

The Political Economy of Ethiopian Cereal Seed Systems: State Control, Market Liberalisation and Decentralisation

Dawit Alemu

Abstract This article explores the political and economic processes governing Ethiopian cereal seed systems. The nature of the Ethiopian agricultural sector, the historical evolution of the seed system and the seed specificities for each cereal crop have resulted in a wide range of actors with diverse linkages and policy processes. A series of economic and political drivers are identified, including top-down state-driven initiatives; agricultural liberalisation and the private sector and political-administrative decentralisation, all of which pull in different directions. It is important that the technocrats, politicians, international donors and supporters understand these political and economic drivers of change and by addressing these conflicts and contradictions, they may improve the chances of designing and implementing more technically effective and socially appropriate policies. This will help establish a vibrant seed system which offers real choices for farmers in terms of seed type, quantity, and quality and delivery time at reasonable prices.

1 Introduction

This article examines the political and economic processes governing Ethiopian cereal seed systems. It does this by analysing the overall policy context, along with the main interests driving seed policy formulation and implementation and the roles and interaction of the different public and private actors. It also examines how these interests and interactions are related to the performance of the system on the ground.

By focusing on three key political economic drivers of change within the seed system – state control, market liberalisation and decentralisation – the article asks: How are seed related policies and implementation guidelines created? How do ideas about what makes ‘good’ policy and implementation guidelines evolve and change over time? Whose voices and views are taken into account in the policy process? What are the key arguments for the choice of actions? What spaces exist for new ideas, actors and networks, and how can these be opened up? And finally, what urgent national/regional seed policy

issues and processes need to be considered for creation of a vibrant seed system within the country?

2 Ethiopia’s seed system

Along with the establishment of the formal agricultural research system in the late 1950s, the formal seed system in Ethiopia started with public sector support, mainly targeting the then state-owned farms. Even following the era of market liberalisation in the early 1990s, the formal seed system is still dominated by the public sector, although different actors, including the private sector, with different incentives and motives are playing increasingly important roles.

The seed sector is of paramount importance to Ethiopia. It plays a dominant role in the economy, representing about 45 per cent of the GDP and 85 per cent of export earnings, with the livelihoods of 85 per cent of the population of 79 million people being primarily based on agriculture. The real GDP for Ethiopia has risen by 48 per cent, in real terms since 2002/03 and this economic growth has been strongly

Table 1 Importance of cereals in terms of area and production (2008/09 production season)

Crop	Area		Production	
	Ha (millions)	Grain land (%)	Qt (millions)	Grain production (%)
Teff	2.5	22.13	30.28	1769
Maize	1.8	15.77	39.32	22.97
Wheat	1.5	12.97	25.37	14.83
Sorghum	1.6	14.41	28.04	16.38
Total cereals	8.8	78.23	144.96	84.69

Source: CSA (2009).

associated with the good performance of the agricultural sector, particularly from 2004 (FAO and WFP 2008). There are multiple reasons for this growth, including area expansion along with an upward trend in input use (mainly improved seeds, fertiliser and other agro-chemicals) (Beyene Tadesse 2008; Byerlee *et al.* 2007). The state pursues an Agricultural Development Led Industrialisation (ADLI) strategy, and agriculture is central to the current Growth and Transformation Plan (GTP), which targets to double agricultural production by 2015 mainly through scaling up the productivity level of smallholder farmers/pastoralists to the productivity level of model farmers.

According to the Central Statistical Agency of Ethiopia (CSA 2009) about 12 million smallholder farmers were engaged in the production of cereal crops in the 2008/09 production season and cereals covered 78 per cent (8.8 million ha) of the total grain crop area. Among cereal crops, teff, maize, wheat and sorghum were dominant (Table 1).

By contrast with other countries in Africa, including those discussed in other articles in this *IDS Bulletin*, Ethiopia is highly reliant on informal seed provision and local varieties. In Ethiopia, most seeds are supplied through an informal seed system where there is no legal certification. This includes retained seed by farmers, farmer-to-farm seed exchange and cooperative or NGO-based seed multiplication and distribution. During the 2008 main *meher* growing season, it is estimated that at least 95 per cent of all seeds used were local seeds carried over from the previous harvest either by the farmers themselves (through the traditional on-farm selection process, whereby the farmer

identifies next year's seed stock while it is still maturing in the field, and gives it special protection) or by buying from preferred seed stock kept by other farmers in the same locality (FAO and WFP 2008).

The formal seed system, on the other hand, is a system that involves the production and distribution of basic seed, mainly by the research system or certified multipliers (like ESE, the regional seed enterprises, as well as recently licensed private seed companies like ANO and Agri-Ceft Ethiopia) and certified seed by public seed enterprises and private seed companies. The average contribution of the formal seed sector as a percentage of cultivated land was only 4.3 per cent in 2008, with considerable variability among different crops. Among the major cereals, 19 per cent of the maize area, 6 per cent of the wheat area and under 1 per cent of teff areas were covered with seed from the formal sectors (NSPDC 2009). The role of different actors in the formal seed system is summarised in Table 2.

Seed policy is also being influenced by donors who are interested in strengthening the national seed system through different programmes. These include the Program for Africa's Seed System (PASS), of the Alliance for a Green Revolution in Africa (AGRA), an initiative of the Bill & Melinda Gates and Rockefeller Foundations, and the Agricultural Growth Program (AGP) of the World Bank (2009), specifically targeting the Ethiopian seed system through technical support and investment. Seed policy issues at the regional level are also being addressed. For example, the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), which represents the National Agricultural Research

Table 2 Major actors in the formal seed system and their role

Components of the seed system	Institutions	Regulatory bodies	Regulatory measures
Plant breeding	EIAR, RARIs, and HLLs	MoARD	Targets in terms of crop, improvement targets
Variety release	NVRC	MoARD	Distinctiveness, uniformity and stability, uniqueness, value for cultivation
Breeder seed production	EIAR, RARIs, and HLLs	Variety Maintaining Research Centre	Seed quality control
Pre-basic seed production	EIAR, RARIs, HLLs and ESE, OSE, ASE		Seed quality control
Basic seed production	ESE	MoARD	Seed quality control
Basic seed distribution and sale	MoARD		Fair distribution among regions
Certified seed production	ESE, OSE, Private seed companies	MoARD	Seed quality control
Farmer-based seed production	ESE, BoARDs, NGOs and farmers	BoARDs	Seed quality control
Seed distribution and sales	ESE, OSE, ASE, Co-operatives, BoARDs	BoARDs	Price, quantity to respective buyers
Overall sight on the seed system	National Seed Production and Distribution Committee	MoARD/EIAR	Planned production Fair distribution of different classes of seed

Source Adapted from Zewdie Bishaw *et al.* (2008).

EIAR, Ethiopian Institute of Agricultural Research; RARI, Regional Agricultural Research Institute; HLLs, higher learning institutes; NVRC, National Variety Release Committee; ESE, Ethiopian Seed Enterprise; OSE, Oromiya Seed Enterprise; ASE, Amhara Seed Enterprise; BoARDs, Bureaus of Agriculture and Rural Development; MoARD, Ministry of Agriculture and Rural Development.

Systems, together with the Common Market for Eastern and Southern Africa (COMESA), which promotes regional trade and investment, is fostering the harmonisation of seed policies in the region. As a member of these regional organisations, Ethiopia has started reviewing the way its seed policy will be harmonised with those of neighbouring countries.

Much of the politics around cereal system seeds revolve around the formal seed sector, as it is assumed to be the sector which will narrow the gap in cereal productivity levels between the current (~12 quintals/ha) and potential productivity levels (~30 quintals/ha). In recent years, there has been a growing recognition that agricultural technologies (and notably improved seed) are available and can considerably improve productivity. With much variability among the different crops, the total supply of improved seed

in the country was only 27 per cent of the officially estimated potential demand in 2005 (Spielman *et al.* 2010; Dawit Alemu and Spielman 2006). Supply is still far below demand, although there are many efforts underway aimed at increasing production and distribution by strengthening the public and private sectors, alongside promoting community-based seed systems. A central strand of current policy thinking is therefore the push to ‘modernise’ the seed system, encouraging uptake of new varieties as part of a strengthening of the formal seed system. The narratives on crop productivity and seed supply gaps therefore frame policy debates, and drive a focus on modernisation and formalisation of the seed system as part of the overall GTP.

The remainder of this article explores the political–economic dynamics which shape these

policy discussions around the Ethiopian seed system, focusing on three themes: (1) the central role of the public sector in maintaining strategic control over the seed sector through top-down, state-led initiatives and coordination; (2) the policy consequences of economic liberalisation and the opening up of the seed sector to private actors; and (3) the challenges and opportunities associated with decentralised political administration and efforts to establish a truly decentralised seed system.

The analysis is based on information generated from secondary data sources and from primary key informant interviews from a diverse group of actors in the system, including farmers, researchers, experts at Ethiopian Seed Enterprise (ESE) and regional seed enterprises, as well as the Ministry of Agriculture and Rural Development (MoARD) and the Bureau of Agriculture and Rural Development (BoARD).

3 The Ethiopian cereal seed system: policies and politics

The Ethiopian seed sector is governed by policies stipulated in the different public proclamations and regulations that were put in place since the early 1990s (Dawit Alemu *et al.* 2010). The main responsibility of implementing these policies is given to MoARD at the federal level and to Bureaus of Agriculture and Rural Development (BoARDs) at regional level.

This section looks at two contrasting policy initiatives: one driven centrally by the federal government and the other more focused at the local level centred on farmer-based seed multiplication programmes.

3.1 The Crash Seed Multiplication Programme

The Crash Seed Multiplication Programme (CSMP) was designed with the main objective of alleviating the serious supply shortage of improved seeds as compared to demand mainly for hybrid maize. It started in the 2008/09 production season through mobilisation of all relevant public sector institutions, including MoARD, EIAR, ESE, and state farms in multiplication of hybrid maize varieties starting from breeder, pre-basic, basic and certified seed, targeting the production of 730,000 quintals of certified hybrid maize seed for the 2010 production season (MoARD 2009). The programme is run by a National Seed

Multiplication and Distribution Committee (NSMDC) composed of three members from three institutions, i.e. from the Ethiopian Institute of Agricultural Research (EIAR), Ethiopian Seed Enterprise (ESE) and Agricultural Marketing Directorate of MoARD.

The CSMP involved assigning Bako Agricultural Research Centre, the national centre of excellence for maize research, to focus on the production of breeder and pre-basic seed, and the strengthening of the capacity of relevant research centres to produce breeder, pre-basic and basic seed twice per year using irrigation. State farms were deployed for basic seed and certified seed multiplication during both the off-season and main season. Accordingly, about 10,000ha were prepared for planting and about 37 per cent of the prepared land was under hybrid maize seed multiplication using irrigation. This has increased the supply of certified hybrid seed from about 87,000 quintals in 2008/09 to 193,000 quintals in the 2010/11 production season (MoARD 2005–2010).

3.2 Farmer-based seed production and marketing

In contrast to the top-down, centrally driven Crash programme, decentralised, locally run farmer-based seed production and marketing schemes (FBSPMS) are also being promoted. Currently, the ESE, in collaboration with the respective regional BoARD, is implementing the schemes. The newly established seed enterprises are also following suit in promoting seed production, mainly for open-pollinated crop varieties (OPVs) through a similar scheme (Dawit Alemu and Tripp 2010).

These schemes improve the possibility of seed production of locally demanded varieties and crops for which there is less commercial interest. There is also an increased possibility of producing and marketing seed within communities, so reducing seed costs (Yonas Sahlu *et al.* 2008). Production sites can also serve as demonstration sites, thereby possibly enhancing the adoption of crop varieties.

Farmer Based Seed Multiplication (FBSM) approaches are thus playing an important role in the national seed system. In terms of the formal seed system, they are the main source of raw seed for the public seed enterprises. All the emerging regional seed enterprises base the production of

seed for OPV crops on FBSM and similarly, a considerable amount of seed for ESE is produced under FBSM, representing 19 per cent of the total. Of the total 63 crop varieties produced by ESE, 44 of them are also produced under FBSM. Much of the seed produced under FBSM is reused by farmers locally, resulting in low recovery rates by seed enterprises. This is due to the limited price incentives of the ESE compared to the black market prices. Seed quality is also an issue affecting FBSM, where on average 94 per cent of the produced seed from cereals and about 80 per cent from pulses was approved.

The FBSM strategy has offered an important route to increasing seed availability through a decentralised system, but there remain challenges of sustainability. The system relies on external support, intensive training of farmers, and supervision, quality control and overall management. Contract enforcement is difficult, and price risks have to be borne.

These two initiatives represent the two ends of a spectrum – from a decentralised, local approach, to a centralised, command-oriented approach. Both are seen as routes to addressing the crop production and seed supply gaps, and so responding to an Ethiopian vision of the Green Revolution initiated through state planning and support. What then are the underlying political and economic factors that influence policy outcomes in Ethiopia? The next section explores three competing drivers.

4 The economic and political drivers of the Ethiopian cereal seed system

In realising the Ethiopian Green Revolution, three political–economic drivers pull in different directions. These are the influence of top-down state-driven initiatives; attitudes towards agricultural liberalisation and the private sector and the dynamics of political–administrative decentralisation in Ethiopia. These combine to shape Ethiopian seed policy and the form of Ethiopia’s attempts at fostering a Green Revolution.

4.1 Centrally driven state initiatives

Over many years, Ethiopia’s agricultural policy framework has been dominated by a top-down, centrally designed, state-directed approach. This has been continuous from the Imperial regime, through the Derg, and to the current political

setting. Whether the integrated rural development programmes of the 1960s, the package programmes of the 1970s, the villagisation efforts of the 1980s or the input supply programmes led by Sasakawa Global 2000 of the 1990s, all have seen a central role for the state in directing rural development, organising delivery and supplying technology. This remains the case today, with the CSMP being a good example.

With agricultural production and food security so high up on the political agenda, at present, the main driver in the seed systems of the country is related to the political decisions to increase and sustain the agricultural growth that has been achieved in the last five years, where the sector has been growing more than 10 per cent annually. The result has been a series of top-down initiatives coming from federal level and supported at the highest political levels. These highlight the importance of technical and institutional change – and the central role of improved seeds in this. A major effort has revolved around ‘Agricultural Technology Scaling-up’ as part of the national initiative of ‘scaling-up of best practices’, which includes wider dissemination of already available agricultural technologies (mainly improved crop varieties and fertiliser) and continuous packaging and validation of technologies; promoting the involvement of the private sector, and working together with donors and development partners.

There is a strong commitment that such activities should have political leadership. Thus, starting from the 2008/09 production season, top policymakers at all levels (federal, regional, zonal, *woreda* and *kebele*) are given as their number one responsibility in promoting the scaling-up of best practices in the agricultural sectors the priority to ensure that improved technologies (in particular, seeds and fertiliser) reach farmers. This form of ‘command agriculture’, linked to centrally defined targets, is embedded in the evaluation criteria for government officials, and in turn linked to budget allocations and performance assessments.

With such strong political backing, this becomes perhaps the number one driver of the seed system. Directed by and through the central state, it reinforces state control over the agricultural system, and acts to pull into line regional differences and diversity in a centrally

managed planning system. While such politically directed centralised initiatives are informed by technical expertise, such technical designs are sometimes overshadowed by political imperatives, creating tensions between the technocracy and the political system.

4.2 The private sector

The Ethiopian state has an ambivalent attitude to economic liberalisation and the private sector. While committed to opening up the economy and attracting investment, directed state control is always evident, as part of a carefully managed transition. Currently, different incentives are provided to support the private agricultural investment, either through overall investment incentives and/or seed sector-specific support. These incentives are related to preferential access to land, duty-free import of capital goods and grace periods of up to five years on land rents and tax holidays (MoTI 2007). In addition, the government is supporting the organisation of the private seed companies through the creation of the Ethiopian Seed Growers and Processors' Association. Although still weak, the association is improving the engagement of emerging private seed companies in the system.

While the private sector is growing, it remains poorly integrated into the national seed production and distributions system and focuses only on particular seeds, i.e. hybrid maize in some regions. Under the current set-up, all private seed companies, except the multinational private seed company, are dependent on the public supply of source seed (basic seed) and also have to align to the public distribution system. Even the currently licensed private seed companies who own parental lines for the popular hybrid maize varieties remain aligned to the public distribution channels and pricing mechanism. This has created a disincentive for the private seed companies to invest in distribution channels and market outlets. This discouragement also is the core reason for lack of seed shops and retail outlets in Ethiopia, unlike other countries where agro-dealers are central to delivery systems.

The only multinational seed company operating in Ethiopia is Pioneer Hi Bred Ethiopia, which has its own source seed and some distribution network. The major issue preventing increased participation of multinationals in the Ethiopian

seed system is the financial regulation that limits the repatriation of foreign currency. This legislation has created a disincentive for most multinationals interested in becoming involved in the country's seed system.

Emerging private seed companies are therefore constrained by publicly dictated source seed supply, limited business opportunities in participating in OPV seed production due to low demand, and only partially liberalised seed markets. In practice, despite the policy rhetoric and profile, the private sector remains weak and fragmented, and state interests – particularly those which are centrally directed with a strong political push – continue to dominate the formal seed sector. Tensions therefore exist between the state and the emergent private sector. While there has been much policy rhetoric about the benefits of liberalisation in Ethiopia, the state retains a strong hold over market actors, either through market disincentives (e.g. price setting) or limiting certain operations (e.g. distribution).

Again, the argument of the strategic importance of food and agriculture and the perceived weak presence of the private sector is deployed to argue for strong state control, even in notionally privatised operations.

4.3 The decentralised political–administrative system

Constitutionally, Ethiopia has a strong commitment to a decentralised political–administrative system. This means the agricultural and rural development efforts are decentralised to the respective regional states under the general national policy framework. The seed system in the country is also becoming decentralised, following the emergence of Regional Agricultural Research Institutes (RARIs) in the late 1990s and Regional Seed Enterprises (RSEs) in early 2009, where the role of ESE as a sole public seed enterprise is ceasing. Two regional Seed Enterprises, namely the Oromiya Seed Enterprise (OSE) and Amhara Seed Enterprise (ASE) were established by their respective regional governments in December 2009. Southern Nations, Nationalities and Peoples Region (SNNPR) also established the South Seed Enterprise in early 2010.

The experience so far shows that the decentralisation of the seed system has both opportunities and challenges. The opportunities

are related to: better research coverage of the different agro-ecologies; improved possibility of expanding the production and marketing of seed for all crops; improving the human and physical capacity at regional level; improving the possibility of producing locally demanded crop varieties; and the possibility of marketing at relatively lower cost due to reduced cost of transportation. The challenges are related to: the need for strong national coordination of agricultural research and development, seed production and marketing activities for better efficiency and creation of institutional synergies; avoiding unnecessary competition among the three regional seed enterprises for the same resources, such as facilities, human resources and markets; and if the regional seed enterprises are to serve only their respective regions, the role of ESE will need to be redefined as a national seed enterprise.

Since 2008, centralised approaches like the CSMP have also come into tension with the decentralised political-administrative system and the decentralised seed system. While highly controlled in many ways (centrally set targets, central appropriation of source seeds, etc.), there remains room for manoeuvre within the regional system, with bureaus of agriculture and local regional politicians having some important areas of autonomy (like setting regional targets, independent planning for established regional seed enterprises, etc.). Thus, parallel efforts may emerge with federal and regional state-level initiatives running side by side.

These three drivers therefore interact to create a particular political-economic setting for policymaking on seeds and agricultural development in Ethiopia. The result is a very particular style of 'Green Revolution' in Ethiopia, one that differs in important respects from other countries in the region. The role of the state remains central, and the private sector, in the context of decentralised political-administrative systems is deployed in line with broad objectives set by the state.

5 Conclusion

Across each of the elements of the seed system – from breeding, to source seed maintenance and multiplication, to basic seed and certified seed production and distribution to price setting – the state dominates, with its mandate for production

and distribution, as well as regulation. The private sector is encouraged to play a more active role in the system, but in reality, its efforts have been fairly circumscribed due to market disincentives or limitation of certain operations.

The historical origins of the current top-down, centrally designed state-directed approach to seed production and distribution can be traced from the Imperial regime through the Derg period to the current political setting. In all modern political eras, the Ethiopian cereal seed system has followed the same approach, with the public sector dominating the formal seed system. The principal target of the system was to serve the needs of large-scale state farms and farmers' cooperatives and fill the gap left by a weak private sector. This bias is still influencing overall policy and planning within the national seed system.

In the last two decades, strong central political leadership committed to growth through agricultural productivity has pushed a vision of a Green Revolution generated by state initiative, supported, in carefully controlled ways, by a partially liberalised private sector. This includes the development of high-yielding varieties of cereal grains, expansion of irrigation infrastructure, facilitation of private agricultural investment and distribution of hybrid seeds, synthetic fertilisers and pesticides to farmers. It is argued that this public-private arrangement is the most effective way of stimulating a Green Revolution, and ensuring broad-based agriculture-led growth (MoFED 2006).

But, as the article has shown, there are limits to this very particular vision of an Ethiopian Green Revolution. For example, in recent years, following a number of major state-led efforts that have mobilised researchers, civil servants and regional officials across the country, it was realised that there was a serious shortage of improved technologies, especially seed. The supply shortages arise from the limited capacity of both public and private seed producers and suppliers. Moreover, there is weak coordination and linkages among actors in the system for seed development, production, multiplication and distribution. Yet it is clear that highly productive technologies require intensive and effective mechanisms for complex coordination and exchange, to allow investment in and operation of different specialised activities. These

mechanisms in turn require an effective institutional environment to govern them (Dorward *et al.* 2005).

Currently, there is no workable national action plan for seed sector development in Ethiopia. The seed quality control system as well as the distribution of breeder, pre-basic and basic seed by NARS are uncoordinated. Furthermore, there is inefficient demonstration and popularisation of newly released varieties by the national public system. Contracts are also poorly enforced within the system, especially those contractual agreements between the public sector and private seed companies, ESE and seed-producing farmers, and seed companies and seed-multiplying farms. The problems are also exacerbated by the limited production and storage capacity of the public seed companies, and the performance of the private seed companies. The public Ethiopian Seed Enterprise (ESE) has an insufficient availability of irrigable land for public production of seed, while the private seed companies focus only on hybrid seed, especially hybrid maize, where there is a sizeable demand and an opportunity to turn a profit. The existence of leftover basic seed by some private companies and the sale of seed through the black market by underreporting the amount of seed produced also undermine policy objectives.

Tensions exist between the technocracy and the political system, especially when technical designs are overshadowed by political imperatives, sometimes misdirecting priorities and investments away from the people and places that need them the most. Centralised approaches have also come into conflict with the decentralised political-administrative system which has sought to promote a decentralised seed system, in part due to the emergence of parallel federal and regional state-level initiatives running side by side. These have led to duplication of effort, wasting of limited resources and unnecessary turf battles. Finally, tensions exist between the state and the emergent private

sector as the state seeks to liberalise the sector, while retaining a strong hold over the market.

With such a singular vision, supported by a strong coalition of state and external donor and investor interests, there is a danger of a narrowing of priorities and potentially a ‘lock-in’ to a limited set of technological-managerial solutions serving particular interests to the exclusion of others. Technology pathways in Ethiopia, with the focus on hybrid varieties and the formal seed system, are increasingly being fashioned by global funding and special interests, sometimes resulting in a lack of involvement of wider stakeholders. Thus, there is a danger that the diverse livelihood pathways and associated agricultural technology demands of the country’s millions of smallholder farmers may not always be well served.

In some quarters, the limits of centrally directed, state-led planning have been realised, with a growing recognition of the importance of private sector actors and new experiments with farmer-based seed multiplication and marketing systems. This has led to important recent changes in policy and practice related to licensing out of basic seed multiplication to both public and private seed companies, expansion of the seed production capacity of public seed enterprises and the promotion of specialisation in the production of the different classes of seed.

As policy in this area develops, we must always remember that the political economy of hunger and poverty looms large in Ethiopia. This continues to focus considerable political attention on increasing economic growth and food security through improved agricultural productivity, with seeds playing a central role in that agenda. This is not just a technical agenda – about new seeds and delivery systems – but one very fundamentally linked to issues of national political economy, and as such, worthy of debate beyond the narrow confines of technical-economic assessments.

References

- Beyene Tadesse (2008) *Applying Historical Precedent to New Conventional Wisdom on Public Sector Roles in Agriculture and Rural Development in Ethiopia*, sponsored by FAO, Rome
- Byerlee, D.; Spielman, D.; Dawit Alemu and Gautam, M. (2007) *Policies to Promote Cereal Intensification in Ethiopia: A Review of Evidence and Experience*, IFPRI Discussion Paper 707, Washington DC: International Food Policy Research Institute
- CSA (2009) 'Report on Area and Production of Crops (Private Peasant Holdings, Meher Season), Agricultural Sample Survey 2008/2009 (2001 E.C.)', Central Statistical Agency, *Statistical Bulletin* 446.I
- Dawit Alemu and Spielman, D.J. (2006) 'The Ethiopian Seed System: Regulations, Institutions and Stakeholders', paper presented at the ESSP Policy Conference 2006, Bridging, Balancing, and Scaling up: Advancing the Rural Growth Agenda in Ethiopia, 6–8 June 2006, Addis Ababa, Ethiopia: Ethiopia Strategy Support Program (ESSP)/IFPRI
- Dawit Alemu and Tripp, R. (2010) *Seed System Potential in Ethiopia: Constraints and Opportunities for Enhancing Production*, IFPRI Working Paper, Washington DC: International Food Policy Research Institute
- Dorward, A.; Kydd, J.; Morrison, J. and Poulton, C. (2005) 'Institutions, Markets and Economic Coordination: Linking Development Policy to Theory and Praxis', *Development and Change* 36.1
- FAO/WFP (2008) *Integrating the Crop and Food Supply and the Emergency Food Security Assessments*, special report of FAO/WFP crop and food security assessment mission to Ethiopia
- MoARD (2009) *The Five Year Seed Plan (2009–2014)*, Addis Ababa, Ethiopia: Ministry of Agriculture and Rural Development
- MoARD (Ministry of Agriculture and Rural Development) (2005–2010) Annual Reports of the Ministry of Agriculture and Rural Development
- MoFED (Ministry of Finance and Economic Development) (2006) *Ethiopia: Building on Progress: A Plan for Accelerated and Sustained Development to End Poverty (2005/06–2009/10)*, Addis Ababa: Ministry of Finance and Economic Development, Federal Democratic Republic of Ethiopia
- MoTI (Ministry of Trade and Industry) (2007) *Export and Investment Incentives Available for Exporters and Investors in Ethiopia*, Addis Ababa, Ethiopia: Export Promotion Department, Ministry of Trade and Industry
- NSPDC (National Seed Production and Distribution Committee) (2009) *Improving Seed Supply and Future Interventions*, Ethiopian Institute of Agricultural Research (Amharic version)
- Spielman, D.; Byerlee, D.; Dawit Alemu and Dawit Kelemwork (2010) 'Policies to Promote Cereal Intensification in Ethiopia: The Search for Appropriate Public and Private Roles', *Food Policy* 35: 185–94
- World Bank (2009) *Assessment of the Formal Seed System in Ethiopia*, report prepared for the Agricultural Growth Program preparation for Ethiopia
- Yonas Sahlü; Belay Simane and Zewdie Bishaw (2008) 'The Farmer-based Seed Production and Marketing Schemes: Lessons Learnt', in Thijssen Marja, Zewdie Bishaw, Abdurahman Beshir and W. de Boef (eds), *Farmers, Seeds, and Varieties: Supporting Informal Seed Supply in Ethiopia*, Wageningen: Wageningen International: 33–46
- Zewdie Bishaw; Yonas Sahlü and Belay Simane (2008) 'The Status of the Ethiopian Seed Industry', in Thijssen Marja, Zewdie Bishaw, Abdurahman Beshir and W. de Boef (eds), *Farmers, Seeds, and Varieties: Supporting Informal Seed Supply in Ethiopia*, Wageningen: Wageningen International: 23–33