiatives to create markets are most advanced.

Uncertainties and values

It is hard to design policy when environmental processes and their eventual outcomes are imperfectly understood and so uncertain: biodiversity, services from ecosystems and climate change all fall in this category. How much disruption ecosystems can tolerate to maintain critical population limits and functions, and how much disruption specific practices inflict is often unclear, making a ranking of practices by their sustainability difficult (Phalan, Balmford, Green & Scharlemann, 2011).

Given uncertainty, some argue for the precautionary principle of not taking the risk of what might turn out to be environmentally disastrous — especially if some threshold is inadvertently breached. Others see this as too cautious, imposing high costs on society to avert what may be very small risks.

Differing opinions on the values of systems also affect these debates. Some view ecosystems as the sum of their functions and services, and feel that as long as a specific function can be sustained by some means, it does not matter if the ecosystem is perturbed — which might, for example, mean the loss of a species or an attractive landscape. Others rank the features inherent to ecosystems more highly on grounds of cultural heritage, uniqueness or aesthetics, arguing that ecosystems should be preserved for their own sake. Linked to this are questions surrounding what to measure for ecosystem services and how. Which key species or features of ecosystems indicate overall health (MEA, 2005)?

For agriculture, a key uncertainty is how alternative agricultures may perform when adopted widely. Can proposed ecologically-friendly practices deliver adequate amounts of food, now and in the future? Some argue that less intense farming can produce all the food needed since yields are comparable with conventional, higher-input farming (Pretty, 2007). Others are less convinced, criticising the methods of studies that show ecological agriculture meeting production goals (Phalan, Balmford, Green & Scharlemann, 2011). For those who believe that environmental sustainability may conflict with production goals, technologies urgently have to be developed to deliver high yields while economising on inputs (FAO, 2012).

Uncertainty over the productive potential of various practices, and over biodiversity loss and ecosystem degradation, fuels a further debate on whether policy should take a 'land sparing' or 'land sharing' approach. Land sparing proponents advocate intensifying agricultural practices in a confined area, leaving more land available for habitat. Land-sharing proponents advocate practicing agriculture on a wider scale, but incorporating wildlife-friendly practices into farming systems (Foresight, 2011).

Mitigation of emissions from agriculture

Climate change poses special challenges for agricultural policy. One is that of how to mitigate (reduce) GHG emissions from farming. Technically emissions from agricultural land and livestock may be curbed by the following measures:

- Improved management of crops and water to reduce nitrogen oxides from fertiliser and methane from flooded fields;
- Switch meat production from ruminant to non-ruminant livestock to cut methane emissions; and,
- Use agro-forestry and no-till farming to capture carbon in soils and trees.

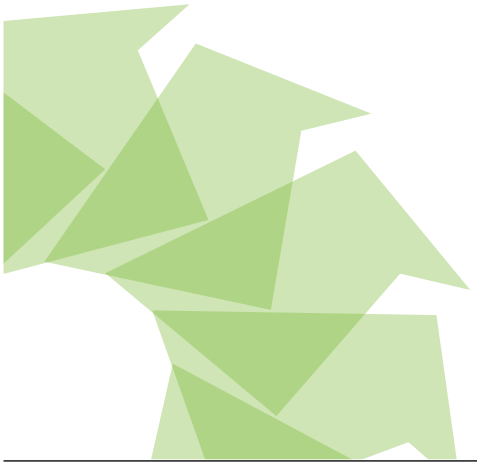
In addition, less transport and processing in food chains, and less waste of food by (well-off) consumers could also stem emissions within the food system as a whole.

More research is needed on how emissions can best, and most economically, be reduced. Rewarding farmers and herders for lower emissions from their lands and herds poses additional challenges: monitoring, reporting and verifying what they have done is difficult. Assuming, of course, that the political will exists to pay for mitigation in the first place (Tubiello, 2011). The dream would be to find farming systems that not only emit less and store more carbon, but which also raise productivity and returns to farming. Where, as applies in much of Africa, current farming has low productivity of both land and labour, advances in agro-forestry may just produce such win-win systems. But that would probably not apply to the highly-intensively farmed lands from which much of Asia's farm output comes.

Adaptation and resilience to future change

Regardless of how successful mitigation of emissions may be, it is almost certain that the world will see further warming this century; and consequently changing climates. Hence agriculture will need to adapt. That much is certain: the detail, however, is much less well known.

The consequences of climate change for any given farming system are known only in the broadest terms: warmer climate, more variability, higher sea levels — often whether more or less rain will fall is not known. How best to adapt is not known either. With so many uncertainties, a resilience approach has emerged, where changes may involve on-farm adaptation, generation of off-farm activities and seasonal migration to allow flexible responses to changed and more variable weather. Anticipation of weather may be improved by better forecasts. New forms of insurance, such as payments based on rainfall indices rather than actual damage, have been piloted with some promise.



So far, not much has been done to prepare for adaptation, although governments and donors are well aware that action will be needed. In areas of dryland farming, as applies across much of Africa, fears of increased droughts may boost efforts for irrigation and better management of soil moisture.

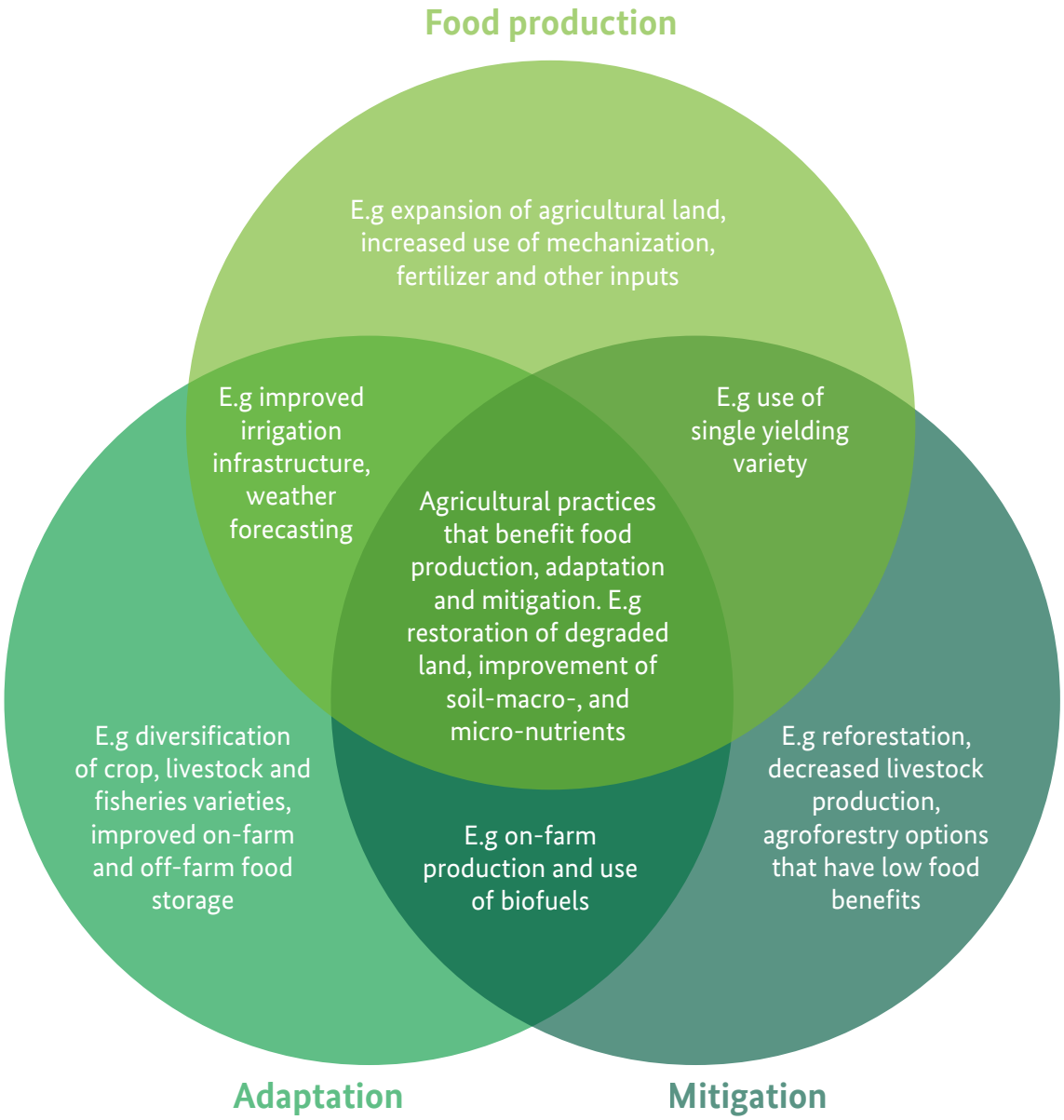
Wider impacts of climate change on food supply chains are equally uncertain. Climate change may also see more people leave agriculture and look for jobs in urban areas. Less thought has been given to such effects than to those on farming itself.

'Climate-smart agriculture' and the triple win

Policy-makers concerned over climate change talk of 'climate-smart agriculture' (Lipper, 2014; Grist, 2015). They envisage an agriculture that is not only productive but also responsive and proactive to climate change, both in adaptation and mitigation (Figure 2.13), by incorporating new or enhanced practices on farms. Meetings of donors and international organisations interested in agricultural development in the 2010s have embraced the concept. To date, agriculture has not however been given much attention in mainstream climate change negotiations, for example at the level of the UNFCCC, hampering access to sufficient climate finance.

Some suggest that an approach to ***climate-smart landscapes*** might acknowledge agriculture's place within the wider landscape. A diversity of land use approaches might be used to provide resilience, managing land uses at the landscape scale for social, economic and ecological benefits (Scherr, 2012). This approach also responds to concerns that environmental issues such as biodiversity loss and land degradation might be eclipsed by climate change concerns (MEA, 2005). Practices for sustainable agriculture may be the best way to respond to climate change: transforming of the high-input specialised farming into a landscape 'mosaic of sustainable agricultural production methods' (IFAD, 2011; Hoffman, 2011).

FIGURE 2.13 OVERLAPPING CONCERNS: FOOD PRODUCTION, ADAPTATION AND MITIGATION



Source: Campbell et al., 2011

Environmental challenges for agriculture: policy issues and conclusions

Although most stakeholders in agriculture are aware that business cannot proceed as usual and that agriculture has to become environmentally sustainable and climate-smart, uncertainty surrounds some of the main problems and potential responses.

Three priorities are evident:

- More research is needed on processes within both local ecosystems and within world ecosystems to reduce uncertainty and provide a better understanding of the challenges faced;
- Equally more needs to be done to find viable responses. Some of this requires new research, but more could be done to document the many trial experiences around the world where NGOs and farmers have experimented with changed practices for sustainability and resilience. A particular need is to find ways to monitor, report and verify changed practices of small-scale farmers so that incentives can be paid to encourage sustainable, climate-smart practices; and,
- Developing specific programmes and policies to assist populations and sectors most vulnerable to climate changes and food insecurity. This includes creating and supporting safety nets, including establishing emergency food reserves and financing to deliver rapid humanitarian responses, and generally to help vulnerable populations in all countries become food secure.

[Adapted from Commission on Sustainable Agriculture and Climate Change (March 2012)]

More broadly, sustainable agriculture should be part of food systems that supply safe, nutritious food; that eradicate malnutrition; and that encourage healthy diets without obesity. These goals, of course, are not so easily met. But it has to be possible to improve on current systems where more than 800 million are undernourished, while many more are overweight and obese leaving them vulnerable to disease, disability and premature death — and all within food systems that are environmentally unsustainable. Complete answers may be elusive, but enough is clear to see some improvements if sufficient political will to act can be mustered.

Further reading:

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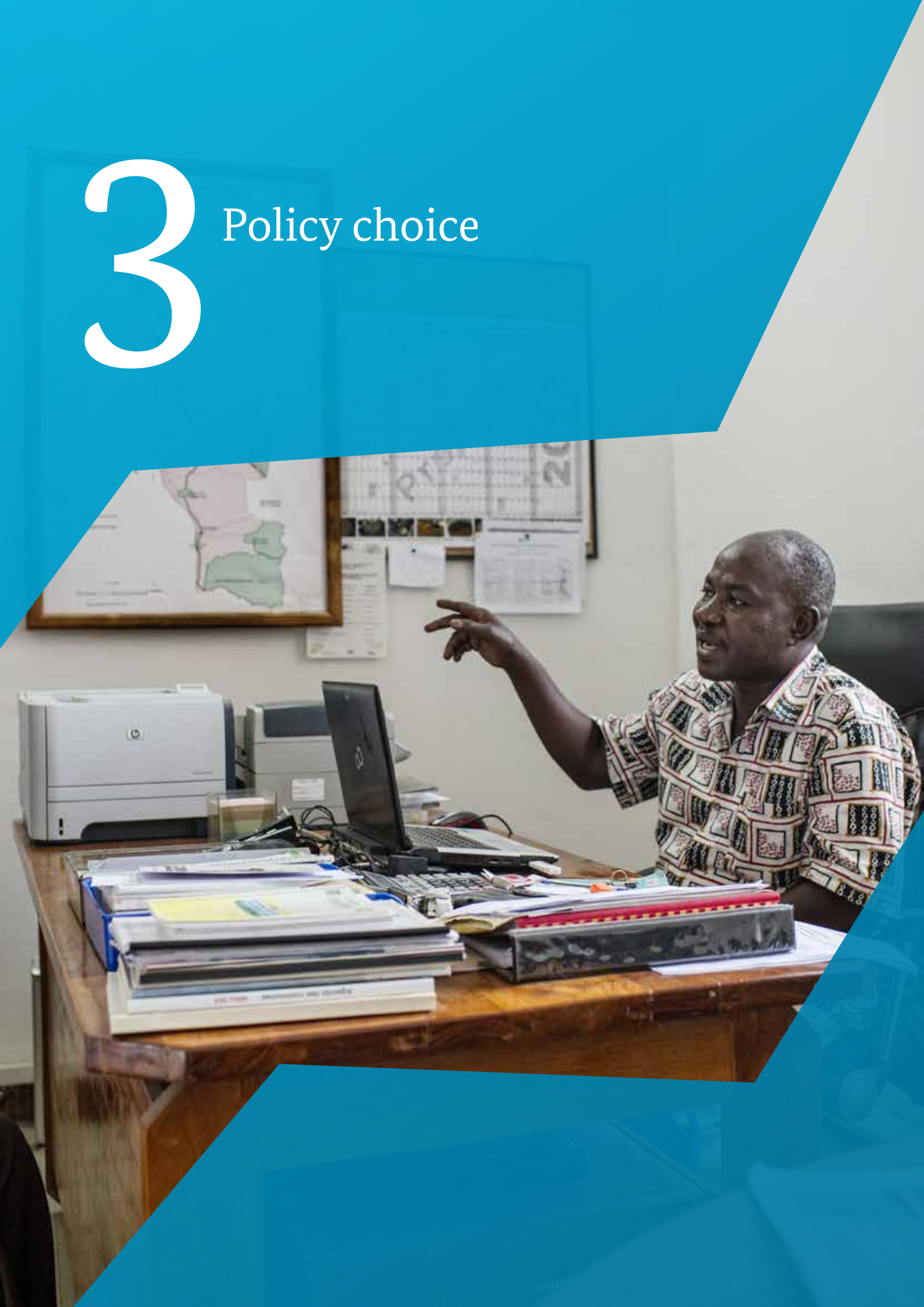
3 Policy choice



Nowadays, 'conventional' questions of development assistance, such as macroeconomic policy choices, investment priorities, and trade reforms, compete with, and are cast within, a broader set of concerns about governance, regulation, corruption, and the institutional foundations of policy. (Adam & Dercon, 2009)

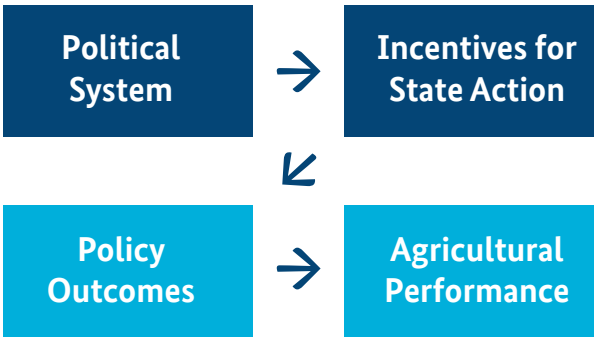
It is one thing to analyse technical and economic dimensions of the challenges of agricultural development; another to make policy and to implement it effectively and equitably. This would apply to any sector, but it may be all the more important for agriculture where choices made across the world often defy technical justification and have had strong repercussions on agricultural performance.

This section, therefore, reviews some of the major findings of political economy literature on agricultural policy-making. Political economy may be defined as "the social science that deals with political science and economics as a unified subject; the study of the interrelationships between political and economic processes"[34].

In practice, this often translates into the study of "how political forces affect the choice of economic policies, especially as to distributional conflicts and political institutions" [35].

This latter definition assumes that the "causality" in "the interrelationships between political and economic processes" is primarily one-way, i.e. from politics to economic policies, as in Figure 3.1. However, political economy analysis also considers how the structure of the economy and the limitations of budgets shape and constrain politics.

FIGURE 3.1
STATE INCENTIVES AND AGRICULTURAL POLICY



Source:
http://www.future-agricultures.org/projects/peapa

Figure 3.1 illustrates a major pathway through which political forces affect agricultural performance, especially in economies where agricultural production is dominated by smallholders who are heavily dependent on the provision of public goods and services if they are to raise their productivity and access markets on beneficial terms. Political will – either to invest in the direct provision of such services or to promote the co-ordination of private investments so that they are delivered – is often treated as something of a "black box", the contents of which are very important but not understood. However, analysis of political systems can shed light on why some states are motivated to deliver supportive policies and services to farmers and others are not.

A second major pathway through which political forces affect agricultural performance is via the direct engagement of interest groups on processes of policy formation. Both of these pathways are considered below.

34 http://www.thefreedictionary.com/political+economy
35 http://en.wikipedia.org/wiki/Political_economy

3.1 THE CHALLENGE OF AGRICULTURAL POLICY-MAKING AND IMPLEMENTATION

Agriculture intersects with an unusually large and growing range of public concerns. In low-income countries agriculture employs much of the workforce, produces one quarter or more of GDP, often generates most exports, and is central to economic growth. Many of those working on farms are poor and hungry, since labour productivity in agriculture is often low. Because farming operates over large areas, regional and environmental matters become agricultural issues. Consequently, a wide range of objectives are commonly invested in agricultural and rural development: economic growth and export earnings; poverty alleviation, employment, equality, gender fairness, food and nutrition security; environmental conservation; and regional equity. Discussions over priorities and trade-offs can thus be long and difficult to resolve.

Agriculture is moreover largely carried out by private enterprises, mainly in the form of small, family-operated farms. They face difficulties when interacting with other actors in the supply chain, especially in finance and insurance, owing to high costs of information that raise transactions costs *(→see "Failings in rural markets", p.42)*. In short, these are market failures that are not simple to remedy.

Faced by these challenges, political direction and administration for agricultural policy can be weak and unfocused. Politically, in many developing countries and especially in low-income countries, rural populations are not well organised to promote their interests. Only rural elites commonly have influence, with the danger that they seek from the state private goods for their personal benefit or for their immediate clients, rather than demanding effective delivery of public goods that would have broader benefit. Administratively, responsibilities for providing the public goods and services to support agriculture are spread over several ministries and agencies of which the ministry of agriculture is only one. Some of the more important and costly public goods, such as rural roads, education, health and clean water, are provided by other ministries.

Combine these factors and it is easy to see that agricultural policy-making can be difficult, with considerable scope for inconsistent and contradictory policy. This, however, does not mean that policy cannot be highly effective. When, in the mid-1960s, it seemed that only the application of new agricultural technology would save Asia from Malthusian famine, public administrations in the region put together programmes that met the challenge. What made the difference at the time? Leaders gave their full support to implementing the Green Revolution and granted the budgets necessary.

3.2 POLITICAL CHOICE AND VALUES

Surprising choices in agricultural policy

The record of agricultural policy-making presents paradoxes. In developing countries where so many are engaged in farming and where agriculture makes up a significant share of output, governments have often taxed agriculture heavily — and especially those activities in which they have the strongest comparative advantage, such as export crops. Such policies have often slowed down agricultural growth and rural poverty alleviation, and given the importance of agriculture, they have put a brake on overall national development. Yet the political logic of these policies is also evident: where will the state obtain resources, if not from taxing farming? Moreover, of all the groups in society able to express their discontent with taxation, unorganised smallholders are often the least powerful group.

Some developing countries have been aware of the potential harm of heavy taxing of agriculture. The temptation is then to compensate farmers by offering subsidies on inputs and finance. All too often larger farmers, richer and more politically powerful, have benefited disproportionately from these. In some cases subsidies have distorted factor prices, and led to inappropriate technical change; as for example, when subsidies to capital investment on farms has led to mechanisation in countries where there is abundant landless rural labour.

Meanwhile in OECD countries where farmers are few and farming contributes only a small share of GDP, support to agriculture has been lavish. While low farm incomes are usually the justification for the support, this has often been linked to levels of production through price supports, so that most of it has ended up in the hands of larger farmers who do not have low incomes. Generous support to OECD farming has stimulated production to levels where governments have intervened to prevent this from depressing domestic prices, with subsidies to exports being the most contentious measure used. Subsidised exports have then pushed down world prices for commodities such as beef and dairy, thereby reducing the prices on domestic markets for developing world producers.

Given that these choices would be unlikely if efficiency were the criterion used, it is clear that they follow a political logic rather than an economic one. So how might such political choices be understood?

Understanding agricultural policy choices[36]

Political choices are made by those who have power; hence policy choices are often seen as resulting from the balance of power exercised by groups in society. These may variously be leaders and ruling elites that (for the moment) control the state, the agencies of government ('the bureaucracy'), private enterprises lobbying individually or in groups, other substantial economic interest groups such as landlords, and citizens organised by ethnicity, religion, political preference or economic interest in associations, parties and movements.

Analysis may be as simple as examining the power of the different groups and explaining choices as representing the interests of the most powerful groups. Hence, for example, the heavy support for agriculture in OECD countries may be attributed to the formation of well-organised farm lobbies that focus on agricultural policy with little opposition, since consumer interests are more diverse and less well focused even if there are many more consumers than farmers. In developing countries the reverse conditions often apply: urban consumers are able to make their voices heard, even if only through urban rioting, while the many more farmers are too dispersed across the countryside and lack resources to organise to advance their interests.

But such analysis rapidly reaches its limits. One objection is that while powerful groups may decide policy, they do not always decide in favour of their own short-term interests or those of their supporters. They may recognise that advantages seized in the short term may be at the expense of longer-term goals. This applies especially with economic growth and development, where long-term prosperity is likely to be gained by investment and hence by curtailing consumption in the short term. Leaders may also recognise that short-term advantage may be at the expense of longer-term political and social stability. A key question then concerns the conditions under which political leaders will be both able and incentivised to pursue longer term and genuinely "national" goals (see below).

36 This section draws on the work of Bates 1989, Berry 1993a & 1993b, Binswanger & Deininger 1997, Birner & Resnick 2010, Booth & Therkildsen 2012, Henley & van Donge 2012, Mahoney 2001, Moore 1966.

A second objection is that analysis needs to go deeper to understand how groups form and become powerful. A host of factors may influence this, ranging from the nature of the main economic activities — can they be carried out by small enterprises, or do they require the co-ordination of larger groups? — to economic and social inequalities, institutions such as property rights, the influence of ideas and the personal power of leaders who capture the popular imagination. Moreover, the very exercise of power itself will influence the distribution of power in the future, so that history may be path dependent, in which decisions made at critical moments come to influence power and hence affect further rounds of decisions for decades. Property rights and the degree to which they confer assets and economic advantage unequally between owners of land, water and mineral rights and those who lacking access end up working as employees of the owners, often play a critical role in accounts that see the present as highly dependent on decisions taken in the past.[37]

It is no surprise, then, that attempts to explain choices veer between the poles of having simple theories that may offer powerful insights, but which are often too crude to capture the reality; or, alternatively, explaining choices in particular circumstances taking account of all factors that apply, but since they are often so many, no generalised insight is possible. No single theory has emerged from history or political science that offers a simplified understanding of political choice.

Frameworks that indicate the (many) factors that may lead to policy choices are seemingly the current limits of generalised understanding.

Influencing political choices: the search for good governance

Faced by these complexities, it may be better to accept that universal explanations may be impossible and to direct attention to dealing with current realities. Hence some look to identify models of government that are likely to produce political choices that avoid conflict, economic crises and gross social inequality; and that instead lead to reasonably equitable and sustainable economic and social development. This has led to much interest in 'good governance' as a foundation for development: what it may be and how it may be achieved.

> *Getting good governance calls for improvements that touch virtually all aspects of the public sector—from institutions that set the rules of the game for economic and political interaction, to decision-making structures that determine priorities among public problems and allocate resources to respond to them, to organizations that manage administrative systems and deliver goods and services to citizens, to human resources that staff government bureaucracies, to the interface of officials and citizens in political and bureaucratic arenas. (Grindle, 2004, p. 525–526)*

Good governance can be shown to lead to better development outcomes, but since it embraces so many aspects of government this should not be surprising. The problem, as Grindle (2004, 2007) explains, is that practice can be reduced to the unhelpful compilation of long lists of conditions that constitute good governance; that then become the basis of advice to developing countries, or even conditions for the supply of aid and development finance. Yet historically the successful development of Southeast and East Asian states has been achieved despite having considerable shortcomings in their governance (Chang, 2003); as of course did many OECD countries at the time they industrialised.

This has led to a search for the more modest conditions of 'good enough' governance: those which are necessary and sufficient to drive economic growth and development. Yet even this may be elusive, since it seems that what has worked in particular cases has been so embedded in local circumstances — Grindle (2007) indicates five different archetypes of polities — that it is far from clear that institutions, forms of government, political processes and so on can be transferred from one context to another. Principles may be clear, but then the question of how they may be adapted to other contexts remains to be defined — and answers may be neither straightforward nor simple to identify.

37 A striking example of how this applies can be found in a recent analysis of the political economy of Bolivia where decisions taken in the late sixteenth century by the Viceroy Toledo sitting in Lima are traced through as having a major influence on Bolivia in the later twentieth century (Laserna, 2005).

A focus of much political economy literature (for example, Khan, 2000; Drazen, 2008,; North et al., 2009; Acemoglu and Robinson, 2013) is the distribution of 'rents'[38] through the official and unofficial actions of those in control of the state. On the one hand, politicians may ensure that rents benefit their supporters – voters, financial backers and other opinion formers – in exchange for their support. On the other hand, if the distribution of rents is too skewed towards particular groups, it may provoke political instability. Both North et al. (2009) and Acemoglu and Robinson (2013) emphasise that in many societies political and economic power is highly concentrated. Thus, political power is used to generate economic rents for a small elite, which in turn can be used to reinforce their control over political power, as few others have the resources necessary to challenge them. Under such circumstances, the prospects for pro-poor policy are limited, whatever official pronouncements say. Poor groups will benefit primarily as a by-product of policies designed first and foremost to benefit the elite. Things will change only as the existing elite perceive the need for some sort of support from non-elite groups: typically in times of crisis (when their legitimacy is called into question) and/or at times of heightened competition between nations or amongst elite groups within a nation. At these junctures, the non-elite groups may demand a greater say in decision making and/or greater checks and balances over the exercise of power, thereby gradually stimulating a more open policy process and more egalitarian policy outcomes over time. In this analysis, good governance is as much the product of the development process as a driver of it. These insights can be applied at sectoral level as well as to national development processes.

Finding opportunities for reform

In the foregoing analysis, substantive change in institutions and/or policy may only be possible infrequently, when political conditions are such that significant reforms can be enacted. Typically 'windows of opportunity' for reform open when crises are sufficient to convince leaders and citizens that significant changes are needed. Fiscal crises, since they affect the ability of the state to act, can be particularly powerful stimuli to change.[39]

Perhaps more important than recognising that reforms are only possible under infrequent conditions are the questions of what may then allow reforms to be undertaken when the windows open. What political groupings may then be able to influence choices? For agricultural and rural development it is taken as more or less axiomatic that it is desirable to have the rural majority organised for a more effective voice. However, this is obviously difficult and it may not even be sufficient. Some farmer groupings that have considerable control over the rural vote have been able to extract subsidies from political leaders with scant regard to whether or not these may be the best use of public funds to support agricultural development: India is the most prominent example.

Another question is what evidence may be useful to inform public debates on those occasions when major changes are possible. That has led to an interest in encouraging and funding the establishment of local think-tanks to generate such evidence.

Democratisation and agricultural policy in Africa

Heavy taxation of African agriculture to satisfy urban interests, sustained by a combination of political repression and selective subsidies to rural elites, was a common characteristic of the two decades prior to structural adjustment in Africa (Bates, 1981), which was also characterised by autocratic political systems. With a return to democratisation since the 1990s, one may expect the interests of the rural electorate – the majority in many countries – to command more attention from politicians. However, whether this translates into policy that is more supportive of smallholder agriculture depends in part on what voters exchange their votes for. Ethnic allegiance and patron-client linkages remain strong, whilst few grass-roots organisations advocating sound policy and investment for the agricultural sector yet exist.

38 Rents are here defined as the super-normal returns (in excess of opportunity costs) that an individual or firm obtains from a particular activity as a result of a particular policy intervention.
39 Historically in Europe when kings and princes needed finances to cover the costs of wars or ambitious constructions, they sometimes then had to admit more democracy to gain approval for new taxes.

Meanwhile, on the supply side, politicians want to be seen to deliver quick and tangible benefits to voters – consistent with established patterns of patronage politics – so input subsidies have emerged as a popular policy intervention. Whilst there is some evidence that voters learn over time to prioritise a track record for growth over electoral handouts, the incentives for politicians to invest in key agricultural public goods (for example, research and extension systems and state capacity for better policy-making and implementation) often remain weak (Poulton, 2014). There are two main reasons for this:

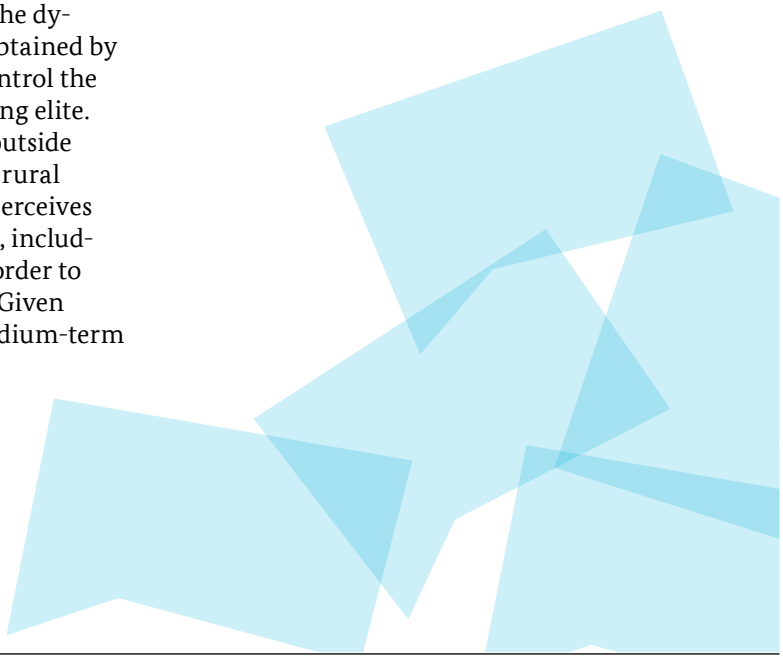
- Firstly, public goods are, by their nature, open to all, or at least to many. By contrast, the logic of a political system characterised by clientelism (Kitschelt and Wilkinson, 2007) is to differentiate between supporters and opponents in the delivery of services and benefits, so as to provide incentives for loyalty to the government.
- Secondly, whilst investment in public goods is widely accepted as being the most efficient way of stimulating economic (including agricultural) growth, the pay-off to such investment – whether infrastructural or institutional – tends to be medium-term. Voters may not perceive many of the ultimate benefits within one electoral cycle. Where fierce political competition causes governments to focus myopically on achieving re-election in 4-5 years, investment in public goods may seem like a luxury that they cannot afford.

By contrast, a small number of African countries, including Ethiopia and Rwanda, appear to exhibit dynamics that have more in common with twentieth century East Asian states than with the dynamics just described. Here power was obtained by force, and discipline can be exerted to control the competition for rents within the governing elite. At the same time, credible threats from outside that elite, with latent support within the rural population, mean that the government perceives that it has to deliver broad-based growth, including smallholder agricultural growth, in order to acquire legitimacy and maintain power. Given restrictions on political competition, medium-term performance is thus a greater preoccupation for these governments that the exigencies of winning the next election. These conditions are conducive to investment in agricultural public goods – for example, large-scale programmes for soil and water conservation, and extension services – and also stimulate a focus on policy outcomes and learning, things that are conspicuously lacking in many African countries (Booth and Golooba-Mutebi, 2014; Berhanu and Poulton, 2014).

Conclusions on political choice

One lesson is clear from this: that politics matter, that attempts to devise optimal policies for agriculture that ignore political calculations are unlikely to succeed. Beyond that, the search for explanation of policy choice, for better governance, windows of opportunity and the groupings and evidence that may contribute to better policy-making has produced a wealth of interesting accounts, some principles, but few lessons that have general application.

Yet if this work at least directs donors and international NGOs to take politics and policy choice into account, to recognise their importance, then it has perhaps served a useful purpose.



3.3 POLICY COHERENCE, CO-ORDINATION AND EFFECTIVE AID

Policy coherence, that is ensuring that policies do not contradict or undermine one another and that as far as possible policies are complementary and create synergies, has become a major concern in agricultural policy-making. The best-known dimension of coherence is consistency between aid and other policies, such as those governing trade, security, immigration, (domestic) agriculture and fisheries. Civil society has long campaigned over cases where policies of the European Union (EU) and the member states for trade, domestic agriculture and fisheries have undermined development efforts.

Other dimensions include the internal consistency of aid programmes of development partners, across different sectors and issues, and between countries; co-ordination across aid programmes of different development partners; and alignment of aid programmes with the national policies and programmes of developing countries. Efforts to improve these have been formally recognised in the Paris Declaration (2005) that set out five principles, namely: country ownership of development strategies; alignment of development partners behind these objectives and local systems; harmonisation, co-ordination and simplification of donor procedures; a focus on results and their measurement; and mutual accountability of developing countries and their partners for these results.[40]

At national level, the drive for more focused plans that development partners can finance has seen the use of instruments such as Poverty Reduction Strategies, Sector Wide Approaches (SWAp), National Donor Partnership Strategies and Joint Assistance Plans, as well as a set of Fragile State Principles all intended to strengthen the planning and co-ordination capacities of partner states.

Progress on coherence and challenges for policy-making

A 2011 review of the issues of policy coherence for agricultural development (Wiggins et al., 2011) reached the following conclusions:

1. The main concern in policy coherence, both for development agencies and for governments of developing countries, is conflict between aid and non-aid policies — where the main inconsistency is between trade and aid policies;

2. While progress on some of the Paris Principles has been achieved, how much further efforts to follow the Paris principles would contribute much to aid effectiveness was in doubt. At first sight, aid-funded programmes for agricultural and rural development appeared to be aligned with national priorities. Yet that was only so formally, since national strategies tend not to make choices and set priorities, but rather set all-embracing goals that would allow all kinds of programmes and policies to be part of the strategy. Country ownership of aid programmes was thus limited.

3. In the absence of clearer priority setting, development policies and programmes proliferate. Competition, duplication and overlapping result, exacerbated by the tendency for new policies and programmes to emerge while older ones are rarely retired. Fundamental issues affecting agricultural development can thus be obscured by less important concerns, with resources dissipated. Moreover, when agriculture lacks a sharp focus it may lose out when competing for budgets with public spending for sectors with clear priorities.

   Two factors may explain this. One is the relative complexity of agricultural development set out above. With so many potential objectives, opinions based on values can differ over priorities, while additional debates, largely technical judgments, exist over the means to achieve them. Fragmented, contested and changing policy can result.

   Two, politically, rural interests typically often lose out to those of urban voters, while administratively, responsibility for agricultural and rural development is usually split across several agencies. The ministry of agriculture is just one, and usually lacks the prestige, power and budget to direct the other agencies. Public agencies, moreover, lack capacity, especially in agriculture in Africa, where the cuts made in the 1980s and 1990s under structural adjustment led to loss of key staff. Low capacity then limits the ability to carry out the analyses that might help make strategic choices. It also reduces the ability to deliver services, make investments, and operate public infrastructure.

40 These were reinforced in 2008 by the Accra Agenda for Action that aims for greater predictability of donor commitments, use of country systems to deliver aid, switching from donor conditions to those of the country and untying aid from donor country procurement.

4. The last point should, however, not be overplayed. Cases reviewed show successes where the common element is the way in which stakeholders have been brought together to form interest groups determined enough to see agreed programmes through to a successful outcome. Interest groups coalesced around crises or strong opportunities and prospered when tangible gains were apparent, preferably with some in the short run. Such interest groups were more effective when they only included those with a significant stake in the outcomes. Participation has to be limited if costs of co-ordination are to be kept down. Continuity of aims, purpose and resources marked success, for which leadership and short-term gains helped.

Implications for co-ordination and policy-making

These findings reinforce the importance of recognising the political dimensions of policy choice, and the corresponding limits to formal planning as a technical exercise. The Paris Principles can be applied narrowly, with a focus on the letter rather than the spirit of the declaration. The result can be plethora of formal documents, with matching committees and stakeholder forums that do not necessarily contribute much to outcomes, since they are not always linked to the forums in which key decisions are taken.

The road to better practice may be neither clear nor certain, but there are signposts. To begin, it is unlikely that co-ordination alone will make a difference. Capacity building in the form of training is not enough. What is often lacking is a countervailing constituency, made up of the rural majority on low incomes, to self-serving elites and narrow interests that demands effective delivery of goods and services. In the long run, the ability of rural civil society to hold leaders and public agencies accountable has to be built. Building coalitions of stakeholders around identified issues helps.

The implication is that processes matter, some of which will take time to come to fruition, and hence patience and a vision of the longer run goals are necessary. Development agencies need to engage with such processes when appropriate, recognising where some support to allow deliberation or to generate evidence can make a difference. It means having field staff who recognise these issues, as well as being prepared to make long-term commitments to working with local partners.

Competitive elections within patronage-driven political systems generate immense pressures for politicians to deliver tangible, short-term benefits to voters. One key function of donor agencies should be to make the case for longer-term investment in public goods, even using their control of funds and relative insulation from domestic political pressures to prioritise such investments, especially where alliances with local technocrats can enhance their effectiveness. In this regard, increasing political and bureaucratic pressures to demonstrate (short-term) impact of aid programmes within donor nations threaten to undermine the ability of donor support to the agricultural sector to perform this role.

Development agencies may be able to improve agricultural policy-making by helping resolve differences of values and reducing uncertainty over technical issues. Competing values can be addressed through debate and dialogue: seeking to bring stakeholders with differing perspectives together to establish common ground and to see where compromises can be made.

For technical uncertainty, more study and analysis is indicated. While there may be few shortcuts to better understanding, one of the simpler and less costly ways to gain knowledge is through learning from experience by evaluation, documentation and dissemination. It is surprising just how few development interventions are evaluated and published: the costs are relatively low compared to the potential technical benefits. In political systems where elite groups retain power through the distribution of patronage and are as yet not held particularly accountable for performance, domestic political demand for such information may be limited. Aid may be valued by politicians as much for the funding per se as for the outcomes that it delivers (van de Walle, 2001). Indeed, the supply of such information may encourage civil society groups to demand wider accountability of government performance. The tension between learning and accountability is also apparent within donor countries: whilst there has been a resurgence in academic interest in evaluation for learning purposes in recent years, current political pressures seem to be more about accountability. This may lead to the hiding of mistakes, rather than learning from them (Korten, 1980), and undermine the potential developmental benefits with which this paragraph opened.

Nor should one argue that all uncertainties can be resolved before programmes are implemented. The complexity the natural and human systems in rural areas means that that outcomes may not always be those expected. Implementing plans as though they were blueprints may not always be appropriate: room has to be creating for learning and making corresponding adjustments, for seeing implementation as a process (Korten, 1980).

Coherence and co-ordination: policy issues and conclusions

This discussion reflects recent thinking, but also retraces ideas that came to the fore in the 1970s and 1980s, as the limits to formal planning both national and for projects became evident (Maxwell, 1996). Planning has for several decades been relegated behind attempts to improve overall public performance. These include the ideas that make up the 'New Public Management'[41] where policy-making and service delivery are separated, as well as recognising that finance allocations — budgeting — are central to public decision-making.

What may be the hallmarks of good contemporary practice? Two points stand out, as follows:

- Pay as much attention to political and administrative concerns as to technical and financial analyses; and
- Recognise the difference between those things that can be implemented using blueprints since there is agreement on both ends and means, and those where uncertainties apply to either ends or means and hence learning processes are indicated.

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41 See Hood 1991, Lawton & Rose 1994

4 Final reflections

By way of a conclusion to this review, while agricultural — and indeed, rural — development presents many and varied challenges, they should not be seen as especially difficult. As with all development challenges, agricultural development can seem daunting, an enterprise more likely to fail than succeed. That would be an exaggeration: matters need to be kept in perspective.

Worldwide, food supply has increased ahead of population growth since 1970, and much of the increase has come from developing countries. Poverty and food insecurity, problems that almost always are more acute in rural areas, have fallen considerably in many countries. Several Asian countries have largely passed through the transition from being rural and agrarian to urban and industrial with broadly-distributed welfare gains. If many of the success stories do come from Asia, then bear in mind that in the 1960s most of Asia was (very) low income. Asian achievements are not the consequences of having a head start, or other exceptionally favourable circumstances: on the contrary, in the late 1960s prospects for most Asian countries looked bleak.

History suggests that countries able to remedy serious failings in their investment climate, to invest in rural public goods and to make some progress on getting rural markets to function are likely to succeed. Much of what needs to be done, moreover, is technically straightforward: proven methods exist for managing exchange rates or building rural roads. The challenge in these cases lies not in finding technical solutions, but in getting a political consensus that gives these measures sufficient priority and budgets. More is understood today about policy choice and the nature of political coalitions for agricultural and rural development; however, the insights do not translate into a set of mechanical steps.

The exceptions to the straightforwardness of most actions lie in the domains of getting rural markets to function better and in tackling the challenges of environment sustainability and climate change. Here the need is to experiment, to learn from trials and pilots, and hence to find workable solutions that can apply more widely. Technical specialists and researchers can assist this process by documenting experiences, evaluating them and disseminating promising results.

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Appendix A: Implications: theory, knowledge and skills for a contemporary agricultural policy advisor

From the topics reviewed in this report, what would an agricultural policy advisor need to be able to engage with debates? These elements have been divided into three groups: theory; knowledge or evidence; and technical skills. More general skills and competences, such as the ability to communicate clearly have not been listed, since these would apply to any and all of the topics: it is taken that advisors will have general abilities in analysis and communication.

Table 4.1 sets out the key requirements for each topic. Entries in italics are those items that might be useful, but which are no considered essential.

TABLE 4.1 THEORY, KNOWLEDGE AND SKILLS FOR A POLICY ADVISOR, BY TOPIC REVIEWED

Topic	Theory and knowledge	Skills
Consensus: rural investment climate & rural public goods	Theory: public goods and other market failures; *New Public Management* Development history: ▪ Policies followed during the Green Revolution in Asia ▪ Negative protection/net rate of assistance to agriculture ▪ Washington Consensus — and structural adjustment and liberalisation as its expression ▪ Understanding change in rural areas: migration and rural-urban links; urbanisation; the dynamics of rural poverty ▪ Familiar with World Development Report 2008	Measures of protection: Nominal rate of protection; Net rate of assistance; Producer subsidy equivalent *(Policy analysis matrix)*
Food Security and Nutrition	Theory: ▪ UNICEF, FAO and SUN frameworks for considering the causes of food and nutrition insecurity	
Rural transitions	Demography: population growth and urban-rural division. Trends in the last 40 years, patterns, explanations. Demographic transition and the demographic dividend Migration: patterns typically seen, explanations, consequences Decentralisation: arguments for, typical experiences Rural non-farm economy: nature, patterns seen, drivers, policies likely to stimulate	*Modelling economies: SAM and CGE models*

Agricultural technology	Theory: ▪ Technical change, impacts on use and hence returns to factors, drivers of technical change (induced innovations, for example) ▪ Farmer adoption of technology, including typical factors inhibiting adoption, and differential adoption by different scales and types of farm ▪ Returns to agricultural research Changing demand for food, transitions from staples to increasing consumption of fats, animal produce Biotechnology: basics of traditional plant breeding and recent advances such as tissue culture, marker-assisted breeding, and transgenics Public concern over novel science such as transgenics Low external input and agro-ecological techniques	
Land	Theory: property rights, as part of the theory of institutions Tenure systems: their strengths and weaknesses, experience of land titling programmes Water rights and their links to land rights Legal frameworks for land Large-scale land deals and the voluntary guidelines of FAO and the World Bank	
Small and large farms	Theory: market failures owing to transactions costs in land, capital, labour markets The inverse ratio of yields and farm size: evidence, explanations, criticisms Emerging supply chains and the demands they place on farmers	Gross margins for crops and livestock enterprises Value chain concepts and analysisv
Failings in rural markets	Theory: New Institutional Economics, Institutional approaches that draw on transactions costs to examine the feasibility of institutional arrangements and collective action, including contract farming and agricultural co-operatives) Gender in agriculture History: ▪ Marketing boards in Africa ▪ Measures used in Asia to encourage the Green Revolution	Value chain concepts and analysis
Competitiveness and value chains	Theory: transactions costs and institutional responses to these: contract farming, farmer co-operation Emerging supply chains: drivers and characteristics	Value chain concepts analysis

Market stabilisation	Theory: ▪ Analysis of markets, including welfare implications (producer and consumer surplus), interactions of national and international markets, concepts of instability in agricultural markets such as cobweb models of price formation ▪ Trade and analysis of effects of different trade policies ▪ Transmission of prices from world to national markets ▪ Risk and uncertainty in agriculture, farmers reactions to this History: agricultural insurance, including pervasive moral hazard with public schemes Recent innovations: weather-based insurance, catastrophe bonds, contingent lines of credit Use of futures markets to reduce risks and uncertainty *(For advisors dealing with international issues: trade agreements; international commodities trading practices.)*	Import and export parity price calculations Ability to read econometrics
Climate change	Theory: risk, uncertainty and resilience Expected impacts of climate change on agriculture Ways that agriculture can mitigate climate change Options for agriculture adapting to climate change International initiatives, including UNFCCC, to mitigate and adapt to climate change, including financing	
Environmental sustainability	Theory: ecosystems and their functions, tracing impacts from agriculture on different parts of ecosystems Biodiversity at different scales International initiatives for conserving biodiversity such as CBD, platforms for discussing issues such as IPBES, TEEB Environmental policies: regulation, incentives such as payment for environmental services, creation of markets	
Political economy and policy choice	Theory: ▪ Contemporary political economy, including distribution of rents, interest groups, governance ▪ New Public Management ▪ Learning processes and blueprints History: critiques of planning and the recognition of the limits to formal planning Aid architecture: Paris Declaration, Accra Agenda for Action; project and programme aid, budget support	Logical frameworks

This not surprisingly produces a long list, although given some overlaps and duplications items can be combined and condensed into the list presented as Table 4.2 that divides the field into five areas, as follows.

I. KEY VARIABLES AFFECTING AGRICULTURAL DEVELOPMENT: DEMOGRAPHY AND MIGRATION, FOOD CONSUMPTION AND THE RURAL NON-FARM ECONOMY

Future demand for food, both volume and composition, will be influenced by population size, age composition and rural/urban distribution, together with increased incomes. By 2050 the world will have a much expanded urban population, but a smaller rural population both relatively and absolutely. Patterns of migration will determine which rural areas lose most population, who is left behind in agriculture (with what resources and decision-taking powers), what volume of funds are remitted, and for what purposes, and so on. In the better-case scenarios, remittances are invested in agriculture, to spur investment in the types of mechanical, chemical and biological technologies necessary for producing additional food. In the worse cases, those left behind have limited labour, funds for investment and decision-making power, so that the locus of responsibility for producing food surpluses will pass increasingly to those households committed to making farming their main livelihood. Hence, it is important to understand the dynamics of rural poverty: how some households will escape poverty, and the forces that may threaten others with entering poverty.

Historically, much agricultural policy has been made in isolation from factors such as migration. For those focused on poverty (such as GIZ advisors), this is no longer adequate: advisors need to ask whether rural-urban linkages of several kinds (including migration) can be made conducive to better outcomes. They need to consider what can be done to support the rural poor (and not the better off) in seizing the opportunities offered by migration. At other levels, it may involve advising on how remittances can be spent, on the design of skill sets for those left behind, on working out enterprise options for them: for instance, can livestock still be kept when the most able-bodied have left, and if so, what livestock options are there?

II. BASIC ECONOMICS, ESPECIALLY THAT NEEDED TO UNDERSTAND OF THE WASHINGTON CONSENSUS AND ITS LIMITATIONS

Advisors need to know the economics of markets and production. They need to know the basics of macro-economics including public finances, inflation and trade. They should also be familiar with growth economics, including the role of technology, investment and factor accumulation, human capital and institutions.

The design and delivery of public goods, plus measures to correct market failure, are among the most important roles of the state. As above with the benefits of migration, the precise form of public good, and its mode of delivery, can help or hinder poverty reduction. The routing of public roads is a case in point, as is the extent to which local labour can be brought into the construction of infrastructure through, for example, public works programmes.

These considerations also include the balance of explicit or implicit taxes and subsidies as between rural and urban areas. Historically, 'urban bias' has meant that rural areas in general, and agriculture in particular, have been disadvantaged. Advisors need to understand both the principles involved in analysis of this kind, but also to understand the skills commonly used to calculate rates of protection or subsidy.

III. APPLICATIONS OF ECONOMICS TO AGRICULTURE: MARKET FAILURES, MARKETING AND VALUE CHAINS, AGRICULTURAL TECHNOLOGY AND LAND

Market failures

Advisors need to be familiar with arguments and evidence demonstrating that small farms often have higher yields per hectare than do large; as well arguments that this advantage may disappear when for marketing, or to access to inputs, they have to interact with large, formal enterprises in the supply chain. It may also disappear as the acquisition of agricultural goods by supermarkets spreads, given the conditions they impose. Some of these potential disadvantages can be overcome by collective action such as farmer associations and by such mechanisms as contract farming.

Advisors thus need to understand transactions and other information costs, the role of economic institutions as rules of the game, and theories of collective action.

They also need to be familiar with the role played by state marketing boards. Where markets are poorly developed they can play a useful role, but, if allowed to dominate, they can 'crowd out' private sector development. In some instances they have been used by politicians to set prices with which the private sector cannot compete, which is potentially highly destabilising.

Marketing and value chains

An understanding will be needed of concepts such as consumer and producer surplus, of interactions between national and international markets, and of instability in agricultural markets. Trade policy analysis is a further area of importance: advisors need to be familiar with the range of trade-related policies, and their likely implications for different categories of farmers. Advisors dealing specifically with international trading agreements may need to focus particularly on arrangements permitted or prohibited by WTO and regional trade agreements.

As farmers become more engaged in markets (and using new farm technologies) they are likely to find themselves exposed to greater risk. Advisors need to understand concepts of risk and uncertainty, how these are perceived by farmers, and how these perceptions will impact on willingness to engage in markets or adopt new technologies. Ways of reducing perceived risk and uncertainty matter for farmers who want to step up their agriculture performance.

Many of these issues lend themselves to econometric analysis. Some basic understanding of econometric techniques is thus desirable. Advisors need to note the overriding importance of (a) asking the right questions – what do econometric models predict for different sets of base conditions? How are sub-sets such as labour-scarce households likely to be affected? etc. and (b) challenging econometricians to explain and justify the assumptions they have made in constructing and applying their models. They need to beware that the jargon of econometrics can hide questionable arguments.

Agricultural technology

Views on agricultural technology are polarised and strongly value-driven. At one extreme, there are those who see the need for a new Green Revolution, mimicking many aspects of the old one. On the other are those who feel that ow external input technologies (LEIT) would deliver adequate productivity increases in ways which better respect a range of environmental and societal values. To feed a rapidly growing urban population with (by 2050) an absolute decline in rural population will require some form of high-yielding technology, in particular forms which are more resource-sparing and environmentally friendly.

Advisors will to understand the returns to factors of production, drivers of technical change, returns to agricultural research, and the propensity to adopt technology according to scale and type of farm. They will need to know something of the basics of plant breeding, and recent advances such as tissue culture, marker-assisted breeding, and transgenics. In particular they will need to understand the grounds for public concern over transgenics in order, where appropriate, to support the gathering of evidence in relation to these concerns. They need also to be aware of advances in agro-ecological techniques.

Land

Access to land and its ownership and the implications for equity and efficiency has long been studied. In the 1960s and 1970s debates centred around land redistribution, and the rationale and productivity of sharecropping. Land has again come to the forefront with the sale or lease by several land-rich countries of large areas to multinationals for the production of export crops, some seeing this as a key revenue-earner, but others as a threat to the rights of small farmers over land.

Advisors need to understand the theory of property rights (especially in relation to institutional theory more generally). They will need relevant local knowledge of legal frameworks in relation to land and water — water rights at times may diverge from rights over land lying above underground water.

They need to know understand tenure systems, including the experience of recent titling programmes. They will need to be familiar with recent large-scale land deals and with how well the voluntary guidelines of the World Bank and FAO work in practice.

IV. POLITICAL ECONOMY AND PUBLIC ADMINISTRATION

Advisors need to appreciate the political dimensions of policy choice, with some familiarity with the ideas discussed in contemporary political economy. Advisors need to understand the political dimensions of policy-making including the roles of: ideas and evidence vs. interests; rent distribution as a means of securing political support; institutions such as property rights; leaders, other actors and interest groups; and of timing and opportunities. Given the importance of values in some policy debates, especially over priorities and the means seen as legitimate to achieve them, advisors need to understand the motivations of key actors, ranging from the pressures from agribusiness to influence markets and obtain subsidies, to politicians who need to weight the implications for power and

stability, to the ideals of equity and justice found among NGOs. Such understanding is probably best developed from cases that show how different agricultural strategies came to be undertaken in particular circumstances.

Advisors should gain an understanding of the strength of political incentives facing national political leaderships in their country or countries of interest to devise policies and to promote public investments that support smallholder farmers. How critical are such policies to their chances of re-election, given the multiple ways that political support can be sought, and/or what might be the impact on medium-term political stability if the interests of large numbers of rural citizens are neglected?

They also need to know the arguments over governance and how it may be improved, including the limitations of orthodox prescriptions for general "good governance" in contexts where political coalitions are held together by practices that are corrupt and/or illegal. In public administration, advisors need to know the theory and practice of New Public Management that has been so influential: its strengths and limitations. The same applies also to decentralisation (and its variants, such as deconcentration) where the search for effective and equitable models continues.

They need to understand the limits to formal planning and the importance of engaging with local processes of debate and decision-making. They need to recognise the strengths and weaknesses of 'blueprint' planning and of learning processes. For debates that turn on technical uncertainty, more study and analysis is indicated. While there may be few shortcuts to better understanding, one of the simpler and less costly ways to gain knowledge is through learning from experience by monitoring and evaluation of sector performance, concise documentation and dissemination of results.

Technically they need to know of the frameworks under which aid programmes operate, including the Paris Declaration and the Accra Agenda for Action, sector-wide programming, and programme-based approaches (PBA) or budget support.

In skills, it will be important to identify how and how far conventional tools such as the Logical Framework can be adapted to respond flexibly to changing circumstances.

V. THE ENVIRONMENT INCLUDING CLIMATE CHANGE

Advisors need to appreciate technical choices and their implications for scarcity of resources, pollution, biodiversity and emissions of greenhouse gases. Although high-yielding technologies will be needed to feed a rapidly growing population, these will differ from those produced in the heyday of the Green Revolution by being less demanding of complementary resources, especially those based on fossil fuels, and more friendly to the environment. High-yielding technologies may be combined these with the soil and water conservation principles of LEIT.

Advisors need to understand concepts of risk, uncertainty and resilience as applied to agriculture, and with biodiversity at different scales. An appreciation of ecosystems and their functioning will be needed to be aware of the potential impacts of agriculture on different parts of ecosystems.

With climate change, advisors need to appreciate potential impacts of climate change on agriculture, including the capacity of agriculture for adaptation, and of agriculture on climate change where scope for mitigation exists. They need to be familiar with the provisions of international initiatives, including the UNFCCC, to mitigate and adapt to climate change. The same applies to initiatives for conserving biodiversity, including CBD, and to platforms for discussing issues, such as IPBES and TEEB. They will need to be familiar with environmental policies at national level including regulatory provisions, the creation of markets (such as for carbon) and payments for environmental services.

Further reading:

Hoeffler, Heike (2014): Capacity development for agricultural policy advice. Rural 21 (04/2014), (http://www.rural21.com/uploads/media/rural2013_04-S28-31.pdf)

TABLE 4.2 THEORY, KNOWLEDGE AND SKILLS FOR A POLICY ADVISOR, COMBINED

	Theory
Context for agricultural development	
Economics	Public goods and other market failures *New Public Management*
Agricultural economics & marketing	Market failures owing to transactions costs in land, capital, labour markets New Institutional Economics The inverse ratio of yields and farm size: evidence, explanations, criticisms
	Analysis of markets, including welfare implications (producer and consumer surplus), interactions of national and international markets, instability in agricultural markets including cobweb models of price formation Trade and analysis of effects of different trade policies Transmission of prices from world to national markets Risk and uncertainty in agriculture, farmers' reactions to this
	Technical change, impacts on use and hence returns to factors, drivers of technical change (induced innovations, for example) Farmer adoption of technology, including typical factors inhibiting adoption, and differential adoption by different scales and types of farm
	Property rights (links to theory of institutions)

Knowledge: past and present experience	Skills
Demography: population growth and urban-rural division.; trends in the last 40 years, patterns, explanations; demographic transition and the demographic dividend Migration: patterns typically seen, explanations, consequences Changing demand for food, transitions from staples to increasing consumption of fats, animal produce Rural non-farm economy: nature, patterns seen, drivers, policies likely to stimulate	
Washington Consensus — and structural adjustment and liberalisation as its expression	Measures of protection: Nominal rate of protection; net rate of assistance; producer subsidy equivalent, *(Policy analysis matrix)*
World Development Report 2008 Negative protection/net rate of assistance to agriculture Marketing boards and parastatals in Africa Policies followed during the Green Revolution in Asia Institutional responses to high transactions costs: contract farming Collective action: farmer associations and co-operatives	Gross margins for crops and livestock enterprises
Gender in agriculture Emerging supply chains: characteristics, drivers, demands they place on farmers Agricultural insurance, including pervasive moral hazard with public schemes Recent innovations: weather-based insurance, catastrophe binds, contingent lines of credit Use of futures markets to reduce risks and uncertainty *(For advisors dealing with international issues: trade agreements; international commodities trading practices.)*	Value chain concepts and analysis Import and export parity price calculations Ability to read econometrics
Biotechnology: basics of traditional plant breeding and recent advances such as tissue culture, marker-assisted breeding, and transgenics Returns to agricultural research Public concern over novel science such as transgenics Low external input and agro-ecological techniques	
Tenure systems: their strengths and weaknesses, experience of land titling programmes Water rights and their links to land rights Legal frameworks for land Large-scale land deals and the voluntary guidelines of FAO and the World Bank	

	Theory
Public policy & administration	Political economy New Public Management
Climate change & the environment	Risk, uncertainty and resilience Ecosystems and their functions, tracing impacts from agriculture on different parts of ecosystems Biodiversity at different scales

Knowledge: past and present experience	Skills
Contemporary political economy; governance Critiques of formal planning and its limits; recognising differences of task and environment and hence the ability to plan in detail and in advance, versus the need to learn and adapt: blueprints and learning processes Public sector budgeting Decentralisation: theory and typical experiences Paris Declaration, Accra Agenda for Action, projects and programmes, sector wider approaches, budget support	Logical frameworks
Expected impacts of climate change on agriculture Ways that agriculture can mitigate climate change Options for agriculture adapting to climate change International initiatives, including the UNFCCC, to mitigate and adapt to climate change, including financing International initiatives for conserving biodiversity such as CBD, platforms for discussing issues such as IPBES, TEEB Environmental policies: regulation, incentives such as payment for environmental services, creation of markets	

Appendix B: Reviewing policy literature

The revival of interest in agriculture in the last few years has not surprisingly led international agencies and bilateral donors to reassess the aims and instruments for agricultural development and associated fields of rural development, food and nutrition security, rural poverty and the management of renewable natural resources. Most of the leading development agencies have made some statement on agricultural policy since 2008, of which the World Development Report for 2008 (World Bank, 2007) is the outstanding example. Given the existence of these documents, plus much research and analysis that lies behind new thinking, there was little point in carrying out new analysis. Instead recent thinking on agricultural development policy has been reviewed by drawing on these documents, complemented by existing knowledge of the literature.

More than 35 reports and position papers published during the last ten years by leading donors were inspected, covering development co-operation, policy positions, strategy, occasional papers and submissions to international debates. The most relevant of these documents — 24 in total, listed in Table 4.3 — were reviewed against eleven areas of interest. More details of the topics covered in these documents and their policy positions have been logged in the last section of this appendix.

Common narratives and themes seen in these documents

A common narrative stresses the ***changing context for agriculture***: of how increased population, changing diets, environmental degradation and climate change are placing pressure on agricultural production. Several documents also highlight increased volatility and higher prices since 2007/08 as a likely feature of the future. These changes provide the context for calls for increased investment in agricultural development and growth, which many of the documents see as a priority on the global agenda (e.g. FAO et al., 2011; HLPE, 2011; World Bank, 2007).

The importance of ***small farms*** and policies to stimulate their development is generally recognised, with some agencies placing these at the centre of their concerns (FAO et al., 2012; US Government, 2010; CIDA, 2010). Raising small farm productivity is seen as a key issue for growth, food security and poverty alleviation.

The role of ***agriculture as a key driver of economic growth in rural economies*** is often reiterated. Attention is also given to the ***rural non-farm economy*** in several documents which emphasise the need to ensure smooth processes of agricultural transition as important pathways out of poverty for households (e.g. IFAD, 2011; ADB, 2007).

Many documents highlight the need for a ***conducive macroeconomic climate or enabling environment***, to enable smallholders as well as the private sector in general to operate effectively, and drive further investment (e.g. US Government, 2010; ADB, 2007).

Most documents underline the role of government in ***provision of rural public goods.*** This includes major infrastructure investments such as roads, research, education, health, financial services and institutions to oversee markets (IFAD, 2011; US Government, 2010; AfDB, 2010; WFP, 2009).

Environmental constraints and sustainability are mentioned widely. Raising smallholder output whilst limiting environmental degradation is a common theme: see, for example, the Foresight Report on the Future of Food and Farming (Foresight, 2011) and FAO's Sustainable Crop Production Intensification (FAO, 2012).

Climate change has come into prominence. Most papers recognise the potential of agriculture to mitigate greenhouse gas emissions, as well as the threat that climate change poses to agriculture and vulnerable rural populations (e.g. BMZ, 2011; CGIAR, 2011; World Bank, 2007). Climate change adaptation is seen as important for future funding (e.g. AfDB, 2010). The role of technological advances to raise yields and resilience in the face of climate change is an area where more work is needed by developing country governments and international research partnerships.

Most documents reaffirm the importance of ***agricultural research and technological advances*** to meet future challenges. The relative decline in spending on public agricultural research since

the 1980s is given as a reason for a slow-down in yield increases. Recent relevant institutional developments and initiatives including the CGIAR evaluation and reform process, the outcome of the IAASTD review and the 2011 GCARD conference, have been influential in mobilising support for development-orientated research (e.g. HLPE, 2011; CIDA, 2010).

TABLE 4.3 DOCUMENTS REVIEWED FOR THIS REPORT

No.	Authors, year of publishing and brief title
1	AfDB, 2010. Agricultural Sector Strategy 2010-2014
2	ADB, 2007. Rural Poverty Reduction and Inclusive Growth
3	BMZ, 2011. Rural development and its contribution to food security
4	CGIAR, 2011. Strategy and Results Framework for the CGIAR
5	Chicago Council on Global Affairs, 2009. Renewing American Leadership in the Fight against Global Hunger and Poverty
6	CIDA, 2010. Increasing Food Security: CIDA's Food Security Strategy
7	CPAN, 2012. Agricultural Policy Guide.
8	EC, 2010. Food Security Thematic Programme 2011–2013
9	FAO, 2012. Save and Grow, Policies and Institutions
10	G8, 2010. 'L'Aquila' Joint Statement on Global Food Security
11	GIZ, 2009-2012. Various position papers on agriculture and rural development
12	HLPE, 2011. Price volatility and food security
13	IFAD, 2010. Rural Poverty Report 2011
14	IFPRI, 2012. Strategies and Priorities for African Agriculture
15	Interagency report to the G20, 2012. Agricultural Productivity and Bridging the Gap for Small Family Farms
16	Interagency Report to the G20, 2011.
17	Multiple agencies, 2010. Scaling up Nutrition: A framework for Action
18	OECD, 2012. Agricultural Policies for Poverty Reduction
19	UK Government, 2011. Foresight Report on the Future of Food and Farming
20	UN HLTF, 2010. Updated Comprehensive Framework for Action
21	United States Government, 2010. Feed the Future Guidelines
22	WFP, 2009. Hunger and Markets
23	Wise and Murphy, 2012. Resolving the Food Crisis: Assessing Global Policy Reforms Since 2007
24	World Bank, 2007. WDR 2008: Agriculture for Development

These documents revealed some renewed and emerging areas on interest in agriculture and development.

Trade policies and price stabilisation are commonly referred to. Statements on the need to reduce export restrictions and import taxes during times of high global prices are common, and some documents discuss the need for LDCs to exercise flexibility in their trade policies and take advantage of preferential access agreements. Several papers raise the need for reform of agricultural support in OECD countries (FAO et al., 2012; HLPE, 2011; GIZ, 2009).

Several documents highlight ***nutrition*** and the case for greater investment into nutrition research and targeted nutritional interventions (e.g. EC, 2010; SUN, 2010; UN HLTF, 2010).

Social safety nets are commonly recommended as tools which governments should use in lieu of general price subsidies in order to protect the food security of the most poor and vulnerable. They are generally touted as a beneficial and low-cost way of mitigating risks. Safety nets are central to another piece of work by ODI for GIZ, namely social protection in relation to robust food and nutrition systems, and so are referred to only occasionally here.

Improving conditions for ***emergency response, including food shipments***, is urged in several documents (e.g. HLTF, 2010). Particular concerns include buffering prices that relief agencies pay for food, and ensuring efficient procurement and transportation.

Changes in ***consumer choices and their diets*** are highlighted by a few reports as a way to reduce pressure for more production. These build on reports of projections of the extra land and input requirements to feed rising populations at Western levels (e.g. Wise and Murphy, 2012; Foresight, 2011).

Numerous reports highlight the importance of ensuring ***women's access to both productive inputs (especially land), new technology and extension services*** (e.g. UN HLTF, 2010; G8, 2010; Chicago Council on Global Affairs, 2009).

LOG OF DOCUMENTS REVIEWED

NB: Cells shaded in pale gold indicates that the report does not discuss this issue, or does so only in passing. Text in italics indicates direct quotes from the documents.

AFDB, 2010. AGRICULTURAL SECTOR STRATEGY 2010–2014

African Development Bank, 2010, **Agricultural Sector Strategy 2010–2014.** Available at http://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/Agriculture%20Sector%20Strategy%2010-14.pdf

AIM: Sets out the AfDB strategy in agriculture, reaffirming the importance of the sector, esp. since 2007/08. Identifies two pillars in particular which are important: agricultural infrastructure and renewable natural resource management (CAADP Pillars I &II).

Enabling environment	Yes. Mentioned briefly as a crosscutting issue
Provision of rural public goods	Cites its experience points to a need for government to play a central role in the provision of investment in rural infrastructure; improving market chains and assisting adaptation to CC (p.8)
Rural transitions	
Small-scale versus large-scale farms	No - but an emphasis on smallholders for targeting for yield improvements
Land rights	Yes. Land titling and registration are mentioned as important constraints; requiring reform and implementation
Rural market failures	
Trade openness and protection	Cites the importance of increasing access to local and regional markets.
Competitiveness and value chains	
Stabilising markets	
Technology	Generally supportive of new technologies, including new varieties and GM crops.
Environmentally sustainable farming	Strong emphasis (one of the two pillars) but does not define in detail
Responding to climate change	Mentioned as an activity to fund
Other concerns	Strong focus upon Gender and its importance for food security

ADB, 2007. RURAL POVERTY REDUCTION AND INCLUSIVE GROWTH

Asian Development Bank, 2007, Rural Poverty Reduction and Inclusive Growth. Report of the Working Group on Rural Poverty (September 2007). Available at http://www.adb.org/documents/rural-poverty-reduction-and-inclusive-growth

Enabling environment	Yes. *'The importance of a sound policy environment should not be underestimated. Rural development is facilitated by policies that encourage private sector roles and investment in markets for agricultural inputs and products, and RNFEs.'* Only mention of the importance of improving investment climate in MICs (e.g. through PPPs).
Provision of rural public goods	Yes. Important role for government in the provision of infrastructure (p. 7).
Rural transitions	Yes. Mentions the need to expand the RNFE, and explicitly help workers make the transition from farm to non-farm activities, especially for areas with low-agro productivity potential and poor market access. Includes a paragraph on the need to invest in rural towns (including infrastructure, BDS).
Small-scale versus large-scale farms	
Land rights	Short mention on the need to improve tenure security, capacity for land registration and protection of tenure rights (p. 9).
Rural market failures	Yes. Highlights the need to provide credit, due to the importance of credit across a number of areas. Highlights the current weaknesses of rural finance institutions in Asia.
Trade openness and protection	
Competitiveness and value chains	
Stabilising markets	
Technology	Very little. Just emphasis on the need for technology breakthroughs which reach the rural poor.
Environmentally sustainable farming	Passing mention of the need to improve sustainable agricultural productivity.
Responding to climate change	Very little. just acknowledges need to adapt to climate change in agriculture.
Other concerns	

BMZ, 2011. RURAL DEVELOPMENT AND ITS CONTRIBUTION TO FOOD SECURITY

German Federal Ministry for Economic Cooperation and Development, 2011, Rural Development and its Contribution to Food Security, BMZ Strategy Paper 1|2011 (March 2011). Available at: http://www.bmz.de/en/publications/topics/rural_development/index.html

AIM: Sets out a framework for approaching development in rural areas and identifies the strategic direction for German official development cooperation.

Enabling environment	Mention of this with regards to both the political and institutional level (introduction and 2.4) and passing mention (Chapter 2) on the need for a business and investment climate.
Provision of rural public goods	Referred to as provision of social services and technical infrastructure.
Rural transitions	Brief acknowledgement of the need to ease these.
Small-scale versus large-scale farms	
Land rights	Yes. Remarks on the need to improve land laws and establish land and water rights are seen as an essential foundation for income generation and food production.
Rural market failures	
Trade openness and protection	
Competitiveness and value chains	
Stabilising markets	
Technology	Brief mention of communication technologies as being potentially important.
Environmentally sustainable farming	Brief mention in as much as the sustainable use of natural resources (which is heavily emphasised) covers this.
Responding to climate change	Agriculture has an important role in contributing to Climate change mitigation. At the same time, rural populations are particularly at risk from climate change.
Other concerns	Important role of rural social services (Social security, community based insurance).

CGIAR, 2011. STRATEGY AND RESULTS FRAMEWORK FOR THE CGIAR

Consultative Group on International Agricultural Research, 2011. Strategy and Results Framework for the CGIAR, (February 2011). Available at http://www.cgiar.org/our-research/

AIM: Sets out CGIAR's views of global trends, challenges and direction for research following its review

Enabling environment	Outlines the importance of providing 'contextual factors' other than productivity growth for poverty alleviation: access to input and output markets; credit and insurance and other areas of service delivery.
Provision of rural public goods	The thrust of the discussion is on research as a public good.
Rural transitions	Little mention, but raises the view that with greater urbanisation, there is a need for more and better trade and efficient use of agricultural resources.
Small-scale versus large-scale farms	Not detailed. While there is a clear need to focus upon smallholders to meet poverty reduction goals of CGIAR research, however to meet global food security there is a parallel need to continue to raise productivity in subtropical Asian lowlands (rice); double rice/wheat systems in Pakistan, Nepal and Southern China; temperate maize rain-fed cropping in North America; rain fed wheat in Europe; and, maize systems in the Pampas and Cerrado. (While this does not specifically mention the smallholder/ large-scale farms, some of these areas are likely to have large scale farmers.)
Land rights	
Rural market failures	
Trade openness and protection	
Competitiveness and value chains	
Stabilising markets	
Technology	Some mention, esp. under reducing 'Reducing Poverty' (p. 45). 'New Technologies themselves are a blunt instrument for reducing poverty'. Rather underlying factors constraining technology adoption are also those closely associated with poverty.
Environmentally sustainable farming	Yes-mainly in the context of sustainable use of natural resources. Includes a useful discussion on the framing of environmental issues, e.g. the attempt to analyse in a comprehensive manner (integrated natural resource management), but increasing trend to analyse at landscape level, instead of at the production system level (p. 55).
Responding to climate change	Yes. Discusses both the need of agriculture to adapt to CC changes (including those due to emissions having occurred in previous decade). Highlights the regional nature of CC effects, and needs to respond according to these changes.
Other concerns	The discussion includes a more in-depth discussion on the specific cropping systems which are needed in order to address the needs of poor smallholders: including root crops; dryland cereals; legumes; agro-forestry, ruminant livestock.

CHICAGO COUNCIL ON GLOBAL AFFAIRS, 2009. RENEWING AMERICAN LEADERSHIP IN THE FIGHT AGAINST GLOBAL HUNGER AND POVERTY

Chicago Council on Global Affairs, 2009. **Renewing American Leadership in the Fight against Global Hunger and Poverty: The Chicago Initiative on Global Agricultural Development**, Chicago Council on Global Affairs

Report Issued by an Independent Leaders Group on Global Agricultural Development, Catherine Bertini & Dan Glickman co-chairs, Chicago, Illinois

AIM: This report is about renewing an effort to boost agricultural development for the benefit of the poor in SS Africa and S Asia, an effort for which the USA needs to take the lead.

Of greatest concern is the extreme plight of the approximately 600 million people who live on less than $1 per day in rural areas of Sub-Saharan Africa and South Asia and depend on agriculture for their livelihoods.

The solution to their plight lies in a sustained, long-term effort to increase agricultural productivity on smallholder farms. Yet over the past two decades there has been a steady decline in the world's support for the research, education and extension, and rural infrastructure improvements that are needed to help smallholder farmers improve their crop yields and gain access to agricultural markets.

Report is the result of the work of a technical committee of a dozen, chaired by Robert Thompson from Illinois.

Stresses the need to revive production:

The problem is basically one of low farm productivity, so that's what needs changing.

The source of these problems is not fluctuating food prices on the world market, but low productivity on the farm. The production growth needed will have to come from improved farm policies, technologies, and techniques, including those that address the effects of climate change. (p.16)

How did it get this way? Well, we known that education, investment and technology work.

Rural hunger and poverty decline dramatically when education, investment, and new technologies give farmers better ways to be productive. (p.16)

Enabling environment	Focuses on US contribution to this: ***R5: Improve U.S. policies currently seen as harmful to agricultural development abroad.*** ACTION 5a. Improve America's food aid policies. ACTION 5b. Repeal current restrictions on agricultural development assistance that might lead to more agricultural production for export in poor countries in possible competition with U.S. exports. ACTION 5c. Review USAID's long-standing objection to any use of targeted subsidies (such as vouchers) to reduce the cost to poor farmers of key inputs such as improved seeds and fertilisers. ACTION 5d. Revive international negotiations aimed at reducing trade-distorting policies, including trade-distorting agricultural subsidies. ACTION 5e. Adopt biofuels policies that place greater emphasis on market forces and on the use of non-food feedstock. And complement US efforts with international changes: ***R4: Improve the national and international institutions that deliver agricultural development assistance*** Restore USAID's leadership and ability to plan and implement agricultural development. Improve Congressional ability to participate in this. Better co-ordination across US agencies concerned with food and agricultural development. Better functioning of international agencies, above all the FAO.

Provision of rural public goods	***R1: Increase support for agricultural education and extension at all levels in Sub-Saharan Africa and South Asia.*** Includes funding students from the two regions to study agriculture in the USA, support for local education, partnerships of US universities with those in the regions, forming an agricultural cadre within the Peace Corps, and encouraging primary schooling of rural boys and girls through school feeding. ***R3: Increase support for rural and agricultural infrastructure, especially in Sub-Saharan Africa.*** More World Bank funding for infrastructure in transport corridors, clean energy, water, irrigation and farm-to-market roads. Faster spending of MCC funds on infrastructure.
Rural transitions	
Small-scale versus large-scale farms	
Land rights	
Rural market failures	
Trade openness and protection:	***R2: Increase support for agricultural research in Sub-Saharan Africa and South Asia*** Fund scientists in NARS, link US expertise to them, fund the CGIAR, and create a competitive fund to reward innovations of use to poor farmers in the region. Recommends the CGIIAR best bets for agricultural research: The Consultative Group on International Agricultural Research (CGIAR) and the International Food Policy Research Institute (IFPRI) have identified several examples of 'best bets' for large-scale research investments, ranging between US$10 million and US$150 million each over five years. These programs are focused on three strategic areas: food for the people, environment for the people, and innovation for the people. Key opportunities include:
Competitiveness and value chains	
Stabilising markets	
Technology	***R2: Increase support for agricultural research in Sub-Saharan Africa and South Asia*** Fund scientists in NARS, link US expertise to them, fund the CGIAR, and create a competitive fund to reward innovations of use to poor farmers in the region. Recommends the CGIIAR best bets for agricultural research: The Consultative Group on International Agricultural Research (CGIAR) and the International Food Policy Research Institute (IFPRI) have identified several examples of 'best bets' for large-scale research investments, ranging between US$10 million and US$150 million each over five years. These programs are focused on three strategic areas: food for the people, environment for the people, and innovation for the people. Key opportunities include:

Technology

	Estimated investment:	*People reached:*
1.WW Revitalizing Yield Growth in the Intensive Cereal Systems of Asia	US$150M over 5 years,	3 billion
2. Increasing Fish Production in Sub-Saharan Africa and South Asia	US$73.5M	32 million
3. Controlling Wheat Rust	US$37.5M	2.88 billion
4. Developing a Disseminating a Vaccine for East Coast Fever in Cattle	US$10.5M	20 million, with additional indirect effects on many more
5. Developing and Disseminating Drought-Resistant Maize in Africa	US$100M	320 million, with additional indirect effects on many more
6. Scaling Up Bio-fortification	US$125M	up to 672 million
7. Increasing Carbon Sequestration and the Livelihoods of Forest People	US$45M	48 million
8. Conducting Climate Change and Adaptation Research	US$127.5M	1.18 billion
9. Combining Organic and Inorganic Nutrients for Increased Crop Productivity	US$55M	400 million
10. Promoting Sustainable Groundwater Use in Agriculture	US$24M	261 million
11. Expanding the Exchange of Genetic Resources	US$15M	global impact, with a focus on developing countries
12. Improving Small Farmer Access to Trade, Market, and Value Chain Systems	US$10.5M	45 million
13. Ensuring Women's Participation in Agriculture	US$30M	200 million
14. Connecting Agriculture and Health	US$75M	global

Source: IFPRI 2008.

Environmentally sustainable farming	
Responding to climate change	
Other concerns	

CIDA, 2010. INCREASWING FOOD SECURITY: CIDA'S FOOD SECURITY STRATEGY

Canadian International Development Agency, 2010, Increasing Food Security: CIDA's Food Security Strategy. Available at http://www.acdi-cida.gc.ca/acdi-cida/acdi-cida.nsf/eng/NAD-31210472-LHX

AIM: CIDA identifies 'Sustainable Agricultural Development as a path to build up food security. This involves (committing more resources, strengthening the 'enabling environment (this is not defined) for sustainable rural development, development of integrated value chains, integration of the agricultural market, strengthening accountability mechanisms in governments and ministries.

Enabling environment	Yes. Creating an enabling environment for sustainable rural development is a core part of CIDA's strategy.
Provision of rural public goods	
Rural transitions	Brief acknowledgement of the need to ease rural transitions.
Small-scale versus large-scale farms	
Land rights	
Rural market failures	
Trade openness and protection	
Competitiveness and value chains	Yes. Brief mention of the importance of integrated value chains.
Stabilising markets	
Technology	
Environmentally sustainable farming	Yes. Promoting this is a core part of the CIDA strategy.
Responding to climate change	Identified as a challenge.
Other concerns	Supports greater investment in research at the international level, especially through the CGIAR.

CPAN, 2012. AGRICULTURAL POLICY GUIDE

Chronic Poverty Advisory Network (CPAN), 2012, Agricultural Policy Guide: Meeting the Challenges of a new pro-poor agricultural paradigm: the role of agricultural policies and programmes. London: Chronic Poverty Advisory Network at Overseas Development Institute. Available online at: https://sustainabledevelopment.un.org/getWSDoc.php?id=1535

AIM: This policy guide set outs options for agricultural policy under different settings, whose aims are to directly benefit the chronic poor. It "makes a new case for a shift in the mainstream agricultural paradigm towards a focus on asset accumulation and protection in the context of sustainable agriculture, as well as an emphasis on farm workers as a major constituency for agricultural agencies."

It also suggests an approach for a pro-poor systems innovation approach.

Enabling environment	Argues that this continues to be important for farming as well as the RNFE. Investment climate improvements, especially in removing tax and regulatory thresholds that discourage business growth beyond the micro or small; improving security and anti-corruption measures are all important for the development of the RNFE
Provision of rural public goods	These are very important in providing the assets that the poor rely upon to move out of poverty. Examples cited include primary education and access to roads. These can also be more important in contributing to higher levels of productivity than systems emphasising high application of fertilisers RPGs are also viewed as highly important for market integration of poor farmers.
Rural transitions	The RNFE is a very important way for the poor to move out of poverty. At the same time, care needs to be taken to ensure that labour conditions there are regulated to ensure that employees benefit.
Small-scale versus large-scale farms	Discusses only in relation to the difficulties that small, resource-constrained, poor farms face, and how traditional models of ARD and extension bypass these, as they favour larger operations.
Land rights	Improving land rights crucial to improve the assets of the poor. Land distribution provides a unique and unparalleled way of improving the lot of the poor (p. 24). In the absence of this, improving renting and leasing governance can be important, especially granting women further rights.
Rural market failures	Insurance markets are highlighted as a particular area where markets fail the poor and where governments, microcredit agencies and other agencies can step in to provide poor people with weather and livestock insurances. Resource-poor farmers commonly do not benefit from private credit systems, or from subsidised inputs such as fertiliser.
Trade openness and protection	
Competitiveness and value chains	Argues that unregulated value chains undermine the poor's ability to move out of poverty. More horizontal co-ordination through farmers' organisations and similar groups play a crucial role. Vertical co-ordination can also be an important means of improving the positions of the poor, e.g. through contract farming (p. 54). However, it is local and national, rather than global value chains, where poor farmers will most likely be able to participate and benefit. Further education amongst national middle classes and other groups is therefore needed. Examples of inclusive value chains are given, such as contract farming, although certain contexts demand additional provisions to ensure that systems are pro-poor, trust is established, and decent arrangements and jobs are created.
Stabilising markets	Argues that these can be beneficial in some circumstances.

Technology	Argues that there is a need for a plurality of ARD systems for different contexts. That technology has been an important part of agricultural development but the poor have been left out of techno-centric approaches, and are likely to continue to be, if contemporary policies do not consider their specific needs. The GR model may work for maize models in SSA, but it clearly has its limits, and more focus is needed on soil conservation, indigenous technology and appropriate mechanisation. (p. 44) Water conservation and soil fertility should be at the core of agricultural agencies' work.
Environmentally sustainable farming	Argues that a shift to sustainable agriculture is needed. Although this may be painful, the poorest should be protected during these transitions. At the same time, the poorest urgently need to take up environmentally sustainable farming to reduce the degradation of their few assets.
Responding to climate change	Identifies a clear need for the further uptake of Conservation Agriculture and Climate-smart agriculture.
Other concerns	A cluster on labour looks at how labour markets—in which the chronically poor are often engaged—can better operate in their interest. Areas include education and awareness campaigns and education on child labour; development of voluntary codes of practice for businesses, which focus on or include farm workers' terms and conditions of employment, rights and entitlements; legislation on minimum wages; and public works schemes which provide a wage floor in a rural economy. A gendered approach is needed across interventions to ensure that women are not disadvantaged by interventions which may help, but be co-opted by men.

EC, 2010. FOOD SECURITY THEMATIC PROGRAMME 2011–2013

European Commission, 2010, Food Security Thematic Programme: Thematic Strategy (Update) and Multiannual Indicative Programme (2011-2013). Brussels: European Commission, Document C/2010/9263

The main focus of this document is on the instruments used by the EU to address food security. It has a strong focus on research and governance of the food security system.

Enabling environment	
Provision of rural public goods	Yes, but focused on international public goods (through research). although investment in agricultural research is a major part of the strategy
Rural transitions	
Small-scale versus large-scale farms	Notes smallholder contributions to poverty reduction and growth: *'evidence shows that investments in the smallholder sector yield the best returns in terms of poverty reduction and growth, priority is given to enhancing the incomes of smallholder farmers.'*
Land rights	Yes; in the context of improving governance and halting LSLA, and support for both CFS as well as PRAI initiatives.
Rural market failures	
Trade openness and protection	
Competitiveness and value chains	Only brief mention of a need to focus along the whole value chain.
Stabilising markets	Passing mention of the importance of volatility in food security.
Technology	
Environmentally sustainable farming	Mentioned in the context of strategic directions for ARD.
Responding to climate change	Yes briefly mentioned throughout, in terms of adaptation and research. Also, that climate change is expected to hit developing countries particularly hard, due to their locations in low latitudes.
Other concerns	A stronger focus on nutrition and social protection is aimed for under this strategy. Nutrition is seen to have important multiplier effects, and the report notes losses of 2–3% of GDP of growth due to poor nutrition.

FAO, 2012. SAVE AND GROW, POLICIES AND INSTITUTIONS

FAO, 2012, Save and Grow. Policies and Institutions, Rome: FAO Available at: http://www.oecd-ilibrary.org/environment/water-management_9789264162600-en

AIM: This document discusses how to bring about Sustainable Crop Production Intensification (SCPI) and specifically what measures are needed in this area.

Enabling environment	Need for greater coherence at the macro-level. This includes reform of major IMF instruments (Compensatory Financing Facility; Exogenous shock Facility).
Provision of rural public goods	Little specific mention. Argues for increased smallholder research, extension, credit and insurance mechanisms.
Rural transitions	Little mention. Only comments that farm consolidation, resulting from increased off-farm rural employment appears inevitable.
Small-scale versus large-scale farms	Emphasises a need to focus research on smallholders, and especially those farming marginal areas.
Land rights	Highlights a need to provide stable property rights in order to encourage long-term sustainable land practices. However, emphasises the security that can be provided through customary property rights.
Rural market failures	Argues for the internalising of environmental externalities especially
Trade openness and protection	
Competitiveness and value chains	Value chains: Highlights concerns that concentration of market power in different points in the chain reduces incomes for other smaller parties in the chain. Discusses the need to create comparative advantages for smallholders when these are disfavoured, or to reduce the transactions costs associated with large numbers of sellers (e.g. through producer coops).
Stabilising markets	Discussion on the need for market-smart subsidies. Also, 'stabilisation of output prices is an increasingly important condition for sustainable intensification of crop production, given recent volatility' p83.
Technology	Brief. Reflecting the findings of IIASTD, argues for a greater need to facilitate knowledge exchange and use of SCPI technologies. Argues that modern communication technologies are needed for this. Argues for broad access to IPRs and for countries to pursue policies which ensure access to genetic resources.
Environmentally sustainable farming	Suggests that a greater use of PES in the agriculture sector is needed, but does not discuss challenges associated with this.
Responding to climate change	Highlights the potential huge effects of CC on productivity, and the high costs (IFPRI estimate of 7 billion to 2050) to increase productivity to offset these losses. Suggests that there are still many unknowns regarding Mitigation, other than the need to include this further in Sustainable Intensification.
Other concerns	Suggest special attention is needed for seed markets for SCPI (including focus on the informal sector).

G8, 2010. 'L'AQUILA' JOINT STATEMENT ON GLOBAL FOOD SECURITY

G8, 2010, 'L'Aquila' Joint Statement on Global Food Security: L'Aquila Food Security Initiative (AFSI). http://www.g8italia2009.it/static/G8_Allegato/LAquila_Joint_Statement_on_Global_Food_Security%5B1%5D,0.pdf

AIM: Presents the joint views on the need to extend efforts on food security by major donors following the G8 discussions.

Enabling environment	Not beyond a statement of commitment to promoting conducive business environments.
Provision of rural public goods	
Rural transitions	
Small-scale versus large-scale farms	Not specifically, although highlight a focus on small farmers, women and families and the need to integrate these into trade strategies.
Land rights	
Rural market failures	
Trade openness and protection	Rejection of protectionism internationally: ***'Open trade flows and efficient markets have a positive role in strengthening food security'***
Competitiveness and value chains	
Stabilising markets	
Technology	
Responding to climate change	Yes. Brief mention on the need for coupling food security with adaptation and mitigation measures in relation to climate change. 'Effective food security actions must be coupled with adaptation and mitigation measures in relation to climate change, sustainable management of water, land, soil and other natural resources, including the protection of biodiversity'.
Environmentally sustainable farming	
Other concerns	Link between health and education and nutrition and food security. Recognition of the important role of cash based social protection systems, emergency feeding and targeted nutrition in the long term. Support for international collaboration and local implementation (supportive of CAADP).

GIZ, 2009-2012. POSITION PAPERS ON AGRICULTURE AND RURAL DEVELOPMENT

GIZ information briefs available from http://www.giz.de/Themen/en/

GIZ, 2009. Agricultural Education and Extension. Information Brief. Eschborn: GIZ

GIZ, 2009. Using Genetically Modified Organisms. Briefing Note. Eschborn: GIZ

GIZ, 2009. Value Chains in Agriculture. Information Brief Eschborn: GIZ

GIZ, 2009. The WTO and Agricultural Trade. Briefing Note. Eschborn: GIZ

GIZ, 2010. Resource Saving Fertilizer Use. Briefing Note. Eschborn: GIZ

GIZ, 2010, Volatile Agricultural and Food Prices. Briefing Note. Eschborn: GIZ

GIZ, 2010. Subsidizing Agricultural Inputs. Briefing Note. Eschborn: GIZ

GIZ, 2011. Securing Land Rights. Briefing Note. Eschborn: GIZ

GIZ, 2012. Large-scale Land Acquisitions and Leases. Briefing Note. Eschborn: GIZ

GIZ, 2012. Supporting Land Reform. Briefing Note. Eschborn: GIZ

AIM: Describing important current issues in global agriculture and rural development and setting out GIZ's position on these.

Enabling environment	
Provision of rural public goods	Paper on knowledge and extension places an emphasis on the importance of extension services, tailoring these to the needs of recipients (including raising demand for services); complementing private sector delivery, and making these cost effective. The paper on agricultural research emphasises the importance of research (targeted through CGIAR) as long as 1. Has a specific poverty alleviation goal 2. Is complementary to other research being carried out. 3. Users are involved.
Rural transitions	
Small-scale versus large-scale farms	
Land rights	Briefs on Land Rights, Land reform and large scale agriculture investments emphasise strengthening land rights especially for the poor. Strong land rights can be built upon customary and communal land rights. Those without information and registration are most at risk when formalising land rights.
Rural market failures	Not directly.
Trade openness and protection	Yes. Is supportive of trade policies which support rather than undermine food security and mentions the importance of ex ante scoping of trade pacts on food security prior to liberalisation.
Competitiveness and value chains	This brief stresses the importance of value chains approaches. Highlights the importance of competitiveness both in addressing poverty, and also in financing social and environmental objectives of agriculture. Emphasises starting with potential, rather than problems in order to achieve successes, and working with the private sector as the lead actor. Because agricultural markets are dynamic, know-how on value chains needs to be anchored within agribusiness communities, public authorities, rural associations as well as universities which supply qualified graduates.

Stabilising markets	Output Prices: acknowledge that there sometimes is no direct transmission of agricultural prices into food prices (food price rises may be higher than agricultural price rises). Although fluctuations are normal, these may be so great as to jeopardise production. In these cases intervention may be justified. There is a sequence for different types of intervention, as follows: measures which improve market functioning (better transport; communications; private and decentralised storage); market orientated instruments which reduce price or income risk: futures-trading, insurance (crop loss or weather- index); and lastly, State-based interventions should be regarded with caution (especially price management) as it disables market signals and leads to informal markets. Strategic stockpiling should be carefully analysed and only used on a small target population and small scale. Arguments for Virtual Grain Reserve are not convincing for price spikes. Speculation may increase amplitude of spikes but rarely cause them; any regulation should beware of removing liquidity from the markets (this applies to minimum holding periods, trader exclusion, and extra-commodity trade transactions). Position paper on fertiliser subsidies reports evidence that these can be effective in raising yields, and leading to growth outside the agricultural sector — especially from experience in Africa and Latin America — but can be costly and unsustainable in the long run. Argues that: The return of nutrients to fields must be ensured. Fertilisation needs to be adapted to local soil conditions, whereafter they are important to maintain/ enhance productivity. There are no blueprints for the design of subsidy programmes. Lessons learned comprise: incorporate subsidies into a strategy which targets the entire agricultural sector; any subsidies should be market-based, incentivising the private sector and lowering entry barriers, promoting competition, and driving up quality; target groups must be involved in the design; and, an exit strategy is needed. In the long run, the State should extract itself over the long run.
Technology	Yes. Paper on GIZ's position on GMO's acknowledges the achievements that the use of GMOs can bring, but views that their importance for reducing poverty is of subsidiary importance when compared to the increased use of conventional technologies. This assessment may change in the future if GM technologies make varieties available in areas facing considerable constraints (e.g. drought, salinity). Certain preconditions are necessary. Approaches should be problem-solving based rather than focusing upon technical solutions. In general, improving access to high quality seed is important. Varieties developed must be freely available to all as a public good. Functional systems for biosafety must be in place.

Environmentally sustainable farming	Application of fertilisers: many contexts need both organic and inorganic fertilisers; inorganic fertilisers especially need to be targeted and programmes need to incorporate training of farmers and advisors on use, not just provide cheap fertilisers. Programmes need to be economical (and take into account labour costs associated with organic fertilisers).
Responding to climate change	Paper on climate change and agriculture emphasises a focus upon adaptation without losing sight of mitigation potential. Within planned adaptation, GIZ supports differentiated responses based upon agro-climatic conditions. Supported measures are based upon 'no regret' strategy, to benefit farmers under all scenarios. On mitigation, agriculture should be linked to carbon markets, reducing high costs of access.
Other concerns	

HLPE, 2011. PRICE VOLATILITY AND FOOD SECURITY

HLPE, 2011, Price volatility and food security, A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2011.

Three perspectives on food price spikes:

- Perfect storm, the confluence of several unusual factors
- The bottom of a cycle of agricultural investment that takes progress for granted until there's a crisis after which funds pile in and we get growth again; and,
- A time of transition from an era of cheap oil and exploitation of natural resources with no account of external costs.

Enabling environment	
Provision of rural public goods	Stable and sustainable long-term investment in agriculture is a necessary condition for addressing the challenges in food security.
Rural transitions	
Small-scale versus large-scale farms	
Land rights	
Rural market failures	
Trade openness and protection	***Trade rules*** were set up in context of access for exporters in a world of surplus, not of access for importers when supplies are scarce. Need a rules-based system, but one that reflects the new reality, thinking of restrictions on export bans. Special exemptions from WTO disciplines should be granted to LIC.
Competitiveness and value chains	

Stabilising markets	Price transmission from world to domestic markets has been uneven. In any country, local volatility stems from domestic and external factors. Analyses need to be specific to domestic markets when looking for policy responses. Volatility is heterogeneous, affected by food preferences, access to world markets, agro-ecology, policy capacity, etc. Hence touted responses such as social safety nets or weather insurance will work in some cases, but not everywhere. A typology of countries might help, especially looking at low income, food insecure countries. ***Higher stocks*** would prevent spikes, but getting international agreement on levels, management and so on is difficult. a. The current context is different from the past, therefore, it is recommended that the CFS continues to explore forms of international cooperation regarding world food stocks and food security including the establishment of guidelines for the efficient management of such stocks. b. Better and transparent information systems are essential for policy decisions and management of stocks. The (AMIS) system proposed by the Inter-agency Report for the G20 is welcomed. ***Speculation*** may be controversial, but the exchanges should be more tightly regulated and more transparency demanded, as a precautionary measure. This implies that tighter regulation is warranted, at least as a precautionary measure. Increasing transparency, by requiring exchange trading and clearing of most agricultural commodity contracts, and setting lower limits for non-commercial actors could be the first set of measures taken by the countries that house major commodity exchanges. a. Action regarding transparency in futures markets and tighter regulation of speculation is necessary.
Technology	b. A significant global expansion in funding for agricultural research and development is recommended. Strengthening the current reform process of the CGIAR and support for national research systems will contribute to long-term solutions to fwood insecurity, especially in the context of land degradation, water scarcity and climate change.
Environmentally sustainable farming	
Responding to climate change	
Other concerns	Need to address: ▪ Demand for meat ▪ Biofuels ▪ Waste

IFAD, 2010. RURAL POVERTY REPORT 2011

Title: International Fund for Agricultural Development, 2010, Rural Poverty Report 2011: New realities, new challenges, new opportunities for tomorrow's generation, Rome: IFAD

AIM: An in-depth study of rural poverty by IFAD, with a strong focus on escalating risk factors.

Enabling environment	Yes. Accorded important emphasis in terms of what is needed to be done to reduce poverty amongst smallholders.
Provision of rural public goods	Yes. Especially infrastructure (roads) but also water and energy; education and healthcare; financial services and BDS. Financial services for the poor are also mentioned, in order to reduce costs of accessing credit, savings and remittances.
Rural transitions	Yes. Mentions the trajectory of most countries will mean that some farmers are able to take advantage of opportunities available, others will move out. 'In the future, growing resource scarcities, market transformations are likely to simultaneously **strengthen** the viability of smallholder agriculture for a number of small farmers, (those who can make it a sound 'business') and push many others to seek different opportunities, as agricultural workers, in the RNFE or through migration. **The key challenge is to ensure that those opportunities enable people to move out of poverty' (p. 221).**
Small-scale versus large-scale farms	Emphasis of this document is largely on small-scale farmers and poverty reduction. Few mentions of how large-scale farms have been better able to respond to changing situation (higher food prices, higher demand).
Land rights	Brief mention in the context of the need for more security in order to encourage farmers to invest in sustainable intensification of production.
Rural market failures	
Trade openness and protection	Relatively little, -mainly linked to stabilising market below.
Competitiveness and value chains	Yes. A role for government in facilitating linkages with the private sector and reducing transactions costs for smallholders along the value chain. Can be done through ICTs, contracts.
Stabilising markets	Takes a view that this can be done, Provides a discussion of the various situations where countries have suffered from volatility (import surges; high prices) and the various successful ways in which governments have done this (etc. defending floor prices). 'The issue is not one of whether governments should or should not engage in food markets. Rather, it is one of ensuring that the policies and interventions are sustainable and that they are appropriate for, and effectively contribute to, reducing risk and promoting on-farm investment. They therefore need to be identified on a case-by-case basis, respond to context-specific (and often time-bound) issues, have clearly defined and circumscribed goals, and be based on government institutional capacity for effective implementation. Finally, they must also have a strong governance framework, and be financially sustainable' (p. 97).
Technology	Yes. Some mention on the benefits of ICTs and their potential for reduced transactions costs. Includes a discussion on the continued relevance of Green Revolution technologies, but how these need also to be improved upon to meet challenges associated with growing scarcity of resources. Has a balanced picture of the role of GM Includes a discussion on technology diffusion and how farmer to farmer systems provide a useful model.

Environmentally sustainable farming	Yes. Emphasises the need for sustainable intensification in farming worldwide, and a need to redress policies so that they become more orientated towards sustainability concerns; and provide incentives towards sustainable intensification. Also highlights a need for integrating smallholder farmers more closely into PES markets.
Responding to climate change	Briefly, but mainly in the context of sustainable intensification.
Other concerns	Includes a stronger focus on risk management. This includes both strengthening smallholders' ability to deal with risks and advocates a role for government/ NGOs in reducing risks that the poor face. This is noted as being of special importance in order to encourage sustainable intensification. Also includes a focus on the need to improve training and vocational skills in rural areas, in order to ease transitions, improve agricultural skills.

IFPRI, 2012. STRATEGIES AND PRIORITIES FOR AFRICAN AGRICULTURE

Diao, Xinshen James Thurlow, Samuel Benin, and Shenggen Fan (Eds), 2012, Strategies and Priorities for African Agriculture. Economy-wide Perspectives from Country Studies. Washington DC: International Food Policy Research Institute

Models 10 African countries to look at the potential returns to investment in agriculture as a way to generate growth and to reduce poverty

Enabling environment	
Provision of rural public goods	Since there are good returns to investment in agriculture, argues for more spend on agricultural development. But qualifies this by arguing for more efficient public investment.
Rural transitions	
Small-scale versus large-scale farms	Broad-based growth has strongest impacts.
Land rights	
Rural market failures	
Trade openness and protection	
Competitiveness and value chains	
Stabilising markets	
Technology	
Environmentally sustainable farming	
Responding to climate change	
Other concerns	Investing in staple crop production usually has a stronger impact than in exports, owing to greater size of staples and stronger multipliers than in export crops where most exports are raw and unprocessed.

INTERAGENCY REPORT TO THE G20, 2012. AGRICULTURAL PRODUCTIVITY AND BRIDGING THE GAP FOR SMALL FAMILY FARMS

FAO, OECD, Bioversity, CGIAR Consortium, IFAD, IFPRI, IICA, UNCTAD, HLTF, WFP, World Bank, and WTO, 2012. Sustainable Agricultural Productivity Growth and Bridging the Gap for Small Family Farms: Interagency Report to the Mexican G20 Presidency. Available at: www.oecd.org/tad/agriculturalpoliciesandsupport/50544691.pdf

AIM: To present evidence and discuss the scope and potential pathways for smallholders to raise levels of productivity. This report was commissioned by the Mexican Presidency of the G20.

Enabling environment	Yes. Cites 'significant improvements in macroeconomic, structural, and agricultural policies and institutions to provide the necessary incentives to farmers and the private sector to increase investments and build the necessary capital.'
Provision of rural public goods	Yes. An important role remains for public sector, as private sector will orient towards high value, market orientated production systems. Highlights the importance of extension.
Rural transitions	No specific mention of out-migration. Only one reference to providing opportunities for farmers to seize opportunities in RNFE.
Small-scale versus large-scale farms	Yes, strong supportive of small farmers and their role in contributing to agricultural development objectives. 'The role of smallholder farmers and their families in increasing agricultural productivity growth sustainably will be crucial...The success of developing countries in increasing agricultural productivity will have global implications in strengthening the resilience of food markets, enhancing food security, improving wellbeing and promoting sustainability' (p. 7). A main focus of the document is how to raise their productivity. Notes that they provide the bulk of agricultural investment in many developing countries.
Land rights	Yes. Mentioned as an area where particular attention is needed. 'Of particular concern are poor policies and institutions that grant smallholders limited control over land and water resources on which their productive activities and livelihoods depend. An estimated 1 to 2 billion people globally live on and use commonly held land over which they have no legal title (IFAD, 2011a). Poorly defined property rights limit their access to credit and insurance markets, and prevent them from investing in improved environmental sustainability and natural resource management.'
Rural market failures	Not specifically. For credit, discussion of benefits of mechanisms (loan guarantees, vouchers) as opposed to subsidies. Mention of risk management tools (weather index insurance) and the need to roll these out.
Trade openness and protection	Yes. Echoes what is said in the Price Volatility in Food and Agricultural Markets report. Generally pushes for liberalisation in markets, with exceptions for exceptional circumstances, and other flexibility in accordance with existing instruments (Aid for Trade initiative).
Competitiveness and value chains	Yes. Provides a nuanced view on support policies through value chains: 'Commodity-based support has the largest impact on production, but protecting farmers from competition does not encourage them to increase productivity. Market interventions often treat the symptoms of market failure and under-development rather than the cause' p16. There are multiple roles for governments to intervene to support the development of agricultural markets and value chains in which smallholders can find profitable, low risk market opportunities...

Stabilising markets	Takes a nuanced view on benefits, citing both the ability to create a more stable investment climate, but also imposing high costs on consumers and thwarting the development of private risk management.
Technology	Short mention emphasising the need for additional commitment to technology breakthrough, better tech transfer mechanism, and the need for developing countries to establish new institutions and policies to drive private sector investment in technology. Discusses IPR and seed laws, and the need for some countries to revise laws (p. 35).
Environmentally sustainable farming	Included in the discussion on CSA, with additional mention of the need for governments to reduce perverse incentives.
Responding to climate change	Yes. Includes a discussion on the need for Climate Smart Agriculture, and policies needed to transition towards this.
Other concerns	There is a strong focus on the need for strengthening Agricultural Innovation Systems, and outlining how these can be built up.

INTERAGENCY REPORT TO THE G20, 2011. PRICE VOLATILITY IN FOOD AND AGRICULTURAL MARKETS

FAO, IFAD, IMF,OECD, UNCTAD, WFP, the World Bank, the WTO, IFPRI and the UN HLTF, 2011. Price Volatility in Food and Agricultural Markets: Policy Responses. 2 June 2011. Available at: http://www.fao.org/fileadmin/templates/est/Volatility/Interagency_Report_to_the_G20_on_Food_Price_Volatility.pdf

Enabling environment	International lending to compensate countries against price risks in world markets Macroeconomic adjustment (could also be considered as crisis prevention mechanisms depending on the triggers) Countercyclical loan instruments and emergency drawing rights ▪ AFD pilot ▪ IMF facility
Provision of rural public goods	
Rural transitions	
Small-scale versus large-scale farms	
Land rights	
Rural market failures	
Trade openness and protection	
Competitiveness and value chains	Contract farming to offset risks.

Stabilising markets	Potential of risk management:
	
	We recommend that bilateral, regional and multilateral development banks develop risk management advisory and intermediary services that would help developing countries: (1) assess their risk coverage needs and establish a mapping of relevant food security and agricultural production risks; (2) identify solutions to satisfy their needs; and (3) negotiate costs for the service to be provided.
	
	Mainly aimed at public agencies, but could extend to private actors
	
	Toolbox might include:
	
	▪ Index-based weather derivatives – Malawi (World Bank intermediation, DFID financing); WFP programs in cooperation with AXA for drought in Ethiopia; WFP-African Union initiative to develop a financial institution (the African Risk Capacity) to provide an ex-ante weather risk management facility
	▪ Cotton price smoothing mechanism – Burkina Faso (French Development Agency)
	▪ Caribbean Catastrophe Risk Insurance Facility
	▪ Futures on corn – Mexico
	▪ Pull mechanisms for farm inputs – Proposal of Canada
	▪ IFC risk sharing facility
	▪ WFP's insurance scheme in Ethiopia's drought using index-based weather derivatives
	
	Increasing transparency and information
	
	▪ Monitoring and data collection mechanism
	  ▪ AMIS project for food security
	▪ Improving meteorological forecasts
	▪ Improving information on stocks (quantity and quality)
	
	Improving agricultural production and productivity
	
	▪ Agricultural development programs that include a risk management dimension
	  ▪ Strengthening of CAADP
	  ▪ Pledges to GAFSP
	▪ Regional agricultural exchange markets
	  ▪ Ethiopia pilot (WB)
	
	Promoting risk management culture and access to market-based instruments
	
	▪ Developing price risk management advisory and intermediation services
	  ▪ Proposal of a multi-donor initiative
	▪ Price smoothing mechanisms
	  ▪ Burkina Faso pilot on cotton (AFD)

	▪ Insurance mechanisms
	  ▪ Malawi pilot on weather derivatives (WB/DFID)
	  ▪ Caribbean pilot on natural disasters (CCRIF)
	Variation of input prices
	▪ Advance market commitments and other pull mechanisms – and link with research
	  ▪ Canada proposal
	▪ Futures on commodities (e.g. oil)
	Variation of climate conditions
	▪ Weather index insurances – including in private contracts
	  ▪ WFP's Ethiopia Drought Index-based insurance scheme
	Variation of international or domestic prices
	▪ Risk hedging – including in private contracts
	  ▪ Risk sharing pilot facility (IFC)
	  ▪ Private contracts with price smoothing mechanisms – proposal to be promoted through public-private risk sharing
	▪ Private stocks and warehouse schemes

Technology	
Environmentally sustainable farming	
Responding to climate change	
Other concerns	

MULTIPLE AGENCIES, 2010. SCALING UP NUTRITION: A FRAMEWORK FOR ACTION

SUN, 2010, Scaling Up Nutrition. A Framework for Action. Available at http://siteresources.worldbank.org/NUTRITION/Resources/281846-1131636806329/PolicyBriefNutrition.pdf

Aims: The first is to provide an outline of the emerging framework of key considerations, principles and priorities for action to address undernutrition.

The second is to mobilise support for increased investment in a set of nutrition interventions across different sectors.

	Only about food and nutrition security Key document since it has been signed by more than 100 research centres, NGOs, donors, multilaterals, UN agencies, etc.
Nutrition	Impassioned plea for more investment and action to combat malnutrition, backed by of the high costs of malnutrition. Argues that waiting for income growth to solve malnutrition will take too long. In addition, the evidence shows not only that improvements in nutrition lag far behind income growth4 but that families with ample incomes for adequate food intake also suffer from surprisingly high rates of undernutrition. Hence calls for emphasis on the 13 specific interventions — in feeding practice, in nutrient supplementation, in fortification of foods, and therapeutic feeding of undernourished infants — that have been proved and for which benefit-cost ratios are high. Results from field studies indicate that, at full implementation, the package of 13 interventions would result in a child mortality decline of about 1 million deaths per year, equivalent in the case of young children to 30 million life years (or, more precisely, what is referred to in public health as 'disability-adjusted life years' or DALYs) saved. Even partial progress would bring extraordinary results. For example, when 50% coverage is attained, 500,000 children's lives would be saved. But, as already noted, the benefits of childhood nutrition interventions go far beyond mortality reduction to include cognitive and physical development, better health and higher earnings A rigorous longitudinal study in Guatemala, for example, found that boys receiving a fortified complementary food prior to age 3 grew up to have wages 46% higher than those in the control group. The study estimated an increase in GDP of at least 2-3%. These substantial benefits are why it is important to address mild as well as severe undernutrition So scale up efforts! For the 36 countries where 90% of the world's under-nourished children live, the costs would be US$11.8G a year. Total costs may be greater when expanding this across countries, when delivering programmes for children over age 2, and if programme delivery were not aimed at 90% coverage, but at 100%. Much made of calls for nutrition-sensitivity and for better co-ordination of existing efforts.

OECD, 2012. AGRICULTURAL POLICIES FOR POVERTY REDUCTION

OECD , 2012. Agricultural Policies for Poverty Reduction, Paris: OECD Publishing.

AIM: Discusses successful agricultural policies and their relationship to poverty reduction in a historical context and across countries.

Enabling environment	Equally important is the overall investment climate, which depends on factors such as peace and political stability, sound macroeconomic management, developed institutions, property rights and governance.
Provision of rural public goods	Heavy stress on investing in these, as opposed to private goods Many of the policies required to improve farmers' opportunities are non-agricultural. Improvements in education and primary healthcare are key to prospects within and outside the sector. In agriculture-dependent economies, there is a strong case for increasing the share of public spending allocated to sectoral public goods, such as rural roads and agricultural research, and to technology transfer, farm extension and advisory services.
Rural transitions	Key part of context: some farmers will leave as and when their farming ceases to pay. In the short to medium term, there is a need to raise the basic incomes of the poor and to strengthen systems of social protection. Since over two-thirds of the world's dollar-a-day poor live in rural areas, where farming is a core economic activity, this implies policies and investments that raise economic returns within agriculture. In the long run, there is a need to anticipate the structural changes in agriculture that accompany successful economic development. These include: i) a declining share of agriculture in GDP as the economy develops and diversifies; ii) a release of labour from the sector driven by a combination of the 'push' of labour-saving technical change in agriculture and the 'pull' of growing labour demand in non-agricultural sectors; and iii) rising agricultural output This means offering multiple development pathways for farm households: improving competitiveness (i.e. productivity) within the agricultural sector; diversifying income sources among household members; and, for some, leaving the sector for better paid jobs.
Small-scale versus large-scale farms	
Land rights	

Rural market failures Stabilising markets	Under-developed institutions and endemic market failures have therefore led to 'second best' options being explored, including the use of price stabilisation schemes and subsidies for fertiliser and other inputs. This volume considers the specific circumstances under which the use of such instruments might be warranted. In low-income countries, however, it has been suggested that – because of weak institutions and endemic market failures – market interventions might also be warranted. Price support, price stabilisation, and input subsidies have been proposed as ways of addressing short-term objectives with respect to incomes, poverty and food security, and of promoting long-term economic development. In the short term, price policies provide an easy lever for government, but are inefficient at addressing income concerns. Price support for food products is a blunt instrument because, among the poor, there are net sellers and net buyers of food – in many poor countries, the majority of farm households are net buyers. Price stabilisation (as opposed to price support) can limit the impact of adverse shocks on producers and consumers, but often proves to be fiscally unsustainable. A preferable option for the poor – both producers and consumers – is targeted social programmes, including cash transfers, although these may be difficult to implement in the poorest economies. At the same time, agricultural investments can improve farmers' resilience to risk. Over the long term, market interventions treat the symptoms of market failure and under-development rather than the causes. Price stabilisation can provide a more stable investment climate, but thwarts the development of private risk management and can export instability onto world markets. Input subsidies can redress failings such as the under-development of infrastructure, missing markets for credit and inputs, and a lack of knowledge of the benefits of using improved seed and fertiliser, but can impede the development of private markets. In both cases, the benefits and costs of intervention need to be judged relative to the benefits and costs of tackling the underlying problems directly. Finally, there are dangers in using market interventions to address multiple economic and social objectives. Such programmes can become an easy target for interest groups, outliving their original justification and becoming a budgetary millstone. An important priority is that expenditures on market interventions should not crowd out essential investments in support of long-term agricultural development.
Trade openness and protection	Liberal trade a prime measure for more stable markets.
Competitiveness and value chains	
Technology	
Environmentally sustainable farming	
Responding to climate change	
Other concerns	Social protection as the prime way to deal with poverty: It leaves an important role for targeted social policies in helping farmers who cannot adjust within the current generation, and for addressing immediate concerns about the level and distribution of income.

UK GOVERNMENT, 2011. FORESIGHT REPORT ON THE FUTURE OF FOOD AND FARMING

Foresight, 2011, The Future of Food and Farming: Challenges and choices for global sustainability, Final Project Report. London: The Government Office for Science

Aims: to explore the pressures on the global food system between now and 2050 and identify the decisions that policy-makers need to take today, and in the years ahead, to ensure that a global population rising to nine billion or more can be fed sustainably2 and equitably.

Enabling environment	
Provision of rural public goods	
Technology	Box 1.2 Appraising new technologies in the food system New technologies (such as the genetic modification of living organisms and the use of cloned livestock and nanotechnology) should not be excluded a priori on ethical or moral grounds, though there is a need to respect the views of people who take a contrary view Investment in research on modern technologies is essential in light of the magnitude of the challenges for food security in the coming decades The human and environmental safety of any new technology needs to be rigorously established before its deployment, with open and transparent decision-making Decisions about the acceptability of new technologies need to be made in the context of competing risks (rather than by simplistic versions of the precautionary principle); the potential costs of not utilising new technology must be taken into account New technologies may alter the relationship between commercial interests and food producers, and this should be taken into account when designing governance of the food system There are multiple approaches to addressing food security, and much can be done today with existing knowledge. Research portfolios need to include all areas of science and technology that can make a valuable impact – any claims that a single or particular new technology is a panacea are foolish Appropriate new technology has the potential to be very valuable for the poorest people in low-income countries. It is important to incorporate possible beneficiaries in decision-making at all stages of the development process.
Small-scale versus large-scale farms	
Trade openness and protection	
Rural market failures	

Stabilising markets	Possible there will be more volatility in future after stable times. Argues that price spikes are inevitable. A wide range of drivers is likely to affect volatility in the future: non-economic factors such as armed conflict and breakdown of regional or national governance; general economic factors such as globalisation and international trade, and shocks in other commodities particularly in the price of oil; the level of food stocks held by private and public sector agents; how the markets are regulated; continuing improvements in crop protection and biotechnology; subsidies or incentives to bi-ofuels; and for particular commodities the size of the relevant market. The cultural importance of certain foods can also be influential, as this can lead to government interventions to reduce price volatility. Policy options include safety nets, more information to allow markets to function better. Explicit rejection of more public reserves, physical or virtual. Suggests that more study of derivatives and automatic trading are needed. Targeted food reserves for vulnerable (typically low-income) countries should be considered. There is a strong case for establishing an emergency food reserve and financing facility for the World Food Programme to help low-income countries facing sudden increases in food import bills when price spikes occur. The poorest food producers need specific assistance to obtain insurance against risk and volatility. Safety nets will be required at times of unusually high food prices.
Land rights	Mention of need to ensure people have secure right.

Responding to climate change Environmentally sustainable farming	The context is that there is widespread hunger and malnutrition in the world, including a rising problem of obesity; with many farming systems are not sustainable. (Strong statement on this) Many systems of food production are unsustainable. Without change, the global food system will continue to degrade the environment and compromise the world's capacity to produce food in the future, as well as contributing to climate change and the destruction of biodiversity. There are widespread problems with soil loss due to erosion, loss of soil fertility, salination and other forms of degradation; rates of water extraction for irrigation are exceeding rates of replenishment in many places; over-fishing is a widespread concern; and there is heavy reliance on fossil fuel-derived energy for synthesis of nitrogen fertilisers and pesticides. In addition, food production systems frequently emit significant quantities of greenhouse gases and release other pollutants that accumulate in the environment Ways to reduce GHG: ▪ Creation of market incentives to encourage emissions reductions. These might include grants, subsidies, levies, carbon taxes or carbon cap and trade schemes ▪ Introduction of mandatory emissions standards or limits by direct regulation ▪ Adoption of low-emission strategies through market pressures driven by consumer choice. This requires active and informed consumers, and sources of accurate and trusted information such as labelling for emissions or product certification ▪ Voluntary (non-profit driven) measures taken by industry as part of corporate social responsibility Some changes entail double wins. Need to take land use change seriously. Link of biofuels needs attention. Increased carbon sequestration through integrated soil and vegetation management is also promising: were the organic carbon pools in the world's soils to be increased by 10% in the 21st century, it would be the equivalent of reducing atmospheric CO2 by 100 parts per million. Need to be able measure better the GHG for food. Industry OK with standards, but worried about not getting a level playing field.
Competitiveness and value chains	
Rural transitions	About transitions to sustainable farming and food systems.
Other concerns	Sets out the issues: by 2030 population with reach around 8 billion; 9 billion or more by 2050. People will be better off. On the supply side, limits to land, water and energy; while adapting to climate change and mitigating it. While globalisation is expected to continue That creates five imperatives in balancing supply and demand, reducing volatility, ending hunger, and doing so in ways that are environmentally sustainable Sets out the issues of ***reducing demand for meat*** and of ***cutting waste*** in food systems

UN HLTF, 2010. UPDATED COMPREHENSIVE FRAMEWORK FOR ACTION

United Nations High-Level Task Force on the Global Food Security Crisis, 2010. Updated Comprehensive Framework for Action, September 2010. Available at http://www.un-foodsecurity.org/node/842

Aims: Sets two objectives:

1. Meeting immediate needs of vulnerable populations

   Objective: Improve access to food and nutrition support and take immediate steps to increase food availability

2. Building longer-term resilience and contributing to global food and nutrition security

   Objective: Strengthen food and nutrition security in the longer term by addressing the underlying factors driving the food crisis

Enabling environment	1.4 Management of macroeconomic implications. Hold down core inflation and inflation expectations. Assess the impact on the balance of payments and feasibility/sustainability of a reserve drawdown. Mobilise external support to finance additional food imports. Ensure adequate levels of foreign exchange reserves. Assess and comprehensively cost all fiscal measures taken in response to the rise in food prices.
Provision of rural public goods	Improve rural infrastructure.
Technology	Invest in agricultural research.
Small-scale versus large-scale farms	2.2 Sustained increases in food availability through growth in smallholder farmer food production. Ensure that the macroeconomic, budget, trade and sector policy framework provides incentives for sustainable increases in smallholder production. Stimulate private investment in agriculture with focus on small-scale farming. Enhance secure and equitable access to natural resources.

Trade openness and protection	Promote increased agriculture trade and more open trading environments. Reduce/eliminate agricultural trade distortions in higher-income countries. Complete the Doha Round of trade negotiations. Ensure additional resources for 'Aid for Trade'. Develop trade financing infrastructure. 1.3 Adjustments to trade and tax policies Encourage better functioning food markets through improved regional political and economic integration and better functioning environments for trade in food. Immediately review trade and taxation policy options and their likely impacts. Use limited strategic grain reserves. Avoid generalised subsidies for food consumers. Minimise use of export restrictions. Reduce restrictions on use of stocks. Reduce import tariffs and other restrictions. Improve efficiency of trade facilitation. Temporarily reduce VAT and other taxes.
Rural market failures	Ensure sustained access to competitive, transparent and private-sector led markets for food produce and quality inputs. Support development of, and strengthen producer organisations with the participation of women. Strengthen access of smallholders and other food value chain actors to financial and risk management instruments.
Stabilising markets	2.4 Improved performance of international food markets Support development of mechanisms for improving emergency access to food through stock sharing. Assess the feasibility of models for the establishment and operation of sustainable, strategic reserves of key grains. Strengthen international oversight and analysis of food commodity and futures markets to improve their transparency and predictability and to limit the scope for speculation to exacerbate price volatility. Reduce constraints to enabling environment that encourages private sector involvement in food markets.
Land rights	
Responding to climate change	
Environmentally sustainable farming	2.3 Better-managed ecosystems for food and nutrition security Strengthen ecosystems monitoring and assessment; Improve natural resource management within agricultural ecosystems; Improve economic and institutional mechanisms to support sustainable management of agricultural ecosystems.

Competitiveness and value chains	
Rural transitions	
Other concerns	1.1 Emergency food assistance, nutrition interventions and safety nets enhanced and made more accessible. Ensure that emergency food needs are fully met; Protect basic consumption needs of vulnerable populations; Scale up nutritional support; Support management and prevention of undernutrition; Promote school feeding; Adjust social protection programmes for food prices; Allow free and predictable flow of food assistance; Ensure that local purchases of food and food components for humanitarian purposes are exempt from restrictions; Explore the establishment of efficient and effective humanitarian food reserves; Reach all households with pertinent public information on food assistance, nutrition and hardship alleviation programmes; Urgent increases in food availability from smallholder farmer food production; Provide productivity-enhancing safety nets; Reduce post-harvest crop losses and improve food stocks along the value chain; Remove artificial constraints to domestic trade throughout the food chain in order to link smallholder farmers to markets; Address basic energy needs of smallholders and rural households. Social protection: 2.1 Expanded social protection systems Strengthen capacity to design and implement social protection policies and programmes; Ensure that special care is taken in identifying and addressing the needs of the most vulnerable; Balance the need to ensure effective coverage of the vulnerable with the need to maintain efficient use of resources; Improve linkages between sectors and between actors; Improve the quality and diversity of foods; Support the implementation of international labour standards. Information, monitoring, accountability: 3.1 Strengthened information monitoring and accountability systems Implement systems that track and review the implementation of national policies strategies, and legislation relevant to food and nutrition security. Improve further the co-ordination of information systems. Continue to carry out comprehensive food and nutrition security assessments, monitoring and evaluation. Undertake integrated analysis and monitoring of the impacts of shocks.

UNITED STATES GOVERNMENT, 2010. FEED THE FUTURE GUIDELINES

United States Government, 2010. Feed the Future Guidelines. Available at http://www.feedthefuture.gov/

AIM: This document lays out the areas of focus for US investments under the Feed the Future initiative. It also provides details of the other on-going national and international initiatives which the US funds.

Enabling environment	Yes. Mentioned in the context of the limitations of public investments, and the need to create these in order for the private sector to step in (p. 6). Highlights the importance of collecting and analysing market info. Is also mentioned in the context of 'increasing economic resilience'.
Provision of rural public goods	Sees this as a critical component allowing private sector to operate. GFASP in particular is expected to fund rural infrastructure, which other donors find difficult to do.
Technology	Access to technology mentioned as being important in the context of raising productivity for smallholders; increasing access to market info; and an area of focus for linking research to smallholders.
Small-scale versus large-scale farms	Broad support for small-scale farming for poverty reduction. 'Unleashing the proven potential of small-scale agricultural producers, while encouraging the sustainable and equitable management of natural resources, will reduce hunger and create a more resilient global food supply for everyone'. Aims most of its support at areas to help small-holders' productivity increases (p. 10).
Trade openness and protection	Yes. Prioritises increasing regional trade (p. 21) and expanding access to markets.
Rural market failures	
Stabilising markets	Yes. Sees government control over commodity prices as a barrier to creating an enabling environment for agribusinesses (p. 12).
Land rights	Yes. Investing in land tenure systems (including harmonizing statutory and customary tenure) is an area highlighted for increased investment.
Responding to climate change	Yes; described in the context of environmentally sustainable farming.
Environmentally sustainable farming	Yes- highlights the importance in reducing environmental degradation and includes objectives related to this (p. 30)
Competitiveness and value chains	
Rural transitions	Yes. Mentions the need to reasonably regulate labour migration and enable labour mobility and small enterprise development.
Other concerns	There is a strong focus on improving nutritional status. Also the need to engage more with women.

WFP, 2009. HUNGER AND MARKETS

World Food Programme, 2009. World Hunger Series: Hunger and Markets, London: Earthscan

AIM: To highlight the links between how markets operate and food security.

Enabling environment	Briefly. Highlights the important role in creating an enabling environment for food marketing in ensuring the proper functioning of markets.
Provision of rural public goods	Supportive of government intervention in backstopping institutions, coupled with market liberalisation. 'Providing public goods and improving market performance may decrease transactions costs, information asymmetries and co-ordination failures, indirectly enhancing both food availability and food access'. Also argues that the provision of public goods may not obviate/ lessen the need for intervention in markets. However, argue that this may also be dangerous: Governments may fail in this (provisions of public goods), potentially weakening markets.
Technology	Yes. States the need for investments in technology are needed to alleviate hunger, but no further details provided.
Small-scale versus large-scale farms	In passing. Acknowledges greater land productivity on small farms. *'Production would...increase if land were cultivated as smaller farms'* (p. 64). However, smallholders also face challenges on four fronts: lower producer prices due to higher unit transport costs; crop choice motivated by safety-first considerations; need for cash and poor storage leads to selling immediately after harvest at low prices; and, opportunity costs for reaching markets may be prohibitive.
Trade openness and protection	Yes. An emphasis on trade policy which supports food security. Acknowledges the mixed benefits brought about by liberalisation (seasonality; thin markets; thin institutions (Kydd & Dorward, 2004) Discusses the need to end sudden disruptive trade bans, but acknowledges that countries are wary of total liberalisation and dependence on large grain dealers. (p. 29). Highlights the need for discussion between government and traders.
Rural market failures	Limited discussion of these in terms of credit, and discusses the role of both microfinance and social safety nets and insurance in addressing credit and risk failures. (p. 105). Discusses the increased frequency of market failures during crises, and in their aftermath. (p. 113)
Stabilising markets	Stabilising prices can be an effective complement, as applied during the Green Revolution in many Asian countries. But uses should be limited to cases of market failure. *'Stabilising prices is less effective if it is not combined with measures to improve price stability, infrastructure, incentives and investment' 'Any government involvement should constantly adapt its policies to changing market situations.' (p. 128).* Should operate only when prices exceed a price band but defending this is troublesome *'In the long run, stabilizing macroeconomic conditions, enhancing market information, reducing transactions costs, improving credit and insurance markets, and developing safety nets may be more beneficial than price stabilization schemes'* (Gabre-Madhin, 2005) (p. 127).
Land rights	Yes. Insecure tenure and lack of registration inhibit the development of a land market in many DCs. Lack of clear title... hinders use by the most productive cultivators.
Responding to climate change	
Environmentally sustainable farming	

Competitiveness and value chains	Emphasises the need to maintain competition and numerous players in the market.
Rural transitions	Transitions are acknowledged (and a heightened role for governments in disciplining markets is suggested) but not expanded upon further.
Other concerns	Looks in detail at the performance and impacts of markets during crises, and actions that should be taken thereafter. Also cautions on providing adequate support (through PPPs) to address the change in markets owing to increasing power of supermarkets, for both consumers and producers. For consumers the issue is of changing diets to increasingly affordable, but less nutritious foods. For producers, the lack of access due to higher standards and purchasing arrangements favourable to large farms.

WISE & MURPHY 2012. RESOLVING THE FOOD CRISIS: ASSESSING GLOBAL POLICY REFORMS SINCE 2007

Wise, T.A. and Murphy S, 2012. Resolving the Food Crisis: Assessing Global Policy Reforms Since 2007, Medford, MA: Global Development and Environment Institute and Institute for Agriculture and Trade Policy

The purpose of this paper is to assess what has changed since the crisis erupted. Our goal is to examine the changing architecture for the global governance of food and agriculture, outline the main policies and priorities of major institutions and governments, and review the ways in which these have led to changes in practice, both in funding levels for agricultural development and in the priorities evident in the programs that are supported.

Reviews the changing narratives since 2007. Sees a major push coming from the World Development Report of 2008 in redirecting attention to agriculture and the role of SF. Notes IIASTD producing a more varied vision of agricultural development.

Reports that there is increasing recognition of the role of the state. While there are declarations in favour of SF and women in agriculture, it is less clear there will be action to reflect this. Their assessment is that analysis of SF still tends to depend on markets working well. Little discussion of lower input farming can be seen. Climate change little addressed.

Critical of G20 as usurping the position of other democratically mandated agencies, such as the UN system.

Enabling environment	
Provision of rural public goods	
Technology	
Small-scale versus large-scale farms	
Trade openness and protection	Trade: argues that trade liberalisation is not needed.
Rural market failures	Critical of excessive faith in free markets. Bank on agricultural finance: Launched in 2010, AgriFin is a new Bank initiative intended to overcome market failures in credit and finance by funding approved domestic financial institutions to encourage increased lending to smallholder agriculture and rural enterprises. Grants support capacity---building in established, regulated financial institutions (AgriFin, 2010).
Stabilising markets	Strong on need to do more.

Land rights	Strong on need to question land deals.
Responding to climate change	Critical of World Bank on environment, and especially of notion of using markets to reward farmers for storing carbon. Finally, from within the UN system the CFS is well positioned to play a positive role on climate change and agriculture. While the UNFCCC negotiations are struggling to agree to basic steps forward on mitigating and adapting to climate change, they have all but entirely ignored agriculture, despite the importance of industrial agriculture as a source of greenhouse gas emissions, and the already evident impact of climate changes on agricultural production in some regions. This gives the multi-stakeholder CFS an important place in global climate negotiations and at the upcoming June 2012 Rio+20 meetings. HLPE will be producing a report on climate change and agriculture in 2012.
Environmentally sustainable farming	Agro-ecology: little progress here.
Competitiveness and value chains	
Rural transitions	
Other concerns	Biofuels: even less, outright parking of the issue by high levels, prompting walk out by CSOs at the CFS. In the conclusions sees three main things being ignored: ▪ Biofuels ▪ Price volatility ▪ Land grabs

WORLD BANK, 2007. WDR 2008: AGRICULTURE FOR DEVELOPMENT

World Bank, 2007, World Development Report 2008: Agriculture for Development. Washington, D.C.: World Bank

AIM AND OVERVIEW: Major statement on agricultural development: needed to beat poverty. Migration usually does not alleviate much poverty.

But changing context and three words in which agriculture operates: agricultural, transition, urbanised.

Enabling environment	Biases in policy against farming - even if the worst of negative protection is now history. Not enough has been spent on farming in many countries, with a disastrous tendency to extract with too little investment in many cases. And aid for agriculture has fallen, owing to: (1) falling international commodity prices that made agriculture less profitable in developing countries; (2) increased competition within ODA especially from social sectors; (3) emergency responses to numerous crises; (4) opposition from farmers in some donor countries to supporting agriculture in their major export markets; and (5) opposition from environmental groups that saw agriculture as a contributor to natural resource destruction and environmental pollution. (p. 43) Ch. 4: Reforming trade, price, and subsidy policies
Provision of rural public goods	Access to assets matters, but for most rural households their access is low - and often highly unequal amongst the rural population. Review in turn: ▪ Human capital - low levels of rural education, health; ▪ Land; ▪ Livestock; ▪ Social capital: Producer organisations can be part of the social capital of many smallholders, contributing to smallholder competitiveness. Between 1982 and 2002, the proportion of villages with a producer organisation rose from 8% to 65% in Senegal and from 21% to 91% in Burkina Faso. Overall, 69% of Senegal's rural households and 57% of Burkina Faso's are now members of producer organisations. Data for other African and Latin American countries, although fragmented, also indicate a rapid increase in the number of such local organisations. Risks - both covariate and idiosyncratic - are pervasive and costly.

Technology	Innovating through science and technology. Genetic improvement has been enormously successful, but not everywhere. Management and systems technologies need to complement genetic improvement. Investing more in R&D. Institutional arrangements to increase the efficiency and effectiveness of R&D systems. Using available technology better: extension and ICT innovations. Moving forward. *focus E: Capturing the benefits of genetically modified organisms for the poor*
Small-scale versus large-scale farms	Small farms: rehearses argument for seeing SF as efficient, but notes the market failures and other disadvantages faced. Evidence on yields from Brazil and Chile shows large farms as having higher yields: sense that longstanding advantages of SF may be ending.
Trade openness and protection	Reforming trade, price, and subsidy policies. Agricultural protection and subsidies in developed countries. Agricultural taxation in developing countries. Simulated gains from trade liberalisation. Scope for achieving potential gains. Transitional support. Public investment for long-term development. Conclusions
Rural market failures	Market failures can mean that the reactions of households to incentive appear perverse. The public role: In many cases, collective action alone cannot correct market failures; that is a crucial role for policies and the state. Yet in many developing countries, the state has failed to play this role. To the contrary, many policies have been detrimental to rural households' livelihoods. Taxation of the agricultural sector, policy biases favoring large farms, and failure to provide education and health services severely constrain the potential of rural households to pull themselves out of poverty through the farming pathway. Reversing such policies can enhance existing household strategies or open the potential for new and successful ones (p. 83).
Stabilising markets	
Land rights	
Responding to climate change	Climate change will affect the distribution of production, with Sub-Saharan Africa expected to lose out.

Environmentally sustainable farming	8 Making agricultural systems more environmentally sustainable (p. 180) Drivers of resource degradation. Improving agricultural water management Greening the green revolution Managing intensive livestock systems Reversing degradation in less-favored areas Payment for environmental services Conclusions *focus F: Adaptation to and mitigation of climate change in agriculture* Acute water scarcity will be apparent. According to the Comprehensive Assessment of Water Management in Agriculture, approximately 1.2 billion people live in river basins with absolute water scarcity (figure 2.1); 478 million live in basins where scarcity is fast approaching; and a further 1.5 billion suffer from inadequate access to water because of a lack of infrastructure or the human and financial capital to tap the available resources (chapter 8). The Middle East and North Africa and Asia face the greatest water shortages, although there are pockets of severe water scarcity in all other regions as well. Over-abstraction of water and drawing down on aquifers: Large areas of China, South Asia, and the Middle East and North Africa are now maintaining irrigated food production through unsustainable extractions of water from rivers or the ground. The groundwater overdraft rate exceeds 25% in China and 56% in parts of northwest India. With groundwater use for irrigation expected to continue rising, often driven by subsidised or free electricity, the degradation of groundwater aquifers from overpumping and pollution is certain to become more severe (chapter 8). Rising energy costs will affect agriculture both on the supply side given high use of energy in machinery and fertilisers, and on the demand side as the demand for biofuels rises.
Competitiveness and value chains	5 Bringing agriculture to the market (p. 118) focus D: Agribusiness for development (p. 135) 6 Supporting smallholder competitiveness through institutional innovations
Rural transitions	With development, with see two things: the share of GDP in agriculture falls, as does the share of the labour force - but the latter is disproportionately high, and poverty tends to be both rural and agricultural. As other sectors, moreover, although rural incomes often rise, the gap between town and country usually widens - see East Asia. ***Three ways out of poverty:*** through farming, the non-farm economy and migration. In all three respects, there are good and bad ways to do this: farming can be subsistence or commercial; non-farm jobs can pay well or very badly; and migration can be a ladder up or an act of desperation.
Other concerns	

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